FIBROMYALGIA

A MEDICAL DICTIONARY, BIBLIOGRAPHY,
AND ANNOTATED RESEARCH GUIDE TO
INTERNET REFERENCES

JAMES N. PARKER, M.D.
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The collective knowledge generated from academic and applied research summarized in various references has been critical in the creation of this book which is best viewed as a comprehensive compilation and collection of information prepared by various official agencies which produce publications on fibromyalgia. Books in this series draw from various agencies and institutions associated with the United States Department of Health and Human Services, and in particular, the Office of the Secretary of Health and Human Services (OS), the Administration for Children and Families (ACF), the Administration on Aging (AOA), the Agency for Healthcare Research and Quality (AHRQ), the Agency for Toxic Substances and Disease Registry (ATSDR), the Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA), the Healthcare Financing Administration (HCFA), the Health Resources and Services Administration (HRSA), the Indian Health Service (IHS), the institutions of the National Institutes of Health (NIH), the Program Support Center (PSC), and the Substance Abuse and Mental Health Services Administration (SAMHSA). In addition to these sources, information gathered from the National Library of Medicine, the United States Patent Office, the European Union, and their related organizations has been invaluable in the creation of this book. Some of the work represented was financially supported by the Research and Development Committee at INSEAD. This support is gratefully acknowledged. Finally, special thanks are owed to Tiffany Freeman for her excellent editorial support.

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FORWARD

In March 2001, the National Institutes of Health issued the following warning: "The number of Web sites offering health-related resources grows every day. Many sites provide valuable information, while others may have information that is unreliable or misleading."[1] Furthermore, because of the rapid increase in Internet-based information, many hours can be wasted searching, selecting, and printing. Since only the smallest fraction of information dealing with fibromyalgia is indexed in search engines, such as **www.google.com** or others, a non-systematic approach to Internet research can be not only time consuming, but also incomplete. This book was created for medical professionals, students, and members of the general public who want to know as much as possible about fibromyalgia, using the most advanced research tools available and spending the least amount of time doing so.

In addition to offering a structured and comprehensive bibliography, the pages that follow will tell you where and how to find reliable information covering virtually all topics related to fibromyalgia, from the essentials to the most advanced areas of research. Public, academic, government, and peer-reviewed research studies are emphasized. Various abstracts are reproduced to give you some of the latest official information available to date on fibromyalgia. Abundant guidance is given on how to obtain free-of-charge primary research results via the Internet. **While this book focuses on the field of medicine, when some sources provide access to non-medical information relating to fibromyalgia, these are noted in the text.**

E-book and electronic versions of this book are fully interactive with each of the Internet sites mentioned (clicking on a hyperlink automatically opens your browser to the site indicated). If you are using the hard copy version of this book, you can access a cited Web site by typing the provided Web address directly into your Internet browser. You may find it useful to refer to synonyms or related terms when accessing these Internet databases. **NOTE:** At the time of publication, the Web addresses were functional. However, some links may fail due to URL address changes, which is a common occurrence on the Internet.

For readers unfamiliar with the Internet, detailed instructions are offered on how to access electronic resources. For readers unfamiliar with medical terminology, a comprehensive glossary is provided. For readers without access to Internet resources, a directory of medical libraries, that have or can locate references cited here, is given. We hope these resources will prove useful to the widest possible audience seeking information on fibromyalgia.

The Editors

[1] From the NIH, National Cancer Institute (NCI): **http://www.cancer.gov/cancerinfo/ten-things-to-know**.

CHAPTER 1. STUDIES ON FIBROMYALGIA

Overview

In this chapter, we will show you how to locate peer-reviewed references and studies on fibromyalgia.

The Combined Health Information Database

The Combined Health Information Database summarizes studies across numerous federal agencies. To limit your investigation to research studies and fibromyalgia, you will need to use the advanced search options. First, go to **http://chid.nih.gov/index.html**. From there, select the "Detailed Search" option (or go directly to that page with the following hyperlink: **http://chid.nih.gov/detail/detail.html**). The trick in extracting studies is found in the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Journal Article." At the top of the search form, select the number of records you would like to see (we recommend 100) and check the box to display "whole records." We recommend that you type "fibromyalgia" (or synonyms) into the "For these words:" box. Consider using the option "anywhere in record" to make your search as broad as possible. If you want to limit the search to only a particular field, such as the title of the journal, then select this option in the "Search in these fields" drop box. The following is what you can expect from this type of search:

- **Fibromyalgia, Chronic Fatigue Syndrome, and Myofascial Pain Syndrome**

  Source: Current Opinion in Rheumatology. 13(2): 117-127. March 2001.

  Summary: This journal article highlights research on fibromyalgia (FM), chronic fatigue syndrome (CFS), and myofascial pain syndrome to provide health professionals with information on the prevalence, symptoms, etiology, diagnosis, and treatment of these conditions. The prevalence of chronic widespread pain in the general population in Israel was comparable with reports from the United States, United Kingdom, and Canada. Comorbidity with FM resulted in somatic hyperalgesia in patients with irritable bowel syndrome. One sixth of the subjects with chronic widespread pain in the general population were also found to have a mental disorder. Mechanisms involved in referred pain, temporal summation, muscle hyperalgesia, and muscle pain at rest were attenuated by the N-methyl-D-aspartate antagonist, ketamine, in FM patients. Delayed

corticotropin release, after interleukin 6 administration, in FM was shown to be consistent with a defect in hypothalamic corticotropin releasing neural function. The basal autonomic state of FM patients was characterized by increased sympathetic and decreased parasympathetic systems tones. The severity of functional impairment as assessed by the Medical Outcome Survey Short Form discriminated between patients with widespread pain alone and FM patients. CFS occurred in about 0.42 percent of a random community based sample of 28,673 adults in Chicago, IL. A significant clinical overlap between CFS and FM was reported. Cytokine dysregulation was not found to be a singular or dominant factor in the pathogenesis of CFS. A favorable outcome of CFS in children was reported. Two thirds recovered and resumed normal activities. No major therapeutic trials in FM and CFS were reported between 2000 and 2001. Data indicate that ultrasound treatment and trigger point injections were equally effective when combined with neck stretching exercises for the treatment of myofascial pain. 83 references. (AA-M).

- **Circadian Rhythms of Women With Fibromyalgia**

  Source: Journal of Clinical Endocrinology and Metabolism. 86(3): 1034-1039. March 2001.

  Summary: This journal article provides health professionals with information on a study that assessed circadian phase and amplitude in 10 women with fibromyalgia and 12 healthy women using a 40 hour constant routine protocol scheduled relative to each participant's habitual sleep wake cycle. Fibromyalgia syndrome is a chronic and debilitating disorder characterized by widespread nonarticular musculoskeletal pain whose etiology is unknown. Many of the symptoms of this syndrome, including difficulty sleeping, fatigue, malaise, myalgias, gastrointestinal complaints, and decreased cognitive function, are similar to those observed in people whose circadian pacemaker is abnormally aligned with their sleep wake schedule or with local environmental time. Abnormalities in melatonin and cortisol, two hormones whose secretion is strongly influenced by the circadian pacemaker, have been reported in women with fibromyalgia. The study protocol controlled factors known to affect markers of the circadian system, including light levels, posture, sleep wake state, meals, and activity. The timing of the events in the protocol were calculated relative to the habitual sleep wake schedule of each participant. Under these conditions, the study found no significant difference between the women with fibromyalgia and control women in the circadian amplitude or phase of rhythms of melatonin, cortisol, and core body temperature. The average circadian phases expressed in hours posthabitual bedtime for women with and without fibromyalgia were 3:43 plus or minus 0:19 and 3:46 plus or minus 0:13, respectively, for melatonin; 10:13 plus or minus 0:23 and 10:32 plus or minus 0:20, respectively, for cortisol; and 5:19 plus or minus 0:19 and 4:57 plus or minus 0:33, respectively, for core body temperature phases. Both groups of women had similar circadian rhythms in self reported alertness. Although pain and stiffness were significantly increased in women with fibromyalgia compared with healthy women, there were no circadian rhythms in either parameter. The article suggests that abnormalities in circadian rhythmicity are not a primary cause of fibromyalgia or its symptoms. 3 figures, 2 tables, and 30 references. (AA-M).

- **Following the Clues to Fibromyalgia Syndrome**

  Source: Journal of Musculoskeletal Medicine. 18(8): 381-386. August 2001.

  Summary: This journal article provides health professionals with information on the etiology, clinical features, diagnosis, and treatment of fibromyalgia syndrome (FMS). This common condition is characterized by chronic diffuse musculoskeletal pain,

stiffness, tenderness, sleep disturbance, and fatigue. FMS is most common in women between the ages of 30 and 60 years and may result from altered central nociception. According to this model, the combination of genetic factors, infections, and several precipitating influences such as physical and emotional trauma or stress may cause muscle microtrauma and abnormalities in peripheral nerve endings, sleep, and neuroendocrine axes. These abnormalities increase nociceptive transmission from the periphery or stimulate substance P production, causing the dorsal horn spinal neurons to become hyperexcitable. This increased nociceptive input to the brain eventually alters the function of structures that process the sensory discriminative and affective motivational dimensions of pain. The diagnosis of FMS is confirmed by a 3 month history of generalized pain and tenderness to digital palpation at 11 of 18 defined tender point sites. Conditions to rule out in the differential diagnosis include polymyalgia rheumatica, spondyloarthropathy, and endocrinopathy. FMS can be managed with a combination of exercise, physical modalities, and pharmacologic support with analgesics, nonsteroidal antiinflammatory drugs, tricyclic antidepressants, selective serotonin reuptake inhibitors, or sedatives. Education about the nature of the disease is also a very important part of management. 1 figure, 4 tables, and 28 references. (AA-M).

- **Follicular Phase Hypothalamic-Pituitary-Gonadal Axis Function in Women With Fibromyalgia and Chronic Fatigue Syndrome**

  Source: Journal of Rheumatology. 27(6): 1526-1530. June 2000.

  Summary: This journal article provides health professionals with information on a study that tested the hypothesis that women with fibromyalgia (FM) and chronic fatigue syndrome (CFS) manifest abnormalities of the hypothalamic-pituitary-gonadal (HPG) hormonal axis. The study population consisted of 9 premenopausal women with FM, with or without comorbid CFS, and 8 with CFS only. Healthy matched controls were also recruited. The secretory characteristics of estradiol, progesterone, follicle stimulating hormone (FSH), and luteinizing hormone (LH) in the women with FM and CFS were compared to the healthy controls. Blood was collected from an indwelling intravenous catheter every 10 minutes over a 12 hour period. LH was assayed from every sample. Pulses of LH were identified by a pulse detection program. FSH and progesterone were assayed from a pool of hourly samples for the 12 hour period, and estradiol was assayed from samples pooled over four 3 hour time periods. The study found that there were no significant differences in FSH, progesterone, or estradiol levels in patients versus controls. Similarly, no significant differences were found between the patients and the controls for any of the measures of LH. The article concludes that there is no indication of abnormal gonadotropin secretion or gonadal steroid levels in this small, but systematic, study of HPG axis function in patients with FM and CFS. 1 figure, 2 tables, and 23 references. (AA-M).

- **Fibromyalgia in Men: Comparison of Clinical Features With Women**

  Source: Journal of Rheumatology. 27(2): 485-490. February 2000.

  Summary: This journal article provides health professionals with information on a study that investigated possible differences between male and female patients with fibromyalgia (FM) syndrome in their clinical manifestations. The study population consisted of 469 women and 67 men with FM who were consecutively seen by referral at an Illinois university rheumatology clinical and 36 healthy men without significant pain seen in the same clinic. Data on demographic and clinical features were gathered by standard protocol. Tender point (TP) examination was performed by the same physician. The study found that several features were significantly milder or less

common among men than women, including number of TPs, TP score, hurt all over, fatigue, morning fatigue, and irritable bowel syndrome (IBS). The total number of symptoms was also fewer among men and approached significance by parametric test, but reached significance by nonparametric analysis. All clinical and psychological symptoms, as well as TP, were significantly more common or greater in male patients with FM than healthy male controls, with the exception of IBS. Patient assessed global severity of illness, Health Assessment Questionnaire disability score, and pain severity were similar in both sexes. 6 tables and 35 references. (AA-M).

- **Treating Fibromyalgia**

  Source: American Family Physician. 62(7): 1575-1582. October 1, 2000.

  Contact: American Academy of Family Physicians. 11400 Tomahawk Creek Parkway, Leawood, KS 66211-2672. (800) 274-2237 or (913) 906-6000. E-mail: fp@aafp.org. Website: www.aafp.org.

  Summary: This journal article provides health professionals with information on the pathophysiology, diagnosis, and treatment of fibromyalgia. This common chronic rheumatologic condition is characterized by spontaneous, widespread soft tissue pain, sleep disturbance, fatigue, and extensively distributed areas of tenderness known as tender points. Although the etiology of fibromyalgia remains unclear, characteristic alterations in the pattern of sleep and changes in neuroendocrine transmitters such as serotonin, substance P, growth hormone, and cortisol suggest that dysregulation of the autonomic and neuroendocrine system appears to be the basis of the syndrome. The diagnosis depends on findings from the history and physical examination rather than on diagnostic testing. Physical examination will reveal areas of pain on palpation but without the classic inflammatory signs of redness, swelling, and heat in the joints and soft tissue. Although tender points are found in many different locations, the American College of Rheumatology (ACR) has selected 18 sites that are most characteristic for fibromyalgia. To have a definitive diagnosis, a patient must have tenderness on palpation at 11 of the 18 sites and a history consistent with established criteria. The differential diagnosis of fibromyalgia includes hypothyroidism, drug induced myopathies, polymyalgia rheumatica, and other rheumatologic syndromes such as myofascial pain syndrome. Treatment is largely empiric, although experience and small clinical studies have proved the efficacy of low dose antidepressant therapy and exercise. Other less well studied measures, such as acupuncture, chronic opioid analgesic therapy, cognitive behavior training, hypnosis, growth hormone therapy, chiropractic treatment, and support groups, also appear to be helpful. Management relies heavily on the physician's supportive counseling skills and willingness to try novel strategies in refractory cases. 1 figure, 2 tables, and 26 references. (AA-M).

- **Use of Complementary and Alternative Treatments by Individuals With Fibromyalgia Syndrome**

  Source: Journal of the American Academy of Nurse Practitioners. 12(8): 311-316. August 2000.

  Summary: This journal article provides nurse practitioners with information on a study that investigated the use of complementary and alternative medicine (CAM) treatments for people who have fibromyalgia syndrome (FMS). Although muscle pain is the primary complaint of patients who have FMS, there are many associated symptoms that cause them to seek health care. Some people try CAM treatments when conventional medicine does not provide symptom relief. The study gathered descriptive information

regarding the use of CAM treatments by people with FMS and the perceived effectiveness of those treatments. The study also gathered qualitative data from patients with FMS regarding what they felt was effective in managing their disease on a daily basis. A questionnaire was developed to collect information on CAM treatments and their effectiveness. Sixty people visited a web page and completed and submitted the online questionnaire about FMS. The most frequently tried intervention was literature, which includes accessing books, videos, and newsletters to gain knowledge about FMS. Heat therapy and walking were the second most tried CAM treatments, followed by vitamins, stretching, and massage therapy. Literature, aromatherapy, support groups, heat therapy, and massage therapy were rated the most effective. The most common means of coping with FMS was availability and use of medications for pain and sleep. Other important coping mechanisms were support from groups, family, friends, and counselors, as well as the ability of the person with FMS to learn his or her body's signals. 3 figures, 3 tables, and 11 references. (AA-M).

- **Pain of Fibromyalgia, The**

  Source: Today's Dietitian. 2(7): 20-23. July 2000.

  Summary: This journal article provides dietitians with information on fibromyalgia syndrome (FMS). The diagnosis of FMS requires that at least 11 of 18 tender points located in the neck, shoulders, hip, elbows, and knees cause pain and that generalized pain has lasted for at least 3 months. People who have FMS also experience consistent sleep pattern disruptions. Women are affected more often than men. Investigations are moving away from an etiology based on muscle or joint disruptions toward a neurological or endocrinological basis. Common therapies for FMS include self-care approaches, and drug therapies targeted at specific symptoms. The most promising drug treatments involve drug combinations such as fluoxetine in the morning and amitriptyline in the evening. Another combination uses alprazolam and ibuprofen to reduce tender point sensitivity. Dietetic practitioners can often help patients who are considering self medications in the form of vitamins, minerals, botanicals, and supplemental preparations. Supplements or herbs that may be of interest to patients with FMS include SAMe, magnesium supplements, ginger, and St. John's wort. Nutrition therapists can also help patients maximize restorative sleep by reviewing nutritional habits and lifestyle factors likely to interrupt sleep. Therapists can help patients evaluate sources of muscle tension or repetitive motion that might exacerbate pain. In addition, dietetic practitioners can address real health factors rather than perceived risk by focusing nutrition therapy sessions on nutrition and lifestyle rather than weight.

- **Fibromyalgia Syndrome in Children and Adolescents**

  Source: Journal of Musculoskeletal Medicine. 17(3): 142-146,148-150, 156-158. March 2000.

  Summary: This journal article provides health professionals with information on epidemiology, etiology, clinical presentation, differential diagnosis, and management of fibromyalgia syndrome in children and adolescents. Juvenile primary fibromyalgia syndrome (JPFS) involves a triad of diffuse or widespread chronic pain, fatigue, and sleep disturbance that occurs in children and adolescents. The cause of JPFS is unknown, and the true prevalence of the condition is unknown as well. Most children are 11 to 13 years old at the time JPFS is diagnosed but have had symptoms for months or years. Girls and young women appear to be affected more often than boys. There may be a tendency for fibromyalgia syndrome (FMS) and JPFS to occur in families. The pain of

JPFS is generally more diffuse than that of other conditions that cause discomfort during childhood. Morning stiffness and gelling are quite common. Other symptoms are a subjective feeling of swelling, headache, paresthesias, and irritable bowel syndrome. Patients with JPFS often suffer from depression, which may be primary or secondary. The differential diagnosis is complicated because many patients who have systemic lupus erythematosus or juvenile rheumatoid arthritis also suffer from secondary fibromyalgia. The differential diagnosis also includes mechanical or traumatic conditions, infection, and malignancy. The treatment approach for children who have JPFS is generally similar to that for adults with FMS, except that the child's age, development stage, and social settings are taken into account. Management includes emotional support; encouragement to return to school and other normal activities; exercise; pharmacotherapy with nonsteroidal antiinflammatory drugs, tricyclic antidepressants, serotonin reuptake inhibitors, and analgesics; cognitive behavioral therapy; and support groups. In some cases, formal psychotherapy is necessary. 2 figures, 4 tables, and 28 references. (AA-M).

- **Trauma and Fibromyalgia: Is There an Association and What Does It Mean?**

  Source: Seminars in Arthritis and Rheumatism. 29(4): 200-216. February 2000.

  Summary: This journal article provides health professionals with information on the role of trauma in fibromyalgia (FM) by reviewing current research literature, including Medline from 1979 to the present. The strongest evidence supporting an association between trauma and FM is a recently published Israeli study in which adults with neck injuries had greater than 10 fold increased risk of developing FM within 1 year of their injury compared with adults with lower extremity fractures. Several other studies provide a hypothetical construct for such an association. These include studies on postinjury sleep abnormalities, local injury sites as a source of chronic distant regional pain, and the concept of neuroplasticity. There are, however, several primary arguments against such an association, including the following: FM may not be a distinct clinical entity; FM may be a psychological, rather than physical, disease; the evidence supporting any association is limited and not definitive; the Israeli study, itself, has some methodological limitations; and other factors may be more important than the injurious event in determining chronic symptoms after an acute injury. The article concludes that, although there is some evidence supporting an association between trauma and FM, the evidence is not definitive. Further prospective studies are needed to confirm this association and to identify whether trauma has a causal role. The establishment of such an association likely would be a major step in understanding the biopsychosocial mechanisms by which FM develops. 3 tables and 205 references. (AA-M).

- **Autonomic Nervous System Dysfunction May Explain the Multisystem Features of Fibromyalgia**

  Source: Seminars in Arthritis and Rheumatism. 29(4): 197-199. February 2000.

  Summary: This editorial provides health professionals with information on the possible role of autonomic nervous system (ANS) dysfunction in the multisystem features of fibromyalgia (FM). The ANS is a network that works below the level of consciousness to maintain homeostasis. This network regulates the function of different organs and glands through antagonistic sympathetic or parasympathetic stimulation. Heart rate variability (HRV) analysis is a new tool used to evaluate the performance of the ANS. The editorial reviews several studies on HRV in FM patients. One study found that FM patients had a deranged sympathetic response to an active orthostatic stress. Another

study found that FM patients had a decreased 24 hour HRV when compared with healthy controls, suggesting a decreased parasympathetic activity over the sinus node. A third study confirmed that sympathetic hyperactivity is frequent in FM. These studies strongly support the notion that ANS dysfunction is frequent in FM. Thus, an unrelenting sympathetic hyperactivity with concurrent hyporeactivity can theoretically explain the multisystem manifestations of FM. 17 references.

- **Effective Management of Fibromyalgia**

  Source: Journal of Musculoskeletal Medicine. 16(11): 622-624,634-637. November 1999.

  Summary: This journal article provides health professionals with information on the nonpharmacologic and pharmacologic treatment options that are currently considered to be the most effective for patients who have fibromyalgia (FM). This common chronic condition is characterized by musculoskeletal pain, nonrestorative sleep, fatigue, and psychosomatic problems. While management is tailored individually, almost all patients can benefit from education, reassurance that FM is not deforming or crippling, and support. A combination program of stretching and aerobic exercise is also helpful. Explaining the cause of pain during exercise and encouraging the patient to work through the discomfort may promote compliance. The most helpful pharmacologic agents include tricyclic antidepressants and selective serotonin reuptake inhibitors (SSRIs). Tricyclic antidepressants are thought to work by inhibiting neuronal reuptake of serotonin and prolonging stage 3 and 4 nonrapid eye movement sleep. For patients who have not responded to a low dose of tricyclic antidepressants, a 20 milligrams per day dose of the SSRI fluoxetine may be added. Electroacupuncture, biofeedback, and hypnotherapy have helped some patients who have FM. Cognitive behavioral therapy (CBT) includes education and cognitive techniques and may be supplemented by relaxation and exercise and delivered in a group setting. Several studies have shown that CBT programs, while not suitable for all patients, appear to be at least as effective as drug therapy and may offer a sustained benefit. 3 figures, 2 tables, and 24 references. (AA-M).

- **Fibromyalgia Syndrome: A Comprehensive Approach to Identification and Management**

  Source: Clinical Excellence for Nurse Practitioners. 3(3): 165-171. May 1999.

  Summary: This journal article provides health professionals with information on key elements in the identification and management of patients who have fibromyalgia syndrome (FMS), a chronic, noninflammatory musculoskeletal disorder of unknown etiology seen predominantly in women. It is recognized as an important clinical problem associated with high levels of functional disability, emotional distress, and utilization of several types of medical services. Although widespread pain and the presence of multiple tender points are the dominating features, a large number of nonrheumatic symptoms and associated conditions occur frequently in this disorder. Other symptoms include fatigue, generalized stiffness, depression, and anxiety. Associated disorders include irritable bowel syndrome, chronic fatigue syndrome, tension headaches, migraine, temporomandibular pain, urinary frequency, and palpitations. When the characteristic pattern of symptoms is recognized, FMS can be successfully managed by nurse practitioners, with some improvement expected. The mainstays of treatment include patient education, medication, aerobic exercise, and physical therapy. An ongoing relationship with the patient and periodic followup are mandatory. 2 tables and 43 references. (AA-M).

- **Is Acupuncture Effective in the Treatment of Fibromyalgia?**

  Source: Journal of Family Practice, The. 48(3): 213-218. March 1999.

  Summary: This journal article provides health professionals with information on a study that assessed the effectiveness of acupuncture in the treatment of fibromyalgia syndrome (FMS), identified any adverse effects, and generated hypotheses for future investigation. Researchers searched MEDLINE, EMBASE, Manual Therapy Information System, the Cochrane registry, the University of Maryland Complementary and Alternative Medicine in Pain, the Centralized Information Service for Complementary Medicine, and the National Institutes of Health Office of Alternative Medicine databases for the key words 'acupuncture' and 'fibromyalgia.' Conference abstracts, citation lists, and letters supplemented the search. Selected for study inclusion were all randomized or quasi randomized controlled trials or cohort studies of patients with FMS who were treated with acupuncture. Methodologic quality, sample characteristics, type of acupuncture treatment, and outcomes were extracted. Three randomized controlled trials and four cohort studies were included. Only one was of high methodologic quality. The high quality study suggests that real acupuncture is more effective than sham acupuncture for relieving pain, increasing pain thresholds, improving global ratings, and reducing morning stiffness of FMS, but the duration of benefit following the acupuncture treatment series is not known. Some patients report no benefit, and a few report an exacerbation of FMS-related pain. Lower quality studies were consistent with these findings. Booster doses of acupuncture to maintain benefit once regular treatments have stopped have been described anecdotally but not investigated in controlled trials. The article concludes that further high quality randomized trials are needed to provide more robust data about the effectiveness of acupuncture in FMS. 2 tables and 25 references. (AA-M).

- **Silicone Filled Breast Implants and the Risk of Fibromyalgia and Rheumatoid Arthritis**

  Source: Journal of Rheumatology. 26(9): 2025-2028. September 1999.

  Summary: This journal article provides health professionals with information on a study that investigated the hypothesis that silicone breast implants (SBIs) might be causally related to the development of fibromyalgia (FM). The study also examined the relationship of SBI to the subsequent development of rheumatoid arthritis (RA). Using a longitudinal databank, implantation status was determined in 464 patients with RA, 508 patients with FM, 261 with osteoarthritis (OA) of the knee or hip, and 503 randomly selected community controls. Data were obtained on the type of implant and its temporal relationship to the onset of FM and RA. Of the 14 implants, 12 were silicone filled and 2 were saline filled. Of the six FM patients with silicone filled implants, two of the silicone filled implants postdated the onset of FM and four preceded the development of FM. Regardless of the controls used and the implantation type, no association was noted between RA and implantation. No association between predisease silicone filled implantation and FM was detected regardless of the control group that was used. When all subjects without FM were considered as controls, the odds ratio (OR) for the effect of implantation on FM was 1.22. However, when all implants were considered, the OR for the relationship between implants and FM was 2.45. The article concludes that, although no relationship between prior SBI and the subsequent development of FM or RA was noted, implants appeared to be more common in patients with than in those without FM. A common, predisposing set of psychosocial characteristics may be shared between those who have FM and those who undergo SBI. 2 tables and 33 references. (AA-M).

- **Joint Hypermobility in Patients With Fibromyalgia Syndrome**

  Source: Arthritis Care and Research. 11(1): 39-42. February 1998.

  Summary: This journal article for health professionals describes a study that ascertained the simultaneous presence of fibromyalgia and joint hypermobility to validate the hypothesis that joint hyperlaxity (JH) may have a role in the pathogenesis of pain in fibromyalgia. On the basis of five criteria, 66 women with fibromyalgia and 70 women with other rheumatic diseases were examined for joint laxity. Those meeting four or five criteria were considered to be hyperlax. Results show that JH was detected in 18 of the women with fibromyalgia and in 8 of those with other rheumatic pathologies. Statistical analysis reveals significant differences between the groups. JH is associated with fibromyalgia more frequently than other rheumatic pathologies are, and it may have a prominent role in the pathogenesis of pain in fibromyalgia as well. 2 tables and 21 references. (AA-M).

- **Fibromyalgia: Recognizing and Treating an Elusive Syndrome**

  Source: Physician and Sportsmedicine. 26(4): 55-57,61-65. April 1998.

  Summary: This journal article provides health professionals with information on the diagnosis and treatment of fibromyalgia (FM). This noninflammatory, diffuse pain syndrome of unknown cause, primarily affects women between puberty and menopause. Symptoms, in addition to musculoskeletal pain and tender points, can include fatigue, nonrestorative sleep, and depression. A precipitating event such as abrupt cessation of exercise, physical injury, or prior debilitating illness can often be identified. Aerobic exercise is usually protective, but sporadic training patterns or other precipitants can place even well trained athletes at risk. Patients must satisfy two criteria before FM can be diagnosed. First, bilateral, widespread pain above and below the waist, involving the axial skeleton, must be present for at least 3 months. Second, the patient must verbally declare the presence of pain at 11 of 18 sites on application of pressure. Patients need to know that they can alter the course of this syndrome. Treatment should include attempts to reverse the precipitating event, plus education, aerobic exercise, correction of any sleep disturbance, analgesia, and physical therapy. 1 figure, 3 tables, and 21 references. (AA-M).

- **Practical Solutions to the Mystery of Fibromyalgia**

  Source: JAAPA: Official Journal of the American Academy of Physician Assistants. 11(1): 26-28,32,37. January 1998.

  Summary: This journal article provides health professionals with information on the diagnosis of and treatment for fibromyalgia. This nonarticular rheumatic disorder, which is characterized by diffuse musculoskeletal pain, chronic fatigue, and nonrestorative sleep, is associated with a multitude of symptoms. The first step in diagnosis is to obtain a thorough history to exclude other disorders and to rule out psychological abnormalities. Various laboratory tests are cost effective and reliable. The second component of the diagnosis is based on the history and physical examination. The patient must have pain at 11 of 18 tender points on digital palpation. Key factors in managing fibromyalgia include establishing a good rapport with the patient, minimizing further diagnostic tests, identifying precipitating and aggravating events, identifying associated conditions that may require treatment, and introducing a multidisciplinary treatment plan. Treatment may consist of antidepressant therapy, pharmacological therapy with nonsteroidal anti-inflammatory drugs, behavior modification, and psychological intervention. The prognosis is usually good for patients

who have been ill for less than a year, for those who are willing to take active responsibility for their well-being, and for those whose onset of symptoms is clearly defined. 18 references.

- **Fibromyalgia Syndrome: Formulating a Strategy for Relief**

  Source: Journal of Musculoskeletal Medicine. 15(11): 4-8,17-21. November 1998.

  Summary: This journal article provides health professionals with information on the epidemiology, natural history, diagnosis, and management of fibromyalgia syndrome (FMS). FMS is a chronic condition characterized by widespread pain, stiffness, fatigue, and other symptoms. Although FMS can present at any age, its onset is most common among persons who are in their mid-40s. Approximately 3.5 percent of women and 0.5 percent of men in the United States have FMS. The natural outcome of FMS appears to be unaltered persistence of symptoms over time. Most patients with FMS present classically with a history of widespread pain that has been present for 3 months or more. The pain is most pronounced in the soft tissue regions. In addition to pain, patients may have other complaints, including sleep and cognitive difficulties and gastrointestinal problems. Diagnosis is confirmed by the presence of a low pain threshold to firm pressure in at least 11 of 18 well defined tender points in all 4 quadrants of the body. The most effective care combines support, exercise, physical modalities, and pharmacologic therapy. A combination of nonsteroidal anti-inflammatory drugs and an anxiolytic or low dose tricyclic muscle relaxant appears to be the most beneficial approach. The efficacy of tricyclic compounds may decrease over time, but this can be managed by a 4 week drug holiday to reestablish normal nerve cell receptor density. Other pharmacologic agents that appear to be beneficial include the selective serotonin reuptake inhibitor fluoxetine and capsaicin cream. Followup is individualized and primarily serves to document the severity of tender point pain and reinforce patient participation in therapy. The article also discusses the role of substance P, a neuropeptide that helps initiate the process of nociception; serotonin; and physical trauma in FMS. In addition, the article lists identifies helpful videos and Internet resources. 1 figure, 5 tables, and 22 references. (AA-M).

- **Neuroscience and Endocrinology of Fibromyalgia, The**

  Source: Journal of Musculoskeletal Pain. 6(3): i-xiv,1-105. 1998.

  Summary: This journal provides health professionals with an overview of the neuroscience and endocrinology of fibromyalgia syndrome (FMS). Articles in this issue are from participants who attended the second National Institutes of Health Conference on FMS. The conference focused on the process of pain signal transmission to perception, sleep physiology, and neuroendocrine function. Contributors in the chronic pain segment of the conference provided evidence that the central nervous system (CNS) may be primarily involved in FMS through altered pain modulatory mechanisms, presented an overview of how peripheral tissue or nerve injury often results in hyperalgesia characterized by increased sensitivity to painful stimuli, and described a model for chronic pain that suggests that FMS is a disorder characterized by abnormal CNS processing of sensory or nociceptive stimuli. Other contributors in this segment examined the role of substance P in FMS, discussed animal models of gender differences in pain and analgesia, and reviewed the evidence for cognitive behavioral interventions in the rheumatic diseases. Contributors in the neuroendocrine segment of the conference provided an overview of the physiology and phenomenology of the stress system and its complex interactions with other endocrine and neurological pathways and with the immune system, reviewed studies addressing the effects of early environmental

exposures on the stress system, discussed interactions between the hypothalamic pituitary adrenal axis and hypothalamic pituitary gonadal axis, considered the responses of the sympathetic nervous and adrenomedullary hormonal systems to stressors, and reviewed research supporting an association between FMS and perturbed function of stress response systems and other neuroendocrine axes. Sleep segment topics included animal models of sleep and sleep deprivation influences on behavior and immune function in animals. 8 figures, 3 tables, and numerous references.

- **Putting the Finger on Fibromyalgia: The Manual Tender Point Survey**

  Source: Journal of Musculoskeletal Medicine. 14(1):61-64,67; January 1997.

  Summary: This journal article for health professionals presents a quick, standardized technique for evaluating tender points in patients with fibromyalgia. The article covers proper pressure application technique, precise identification of survey sites, and management of problems that may arise during the examination. The demonstration of tenderness in at least 11 of 18 specified locations throughout the body is one of the criteria used for the classification of fibromyalgia. The tender point evaluation is a key part of the diagnostic process because other findings in fibromyalgia are often nonspecific. For greatest reproducibility, the survey should be conducted at the start of the physical examination, precisely identifying survey sites and palpating each site just once with 4 kilograms of pressure. Pain at each point is scored on an 11-point scale, based on the patient's response to palpation. Determining the fibromyalgia intensity score is helpful when comparing patients or following them over time. 6 references, 2 figures, and 3 tables. (AA-M).

- **Exercise Training in Treatment of Fibromyalgia**

  Source: Journal of Musculoskeletal Pain. 5(1):71-79; 1997.

  Summary: This journal article for health professionals describes a study that evaluated a steady exercise program and an aerobic dance program in the treatment of fibromyalgia syndrome (FMS). Of the 176 patients invited to participate in the treatment program, only 38 volunteered. Fifteen were randomized to a slowly increasing dance program three times a week and 15 to a steady exercise program twice a week. The remaining eight received hot packs twice a week as a control intervention. All treatments continued for 12 weeks. Only 5 participants in the aerobic group, 11 participants in the steady exercise group, and 7 participants in the hot pack treatment group completed the trial. Results reveal that, after 12 weeks, there was no improvement in pain, fatigue, general condition, sleep, Beck's depression score, functional status, muscle strength, or aerobic capacity in any of the groups. The very low percentage of volunteers, the high percentage of withdrawals, and the absence of improvements in aerobic capacity illustrate the difficulty in treating FMS with physical modalities. 27 references and 1 table. (AA-M).

- **Standardized Manual Tender Point Survey. I. Development and Determination of a Threshold Point for the Identification of Positive Tender Points in Fibromyalgia Syndrome**

  Source: Journal of Rheumatology. 24(2):377-383; 1997.

  Summary: This journal article for health professionals describes a study that attempted to develop a standardized tender point examination protocol as a diagnostic procedure to evaluate the tender point criterion for fibromyalgia. The study also examined the sensitivity and specificity of the Manual Tender Point Survey (MTPS). The MTPS

consisted of standardized components, including location of the survey sites, patient and examiner positioning, order of examination, pressure application technique, and pain severity rating scores. Seventy patients with fibromyalgia and 70 with chronic headache were examined using the MTPS protocol. Results show that a pain severity score of 2 was found to be an optimal threshold point for identifying positive tender points, with sensitivity of 88.57 percent and specificity of 71.43 percent. These results are comparable to the sensitivity and specificity of the 1990 multicenter study of criteria for the classification of fibromyalgia. Results demonstrate that the MTPS provides a step-by-step, standardized tender point examination protocol that is sensitive and specific in discriminating patients with fibromyalgia from patients with chronic headache. An appendix presents MTPS general procedures. 24 references, 1 figure, and 3 tables. (AA-M).

- **Treating Sleep Disorders in Patients With Fibromyalgia**

  Source: Journal of Musculoskeletal Medicine. 14(6):25-28,33-34; June 1997.

  Summary: This journal article for health professionals reviews current knowledge about sleep disorders in patients with fibromyalgia and the treatment strategies currently used. Sleep disturbance may be central to the fibromyalgia syndrome. Many patients have difficulty in falling and staying asleep and awaken unrefreshed with intensified morning aching. Alpha-delta sleep, in which internally triggered arousal results in delta sleep deprivation, appears responsible. Moreover, such triggers may also lead to depressed and anxious mood, fatigue, morning stiffness, and musculoskeletal pain, which, in turn, contribute to the nonrestorative sleep cycle. Success in improving sleep is greatest when general approaches and specific sleep interventions are combined. Psychotherapy, behavioral therapy, and exercise may lead to better sleep habits and symptomatic relief. Tricyclic agents improve sleep and overall functioning. Benzodiazepines administered with nonsteroidal anti-inflammatory drugs may improve sleep and decrease tenderness. 29 references and 2 tables. (AA-M).

- **Fibromyalgia: Syndrome of the '90s**

  Source: Arthritis Today. 41-42,44-47; September-October 1997.

  Summary: This journal article for the general public and individuals with fibromyalgia presents an overview of fibromyalgia. Research providing evidence that fibromyalgia pain has a biological basis is highlighted. Findings regarding some common theories about the cause of fibromyalgia are summarized, focusing on findings related to muscle abnormalities, abnormal levels of the neurotransmitters substance P and serotonin, low testosterone and cortisol levels, heredity, emotional or physical trauma in childhood, and autoimmunity. In addition, current thinking on the cause and treatment of fibromyalgia is discussed.

- **Fibromyalgia, Chronic Fatigue, and Other Iatrogenic Diagnostic Algorithms**

  Source: Postgraduate Medicine. 102(2):161-162,165-166, 171-172,175-177; August 1997.

  Summary: This journal article for health professionals explains how applying diagnostic labels to patients in a vulnerable state may actually escalate illness, thus teaching patients to stay sick. The article uses the diagnostic labels of chronic fatigue, irritable bowel syndrome, and fibromyalgia to illustrate how such labeling may perpetuate illness, and it presents the diagnostic criteria for these conditions. In addition, arguments against a major role for psychological illness in fibromyalgia are provided. The article concludes that the disease-illness paradigm may be harmful to certain

individuals and that physicians need to learn about circumstances where hunting for a diagnosis may be harmful to the health of the patient. 46 references and 4 tables.

- **Musculoskeletal Complaints and Fibromyalgia in Patients Attending a Respiratory Sleep Disorders Clinic**

  Source: Journal of Rheumatology. 23(9):1612-1616; 1996.

  Summary: This journal article for health professionals describes a study that examined the prevalence of musculoskeletal complaints, including tender point score and diagnosis of fibromyalgia (FM), in 108 consecutive patients attending a respiratory sleep disorders clinic. The study also examined the association of physical activity and levels of reported pain. Assessment of musculoskeletal pain symptoms included patient history of pain, painful sites marked on a mannequin, visual analog scale (VAS) pain score, and tender point count. Daily physical activity was recorded, and all patients underwent nocturnal polysomnography, blind to clinical status. Results indicate that FM was identified in 3 patients. Pain reporting was more strongly associated with reduced physical activity than with a specific sleep disorder. Patients with reduced physical activity were more likely to have pain symptoms than physically active patients, six or more tender points, three or more sites marked on a mannequin, axial pain, and VAS pain score. The article concludes that FM by defined criteria was uncommon in patients with a primary complaint of disturbed sleep, and in particular, patients with sleep apnea. Reduced physical activity was strongly associated with reported pain symptoms. 35 references and 4 tables. (AA-M).

- **Self-efficacy Predicting Outcome Among Fibromyalgia Subjects**

  Source: Arthritis Care and Research. 9(2):97-104; April 1996.

  Summary: This journal article for health professionals describes a study that examined whether pre-treatment self-efficacy and pre- to post-treatment changes in self-efficacy predicted post-treatment tender point index, disease severity, pain, and physical activity among individuals with fibromyalgia syndrome (FMS). One hundred nine subjects with fibromyalgia were assessed before and after a 6-week training intervention. Measures included tender point index, physician ratings of disease severity, the visual analog scale for pain, the Physical Activities subscale of the Arthritis Impact Measurement Scales, and the Arthritis Self-Efficacy Scale. Results indicate that pretreatment self-efficacy significantly predicted post-treatment physical activity, with higher self-efficacy associated with better physical activity outcome. Changes in self efficacy significantly predicted post-treatment tender point index, disease severity, and pain. Improvements in self-efficacy were associated with better outcomes on each measure. Results demonstrate that self-efficacy has an important role in understanding effective treatment of FMS. 30 references and 5 tables. (AA-M).

- **Fibromyalgia Benefits From Massage Therapy and Transcutaneous Electrical Stimulation**

  Source: Journal of Clinical Rheumatology. 2(1):18-22; February 1996.

  Summary: This journal article for health professionals describes a study that determined the effects of massage therapy on pain, depression, and anxiety associated with fibromyalgia syndrome (FMS). Thirty adult FMS subjects were randomly assigned to a massage therapy, a transcutaneous electrical stimulation (TENS), or a transcutaneous electrical stimulation no-current group (Sham TENS) for 30-minute treatment sessions 2 times per week for 5 weeks. Results indicate that the massage therapy subjects reported

lower anxiety and depression and that their cortisol levels were lower immediately after the therapy sessions on the first and last days of the study. The TENS groups showed similar changes, but only after therapy on the last day of the study. Results show that the massage therapy group improved on the dolorimeter measure of pain. In addition, they reported less pain the last week, less stiffness and fatigue, and fewer nights of difficult sleeping. Results suggest that massage therapy was the most effective therapy with this group of FMS patients. 14 references and 3 tables. (AA-M).

- **Exercise Program for Fibromyalgia**

  Source: American Family Physician. 53(5). April 1996.

  Contact: American Academy of Family Physicians. 11400 Tomahawk Creek Parkway, Leawood, KS 66211-2672. (800) 274-2237 or (913) 906-6000. E-mail: fp@aafp.org. Website: www.aafp.org.

  Summary: This journal article for individuals with fibromyalgia discusses the incorporation of an exercise program into their daily life. The nature of fibromyalgia is explained, and the importance of exercise for relieving fibromyalgia symptoms is discussed. Guidelines for walking, walking and jogging, and bicycling are provided.

- **The Effects of Bright Light Treatment on the Symptoms of Fibromyalgia**

  Source: Journal of Rheumatology. (23)5:896-902. 1996.

  Summary: This article investigates the effects of bright light treatment on the symptoms of pain, mood, and sleep in patients with fibromyalgia (FM) reporting seasonality of symptoms on the Seasonal Pattern Assessment Questionnaire (SPAQ). A randomized 10-week crossover study compared the effects of 4 weeks of visible electromagnetic fields (EMF) to 4 weeks of nonvisible EMF in 14 patients with FM having a minimum SPAQ score of 11. The light visor system was fitted with an opaque filter for the nonvisible EMF control condition. Results show no significant differences between treatment conditions on tenderness measured with dolorimetry , self-ratings of sleep, pain, mood, and global measures. Mood was not related to pain or sleep. There was significant reduction in depression scores and subjective pain, but increased tenderness and nocturnal awakenings related to time. 3 tables, 36 references.

- **Fibromyalgia Syndrome: Blueprint for a Reliable Diagnosis**

  Source: Consultant. 1260-1262,1265-1266,1271-1272,1274; June 1996.

  Summary: This journal article for health professionals addresses the concerns that physicians most often have about fibromyalgia syndrome (FMS). The biophysiologic mechanisms and clinical features of FMS are described. This syndrome is characterized by chronic, widespread musculoskeletal pain, fatigue, poor sleep, and paresthesias. Associated problems include headaches, irritable bowel syndrome, dysmenorrhea, and restless legs syndrome. About 90 percent of patients with FMS are women. FMS is not a diagnosis of exclusion. The presence of another disease, such as rheumatoid arthritis, does not rule out FMS. There are no specific diagnostic laboratory tests. The diagnosis is based on a history of widespread pain for a minimum of 3 months and the presence of at least 11 tender points among 18 sites on digital palpation. FMS is not a variant of depression, but psychological factors and co-morbid conditions may aggravate symptoms. 26 references, 3 figures, and 4 tables. (AA-M).

- **Fibromyalgia Syndrome: Is There Any Effective Therapy?**

  Source: Consultant. 1279-1285; June 1996.

  Summary: This journal article for health professionals addresses the concerns that physicians most often have about the treatment of fibromyalgia syndrome (FMS). A variety of nonpharmacologic and pharmacologic therapies are available for patients with FMS. An empathetic attitude on the physician's part is particularly important. Mildly symptomatic patients usually respond well to patient education; physical therapy; an exercise program; simple analgesics; and, in some cases, low doses of a tricyclic antidepressant, cyclobenzaprine, or trazodone. Patients with severe symptoms usually require higher doses of these drugs or combined therapy with a tricyclic agent and a selective serotonin reuptake inhibitor. Valuable adjunctive therapies include cognitive behavior therapy, which may be particularly beneficial in patients with poor coping skills, and the injection of tender points with lidocaine or a mixture of lidocaine and triamcinolone diacetate. Recalcitrant symptoms or an acute flare-up may require a short course of acetaminophen with low-dose codeine. 14 references, 2 figures, and 3 tables. (AA-M).

- **Pain, Disability, and Physical Functioning in Subgroups of Patients with Fibromyalgia**

  Source: Journal of Rheumatology. 23(7):1255-62; 1996.

  Summary: This journal article describes a study investigating whether patients with fibromyalgia (FM) could be subgrouped on the basis of psychosocial and behavioral responses to pain; and the relationships among pain severity, perceived disability, and observed physical functioning, as measured by cervical spinal mobility. A group of 117 patients with FM responded to a questionnaire, underwent physical performance tasks during the evaluation, and completed self-report inventories. Findings reveal approximately 84 percent of the patients could be classified into the Multidimensional Pain Inventory clustering groups identified and validated in patients with a range of chronic pain problems (Dysfunctional, Interpersonally Distressed, and Adaptive Copers). Although the three groups exhibited comparable levels of physical functioning, the Dysfunctional and Interpersonally Distressed patients reported higher levels of pain, disability, and depression. Interpersonally Distressed patients also reported significantly lower levels of marital satisfaction than the other two subgroups. There were significant associations between pain severity and perceived disability, and pain severity and physical functioning, defined by spinal mobility tests. The relationship between disability and physical functioning did not reach statistical significance. Correlational analyses by subgroups revealed a significant association between patient-perceived disability and physical functioning in the Adaptive Copers, but not the Dysfunctional or Interpersonally Distressed patients. Researchers concluded that the differential relationships between perceived disability and physical functioning across cluster groups suggest the importance of FM syndrome as a heterogeneous disorder, and that treating patients with FM as a homogeneous group may compromise research results, impede understanding of the mechanisms underlying this condition, and deter development of effective treatment. 43 references, 4 tables, 2 figures. (AA-M).

- **Exercise Program in the Treatment of Fibromyalgia**

  Source: Journal of Rheumatology. 23(6):1050-1053; 1996.

  Summary: This journal article for health professionals describes a study that assessed the utility of an exercise program, which included aerobic, flexibility, and strengthening

elements, in the treatment of the chronic musculoskeletal condition known as fibromyalgia (FM). Sixty patients who met American College of Rheumatology criteria for FM and had no significant comorbidities participated in the study. Measurements performed on each patient at the pre study and post study assessments included the number of tender points (TP), total myalgic scores (TM), aerobic fitness (AF), flexibility, and isokinetic strength. After initial evaluation, patients were randomly assigned to either an exercise or a relaxation group. Each group met 3 times per week for 6 weeks for 1 hour of supervised exercise or relaxation. Eighteen patients from the exercise group and 20 patients from the relaxation group completed the study. Results indicate that there was no significant difference between the groups in their pre study assessments; however, post study assessments showed a significant improvement between the exercise and relaxation groups in TP, TM, and AF. Similar improvements were also found when the pre study and post study assessments of the exercise group were compared. Although results show that FM patients can undertake an exercise program that includes strength training without adverse effects, any exercise program undertaken by FM patients would be individualized and developed by instructors with a knowledge of FM. 20 references and 2 tables. (AA-M).

- **Fibromyalgia Syndrome: Current Concepts in Pathophysiology, Clinical Features, and Management**

  Source: Arthritis Care and Research. 9(4):315-328; August 1996.

  Summary: This journal article for health professionals reviews recent studies on the pathophysiology and clinical features of fibromyalgia. Researchers have examined diverse mechanisms in fibromyalgia, including studies of muscle, sleep physiology, regional cerebral blood flow, neurohormonal function, and psychological status. Findings from these studies support a central mechanism for fibromyalgia. The clinical features of fibromyalgia are discussed in terms of its epidemiology, outcome and natural history, diagnosis, tender points, overlap with chronic fatigue syndrome, and association with myofascial pain syndrome and other conditions. Controlled and uncontrolled trials of various treatment modalities are summarized, focusing on controlled trials of psychotropic agents such as tricyclic agents and other antidepressants, anti-inflammatory agents, and other central nervous system active medications; controlled trials of exercise therapy; and controlled trials of nonconventional therapy such as electromyography biofeedback, acupuncture and electroacupuncture, and hypnotherapy; and uncontrolled therapeutic trials. In addition, a suggested approach to management is presented, and the issue of assessing severity, functional impairment, and disability is considered. 124 references and 3 tables.

- **Fibromyalgia and Chronic Fatigue Syndrome: Similarities and Differences**

  Source: Rheumatic Disease Clinics of North America. 22(2):219-243; May 1996.

  Summary: This journal article for health professionals examines the similarities and differences between fibromyalgia (FM) and chronic fatigue syndrome (CFS). CFS and FM are clinical conditions characterized by a variety of nonspecific symptoms, including prominent fatigue, myalgia, and sleep disturbances. There are no diagnostic studies or widely accepted, pathogenic explanatory models for either illness. Despite remarkably different diagnostic criteria, CFS and FM have many demographic and clinical similarities. Similarities and differences in the epidemiologic, clinical, laboratory, and psychiatric features of FM ad CFS are discussed, as are the prognosis and treatment of these conditions. This discussion reveals that few differences exist in the domains of symptoms, examination findings, laboratory tests, functional status, psychosocial

features, and psychiatric disorders. FM appears to represent an additional burden of suffering among those with CFS. Further clarification of the similarities and differences between CFS and FM may be useful in studies of the prognosis and help define subsets of patients who may benefit from specific therapeutic interventions. 178 references and 5 tables. (AA-M).

- **Is There Muscle Pathology in Fibromyalgia Syndrome?**

  Source: Rheumatic Disease Clinics of North America. 22(2):245-266; May 1996.

  Summary: This journal article for health professionals highlights early muscle studies of fibromyalgia syndrome and reviews recently reported studies of muscle in fibromyalgia that involved the use of biopsies, forearm ischemic exercise testing, nuclear magnetic resonance spectroscopy, blood flow and strength measurements, and electromyography (EGM). Muscle pain has been the main symptom of fibromyalgia syndrome, so studies of muscle have been of interest to researchers. Results of recent studies of morphology show only nonspecific or mild muscle abnormalities, perhaps consistent with subtle metabolic changes, at tender point sites. Studies of muscle metabolism, however, have failed to confirm abnormalities in muscle metabolism, both at tender and nontender point locations. Studies of muscle blood flow also demonstrate abnormalities that can be explained by deconditioning alone. Studies of muscle strength that show differences between patients and controls can be explained by lack of voluntary effort. In aggregate, studies using EGM techniques show no evidence of excessive muscle tension or defective sympathetic nervous function. Therefore, although muscle pain has been a major feature of fibromyalgia, controlled muscle studies fail to support a convincing role for muscle in the pathophysiology of this condition. 72 references, 2 figures, and 1 table. (AA-M).

- **Evidence That Abnormalities of Central Neurohormonal Systems Are Key to Understanding Fibromyalgia and Chronic Fatigue Syndrome**

  Source: Rheumatic Disease Clinics of North America. 22(2):267-284; May 1996.

  Summary: This journal article for health professionals discusses the specific neurohormonal abnormalities found in fibromyalgia (FM) and chronic fatigue syndrome (CFS). FM and CFS can be categorized as stress-associated syndromes by virtue of frequent onset after acute or chronic stressors and apparent exacerbation of symptoms during periods of physical or emotional stress. These illnesses also share perturbation of the hypothalamic-pituitary-adrenal (HPA) axis and sympathetic stress response systems. Potential mechanisms by which dysfunction of neurohormonal stress-response systems could contribute to vulnerability to stress-associated syndromes and to the symptoms of FM and CFS are examined, focusing on findings from studies of the HPA axis, sympathetic nervous system, other neurohormonal systems, and serotonin. A neurohormonal hypothesis of the pathogenesis of FM and CFS is presented. 86 references, 2 figures, and 1 table. (AA-M).

- **Relationship Between Fibromyalgia and Major Depressive Disorder**

  Source: Rheumatic Disease Clinics of North America. 22(2):285-303; May 1996.

  Summary: This journal article for health professionals reviews evidence on the relationship between fibromyalgia and major depressive disorder. Studies that have assessed the possible association between fibromyalgia and major depressive disorder are summarized, focusing on studies that have examined phenomenology, personal and family history of psychiatric and medical disorders, response to antidepressant

medications, and results of laboratory tests. Although this evidence is not entirely consistent, it favors an association between fibromyalgia and major depressive disorder because of overlapping symptomatology, a similar pattern of comorbid disorders, and high rates of major depressive disorders among relatives of patients with fibromyalgia. There is additional support for an association on the basis of responses to psychological tests and rating scales and the high lifetime rates of mood disorders in fibromyalgia. Two lines of evidence, response to antidepressant medications and response to biologic tests, provide little support either for or against an association. However, findings cannot be explained by the hypothesis that fibromyalgia causes depression or vice versa. Therefore, it appears most likely that both disorders share some unknown common etiologic factor. 89 references and 2 tables. (AA-M).

- **Cost-effective Approach to the Diagnosis and Treatment of Fibromyalgia**

  Source: Rheumatic Disease Clinics of North America. 22(2):323-349; May 1996.

  Summary: This journal article for health professionals suggests a comprehensive but simple approach to the myalgic patient, with an emphasis on the confounding features of fibromyalgia. This condition is no longer solely a diagnosis of exclusion. It can now be confidently diagnosed using the positive features of the patient's illness and classified according to well-defined criteria. The diagnosis of fibromyalgia is discussed in terms of its characteristic presenting features and ancillary features. Other syndromes and diseases that present with myalgia or weakness that may be confused with fibromyalgia are identified. A simple algorithmic approach to differential diagnosis is presented. Studies on various pharmacologic and nonpharmacologic approaches to treating fibromyalgia are reviewed. Clinical trials have been conducted on such drugs as amitriptyline, cyclobenzaprine, and alprazolam. Nonpharmacologic treatments include cardiovascular fitness training, electromyography biofeedback training, electroacupuncture, hypnotherapy, and cognitive behavioral therapy. In addition, a cost effective treatment strategy for patients with fibromyalgia is presented. Level of intervention is tailored to the degree of functional impairment experienced at clinical presentation or followup. 80 references, 2 figures, and 2 tables. (AA-M).

- **Multidisciplinary Group Programs to Treat Fibromyalgia Patients**

  Source: Rheumatic Disease Clinics of North America. 22(2):351-367; May 1996.

  Summary: This journal article for health professionals focuses on the concept of team care for fibromyalgia patients. Fibromyalgia is a complex pain syndrome that is multifactorial in the generation of symptoms. Current ideas on etiology favor the development of a central pain sensitization state that is driven by nociceptive impulses from muscle and other soft tissues. The resulting state of chronic pain leads to physiologic arousal that in turn generates many of the symptoms that are characteristic of the total syndrome. The secondary symptoms due to physiologic arousal are often amenable to modification through the techniques of cognitive behavioral therapy. The rationale for the use of a multidisciplinary group approach to treating fibromyalgia patients is presented. The composition of the treatment team is described, and a multidisciplinary program is discussed in terms of logistics and content. Multidisciplinary education in the areas of sleep hygiene, pacing, aerobic exercise, stretching, stress reduction, and therapeutic options provides fibromyalgia patients with more control and enhances their interaction with clinicians. Features of fibromyalgia that need to be addressed on an individual basis include management of myofascial pain, improved sleep, exercise, and psychological issues. 59 references, 3 figures, and 1 table. (AA-M).

- **Fibromyalgia and Work Disability: Is Fibromyalgia a Disabling Disorder?**

  Source: Rheumatic Disease Clinics of North America. 22(2):369-391; May 1996.

  Summary: This journal article for health professionals addresses the issues of disability determination in fibromyalgia from legal and medical viewpoints. Fibromyalgia appears to be an increasingly important source of disability claims and payments. Twenty-five percent of patients seen in rheumatology clinics have received disability payments. Social Security disability (SSD) is discussed in terms of the process of disability determination in the Social Security system, the requirements for consideration for SSD, and court decisions on fibromyalgia and disability. Limitations regarding the reliability and validity of diagnosis and physician or SSD severity assessments in the medicolegal setting are identified. Physician guidelines are provided for determining whether an individual is work disabled, handling dual roles, and preparing a disability report for a patient with fibromyalgia. Data concerning the rate of work disability are summarized. In addition, the issue of whether trauma causes fibromyalgia is addressed. 44 references, 1 figure, and 3 tables. (AA-M).

- **What Is the Future of Fibromyalgia?**

  Source: Rheumatic Disease Clinics of North America. 22(2):393-406; May 1996.

  Summary: This journal article for health professionals reviews the current state of the art in regard to fibromyalgia (FM) and chronic fatigue syndrome (CFS) and suggests potential future etiologic and pathophysiologic studies of FM. Future studies should focus on the overlapping features of these disorders and how they relate to other poorly understood syndromes, such as depression, irritable bowel syndrome, and migraine headache. The areas of therapeutic trials, longitudinal and outcome studies, and the role of the rheumatology community in the future of FM are discussed, and the conclusions reached about future directions in each of these areas are presented. 48 references, 2 figures, and 2 tables. (AA-M).

- **Rheumatic Disease Clinics of North America. Controversies in Fibromyalgia and Related Conditions**

  Source: Orlando, FL: W.B. Saunders Company. May 1996. 199 p.

  Contact: Available from W.B. Saunders Company, 6277 Sea Harbor Drive, Orlando, FL 32821-9816. (800) 654-2452. PRICE: $104.00 per year (U.S. individuals), $131.00 per year (U.S. institutions), $147.00 per year (foreign individuals), $157.00 per year (foreign institutions).

  Summary: This journal for health professionals focuses on controversies in fibromyalgia and related conditions. Article contributors discuss the similarities and differences between fibromyalgia (FM) and chronic fatigue syndrome (CFS), studies on muscle in fibromyalgia syndrome, the neurohormonal abnormalities in FM and CFS, the relationship between FM and major depressive disorder, the distinction between trigger points and tender points, a cost-effective approach to the diagnosis and treatment of FM, the use of multidisciplinary group programs to treat FM patients, disability determination in individuals with FM, the current state of knowledge about FM and CFS, and future directions for research on FM and CFS. Numerous references, 13 figures, and 19 tables.

- **Clinical Overview of the Fibromyalgia Syndrome**

  Source: Journal of Musculoskeletal Pain. 4(1/2):9-34; 1996.

Summary: This journal article for health professionals presents an overview of fibromyalgia syndrome (FMS). Topics addressed include the definition of FMS; the core features of FMS, primarily pain and widespread tenderness over discrete anatomical areas; the prevalence of FMS; and the overlap of FMS with such other pain syndromes as Lyme disease and chronic fatigue syndrome. Studies on various pharmacologic and nonpharmacologic approaches to treating fibromyalgia are reviewed. Clinical trials have been conducted on such drugs as amitriptyline, cyclobenzaprine, and alprazolam. Nonpharmacologic treatments include cardiovascular fitness training, electromyography biofeedback training, electroacupuncture, hypnotherapy, and cognitive behavioral therapy. In addition, a treatment strategy for patients with fibromyalgia is presented. This strategy tailors the level of intervention to the degree of functional impairment experienced at clinical presentation or followup. 79 references, 1 figure, and 3 tables.

- **Contribution of Muscle to the Generation of Fibromyalgia Symptomatology**

  Source: Journal of Musculoskeletal Pain. 4(1/2):35-59; 1996.

  Summary: This journal article for health professionals reviews studies of muscle in fibromyalgia that involved the use of biopsies, nuclear magnetic resonance spectroscopy, respiratory gas exchange, muscle blood flow and strength measurements, and observations of muscle tension. Clinical observations that indicate that muscles are the source of pain in FM are highlighted. Animal studies that provide information on the pathophysiology of muscle pain and the way in which focal muscle pain can spread to other areas are discussed. The role of muscle injury in FM is considered. Feedback loops resulting from chronic stress are described. In addition, a hypothetical schema for FM is presented. This schema postulates that chronic widespread pain results in various feedback loops that make up the symptoms of FM and provide a means for perpetuating the syndrome. 96 references and 7 figures.

- **Neurochemical Pathogenesis of Fibromyalgia Syndrome**

  Source: Journal of Musculoskeletal Pain. 4(1/2):61-92; 1996.

  Summary: This journal article for health professionals presents information that provides a basis for a better understanding of the neurochemical processes involved in fibromyalgia syndrome (FS). Clinical features that suggest a neurochemical pathogenesis in FS are identified, including histological diversity of the tissues tender to palpation, a high degree of correlation between the severity of tender points and control points, and a lower-than-normal pain threshold. The process of nociception is defined, and a critical component of the nociceptive system is described. Studies on the role of serotonin, substance P, calcitonin gene-related peptide, and excitatory amino acids in FS are reviewed. In addition, a working model to explain findings about these substances is presented. 70 references, 2 figures, and 9 tables.

- **Hypothalamic-pituitary-adrenal Stress Axis in the Fibromyalgia Syndrome**

  Source: Journal of Musculoskeletal Pain. 4(1/2):181-200; 1996.

  Summary: This journal article for health professionals examines the role of the hypothalamic-pituitary-adrenal (HPA) stress axis in fibromyalgia (FM) syndrome. Stress can be defined as a disturbance that perturbs homeostasis and leads to activation of stereotypical stress-adaptation mechanisms, including the HPA axis and the sympathetic nervous system. Patients with FM syndrome often report the onset of symptoms following an acute stress or a period of intense stress. In addition, symptoms

are commonly exacerbated during periods of stress, and patients report increased levels of daily stress. Results of studies of HPA axis hormones in patients with FM reveal that patients with FM exhibit a unique pattern of HPA axis perturbation characterized by exaggerated adrenocorticotropic hormone response to exogenous corticotropin releasing hormone (CRH) or to endogenous activators of CRH such as insulin-induced hypoglycemia. Patients with FM also have low 24-hour urine free cortisol, low plasma Y neuropeptide, and loss of circadian fluctuation. The conclusion is reached that disturbances in the function of HPA and sympathetic stress-response systems in FM may have a role in the pathophysiology of the syndrome. 59 references, 4 figures, and 4 tables. (AA-M).

- **Association Between IBS and Fibromyalgia**

  Source: Functional Brain Gut (FBG) Research Group Newsletter. 26: 3, 15-17. Spring 2001.

  Contact: Available from University of North Carolina at Chapel Hill. Department of Medicine. 726 Burnett-Womack, Campus Box 7080, Chapel Hill, NC 27599-7080. (919) 966-0146. Fax (919) 966-8929. Email: fbgrg@unc.edu. Website: www.unc.edu/depts/fbgrg.

  Summary: Functional disorders have been described and defined in the various organ systems, including the gastrointestinal system. The diagnosis is based primarily on symptom clusters, in most cases with no or minimal findings on physical examination or other diagnostic tests. Psychological comorbidity is often present and many physicians perceive patients with functional illnesses as difficult to treat, although the physician-patient relationship is an important part of successful therapy. This article considers the association between irritable bowel syndrome (IBS) and the fibromyalgia syndrome (FMS). FMS is a soft tissue disorder characterized by diffuse musculoskeletal pain and specific tender points on examination. The author reviews the similarities and differences between the two conditions. Both disorders account for substantial proportions of visits to family physicians and specialists, both have been associated with major life events and personal trauma, and both share treatment strategies including the use of antidepressant medications, psychological behavioral therapies, and hypnosis. The primary difference is that FMS is considered a disorder of somatic hypersensitivity, while IBS is considered a disorder of visceral hypersensitivity. The author stresses that comparative studies of the similarities and differences between these functional disorders require strict adherence to the respective consensus diagnostic criteria. The author concludes that, by clinical impression (unsupported by experimental data) patients with more than one functional syndrome tend to have a consistent focus of complaints that preferentially expresses one of the syndromes over time. 3 figures. 19 references.

- **Fibromyalgia: More than Just a Musculoskeletal Disease**

  Source: American Family Physician. 52(3): 843-851, 853-854. September 1, 1995.

  Summary: This article discusses fibromyalgia, a common condition characterized by diffuse musculoskeletal pain and fatigue. Additionally, people with this syndrome have a high incidence of headaches, ocular and vestibular complaints, paresthesias, esophageal dysmotility, 'allergic' symptoms, irritable bowel syndrome (IBS), genitourinary symptoms, and affective disorders. Recent research has revealed a number of objective biochemical, hormonal, and neurotransmitter abnormalities associated with fibromyalgia, making it a clearly identifiable condition. In discussing the

symptoms, the author hopes to clarify the understanding of the pathogenesis and treatment of fibromyalgia. A patient information handout is included for physicians to photocopy and distribute to their patients with fibromyalgia. 2 figures. 3 tables. 33 references. (AA-M).

- **Myofascial Pain Syndrome and Fibromyalgia: A Critical Assessment and Alternate View**

  Source: Clinical Journal of Pain. 14(1): 74-85. March 1998.

  Summary: This article reviews the clinical diagnoses of myofascial pain syndrome (MPS) and fibromyalgia (FM) and the controversy surrounding these conditions. Many clinicians believe that these problems are being overly diagnosed and that the diagnosis has become a catch-all for patients who say they hurt and have no objective findings (physical signs, or radiologic, histologic, and laboratory findings). The author presents an alternative model within which some chronic myalgias might be considered. The author notes that, unfortunately, some physicians still limit themselves to a biomedical rather than a biopsychosocial model and take an inadequate psychosocial history; thus, they miss the correct diagnosis of somatization and depression. The article is appended with three lengthy commentaries (each with references) and a rebuttal from the original author. 4 tables. 25 references. (AA-M).

- **Chronic Disabling Diseases and Disorders: The Challenges of Fibromyalgia**

  Source: JADA. Journal of American Dental Association. 128(11): 1583-1589. November 1997.

  Summary: For the increasing number of patients with chronic and disabling diseases and disorders, health professionals need to develop a comprehensive understanding of the disease as well as the competence to manage the illness over the long term. The author of this article focuses on the recently defined fibromyalgia syndrome (FMS). FMS includes pain that emanates from tendons, ligaments, bursae, and muscle tissue. In FMS, the symptoms can vary from person to person and may include more generalized discomfort beyond the chronic and widespread craniofacial and skeletal muscular pain with specific tender points. Topics include the criteria for establishing FMS; the epidemiology and etiology of FMS; conditions associated with FMS, including Sjogren's syndrome, and temporomandibular disorder (TMD); treatments for FMS, including palliative therapy, patient education, physical therapy, and counseling; and research into the etiology of FMS. One sidebar lists resource organizations and publications for readers needing additional information. 1 figure.

- **Fibrositis (Fibromyalgia Syndrome) and the Dental Clinician**

  Source: Journal of Craniomandibular Practice. 9(1): 63-70. January 1991.

  Summary: This article informs the general dentist treating temporomandibular joint disorders (TMD) about fibrositis (fibromyalgia syndrome). Fibromyalgia syndrome is a pain syndrome of probable multifactorial and central nervous system origin. Patients may present with spasms in the muscles of mastication, which may mimic joint pain or cause joint dysfunction. Tooth pain, which may mimic endodontic pain, may also be referred from a trigger pain in a muscle. Other topics covered include the differential diagnosis of fibromyalgia syndrome, the association of sleep disorders, trigger points in patients with fibromyalgia syndrome, treatment options, and the natural course of the disease. 89 references. (AA-M).

Federally Funded Research on Fibromyalgia

The U.S. Government supports a variety of research studies relating to fibromyalgia. These studies are tracked by the Office of Extramural Research at the National Institutes of Health.[2] CRISP (Computerized Retrieval of Information on Scientific Projects) is a searchable database of federally funded biomedical research projects conducted at universities, hospitals, and other institutions.

Search the CRISP Web site at **http://crisp.cit.nih.gov/crisp/crisp_query.generate_screen**. You will have the option to perform targeted searches by various criteria, including geography, date, and topics related to fibromyalgia.

For most of the studies, the agencies reporting into CRISP provide summaries or abstracts. As opposed to clinical trial research using patients, many federally funded studies use animals or simulated models to explore fibromyalgia. The following is typical of the type of information found when searching the CRISP database for fibromyalgia:

- **Project Title: A TWIN STUDY OF CHRONIC FATIGUE SYNDROME IN SWEDEN**

  Principal Investigator & Institution: Pedersen, Nancy L.; Karolinska Institute Tomtebodavagen 11F Stockholm,

  Timing: Fiscal Year 2001; Project Start 15-AUG-2001; Project End 31-JUL-2004

  Summary: Despite considerable research, fundamental questions about CFS remain at best partially answered. These questions include its definition, validity, the degree to which it results from genetic versus environmental factors, the nature of the substantial comorbidity observed with other conditions, and the basis of the female preponderance. The overarching aim of this project is to shed light on a number of basic questions about CFS via a large, population-based classical twin study. First, we will collect data on approximately 32,000 adults aged 42-65 years (13,000 complete twin pairs) who are members of the population- based Swedish Twin Registry for persistent fatigue, several overlapping conditions (fibromyalgia, irritable bowel syndrome, tension headache, allergy/eczema, generalized anxiety disorder, and major depression), and a detailed medical history. Second, the medical records of all twins who appear to have CFS-like illness and a subset of those with "CFS-explained" will be requested via an efficient national retrieval system. Following expert review, these individuals will be classified in regard to the CDC CFS criteria. Obtaining these unique data will allow us to address a set of critical questions regarding CFS. First, we will estimate the prevalence of CFS and its common comorbidities (fibromyalgia, irritable bowel syndrome, tension headache, allergy/eczema, generalized anxiety disorder, and major depression) in one of the largest samples yet studied. Second, we will use a variety of multivariate techniques to derive an empirical typology of prolonged fatigue and to assess how this typology compares to the CFS definition. Third, we will quantify the genetic and environmental sources of variation for CFS and its comorbid conditions. Fourth, critically, we will examine the influence of gender on these sources of variation. Finally, we will analyze the patterns of comorbidity between CFS and **fibromyalgia,** irritable bowel syndrome, tension headache, allergy/eczema, generalized anxiety disorder, and major depression using multivariate twin analyses and thereby to estimate the extent of overlap between

[2] Healthcare projects are funded by the National Institutes of Health (NIH), Substance Abuse and Mental Health Services (SAMHSA), Health Resources and Services Administration (HRSA), Food and Drug Administration (FDA), Centers for Disease Control and Prevention (CDCP), Agency for Healthcare Research and Quality (AHRQ), and Office of Assistant Secretary of Health (OASH).

the shared and unique genetic and environmental sources of variation. In concert with other twin studies being conducted by the investigators and their collaborators, we hope to hasten progress in understanding the etiology of CFS by parallel studies in multiple populations. The current proposal has several unique aims and represents a cost-effective means to extend this work in an epidemiological sample that is arguably the best twin registry in the world.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: ADAPTATION TO PAIN AND STRESS IN FIBROMYALGIA**

  Principal Investigator & Institution: Zautra, Alex J. Professor and Program Director; Psychology; Arizona State University P.O. Box 873503 Tempe, AZ 852873503

  Timing: Fiscal Year 2001; Project Start 08-MAY-2001; Project End 30-JUN-2006

  Summary: APPLICANT?S This grant focuses on individual differences in the stress response as significant factors determining who develops a chronic pain syndrome characterized by widespread pain, and who is unable to recover from it. Maladaptive responses to pain and withdrawal from positive social interactions are studied as key factors that underlie the affective distress and persistence of **fibromyalgia** symptoms. To test this model three well established methods of inquiry are used: 1. Field assessments of responses to stress, developed in prior research on arthritis patients, and 2. Laboratory tests of stress reactivity under controlled experimental conditions. 3. Longitudinal follow-up of patient status 2 years after pre-tests. Two groups of Osteoarthritis participants are studied: (1) 150 OA participants who meet criteria for **Fibromyalgia** (FM), and (2) 200 participants with osteoarthritis (OA) who report levels of pain comparable to the FM group, but who do not display the classic tender point symptoms found among those with FM. Longitudinal assessments on all subjects as well as thorough initial testing will permit three types of comparisons. 1.The examination of case-control differences between groups of FM respondents and those with OA only. 2.The examination of variables predictive of recovery among those with FM. 3. The examination of those factors predictive of the onset of widespread pain among the OA sample that displayed only regional pain at the initial assessment.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: ARE FIBROMYALGIA AND CHIARI I MALFORMATION RELATED?**

  Principal Investigator & Institution: Buchwald, Dedra S. Professor; Medicine; University of Washington Seattle, WA 98195

  Timing: Fiscal Year 2002; Project Start 01-AUG-2002; Project End 31-JUL-2006

  Summary: Fibromyalgia (FM) is a common condition of unknown etiology characterized by widespread muscle pain, sleep disturbances, fatigue, and various subjective neurological complaints. FM also frequently co-occurs with chronic fatigue syndrome, a condition similar to FM, whose hallmark is persistent, disabling fatigue. Many mechanisms for FM have been postulated but none has gained widespread acceptance or withstood the rigors of repeated scientific inquiry. Chiari I malformation (CIM), a hindbrain malformation associated with impairment of cerebral spinal fluid (CSF) flow, and syringomyelia, a cavitation of the spinal cord found in up to 80 percent of CIM patients, are neurological disorders. Although CIM patients typically seek medical attention for valsalva or exercise-related headaches, some present with non-specific complaints that are difficult to associate with CIM or syringomyelia. Common misdiagnoses for CIM include migraine, psychiatric disorder, multiple sclerosis, and FM. Successful treatment for symptomatic CIM patients, with or without syringomyelia,

involves surgery to correct the presumed underlying pathophysiology by normalizing CSF flow in the hindbrain and enlarging the posterior fossa of the cranium. The overall safety and efficacy of the most common approach, a posterior fossa craniectomy and cervical laminectomy to expand the posterior fossa volume, is well supported in the literature. Recently, some FM patients have been treated with a posterior fossa and cervical operation. This procedure, performed by a select group of neurological surgeons, has attracted the attention of patients, the media, and the medical community. Hundreds, perhaps several thousand, of these operations have been performed without any scientific support for the safety or efficacy of this intervention in FM. The purpose of this study is to establish the relationship of hindbrain anomalies and cervical cord problems to FM. The Specific Aims are to: 1) determine the prevalence of CIM and cervical syringomyelia among patients with FM (with and without CFS) and pain- and fatigue-free controls using magnetic resonance (MR) imaging; 2) compare the clinical correlates and physical examination findings in these FM patients with and without CIM. There are plans to gather information on symptoms, and perform blinded neurological and MR examinations in 213 FM patients and 71 pain- and fatigue-free control subjects. MR sequences will quantitate posterior fossa anatomy, posterior fossa CSF volume, tonsillar position, and cervical spinal cord and canal pathology. To measure physiological parameters such as CSF velocity and direction of flow in the craniocervical junction, there are plans to employ cardiac gated phase-contrast cine-MR imaging. This study will assess the usefulness of MR imaging in the evaluation of FM patients with and without CFS, and may identify those who might benefit from surgery for hindbrain abnormalities and dissuade others from undergoing a potentially harmful intervention.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: ARTHRITIS AND MUSCULOSKELETAL DISEASES CENTER**

  Principal Investigator & Institution: Fox, David A. Professor; Internal Medicine; University of Michigan at Ann Arbor 3003 South State, Room 1040 Ann Arbor, MI 481091274

  Timing: Fiscal Year 2001; Project Start 20-SEP-1977; Project End 31-DEC-2002

  Summary: The University of Michigan Multipurpose Arthritis and Musculoskeletal Diseases Center (UM-MAC) will provide the leadership and environment necessary to coordinate the multiple resources of the University of Michigan in support of arthritis-related research, education and patient care. This will be accomplished by a broad-based, inclusive approach that crosses traditional clinical and scientific boundaries. The Center involves over 100 faculty members from multiple departments and schools of The University of Michigan who have made substantial commitments to the support of arthritis-related programs. The leadership of the Center will foster collaboration between individual investigators and programs, closely monitor progress in UM-MAC funded research projects and cores, organize comprehensive educational programs, and ensure that the UM-MAC is responsive to the needs of the community. The UM-MAC is divided into two major components: 1) the Biomedical Research Division; 2) the Education, Epidemiology and Health Services Research Division; both supported by the administrative unit. Within the Biomedical Research Division the six major scientific programs are: 1) Genetic Mechanisms, 2) Immunobiology, 3) Mechanisms of Tissue Destruction, Repair and Aging, 4) Development and Application of Imaging Techniques, 5) Orthopedics and Biomechanics, and 6) Organogenesis. In support of these major programs, funding is requested for none core facilities: 1) Flow Cytometry Core, 2) Hybridoma Core, 3) Molecular Biology Core, 4) Protein Structure and Design

Core , 5) Biomechanics and Image Processing Core, 6) Biostatistics Core, 7) Transgenic Animal Core, 8) Vector Core and 9) DNA Sequencing Core. Three Developmental and feasibility projects are proposed for funding in years one through three, representing novel approaches to questions in the areas of immunology and musculoskeletal organogenesis. Additional funds are requested for developmental and feasibility projects to be competitively awarded during years three and four. Within the Education, Epidemiology and Health Service Research Division, there are four major programs, 1) Education, 2) Epidemiology, 3) Clinical Investigation and 4) Health Services Research, Funding is requested for three research projects: 1) Biomarker of osteoarthritis: The epidemiology, 2) Evaluating and reinforcing arthritis patient education for urban African Americans, and Cognitive and neurochemical function in **fibromyalgia.** The UM-MAC will also form interdisciplinary working groups focused on specific diseases, in order to better link BRD and E/E/HSR investigators to facilitate innovative research directed at issues directly related to specific arthritic and musculoskeletal diseases. This proposal incorporates many new investigators from a variety of departments, and reflects success of the UM-MAC in its current funding cycle in attracting diverse new talent into research related to rheumatic diseases at The University of Michigan.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: ASSESSMENT OF PSYCHOLOGICAL DISTRESS IN FIBROMYALGIA**

  Principal Investigator & Institution: Winfield, John B. Professor; University of North Carolina Chapel Hill Office of Sponsored Research Chapel Hill, NC 27599

  Timing: Fiscal Year 2001

  Summary: The bases for the decreased pain threshold and pain tolerance that is characteristic of people with **fibromyalgia** remain to be clarified. In addition to biological variables, such as gender, central sensitization, "wind-up" (abnormal temporal summation of pain), and central dysregulation of several axes of the stress response, cognitive, behavioral, emotional, environmental, and cultural variables appear to contribute importantly to the chronic pain experience and associated symptomatology in this disorder. A common denominator linking both biological and psychosocial contributors in this regard may be psychologic distress. The applicant's preliminary data are consistent with the hypothesis that psychological distress lowers pain threshold and, therefore, contributes to widespread allodynia and hyperalgesia in **fibromyalgia.** The immediate objective of this proposal is to use established databases from a cohort of patients with **fibromyalgia** and other rheumatologic conditions to define some of the individual differences that underlie the development and perpetuation of chronic widespread pain. This will be accomplished through the following Specific Aims: Aim 1, to determine the association of psychological distress with pain threshold and tolerance using thermal and ischemic pain techniques; Aim 2, to determine whether helplessness, optimism, and pessimism are associated with defined patterns of self-reported pain, pressure pain threshold and distress in patients with **fibromyalgia** and other rheumatologic disorders; and Aim 3, to determine whether our preliminary data showing an inverse relationship of distress and pressure pain threshold in **fibromyalgia** and other rheumatic disease patients receiving care in an academic medical center also obtain for patients in the community. Aim 3 will allow us to determine the generalizability of our preliminary data through comparisons of the UNC Arthritis Clinic Database, which consists of information on consecutive patients obtained from completion of a self-report questionnaire, Activities and Lifestyle Index and pressure pain threshold by algometry at 4 **fibromyalgia** tender points and the NC

Rheumatologists Database also based on the Activities and Lifestyle Index completed by patients of rheumatologists in private practice in North Carolina; in addition, cross-sectional - data concerning the relationship of psychological distress and pressure pain threshold by algometry will be obtained in a subset of patients with **fibromyalgia** and other diagnoses under the care of NC rheumatologists.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: BEHAVIORAL INSOMNIA THERAPY FOR FIBROMYALGIA PATIENTS**

  Principal Investigator & Institution: Edinger, Jack D. Clinical Professor; Psychiatry; Duke University Durham, NC 27706

  Timing: Fiscal Year 2001; Project Start 01-JUL-1999; Project End 30-JUN-2003

  Summary: Fibromyalgia (FM) is a prevalent and debilitating condition which contributes to impaired occupational/social functioning and increased disability among affected individuals. The vast majority of FM patients present with persistent sleep disturbances (e.g. onset difficulty; repeated or extended awakenings; nonrestorative sleep) which worsen other FM-related symptoms (e.g. chronic pain, fatigue) and sustain their general dysfunction. Pharmacologic treatments (e.g. antidepressants, hypnotics) may produce symptom reduction for some FM patients but many FM patients display little enduring improvement in their sleep and other FM-related symptoms in response to such agents. Our clinical observations and initial pilot work have suggested that factors common among other insomnia subtypes such as conditioned bedtime arousal, erratic sleep/wake scheduling and spending too much time in bed likely perpetuate the sleep problems of these medication-refractory FM patients. Over the past decade, we have developed, refined, and repeatedly tested a cognitive-behavioral therapy (CBT) which has proven effective for reducing sleep disturbances perpetuated by such underlying cognitive/behavioral mechanisms. Moreover, as suggested by the case study reported herein, this treatment holds promise for addressing medication-refractory FM-related sleep disturbance. The proposed project's Specific Aims/Major Objectives entail conducting a prospective randomized clinical trial to confirm these preliminary findings and to determine the efficacy of CBT insomnia treatment for interrupting the disturbed nocturnal sleep/daytime pain, fatigue and distress symptom complex which defines FM. One arm of this study's 3 x 4 factorial design will compare CBT with both a contact control treatment and standard care. The other arm in the design is a repeated-measures factor consisting of 4 time points (i.e. baseline, mid-treatment, post-treatment, and 6 month follow-up periods) at which outcome is assessed. Subjects will be assessed at all 4 time points with objective (wrist actigraphy) and subjective (sleep logs, Insomnia Symptom Questionnaire) measures of sleep improvements, measures of subjective pain, and questionnaires which assess mood (State-Trait Anxiety and Beck Depression Scales) and general quality of life (SF-36). Multivariate statistics and tests of clinical significance will be conducted with these various measures. Exploratory analyses will also be conducted to determine if polysomnographically-derived sleep measures obtained prior to treatment correlate with initial levels of pain/distress or eventual treatment outcome. Results should provide information about the usefulness of CBT for treating FM-related sleep difficulties. Results should also improve understanding of the FM syndrome in general and provide new information about the potential role of behavioral therapy in the overall management of this disorder.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: BIOBEHAVIORAL ETIOLOGY OF CHRONIC TEMPOROMANDIBULAR**

  Principal Investigator & Institution: Fricton, James R. Professor; Diagnostic/Surgical Scis; University of Minnesota Twin Cities 200 Oak Street Se Minneapolis, MN 554552070

  Timing: Fiscal Year 2001; Project Start 01-SEP-1997; Project End 30-JUN-2002

  Summary: This research proposal is designed to determine which central and peripheral factors are involved in the etiology of chronic dysfunctional TMS. This study is a prospective observational cohort study in which baseline jaw dysfunction, oral habits, depression, and **fibromyalgia** are the primary risk factors to be evaluated for their prognostic importance in the development of chronic dysfunctional pain in temporomandibular disorders. The study design is a 3-year cohort study of 500 non-chronic TMD pain patients who will be followed at 18 and 36 months to determine which subjects develop chronic pain and the influence that these factors have in predicting development. These patients will meet Research Diagnostic Criteria (RDC) axis II Chronic Pain Grading system I or II and have a physical diagnosis of myofacial pain and/or temporomandibular joint (TMJ) disc displacement. Examination data will include the standardized exam of the RDC/TMD axis I, Craniomandibular Index, an occlusal index, and a tender point exam to screen for possible **fibromyalgia.** Questionnaires will include RDC/TMD axis I and II, coping strategies questionnaire, a self report **fibromyalgia** screening form, and IMPATH.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: BIOMARKERS OF HOMEOPATHY IN FIBROMYALGIA**

  Principal Investigator & Institution: Bell, Iris R. Professor; Psychiatry; University of Arizona P O Box 3308 Tucson, AZ 857223308

  Timing: Fiscal Year 2001; Project Start 01-AUG-2000; Project End 31-MAY-2002

  Summary: (Adapted from Applicant's Abstract): Clinical researchers have not yet demonstrated therapeutic effectiveness of any single intervention that can target the polysymptomatic nature of FM, a chronic debilitating nonarticular rheumatic disorder. Classical homeopathy, a controversial alternative therapy, claims to provide such an integrative intervention to treat the totality of symptoms. This revised R21, 2-year exploratory effectiveness study will involve a 3-month parallel group (N=60), randomized, placebo-controlled, double-blind clinical trial, with an additional 3-month optional crossover, double-blind trial of individualized homeopathic treatment of FM. We will use self-report questionnaires, tender point examinations, and physiological markers of response to the homeopathic remedies and placebo (i.e., EEG alpha activity and orthostatic HRV. Specific aims and hypotheses are: 1) to evaluate the effectiveness of individually-chosen homeopathic treatment for the mental, emotional and somatic symptomatology of FM under double-blind conditions in which active and placebo-treated groups receive the same amount of attention using the same treatment procedures and differ only in the contents of the dispensed drug vials. The investigators hypothesize that individually chosen homeopathic remedies will lead to improvement in spiritual, mental, emotional, and somatic symptoms of FM than will placebo; 2) to determine the ability of acute changes in EEG alpha activity to differentiate active from placebo homeopathic remedies upon olfactory administration in FM patients and to predict subsequent responders and non-responders to treatment. The prediction is that active homeopathic remedies will lead to greater EEG alpha blocking than placebo; and 3) to assess resting EEG alpha power and orthostatic HRV as markers of global clinical

improvement in FM over time. Global clinical improvement in FM will correlate with parallel improvements in resting EEG and orthostatic HRV.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: BRAIN MECHANISMS OF RESILIENCE AND VULNERABILITY**

  Principal Investigator & Institution: Davidson, Richard J. Vilas Professor; University of Wisconsin Madison 750 University Ave Madison, WI 53706

  Timing: Fiscal Year 2002

  Summary: (adapted from investigator?s abstract): This project builds on studies in Davidson?s laboratory that have highlighted the important role of prefrontal cortex and amygdala in the production and regulation of affective reactivity and affective style. This corpus of work has also focused on relations between differences in the central circuitry of emotion and peripheral measures of endocrine, autonomic and immune function. The first study in this project will examine the central and peripheral biology of resilience using subjects from two ongoing longitudinal samples that are being studied in Project 1. Subjects will be selected based upon their life history profile in conjunction with measures of psychological well-being as being either vulnerable or resilient. These individuals will then participate in two laboratory sessions. The first session will consist of a functional MRI (fMRI) session during which w hole brain echo planar images using BOLD contrast will be obtained in an event-related paradigm while subjects view positive, negative and neutral pictures. Structural images will also be obtained at this session for both anatomical localization of the functional data and for morphometric measurement of the hippocampus. The second session will consist of a psychophysiological assessment during which measures of brain electrical activity, impedance cardiography, startle and salivary cortisol will be obtained while subjects anticipate receiving reward or punishment, as well as during a mental stressor task. Vulnerable subjects are predicted to show more right frontal and amygdala activation, greater startle reactivity to threat and slower recovery following punishment, greater cortisol reactivity and increased sympathetic activation. The second study will examine patients with rheumatoid arthritis (RA) and **fibromyalgia** (FMS) along with matched controls who will be evaluated in Project 2. The study in this part of the project will provide an intensive biological assessment of the changes produced by a mindfulness meditation intervention. The assessment procedure used in Study I will also be used in this study. Subjects will undergo this two-session assessment before, just after, and 6 months following an 8-week mindfulness meditation intervention. The investigators predict that the mindfulness intervention will increase left anterior activation, decrease amygdala reactivity to negative stimuli, improve the recovery following punishment, increase pre-ejection period (PEP, i.e., decrease sympathetic activation) in response to mental stress and decrease cortisol compared with the initial assessment. Moreover, these biological changes are expected to predict improvements in clinical status among the patients.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: CENTER FOR ALTERNATIVE MEDICINE RESEARCH OF ARTHRITIS**

  Principal Investigator & Institution: Berman, Brian M. Director; Family Medicine; University of Maryland Balt Prof School Baltimore, MD 21201

  Timing: Fiscal Year 2001; Project Start 30-SEP-1999; Project End 31-JUL-2004

Summary: Arthritis and related musculoskeletal disorders are a leading cause of disability, and usage of complementary and alternative medicine (CAM) interventions i particularly high among those with the severest forms of these conditions. Although largely unproven, these therapies are commonly sought by those experiencing the severest disease and frequently used in combination with other alternative or conventional treatments. There is, thus, a great unmet need to evaluate the safety, efficacy, and cost-effectiveness of these CAM interventions in a collaborative setting in which experts in rheumatology, complementary medicine, epidemiology, statistics and health services research approach these questions in a scientifically rigorous, multi-disciplinary manner. The major objective of this application is the establishment of a specialized center for research in complementary and alternative medicine (CAM) focusing on arthritis and related diseases at the University of Maryland Baltimore. The Center for Alternative Medicine Evaluation and Research in Arthritis (CAMERA) will support a multi-disciplinary team of researchers and develop institutional and regional collaborations to conduct clinical and basic research exploring the potential efficacy, safety, and cost-effectiveness of long-term outcomes following acupuncture treatment for osteoarthritis of the knee; 2) the effectiveness of mind/body therapies for **fibromyalgia;** 3) the mechanism of action and effects of electroacupuncture on persistent pain & inflammation; and 4) the mechanism of action of a herbal combination with immunomodulatory properties. The Center will create core resource facilities to support, monitor and evaluate its research activities. Future investigation of CAM and arthritis and related disorders will be encouraged through: 1) the training of new investigators in the Center's Career Development & Training Program, and 2) the Development and Feasibility Research Program, which will solicit, meritoriously evaluate and support innovative pilot research.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: CHARACTERIZATION OF SKELETAL MUSCLE BY MR ELASTOGRAPHY**

  Principal Investigator & Institution: An, Kai-Nan; Professor & Chair; Mayo Clinic Rochester 200 1St St Sw Rochester, MN 55905

  Timing: Fiscal Year 2003; Project Start 01-APR-1999; Project End 31-MAR-2008

  Summary: (provided by applicant): The goal of this proposal is two-fold: (1) to further develop and validate a technology, magnetic resonance elastography (MRE), for quantitatively imaging mechanical properties and tension distribution in muscle and (2) to apply the technique for in vivo evaluation of patients with four common, and clinically significant muscle disorders (spasticity, disuse atrophy, myofascial pain and a metabolic myopathy). These studies will employ a magnetic resonance imaging sequence with synchronous motion-sensitizing gradients to map propagating shear waves in the muscle. The technique will assess the mechanical properties of the muscle and its tension distribution. Specifically, the study can be divided into three specific aims. Aim 1: Optimize MRE methods of acquisition and analysis for the assessment of muscle, including electromechanical drivers, data acquisition techniques, and methods for image analysis. Advanced techniques for very rapid MRE assessment of muscle will continue to be developed. Aim 2: Validate the MRE assessment of muscle properties and tension with phantom, ex-vivo muscle, and Finite Element Modeling (FEM) techniques. Finite Element Analysis will be performed by using both phantom and bovine muscles to better correlate MRE wave-length findings as function of muscle properties, tension and fiber architecture. Aim 3: Study In Vivo Normal and Abnormal Muscle. The MRE technique will be applied in vivo to provide elastographic images of abnormal muscle

with known disorders. The patient groups chosen for study are each important in their own right, and furnish unique information across the spectrum of muscular disease and dysfunction. Groups to be studied include individuals with new onset of spasticity following an ischemic, hemispheric stroke, disuse atrophy as a result of immobilization, metabolic (hyperthyroid) myopathy and myofascial pain for trigger point identification. The overall hypothesis of this work is that will bring benefits to both basic research and clinical care.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: CHRONIC LOW BACK PAIN AS A MODEL OF FIBROMYALGIA**

  Principal Investigator & Institution: Clauw, Daniel J. Associate Professor; Medicine; Georgetown University Washington, DC 20057

  Timing: Fiscal Year 2001; Project Start 15-JUN-1999; Project End 31-MAY-2003

  Summary: Fibromyalgia (FM) is defined by a history of widespread pain, and the finding of tender points on examination. Arguably the two most discriminating features of FM are: 1) a generalized disturbance in pain perception, and 2) elevated levels of pro-nociceptive neuropeptides in the cerebrospinal fluid. The first feature, pain induced by a normally non-painful stimuli, is not surprising since this is a defining feature of FM. But it is not certain how tenderness relates to pain, since population based studies have demonstrated that not all persons who are tender have pain, and vice versa. And it has recently become clear that tender points are a poor measure of a person's inherent tenderness. The meaning of these elevated levels of CSF neuropeptides is likewise unclear. These findings may not be specific for FM, and may be the cause of pain and/or tenderness, or may be the result of pain, tenderness, or some other process. Chronic lower back pain (CLBP) is among the most common medical problems in industrial societies. Despite this, little is actually known about the precise cause for most cases of CLBP. Anatomic and psychosocial factors have been demonstrated to predict only a small portion of the variance in the degree of pain or disability in CLBP. In preliminary studies in CLBP, we have demonstrated that tenderness predicts a significant percentage of the variance in both functional status and pain, more than either the severity of path-anatomical abnormality (i.e., X-ray/MRI),or by psychosocial factors. In a small pilot study of a subset of these patients tenderness was correlated with CSF levels of pro-nociceptive neuropeptides. There are 3 specific aims in the proposed study: 1) To confirm in a cross-sectional study of 200 CLBP patients that pain sensitivity predicts more variance in clinical outcome (e.g. functional status, pain level, Roland index) than either anatomic or psychological factors. Furthermore, we will demonstrate that pain sensitivity is an independent trait, and not a surrogate for psychological factors such as depression, anxiety, or work-related stressors. 2) To demonstrate that an individual's global pain sensitivity is determined primarily by physiologic factors (e.g. neurotransmitters in cerebrospinal fluid) and modified by psychosocial factors (e.g. cognitive and behavior influences on pain perception). We will measure the CSF concentrations of pro-nociceptive peptides such as Substance P and Nerve Growth Factor, and hypothesize that the levels of these substances largely determine an individual's global pain sensitivity. This testing will be done in patients with CLBP and FM, as well as sedentary and non-healthcare-seeking controls. 3) To use alternative methods of pain assessment that are much less influenced by psychological factors (e.g., scaling methods, Multiple Random Staircase), using both pressure and thermal stimuli, to examine the true meaning of tender points, and the relationship between these results, and the results of the above noted physiologic and psychologic parameters in individuals with FM and CLBP.

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- **Project Title: COGNITIVE AND NEUROCHEMICAL FUNCTION IN FIBROMYALGIA**

  Principal Investigator & Institution: Park, Denise Cortis. Professor; University of Michigan at Ann Arbor 3003 South State, Room 1040 Ann Arbor, MI 481091274

  Timing: Fiscal Year 2001

  Summary: Fibromyalgia (FM) is a rheumatic disorder characterized by the presence of widespread musculoskeletal pain and the presence of tender points. Other symptoms, including fatigue, sleep disturbance, and neuropsychological complaints, contribute significantly to the morbidity associated with FM. One of the most prominent complaints in patients with FM is impaired cognitive ability. The notion that cognitive deficits are fundamental to FM is impaired cognitive ability. The notion that cognitive deficits are fundamental to FM has some credibility, as there is growing evidence that there are subtle but important cognitive deficits associated with Chronic Fatigue Syndrome (CFS), a related disorder, that cannot be explained by psychiatric symptoms. It is possible that cognitive defects in FM patients could result from single or multiple central nervous system perturbations associated with FM. In the present proposal, we will correlate cognitive function of FM patients with measures of neuroendocrine function. A basic thesis advanced is that FM patients may have both cognitive and neuroendocrine function similar to that of controls subjects who are 20 to 30 years older. Indeed, cognitive testing in patients with CFS reveals changes similar to those seen in subjects of advanced chronological age. In two experiments, FM patients will be compared to age-and education- matched controls, as well as to education-matched older adults. Neuroendocrine function will be measured as well, as will depression, pain, fatigue, and beliefs about memory function. This approach permits us to determine whether there are differences in cognitive function of **fibromyalgia** patients from others, and whether cognitive agins is a good model for understanding the cognitive effects of FM. In addition and perhaps more importantly, the integration of a cognitive approach with a neuroendocrine approach will allow us to determine what mechanisms account for the cognitive differences--neurochemical, psychiatric, or experience pain and fatigue. Knowing the mechanisms underlying observed cognitive deficits, rather than merely demonstrating that there are deficits, has important implications for treatment of the disorder as well as for understanding its etiology.

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- **Project Title: COGNITIVE FUNCTION & EXECUTIVE CONTROL IN FIBROMYALGIA**

  Principal Investigator & Institution: Glass, Jennifer M. Psychiatry; University of Michigan at Ann Arbor 3003 South State, Room 1040 Ann Arbor, MI 481091274

  Timing: Fiscal Year 2002; Project Start 20-SEP-2002; Project End 30-JUN-2005

  Summary: (provided by applicant): **Fibromyalgia** (FM) is a disorder characterized by widespread musculoskeletal pain and the presence of tender points. Other symptoms, including fatigue, sleep disturbance and neuropsychological complaints contribute significantly to the morbidity associated with FM. One of the most prominent complaints in patients with FM is impaired cognitive ability. However, there is limited data on actual cognitive function in FM. Nonetheless, these cognitive complaints interfere with work and disrupt the lives of FM patients. The data available from our current work on cognitive function in FM and from other research, point toward a

deficit in executive control of cognitive processes, especially working memory. Two experiments are proposed that will investigate various aspects of executive control and task-switching ability. The design includes standard neuropsychological tests as well as techniques developed in cognitive psychology. The latter techniques involve manipulation of experimental factors such as delay between encoding and recall that affect particular cognitive processes, such as decay from memory. This type of design allows a detailed view of the specific cognitive processing mechanisms that are affected in FM. Because FM is associated with other symptoms that could impact cognitive function, two special control groups are included in the design in addition to healthy controls. A group of rheumatoid arthritis patients will provide a control for the attentional demands of managing chronic pain. A group of depressed patients will provide a control for depression in FM, since patients with FM frequently report more depressive symptoms than healthy controls. We hypothesize that FM is associated with cognitive dysfunction that cannot be explained solely on the basis of pain or depression. This research will lead to a better understanding of the characterization of cognitive dysfunction in FM, as well as the potential causes of this dysfunction. The emphasis on executive control processes is important because these are critical in many demanding work and life situations.

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- **Project Title: COMBINING N-OF-1 TRIALS TO ASSESS FIBROMYALGIA THERAPIES**

  Principal Investigator & Institution: Zucker, Deborah R.; New England Medical Center Hospitals 750 Washington St Boston, MA 021111533

  Timing: Fiscal Year 2001; Project Start 09-SEP-1999; Project End 31-DEC-2003

  Summary: Fibromyalgia (FM) is a very common rheumatologic condition yet providing an effective treatment for an individual patient remains a challenge. To improve clinical treatment, better understanding of the effectiveness of new drug regimens and the factors effecting patients' responses to these treatments is needed. Anti-depressant medications have been used to treat patients with FM. However, most studies have reported that only about one third of patients show significant improvement with these treatments. A recent study reported that a combination therapy of amitriptyline and fluoxetine (AM + FL) resulted in significantly greater improvement in patients' symptoms as compared with either drug alone. As part of medical practice, physicians and patients often try new, potentially beneficial therapies to assess their effectiveness for the individual. If these studies could be carried out in a scientifically rigorous manner, the collective information could contribute greatly to our understanding of patients' responses to medical treatments. We have developed a method for effectiveness research which uses patient-focused N- of-1 trials and then combines these trials' results to obtain population estimates of treatment effectiveness and to aid in treatment decision-making for an individual patient. This proposal aims to prospectively apply this methodology to compare the effectiveness of the combination therapy AM + FL versus AM alone in the treatment of patients with FM. We propose to carry out N-of-1 trials to compare the effectiveness of AM vs. AM + FL for patients with FM using individual patient (N-of-1) trials. We will analyze the resulting data using the combined N-of-1 methodology to assess overall treatment effectiveness and compare this to results from a prior standard center-based trial. We propose to extend the use of N-of-1 trials into community practices to enable comparison of center-based and practice-based results. Through this broader patient inclusion we will attempt to identify potential patient characteristics which may affect treatment response variation.

The results and feedback from both patients and physicians participating in this study will help to develop a framework that will allow transportability of this approach to effectiveness research to the study of other diagnoses and treatments.

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- **Project Title: CONTROLLED FAMILY STUDY IN PATIENTS WITH FIBROMYALGIA**

  Principal Investigator & Institution: Arnold, Lesley M. Associate Professor; Psychiatry; University of Cincinnati 2624 Clifton Ave Cincinnati, OH 45221

  Timing: Fiscal Year 2001; Project Start 01-JUL-1999; Project End 30-JUN-2003

  Summary: Fibromyalgia, a chronic musculoskeletal pain disorder of unknown etiology, is a significant public health problem. Evidence from studies of phenomenology, comorbidity, family history, and pharmacologic treatment response suggest that **fibromyalgia** may be associated with major mood disorder, and possibly to a proposed group of conditions known as affective spectrum disorders. Prior psychiatric research has demonstrated that major mood disorder is highly familial. Family history studies provide a method by which to assess how medical disorders co-aggregate in families and, therefore may share a common risk factor or pathophysiologic mechanism. To date, few studies have explored the morbid risk of major mood disorder (and other proposed affective spectrum disorders) in probands with **fibromyalgia** and their first- degree relatives. All of these studies have used the family history method, which entails interviewing probands regarding their knowledge of psychiatric illness in relatives. Although most of these studies have provided important preliminary data suggesting an association between **fibromyalgia** and major mood disorder, this method has been demonstrated to be less sensitive in detecting illness in relatives than direct interview (the family interview method). In order to provide further evidence of a relationship between **fibromyalgia** and major mood disorder, we propose to study the prevalence of psychiatric and rheumatologic disorders in probands with **fibromyalgia** and their first-degree relatives as compared to probands with rheumatoid arthritis and their relatives using the family interview method. In addition to assessing the degree of co-aggregation of these disorders within families, we will also study the occurrence of other conditions within the proposed group of affective spectrum disorders in relation to **fibromyalgia,** and the association between the severity of **fibromyalgia** symptoms and the presence of major mood disorder within families.

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- **Project Title: EFFECTIVENESS OF STATIC MAGNETIC FIELDS IN FIBROMYALGIA**

  Principal Investigator & Institution: Boyden, Kathleen M. Nursing; University of Virginia Charlottesville Box 400195 Charlottesville, VA 22904

  Timing: Fiscal Year 2001; Project Start 01-JUN-2000

  Summary: Fibromyalgia affects up to an estimate 10 percent of the population, primarily women. The syndrome is characterized as both a musculoskeletal and a subtle neurological disorder, and is associated with widespread muscle pain and tender points, along with fatigue, muscle weakness, and stiffness. Conventional medical approaches have limited success in treating **fibromyalgia,** leading patients to seek complementary therapies, including the use of magnetic therapies, in the hope of finding more effective pain relief. However, the efficacy and safety of magnetic therapy has not been definitively established through rigorously controlled trials. This double-blind

randomized placebo-controlled study is the second in a series investigating the efficacy of static magnetic field (SMF) therapies in alleviating symptoms associated with **fibromyalgia.** Chronic conditions are frequently associated with poor quality of life; and **fibromyalgia** is associated with even poorer quality of life than a variety of other chronic conditions such as rheumatoid arthritis, osteoarthritis, permanent ostomies, chronic obstructive pulmonary disease, and insulin dependent diabetes. Successful management of pain, the primary symptom of **fibromyalgia,** may result in improved quality of life. The study tests the primary hypotheses that locally applied quadripolar SMF devices, which have been shown to suppress the firing of action potentials of sensory neurons, will provide pain reduction and other therapeutic benefits. It is further proposed that treatment with SMF devices will lead to improved functional status and improved quality of life. The specific aims of the research are to compare the effects of quadripolar SMF devices externally applied to tender points and the effects of magnetic placebo devices. The proposed study will include a 6-month treatment period and a 9 month follow-up assessment to determine long-term effectiveness.

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- **Project Title: EMPLOYMENT AND HEALTH STATUS IN WOMEN WITH FIBROMYALGIA**

  Principal Investigator & Institution: Reisine, Susan T. Professor and Head; Behav Scis & Community Health; University of Connecticut Sch of Med/Dnt Bb20, Mc 2806 Farmington, CT 060302806

  Timing: Fiscal Year 2001; Project Start 01-JUL-1999; Project End 30-JUN-2004

  Summary: Preliminary data on women with rheumatoid arthritis (RA) indicate that those who are able to enter and leave the work force experience the best health outcomes; homemakers report the worst health. These findings raise several new questions about the dynamic relationship among paid work, unpaid family work and health status among women with rheumatic diseases and whether these results hold for other musculoskeletal conditions. We propose to study women with primary **fibromyalgia** syndrome (FMS) and to describe prospectively the simultaneous evolution of health status, paid work status, unpaid family work, and daily stressors. Women with MS will be compared to a control group similar in age, race, and employment status. Finding from the study will shed light on the relationships among paid and unpaid family work and physical and psychological health status. We will recruit a sample of 245 women diagnosed with FMS and 250 healthy women from the community similar in age, race, and employment status. The total sample will consist of equal groups of those who are employed outside the home and those who are not currently employed. Patients will be recruited from a national sample of rheumatologists who are fellows in the ACR. Annual interviews will be conducted with participants from a national sample of rheumatologists who are fellows in the ACR. Annual interviews will be conducted with participants to collect detailed data on family and employment structure and functional status. Participants to collect detailed data on family and employment structure and functional status. Participants also will complete a daily diary for one week at the time of the baseline and annual interviews each year to collect detailed data on daily stressors as possible mediator of work and family structure on functional status. The proposed study will provide data describing the natural course of paid and unpaid family work and health status among FMS patients and control subjects and will address questions about the relationship between paid work, unpaid family work structure and the physical and psychological health status of women with FMS and controls. The data will be analyzed first, using descriptive statistics in order to describe

the experiences of the patients and controls in the study; second, MANOVA and MANCOVA techniques will be used to assess differences in health status between groups at baseline and to assess changes over time in health status between groups adjusting for covariates.

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- **Project Title: EXERCISE INDUCED CHANGES IN HPA ACTIVITY IN FIBROMYALGIA**

  Principal Investigator & Institution: Deuster, Patricia A.; Henry M. Jackson Fdn for the Adv Mil/Med Rockville, MD 20852

  Timing: Fiscal Year 2002; Project Start 15-SEP-1999; Project End 31-AUG-2004

  Summary: Five to 10 percent of patients entering general practice centers report symptoms of **fibromyalgia** syndrome (FMS), a painful and debilitating condition of the musculoskeletal system. Although the cause(s) and pathophysiology of this disorder are poorly understood, FMS has been referred to as a syndrome of physical deconditioning and involves dysregulation of the hypothalamic- pituitary-adrenal (HPA) axis. Interestingly, regular exercise has been shown to confer benefit for some patients with FMS, as well as rheumatoid arthritis and depression. Importantly these health conditions all have the common element of reduced hypothalamic drive for pituitary adrenal function. Thus, exercise may confer benefit in FMS by upregulating hypothalamic drive to the pituitary and adrenal glands. The overall objective of this proposal is to determine whether aerobic training benefits FMS by inducing alternations in HPA axis regulation. The central hypothesis is that aerobic training serves to enhance hypothalamic drive, and thus pituitary-adrenal function. Specifically, 20 patients with FMS and 20 age-, gender-, weight-matched controls will be challenged at baseline; after 12 weeks with no intervention (control), and after 12 weeks of aerobic conditioning to evaluate whether aerobic training results in: (1) An increase in hypothalamic drive as evidenced by augmented adrenocorticotropin (ACTH) responses to a standardized exercise test (SET); (2) An increase in tonic and stimulated hypothalamic drive as evidenced by augmented ACTH responses following administration of metyrapone and dexamethasone (DEX) coupled with SET; (3) An increase in hypothalamic-pituitary responsiveness as evidenced by augmented ACTH responses stimulated by a bolus of ovine corticotropin releasing hormone (o-CRH) after pretreatment with DEX; and (4) Improved clinical and psychological profiles in FMS. Plasma ACTH will be used to assess hypothalamic drive during four challenge tests: (a) SET for control stimulation; (b) SET during enhancement of glucocorticoid negative feedback by DEX; (c) tonic and SET during attenuation of glucocorticoid negative feedback by metyrapone; and (d) responsivity of pituitary corticotropes following a bolus of o-CRH during enhancement of glucocorticoid negative feedback by DEX. Finally, disease activity (tender point index, tender point score, and myalgic score), and self-reported physical measures of function, depression and self efficacy will be used to assess clinical and psychological profiles over the course of the study. The information gained will provide an understanding of the pathology of FMS and the mechanisms by which exercise confers benefit in FMS. Given the important role exercise serves in the prevention of disease, this information will also contribute to our basic knowledge regarding how exercise modulates HPA axis reactivity in health and, in so doing suggest, mechanisms for HPA dysregulation in disease.

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- **Project Title: FIBROMYALGIA AND TMD IN YOUNG WOMEN-A MULTIRACIAL STUDY**

  Principal Investigator & Institution: Plesh, Octavia; Professor; Preventative and Restorative Dental Sciences; University of California San Francisco 500 Parnassus Ave San Francisco, CA 94122

  Timing: Fiscal Year 2001; Project Start 25-SEP-1999; Project End 31-AUG-2004

  Summary: This investigation will determine the relationship of temporomandibular disorders (TMDs) with **fibromyalgia** (FM) and factors associated with the two conditions in an established, populations-based cohort (51% black, 49% white) women; and assess racial differences regarding prevalence and the factors explaining this difference. This cohort has been participating for 10 years in the longitudinal National Heart Lung and Blood Institute Growth and Health Study (NGHS) conducted by the University of California, Berkeley and the University of Cincinnati The specific aims are: 1) to assess the prevalence of self-reported, common chronic pains (including TMD and FM) based on questionnaires and to identify potential TMD, FM, and regional chronic pain (RCP) cases and controls; 2) to clinically determine combined body pain and TMD status based on palpating tender points and the distribution of TMD diagnostic types; 3) to compare potential explanatory risk factors (predictors) for these groups and determine the temporal relationship between NGHS-collected factors and diagnostic group status; 4) to analyze factors responsible for racial differences. The cohort consists of 1573 women currently 18-19 years old, recruited from west Contra Costa County, CA and the greater Cincinnati area. Longitudinal data collected over 10 years in the NGHS study regarding physical development, (e.g. growth, sexual development, and reproductive health history) and psychosocial development (e.g. coping strategies inventory and family environmental scale) will be assessed as potential risk factors for combined body pain and TMD group status. These longitudinal data collected during the development of this cohort offer a unique opportunity to study multiple risk factors thought to be associated with different types of chronic pain such as FM and TMDs, as they enter the most vulnerable period of life for developing such conditions. Our proposed study will be able to examine the interconnectedness of the longitudinal psychosocial and physiological measures with cross-sectional FM and TMD status, enabling a case-control design to draw conclusions like a longitudinal study.

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- **Project Title: FIBROMYALGIA, DEPRESSION AND MYOFASCIAL TMD**

  Principal Investigator & Institution: Raphael, Karen G. Associate Professor; Psychiatry; Univ of Med/Dent Nj Newark Newark, NJ 07103

  Timing: Fiscal Year 2001; Project Start 01-JUL-1999; Project End 30-JUN-2003

  Summary: (taken from the application): The well-established comorbidity of **fibromyalgia** (FMS) and major depression (MDD) has motivated speculations about the direction of the relationship. Three principal hypotheses to be tested here are: (l)that FMS is a variant of depression; (2) that MDD in FMS sufferers is a reaction to FMS; and (3) that high rates of MDD in FMS patients are an artifact of studying treatment-seekers. The proposed study's first aim is to support one and refute other hypotheses, by conducting a family study. Community women meeting criteria for FMS (n= 120) will be stratified so that half (n=60) have a lifetime history of MDD. Demographically-matched non-FMS controls (n= 120) from the same sampling frame will also be stratified on MDD status. Direct psychiatric interviews and physical examinations will be conducted with probands and all their available adult first degree relatives. To support the first

hypothesis, familial MDD rates should be elevated in FMS probands, even among probands with no personal depression histories; to support the second, probands with FMS and MDD should have low familial depression rates, as their depression should be more likely reactive to FMS; to support the last, familial MDD should be elevated in probands with MDD histories themselves, regardless of FMS status. A second aim, prompted by the comorbidity of FMS and myofascial temporomandibular disorder (M/TMD), is test (1) whether M/TMD is a regional manifestation of FMS or (2) whether M/TMD comorbid with FMS is different from M/TMD expressed as a regional disorder. To accomplish this aim, we will first reconfirm that FMS is familial, utilizing data gathered to satisfy the first aim. Second, we will reconstitute the groups from Aim 1, according to both FMS and M/TMD status. Rates of familial M/TMD in FMS and control probands, broken down by proband M/TMD status, will be examined. If M/TMD is found in the family of FMS probands, regardless of proband M/TMD status, this will support the first hypothesis. If only FMS probands have familial M/TMD but M/TMD probands do not, this will support the 2nd hypothesis and indicate that the two disorders are provoked through different pathogenic processes.

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- **Project Title: FOREBRAIN MECHANISMS IN CHRONIC NON-NEUROPATHIC PAIN**

  Principal Investigator & Institution: Casey, Kenneth L. Professor; Neurology; University of Michigan at Ann Arbor 3003 South State, Room 1040 Ann Arbor, MI 481091274

  Timing: Fiscal Year 2001; Project Start 30-SEP-2000; Project End 31-AUG-2003

  Summary: Psychophysical studies have shown that patients with **fibromyalgia** (FM) have cutaneous heat and pressure thresholds that are lower and ratings of these stimuli that are higher than normal. Patients with the chronic pain of arthritis (CPA) have similar, but less severe, hypersensitivity to cutaneous heat and pressure stimuli. These abnormalities may reflect an amplification of forebrain nociceptive processing due to continual nociceptive input (CPA), or primary adaptive changes in CNS nociceptive processing (FM). We will obtain psychophysical measurements of the thresholds and perceived intensities and unpleasantness of cutaneous heat and somatic pressure stimuli in all subjects. We will use H215O positron emission tomography (PET) to test the overall hypothesis that FM and CPA patients have correspondingly larger stimulus-evoked increases in regional cerebral blood flow (rCBF) within bilateral volumes of interest (VOI; thalamus, insula, and the sensorimotor (S1/M1), S2, anterior cingulate, and premotor (B6) cortices) than normal subjects. Because FM occurs primarily in women, we will study two groups of right-handed female patients: 20 with FM and 20 with CPA, and compare their rCBF responses to those of 20 normal women within the same age range (20-50 years). Patients will rate their clinical pain at or above 4 on a visual analog scale of pain (VAS; 0-10) and will complete a short-form McGill Pain Questionnaire (VAS, MPQ). Standard VOI will be developed in normal subjects from peak rCBF increases within the above structures in response to heat stimuli applied at 35EC, heat pain threshold (HPT), heat pain tolerance (Hptol), and at 3 additional intensities anchored symmetrically around HPT and below Hptol. These standard VOI and stimulus intensities will be used to determine the correlation between rCBF increases and applied stimulus intensity and perceived unpleasantness, as estimated with a VAS, in normal subjects and in patients with FM or CPA who have not been taking opioid analgesic or psychoactive medication for one month. We predict that the psychophysical responses, and the rCBF responses within one or more VOI will be larger in FM and CPA patients than in normal subjects. These same studies will be

performed again after all patients have been taking nortriptyline (NT) and/or physical therapy (PT) for approximately one year. Normal subjects will take NT for 3 weeks before the second PET scan (1 year later). We predict that both patient groups, but not normal subjects, will show clinical pain scores, stimulus-evoked psychophysical responses, and rCBF responses, in one or more VOI, that are less than those obtained before NT or PT treatment. We will also examine differences between FM and CPA patients. Support for the overall and correlative hypotheses will constitute evidence that, in the absence of peripheral causes, the pain experienced by FM and CPA patients is due, at least in part, to abnormal central nociceptive processing mechanisms.

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- **Project Title: FUNCTIONING OF ADOLESCENTS WITH JUVENILE FIBROMYALGIA**

  Principal Investigator & Institution: Noll, Robert B.; Children's Hospital Med Ctr (Cincinnati) 3333 Burnet Ave Cincinnati, OH 45229

  Timing: Fiscal Year 2001; Project Start 01-SEP-2001; Project End 30-JUN-2006

  Summary: The first objective of this work is to evaluate the social, emotional, and behavioral quality of life of children with juvenile primary **fibromyalgia** syndrome (JPFS) and explore potential mechanisms. The second objective of this work is to evaluate parental distress, family functioning, and child rearing practices. It is hypothesized that the social and emotional status in children with JPFS plays an important role in predicting eventual functioning and the quality of life they obtain. To determine which medical and psychological variables are involved, a cross sectional study of peer relationships, emotional well-being, and family functioning is required. Peer relations play a central role in children?s social and emotional development and are fundamental for the development of adequate social skills and for the emergence of a healthy self-concept. Although a growing body of empirical evidence has shown peer perceptions of social competence are predictive both of current adjustment and of future adaptations through adulthood, no data are available on the peer relationships of adolescents with JPFS. Clinically, parents often voice concerns that their teens with JPFS are socially withdrawn, miss many days of school, and are rejected by peers. Additionally, minimal data are available focusing on the emotional well being of adolescents with JPFS. Finally, we could locate no controlled studies focusing on parent distress, family functioning, or child rearing concerns. The proposed research will compare measures of (a) peer relationships, (b) emotional well-being, and (c) parental well-being, family functioning, and child rearing practices of 60 adolescents with JPFS and their parents to data obtained from 60 case control adolescents and their parents. Case controls are classmates of the adolescent with JPFS who are closest in date of birth, same race/gender, and do not have a chronic illness. Our previous work with this strategy during the past 10 years has shown we can recruit better than 80% of our first choice case control comparison families. This approach provides us with comparison families with similar social and demographic profiles. Our measurement strategy evaluates key domains with psychometrically sound and developmentally appropriate measures from multiple perspectives using diverse response formats. Information gained will identify psychological and medical variables associated with positive and negative outcomes. The research will identify whether adolescents with JPFS are at risk for less optimal quality of life thereby allowing effective psychosocial interventions to be developed.

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- **Project Title: GONADAL STEROID HORMONAL REGULATION OF PESISTENT PAIN**

  Principal Investigator & Institution: Ren, Ke; Associate Professor; Oral Surgery; University of Maryland Balt Prof School Baltimore, MD 21201

  Timing: Fiscal Year 2001; Project Start 01-SEP-1999; Project End 31-AUG-2003

  Summary: Chronic or persistent pain affects millions of adults each year with costs in lost work days, medical treatment and the reduction in the quality of life in the range of billions of dollars. Many of these conditions are gender-related. Women exhibit a higher prevalence of temporomandibular disorders, neuropathic pain, **fibromyalgia,** migraine headaches and some forms of arthritis. Furthermore, variations in hormonal levels associated with menstrual cycle, menopause, pregnancy and lactation influence pain levels. The purpose of this study is to evaluate the effects of progesterone and progesterone in combination with estrogen on the hyperalgesia and neuronal hyperexcitability associated with a rat model of persistent pain and inflammation. Our major hypothesis is that endogenous reproductive hormones can suppress persistent pain by their influence on a cascade of molecular, biochemical and physiological events at the spinal level involving inhibitory and excitatory amino acids and their receptors, and opioid peptides and their receptors. We will investigate the effects of these hormones on behavioral hyperalgesia, spinal cord neurons, modulation of GABA receptors, expression of opioid receptors and opioid peptides, and NMDA receptor function. Specific Aim 1 will characterize the changes in behavioral inflammatory hyperalgesia produced by progesterone, in lactating females, ovariectomized females with hormone replacement, and castrated males. Specific Aim 2 will determine the effects of progesterone on the development and maintenance of behavioral hyperalgesia, as well as the possible target sites of the antihyperalgesic effects in peripheral tissue, the spinal cord and the brain. Specific Aim 3 will determine that progesterone's antihyperalgesic effects are mediated, in part, via modulation of GABAA receptor activation. Specific Aim 4 will test the hypothesis that progesterone's antihyperalgesic effects are opioid-mediated, in part, at the level of the spinal cord. Specific Aim 5 will examine progesterone effects on NMDA receptor function and changes in NMDA receptor subunit gene expression following inflammation and hyperalgesia. In summary, we propose to elucidate the influence of reproductive hormones on mechanisms of persistent pain in a rat model that mimics human chronic pain conditions known to exhibit cyclical or pregnancy-related variations. The findings will be important for the development of new approaches to the management of these conditions.

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- **Project Title: GUIDED IMAGERY: A NURSING INTERVENTION FOR FIBROMYALGIA**

  Principal Investigator & Institution: Menzies, Victoria S. None; University of Virginia Charlottesville Box 400195 Charlottesville, VA 22904

  Timing: Fiscal Year 2001; Project Start 15-SEP-2001

  Summary: (provided by applicant) **Fibromyalgia** affects up to an estimated 11 percent of the population, primarily women. The syndrome is characterized as both a musculoskeletal and a subtle neurological disorder, and is associated with widespread muscle pain and tender points, along with fatigue, muscle weakness, and stiffness. Conventional medical approaches have limited success in treating **fibromyalgia,** leading patients to seek complementary modalities, including the use of cognitive behavioral

approaches such as relaxation and imagery, in the hope of finding more effective symptom management. The purpose of the proposed study will be to investigate the effects of guided imagery on selected outcomes in persons with **fibromyalgia.** The primary aim will be to investigate the effects of an eight-week intervention of guided imagery on self-efficacy and functional status. Two secondary aims will include: (1) to examine the relationship between absorption, a personality trait, and guided imagery effectiveness to identify patients who may benefit most from this modality; and (2) to explore the dose-response effect of imagery use (number of practices) on outcomes. The proposed project is a quasi-experimental study that will use a repeated measures single group design to examine the effectiveness of guided imagery, as an adjunctive modality, to enhance self-efficacy and function a status in persons diagnosed with **fibromyalgia.** If it can be demonstrated that self-efficacy can be increased and functional status can be improved in this population using a guided imagery intervention, then a future randomized controlled study will explore the effectiveness of guided imagery, as an adjunctive modality, on these outcomes.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: HEALTH PROMOTION FOR WOMEN WITH FIBROMYALGIA**

  Principal Investigator & Institution: Stuifbergen, Alexa K. Professor and Associate Dean for Researc; None; University of Texas Austin 101 E. 27Th/Po Box 7726 Austin, TX 78712

  Timing: Fiscal Year 2003; Project Start 30-SEP-1996; Project End 31-MAY-2007

  Summary: (provided by applicant): Women with chronic disabling conditions such as **fibromyalgia** syndrome (FMS) must manage a wide variety of disease-related, intrapersonal, and environmental demands to maintain their health and quality of life. Engaging in health-promoting behaviors is one strategy recommended to manage disease symptoms and enhance quality of life (USDHHS, 2000). The purpose of this four-year study is to test a theoretically and empirically based intervention to promote the health and well being of women with the chronic disabling condition of **fibromyalgia.** This wellness intervention, originally developed and tested in a randomized clinical trial of women with MS (N=113), resulted in significant improvements in self-efficacy, health behaviors and improvements in pain, and mental health. The specific aims of this study are to examine the effects of the adapted wellness intervention on self-efficacy, resources, barriers, health behaviors and health outcomes for women with **fibromyalgia.** A sample of 160 women with FMS will be recruited to participate in a randomized clinical study to determine the effects of this wellness intervention that includes an eight-week health promotion/behavior change component and 3 months of follow-up phone support. Women will be randomly assigned to either the intervention or the attention control group. Women in the intervention group will receive content regarding stress management, lifestyle adjustment, physical activity, nutrition and women's health issues with an emphasis on the unique adaptations and associated skills required to empower women with the tools for exercising personal control over their health behaviors. The effects of the intervention on outcome variables will be assessed over an 8-month period with measurements at baseline, 2 months (immediately after the educational/skill-building component), 5 months (after 3 months of phone support) and at 8 months. Hierarchical linear modeling techniques will be used to determine the significance of group by time interactions across the four measurement periods.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: HORMONAL RESPONSES TO EXERCISE STRESS TESTING**

  Principal Investigator & Institution: Bennett, Robert M.; Oregon Health & Science University Portland, OR 972393098

  Timing: Fiscal Year 2001

  Summary: This study will address whether patients with **fibromyalgia** (FM) have a normal endocrine response to the stress of exercise. Subjects will be 12 FM and 12 healthy subjects with low aerobic fitness. Aerobic fitness, growth hormone and cortisol will be measured before and after graded exercise on a treadmill. During a second testing, the same procedures will be used with the addition of pyridostigmine bromide 60 mg (to inhibit somatostatin tone) one hour before treadmill testing.

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- **Project Title: IVMT FOR FIBROMYALGIA SYNDROME: A PILOT STUDY**

  Principal Investigator & Institution: Katz, David L. Director of Medical Studies; Griffin Hospital 130 Division St Derby, CT 06418

  Timing: Fiscal Year 2003; Project Start 15-AUG-2003; Project End 31-JUL-2004

  Summary: (provided by applicant): **Fibromyalgia** syndrome (FMS) is a prevalent and debilitating condition for which definitive therapy is lacking and urgently needed. Characterized by widespread pain and muscle tenderness, the syndrome affects roughly 6 million people in the United States alone. Conventional therapies targeting a variety of theories regarding etiology and pathogenesis have largely proved ineffective. As a result, the great majority of FMS sufferers seek complementary/alternative medicine (CAM) therapies for palliation of their symptoms, but often with limited success. Intravenous micronutrient therapy (IVMT) with the Myer's Cocktail has emerged as a popular treatment for **fibromyalgia.** While the theoretical rationale for this treatment approach is limited, a therapeutic effect is plausible, and the empirical evidence supporting it appears to be strong. An on-line survey of treatment clinics representing 12,000 patient experiences with IVMT conducted exclusively in support of this application suggests that the therapy is very safe and often (60-80%) effective. Despite its popularity, and the increasing prevalence of its use, IVMT has not been subjected to formal investigation. We therefore propose a randomized, double-blind, placebo-controlled pilot study of IVMT for **fibromyalgia** with validated functional and pain measures as the outcomes of interest. The study will be conducted in 4 phases over a 12-month period with assessment of treatment effect based primarily on the tender point index (TPI) derived from the examination of a dedicated, board-certified research rheumatologist blinded to the subjects' treatment status. The study will be conducted out of the Yale-Griffin Prevention Research Center, in collaboration with the Integrative Medicine Center in Derby, CT, a partnership already actively involved in CAM outcomes research with CDC funding. The proposed pilot study is designed to demonstrate feasibility and safety, and is adequately powered to provide evidence of treatment efficacy. Follow-up study will be indicated if pilot data are encouraging as anticipated; a consortium of sites (the Northeast Regional CAM Consortium) in which the applicant is a member has already expressed interest in participating in follow-up study pending results of the pilot. The identification of an effective, safe, inexpensive therapy for **fibromyalgia** would represent a great advance, and a major contribution to the public health.

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- **Project Title: LAMINA I AND HOMEOSTASIS**

  Principal Investigator & Institution: Craig, Arthur D. Atkinson Research Scientist; St. Joseph's Hospital and Medical Center 350 W Thomas Rd Phoenix, AZ 85013

  Timing: Fiscal Year 2002; Project Start 19-APR-2002; Project End 31-MAR-2006

  Summary: Ascending inputs to the brainstem from the spinal cord are critical for the control of homeostatic (pre-autonomic) functions, such as cardiovascular and respiratory responses to noxious or thermal stimuli that challenge the stable physiological condition of the body. It has been recognized for over 30 years that small-diameter (A-delta and C-fiber) afferent inputs generate powerful somato-autonomic reflexes in the brainstem, but there is still very little information available regarding the spinobulbar neurons that carry such activity to homeostatic brainstem integration sites. Neurons in lamina I of the superficial dorsal horn that receive direct - delta and C-fiber are the major source of spinal input to the brainstem. We have shown in prior work that lamina I neurons project to the homeostatic regions of the brainstem. New evidence suggests that lamina I spinobulbar neurons are unique population of lamina I neurons that has never been studied before. The goal of this project is to discriminate lamina I spinobulbar neurons anatomically and physiologically. In anatomic studies, we will (Aim 1) use retrograde labeling to identify lamina I and other spinal neurons that project to particular homeostatic sites in the brainstem and to verify that lamina I and other spinal neurons that project to particular homeostatic sites in the brainstem and to verify that lamina I spinobulbar an spinothalamic neurons are distinct (using double-labeling). In physiologic studies, we will (Aim 2) record and characterize single lamina I spinobulbar neurons, using antidromic activation and natural cutaneous and deep somatic stimulation, and differentiate them from spinothalamic neurons. In addition, we will (Aim 3) stimulate the anterior hypothalamus and the periacqueductal gray, two pre-autonomic control sites that drive sympathetic vasoconstrictor output, in order to determine whether descending homeostatic controls differentially modulate the activity of spinobulbar and spinothalamic lamina I neurons. Using protocols that we have refined in experiments in cats (which nonetheless have fundamental neuroanatomical differences from primates), these experiments will obtain data in macaque monkeys that will be directly relevant to human physiology. Preliminary evidence strongly indicates that these experiments will confirm the central hypotheses that lamina I spinobulbar neurons are a distinct population of neurons. These experiments will differentiate and characterize for the first time the ascending modality-selective spinal neurons that carry small- diameter A-delta and C-fiber afferent inputs to homeostatic and pre- autonomic integration mechanisms in the brain stem. The fundamental knowledge will provide new opportunities for explaining maladaptive homeostatic responses to somatic physiological changes, including such human pathological conditions as **fibromyalgia.**

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- **Project Title: LUPUS COHORT**

  Principal Investigator & Institution: Petri, Michelle A. Associate Professor; Medicine; Johns Hopkins University 3400 N Charles St Baltimore, MD 21218

  Timing: Fiscal Year 2002; Project Start 30-SEP-1996; Project End 31-MAR-2007

  Summary: (provided by applicant): The Hopkins Lupus Cohort is an ongoing, prospective study in which SLE patients are followed by protocol, with visits at a minimum of every 3 months, now in its 16th year. The Cohort is racially balanced, with one-half of the members being African-American, and reflects a broad socioeconomic range. The Cohort represents a 15 year investment in the study of SLE outcomes,

sponsored by NIH. It has led to a unique, prospective database of demographic, social, clinical and laboratory (routine, serologic, and antiphospholipid antibody) measures. The four major accomplishments of the Cohort during the last funding period were: 1) the determination that serologic markers of disease activity, such as anti-dsDNA, C3, and C4, have limited utility in the prediction of SLE flare; 2) the determination that the cumulative prednisone dose is predictive of coronary artery disease and osteoporosis, whereas high-dose prednisone is predictive of avascular necrosis; 3) the determination that antiphospholipid antibodies are associated with future risk of thrombosis and with atherosclerosis; and 4) the finding that the poor health status of SLE patients is associated with **fibromyalgia,** whereas **fibromyalgia** itself correlates highly with neurally-mediated hypotension, a form of autonomic neuropathy. In this revised grant, four new specific aims will be undertaken. First, in the cohort as a whole and in an inception cohort followed since diagnosis, we will determine the relative importance of disease activity versus corticosteroid treatment as a predictor of specific types of organ damage. Second, in a study of 75 patients seen monthly, we will investigate cytokines and platelet-related factors as predictors of disease activity. Third, 250 patients from the inception cohort will have carotid duplex and helical CT (for coronary calcification scores) at baseline and 2 years later to determine associates and predictors of atherosclerosis, including traditional and novel cardiovascular risk factors. Fourth, we will assess, in 100 SLE patients with and 100 without **fibromyalgia,** the frequency of autonomic neuropathy and the correlation with health status.

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- **Project Title: MASSAGE THERAPY FOR CANCER-RELATED FATIGUE**

  Principal Investigator & Institution: Avins, Andrew L. Assistant Clinical Professor; Osher Ctr for Integrative Med; University of California San Francisco 500 Parnassus Ave San Francisco, CA 94122

  Timing: Fiscal Year 2001; Project Start 01-MAR-2001; Project End 31-DEC-2002

  Summary: (APPLICANT'S ABSTRACT): The proposed project is a randomized pilot trial of a Swedish-style massage therapy intervention for the treatment of fatigue in patients who are undergoing cancer chemotherapy. Fatigue is the most common complaint of patients receiving treatment for cancer, but is often difficult to treat and causes a substantial decrement in patients' quality of life. Massage therapy is a non-invasive intervention used in many patients with cancer for symptom control. Prior small studies have suggested some efficacy of bodywork therapies in conditions characterized by fatigue, such as **fibromyalgia** and chronic fatigue syndrome. Based on these results, massage therapy may provide an important adjunct in ameliorating fatigue and enhancing cancer patients' well being. The proposed study is a 12-week, randomized, three-arm, parallel-comparison clinical trial comparing the effects of a Swedish-style massage regimen to a sham bodywork control and a usual-care group for fatigue reduction in cancer patents undergoing chemotherapy. Sixty patients with breast, ovarian, prostate, or colo-rectal cancer will be enrolled; the primary outcome measure is a quantitative assessment of fatigue symptoms. In addition to obtaining estimates of efficacy, this Exploratory/Developmental Research Grant (R21) application also proposes several research design innovations to address critical methodological issues that have plagued prior studies of complementary and alternative medicine (CAM) interventions in general, and bodywork therapies, in particular. 1) Current quantitative assessment tools often fail to fully capture the nature and degree of change in highly subjective conditions and their impact on an individual's functioning and quality of life. We propose to add a novel qualitative research component to study

changes in participants' perceptions of fatigue severity and its impact on their lives. 2) Most prior studies in bodywork interventions have failed to adequately control for the non-specific effects of the time spent with a practitioner and physical contact between the provider and participant. We propose to test a unique control condition (in addition to a usual-care control arm) to account for these effects. 3) Prior studies of bodywork therapies have neglected important psychological and sociocultural factors associated with subjects' participation and outcomes. We will examine these issues within the qualitative research component. 4) Because bodywork involves close personal physical contact, gender issues may complicate the provision and success of massage therapy. We will study these effects using qualitative methods, as well as a stratified randomization of gender-concordant and gender-discordant pairs to examine outcomes. This study should provide not only important data on the potential efficacy of massage therapy for the treatment of fatigue, but also advance the methodology for studying CAM interventions for difficult-to-treat symptomatic conditions.

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- **Project Title: MAXIMIZING BENEFICIAL EXERCISE EFFECTS IN FIBROMYALGIA.**

  Principal Investigator & Institution: Jones, Kim D. Primary Care Nursing; Oregon Health & Science University Portland, OR 972393098

  Timing: Fiscal Year 2002; Project Start 01-SEP-2002; Project End 31-MAY-2006

  Summary: (provided by applicant) **Fibromyalgia** (FM) is a common, costly and debilitating chronic pain syndrome diagnosed in nearly 6 million Americans, 90% of whom are women. Conservative estimates place direct and indirect costs of FM at $700 million annually. By definition, people with FM have chronic widespread pain and specified tender point areas. Other symptoms associated with FM include disrupted sleep, fatigue, decreased cognition, visceral and other pain syndromes, neurological symptoms, post-exertion muscle pain and exercise intolerance. The majority of people with FM are known to be aerobically unfit, have poor muscle strength and limited flexibility. Deconditioned muscle is theoretically more prone to muscle microtrauma, which causes localized pain and triggers widespread pain through disordered central nervous system processing (i.e., central sensitization). A negative cycle of de-conditioning occurs in FM in large part due to exercise-induced pain that limits exercise tolerance. Dysfunction of the hypothalamic-somatotropic axis, specifically growth hormone (GH)/insulin-like growth factor-one (IGF-1), may also contribute to exercise induced pain and exercise intolerance in FM, due to the critical role of GH/IGF-1 in muscle homeostasis and repair following exercise. Over the past 25 years, the broad research theme of the Oregon Health and Science University's (OHSU) **Fibromyalgia** Research and Treatment Team has been investigating pain in **fibromyalgia** with an emphasis on exercise and pharmacological therapies. We recently documented GH/IGF-1 dysfunction in persons with FM at rest, and in response to exercise. We also pharmacologically altered the GH/IGF-1 axis in women with FM, with resultant improvements in pain and exercise tolerance by self-report. The focus of the proposed study is to test the effects of exercise training in women with FM whose GH profiles have been experimentally manipulated with low dose pyridostigmine bromide (Mestinon). To fully investigate the effects of exercise training and pyridostigmine bromide, a 2 x 2 x 2 (exercise x drug x time) design will be used. We propose a randomized clinical trial in which four groups of participants are observed over time (placebo only, pyridostigmine bromide only, exercise + placebo and exercise + pyridostigmine bromide). We will test the effects of the exercise and drug independent

variables, alone and in combination, on the outcome variables of 1) pain and 2) FM associated symptoms and impact, cognition and quality of life. The specific aims of this study are to: Test the effects of a 6-month, 3-times-weekly exercise training program plus 3-times-daily 60 mg pyridostigmine bromide on pain, the primary and defining symptom of FM; and test the effects of a 6-month, 3-times-weekly exercise training program plus 3-times-daily 60 mg pyridostigmine bromide on FM-associated symptoms and impact, cognition, and quality of life.

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- **Project Title: MECHANISM OF PAIN IN PATIENTS WITH FIBROMYALGIA SYNDROME**

  Principal Investigator & Institution: Staud, Roland M. Associate Professor; Medicine; University of Florida Gainesville, FL 32611

  Timing: Fiscal Year 2001; Project Start 10-JUN-1999; Project End 31-MAY-2003

  Summary: Fibromyalgia Syndrome (FMS) is characterized by chronic widespread pain associated with allodynia. Our preliminary experiments with FMS subjects have indicated abnormalities of second pain in these patients which are related to central N-methyl-D-aspartate (NMDA) receptor processing. Our basic hypothesis is that abnormal central pain processing of second pain in FMS subjects is one of the fundamental abnormalities in this syndrome. Second pain results from impulse conduction in peripheral C (unmyelinated) afferent axons and is particularly sensitive to inhibition by opioid compounds. Second pain also increases in intensity when stimuli are applied more often than once every three seconds and this summation has been hypothesized to result from a central NMDA receptor mechanism. First pain is related to stimulation of A-Delta (myelinated) nociceptors and has been utilized almost exclusively to evaluate pain sensitivity. In order to compare directly abnormal processing of A-Delta and C-Fiber input in FMS subjects, we will utilize forms of brief experimental pain stimuli that can reliably evoke perceptions of first and second pain when applied to the hand or foot of human subjects. We will test the hypothesis that oral doses of dextromethorphan, a common cough suppressant and NMDA receptor antagonist, will selectively reduce temporal summation of second pain for normal male and female subjects. The purpose of another experiment is to examine the effects of graded doses of naloxone and fentanyl on first and second pain and temporal summation of second pain for normal male and female subjects, This analysis is designed to answer questions about opioid mechanisms of pain reduction and about the possible existence of a tonic endogenous pain modulatory system. These psychophysical tests of NMDA receptor mechanisms, opioid responsiveness, and level of tonic pain inhibitory mechanisms will then be compared across pain-free control subjects and **fibromyalgia** patients in order to ascertain the extent to which abnormalities of these mechanisms contribute to these pain states. Potential sex differences in pain sensitivity and effects of pharmacological manipulations will be evaluated in normal subjects and pain patients, with attention to the impact of psychosocial variables. Also, relevant to the greater risk factor for females to present with **fibromyalgia,** ovarian hormone states will be monitored in female subjects. Because **fibromyalgia** is a generalized muscular pain disorder which characteristically worsens with physical activity, the effects of exercise on different forms of pain sensitivity will be compared for **fibromyalgia** patients and matched normal controls.

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- **Project Title: MECHANISMS OF ACUPUNCTURE ANALGESIA**

  Principal Investigator & Institution: Harris, Richard E. Internal Medicine; University of Michigan at Ann Arbor 3003 South State, Room 1040 Ann Arbor, MI 481091274

  Timing: Fiscal Year 2002; Project Start 15-SEP-2002; Project End 31-JUL-2007

  Summary: (adapted from the application): Pain is one of the major complaints of those seeking professional healthcare. Although recent advances have been made in pharmacological and invasive approaches to relief pain, many patients suffering pain chose alternative healing modalities, such as acupuncture. This application focuses on determining the neurobiological mechanisms of acupuncture analgesia (the relief of pain) in people who suffer from **fibromyalgia** (FM), a chronic pain condition. All proposed work will occur at the University of Michigan. The first year of funding of this proposed K award would coincide with the final year of funding of the R01 grant, allowing an opportunity to use both the research subjects and information from the existing grant to obtain preliminary data for the remainder of the K award. During the first two years of the K award, the applicant will: 1) establish the ideal conditions for acupuncture induced analgesia, and 2) begin to elucidate the mechanisms of acupuncture induced analgesia by using both psychophysical and fMRI experiments. In the final three years of the K award, the applicant will focus on the techniques that show the most promise for elucidating neural mechanisms underlying the analgesia. Comparisons will be drawn between analgesia of patient?s clinical spontaneous pain as well as evoked pain. In addition to clinical research experience, the applicant will attend didactic lectures, seminars, and conferences designed to increase his knowledge of clinical research. Although the applicant already has training in acupuncture and a strong basic research training in neuroscience, this career development program is designed to allow the Candidate to become a successful independent clinical investigator. There is a strong institutional commitment to see the applicant succeed in this task due to a tremendous need for well-trained clinical investigators in alternative and complementary medicine.

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- **Project Title: MECHANISMS OF RHINITIS IN CFS**

  Principal Investigator & Institution: Baraniuk, James N. Professor; Medicine; Georgetown University Washington, DC 20057

  Timing: Fiscal Year 2002; Project Start 01-JUL-1997; Project End 31-MAY-2005

  Summary: This abstract is not available.

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- **Project Title: MULTIDISCIPLINARY CLINICAL RESEARCH CENTER**

  Principal Investigator & Institution: Kimberly, Robert P. Professor; Medicine; University of Alabama at Birmingham Uab Station Birmingham, AL 35294

  Timing: Fiscal Year 2002; Project Start 15-MAR-2002; Project End 31-DEC-2006

  Summary: The proposed UAB-MCRC is uniquely positioned to enable the rapid improvement of health care for patients with arthritis and musculoskeletal diseases through utilization of state-of-the-art methodology to promote scientifically rigorous and informative clinical and translational research. The established capabilities of the UAB Arthritis and Musculoskeletal Center will be harnessed through units designed to respond effectively to the anticipated growth in the areas of experimental therapeutics, genetics and functional genomics and outcomes, prevention, and rehabilitation. Clinical

research in RA, SLE, OA, systemic sclerosis, **fibromyalgia,** Wegener's granulomatosis, and osteoporosis will be leveraged through the expertise of the Methodology Core. This Core assembles an outstanding group of investigators with expertise in statistics, statistical genetics, and clinical epidemiology and outcomes research. These investigators have a proven track record of collaboration in clinical investigation in musculoskeletal diseases and the development, testing, and implementation of new techniques. Three innovative projects are proposed that represent cross-fertilization of collaborations and implementation of new techniques: (1) Sex-Related Determinants of Pain in **Fibromyalgia;** (2) Pharmacogenetics of Methotrexate in RA; (3) Improving Quality of Care in Steroid-Induced Osteoporosis. Continued scientific development, strategic planning, integration of efforts, and scientifically rigorous oversight are ensured through the expertise of the Administrative Unit.

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- **Project Title: NEUROBIOLOGY OF CHRONIC MUSCLE PAIN**

  Principal Investigator & Institution: Sluka, Kathleen A. Physical Therapy and Rehabilitation Science; University of Iowa Iowa City, IA 52242

  Timing: Fiscal Year 2001; Project Start 26-JUL-1999; Project End 29-FEB-2004

  Summary: (taken from the application): Although 14% of the United States population suffers from chronic musculoskeletal pain, most of our knowledge about pain has been obtained from studies on cutaneous pain. The current models of musculoskeletal pain typically produce short term hyperalgesia (resolved in 24 h or less). However, clinically, chronic muscle pain, as experienced by people with **fibromyalgia,** is long lasting (months to years). In preliminary studies, I determined that a long lasting bilateral hyperalgesia can be induced by two injections of low pH saline, five days apart, into one gastrocnemius muscle. In the work proposed I hypothesize that the development of the long lasting bilateral hyperalgesia is dependent initially on input from the site of injection following both the first and second injection. I further propose that once the long lasting hyperalgesia develops plastic changes in the central nervous system occur that maintain the hyperalgesia through increased activity in spinal neurons. The specific aims will establish and characterize a new model of muscle pain that is chronic and widespread. The proposed studies will establish if the neural mechanisms involved in the development and maintenance of chronic pain, induced by stimulation of muscle nociceptors, involve peripheral or central nervous system processes. These proposed studies will help in the understanding and thus potential treatment of chronic muscle pain, including such conditions as **fibromyalgia,** myofascial pain and low back pain.

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- **Project Title: NEUROENDOCRINE ALTERATIONS IN FIBROMYALGIA AND IBS**

  Principal Investigator & Institution: Chang, Lin; Medicine; University of California Los Angeles 10920 Wilshire Blvd., Suite 1200 Los Angeles, CA 90024

  Timing: Fiscal Year 2001; Project Start 13-SEP-1999; Project End 31-AUG-2004

  Summary: The long-range goal of this proposal is to develop an understanding of the etiology of chronic functional pain syndromes, such as **fibromyalgia** (FM) and irritable bowel syndrome (IBS). The constellation of symptoms in the FM and IBS suggest a failure to appropriately activate pain modulatory mechanisms, a failure to activate neuroendocrine stress mechanisms, and an alteration in the autonomic response. Our general hypothesis is that a neurobiological model exists in patients with FM and IBS, which includes as its primary components alterations in the following CNS responses to

stressors: inadequate antinociceptive response, blunted hypothalamic-pituitary-adrenal (HPA) axis response and altered autonomic balance and responsiveness. By applying similar methodologies across two functional pain syndromes (FM, IBS, and IBS plus FM), we will elucidate if altered CNS circuits are shared by these functional disorders or are site-specific and may explain the differences in symptom expression in the somatic or visceral domains. The first aim is compare the visceral and somatic pain thresholds before and after a noxious conditioning stimulus in three female patient populations (IBS, FM and IBS plus FM) with female controls, which would allow us to determine if altered perceptual responses are due to hypersensitive afferent pathways, or to a failure to activate antinociceptive systems. To further characterize alterations in the activation of specific antinociceptive pathways in response to conditioning stimuli, we will assess the effect of pharmacological manipulations of the opioid system (fentanyl, naloxone), and the noradrenergic system (corticotropin-releasing hormone (CRH), dexamethasone) on pain thresholds. Finally, we will compare brain activation in regions known to play central roles in antinociception in the 4 study populations with H215O PET brain imaging during visceral and somatic stimuli before and after the conditioning stimulus. In the second aim, we will test the responsiveness of the HPA axis, which has been shown to be altered in patients with FM, in the 4 study populations and address the potential mechanisms to explain these HPA axis alterations. To characterize these alterations, we will obtain serial measurements of plasma cortisol and ACTH over a 24-hour period to assess baseline alterations in the diurnal pulsatile rhythm and synchrony of ACTH and cortisol. We will also assess HPA axis responsiveness to acute stress by comparing ACTH and cortisol levels before and after a visceral or somatic conditioning stimulus. Finally, in our third aim, we will compare autonomic responses to visceral and somatic stimuli during visceral and somatic conditioning paradigms. In order to determine if the response of central autonomic networks to visceral or somatic stimulation differ between the study groups, regional brain activation will be correlated to autonomic responses during the visceral and somatic stimuli in the PET studies using covariate analysis. The combination of experimental approaches should improve our understanding of the CNS mechanisms underlying functional pain syndromes.

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- **Project Title: NEUROENDOCRINE FUNCTION IN FIBROMYALGIA**

  Principal Investigator & Institution: Crofford, Leslie J. Associate Professor; Internal Medicine; University of Michigan at Ann Arbor 3003 South State, Room 1040 Ann Arbor, MI 481091274

  Timing: Fiscal Year 2001; Project Start 01-JUL-2000; Project End 31-MAY-2005

  Summary: The etiology of **fibromyalgia** (FM) and other chronic musculoskeletal pain syndromes remains unclear. Treatment options are limited and often ineffective. Our group considers FM to be one of a spectrum of disorders characterized by dysregulated hypothalamic-pituitary-adrenal (HPA) axis function spanning both somatic and psychiatric syndromes. The HPA axis is a principal component of the coordinate stree-response system that is activated in response to both physical and psychological stimuli. There are interactions between the HPA axis and other systems contributing to linkage between the central nervous system and peripheral structures. Evidence of functional interaction between stress response systems and descending pain modulatory pathways exists. These findings suggest a role for the central nervous system in chronic musculoskeletal pain syndromes such as FM. Our research program is a multidisciplinary effort focused on basal and stimulated HPA axis function of patients with FM that is directed by the applicant. Our program has strong institutional support

from units within the institution, including the general clinical research, psychology and the Institute for Social Research, psychiatry, neurology, and internal medicine. We have developed a database of patients with FM from which patients to participate in our research efforts are recruited. There is an ongoing effort to recruit appropriate patients to participate in our programs. There is a tremendous need for clinical research in the area of musculoskeletal pain. The applicant's efforts in this area have stimulated a programmatic effort at this institution that did not previously exist. Funding from the applicants research efforts have been secured, and trainees have been recruited to participate in the research program. This award will allow for continuing high quality patient-oriented research in central and peripheral neuroendocrine function in FM and other syndromes of chronic musculoskeletal pain.

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- **Project Title: NEURONAL PLASTICITY RELATED TO TMD AND FIBROMYALGIA**

  Principal Investigator & Institution: Dessem, Dean A. Oral & Craniofacial Biol Scis; University of Maryland Balt Prof School Baltimore, MD 21201

  Timing: Fiscal Year 2003; Project Start 07-JUL-2003; Project End 30-APR-2007

  Summary: (provided by applicant): The long term objective of this project is to elucidate the role of craniofacial primary afferent neurons in musculoskeletal disorders such as temporomandibular disorders (TMD) and **fibromyalgia** (FM) using animal models. Two hypotheses are proposed: Hypothesis 1) Masticatory muscle inflammation increases the number of trigeminal ganglion (TG) muscle afferent neurons that express: substance P (SP), calcitonin gene-related peptide (CGRP), neurokinin-1 receptor (NK-lr) and CGRP receptor (CGRPr). This increase involves a phenotypic switch in which muscle primary afferent neurons that do not normally express neuropeptides express SP, CGRP, NK-1r, CGRPr following inflammation. We propose that this change contributes to muscle allodynia and hyperalgesia and can be modulated by pharmacologic manipulations thus providing insight into therapeutics for deep tissue pain. This hypothesis will be tested by quantifying the distribution of TG muscle afferent somata and peripheral axons containing SP, CGRP, NK-1r, CGRPr in three groups: i) control, ii) inflamed muscle, iii) inflamed muscle with intervention (anti-nerve growth factor, NK-lr and CGRPr antagonists). This hypothesis will also be tested by determining the levels ofCGRP, SP and gene expression for CGRP, SP within the TG using radioimmunoassay and reverse transcriptase polymerase chain reaction. Hypothesis 2) SP and CGRP alter the functional properties of TG muscle afferent neurons in part by evoking spontaneous activity and increasing their excitability. We predict that substantially more group II, III and IV TG muscle afferent neurons will be modulated by SP and CGRP following inflammation and that these functional alterations can be modulated pharmacologically. This hypothesis will be tested by characterizing the a) spontaneous and evoked activity and b) active and passive membrane properties of TG muscle afferent neurons prior to muscle inflammation, following muscle inflammation, and following muscle inflammation combined with pharmacological intervention. This will be achieved using intracellular electrophysiological recordings from masseter muscle afferent neurons in a trigeminal ganglion-masseter nerve in vitro preparation. Determination of soma size, axon diameter, and SP, CGRP immunoreactivity for physiologically characterized TG muscle afferent neurons will also test Hypothesis 1. Because a gender difference is reported for TMD and FM, both hypotheses will be tested in males, estrous females and diestrous females.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: NEUROTHERAPY OF FIBROMYALGIA**

  Principal Investigator & Institution: Nelson, David V. Behavioral Neuroscience; Oregon Health & Science University Portland, OR 972393098

  Timing: Fiscal Year 2003; Project Start 01-SEP-2003; Project End 31-MAY-2005

  Summary: (provided by applicant): **Fibromyalgia** (FM) is one of the most puzzling of the chronically painful disorders. It involves a core symptom of chronic widespread musculoskeletal pain at specific tender point (TP) sites on physical examination and is typically accompanied by fatigue, disordered sleep, cognitive complaints, an array of other somatic complaints, as well as psychological distress and significant impairments in functioning. Although largely championed and defined by rheumatologists, FM is now increasingly recognized to have a basis in central nervous system dysfunction. Treatments to date have been only partially effective and typically of modest benefit. Many persons with FM remain persistently dysfunctional and often disabled. This has given greater impetus for patients to seek complementary and alternative medicine (CAM) therapies. Within the scope of CAM, recent developments in biofeedback using electroencephalograph (EEG) or brainwave information have suggested some potential for application to FM. A novel variant of EEG biofeedback known as the Flexyx Neurotherapy System (FNS) uses very small pulses of electromagnetic energy to stimulate changes in brainwave patterns. The specific aim of this study is to evaluate the efficacy of FNS for the reduction of FM symptoms in a randomized, double-blind, placebo-controlled trial comparing two groups each of 20 patients who receive either the active intervention or a sham treatment for the same number of sessions. It is expected that immediately at the conclusion of treatment and at 3- and 6-month follow-up, patients receiving the active treatment will score significantly better on the primary outcome measure, the **Fibromyalgia** Impact Questionnaire total score. In terms of secondary outcome measures, it is further expected that patients receiving the active treatment will demonstrate significantly decreased heat sensitization (an objective indicator of abnormal central nervous system activity), fewer TPs and higher pressure thresholds to elicit TPs, less fatigue, improved cognitive functioning, reduced psychological distress, less depression, and improved quality of sleep. Preliminary data from this exploratory/developmental project will justify larger randomized, double-blind, placebo-controlled clinical trials of FNS and comparisons to other treatments for FM, and may provide a basis for investigating correlates and potential mechanisms of change. This program of research may contribute to immediate clinical applications to reduce FM symptoms and to better understanding of mechanisms of FM.

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- **Project Title: NEUROTROPHINS AND AN ANIMAL MODEL OF FIBROMYALGIA**

  Principal Investigator & Institution: Larson, Alice A. Professor; Veterinary Pathobiology; University of Minnesota Twin Cities 200 Oak Street Se Minneapolis, MN 554552070

  Timing: Fiscal Year 2001; Project Start 26-JUL-1999; Project End 31-MAR-2004

  Summary: (taken from the application): **Fibromyalgia** syndrome (FMS) is characterized by pain throughout the body (multifocal) with specific areas that are particularly sensitive to pressure. Primary afferent C-fibers are believed to be important in pain transmission. Some C-fibers contain substance P (SP) and are regulated by nerve growth factor (NGF), while others are characterized by the enzyme thiamine monophosphatase (TMPase) and are supported by glial derived neurotrophic factor (GDNF). Consistent with the hypothesis that C-fibers are involved in FMS, the concentrations of SP and NGF in the CSF of these patients are elevated. What initiates this is not known. C-fibers are

depolarized by kainic acid, an excitatory amino acid analog. A single i.p. injection of kainic acid increases TMPase stain in the dorsal spinal cord, suggesting sprouting, and produces a persistent (> 12 weeks) decrease in the intensity of mechanical stimulation required to evoke withdrawal responses in rats similar to the lowered threshold of pressure required to produce pain in patients with FMS. Whether kainic acid produces these effects by increasing GDNF or NGF activity along nociceptive pathways is not known. We will test the hypotheses that the mechanical hyperalgesia produced by kainic acid is caused by enhancement of neurotrophic activity that supports C-fibers (NGF and GDNF) which, in turn, enhances proteins associated with these nociceptive pathways. To accomplish this, we will use a rat model (1) to characterize the effect of kainic acid on mechanical nociception using von Frey fibers and grip force; (2) determine whether the content of NGF and GDNF (immunoreactivity) or its receptors (binding) are affected by treatment with kainic acid; (3) to determine whether the application of exogenous NGF or GDNF is sufficient to increase mechanical nociception; (4) to determine whether there is a change in the density of SP- or NkiR immunoreactivity and/or the density of TMPase in the spinal cord or DRG after injection of NGF or GDNF; and (5) to determine whether injection of kainic acid alters either the density of SP- or NKiR-immunoreactivity in the spinal cord or DRG, in a fashion that correlates with its ability to induce mechanical hyperalgesia. These studies will determine whether kainic acid alters neurotrophic activity and nociceptive responses in the rat in a fashion that is consistent with the biochemical and sensory characteristics of FMS. If kainic acid activity proves to be a useful model of FMS, therapeutic options may be more readily developed for this disease.

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- **Project Title: NIAMS MULTIDICIPLINARY CLINICAL RESEARCH CENTER**

  Principal Investigator & Institution: Glass, David N. Professor of Pediatrics and Director; Children's Hospital Med Ctr (Cincinnati) 3333 Burnet Ave Cincinnati, OH 45229

  Timing: Fiscal Year 2001; Project Start 01-SEP-2001; Project End 30-JUN-2006

  Summary: OF THE OVERALL PROGRAM: (Taken from the application) This proposal from the Children's Hospital Medical Center in Cincinnati has the goal of impacting a clinical practice as it is applied to the most common rheumatic diseases of childhood. This proposal also represents in part the competing renewal for the Centers existing P60 MAMDC and is complimentary to the P30 Cincinnati Rheumatic Diseases Core Center submitted earlier this year. It is estimated that 140,000-200,000 children within the United States have rheumatic disease, many, but not all, of which are autoimmune. The major diseases are juvenile rheumatoid arthritis, systemic lupus erythematosus, scleroderma and juvenile dermatomyositis. Of increasing impact are illnesses with regional and generalized musculoskeletal pain syndromes of which **fibromyalgia** is particularly common and appears to be increasing in frequency and can present a major management problem. The five components of the Center are: A methods core interacting with all projects; A trial of etanercept in juvenile dermatomyositis; A study of psychological status in juvenile onset **fibromyalgia;** An imaging study using quantitative T2 mapping JRA; Methotrexate pharmacogenomics in JRA. In addition, there is an administrative unit which will exercise operational control and administrative oversight of all the projects through an executive committee, two Advisory Boards and a Community-Based Board of Directors. The short- and long-term goals are to improve the health of children with these conditions and to better ensure a smooth transition from childhood and adolescence through to young adulthood for the child with a chronic rheumatic disease.

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- **Project Title: NOCICEPTOR AXONS AND NEURAL INFLAMMATION**

  Principal Investigator & Institution: Bove, Geoffrey M.; Beth Israel Deaconess Medical Center St 1005 Boston, MA 02215

  Timing: Fiscal Year 2001; Project Start 05-FEB-2001; Project End 31-DEC-2002

  Summary: (APPLICANT'S ABSTRACT): Neuropathic pain can result from nerve injury or numerous disease processes, and occur without axonal injury. Symptoms are typically difficult to manage clinically, and include nerve trunk pain, perceived locally at the nerve, and dysesthetic pain, perceived in the nerve's distal distribution. Painful symptoms can be spontaneous, and can also be reproduced by many cases of dysesthetic pain by movement of the affected nerve, or the tissue surrounding it. Observations of mechanically-evoked dysesthetic pain imply that axons have or acquire a transductive mechanism at the site of pathology. The proposed experiments address the hypothesis that dysesthetic pain results from sensitivity changes of nociceptor axons due to inflammation of the nerve that carries its axon. Single-unit recording will be made from dorsal root C-fibers with a nociceptive receptive field in the hind limb. The sciatic nerve will be identified in mid thigh, remote from the receptive field. Endogenous algesic chemicals, inflammatory mediators, and pro-inflammatory agents will be applied to the nerve. The properties of the neuron, including the mechanical sensitivity of the axon, will be tested before and at various times following application. In other experiments, a chronic neuritis will be induced and the neurons similarly tested. These experiments test the hypothesis that inflammation of a nerve induces changes in neuronal function. Additional, the answers to the posed questions will address part of a novel hypothesis of movement-induced pain generation. Descriptions of neuropathic pain are similar to those characteristics of some forms of chronic musculoskeletal pain, such as **myofascial pain syndrome, fibromyalgia,** and back pain. Research into these disorders has focused on various somatic tissues as a pain source, but the etiologies remain elusive and thus the disorder are different to treat. It is possible that these disorders are misdiagnosed neuropathy. Existing data suggest that focal neuropathies are the root pathology in some chronic musculoskeletal diseases, especially back pain, that typically are symptomatically worsened by movement. The information provided by the proposed studies will help form a foundation for development of an animal model of chronic, movement-induced musculoskeletal pain.

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- **Project Title: NORADRENERGIC DYSFUNCTION--A MODEL OF FIBROMYALGIA PAIN**

  Principal Investigator & Institution: Jasmin, Luc; Neurological Surgery; University of California San Francisco 500 Parnassus Ave San Francisco, CA 94122

  Timing: Fiscal Year 2001; Project Start 01-JUL-1999; Project End 30-JUN-2003

  Summary: The goal of this project is to develop a rat model of **fibromyalgia** pain which could provide the basis for future research into this complex disease. The difficulty in finding an etiology for this painful condition is in part because **fibromyalgia** is not a discrete or unique disease, but patients also a display number of different symptoms in addition to the widespread tenderness, including fatigue, sleep disturbances, headaches, gastrointestinal symptoms, etc. As such, **fibromyalgia** overlaps conditions such as Chronic Fatigue Syndrome, Irritable Bowel Syndrome, tension and migraine headaches. These conditions share several features, including a female predominance, initiation or

exacerbation in response to several different types of "stressors", and response to similar types of pharmacologic and non-pharmacologic modalities (e.g. tricyclic drugs, aerobic exercise). A dysfunction of the noradrenergic system, the basis for the proposed model, presents a unifying explanation for many seemingly disparate findings in **fibromyalgia** by accounting for the neuroendocrine and autonomic abnormalities, in addition to the chronic pain. Our guiding hypothesis is that in **fibromyalgia,** chronically decreased noradrenergic input to the spinal cord facilitates substance P release and subsequent hyperalgesia (decreased threshold for pain). This hypothesis is based on both clinical evidence of decreased noradrenaline and increased substance P in the spinal cord of **fibromyalgia** patients, as well as evidence from basic research demonstrating that acute decreases in spinal noradrenaline allow for greater release of substance P and sustained hyperalgesic effects of this neurotransmitter. These alterations in turn result in greater expression and redistribution of the substance P receptor in the spinal cord, contributing to the chronicity of the hyperalgesia. In the female rat, we will apply a novel technique of selective immunolesion of brainstem noradrenergic input to nociceptive areas of the spinal cord. The first aim will test the hypothesis that lowered nociceptive thresholds in rats with decreased spinal noradrenaline depend on substance P neurotransmission. This hypothesis will be tested by determining the contribution of spinal SP neurotransmission in alterations of nociceptive behavioral and neuronal responses to noxious and innocuous stimuli. The second aim will test the hypothesis that chronically decreased spinal noradrenaline chronically increases basal levels, and facilitates evoked release of substance P, by measuring levels of substance P in the CSF, primary afferent neurons, and spinal cord, both basal and following noxious and innocuous stimulation. In the third aim, we will test the hypothesis that decreased spinal noradrenaline facilitates stimulus-induced increased expression and redistribution of the substance P receptor (NK1 receptor) in the spinal cord by measuring basal and noxious stimulus-induced alterations in the expression of this receptor.

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- **Project Title: OPTIMIZING FIBROMYALGIA SELF-MANAGEMENT**

  Principal Investigator & Institution: Rooks, Daniel S.; Beth Israel Deaconess Medical Center St 1005 Boston, MA 02215

  Timing: Fiscal Year 2002; Project Start 01-JUN-2002; Project End 31-MAY-2007

  Summary: (provided by applicant): **Fibromyalgia** syndrome (FMS) is a common, chronic musculoskeletal disorder and a growing cause of disability and increased health care utilization. Current treatment focuses largely on pharmacological intervention, which is often ineffective at improving symptoms and functional status. Recent research suggests that disease self-management can be efficacious in the short-term at reducing symptom severity and improving function in persons with FMS. The most common forms of FMS self-management are coping skills, training (behavioral/education) and exercise. Limited in number, most FMS self-management studies examine the short-term effects of one form or the other, with most using the coping skills training approach. Little data exist to examine the long-term effects of these interventions, the potential additive effect of combining coping skills training with a comprehensive, group exercise program or an approach for promoting long-term compliance of these interventions. The objective of this proposal is for the PI to acquire new competencies in the area of health behavior; to expand research skills; and to apply this knowledge in a study to identify the optimal approach to FIVIS self-management. The PI will combine formal learning in health and social behavior, research design and analysis, and ethics in clinical research with informal learning, in a proven academic training environment

under the guidance of a committed mentor. The study is a randomized, controlled trial comparing coping skills training (the Arthritis Foundation **Fibromyalgia** Self-Help Course (FSHC)) with a comprehensive exercise program (previous work of PI), a combination (the FSHC plus the exercise program) or no treatment (waiting list control). Each intervention period will last 16 weeks and include group sessions led by trained personnel. Subjects will be followed for 6 months after completing the intervention to evaluate the short-term effect of each program. At 6 months, subjects will be randomized into two groups-one group will receive a 4 week refresher course of their original intervention every 6 months and the other group will receive no further intervention. Long-term follow up will be for 24 months after completing the 16 week intervention period. Subjects will include 200 women (four groups of 50), 25 to 65 years old with a confirmed diagnosis of FMS. Participants will undergo blinded assessment at the Beth Israel Deaconess Medical Centers GCRC at five time points-baseline, completion of the 16-week intervention and 6, 12 and 24 month follow up. We will assess health and functional status (FIQ, SF36), symptom severity (FIQ, SF36, Beck scales), self-efficacy (Arthritis Self-Efficacy Scale), fitness (muscle strength, cardiovascular fitness, flexibility) and health care utilization (direct and indirect costs). The study will improve treatment outcomes for persons with FMS by identifying the optimal self-management program.

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- **Project Title: ORTHOSTATIC INTOLERANCE IN CFS**

  Principal Investigator & Institution: Freeman, Roy; Associate Professor of Neurology; Beth Israel Deaconess Medical Center St 1005 Boston, MA 02215

  Timing: Fiscal Year 2001; Project Start 01-FEB-1998; Project End 31-JAN-2002

  Summary: (Adapted from the Investigator's Application): The over-all objectives of this proposal are: (1) to delineate the pathophysiology and pathogenesis of orthostatic intolerance in the chronic fatigue syndrome (CFS) (2) to investigate the role of orthostatic intolerance in producing the symptoms of CFS and (3) to use this information to apply physiologically appropriate therapeutic interventions and thereby decrease the symptoms of fatigue. The investigators plan to determine the physiological characteristics of orthostatic intolerance in CFS patients and healthy controls, characterize the differences in functional exercise capacity among CFS patients and between CFS patients and controls; and identify the relationships between the physiological measures of orthostatic intolerance, measures of functional exercise capacity, symptoms of orthostatic intolerance and symptoms of fatigue. Cardiovascular autonomic functions are to be assessed using standard tests of the sympathetic and parasympathetic nervous system; arterial baroreflex gain is to be measured using the heart rate and muscle sympathetic nerve activity response to pharmacological provocations; the cardiopulmonary baroreflex functions is to be assessed in response to graded central hypovolemia elicited by lower body negative pressure; plasma volume will be measured using the Evans Blue dye method; venous compliance assessed with venous occlusion plethysmography, Assessment of neurohumoral status and the functional exercise capacity is also to be included. These measures, which comprise the elements of orthostatic tolerance, will be compared with matched healthy controls. The relationships between these variables and the role of covariates such as the level of physical activity and psychiatric state, determined with standardized instruments, are to be analyzed using multivariate statistics.

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- **Project Title: PAIN PERCEPTION AND HEALTH CARE SEEKING BEHAVIOR IN FIBROMYALGIA**

  Principal Investigator & Institution: Bradley, Laurence A.; University of Alabama at Birmingham Uab Station Birmingham, AL 35294

  Timing: Fiscal Year 2001

  Summary: The initial purpose of this project was to examine abnormal pain perception and health care seeking behavior among persons with **fibromyalgia** (FM). Our initial subject groups consisted of 66 rheumatology clinic patients with FM, 39 community residents with FM who had not obtained medical care for their painful FM symmptoms in the past 10 years (i.e., nonpatients), and 39 healthy controls recruited from the community. We found that both patients and nonpatients with FM show significantly lower pain threshold levels and produce significantly higher scores on an index of sensory discrimination than healthy controls. These findings were replicated at 1- and 2-year followup assessments. These findings indicated that abnormal pain perception is associated with FM independently of health care seeking behavior. Moreover, it was found that lifetime history of psychiatric disorders was the best psycho-social predictor of obtaining health care at a tertiary care, rheumatology clinic for FM symptoms, i.e., greater psychiatric morbidity was associated with health care seeking. This indicated that the high levels of psychiatric morbidity seen in tertiary care clinic patients with FM is more strongly related to health care seeking than to the disorder itself. This project has been renewed by the NIH for another four years. The purpose of the second cycle of the project is to examine functional brain activity in three groups of subjects during resting conditions and during exposure to an acute painful stimuluus. These groups are 30 patients with **fibromyalgia,** 30 patients with chronic fatigue syndrome, and 30 healthy controls. Functional brain activity is assessed by single photon emission computed tomographic imaging. Four subject protocols have been completed at present. It is anticipated that patients with **fibromyalgia** will show inhibited funtional brain activity, relative to patients with chronic fatigue syndrome and controls, in the thalamus and caudate nucleus during resting conditions and during painful stimulation. However, it also is expected that the **fibromyalgia** patients, compared to the other subject groups, will show higher levels of functional brain activity in the anterior cingulate cortex during painful stimulation.

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- **Project Title: PAIN SIMILARITIES IN BREAST CANCER AND FIBROMYALGIA**

  Principal Investigator & Institution: Burckhardt, Carol S. Professor; Oregon Health & Science University Portland, OR 972393098

  Timing: Fiscal Year 2001; Project Start 15-SEP-2001; Project End 31-AUG-2004

  Summary: (from applicant's Abstract) The majority of women with breast cancer are likely to survive for many years after the initial diagnosis and treatment. Unfortunately, long-term disease and treatment-related symptoms, such as chronic pain, can have wide-ranging consequences for health, functioning, and life quality. The purpose of this pilot project is to describe the characteristics of the chronic pain experienced by women with breast cancer who are post-breast cancer surgery with particular emphasis on the description of widespread pain, The specific aims are to: (1) describe characteristics of the chronic pain experienced by women who are post-breast cancer surgery; and (2) compare and contrast the pain characteristics, sensory thresholds, upper body muscle strength and impairment, syndrome impact, health status, and quality of life of women with neuropathic pain only with that of women who meet criteria for **fibromyalgia,** a

specific syndrome of widespread pain. The immediate goal of this pilot project is to test an assessment strategy for characterizing the pain, impairment, and impact. The long term goals are to use the information to support the development of better diagnostic assessments of post-breast cancer surgery pain and the development of innovative early intervention strategies to prevent widespread pain and increase the functioning, health and quality of life of women who have post-breast cancer surgery pain. The study will use a descriptive design in which 30 women, with either post-surgery chronic pain that is limited to the operated side or widespread body pain, will be assessed for descriptions of the pain, muscle strength of the upper extremities, lymphedema, tender points, joint tenderness and swelling, sensory integrity, thermal sensation, health status, and quality of life.

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- **Project Title: PAIN, SUPRASPINAL SEROTONIN AND NEUROTROPHIC FACTORS**

  Principal Investigator & Institution: Hackshaw, Kevin V. Assistant Professor; Internal Medicine; Ohio State University 1800 Cannon Dr, Rm 1210 Columbus, OH 43210

  Timing: Fiscal Year 2001; Project Start 01-APR-2000; Project End 31-MAR-2004

  Summary: Fibromyalgia comprises a subset of hyperalgesic or allodynic syndromes characterized by a dysregulation of nociceptive processing and neuroendocrine function. Chronic generalized pain together with decreased endocrine and autonomic responsiveness to stress has been observed. Clearly, supraspinal systems regulate nociceptive pathways, but our understanding of the neuromodulators participating in chronic pain pathways is quit incomplete. Therapeutically, drugs that alter serotonergic neurotransmission show modest effectiveness in these disorders. This study will utilize in vivo microdialysis to investigate monoamine release in supraspinal sites important in endocrine (paraventricular nucleus of the hypothalamus) and pain regulating (ventral lateral thalamus) systems in an animal model of chronic pain. In addition, the effects of chronic pain on responsiveness of the autonomic nervous system will also be assessed. Neurotrophic factors NGF, FGF-1 and FGF-2 are prominently expressed in the central nervous system however, there is a paucity of information on how their expression changes in the setting of chronic pain. In situ hybridization and immunohistochemical localization of these growth factors will be conducted on brain from Sprague-Dawley rats with adjuvant induced arthritis (a model of chronic pain), rats having undergone partial sciatic nerve ligation (a model of acute pain) and sham treated control rats. In vivo experiments will utilize antigens oligonucleotide technology to modulate c-fos, NGF, FGF-1 and FGF-2 expression. Microdialysis will allow us to dynamically assess Serotonin, Substance P and NGF levels in selected regions of rat brain following antigens oligonucleotide delivery. This proposal will provide a novel approach to dynamically measure critical compounds involved in nociceptive transmission.

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- **Project Title: PHYSIOLOGICAL BENEFITS OF MENTAL WELLBEING IN CHRONIC DISEASE**

  Principal Investigator & Institution: Coe, Christopher L. Professor; University of Wisconsin Madison 750 University Ave Madison, WI 53706

  Timing: Fiscal Year 2002

  Summary: (adapted form the investigator's abstract): This project proposes to evaluate psychological well-being, symptom expression, and endocrine/immune functioning in

women with two musculoskeletal conditions, **fibromyalgia** (FMS), and rheumatoid arthritis (RA). Specifically, the studies will assess whether a capacity to sustain a sense of psychological wellbeing results in severity and self-reported experience of symptoms. The first study will compare women with FMS, RA, and healthy controls across two phases of the menstrual cycle for symptom expression, pain sensitivity, and physiological function. In a second intervention study, an attempt will be made to enhance psychological wellbeing and positive affect with an eight-week training program in women newly diagnosed with RA and FMS.

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- **Project Title: POPULATION BASED TWIN STUDY OF CHRONIC FATIGUE SYNDROME**

  Principal Investigator & Institution: Sullivan, Patrick F. Associate Professor; University of Washington Seattle, WA 98195

  Timing: Fiscal Year 2001

  Summary: Despite considerable research, fundamental questions about CFS-like illness remain at best partially answered. These questions include its definition, validity, the degree to which it results from genetic versus environmental factors, and the nature of the substantial comorbidity observed with other conditions. The overarching aim of this Project is to shed light on a number of basic questions about CFS via a large population-based classical twin study. First, we will screen approximately 13,000 same-sex twin pairs who are members of the Mid-Atlantic Twin Registry for the lifetime presence of CFS-like illness (and several overlapping conditions such as **fibromyalgia** and major depression). Second, all twins who screen positive and a subset of twins who screen negative will be directly and blindly interviewed. The interviews will collect information about CFS symptoms, psychiatric disorders, stress life events, and medical history, and medical history. We will obtain additional standardized medical data via the subject's physician(s). Third, all screening, direct interview and medical data will be independently reviewed by three of the study investigators to determine the certainty than an individual meets criteria for "presumptive CFS" plus approximations of the Centers for Disease Control, British, and Australian CFS case definitions. Obtaining these unique data will allow us to address a set of critical questions regarding CFS-like illness. First, using the direct interview data will allow us to address a set of critical questions regarding CFS-like illness. First, using the direct interview data, we will use multivariate techniques to derive and empirical typology of prolonged fatigue and to assess how this typology compares to the major CFS case definitions to answer the question: "Is there a point of rarity that distinguishes the common symptom of fatigue from case definitions of CFS"? Next, we will quantify the role of genetic predisposition and environmental sources of variation from different definitions of CFS-like illness. This will allow us to address 2 important questions. Because the degree to which a complex and idiopathic condition is heritable is an important validator, we can address the question: "Do these definitions yield similar or different estimates of heritability?" In addition, examining the extent to which liability to CFS- like illness is due to additive genetic, shared environmental, and individual-specific environmental precipitating effects will yield glimpses into the fundamental nature of CFS. Finally, using multivariate twin analyses, we address the question: "To what extent to the genetic and environmental sources of variation of these other conditions overlap with CFS?"

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- **Project Title: RAT MODELS TO SCREEN COMPOUNDS INDUCING SLOW-WAVE SLEEP**

  Principal Investigator & Institution: Bergmann, Bernard M.; Slowave 20 N Wacker Dr, Ste 2200 Chicago, IL 60606

  Timing: Fiscal Year 2003; Project Start 01-SEP-2000; Project End 30-JUN-2004

  Summary: (provided by applicant): A main goal of SloWave, Inc. is to develop a novel class of sleep-enhancing compounds that, unlike all currently available hypnotics, stimulate slow-wave sleep (SWS), the deepest and most restorative stage of sleep. SloWave plans to develop structural analogs of a natural neuromodulator, gamma-hydroxybutyrate (GHB), which is a potent stimulant of SWS, and has a specific newly identified receptor system in the brain. The objective of this Phase II proposal is to synthesize and screen compounds with the most potent effects on SWS. The specific aims are: 1. To test about 50 GHB agonists, identified by binding assays to have affinity for the GHB receptor, for their ability to induce changes in locomotor activity and body temperature, and to later test about 10 of the lead compounds for their effects on EEG sleep-wake states. 2. To test important hypotheses concerning the mechanisms of action of GHB by examining the effects of various GABAergic or dopaminergic antagonists on GHB-induced alterations in behavioral or physiological state. 3. To determine the effect of chronic treatment with GHB on sleep, and to determine if withdrawal from chronic drug exposure leads to sleep disturbances. The completion of these studies will result in: 1. The identification of 2-3 novel compounds that will subsequently be tested for toxicity prior to human Phase I studies. 2. Increased understanding of the mechanisms of action of GHB on sleep information, which is critical for the design of clinical studies. 3. The definition of the effects of chronic GHB treatment on sleep information, which is important for later pre-clinical studies on the chronic effects of our compounds. The development of GHB related compounds will represent a major breakthrough in the treatment of conditions which involve decreased or abnormal slow-wave sleep, such as aging depression, **fibromyalgia** and narcolepsy, which together affects many millions of individuals. PROPOSED COMMERCIAL APPLICATION: SloWave will develop a novel class of sleep-enhancing compounds acting via the GHB system which, unlike currently available hypnotics, stimulate slow-wave sleep, the deepest and most restorative stage of sleep, and have a pharmacokinetic profile consistent with the maintenance of sleep and a heightened level of alertness upon awakening. These new compounds will represent a major breakthrough in the treatment of conditions and illnesses which involve disturbed sleep.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: REGULATION OF ADRENAL FUNCTION IN FIBROMYALGIA**

  Principal Investigator & Institution: Adler, Gail K. Assistant Professor; Brigham and Women's Hospital 75 Francis Street Boston, MA 02115

  Timing: Fiscal Year 2001; Project Start 25-SEP-1994; Project End 31-JUL-2003

  Summary: (Adapted From Applicant's Abstract) This competitive renewal project proposes to extend studies of the hypothalamic-pituitary-adrenal axis in **fibromyalgia** syndrome previously undertaken by the PI. Her initial data suggested reduced adrenocorticotropin (ACTH) and epinephrine responses to graded hypoglycemic challenge, and blunting of the normal diurnal cortisol rhythm in patients with **fibromyalgia** when compared to normal controls. The PI postulates that the decreased ACTH response to hypoglycemic challenge is the result of impaired CRH release, this also results in decreased sympathoadrenal response to hypoglycemia. The PI further

proposes that the diurnal cortisol rhythm in patients with **fibromyalgia** is abnormal due to a shift in the circadian phase. In Specific Aim 1, the PI and her colleagues propose to assess hypothalamic CRH-pituitary ACTH activity at baseline and in response to three stimuli: hypoglycemia, metapyrone-induced glucocorticoid administration, and an immune stimulus with tetanus toxoid vaccine. In Specific Aim 2, sypathoadrenal responses to hypoglycemia, the cold pressor test, metapyrone vs. placebo will be compared in patients with **fibromyalgia** and controls. In Specific Aim 3, the circadian phase (measured by core body temperature and melatonin levels) will be compared in women with **fibromyalgia** and healthy controls. Additional studies of the relationship between disrupted sleep pattern and night-time secretion of ACTH and cortisol and cytokines are planned if the circadian phase is not shifted.

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- **Project Title: ROLE OF FATIGUE IN RHEUMATIC DISEASES**

  Principal Investigator & Institution: Lange, Gudrun; Associate Professor; Psychiatry; Univ of Med/Dent Nj Newark Newark, NJ 07103

  Timing: Fiscal Year 2003; Project Start 30-SEP-2003; Project End 29-SEP-2004

  Summary: (provided by applicant): Fatigue is a common complaint in rheumatic disorders and is one of the strongest predictors of physical dysfunction in patients with **Fibromyalgia** (FM) and other related disorders, rheumatoid arthritis (RA), osteoarthritis (OA), and systemic lupus erythematosus (SLE). However, research addressing the causes and mechanisms of fatigue is rare in rheumatic illnesses. The lack of scientific evidence focusing on the role of fatigue in rheumatic illness directly impacts on the ability of health care professionals to assess the presence, severity and trajectory of fatigue and to evaluate the relationship of fatigue with other symptoms of these disorders in order to provide appropriate treatment recommendations. Fatigue is one of the most commonly reported, yet least understood and unrelieved symptoms accompanying chronic illnesses. The primary objective of the proposed workshop is to establish a knowledge base of current information on fatigue in rheumatic illness that will be compared with the state of knowledge gained from studies of fatigue in cancer, HIV/AIDS, stroke, and MS. This process will serve to identify knowledge gaps concerning the role of fatigue in rheumatic illness. Directions for future fatigue research in rheumatic illness will be suggested incorporating research methodologies that have proven successful in other somatic disorders. To achieve these objectives, a group of renowned fatigue and sleep researchers drawn from a variety of scientific areas including neuroscience, physiology, immunology, and psychiatry/psychology, clinical practice, as well as representatives of public interest groups will be invited to attend a workshop to be held on March 18 and 19, 2004 at the Dolce Hamilton Park Conference Center in Florham Park, NJ. Presentations addressing definition, conceptualization, and assessment of fatigue in general will proceed state-of-the-art overviews of fatigue research in FM, RA, OA, SLE, cancer, HIV/AIDS, stroke, and MS, and will be followed by concentrated discussions in break-out groups. A position statement summarizing the results from this workshop will be produced at the conclusion of the meeting and disseminated via publication in a peer-reviewed journal. The collaborative and interactive nature of the proposed workshop will ensure that the recommendations generated will have a broad impact on the scientific community, and will generate collaborative, interactive research amongst scientists and clinicians with an interest in rheumatic illnesses.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: SEX HORMONES, STRESS, AND PAIN IN FIBROMYALGIA**

  Principal Investigator & Institution: Okifuji, Akiko; Associate Professor; Anesthesiology; University of Utah 200 S University St Salt Lake City, UT 84112

  Timing: Fiscal Year 2001; Project Start 11-SEP-2000; Project End 31-JUL-2005

  Summary: Many chronic pain disorders are more prevalent in women. Women also exhibit greater sensitivity to experimentally induced pain. Research has suggested that sex hormones exert multiple impacts upon human CNS, including the sympathoadrenal and serotonergic functions. The primary purpose of this proposal is to test several components of a conceptual model hypothesizing how the hormonal and stress factors are related to **fibromyalgia** syndrome (FMS), a chronic musculoskeletal pain disorder, predominantly seen in women. We will use both laboratory and field study approaches to evaluate the effects of sex hormones in pain sensitivity, stress reactivity, and symptom perception across a menstrual cycle in women with FMS, in comparisons to healthy pain-free females (PFF) and males (PFM). Specifically, we will test sex steroid production in FMS, estrogenic effects on the sympathoadrenal functions in response to stressors, estrogenic effects on pain sensitivity, involvement of sex hormones in perimenstrual and FMS symptoms across menstrual cycle, and sleep and stress as predictors of pain, fatigue, distressed mood in FMS. A total of 300 subjects (100 each in FMS, PFF, PFM) will undergo home urine tests, daily symptom monitoring, blood and saliva sampling, and experimentally induced stress and pain testing. The laboratory testing will be repeated on 3 separate days: once during the mid-luteal phase (high estrogen E + high progesterone P), once during the perimenstrual phase (low E + low P), and once during the late-follicular phase (high E + low P). Male subjects will be scheduled using a "yoked-cycle" to female subjects. Each subject will be randomly assigned to one of the two experimental conditions ("stress-priming" vs "non-stress-priming" tasks just prior to pain testing). Blood pressure and salivary cortisol will be sampled multiple times throughout the laboratory sessions. The findings from this project are expected to promote better understanding of the role of female sex hormones in noxious sensory processing in chronic pain disorders.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: SLE DISEASE ACTIVITY--PREDICTORS OF MORBIDITY AND HEALTH**

  Principal Investigator & Institution: Tucker, Brian; Johns Hopkins University 3400 N Charles St Baltimore, MD 21218

  Timing: Fiscal Year 2001

  Summary: The Lupus Center at JHH is uniquely situated to address clinical research issues through prospective follow-up of a large number of SLE patients. During Dr. Petri's FIRST award, issues addressed included the risk of future thrombosis and coronary artery disease associated with antiphospholipid antibodies, routine cardiovascular risk factors, and prednisone use. The Lupus Cohort has now been refunded by the NIH. The specific aims of the RO-1, although a continuation of the FIRST award work, now include an emphasis on disease activity and disability. Ongoing disease activity exposes patients to the side effects of corticosteroids. Over one-half of patients sustain permanent organ damage. Determination of predictors of disease activity should help to reduce unneeded corticosteroid treatment and allow institution of earlier treatment when it is needed.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: SPATIAL AND TEMPORAL CHARACTERISTICS OF CENTRAL PAIN SE**

  Principal Investigator & Institution: Mauderli, Andre P. Prosthodontics; University of Florida Gainesville, FL 32611

  Timing: Fiscal Year 2002; Project Start 01-JUL-2002; Project End 31-MAY-2007

  Summary: (provided by the applicant): Prolonged pain appears to have the potential to modulate its own intensity through positive and negative feedback (central sensitization by pain, pain inhibition by pain). If the feedback is positive, the result is a vicious pain cycle and a progressive increase in pain sensitivity. Increased pain sensitivity means that a given stimulus is perceived as more painful (hyperalgesia), or - in more extreme cases - that a previously non-painful stimulus becomes painful (allodynia). The vicious cycle may lead to sensitization beyond the topographical boundaries of the original pain, and thus it may render remote body regions more pain-prone. The result may be a snowball effect of progressive expansion of the painful area. There is evidence suggesting that the vicious cycle may be a pathophysiological factor in certain chronic pain diseases, including **fibromyalgia** syndrome (FMS), **myofascial pain syndrome** (MPS), and irritable bowel syndrome (IBS). This research is guided by 4 questions: 1) Does the intensity and duration of a persistent pain have an effect on how pain sensitivity changes over time? 2) Does the sensitizing effect of pain signals reach beyond the topographical location of the original pain focus? 3) Is it possible to interrupt the vicious pain cycle and allow the sensitized state to return to normal by temporarily silencing the local pain focus that presumably started the cycle? 4) Does the maintenance of the sensitized state depend on central NMDA receptor function, molecular constituents known to play a role in temporal integration of pain stimuli and other memory systems? The subjects in this study will be asked to rate pain intensities by setting the slider on an electronic visual analog scale. Novel methodology will be used for probing the temporal and spatial response properties of central pain modulation with experimental pain with prolonged series of thermal pulses. The effect of silencing clinical pain foci with transdermally delivered local anesthetics on thermallyinduced sensitization will be studied. The importance of NMDA receptor systems in the maintenance of a sensitized state will be assessed by measuring pain sensitization properties before and after pharmacologically blocking them.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: STRESS, ADRENERGIC AND INFLAMMATORY FACTORS IN 4 DISORDERS**

  Principal Investigator & Institution: Light, Kathleen C.; University of North Carolina Chapel Hill Office of Sponsored Research Chapel Hill, NC 27599

  Timing: Fiscal Year 2001; Project Start 01-AUG-1999; Project End 31-JUL-2004

  Summary: Chronic fatigue syndrome (CFS), Temporomandibular Disorder (TMD) and **Fibromyalgia** (FM) are common chronic disabling disorders whose pathogenesis and treatment are not well understood, but which share four characteristics: sensitivity to life stress, signs of pain system dysregulation, psychological distress and negative affect, and possible alteration of inflammatory mediators. The focus of the present investigation is to compare 40 patients meeting accepted diagnostic criteria for each of these disorders with 40 age- and gender-matched healthy controls and with 40 patients diagnosed criteria for each of these disorders with 40 age- and gender-matched healthy controls and with 40 patients diagnosed with Rheumatoid Arthritis (RA), the prototypical chronic inflammatory disorder. To determine whether there is evidence of

dysregulation of autonomic (particularly beta-adrenergic function, hypothalamic-pituitary adrenocortical function (HPA), endogenous opioids, and inflammatory cytokine responses, these interacting physiological systems will be assessed during baseline and in response to two standardized stressors, a speech about interpersonal conflict and tourniquet-induced ischemic arm pain. Prior research has confirmed beta-adrenergic mediation of stress-induced changes in immune parameters. Thus, each subject will be studied twice, once after placebo and once after acute pretreatment with the non-selective beta-receptor antagonist, propranolol, to confirm the hypothesized involvement of beta-receptor activity in the dysregulated responses of the CFS, TMD and FM groups. In a second study, these same patients will be recruited to enter a placebo-controlled, double-blind cross-over treatment trial (6 weeks) of propranolol's potential benefits in normalizing responses to lab stressors and real life demands, in decreasing pain hypersensitivity, and improving somatic and psychological symptoms. A novel aspect of these studies will be their focus on the relationships between HPA axis function, autonomic function and effects upon IL6, IL1beta, and TNFalpha, the cytokines forming the central cascade in initiation of the inflammatory response. This investigation will provide important and needed assessment of basic physiological alterations, as well as more concrete tests of the contribution of stress exposure, in CFS, TMD and FM patients. Further, by clarifying the hypothesized role of beta-adrenergic activity and benefits of beta-blockade, it also provides a starting point for research on more effective medical treatment in disorders which have been medically difficult to manage.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: SUBGROUPS OF FMS--SYMPTOMS, BELIEFS & TAILORED TREATMENT**

  Principal Investigator & Institution: Turk, Dennis C. John & Emman Bomica Professor Of; Anesthesiology; University of Washington Seattle, WA 98195

  Timing: Fiscal Year 2001; Project Start 20-JUL-1998; Project End 30-JUN-2003

  Summary: Fibromyalgia syndrome (FMS) is a prevalent, chronic musculoskeletal pain disorder. Despite extensive research the etiology and pathophysiologic mechanisms of FMS are not well understood, and no treatment has been shown to be universally effective. In this project, we propose that FMS is a complex disorder involving multiple factors, both physical and psychosocial-behavioral. In our previous research, we have demonstrated that FMS patients are heterogeneous in the psychosocial-behavioral axis and can be classified into 3 distinct subgroups on a basis of their psychosocial adaptation to symptoms. In this application we will extend our previous research and attempt to match treatments to patients psychosocial-behavioral characteristics. Specifically, we will test the efficacy of uniquely tailored treatment for each psychosocial subgroup. Three groups of FMS patients will be treated with one of the 3 treatment protocols with standard physical therapy and varying psychological treatments. A total of 312 FMS patients will undergo a 6 half-day interdisciplinary treatment sessions consisting of physical therapy and psychological treatments. All protocols include a standardized physical therapy but include either cognitive-behavioral pain management therapy, interpersonal skill training, or supportive counseling. In addition to the treatment outcome study, various symptoms of FMS will be assessed prospectively in the patients natural habitats to better understand covariations of FMS symptoms. The repeated daily monitoring using the palm-top computer (ecological momentary assessment) will permit us to evaluate the value of process ratings compared to retrospective reports. Overall, the results of these studies should establish the benefit of

matching treatments to subject characteristics, and enhance our understanding of the roles of cognitive-affective-behavioral adaptation of FMS patients.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: THE EFFICACY OF REIKI IN THE TREATMENT OF FIBROMYALGIA**

  Principal Investigator & Institution: Assefi, Nassim P. Women's Health Specialist; Medicine; University of Washington Seattle, WA 98195

  Timing: Fiscal Year 2002; Project Start 15-APR-2002; Project End 28-FEB-2004

  Summary: (provided by applicant): **Fibromyalgia** (FM), one of the most common rheumatologic diagnoses, is a condition of unknown etiology characterized by widespread muscle pain and stiffness, accompanied by a variety of other symptoms including sleep disturbance, headaches, irritable bowel syndrome, and psychological distress. Treatment is generally unsatisfactory and most randomized, controlled treatment trials have been unable to demonstrate a sustained effective intervention. Thus, it is not surprising that the vast majority of FM patients have tried complementary and alternative medicine (CAM) therapies. Reiki is a form of energy medicine in which practitioners reportedly access universal life energy to heal patients, either by direct contact at specific hand positions or from a distance. A vast body of anecdotal literature as well as 2 randomized controlled trials suggest that Reiki may be an effective treatment for FM, appearing to relieve pain and improve psychological well being. In addition, it appears to have no adverse effects and can eventually be self-administered, making it a low-risk, low-cost, potentially patient-empowering intervention. This study will investigate the efficacy of Reiki in the treatment of FM. 100 Reiki-naive FM patients will be recruited from a chronic fatigue referral clinic, and will undergo an 8-week, biweekly (16 treatments) trial. Patients will be randomized into 2 Reiki groups (direct-contact and distant Reiki) and 2 control (sham and placebo) groups. The sham Reiki practitioners will be professional actors who resemble the true Reiki practitioners but have no experience with health care or healing arts and are taught to mimic the Reiki Masters' verbal and physical interactions with the patients, while distracting whatever healing intention they may possess by doing mental arithmetic. The specific aims of this study are: 1) to evaluate the short and long-term efficacy and safety of an 8-week placebo-controlled randomized trial of both direct-contact and distant Reiki in the treatment of FM; 2) establish carefully constructed control groups for their feasibility and scientific usefulness for future trials of Reiki and other types of energy medicine; and 3) to collect pilot data for larger trials on the mechanism, safety, and duration of clinical and subjective effects of Reiki. Patients will be assessed at enrollment, 4 and 8 weeks during treatment and 12 weeks post-treatment. Our primary outcomes will be patient global assessment, subjective pain and mean number of tender points. Secondary outcomes will include pain threshold, sleep, fatigue, and psychological indicators. This pilot study could potentially impact the clinical care of the estimated 6 million Americans with FM, and shape the design of future larger, randomized, placebo-controlled trials of Reiki and other energy therapies.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: THE ROLE OF CO-MORBID MENTAL DISORDERS IN LYME DISEASE**

  Principal Investigator & Institution: Hassett, Afton L. Medicine; Univ of Med/Dent Nj-R W Johnson Med Sch Robert Wood Johnson Medical Sch Piscataway, NJ 08854

  Timing: Fiscal Year 2002; Project Start 01-MAY-2002; Project End 30-APR-2007

Summary: (provided by investigator): Committed to a career in behavioral science research, the candidate's immediate goals are to obtain high quality didactic training and additional mentored experience related to interdisciplinary research. Long term career goals include exploring the role of co-morbid mental disorders and related psychological processes in rheumatologic illness and eventually becoming an expert on medically unexplained symptom syndromes across specialties. Current research is based on the candidate's stress-diathesis theoretical model for the "psychopathogenesis" of unexplained symptom syndromes present in rheumatology, i.e., Post Lyme Disease and **fibromyalgia.** The K08 Award would allow the candidate to devote 80 percent of her time to research and training. UMDNJ-Robert Wood Johnson Medical School is an outstanding environment in which to conduct this type of research. In addition to traditional biomedical research, many faculty members are actively exploring the role of psychological processes in health and illness. Mentorship would be provided by two such exceptional faculty, Javier I. Escobar, MD, Chairman of Psychiatry and Leonard H. Sigal MD, Chief of Rheumatology and Director of the Lyme Disease Center at UMDNJ-RWJMS. In addition to superior mentored clinical research experience, the candidate will receive advanced training in research methodology, statistical analysis, the responsible conduct of research, and neuroscience. Training highlights include statistical analyses through the Department of Statistics at Rutgers University and Neuroscience coursework at Princeton University. Mentored experience in research will consist of two studies. Study 1 will assess the co-morbid clinical disorders (Axis I) and pathological personality traits (Axis II) of patients who attribute chronic symptoms to Lyme disease. Study 2 prospectively examines newly diagnosed Lyme disease patients for co-morbid mental disorders and related cognitive/behavioral processes at baseline and follows them for one year. Our goal is to identify risk factors for the development of chronic symptoms ascribed to Lyme disease after adequate antibiotic treatment.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: THERAPEUTIC EFFECT OF EMFS ON NEURAL PROCESSES/FUNCTIONS**

  Principal Investigator & Institution: Tuttle, Jeremy B. Professor; Neuroscience; University of Virginia Charlottesville Box 400195 Charlottesville, VA 22904

  Timing: Fiscal Year 2001; Project Start 01-JUN-2000; Project End 31-MAR-2005

  Summary: Magnetic devices and therapies are gaining rapid acceptance among some groups, even in the absence of reliable outcome data. This Center is focused upon the potential treatment with electromagnetic fields (EMFs) of **fibromyalgia** and the sequelae to CVA and closed head trauma. Despite considerable effort, it is still not clear how biological systems might be responding to therapeutically applied EMFs. The development and refinement of this potential new mode of therapy will be advanced considerably by a more explicit understanding of what basic biological processes are responsible for the desired therapeutic effects. This project will examine the effect of therapeutic magnetic fields upon specific neural processes and functions, in the effort to outline potential biosensors for EMFs in the nervous system. The tests will be conducted in vitro upon reasonable cellular reductionist models of events in the nervous system. In each case, EMF effects under basal and stressed conditions will be examined. Specific aims will measure magnetic field effects upon: l) Fiber regeneration by peripheral and central neurons. Primary neurons in culture will be used and the rate of regeneration of neurites measured. 2) Synapse formation and maturation. Cultures of peripheral neurons and muscle, as well as central neurons, will be examined for synapse formation and function at various times after isolation. 3) Calcium signaling via cytosolic

transients in nerve and muscle cells. Fura-2 imaging will be used to examine EMF effects on IP3-mediated calcium signaling in primary cultures of muscle and human neuroblastoma cells. 4) Synthesis and release of neurotrophins. The production of NGF at the cellular level by muscle, neuroblastoma and glial cells will be examined. 5) Cell death and neuroprotective gene expression. EMF effects on induction of apoptosis and expression of free-radical scavengers and bcl-2 will be tested. Each of these test areas relates to a biological process involved in the response of the nervous system to injury or disorder and thus may be involved in the therapeutic efficacy of magnetic fields. The results of these largely exploratory experiments will outline likely basic biological processes capable of responding to EMF with a desirable therapeutic effect.

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: UTILITY OF MELATONIN IN TREATMENT OF FIBROMYALGIA**

  Principal Investigator & Institution: Csuka, Mary E.; Medical College of Wisconsin Po Box26509 Milwaukee, WI 532264801

  Timing: Fiscal Year 2001

  Summary: This abstract is not available.

  Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

- **Project Title: WORK SCHEDULES AND HEALTH IN WOMEN HEALTH PROFESSIONALS**

  Principal Investigator & Institution: Barnett, Rosalind C. None; Brandeis University 415 South Street Waltham, MA 024549110

  Timing: Fiscal Year 2001; Project Start 01-JUN-1999; Project End 31-MAY-2003

  Summary: Women health-care providers with children at home experience especially heavy distress and are at high risk for such mental health problems as psychological distress and poor marital- and job-role quality and for such stress-related physical health problems as tension headaches. TMJ, hypertension, coronary artery disease (CAD), peptic ulcer disease (PUD) and nonulcer dyspepsia, and **fibromyalgia.** Alternative career options (e.g., part-time) have been proposed as a means of decreasing distress by increasing flexibility. Whereas such options have already been adopted in such less prestigious health-care occupations as licensed practical nursing, demand for female physicians is prompting the creation of flexible career options in medicine. The aim of the proposed three-year in-depth interview and survey study is to estimate the relationship between full- and part-time work schedules and stress-related mental and physical health outcomes in a random sample of 200 married women ages 25-50 with under-high-school-age children in two-health-care professions that vary in occupational prestige, medicine and licensed practical nursing, and who vary in race/ethnicity. The focus of our proposed study is on one key aspect of flexibility, work scheduling, conceptualized as a complex construct comprising at least two components-- number of work hours (i.e., full-time vs. reduced hours) and work arrangements (e.g., compressed work weeks, weekend or night work, standard work week). We hypothesize that the relationship between work hours and health outcomes varies with work arrangements. We also assess several subjective aspects of work scheduling, including fit, or how well the schedule meets the needs of the health-care professional and her children, spouse, and elderly dependents (if any), and, among reduced-hours workers, the discomfort she experiences over the tradeoff of certain professional activities for more non-work time. These subjective indicators are also thought to mediate or moderate the relationship between work hours and health outcomes. The proposed project addresses four major

questions: 1) Are full- time married women with children employed in medicine and licensed practical nursing at higher risk for stress-related mental- and physical-health problems than their reduced-hour counterparts? 2) Do these relationships depend on work arrangements, occupational prestige, race-ethnicity, age, household income, medical setting, number of children at home, elderly dependent care, and, for doctors, area of medical specialization?; 3) Are objective job conditions (e.g., work hours or arrangements) or subjective indicators (e.g., fit, discomfort over tradeoffs) better predictors of stress-related health outcomes; and 4) What are the processes by which schedules affect health outcomes? For example, does the degree to which the health-care professionals are optimizing their work- family preferences (i.e., fit) mediate this relationship?

Website: http://crisp.cit.nih.gov/crisp/Crisp_Query.Generate_Screen

E-Journals: PubMed Central[3]

PubMed Central (PMC) is a digital archive of life sciences journal literature developed and managed by the National Center for Biotechnology Information (NCBI) at the U.S. National Library of Medicine (NLM).[4] Access to this growing archive of e-journals is free and unrestricted.[5] To search, go to **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Pmc**, and type "fibromyalgia" (or synonyms) into the search box. This search gives you access to full-text articles. The following is a sample of items found for fibromyalgia in the PubMed Central database:

- **Diagnosis of fibromyalgia.** by Bayne R. 2001 Jun 12; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&rendertype=external&artid=81142
- **Efficacy and adverse effects of intravenous lignocaine therapy in fibromyalgia syndrome.** by Raphael JH, Southall JL, Treharne GJ, Kitas GD. 2002; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=126218
- **Factors explaining variance in perceived pain in women with fibromyalgia.** by Malt EA, Olafsson S, Lund A, Ursin H. 2002; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=113754
- **Fibromyalgia syndrome improved using a mostly raw vegetarian diet: An observational study.** by Donaldson MS, Speight N, Loomis S. 2001; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=57816
- **Norepinephrine-evoked pain in fibromyalgia. A randomized pilot study ISCRTN70707830.** by Martinez-Lavin M, Vidal M, Barbosa RE, Pineda C, Casanova JM, Nava A. 2002; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=65524

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[3] Adapted from the National Library of Medicine: **http://www.pubmedcentral.nih.gov/about/intro.html**.

[4] With PubMed Central, NCBI is taking the lead in preservation and maintenance of open access to electronic literature, just as NLM has done for decades with printed biomedical literature. PubMed Central aims to become a world-class library of the digital age.

[5] The value of PubMed Central, in addition to its role as an archive, lies in the availability of data from diverse sources stored in a common format in a single repository. Many journals already have online publishing operations, and there is a growing tendency to publish material online only, to the exclusion of print.

- **Prescribed exercise in people with fibromyalgia: parallel group randomised controlled trial.** by Richards SC, Scott DL. 2002 Jul 27;
  http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=117444
- **Prospective Epidemiological Observations on the Course of the Disease in Fibromyalgia Patients.** by Noller V, Sprott H. 2003;
  http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=194775

The National Library of Medicine: PubMed

One of the quickest and most comprehensive ways to find academic studies in both English and other languages is to use PubMed, maintained by the National Library of Medicine.[6] The advantage of PubMed over previously mentioned sources is that it covers a greater number of domestic and foreign references. It is also free to use. If the publisher has a Web site that offers full text of its journals, PubMed will provide links to that site, as well as to sites offering other related data. User registration, a subscription fee, or some other type of fee may be required to access the full text of articles in some journals.

To generate your own bibliography of studies dealing with fibromyalgia, simply go to the PubMed Web site at **http://www.ncbi.nlm.nih.gov/pubmed**. Type "fibromyalgia" (or synonyms) into the search box, and click "Go." The following is the type of output you can expect from PubMed for fibromyalgia (hyperlinks lead to article summaries):

- **A 5.5 year prospective study of self-reported musculoskeletal pain and of fibromyalgia in a female population: significance and natural history.**
  Author(s): Forseth KO, Forre O, Gran JT.
  Source: Clinical Rheumatology. 1999; 18(2): 114-21.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10357115&dopt=Abstract

- **A case-control study examining the role of physical trauma in the onset of fibromyalgia syndrome.**
  Author(s): Al-Allaf AW, Dunbar KL, Hallum NS, Nosratzadeh B, Templeton KD, Pullar T.
  Source: Rheumatology (Oxford, England). 2002 April; 41(4): 450-3.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11961177&dopt=Abstract

- **A community-based survey of fibromyalgia-like pain complaints following the World Trade Center terrorist attacks.**
  Author(s): Raphael KG, Natelson BH, Janal MN, Nayak S.
  Source: Pain. 2002 November; 100(1-2): 131-9.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12435466&dopt=Abstract

[6] PubMed was developed by the National Center for Biotechnology Information (NCBI) at the National Library of Medicine (NLM) at the National Institutes of Health (NIH). The PubMed database was developed in conjunction with publishers of biomedical literature as a search tool for accessing literature citations and linking to full-text journal articles at Web sites of participating publishers. Publishers that participate in PubMed supply NLM with their citations electronically prior to or at the time of publication.

- **A comparison between low-dose (1 microg), standard-dose (250 microg) ACTH stimulation tests and insulin tolerance test in the evaluation of hypothalamo-pituitary-adrenal axis in primary fibromyalgia syndrome.**
  Author(s): Kirnap M, Colak R, Eser C, Ozsoy O, Tutus A, Kelestimur F.
  Source: Clinical Endocrinology. 2001 October; 55(4): 455-9.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11678827&dopt=Abstract

- **A comparison of pain measures used with patients with fibromyalgia.**
  Author(s): Bigatti SM, Cronan TA.
  Source: J Nurs Meas. 2002 Spring-Summer; 10(1): 5-14.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12048970&dopt=Abstract

- **A comparison of rheumatoid arthritis and fibromyalgia patients and healthy controls exposed to a pulsed (200 microT) magnetic field: effects on normal standing balance.**
  Author(s): Thomas AW, White KP, Drost DJ, Cook CM, Prato FS.
  Source: Neuroscience Letters. 2001 August 17; 309(1): 17-20.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11489536&dopt=Abstract

- **A comparison of three types of neck support in fibromyalgia patients.**
  Author(s): Ambrogio N, Cuttiford J, Lineker S, Li L.
  Source: Arthritis Care and Research : the Official Journal of the Arthritis Health Professions Association. 1998 October; 11(5): 405-10.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9830885&dopt=Abstract

- **A comprehensive medical evaluation of patients with fibromyalgia syndrome.**
  Author(s): Yunus MB.
  Source: Rheumatic Diseases Clinics of North America. 2002 May; 28(2): 201-17, V-Vi. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12122914&dopt=Abstract

- **A double-blind, randomized, controlled study of amitriptyline, nortriptyline and placebo in patients with fibromyalgia. An analysis of outcome measures.**
  Author(s): Heymann RE, Helfenstein M, Feldman D.
  Source: Clin Exp Rheumatol. 2001 November-December; 19(6): 697-702.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11791642&dopt=Abstract

- **A fibromyalgia scale in a general rheumatology clinic.**
  Author(s): Huston GJ.
  Source: Rheumatology (Oxford, England). 2000 March; 39(3): 336-7.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10788548&dopt=Abstract

- **A general population study of fibromyalgia tender points in noninstitutionalized adults with chronic widespread pain.**
  Author(s): White KP, Harth M, Speechley M, Ostbye T.
  Source: The Journal of Rheumatology. 2000 November; 27(11): 2677-82.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11093453&dopt=Abstract

- **A meta-analysis of fibromyalgia treatment interventions.**
  Author(s): Rossy LA, Buckelew SP, Dorr N, Hagglund KJ, Thayer JF, McIntosh MJ, Hewett JE, Johnson JC.
  Source: Annals of Behavioral Medicine : a Publication of the Society of Behavioral Medicine. 1999 Spring; 21(2): 180-91.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10499139&dopt=Abstract

- **A naturalistic evaluation of cortisol secretion in persons with fibromyalgia and rheumatoid arthritis.**
  Author(s): Catley D, Kaell AT, Kirschbaum C, Stone AA.
  Source: Arthritis Care and Research : the Official Journal of the Arthritis Health Professions Association. 2000 February; 13(1): 51-61.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11094926&dopt=Abstract

- **A phenomenological study of fibromyalgia. Patient perspectives.**
  Author(s): Hellstrom O, Bullington J, Karlsson G, Lindqvist P, Mattsson B.
  Source: Scandinavian Journal of Primary Health Care. 1999 March; 17(1): 11-6.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10229986&dopt=Abstract

- **A placebo controlled crossover trial of subcutaneous salmon calcitonin in the treatment of patients with fibromyalgia.**
  Author(s): Bessette L, Carette S, Fossel AH, Lew RA.
  Source: Scandinavian Journal of Rheumatology. 1998; 27(2): 112-6.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9572636&dopt=Abstract

- **A practical approach to fibromyalgia.**
  Author(s): Brecher LS, Cymet TC.
  Source: J Am Osteopath Assoc. 2001 April; 101(4 Suppl Pt 2): S12-7. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11392205&dopt=Abstract

- **A prospective study of tender points and fibromyalgia during and after an acute viral infection.**
  Author(s): Rea T, Russo J, Katon W, Ashley RL, Buchwald D.
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- **Why would fibromyalgia patients have osteoporosis?**
  Author(s): Dessein PH, Stanwix AE.
  Source: The Journal of Rheumatology. 2000 July; 27(7): 1816-7.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10914876&dopt=Abstract

- **Widespread body pain and mortality. Diagnosing fibromyalgia stops doctors from thinking.**
  Author(s): Wright M.
  Source: Bmj (Clinical Research Ed.). 2002 February 2; 324(7332): 300.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11936135&dopt=Abstract

- **Women's experiences of stigma in relation to chronic fatigue syndrome and fibromyalgia.**
  Author(s): Asbring P, Narvanen AL.
  Source: Qualitative Health Research. 2002 February; 12(2): 148-60.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11837367&dopt=Abstract

- **Women's pursuit of personal goals in daily life with fibromyalgia: a value-expectancy analysis.**
  Author(s): Affleck G, Tennen H, Zautra A, Urrows S, Abeles M, Karoly P.
  Source: Journal of Consulting and Clinical Psychology. 2001 August; 69(4): 587-96.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11550725&dopt=Abstract

- **Work and disability status of persons with fibromyalgia.**
  Author(s): Wolfe F, Anderson J, Harkness D, Bennett RM, Caro XJ, Goldenberg DL, Russell IJ, Yunus MB.
  Source: The Journal of Rheumatology. 1997 June; 24(6): 1171-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9195528&dopt=Abstract

- **Working with fibromyalgia.**
  Author(s): Sitzman K.
  Source: Aaohn Journal : Official Journal of the American Association of Occupational Health Nurses. 2003 May; 51(5): 236.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12769170&dopt=Abstract

- **Zolpidem efficacy in fibromyalgia.**
  Author(s): Rothschild BM.
  Source: The Journal of Rheumatology. 1997 May; 24(5): 1012-3.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9150102&dopt=Abstract

CHAPTER 2. NUTRITION AND FIBROMYALGIA

Overview

In this chapter, we will show you how to find studies dedicated specifically to nutrition and fibromyalgia.

Finding Nutrition Studies on Fibromyalgia

The National Institutes of Health's Office of Dietary Supplements (ODS) offers a searchable bibliographic database called the IBIDS (International Bibliographic Information on Dietary Supplements; National Institutes of Health, Building 31, Room 1B29, 31 Center Drive, MSC 2086, Bethesda, Maryland 20892-2086, Tel: 301-435-2920, Fax: 301-480-1845, E-mail: ods@nih.gov). The IBIDS contains over 460,000 scientific citations and summaries about dietary supplements and nutrition as well as references to published international, scientific literature on dietary supplements such as vitamins, minerals, and botanicals.[7] The IBIDS includes references and citations to both human and animal research studies.

As a service of the ODS, access to the IBIDS database is available free of charge at the following Web address: **http://ods.od.nih.gov/databases/ibids.html**. After entering the search area, you have three choices: (1) IBIDS Consumer Database, (2) Full IBIDS Database, or (3) Peer Reviewed Citations Only.

Now that you have selected a database, click on the "Advanced" tab. An advanced search allows you to retrieve up to 100 fully explained references in a comprehensive format. Type "fibromyalgia" (or synonyms) into the search box, and click "Go." To narrow the search, you can also select the "Title" field.

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[7] Adapted from **http://ods.od.nih.gov**. IBIDS is produced by the Office of Dietary Supplements (ODS) at the National Institutes of Health to assist the public, healthcare providers, educators, and researchers in locating credible, scientific information on dietary supplements. IBIDS was developed and will be maintained through an interagency partnership with the Food and Nutrition Information Center of the National Agricultural Library, U.S. Department of Agriculture.

The following information is typical of that found when using the "Full IBIDS Database" to search for "fibromyalgia" (or a synonym):

- **A comparison between low-dose (1 microg), standard-dose (250 microg) ACTH stimulation tests and insulin tolerance test in the evaluation of hypothalamo-pituitary-adrenal axis in primary fibromyalgia syndrome.**
  Author(s): Department of Physical Medicine and Rehabilitation, Erciyes University Medical School Kayseri, Turkey.
  Source: Kirnap, M Colak, R Eser, C Ozsoy, O Tutus, A Kelestimur, F Clin-Endocrinol-(Oxf). 2001 October; 55(4): 455-9 0300-0664
- **A placebo controlled crossover trial of subcutaneous salmon calcitonin in the treatment of patients with fibromyalgia.**
  Author(s): Department of Medicine, Laval University, Quebec, Ste-Foy, Canada.
  Source: Bessette, L Carette, S Fossel, A H Lew, R A Scand-J-Rheumatol. 1998; 27(2): 112-6 0300-9742
- **A raw vegetarian diet for patients with fibromyalgia.**
  Source: Bennett, R M Curr-Rheumatol-Repage 2002 August; 4(4): 284 1523-3774
- **A review of recent clinical trials of the nutritional supplement Chlorella pyrenoidosa in the treatment of fibromyalgia, hypertension, and ulcerative colitis.**
  Author(s): Virginia Commonwealth University, Medical College of Virginia, Richmond, VA 23298-0709, USA. rmerchan@hsc.vcu.edu
  Source: Merchant, R E Andre, C A Altern-Ther-Health-Med. 2001 May-June; 7(3): 79-91 1078-6791
- **Altered interleukin-2 secretion in patients with primary fibromyalgia syndrome.**
  Author(s): Department of Internal Medicine B, Carmel Medical Center, Haifa, Israel.
  Source: Hader, N Rimon, D Kinarty, A Lahat, N Arthritis-Rheum. 1991 July; 34(7): 866-72 0004-3591
- **Alternative medicine use in fibromyalgia syndrome.**
  Source: Pioro Boisset, M Esdaile, J M Fitzcharles, M A Arthritis-Care-Res. 1996 February; 9(1): 13-7 0893-7524
- **An open, pilot study to evaluate the potential benefits of coenzyme Q10 combined with Ginkgo biloba extract in fibromyalgia syndrome.**
  Author(s): Phylax Ltd, Beaconsfield, UK. bobphylax@cs.com
  Source: Lister, R E J-Int-Med-Res. 2002 Mar-April; 30(2): 195-9 0300-0605
- **Are advanced glycation end-product-modified proteins of pathogenetic importance in fibromyalgia?**
  Author(s): Department of Internal Medicine IV, Rheumatology and Osteology, Friedrich-Schiller-University of Jena, 07740 Jena, Germany.
  Source: Hein, G Franke, S Rheumatology-(Oxford). 2002 October; 41(10): 1163-7 1462-0324
- **Chronic fatigue syndrome and fibromyalgia. Dilemmas in diagnosis and clinical management.**
  Author(s): Lilly Research Laboratories, Indianapolis, Indiana, USA.
  Source: Demitrack, M A Psychiatr-Clin-North-Am. 1998 September; 21(3): 671-92, viii 0193-953X
- **Clinical trials in fibrositis: a critical review and future directions.**
  Author(s): Rheumatic Disease Unit, Wellesley Hospital, University of Toronto, ON, Canada.

Source: Gabriel, S E Bombardier, C J-Rheumatol-Suppl. 1989 November; 19177-9 0380-0903

- **Complementary and alternative therapies for fibromyalgia.**
  Author(s): University of Michigan, 1150 West Medical Center Drive, Ann Arbor, MI, 48109-0680, USA. crofford@umich.edu
  Source: Crofford, L J Appleton, B E Curr-Rheumatol-Repage 2001 April; 3(2): 147-56 1523-3774

- **Complementary medicine treatments for fibromyalgia syndrome.**
  Author(s): University of Maryland School of Medicine, James L. Kernan Hospital, Baltimore 21207-6697, USA.
  Source: Berman, B M Swyers, J P Baillieres-Best-Pract-Res-Clin-Rheumatol. 1999 September; 13(3): 487-92 1521-6942

- **Counter irritation test in primary fibromyalgia.**
  Author(s): URA CNRS 1455, Faculte de medecine secteur Nord, Marseille, France.
  Source: Guieu, R Serratrice, G Pouget, J Clin-Rheumatol. 1994 December; 13(4): 605-10 0770-3198

- **Cytokines play an aetiopathogenetic role in fibromyalgia: a hypothesis and pilot study.**
  Author(s): Department of Medicine/Division of Rheumatology, Cedars-Sinai Medical Center/UCLA School of Medicine, Los Angeles, CA, USA.
  Source: Wallace, D J Linker Israeli, M Hallegua, D Silverman, S Silver, D Weisman, M H Rheumatology-(Oxford). 2001 July; 40(7): 743-9 1462-0324

- **Disordered growth hormone secretion in fibromyalgia: a review of recent findings and a hypothesized etiology.**
  Author(s): Dept. Medicine (L329A), Oregon Health Sciences University, Portland 97201, USA.
  Source: Bennett, R M Z-Rheumatol. 1998; 57 Suppl 272-6 0340-1855

- **Double-blind study of 5-hydroxytryptophan versus placebo in the treatment of primary fibromyalgia syndrome.**
  Author(s): Rheumatology Unit, L. Sacco Hospital, Milan, Italy.
  Source: Caruso, I Sarzi Puttini, P Cazzola, M Azzolini, V J-Int-Med-Res. 1990 May-June; 18(3): 201-9 0300-0605

- **Double-blind, placebo-controlled cross-over study of intravenous S-adenosyl-L-methionine in patients with fibromyalgia.**
  Author(s): Department of Rheumatology, Frederiksberg Hospital, Copenhagen, Denmark.
  Source: Volkmann, H Norregaard, J Jacobsen, S Danneskiold Samsoe, B Knoke, G Nehrdich, D Scand-J-Rheumatol. 1997; 26(3): 206-11 0300-9742

- **Enhanced temporal summation of second pain and its central modulation in fibromyalgia patients.**
  Author(s): Department of Oral and Maxillofacial Surgery, University of Florida College of Dentistry, Box 100416, Gainesville, FL 32610-0416, USA. dprice@dental.ufl.edu
  Source: Price, D D Staud, R Robinson, M E Mauderli, A P Cannon, R Vierck, C J Pain. 2002 September; 99(1-2): 49-59 0304-3959

- **Evaluation and management of endocrine dysfunction in fibromyalgia.**
  Author(s): Department of Health Psychology, Utrecht University, P.O. Box 80140, 3508 TC Utrecht, The Netherlands. R.Geenen@fss.uu.nl

Source: Geenen, R Jacobs, J W Bijlsma, J W Rheum-Dis-Clin-North-Am. 2002 May; 28(2): 389-404 0889-857X

- **Evaluation of S-adenosylmethionine in primary fibromyalgia. A double-blind crossover study.**
  Author(s): Institute of Medical Pathology I, University of Pisa, Italy.
  Source: Tavoni, A Vitali, C Bombardieri, S Pasero, G Am-J-Med. 1987 November 20; 83(5A): 107-10 0002-9343

- **Factors predisposing to the resort of complementary therapies in patients with fibromyalgia.**
  Author(s): Clinical Pharmacology Unit (Rheumatism Research), University of Leeds, United Kingdom.
  Source: Dimmock, S Troughton, P R Bird, H A Clin-Rheumatol. 1996 September; 15(5): 478-82 0770-3198

- **Fibromyalgia and the serotonin pathway.**
  Source: Juhl, J H Altern-Med-Revolume 1998 October; 3(5): 367-75 1089-5159

- **Fibromyalgia in hyperkalemic periodic paralysis.**
  Author(s): Department of Internal Medicine/Rheumatology, Sahlgren University Hospital/Ostra, Goteborg, Sweden.
  Source: Gotze, F R Thid, S Kyllerman, M Scand-J-Rheumatol. 1998; 27(5): 383-4 0300-9742

- **Fibromyalgia, psychiatric disorders, and assessment of the longterm outcome of eosinophilia-myalgia syndrome.**
  Author(s): Biological Psychiatry Laboratory, McLean Hospital, Belmont, MA 02178, USA.
  Source: Hudson, J I Pope, H G Carter, W P Daniels, S R J-Rheumatol-Suppl. 1996 October; 4637-42; discussion 42-3 0380-0903

- **Fibromyalgia: a risk factor for osteoporosis.**
  Author(s): Osteoporosis Prevention and Treatment Center, Santa Monica, California 90404, USA.
  Source: Swezey, R L Adams, J J-Rheumatol. 1999 December; 26(12): 2642-4 0315-162X

- **Fibromyalgia--are there different mechanisms in the processing of pain? A double blind crossover comparison of analgesic drugs.**
  Author(s): Department of Anaesthesiology, University Hospital, Linkoping, Sweden.
  Source: Sorensen, J Bengtsson, A Ahlner, J Henriksson, K G Ekselius, L Bengtsson, M J-Rheumatol. 1997 August; 24(8): 1615-21 0315-162X

- **Food supplements in the treatment of primary fibromyalgia: a double-blind, crossover trial of anthocyanidins and placebo.**
  Source: Edwards, A.M. Blackburn, L. Christie, S. Townsend, S. David, J. J-nutr-environ-med. Abingdon, U.K. : Carfax Publishing Company. Sept 2000. volume 10 (3) page 189-199. 1359-0847

- **Hair calcium and magnesium levels in patients with fibromyalgia: a case center study.**
  Source: Ng, S Y J-Manipulative-Physiol-Ther. 1999 Nov-December; 22(9): 586-93 0161-4754

- **Health status in fibromyalgia--a followup study.**
  Author(s): Center for Rheumatic Diseases, the National Hospital, Oslo, Norway. a.m.mengshoel@helsefag.uio.no

Source: Mengshoel, A M Haugen, M J-Rheumatol. 2001 September; 28(9): 2085-9 0315-162X

- **How effective are complementary/alternative medicine (CAM) therapies for fibromyalgia?**
  Author(s): Michigan State University, USA.
  Source: Ebell, M H Beck, E J-Fam-Pract. 2001 May; 50(5): 400-1 0094-3509

- **Increased capsaicin-induced secondary hyperalgesia as a marker of abnormal sensory activity in patients with fibromyalgia.**
  Author(s): Bone and Joint Research Unit, St Bartholomew's and Royal London Hospital School of Medicine, UK.
  Source: Morris, V Cruwys, S Kidd, B Neurosci-Lett. 1998 July 10; 250(3): 205-7 0304-3940

- **Increased concentrations of homocysteine in the cerebrospinal fluid in patients with fibromyalgia and chronic fatigue syndrome.**
  Author(s): Institute of Clinical Neuroscience, Goteborg University, Sweden.
  Source: Regland, B Andersson, M Abrahamsson, L Bagby, J Dyrehag, L E Gottfries, C G Scand-J-Rheumatol. 1997; 26(4): 301-7 0300-9742

- **Is acupuncture effective in the treatment of fibromyalgia?**
  Author(s): Complementary Medicine Program, University of Maryland School of Medicine, Baltimore 21207, USA.
  Source: Berman, B M Ezzo, J Hadhazy, V Swyers, J P J-Fam-Pract. 1999 March; 48(3): 213-8 0094-3509

- **Is fibromyalgia caused by a glycolysis impairment?**
  Source: Anonymous Nutr-Revolume 1994 July; 52(7): 248-50 0029-6643

- **Is there any relationship between eosinophilia myalgia syndrome (EMS) and fibromyalgia syndrome (FMS)? An analysis of clinical and immunological data.**
  Author(s): Department of Internal Medicine, University of Tubingen, Germany.
  Source: Barth, H Berg, P A Klein, R Adv-Exp-Med-Biol. 1999; 467487-96 0065-2598

- **Lithium carbonate augmentation therapy in fibromyalgia.**
  Source: Tyber, M A CMAJ. 1990 November 1; 143(9): 902-4 0820-3946

- **Looks can be deceiving. The behind-the-scenes battle of fibromyalgia.**
  Source: Leake, N B Adv-Nurse-Pract. 2001 June; 9(6): 40-4, 46, 51-2 passim 1096-6293

- **Lymphocyte markers and natural killer cell activity in fibromyalgia syndrome: effects of low-dose, sublingual use of human interferon-alpha.**
  Author(s): Department of Medicine, University Clinical Research Center, The University of Texas Health Science Center, San Antonio 78284-7868, USA. russell@uthscsa.edu
  Source: Russell, I J Vipraio, G A Michalek, J E Craig, F E Kang, Y K Richards, A B J-Interferon-Cytokine-Res. 1999 August; 19(8): 969-78 1079-9907

- **Magnesium deficiency in fibromyalgia syndrome.**
  Source: Romano, T.J. Stiller, J.W. J-nutr-med. Abingdon [England] : Carfax Pub. Co., c1990-c1994. 1994. volume 4 (2) page 165-167. 0955-6664

- **Melatonin levels in women with fibromyalgia and chronic fatigue syndrome.**
  Author(s): Department of Psychiatry, University of Michigan Medical Center, Ann Arbor, USA. akorszun@umich.edu
  Source: Korszun, A Sackett Lundeen, L Papadopoulos, E Brucksch, C Masterson, L Engelberg, N C Haus, E Demitrack, M A Crofford, L J-Rheumatol. 1999 December; 26(12): 2675-80 0315-162X

- **Multidisciplinary approach to fibromyalgia. A pilot study.**
  Author(s): Oslo Sanitetsforening Rheumatism Hospital, Norway.
  Source: Mengshoel, A M Forseth, K O Haugen, M Walle Hansen, R Forre, O Clin-Rheumatol. 1995 March; 14(2): 165-70 0770-3198
- **Nonphysician practitioner treatments and fibromyalgia syndrome.**
  Author(s): Division of Rheumatology, McGill University, Montreal, Canada.
  Source: Fitzcharles, M A Esdaile, J M J-Rheumatol. 1997 May; 24(5): 937-40 0315-162X
- **Normal melatonin levels in patients with fibromyalgia syndrome.**
  Author(s): Epidemiology Department, Ben-Gurion University of the Negev and Soroka Medical Center, Beer Sheva, Israel.
  Source: Press, J Phillip, M Neumann, L Barak, R Segev, Y Abu Shakra, M Buskila, D J-Rheumatol. 1998 March; 25(3): 551-5 0315-162X
- **Nutritional supplementation with Chlorella pyrenoidosa for patients with fibromyalgia syndrome: a pilot study.**
  Author(s): Departments of Anatomy and Internal Medicine, Virginia Commonwealth University, Medical College of Virginia Richmond, VA 23298-0709, USA. rmerchan@hsc.vcu.edu
  Source: Merchant, R E Carmack, C A Wise, C M Phytother-Res. 2000 May; 14(3): 167-73 0951-418X
- **Oral S-adenosylmethionine in primary fibromyalgia. Double-blind clinical evaluation.**
  Author(s): Department of Rheumatology, Frederiksberg Hospital, Copenhagen, Denmark.
  Source: Jacobsen, S Danneskiold Samsoe, B Andersen, R B Scand-J-Rheumatol. 1991; 20(4): 294-302 0300-9742
- **Pain analysis in patients with fibromyalgia. Effects of intravenous morphine, lidocaine, and ketamine.**
  Author(s): Department of Anesthesiology, University Hospital, Linkoping, Sweden.
  Source: Sorensen, J Bengtsson, A Backman, E Henriksson, K G Bengtsson, M Scand-J-Rheumatol. 1995; 24(6): 360-5 0300-9742
- **Pituitary release of growth hormone and prolactin in the primary fibromyalgia syndrome.**
  Author(s): Department of Rheumatology, Rijnstate Hospital, Arnhem, The Netherlands.
  Source: Griep, E N Boersma, J W de Kloet, E R J-Rheumatol. 1994 November; 21(11): 2125-30 0315-162X
- **Primary fibromyalgia and the irritable bowel syndrome: different expressions of a common pathogenetic process.**
  Author(s): Department of Rheumatology, Beaumont Hospital, Dublin, Ireland.
  Source: Veale, D Kavanagh, G Fielding, J F Fitzgerald, O Br-J-Rheumatol. 1991 June; 30(3): 220-2 0263-7103
- **Primary fibromyalgia syndrome and 5-hydroxy-L-tryptophan: a 90-day open study.**
  Author(s): Rheumatology Unit, L Sacco Hospital, Milan, Italy.
  Source: Puttini, P S Caruso, I J-Int-Med-Res. 1992 April; 20(2): 182-9 0300-0605
- **Psychosocial factors associated with complementary treatment use in fibromyalgia.**
  Author(s): California School of Professional Psychology (CSPP), San Diego 92121-3725, USA.
  Source: Nicassio, P M Schuman, C Kim, J Cordova, A Weisman, M H J-Rheumatol. 1997 October; 24(10): 2008-13 0315-162X

- **Reduced hypothalamic-pituitary and sympathoadrenal responses to hypoglycemia in women with fibromyalgia syndrome.**
  Author(s): Department of Medicine, Brigham & Women's Hospital, Harvard Medical School, Boston, Massachusetts 02115, USA.
  Source: Adler, G K Kinsley, B T Hurwitz, S Mossey, C J Goldenberg, D L Am-J-Med. 1999 May; 106(5): 534-43 0002-9343
- **Regulation of the renin-angiotensin-aldosterone system in fibromyalgia.**
  Author(s): Brigham and Women's Hospital, Department of Medicine, Harvard Medical School, Boston, Massachusetts 02115, USA.
  Source: Maliszewski, A M Goldenberg, D L Hurwitz, S Adler, G K J-Rheumatol. 2002 July; 29(7): 1482-7 0315-162X
- **Relief of fibromyalgia symptoms following discontinuation of dietary excitotoxins.**
  Author(s): Malcolm Randall Veterans Affairs Medical Center, Gainesville, FL, USA.
  Source: Smith, J D Terpening, C M Schmidt, S O Gums, J G Ann-Pharmacother. 2001 June; 35(6): 702-6 1060-0280
- **Selenium and magnesium status in fibromyalgia.**
  Author(s): Centre Hospitalier de Toulon, France.
  Source: Eisinger, J Plantamura, A Marie, P A Ayavou, T Magnes-Res. 1994 December; 7(3-4): 285-8 0953-1424
- **Static magnetic fields for treatment of fibromyalgia: a randomized controlled trial.**
  Author(s): Department of Physical Medicine and Rehabilitation, University of Virginia Health System, Charlottesville, USA. apa6r@virginia.edu
  Source: Alfano, A P Taylor, A G Foresman, P A Dunkl, P R McConnell, G G Conaway, M R Gillies, G T J-Altern-Complement-Med. 2001 February; 7(1): 53-64 1075-5535
- **Systematic review of randomized controlled trials of nonpharmacological interventions for fibromyalgia.**
  Author(s): Primary Care Sciences Research Center, Keele University, Keele, Staffordshire, UK. pta05@keele.ac.uk
  Source: Sim, J Adams, N Clin-J-Pain. 2002 Sep-October; 18(5): 324-36 0749-8047
- **The 5-HT3 blockers in the treatment of the primary fibromyalgia syndrome: a 10-day open study with Tropisetron at a low dose.**
  Author(s): Hochrhein-Institute for Rehabilitation Research, Bad Sackingen, Germany/Rheinfelden, Switzerland.
  Source: Samborski, W Stratz, T Lacki, J K Klama, K Mennet, P Muller, W Mater-Med-Pol. 1996 Jan-March; 28(1): 17-9 0025-5246
- **The effect of melatonin in patients with fibromyalgia: a pilot study.**
  Author(s): Rheumatology Section, Instituto de Rehabilitacion Psicofisica and Department of Physiology, Facultad de Medicina, Universidad de Buenos Aires, Argentina.
  Source: Citera, G Arias, M A Maldonado Cocco, J A Lazaro, M A Rosemffet, M G Brusco, L I Scheines, E J Cardinalli, D P Clin-Rheumatol. 2000; 19(1): 9-13 0770-3198
- **The effects of collagen hydrolysat on symptoms of chronic fibromyalgia and temporomandibular joint pain.**
  Source: Olson, G B Savage, S Olson, J Cranio. 2000 April; 18(2): 135-41 0886-9634
- **The effects of nutritional supplements on the symptoms of fibromyalgia and chronic fatigue syndrome.**
  Author(s): Mannatech Inc., Coppell Texas 75019, USA.

Source: Dykman, K D Tone, C Ford, C Dykman, R A Integr-Physiol-Behav-Sci. 1998 Jan-March; 33(1): 61-71 1053-881X

- **The use of ascorbigen in the treatment of fibromyalgia patients: a preliminary trial.**
  Author(s): National College of Naturopathic Medicine, USA. benandnanette@juno.com
  Source: Bramwell, B Ferguson, S Scarlett, N Macintosh, A Altern-Med-Revolume 2000 October; 5(5): 455-62 1089-5159
- **Thyroid function in patients with fibromyalgia syndrome.**
  Author(s): Department of Rheumatology and Physical Medicine, University of Giessen, Bad Nauheim, Germany.
  Source: Neeck, G Riedel, W J-Rheumatol. 1992 July; 19(7): 1120-2 0315-162X
- **Transketolase stimulation in fibromyalgia.**
  Author(s): Rheumatology Service, General Hospital, Toulon, France.
  Source: Eisinger, J Ayavou, T J-Am-Coll-Nutr. 1990 February; 9(1): 56-7 0731-5724
- **Treatment of fibromyalgia (fibrositis syndrome): a parallel double blind trial with carisoprodol, paracetamol and caffeine (Somadril comp) versus placebo.**
  Author(s): Oslo Sanitetsforenings Rheumatism Hospital, University of Oslo, Norway.
  Source: Vaeroy, H Abrahamsen, A Forre, O Kass, E Clin-Rheumatol. 1989 June; 8(2): 245-50 0770-3198
- **Use of complementary and alternative treatments by individuals with fibromyalgia syndrome.**
  Author(s): connienp@mindspring.com
  Source: Barbour, C J-Am-Acad-Nurse-Pract. 2000 August; 12(8): 311-6 1041-2972
- **Vegan diet alleviates fibromyalgia symptoms.**
  Author(s): Department of Physiology, University of Kuopio, Finland. hietanen.kaartinen@pp.inet.fi
  Source: Kaartinen, K Lammi, K Hypen, M Nenonen, M Hanninen, O Rauma, A L Scand-J-Rheumatol. 2000; 29(5): 308-13 0300-9742
- **Vegetarian diet in the treatment of fibromyalgia.**
  Author(s): Deptt. of Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka.
  Source: Azad, K A Alam, M N Haq, S A Nahar, S Chowdhury, M A Ali, S M Ullah, A K Bangladesh-Med-Res-Counc-Bull. 2000 August; 26(2): 41-7 0377-9238
- **Vitamin D levels in women with systemic lupus erythematosus and fibromyalgia.**
  Author(s): Department of Medicine, University of Western Ontario, London, Canada. Margriet.Huisman@planet.nl
  Source: Huisman, A M White, K P Algra, A Harth, M Vieth, R Jacobs, J W Bijlsma, J W Bell, D A J-Rheumatol. 2001 November; 28(11): 2535-9 0315-162X

Federal Resources on Nutrition

In addition to the IBIDS, the United States Department of Health and Human Services (HHS) and the United States Department of Agriculture (USDA) provide many sources of information on general nutrition and health. Recommended resources include:

- healthfinder®, HHS's gateway to health information, including diet and nutrition: **http://www.healthfinder.gov/scripts/SearchContext.asp?topic=238&page=0**
- The United States Department of Agriculture's Web site dedicated to nutrition information: **www.nutrition.gov**

- The Food and Drug Administration's Web site for federal food safety information: **www.foodsafety.gov**
- The National Action Plan on Overweight and Obesity sponsored by the United States Surgeon General: **http://www.surgeongeneral.gov/topics/obesity/**
- The Center for Food Safety and Applied Nutrition has an Internet site sponsored by the Food and Drug Administration and the Department of Health and Human Services: **http://vm.cfsan.fda.gov/**
- Center for Nutrition Policy and Promotion sponsored by the United States Department of Agriculture: **http://www.usda.gov/cnpp/**
- Food and Nutrition Information Center, National Agricultural Library sponsored by the United States Department of Agriculture: **http://www.nal.usda.gov/fnic/**
- Food and Nutrition Service sponsored by the United States Department of Agriculture: **http://www.fns.usda.gov/fns/**

Additional Web Resources

A number of additional Web sites offer encyclopedic information covering food and nutrition. The following is a representative sample:

- AOL: **http://search.aol.com/cat.adp?id=174&layer=&from=subcats**
- Family Village: **http://www.familyvillage.wisc.edu/med_nutrition.html**
- Google: **http://directory.google.com/Top/Health/Nutrition/**
- Healthnotes: **http://www.healthnotes.com/**
- Open Directory Project: **http://dmoz.org/Health/Nutrition/**
- Yahoo.com: **http://dir.yahoo.com/Health/Nutrition/**
- WebMD®Health: **http://my.webmd.com/nutrition**
- WholeHealthMD.com: **http://www.wholehealthmd.com/reflib/0,1529,00.html**

The following is a specific Web list relating to fibromyalgia; please note that any particular subject below may indicate either a therapeutic use, or a contraindication (potential danger), and does not reflect an official recommendation:

- **Vitamins**

  Vitamin B1
  Source: Healthnotes, Inc. www.healthnotes.com

  Vitamin B1
  Source: Prima Communications, Inc.www.personalhealthzone.com

  Vitamin E
  Source: Healthnotes, Inc. www.healthnotes.com

- **Minerals**

  Carnitine
  Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10012,00.html

  Magnesium
  Source: Healthnotes, Inc. www.healthnotes.com

  Magnesium
  Source: Integrative Medicine Communications; www.drkoop.com

  Magnesium
  Source: Prima Communications, Inc.www.personalhealthzone.com

  Magnesium
  Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,890,00.html

  Zinc
  Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10071,00.html

CHAPTER 3. ALTERNATIVE MEDICINE AND FIBROMYALGIA

Overview

In this chapter, we will begin by introducing you to official information sources on complementary and alternative medicine (CAM) relating to fibromyalgia. At the conclusion of this chapter, we will provide additional sources.

The Combined Health Information Database

The Combined Health Information Database (CHID) is a bibliographic database produced by health-related agencies of the U.S. federal government (mostly from the National Institutes of Health) that can offer concise information for a targeted search. The CHID database is updated four times a year at the end of January, April, July, and October. Check the titles, summaries, and availability of CAM-related information by using the "Simple Search" option at the following Web site: **http://chid.nih.gov/simple/simple.html**. In the drop box at the top, select "Complementary and Alternative Medicine." Then type "fibromyalgia" (or synonyms) in the second search box. We recommend that you select 100 "documents per page" and to check the "whole records" options. The following was extracted using this technique:

- **Foods that Fight Pain: Revolutionary New Strategies for Maximum Pain Relief**

  Source: New York, NY: Harmony Books. 1999. 347 p.

  Contact: Available from Harmony Books. 231 Broad Street, Nevada City, CA 95959. (530) 265-9564. PRICE: $14.00. ISBN: 0609804367.

  Summary: This book is intended to help people fight pain by using common foods, traditional supplements, and herbs. It explains which foods contribute to pain and how to avoid them, which foods are pain-safe but high in nutrition, and which foods can actively soothe pain by improving blood circulation, relieving inflammation, and balancing hormones. An introduction describes how food can fight pain at any of the stages of the pain process: the initial injury, the inflammatory response, the pain message traveling through the nerves, and the brain's perception of pain. Part 1 discusses conditions related to poor circulation, such as backaches and chest pain. Part 2 addresses conditions caused by food sensitivities and inflammation, including

migraines, other headaches, joint ailments, stomach aches and digestive problems, and **This book is.** Part 3 discusses hormone-related conditions such as menstrual pain, breast pain, and cancer pain. Part 4 discusses metabolic and immune problems, including carpal tunnel syndrome, diabetes, herpes and shingles, sickle cell anemia, kidney stones, and urinary infections. Part 5 discusses the roles of exercise, rest, and sleep in pain relief; describes several stress-reducing exercises; and explains why the body rebels against certain foods. The book includes menus and recipes, a glossary of ingredients, a list of resources, a list of suggested readings, and an index.

- **NIH Consensus Conference: Acupuncture**

  Source: JAMA. Journal of the American Medical Association. 280(17): 1518-1524. November 4, 1998.

  Summary: This journal article presents the findings of the consensus conference on acupuncture, sponsored by the Office of Alternative Medicine and the Office of Medical Applications of Research, National Institutes of Health. The purpose of the conference was to provide clinicians, patients, and the general public with a reliable assessment of the use and effectiveness of acupuncture for a variety of conditions. A multidisciplinary panel evaluated evidence presented by experts and in the scientific literature, and developed a consensus statement addressing five issues: the efficacy of acupuncture compared with placebo or sham acupuncture, the place of acupuncture in clinical practice, the biological effects of acupuncture, the integration of acupuncture into the health care system, and directions for future research. The panel concluded that many of the efficacy studies of acupuncture provide equivocal results because of design, sample size, and other factors. The issue is further complicated by inherent difficulties in the use of appropriate controls. However, promising results have emerged showing the efficacy of acupuncture for adult postoperative and chemotherapy nausea and vomiting, and in postoperative dental pain. In other conditions such as addiction, stroke rehabilitation, headache, menstrual cramps, **This journal,** myofascial pain, osteoarthritis, tennis elbow, low back pain, carpal tunnel syndrome, and asthma, acupuncture may be useful as an adjunct treatment, an acceptable alternative, or part of a comprehensive management plan. This article has 66 references.

National Center for Complementary and Alternative Medicine

The National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health (**http://nccam.nih.gov/**) has created a link to the National Library of Medicine's databases to facilitate research for articles that specifically relate to fibromyalgia and complementary medicine. To search the database, go to the following Web site: **http://www.nlm.nih.gov/nccam/camonpubmed.html**. Select "CAM on PubMed." Enter "fibromyalgia" (or synonyms) into the search box. Click "Go." The following references provide information on particular aspects of complementary and alternative medicine that are related to fibromyalgia:

- **A combined ischemic compression and spinal manipulation in the treatment of fibromyalgia: a preliminary estimate of dose and efficacy.**
  Author(s): Hains G, Hains F.
  Source: Journal of Manipulative and Physiological Therapeutics. 2000 May; 23(4): 225-30.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10820294&dopt=Abstract

- **A comparative evaluation of a fibromyalgia rehabilitation program.**
  Author(s): Bailey A, Starr L, Alderson M, Moreland J.
  Source: Arthritis Care and Research : the Official Journal of the Arthritis Health Professions Association. 1999 October; 12(5): 336-40.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11081003&dopt=Abstract

- **A pilot study of cognitive behavioral therapy in fibromyalgia.**
  Author(s): Singh BB, Berman BM, Hadhazy VA, Creamer P.
  Source: Alternative Therapies in Health and Medicine. 1998 March; 4(2): 67-70.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9682514&dopt=Abstract

- **A practical approach to fibromyalgia.**
  Author(s): Cymet TC.
  Source: Journal of the National Medical Association. 2003 April; 95(4): 278-85. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12749618&dopt=Abstract

- **A psychological profile of fibromyalgia patients: a chiropractic case study.**
  Author(s): Jamison JR.
  Source: Journal of Manipulative and Physiological Therapeutics. 1999 September; 22(7): 454-7.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10519562&dopt=Abstract

- **A randomized clinical trial comparing fitness and biofeedback training versus basic treatment in patients with fibromyalgia.**
  Author(s): van Santen M, Bolwijn P, Verstappen F, Bakker C, Hidding A, Houben H, van der Heijde D, Landewe R, van der Linden S.
  Source: The Journal of Rheumatology. 2002 March; 29(3): 575-81.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11908576&dopt=Abstract

- **A randomized, controlled clinical trial of education and physical training for women with fibromyalgia.**
  Author(s): Burckhardt CS, Mannerkorpi K, Hedenberg L, Bjelle A.
  Source: The Journal of Rheumatology. 1994 April; 21(4): 714-20.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8035399&dopt=Abstract

- **A raw vegetarian diet for patients with fibromyalgia.**
  Author(s): Bennett RM.
  Source: Curr Rheumatol Rep. 2002 August; 4(4): 284. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12166411&dopt=Abstract

- **A reply to the comments on complementary and alternative medicine use and fibromyalgia.**
  Author(s): Poyhia R, Da Costa D, Fitzcharles MA.

Source: Arthritis and Rheumatism. 2002 October 15; 47(5): 566-7.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12382309&dopt=Abstract

- **A review of recent clinical trials of the nutritional supplement Chlorella pyrenoidosa in the treatment of fibromyalgia, hypertension, and ulcerative colitis.**
  Author(s): Merchant RE, Andre CA.
  Source: Alternative Therapies in Health and Medicine. 2001 May-June; 7(3): 79-91. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11347287&dopt=Abstract

- **Abnormal responses to electrocutaneous stimulation in fibromyalgia.**
  Author(s): Arroyo JF, Cohen ML.
  Source: The Journal of Rheumatology. 1993 November; 20(11): 1925-31.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7848390&dopt=Abstract

- **Acupuncture in the treatment of fibromyalgia.**
  Author(s): Koenig C, Stevermer J.
  Source: The Journal of Family Practice. 1999 July; 48(7): 497.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10428243&dopt=Abstract

- **Alpha sleep and information processing, perception of sleep, pain, and arousability in fibromyalgia.**
  Author(s): Perlis ML, Giles DE, Bootzin RR, Dikman ZV, Fleming GM, Drummond SP, Rose MW.
  Source: The International Journal of Neuroscience. 1997 February; 89(3-4): 265-80.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9134461&dopt=Abstract

- **Altered sympathetic nervous system response in patients with fibromyalgia (fibrositis syndrome).**
  Author(s): Vaeroy H, Qiao ZG, Morkrid L, Forre O.
  Source: The Journal of Rheumatology. 1989 November; 16(11): 1460-5.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2689647&dopt=Abstract

- **Alternative medicine use in fibromyalgia syndrome.**
  Author(s): Pioro-Boisset M, Esdaile JM, Fitzcharles MA.
  Source: Arthritis Care and Research : the Official Journal of the Arthritis Health Professions Association. 1996 February; 9(1): 13-7.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8945108&dopt=Abstract

- **An intuitive person-centred perspective on fibromyalgia syndrome and its management.**
  Author(s): Masi AT.

Source: Baillieres Clin Rheumatol. 1994 November; 8(4): 957-93. Review. No Abstract Available.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7850888&dopt=Abstract

- **An open, pilot study to evaluate the potential benefits of coenzyme Q10 combined with Ginkgo biloba extract in fibromyalgia syndrome.**
  Author(s): Lister RE.
  Source: J Int Med Res. 2002 March-April; 30(2): 195-9.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12025528&dopt=Abstract

- **Attributions in chronic fatigue syndrome and fibromyalgia syndrome in tertiary care.**
  Author(s): Neerinckx E, Van Houdenhove B, Lysens R, Vertommen H, Onghena P.
  Source: The Journal of Rheumatology. 2000 April; 27(4): 1051-5.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10782836&dopt=Abstract

- **Balneotherapy at the Dead Sea area for patients with psoriatic arthritis and concomitant fibromyalgia.**
  Author(s): Sukenik S, Baradin R, Codish S, Neumann L, Flusser D, Abu-Shakra M, Buskila D.
  Source: Isr Med Assoc J. 2001 February; 3(2): 147-50.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11344827&dopt=Abstract

- **Balneotherapy for fibromyalgia at the Dead Sea.**
  Author(s): Karagulle Z, Donmez A.
  Source: Rheumatology International. 2002 March; 21(5): 210-1.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11958439&dopt=Abstract

- **Balneotherapy for fibromyalgia at the Dead Sea.**
  Author(s): Buskila D, Abu-Shakra M, Neumann L, Odes L, Shneider E, Flusser D, Sukenik S.
  Source: Rheumatology International. 2001 April; 20(3): 105-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11354556&dopt=Abstract

- **Biofeedback/relaxation training and exercise interventions for fibromyalgia: a prospective trial.**
  Author(s): Buckelew SP, Conway R, Parker J, Deuser WE, Read J, Witty TE, Hewett JE, Minor M, Johnson JC, Van Male L, McIntosh MJ, Nigh M, Kay DR.
  Source: Arthritis Care and Research : the Official Journal of the Arthritis Health Professions Association. 1998 June; 11(3): 196-209.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9782811&dopt=Abstract

- **Both pain and EEG response to cold pressor stimulation occurs faster in fibromyalgia patients than in control subjects.**
  Author(s): Stevens A, Batra A, Kotter I, Bartels M, Schwarz J.
  Source: Psychiatry Research. 2000 December 27; 97(2-3): 237-47.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11166094&dopt=Abstract

- **Chronic fatigue syndrome and fibromyalgia. Dilemmas in diagnosis and clinical management.**
  Author(s): Demitrack MA.
  Source: The Psychiatric Clinics of North America. 1998 September; 21(3): 671-92, Viii. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9774804&dopt=Abstract

- **Chronic fatigue syndrome and fibromyalgia: clinical assessment and treatment.**
  Author(s): Friedberg F, Jason LA.
  Source: Journal of Clinical Psychology. 2001 April; 57(4): 433-55. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11255201&dopt=Abstract

- **Chronic fatigue, chronic fatigue syndrome, and fibromyalgia. Disability and health-care use.**
  Author(s): Bombardier CH, Buchwald D.
  Source: Medical Care. 1996 September; 34(9): 924-30.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8792781&dopt=Abstract

- **Cognitive-behavioral intervention for juvenile primary fibromyalgia syndrome.**
  Author(s): Walco GA, Ilowite NT.
  Source: The Journal of Rheumatology. 1992 October; 19(10): 1617-9.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1464878&dopt=Abstract

- **Collagen crosslinks as markers of a therapy effect in fibromyalgia.**
  Author(s): Sprott H, Muller A.
  Source: Clin Exp Rheumatol. 1998 September-October; 16(5): 626-7. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9779321&dopt=Abstract

- **Comparison of integrated group therapy and group relaxation training for fibromyalgia.**
  Author(s): Keel PJ, Bodoky C, Gerhard U, Muller W.
  Source: The Clinical Journal of Pain. 1998 September; 14(3): 232-8.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9758073&dopt=Abstract

- **Complementary and alternative medicine in fibromyalgia and related syndromes.**
  Author(s): Holdcraft LC, Assefi N, Buchwald D.

Source: Best Practice & Research. Clinical Rheumatology. 2003 August; 17(4): 667-83.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12849718&dopt=Abstract

- **Complementary and alternative medicine use and fibromyalgia.**
  Author(s): Logan AC.
  Source: Arthritis and Rheumatism. 2002 Aug15; 47(4): 456.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12209495&dopt=Abstract

- **Complementary and alternative therapies for fibromyalgia.**
  Author(s): Crofford LJ, Appleton BE.
  Source: Curr Rheumatol Rep. 2001 April; 3(2): 147-56. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11286671&dopt=Abstract

- **Complementary medicine treatments for fibromyalgia syndrome.**
  Author(s): Berman BM, Swyers JP.
  Source: Baillieres Best Practice & Research. Clinical Rheumatology. 1999 September; 13(3): 487-92. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10562380&dopt=Abstract

- **Connective tissue massage in the treatment of fibromyalgia.**
  Author(s): Brattberg G.
  Source: European Journal of Pain (London, England). 1999 June; 3(3): 235-244.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10700351&dopt=Abstract

- **Controlled trial of hypnotherapy in the treatment of refractory fibromyalgia.**
  Author(s): Haanen HC, Hoenderdos HT, van Romunde LK, Hop WC, Mallee C, Terwiel JP, Hekster GB.
  Source: The Journal of Rheumatology. 1991 January; 18(1): 72-5.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2023202&dopt=Abstract

- **Controlled trials of therapy in fibromyalgia syndrome.**
  Author(s): Simms RW.
  Source: Baillieres Clin Rheumatol. 1994 November; 8(4): 917-34. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=7850886&dopt=Abstract

- **Diagnosis of fibromyalgia.**
  Author(s): Bayne R.
  Source: Cmaj : Canadian Medical Association Journal = Journal De L'association Medicale Canadienne. 2001 June 12; 164(12): 1661.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11450204&dopt=Abstract

- **Difference in pain relief after trigger point injections in myofascial pain patients with and without fibromyalgia.**
  Author(s): Hong CZ, Hsueh TC.
  Source: Archives of Physical Medicine and Rehabilitation. 1996 November; 77(11): 1161-6.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8931529&dopt=Abstract

- **Effect of homeopathic treatment on fibrositis (primary fibromyalgia)**
  Author(s): Fisher P, Greenwood A, Huskisson EC, Turner P, Belon P.
  Source: Bmj (Clinical Research Ed.). 1989 August 5; 299(6695): 365-6.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2506969&dopt=Abstract

- **Effect of omega-3 fatty acids in the management of fibromyalgia syndrome.**
  Author(s): Ozgocmen S, Catal SA, Ardicoglu O, Kamanli A.
  Source: Int J Clin Pharmacol Ther. 2000 July; 38(7): 362-3. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=10919346&dopt=Abstract

- **Effects of aerobic exercise versus stress management treatment in fibromyalgia. A 4.5 year prospective study.**
  Author(s): Wigers SH, Stiles TC, Vogel PA.
  Source: Scandinavian Journal of Rheumatology. 1996; 25(2): 77-86.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8614771&dopt=Abstract

- **Efficacy of an EMG-biofeedback therapy in fibromyalgia patients. A comparative study of patients with and without abnormality in (MMPI) psychological scales.**
  Author(s): Drexler AR, Mur EJ, Gunther VC.
  Source: Clin Exp Rheumatol. 2002 September-October; 20(5): 677-82.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12412199&dopt=Abstract

- **Electroacupuncture in fibromyalgia.**
  Author(s): Lewis PJ.
  Source: Bmj (Clinical Research Ed.). 1993 February 6; 306(6874): 393.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8461698&dopt=Abstract

- **Electroacupuncture in fibromyalgia: results of a controlled trial.**
  Author(s): Deluze C, Bosia L, Zirbs A, Chantraine A, Vischer TL.
  Source: Bmj (Clinical Research Ed.). 1992 November 21; 305(6864): 1249-52.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1477566&dopt=Abstract

- **Electrodermal and microcirculatory activity in patients with fibromyalgia during baseline, acoustic stimulation and cold pressor tests.**
  Author(s): Qiao ZG, Vaeroy H, Morkrid L.

Source: The Journal of Rheumatology. 1991 September; 18(9): 1383-9.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=1757941&dopt=Abstract

- **EMG-biofeedback in fibromyalgia syndrome.**
  Author(s): Ferraccioli GF, Fontana S, Scita F, Chirelli L, Nolli M.
  Source: The Journal of Rheumatology. 1989 July; 16(7): 1013-4.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=2769660&dopt=Abstract

- **EMG-biofeedback training in fibromyalgia syndrome.**
  Author(s): Ferraccioli G, Ghirelli L, Scita F, Nolli M, Mozzani M, Fontana S, Scorsonelli M, Tridenti A, De Risio C.
  Source: The Journal of Rheumatology. 1987 August; 14(4): 820-5.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=3478492&dopt=Abstract

- **Factors predisposing to the resort of complementary therapies in patients with fibromyalgia.**
  Author(s): Dimmock S, Troughton PR, Bird HA.
  Source: Clinical Rheumatology. 1996 September; 15(5): 478-82.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8894361&dopt=Abstract

- **Fibromyalgia and chronic fatigue: the holistic perspective.**
  Author(s): Kenner C.
  Source: Holistic Nursing Practice. 1998 April; 12(3): 55-63. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9624958&dopt=Abstract

- **Fibromyalgia and the serotonin pathway.**
  Author(s): Juhl JH.
  Source: Alternative Medicine Review : a Journal of Clinical Therapeutic. 1998 October; 3(5): 367-75. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9802912&dopt=Abstract

- **Fibromyalgia and trigger point injections.**
  Author(s): Jayson MI.
  Source: Bull Hosp Jt Dis. 1996; 55(4): 176-7. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=8933945&dopt=Abstract

- **Fibromyalgia syndrome improved using a mostly raw vegetarian diet: An observational study.**
  Author(s): Donaldson MS, Speight N, Loomis S.

Source: Bmc Complementary and Alternative Medicine [electronic Resource]. 2001; 1(1): 7. Epub 2001 September 26.
http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11602026&dopt=Abstract

- **Fibromyalgia syndrome.**
  Author(s): Smith WA.
  Source: Nurs Clin North Am. 1998 December; 33(4): 653-69. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=9769357&dopt=Abstract

- **Fibromyalgia syndrome: a new paradigm for differential diagnosis and treatment.**
  Author(s): Brady DM, Schneider MJ.
  Source: Journal of Manipulative and Physiological Therapeutics. 2001 October; 24(8): 529-41. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11677554&dopt=Abstract

- **Fibromyalgia, chronic fatigue syndrome, and myofascial pain syndrome.**
  Author(s): Buskila D.
  Source: Current Opinion in Rheumatology. 2001 March; 13(2): 117-27. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=11224736&dopt=Abstract

- **Fibromyalgia.**
  Author(s): Fisk JW.
  Source: N Z Med J. 1982 February 10; 95(701): 91-2. No Abstract Available.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=6952115&dopt=Abstract

- **Fibromyalgia: evolving concepts and management in primary care settings.**
  Author(s): Lash AA, Ehrlich-Jones L, McCoy D.
  Source: Medsurg Nursing : Official Journal of the Academy of Medical-Surgical Nurses. 2003 June; 12(3): 145-59, 190; Quiz 160. Review.
  http://www.ncbi.nlm.nih.gov:80/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=12861752&dopt=Abstract

- **Fibromyalgia: is recovery impeded by the internet?**
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Additional Web Resources

A number of additional Web sites offer encyclopedic information covering CAM and related topics. The following is a representative sample:

- Alternative Medicine Foundation, Inc.: **http://www.herbmed.org/**
- AOL: **http://search.aol.com/cat.adp?id=169&layer=&from=subcats**
- Chinese Medicine: **http://www.newcenturynutrition.com/**
- drkoop.com®: **http://www.drkoop.com/InteractiveMedicine/IndexC.html**
- Family Village: **http://www.familyvillage.wisc.edu/med_altn.htm**
- Google: **http://directory.google.com/Top/Health/Alternative/**
- Healthnotes: **http://www.healthnotes.com/**
- MedWebPlus: **http://medwebplus.com/subject/Alternative_and_Complementary_Medicine**
- Open Directory Project: **http://dmoz.org/Health/Alternative/**
- HealthGate: **http://www.tnp.com/**
- WebMD®Health: **http://my.webmd.com/drugs_and_herbs**
- WholeHealthMD.com: **http://www.wholehealthmd.com/reflib/0,1529,00.html**
- Yahoo.com: **http://dir.yahoo.com/Health/Alternative_Medicine/**

The following is a specific Web list relating to fibromyalgia; please note that any particular subject below may indicate either a therapeutic use, or a contraindication (potential danger), and does not reflect an official recommendation:

- **General Overview**

  Chronic Fatigue Syndrome
  Source: Healthnotes, Inc. www.healthnotes.com

  Fibromyalgia
  Source: Healthnotes, Inc. www.healthnotes.com

  Fibromyalgia
  Source: Integrative Medicine Communications; www.drkoop.com

  Fibromyalgia
  Source: Integrative Medicine Communications; www.drkoop.com

  Insomnia
  Source: Healthnotes, Inc. www.healthnotes.com

  Insomnia
  Source: Integrative Medicine Communications; www.drkoop.com

  Pain
  Source: Healthnotes, Inc. www.healthnotes.com

  Prostatitis
  Source: Healthnotes, Inc. www.healthnotes.com

  Sleeplessness
  Source: Integrative Medicine Communications; www.drkoop.com

  Vertigo
  Source: Healthnotes, Inc. www.healthnotes.com

- **Alternative Therapy**

  Acupuncture
  Source: Healthnotes, Inc. www.healthnotes.com

  Acupuncture
  Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,663,00.html

  Alexander technique
  Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
  Hyperlink:
  http://www.wholehealthmd.com/refshelf/substances_view/0,1525,665,00.html

  Biofeedback
  Source: Integrative Medicine Communications; www.drkoop.com

  Biofeedback
  Source: WholeHealthMD.com, LLC. www.wholehealthmd.com

Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,675,00.html

Homeopathy
Source: Integrative Medicine Communications; www.drkoop.com

Hydrotherapy
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,705,00.html

Hypnotherapy
Source: Integrative Medicine Communications; www.drkoop.com

Hypnotherapy
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,706,00.html

Massage therapy
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,716,00.html

Meditation
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,717,00.html

Myotherapy
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,931,00.html

Polarity therapy
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,727,00.html

Qigong
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,729,00.html

Relaxation Techniques
Source: Integrative Medicine Communications; www.drkoop.com

Traditional Chinese medicine
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10085,00.html

Yoga
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,746,00.html

- **Homeopathy**

Actaea racemosa
Source: Healthnotes, Inc. www.healthnotes.com

Arnica
Source: Healthnotes, Inc. www.healthnotes.com

Bryonia
Source: Healthnotes, Inc. www.healthnotes.com

Calcarea carbonica
Source: Healthnotes, Inc. www.healthnotes.com

Causticum
Source: Healthnotes, Inc. www.healthnotes.com

Cimicifuga
Source: Healthnotes, Inc. www.healthnotes.com

Kalmia latifolia
Source: Healthnotes, Inc. www.healthnotes.com

Ranunculus bulbosus
Source: Healthnotes, Inc. www.healthnotes.com

Rhus toxicodendron
Source: Healthnotes, Inc. www.healthnotes.com

Ruta graveolens
Source: Healthnotes, Inc. www.healthnotes.com

- **Herbs and Supplements**

5-HTP
Source: Integrative Medicine Communications; www.drkoop.com

5-HTP (5-Hydroxytryptophan)
Source: Prima Communications, Inc.www.personalhealthzone.com

5-Hydroxytryptophan
Source: Healthnotes, Inc. www.healthnotes.com

5-Hydroxytryptophan (5-HTP)
Source: Integrative Medicine Communications; www.drkoop.com

Aloe
Alternative names: Aloe vera L.
Source: Alternative Medicine Foundation, Inc. www.amfoundation.org

Amino Acids Overview
Source: Healthnotes, Inc. www.healthnotes.com

Antioxidants
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10004,00.html

Beta-carotene
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10103,00.html

Cayenne
Alternative names: Capsicum annuum, Capsicum frutescens
Source: Healthnotes, Inc. www.healthnotes.com

Cayenne
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,765,00.html

Coenzyme Q
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,768,00.html

Coenzyme Q10
Source: Healthnotes, Inc. www.healthnotes.com

DHEA
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10022,00.html

Flavonoids
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,782,00.html

GINGER
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca

Ginkgo biloba
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,788,00.html

Grape seed extract
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,793,00.html
Kava
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,798,00.html

Licorice
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,801,00.html

Malic Acid
Source: Healthnotes, Inc. www.healthnotes.com

Melatonin
Source: Healthnotes, Inc. www.healthnotes.com

Melatonin
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,804,00.html

MSM
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,807,00.html

NADH
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,10047,00.html

Peppermint
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,812,00.html

Phosphatidylserine (PS)
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,813,00.html

PMS Herbal combination
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,947,00.html

S-Adenosylmethionine (SAMe)
Source: Integrative Medicine Communications; www.drkoop.com

SAMe
Source: Healthnotes, Inc. www.healthnotes.com

SAMe
Source: Integrative Medicine Communications; www.drkoop.com

SAMe (S-Adenosylmethionine)
Source: Prima Communications, Inc.www.personalhealthzone.com

SAMe (S-adenosylmethionine)
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,818,00.html

Siberian ginseng
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,821,00.html

ST. JOHN'S WORT
Source: The Canadian Internet Directory for Holistic Help, WellNet, Health and Wellness Network; www.wellnet.ca

St. John's wort
Source: WholeHealthMD.com, LLC. www.wholehealthmd.com
Hyperlink:
http://www.wholehealthmd.com/refshelf/substances_view/0,1525,824,00.html

General References

A good place to find general background information on CAM is the National Library of Medicine. It has prepared within the MEDLINEplus system an information topic page dedicated to complementary and alternative medicine. To access this page, go to the MEDLINEplus site at **http://www.nlm.nih.gov/medlineplus/alternativemedicine.html**. This Web site provides a general overview of various topics and can lead to a number of general sources.

CHAPTER 4. DISSERTATIONS ON FIBROMYALGIA

Overview

In this chapter, we will give you a bibliography on recent dissertations relating to fibromyalgia. We will also provide you with information on how to use the Internet to stay current on dissertations. **IMPORTANT NOTE:** When following the search strategy described below, you may discover non-medical dissertations that use the generic term "fibromyalgia" (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on fibromyalgia, we have not necessarily excluded non-medical dissertations in this bibliography.

Dissertations on Fibromyalgia

ProQuest Digital Dissertations, the largest archive of academic dissertations available, is located at the following Web address: **http://wwwlib.umi.com/dissertations**. From this archive, we have compiled the following list covering dissertations devoted to fibromyalgia. You will see that the information provided includes the dissertation's title, its author, and the institution with which the author is associated. The following covers recent dissertations found when using this search procedure:

- **A Needs Assessment As a Basis for Developing Fibromyalgia Education Programs (health Education)** by Rogers, Janet Lynn, Phd from Southern Illinois University at Carbondale, 1995, 274 pages
  http://wwwlib.umi.com/dissertations/fullcit/9614961
- **Effects of Aquatic Exercise on Physical Fitness, Pain Levels, and Perceived Health Status in Individuals with Fibromyalgia Syndrome** by Young, Mary Julienne; Phd from University of Arkansas, 2002, 243 pages
  http://wwwlib.umi.com/dissertations/fullcit/3067061
- **Impact of Personality Characteristics on Pain and Functional Status in Fibromyalgia** by Boyden, Kathleen Marie; Phd from University of Virginia, 2003, 204 pages
  http://wwwlib.umi.com/dissertations/fullcit/3083077
- **Impacts of Fibromyalgia Syndrome on the Daily Lives of Women** by Zdravecky, Nicole L. Ms from D'youville College, 2003, 120 pages
  http://wwwlib.umi.com/dissertations/fullcit/1413530

- **Psychobiology of Fibromyalgia: a Study of Women with Fibromyalgia Compared to Female Patients with Functional Dyspepsia and Female Population-based Random Sample Controls (helicobacter Pylori)** by Malt, Eva Albertsen; Phd from Universitetet I Bergen (norway), 2002
  http://wwwlib.umi.com/dissertations/fullcit/f663105
- **Psychological Variables in Patients with Primary Fibromyalgia Syndrome** by Uveges, John Michael, Phd from University of Missouri - Columbia, 1987, 91 pages
  http://wwwlib.umi.com/dissertations/fullcit/8818975
- **Sociocultural, Physiologic, and Psychologic Variables That Influence Pain in the Fibromyalgia Patient** by Hughes, Linda Carol; Phd from University of Nebraska Medical Center, 2002, 176 pages
  http://wwwlib.umi.com/dissertations/fullcit/3054199
- **The Effects of a Supervised Group Aerobic Exercise Program and a Chronobiologically Oriented Treatment Protocol on Symptomatology and Mood in Women with Fibromyalgia** by Beltran, Robin; Phd from Alliant International University, San Diego, 2003, 100 pages
  http://wwwlib.umi.com/dissertations/fullcit/3082022
- **The Effects of Written Emotional Disclosure on Adjustment in Fibromyalgia Syndrome** by Gillis, Mazy Elizabeth; Phd from Wayne State University, 2002, 85 pages
  http://wwwlib.umi.com/dissertations/fullcit/3047745
- **The Experiences of Older Women with Fibromyalgia in a Mindfulness-based Stress Reduction and Relaxation Program: a Qualitative Study** by Prewitt, Sallie Hanna; Edd from University of Kentucky, 2000, 305 pages
  http://wwwlib.umi.com/dissertations/fullcit/9996048

Keeping Current

Ask the medical librarian at your library if it has full and unlimited access to the *ProQuest Digital Dissertations* database. From the library, you should be able to do more complete searches via **http://wwwlib.umi.com/dissertations**.

CHAPTER 5. CLINICAL TRIALS AND FIBROMYALGIA

Overview

In this chapter, we will show you how to keep informed of the latest clinical trials concerning fibromyalgia.

Recent Trials on Fibromyalgia

The following is a list of recent trials dedicated to fibromyalgia.[8] Further information on a trial is available at the Web site indicated.

- **Eligibility Screening for National Institute of Dental and Craniofacial Research Studies**

  Condition(s): Fibromyalgia

  Study Status: This study is currently recruiting patients.

  Sponsor(s): National Institute of Dental and Craniofacial Research (NIDCR)

  Purpose - Excerpt: This screening protocol is designed to evaluate patients for participation in clinical studies in the Gene Therapy and Therapeutics Branch (GTTB) of the National Institute of Dental and Craniofacial Research. To participate, patients must meet the specific requirements of at least one of the available research studies; this protocol serves as a first step for admitting patients to an appropriate program. People with diagnosed or undiagnosed conditions may participate in this screening protocol. They will undergo procedures that may include questionnaires, a physical examination, routine laboratory tests, and diagnostic imaging or radiological studies. Eligibility screening will be limited to three visits within 12 months of entry into the protocol. If an appropriate study is not found by the end of this time, the candidate's participation in the screening program will terminate. No experimental treatments are offered under the screening protocol. Patients who are found eligible for a current GTTB study will be notified of their options and invited to enroll.

  Study Type: Observational

  Contact(s): see Web site below

[8] These are listed at **www.ClinicalTrials.gov**.

Web Site: http://clinicaltrials.gov/ct/show/NCT00001983

- **Gabapentin in Fibromyalgia Trial (GIFT)**

  Condition(s): Fibromyalgia

  Study Status: This study is currently recruiting patients.

  Sponsor(s): National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

  Purpose - Excerpt: This study will assess the safety and effectiveness of the drug gabapentin in reducing pain associated with primary fibromyalgia.

  Phase(s): Phase II; Phase III

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00057278

- **Tailored Treatments of Fibromyalgia**

  Condition(s): Fibromyalgia

  Study Status: This study is currently recruiting patients.

  Sponsor(s): National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

  Purpose - Excerpt: This study will evaluate the effects of matching treatments to people with fibromyalgia syndrome (FMS) on the basis of their psychosocial and behavioral characteristics. We will look at how patients respond to a rehabilitation program that includes physical therapy and information about fibromyalgia. We will combine this program with psychological treatments that are either matched or mismatched to the way patients cope with and adapt to symptoms of FMS. The second aim of our study is to better understand how different FMS symptoms may vary together and how these symptoms change as a result of treatment in a person's natural environment. People with FMS and healthy people of the same ages will record their moods, thoughts, symptoms, activities, and fatigue levels three times a day for 2 weeks. Participants will use palm-top computers to record these "real-time" assessments. This approach will permit people to rate how they feel at a particular time rather than looking back in time.

  Phase(s): Phase II; Phase III

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00000422

- **The Efficacy of Reiki in the Treatment of Fibromyalgia**

  Condition(s): Fibromyalgia

  Study Status: This study is currently recruiting patients.

  Sponsor(s): National Center for Complementary and Alternative Medicine (NCCAM)

  Purpose - Excerpt: The purpose of this study is to investigate the effectiveness of Reiki in the treatment of fibromyalgia (FM), a condition characterized by widespread muscle pain and stiffness, often accompanied by sleep disturbance, headaches, irritable bowel

syndrome, and psychological distress. Reiki is a form of energy medicine in which practitioners reportedly access universal life energy to heal patients, either by direct contact at specific hand positions or from a distance.

Phase(s): Phase I

Study Type: Interventional

Contact(s): see Web site below

Web Site: http://clinicaltrials.gov/ct/show/NCT00051428

- **Acupuncture in Fibromyalgia**

  Condition(s): Fibromyalgia; Pain

  Study Status: This study is no longer recruiting patients.

  Sponsor(s): National Center for Complementary and Alternative Medicine (NCCAM)

  Purpose - Excerpt: Fibromyalgia is the second most common rheumatic disorder, affecting approximately 8-10 million persons in the U.S., and is characterized by widespread musculoskeletal pain and soft tissue tenderness upon examination. This study focuses on the use of acupuncture as a mode of therapy for fibromyalgia. The issues under examination are: 1) the optimal duration of treatment, 2) the independent and synergistic effects of needle placement and needle stimulation, and 3) appropriate control strategies. The proposal utilizes a randomized, blinded, sham-controlled design to achieve these aims. Subjects are randomly assigned to one of four groups: 1)active site with stimulation, 2) active site, without stimulation, 3) sham site with stimulation, and 4) sham site, without stimulation. All subjects will receive acupuncture at escalating frequency, beginning at once per week and ending at 3 times per week. This "forced titration" design allows for the detection of inter-subject differences in responsiveness to acupuncture, as well as the factors which may predict responsiveness (or lack thereof). Secondary goals of the study are to collect data on the mechanism, safety, and cost-effectiveness of acupuncture in fibromyalgia, and to determine the optimal outcome measures, for a full scale research clinical trial.

  Phase(s): Phase III

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00010504

- **Assessing Fibromyalgia Treatments**

  Condition(s): Fibromyalgia

  Study Status: This study is no longer recruiting patients.

  Sponsor(s): National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

  Purpose - Excerpt: This study will compare the effectiveness of combination therapy with the drugs amitriptyline and fluoxetine (AM+FL) and amitriptyline (AM) alone in the treatment of people with fibromyalgia. Doctors will treat each study participant with both AM + FL and AM alone for 6 weeks at a time. The study uses a method that combines results from treatment of individual patients to assess overall treatment effectiveness and help individual patients and their physicians with their treatment

decisions. This study will also help compare the results of community-based studies (studies involving private doctors) and studies based at clinical research centers.

Phase(s): Phase IV

Study Type: Interventional

Contact(s): see Web site below

Web Site: http://clinicaltrials.gov/ct/show/NCT00000428

- **Behavioral Insomnia Therapy for Fibromyalgia**

  Condition(s): Fibromyalgia; Insomnia

  Study Status: This study is no longer recruiting patients.

  Sponsor(s): National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

  Purpose - Excerpt: This study tests the effectiveness of a nondrug treatment for the insomnia that often occurs in people with fibromyalgia. The treatment is a type of psychotherapy called cognitive-behavioral therapy. Cognitive-behavioral therapy combines cognitive therapy, which can modify or eliminate thought patterns contributing to the person's symptoms, and behavioral therapy, which aims to help the person change his or her behavior.

  Phase(s): Phase II

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00000397

- **Efficacy of Acupuncture in the Treatment of Fibromyalgia**

  Condition(s): Fibromyalgia

  Study Status: This study is no longer recruiting patients.

  Sponsor(s): National Center for Complementary and Alternative Medicine (NCCAM); National Heart, Lung, and Blood Institute (NHLBI)

  Purpose - Excerpt: Fibromyalgia (FM), one of the most common rheumatic conditions, is a condition of unknown etiology characterized by widespread muscle pain and stiffness. Treatment is generally unsatisfactory and most randomized, controlled treatment trials have been unable to demonstrate a sustained effective intervention. A single, brief trial of electroacupuncture demonstrated remarkable improvement among patients with FM, although lasting effects were not evaluated. Nonetheless, the recently published National Institutes of Health Consensus Development Statement on Acupuncture says "musculoskeletal conditions such as fibromyalgia, myofascial pain.are conditions for which acupuncture may be beneficial". Thus, 96 patients will be recruited from a referral clinic for fatigue for a 12 week (24 treatments) trial. These patients will be randomized into 3 control groups and 1 "true" acupuncture group. The control groups will consist of a group receiving acupuncture treatment for an unrelated condition (morning sickness), a group receiving needle insertion at non-channel, non-point locations, and a "true" placebo group. This latter group will have acupuncture needle guides tapped on the skin, then needles tapped. Thus, the specific aims of this study are to 1) evaluate the short and long term efficacy and side effects of a 12 week randomized, controlled trial of bi-weekly acupuncture in the treatment of FM; 2) establish the most useful and

scientifically sound control group for studies of acupuncture using FM as a model for conditions characterized by chronic pain; 3) use both subjective and objective measures of overall health and pain to determine the optimal time length of treatment; and 4) examine the concordance of allopathic and acupuncture-based measures of outcome. For the purposes of this study, subjects will be asked to complete a unique set of study measures at enrollment, at 4, 8, and 12 weeks, and then again at 1 and 6 months post-treatment. Our primary outcomes will be patient global assessment, subjective pain, and mean number of tender points. Secondary outcomes will be pain threshold, analgesic use, physician global assessment, functional status, sleep, psychological distress, and fatigue. Thus, this trial will have both immediate and longer term implications for the scientific study of acupuncture as well as the clinical care of the estimated 5 million patients with FM in the US. From a methodological point of view, the proposed trial will establish the most appropriate methods for choosing a control group should larger trials be conducted, suggest the optimum duration of treatment, and evaluate the utility of diverse allopathic and alternative outcome measures. Of equal importance, however, this research will test and potentially establish the effectiveness of acupuncture.

Phase(s): Phase I

Study Type: Interventional

Contact(s): see Web site below

Web Site: http://clinicaltrials.gov/ct/show/NCT00010764

- **Fibromyalgia: A Randomized Controlled Trial of a Mind/Body Intervention**

  Condition(s): Fibromyalgia

  Study Status: This study is no longer recruiting patients.

  Sponsor(s): National Center for Complementary and Alternative Medicine (NCCAM)

  Purpose - Excerpt: The goal of this proposal is to evaluate the efficacy of a multiple component mind-body (MCMB) therapy for fibromyalgia, both in short and long term outcomes. Preliminary work suggests that FM patients do benefit from MCMB therapy (Singh et al 1998; Creamer et al 1998). This two-arm clinical trial will randomize 110 patients to either a 12 week MCMB intervention or a 12 week education/attention intervention. The primary aims of this study are 1) to determine if a 12 week MCMB intervention improves short term (i.e. at 12 weeks) outcomes in FM patients compared to an education/attention control group; and 2) to determine if a 12 week MCMB intervention improves long term (i.e. at 24 weeks) outcomes in FM patients compared to an education/attention control group. A secondary aim of this project involves determining if there are patient characteristics (i.e. disease severity and duration, demographics, psychological factors) associated with improvements in short or long term outcomes as well as responses to the MCMB intervention. The primary outcome measure will include physical functioning and pain as measured by the Fibromyalgia Impact Questionnaire.

  Phase(s): Phase II

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00010777

- **Behavioral Treatment of Fibromyalgia**

  Condition(s): Fibromyalgia

  Study Status: This study is completed.

  Sponsor(s): National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

  Purpose - Excerpt: Fibromyalgia (FM) is one of the most common rheumatic diseases (conditions or disorders that cause pain or stiffness in the joints, muscles, or bones). It affects 6 million Americans and up to 20 percent of patients seen by doctors who specialize in treating rheumatic diseases. This study will evaluate the effects of two of the most promising nondrug treatments for FM: coping skills training and physical exercise training. We will randomly assign each of 180 patients diagnosed with FM to one of four groups: coping skills training (CST), physical exercise training alone, CST plus physical exercise training, or a waiting list (nontreatment group). We will look at the separate and combined effects of CST and physical exercise training and evaluate how changes in aerobic fitness, self-effectiveness (a person's belief in his or her ability to reach a goal, such as managing one's own disease), and negative pain-related thoughts relate to improvements in pain and disability.

  Phase(s): Phase II

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00000398

- **Biomarkers of Homeopathy in Fibromyalgia**

  Condition(s): Fibromyalgia

  Study Status: This study is completed.

  Sponsor(s): National Center for Complementary and Alternative Medicine (NCCAM)

  Purpose - Excerpt: The purpose of this study is to evaluate the efficacy of individualized classical homeopathy in treatment of persons with fibromyalgia and to determine the usefulness of electroencephalographic and electrocardiographic measures to serve as markers of differences between active and placebo treatment.

  Phase(s): Phase I; Phase II

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00065702

- **Compare the Medical Conditions of Gulf War Veterans to Non-Deployed Veterans**

  Condition(s): Chronic Fatigue Syndrome; Fibromyalgia; Post-Traumatic Stress Disorder; neurologic abnormalities; general health status

  Study Status: This study is completed.

  Sponsor(s): Department of Veterans Affairs; Department of Veterans Affairs Cooperative Studies Program

  Purpose - Excerpt: Primary Hypothesis: Gulf War veterans will have an equal prevalence or mean level of the following medical and psychological conditions frequently reported in the literature compared to a control group of nondeployed

veterans: (1) chronic fatigue syndrome, (2) **fibromyalgia,** (3) post-traumatic stress disorder, (4) neurologic abnormalities, including peripheral neuropathy and cognitive dysfunction, and (5) general health status.

Study Type: Observational

Contact(s): see Web site below

Web Site: http://clinicaltrials.gov/ct/show/NCT00032461

- **Glucocorticoid Effects on Cellular Cytokine Release**

  Condition(s): Depressive Disorder; Fatigue Syndrome, Chronic; Fibromyalgia; Healthy; Inflammation

  Study Status: This study is completed.

  Sponsor(s): National Institute of Mental Health (NIMH)

  Purpose - Excerpt: A variety of hormones and immune system processes are responsible for how the body responds to illness. This study concentrates on how the hormone cortisol effects the release of immune system factors called cytokines. Cortisol is a hormone produced in the adrenal glands as a response to stimulation from the pituitary gland. Abnormal levels of cortisol have been seen in several diseases such as depression and multiple sclerosis. Cytokines are factors produced by certain white blood cells. They act by changing the cells that produce them (autocrine effect), altering other cells close to them (paracrine), and effecting cells throughout the body (endocrine effect). Cytokines are important in controlling inflammation processes. In this study researchers would like to determine if changes in levels of hormones in the blood are associated with changes in cytokine levels. In addition, researchers would like to learn more about how cytokines respond to hormones in certain diseases.

  Study Type: Observational

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00001415

- **Intravenous micronutrient therapy (IVMT) for Fibromyalgia**

  Condition(s): Fibromyalgia

  Study Status: This study is not yet open for patient recruitment.

  Sponsor(s): National Center for Complementary and Alternative Medicine (NCCAM)

  Purpose - Excerpt: The purpose of this study is to determine if intravenous micronutrient therapy (IVMT) is effective in the treatment of fibromyalgia, as assessed by validated functional and pain measures.

  Phase(s): Phase I; Phase II

  Study Type: Interventional

  Contact(s): see Web site below

  Web Site: http://clinicaltrials.gov/ct/show/NCT00067405

- **Support, Health, and Fibromyalgia**

  Condition(s): Fibromyalgia; Quality of Life

  Study Status: This study is completed.

Sponsor(s): National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)

Purpose - Excerpt: This study tests the effects of social support and education on the health and well-being of people with fibromyalgia (FMS). We recruited 600 adults with a confirmed diagnosis of FMS from a large health maintenance organization. We randomly assigned the study participants to one of three groups. People in the social support group met with others who suffer from FMS for 2 hours every week for 10 weeks, and then monthly for an additional 10 months. The social support and education group also had 10 2-hour weekly meetings followed by 10 monthly meetings with others who suffer from FMS. Members of this group learned about the disease and ways they can manage it themselves. The third group participated only in the five assessment periods. The study lasted 4 years.

Phase(s): Phase II

Study Type: Interventional

Contact(s): see Web site below

Web Site: http://clinicaltrials.gov/ct/show/NCT00000423

Keeping Current on Clinical Trials

The U.S. National Institutes of Health, through the National Library of Medicine, has developed ClinicalTrials.gov to provide current information about clinical research across the broadest number of diseases and conditions.

The site was launched in February 2000 and currently contains approximately 5,700 clinical studies in over 59,000 locations worldwide, with most studies being conducted in the United States. ClinicalTrials.gov receives about 2 million hits per month and hosts approximately 5,400 visitors daily. To access this database, simply go to the Web site at **http://www.clinicaltrials.gov/** and search by "fibromyalgia" (or synonyms).

While ClinicalTrials.gov is the most comprehensive listing of NIH-supported clinical trials available, not all trials are in the database. The database is updated regularly, so clinical trials are continually being added. The following is a list of specialty databases affiliated with the National Institutes of Health that offer additional information on trials:

- For clinical studies at the Warren Grant Magnuson Clinical Center located in Bethesda, Maryland, visit their Web site: **http://clinicalstudies.info.nih.gov/**
- For clinical studies conducted at the Bayview Campus in Baltimore, Maryland, visit their Web site: **http://www.jhbmc.jhu.edu/studies/index.html**
- For cancer trials, visit the National Cancer Institute: **http://cancertrials.nci.nih.gov/**
- For eye-related trials, visit and search the Web page of the National Eye Institute: **http://www.nei.nih.gov/neitrials/index.htm**
- For heart, lung and blood trials, visit the Web page of the National Heart, Lung and Blood Institute: **http://www.nhlbi.nih.gov/studies/index.htm**
- For trials on aging, visit and search the Web site of the National Institute on Aging: **http://www.grc.nia.nih.gov/studies/index.htm**

- For rare diseases, visit and search the Web site sponsored by the Office of Rare Diseases: **http://ord.aspensys.com/asp/resources/rsch_trials.asp**
- For alcoholism, visit the National Institute on Alcohol Abuse and Alcoholism: **http://www.niaaa.nih.gov/intramural/Web_dicbr_hp/particip.htm**
- For trials on infectious, immune, and allergic diseases, visit the site of the National Institute of Allergy and Infectious Diseases: **http://www.niaid.nih.gov/clintrials/**
- For trials on arthritis, musculoskeletal and skin diseases, visit newly revised site of the National Institute of Arthritis and Musculoskeletal and Skin Diseases of the National Institutes of Health: **http://www.niams.nih.gov/hi/studies/index.htm**
- For hearing-related trials, visit the National Institute on Deafness and Other Communication Disorders: **http://www.nidcd.nih.gov/health/clinical/index.htm**
- For trials on diseases of the digestive system and kidneys, and diabetes, visit the National Institute of Diabetes and Digestive and Kidney Diseases: **http://www.niddk.nih.gov/patient/patient.htm**
- For drug abuse trials, visit and search the Web site sponsored by the National Institute on Drug Abuse: **http://www.nida.nih.gov/CTN/Index.htm**
- For trials on mental disorders, visit and search the Web site of the National Institute of Mental Health: **http://www.nimh.nih.gov/studies/index.cfm**
- For trials on neurological disorders and stroke, visit and search the Web site sponsored by the National Institute of Neurological Disorders and Stroke of the NIH: **http://www.ninds.nih.gov/funding/funding_opportunities.htm#Clinical_Trials**

CHAPTER 6. PATENTS ON FIBROMYALGIA

Overview

Patents can be physical innovations (e.g. chemicals, pharmaceuticals, medical equipment) or processes (e.g. treatments or diagnostic procedures). The United States Patent and Trademark Office defines a patent as a grant of a property right to the inventor, issued by the Patent and Trademark Office.[9] Patents, therefore, are intellectual property. For the United States, the term of a new patent is 20 years from the date when the patent application was filed. If the inventor wishes to receive economic benefits, it is likely that the invention will become commercially available within 20 years of the initial filing. It is important to understand, therefore, that an inventor's patent does not indicate that a product or service is or will be commercially available. The patent implies only that the inventor has "the right to exclude others from making, using, offering for sale, or selling" the invention in the United States. While this relates to U.S. patents, similar rules govern foreign patents.

In this chapter, we show you how to locate information on patents and their inventors. If you find a patent that is particularly interesting to you, contact the inventor or the assignee for further information. **IMPORTANT NOTE:** When following the search strategy described below, you may discover non-medical patents that use the generic term "fibromyalgia" (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on fibromyalgia, we have not necessarily excluded non-medical patents in this bibliography.

Patents on Fibromyalgia

By performing a patent search focusing on fibromyalgia, you can obtain information such as the title of the invention, the names of the inventor(s), the assignee(s) or the company that owns or controls the patent, a short abstract that summarizes the patent, and a few excerpts from the description of the patent. The abstract of a patent tends to be more technical in nature, while the description is often written for the public. Full patent descriptions contain much more information than is presented here (e.g. claims, references, figures, diagrams, etc.). We will tell you how to obtain this information later in the chapter. The following is an

[9] Adapted from the United States Patent and Trademark Office: **http://www.uspto.gov/web/offices/pac/doc/general/whatis.htm**.

example of the type of information that you can expect to obtain from a patent search on fibromyalgia:

- **Compounds for treating fibromyalgia and chronic fatigue syndrome**

  Inventor(s): McCall; Robert B. (Kalamazoo, MI), Marshall; Robert Clyde (Mattawan, MI), Robertson; David W. (Galesburg, MI), Ashley; Thomas M. (Portage, MI)

  Assignee(s): Pharmacia & Upjohn Company (Kalamazoo, MI)

  Patent Number: 6,555,548

  Date filed: May 30, 2002

  Abstract: The present invention provides for methods for the treatment of fibromyalgia syndrome or chronic fatigue syndrome by the administration of cabergoline-type compounds or a salt of said compound.

  Excerpt(s): The present invention relates to the use of neuromuscular agents, and the pharmacologically acceptable salts thereof, for the treatment of nervous system disorders, and more particularly to the use of compounds of U.S. Pat. Nos. 5,273,975, 5,436,240, 5,594,024, 5,462,947, and 4,526,892 for the treatment of symptoms of fibromyalgia syndrome and chronic fatigue syndrome. Chronic fatigue syndrome (CFS), also referred to as chronic fatigue immune disorders syndrome, yuppie flu; fatigue--chronic, and chronic fatigue and immune dysfunction syndrome, is a clinically defined condition characterized by profound tiredness or fatigue. In addition, patients with CFS generally report various nonspecific symptoms, including weakness, muscle aches and pains, excessive sleep, malaise, fever, sore throat, tender lymph nodes, impaired memory and/or mental concentration, insomnia, and depression. The exact cause of CFS is unknown and, to date, there are no specific tests to confirm the diagnosis of CFS, though a variety of tests are usually done to exclude other possible causes of the symptoms. Fibromyalgia syndrome (FMS), also referred to as fibromyalgia, fibromyositis, fibrositis, or myofasical pain syndrome, is a rheumatic condition generally characterized by widespread pain in fibrous tissues, muscles, tendons, and other connective tissues, fatigue, headaches, lack of restorative sleep, and numbness. Thus, FMS shares many clinical features with CFS. Similar to CFS, there are no specific diagnostic tests for FMS.

  Web site: http://www.delphion.com/details?pn=US06555548__

- **Detection of Mycoplasma genus and species in patients with chronic fatigue syndrome and fibromyalgia**

  Inventor(s): Vojdani; Aristo (Los Angeles, CA)

  Assignee(s): Immunosciences Lab, Inc., Calif. corporation (Beverly Hills, CA)

  Patent Number: 6,492,113

  Date filed: April 1, 1999

  Abstract: Methods for detecting chronic fatigue syndrome and/or fibromyalgia in an individual, comprising isolating peripheral blood mononuclear cells (PBMC) and: 1) determining the amounts of Mycoplasma genus or Mycoplasma species; 2) determining the Mycoplasma gene copy number; or 3) determining the levels of anti-M. fermentans antibodies present in serum, wherein elevated levels of any of these indicate the presence of CFS and/or fibromyalgia.

Excerpt(s): The present invention relates to a method for determining an increased likelihood of the presence of chronic fatigue syndrome (CFS) in an individual by determining the presence of elevated levels of Mycoplasma DNA in peripheral blood mononuclear cells. Chronic Fatigue Syndrome (CFS) is an illness with increasingly reported frequency in the United States and other industrialized countries (Straus, Rev. Infect. Dis. 13(Suppl. 1):S2-S7, 1991). CFS is characterized by prolonged and debilitating fatigue with multiple non-specific symptoms such as headaches, recurring sore throats, muscle and joint pains and cognitive complaints. Profound fatigue, the hallmark of the disorder, can appear suddenly or gradually and persists throughout the course of the illness. Unlike the short-term disability of an acute viral infection, for example, CFS symptoms by definition linger for at least six months and often for years (Fukuda et al., Ann. Intern. Med. 121:953-959, 1994). Physicians can evaluate patients with persistent fatigue of undetermined cause using guidelines developed by the international CFS study group (Fukuda et al., Fed. Pract. 12:12-17, 1995). It has been well documented that individuals who suffer from fibromyalgia (FMS) exhibit many of the same symptoms found in atypical CFS (Buchwald et al., Arch. Intern. Med. 154:2049-2053, 1994; Ziem et al., Arch. Intern. Med. 154:1913, 1995) in which a patient has 6 or 7 tender points. These two illnesses are so similar that for years many medical practitioners have considered them to be the same condition.

Web site: http://www.delphion.com/details?pn=US06492113__

- **Flupirtine in the treatment of fibromyalgia and related conditions**

  Inventor(s): Stoll; Andrew L. (Lincoln, MA)

  Assignee(s): The McLean Hospital Corporation (Belmont, MA)

  Patent Number: 6,610,324

  Date filed: March 24, 2000

  Abstract: The present invention is directed to a method for treating the symptoms associated with fibromyalgia and related conditions by administering flupirtine.

  Excerpt(s): The present invention is directed to medical treatments for fibromyalgia and related conditions. Specifically, the invention is directed to the administration of the drug flupirtine as a means for alleviating the symptoms associated with these disorders. Fibromyalgia is a chronic condition characterized by pain in muscles, fascia and joints. Other symptoms typically include sleep disturbances, chronic fatigue and major depression. The etiology and pathophysiology of fibromyalgia are unknown, but it is clear that the central nervous system is involved. Patients may obtain a degree of relief from analgesic drugs, antidepressants and adjunctive treatments such as moderate exercise, proper diet and stress reduction techniques. Table 1 summarizes the studies that have been carried out in an effort to find an effective drug treatment. Despite the efforts that have been made, there is still no treatment that is effective in the majority of patients with fibromyalgia. Thus, there is a clear need for new therapies designed to alleviate the suffering of patients with this, and closely related, conditions.

  Web site: http://www.delphion.com/details?pn=US06610324__

- **Method for detecting antipolymer antibodies and diagnosing silicone related disease (SRD) fibromyalgia and chronic fatigue syndrome (CFS)**

  Inventor(s): Tenenbaum; Scott A. (New Orleans, LA), Plymale; Douglas R. (New Orleans, LA), Garry; Robert F. (New Orleans, LA)

  Assignee(s): The Administrators of the Tulane Educational Fund (New Orleans, LA)

  Patent Number: 5,834,215

  Date filed: October 20, 1995

  Abstract: The present invention provides for a method of detecting antipolymer antibodies, and a method for detecting silicone related disease, fibromyalgia, and chronic fatigue syndrome.

  Excerpt(s): This invention relates to a method and a kit for detecting antipolymer antibodies, and more particularly, to a method for diagnosing silicone related disease (SRD) fibromyalsia, and chronic fatigue syndrome (CFS). Various immunoassay techniques typically used in characterizing autoimmune responses, which are known to be extremely sensitive and specific, were used to identify antipolymer antibodies in over 50% of tested individuals diagnosed with silicone related disease and over 80% of tested individuals diagnosed with fibromyalgia and chronic fatigue syndrome. The detection of antipolymer antibodies provide the first definitive evidence that silicone breast implants are capable of producing an immunological response that is diagnostically testable, and the first evidence that an immunological response to fibromyalgia and chronic fatigue can be tested by an objective method. Immunoassay techniques and methods generally known to those skilled in the art for detecting human antibodies are described in Antibodies: A Laboratory Manual by Ed Harlow and David Lane (1988) Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y. generally including homogenous and heterogeneous assay configurations. Currently, no known method exists for detecting antipolymer antigens, or serum antibodies immunologically produced in response to SRD, fibromyalsia, or CFS.

  Web site: http://www.delphion.com/details?pn=US05834215__

- **Method for treating chronic fatigue syndrome and fibromyalgia with buprenorphine**

  Inventor(s): Cole; William L. (1015 Canter Rd., Atlanta, GA 30324)

  Assignee(s): none reported

  Patent Number: 5,900,420

  Date filed: June 18, 1998

  Abstract: The present invention encompasses methods for treating chronic fatigue syndrome and fibromyalgia by administering buprenorphine or a salt thereof. The compound may optionally be administered in a pharmaceutical composition. Preferred compositions for delivery of the buprenoiphine are sublingual lozenges and transdermal gel.

  Excerpt(s): The present invention relates to the use of buprenorphine for the treatment of chronic fatigue syndrome, also referred to as chronic fatigue immune deficiency syndrome, and fibromyalgia. In addition, the present invention relates to two preferred delivery systems for the treatment of chronic fatigue syndrome with buprenorphine. More specifically, the first system of delivery of buprenorphine is via a sublingual lozenge. The second system involves a transdermal gel system, whereby a specific

quantity of a gel containing the buprenorphine is applied to any vascular area of the body. Chronic fatigue syndrome (CFS) is a clinically defined condition characterized by severe disabling flu-like fatigue and a combination of symptoms that include impairment in concentration and short-term memory, sleep disturbances, and musculoskeletal pain. No specific test exists to diagnose chronic fatigue syndrome. Therefore, the presence of chronic fatigue requires a clinical evaluation to identify underlying conditions that may require treatment. A patient should be evaluated for depression and other psychiatric disorders; alcohol or other substance abuse; and current use of prescription and over-the-counter medications and food supplements. In addition, a complete laboratory work-up should be performed to rule out the possibility of any existing medical problems. The central issue is whether chronic fatigue syndrome or any subset of the syndrome is a pathologically discrete entity or a debilitating but nonspecific condition shared by many different illnesses. The study of chronic fatigue syndrome is problematic because, to date, no tests have consistently proven or demonstrated this illness. Tests should be directed toward confirming or excluding other etiologic possibilities. Clarification of the relation between chronic fatigue syndrome and neuropsychiatric syndromes are particularly important. These latter disorders are the source of confusion in studies of chronic fatigue syndrome as these disorders are diagnosed more frequently in populations affected by chronic fatigue than in the general population. The extent to which the features of chronic fatigue syndrome are generic features of chronic fatigue and deconditioning due to physical inactivity common to a diverse group of illnesses must be established.

Web site: http://www.delphion.com/details?pn=US05900420__

- **Method for treatment of fibromyalgia and chronic fatigue syndrome**

  Inventor(s): Scharf; Martin B. (Cincinnati, OH)

  Assignee(s): Orphan Medical, Inc. (Minnetonka, MN)

  Patent Number: 5,990,162

  Date filed: August 29, 1997

  Abstract: A method is provided to treat a human afflicted with chronic fatigue syndrome or fibromyalgia syndrome by the administration of certain butyrate derivatives.

  Excerpt(s): An estimated 6 million Americans suffer the often baffling symptoms of fibromyalgia or chronic fatigue syndrome. Patients with fibromyalgia, also referred to as fibromyalgia syndrome, FMS or fibrositis syndrome, report widespread musculoskeletal pain, chronic fatigue, and non-restorative sleep, and show specific regions of localized tenderness in the absence of demonstrable anatomic or biochemical pathology. Typically, they describe light and/or restless sleep. They awaken feeling unrefreshed with pain, stiffness, physical exhaustion, and lethargy. See, H. D. Moldofsky et al., J. Muscoloskel. Pain, 1, 49 (1993). In a series of studies, Moldofsky's group has shown that aspects of the patients' sleep pathology are related to their pain and mood symptoms. That is, patients with fibrositis syndrome show an alpha (7.5 to 11 Hz) electroencephalographic (EEG), non-rapid-eye-movement (NREM) sleep anomaly correlated with musculoskeletal pain and altered mood. Moldofsky has interpreted this alpha EEG NREM sleep anomaly to be an indicator of an arousal disorder within sleep associated with the subjective experience of non-restorative sleep. See H. D. Moldofsky et al., Psychosom. Med., 37, 341 (1975). Fibromyalgia patients frequently report symptoms similar to those of patients with post-infectious neuromyasthenia, also

referred to as chronic fatigue syndrome (CFS). Chronic fatigue syndrome, or CFS, is a debilitating disorder characterized by profound tiredness or fatigue. Patients with CFS may become exhausted with only light physical exertion. They often must function at a level of activity substantially lower than their capacity before the onset of illness. In addition to these key defining characteristics, patients generally report various nonspecific symptoms, including weakness, muscle aches and pains, excessive sleep, malaise, fever, sore throat, tender lymph nodes, impaired memory and/or mental concentration, insomnia, and depression. CFS can persist for years. Compared with fibromyalgia patients, chronic fatigue patients have similarly disordered sleep, localized tenderness, and complaints of diffuse pain and fatigue. The presence of considerable symptom overlap in FMS and chronic fatigue syndrome has led to speculation that they may represent different facets of the same underlying, as yet unknown disease process (D. L. Goldenberg, J. Musculoskel. Med., 7, 19 (1990); D. L. Goldenberg, Arth. Rheum., 33, 1132 (1990); M. B. Yunus, J. Rheumatol., 16 (S19), 62 (1989)). Although no specific inheritance pattern has been identified, an increased incidence in relatives of affected patients has been noted (M. J. Pellegrino et al., Arch. Phys. Med. Rehab., 70, 61 (1989)). Development of the syndrome may require a predisposing factor, possibly inherited, as well as a precipitating factor, perhaps something disturbing sleep.

Web site: http://www.delphion.com/details?pn=US05990162__

- **Method of treating fibromyalgia with relaxin**

  Inventor(s): Yue; Samuel K. (4928 Hoppy La., Edina, MN 55435)

  Assignee(s): none reported

  Patent Number: 5,707,642

  Date filed: February 11, 1997

  Abstract: A method of treating involuntary muscle dysfunctions includes administering a therapeuticaly effective amount of relaxin to a patient. Involuntary muscle dysfunctions amenable to treatment with relaxin include fibromyalgia, myofascial pain syndrome, chronic fatigue syndrome, dystonia, pelvic floor dysfunction, irritable bowel syndrome, and others.

  Excerpt(s): The present invention relates to the treatment of involuntary muscle dysfunctions. In particular, the present invention relates to the treatment of involuntary muscle dysfunction with relaxin hormone. Involuntary muscle dysfunction plagues a large portion of the chronic pain and chronic fatigue patient population. Two prominent conditions involving involuntary muscle dysfunction include fibromyalgia and myofascial pain syndrome, amongst others. Fibromyalgia is identified by the main symptoms of generalized chronic pain occurring mainly in the muscles and hyperalgesia, i.e. multiple tender points spread out over the body. The full range of symptoms include generalized pain, hyperalgesia, sleep disturbance, fatigue, muscle stiffness, hypersthesias, tension-type headaches, decreased muscle endurance and muscle weakness. Fibromyaglia has also been associated with irritable bowel syndrome, chronic fatigue syndrome, temporomandibular dysfunction syndrome, migraines, primary dysmenhorrea (painful menstruation) and others conditions including Raynaud's phenomenon. See Yunnus, Fibromyalgia Syndrome: Clinical Features and Spectrum, The Fibromyalgic Syndrome: Current Research and Future Directions in Epidemiology, Pathogenesis, and Treatment, 1994, pp. 5-21. See also Wolfe, When to Diagnose Fibromyalgia, Rheumatic Disease Clinics Of North America, Vol. 20, Number

2, May 1994. See Henriksson, Pathogenesis of Fibromyalgia, Journal of Musculoskeletal Pain, 1993, Vol. 1, pp. 3-16.

Web site: http://www.delphion.com/details?pn=US05707642__

- **Method of treating or preventing fibromyalgia and other somatoform disorders with a highly selective norepinephrine reuptake inhibitor**

  Inventor(s): Ahmed; Saeeduddin (Indianapolis, IN), McArthur; Robert (Kalamazoo, MI), Wong; Erik H. F. (Portage, MI), Marshall; Robert C. (Mattawan, MI), Taylor; Duncan P. (Kalamazoo, MI)

  Assignee(s): Pharmacia & Upjohn Company (Kalamazoo, MI)

  Patent Number: 6,610,690

  Date filed: January 4, 2002

  Abstract: This application relates to methods for treating humans suffering from, fibromyalgia or other somatoform disorders where inhibiting reuptake of norepinephrine is a benefit. The methods comprise a compound having a pharmacological selectivity of serotonin (K.sub.1)/norepinephrine (K.sub.1) of at least about 5000. Examples of such compounds include reboxetine, and more preferably optically pure (S,S) enantiomer of reboxetine.

  Excerpt(s): The present invention relates to methods of treating individuals suffering from a variety of conditions wherein inhibiting reuptake of norepinephrine provides a benefit. In particular, the present invention relates to methods of treatment comprising administration of a compound, such as (S,S) reboxetine, to an individual, wherein the compound has a high pharmacological selectivity with respect to norepinephrine reuptake sites compared to serotonin reuptake sites. The present invention also relates to a composition containing the compound and to a preparation of a medicament containing the composition. Many types of depression, mental, behavioral, and neurological disorders originate from disturbances in brain circuits that convey signals using certain monoamine neurotransmitters. Monoamine neurotransmitters include, for example, norepinephrine (noradrenaline), serotonin (5-HT), and dopamine. Lower-than-normal levels of norepinephrine are associated with a variety of symptoms including lack of energy, motivation, and interest in life. Thus, a normal level of norepinephrine is essential to maintaining drive and capacity for reward. These neurotransmitters travel from the terminal of a neuron across a small gap (i.e., the synaptic cleft) and bind to receptor molecules on the surface of a second neuron. This binding elicits intracellular changes that initiate or activate a response or change in the postsynaptic neuron. Inactivation occurs primarily by transport (i.e., reuptake) of the neurotransmitter back into the presynaptic neuron. Abnormality in noradrenergic transmission results in various types of depression, mental, behavioral, and neurological disorders attributed to a variety of symptoms including a lack of energy, motivation, and interest in life. See generally, R. J. Baldessarini, "Drugs and the Treatment of Psychiatric Disorders: Depression and Mania" in Goodman and Gilman's The Pharmacological Basis of Therapeutics, McGraw-Hill, NY, N.Y., pp. 432-439 (1996).

  Web site: http://www.delphion.com/details?pn=US06610690__

- **Methods for treating fibromyalgia**

  Inventor(s): Voet; Martin A. (San Juan Capistrano, CA)

  Assignee(s): Allergan, Inc. (Irvine, CA)

  Patent Number: 6,623,742

  Date filed: September 17, 2001

  Abstract: Methods for treating fibromyalgia may include administering a therapeutically effective amount of a Clostridial toxin to a peripheral location on the body of a patient. This peripheral location is other than the site on the body where the pain emanates.

  Excerpt(s): The underlying pathophysiology and pathology of fibromyalgia is not well understood. Radiographic and histological examinations of regions associated with tenderness reveal no abnormalities. Blood chemistries, CBC, erythrocyte sedimentation rate (ESR), as well as other immunologic manifestations commonly known for other diseases (i.e. autoantibodies in Lupus), are normally negative unless there is another underlying disorder. The source of the pain appears to be somewhat unclear. Nociceptors are present in the interstitial space between muscle fibers, in particular, on blood vessels. Studies have reported intramuscular microcirculation abnormalities as well as a decrease in energy-rich phosphates in fibromyalgia musculature, Raj et al, Pain Digest, 8(6), 357-363 (1998)). These abnormalities may be important for producing muscle associated pain since 1) impaired microcirculation results in insufficient delivery of oxygen to localized muscle regions which results in sub-optimal working capacity of the musculature which may lead to exhaustion of some motor units; and 2) reduced energy-rich phosphates (ATP and phosphorylcreatine) means that demands of working muscles are not met by the energy supply, which may cause localized muscular strain, weakness, fatigue and pain. Fibromyalgia tender points are characterized by allodynia (a.cndot.state where a normally non-painful stimulus elicits a painful perception). Muscular dysfunction, either mechanical or metabolic, can lead to a state of sensitization of the nociceptive sensory inputs into the spinal cord altering the neurochemical balance important for nociceptive control. The process of nociception may be accomplished by a controlled release of various pro-nociceptive and anti-nociceptive agents in the nervous system. These agents include excitatory amino acids, neuropeptides, biogenic amines, nitric oxide, and prostaglandins. One important pro-nociceptive mediator is the neuropeptide substance P, which is found to be consistently elevated in the cerebrospinal fluid of fibromyalgia patients. Substance P may be released by sensory afferents arising from the muscle into the dorsal horn of the spinal cord to interact with neurokinin-1 receptors. Activation of spinal neurons by substance P prepares the neurons for an inceptive pain signal, thereby facilitating nociceptive perception. Injection of substance P into animals causes allodynia by increasing the number of afferent neurons that are activated (e.g. discharge one or more action potentials) in response to a certain nociceptive stimulus and reducing the voltage threshold needed for their activation.

  Web site: http://www.delphion.com/details?pn=US06623742__

- **Methods for treating or preventing fibromyalgia using very low doses of cyclobenzaprine**

  Inventor(s): Iglehart, III; Iredell W. (Baltimore, MD)

  Assignee(s): Vela Pharmaceuticals, Inc. (Lawrenceville, NJ)

  Patent Number: 6,541,523

  Date filed: June 27, 2001

  Abstract: The present invention relates to methods and compositions comprising a very low dose of cyclobenzaprine or metabolite thereof for preventing and treating sleep disturbances and illnesses manifested with sleep dysfunction including fibromyalgia syndrome, chronic fatigue syndrome, sleep disorders, psychogenic pain disorders or chronic pain syndromes or symptoms thereof. The present invention further relates to methods and compositions for treating sleep disturbances, chronic pain or fatigue in humans suffering from fibromyalgia syndrome, chronic fatigue syndrome, sleep disorders, psychogenic pain disorders, chronic pain syndromes using a very low dose of cyclobenzaprine.

  Excerpt(s): The invention relates to methods and compositions comprising very low doses of cyclobenzaprine. The methods and compositions are useful for treating or preventing sleep disturbances. Particularly, the methods and compositions of this invention are useful for treating patients suffering from fibromyalgia syndrome, prolonged fatigue, chronic fatigue, chronic fatigue syndrome, sleep disorders, psychogenic pain disorders, chronic pain syndromes, autoimmune diseases and symptoms thereof. Cyclobenzaprine was first synthesized in 1961. [Villani, F. J., et al., "Dialkylaminoalkyl derivatives of 10,11-dihydro-511-dibenzo a,d cycloheptene and related compounds," J. Med. Pharm. Chem. 5:373-383 (1962)]. Cyclobenzaprine was approved by the U.S. Food and Drug Administration in 1977 for the treatment of acute muscle spasms of local origin. [Katz, W., et al., "Cyclobenzaprine in the Treatment of Acute Muscle Spasm: Review of a Decade of Clinical Experience," Clinical Therapeutics 10:216-228 (1988)]. Cyclobenzaprine is sold as a hydrochloride salt in a 10 mg non-scored tablet under the tradename Flexeril.RTM. (Merck and Co.) or as a generic (Genera, Warner-Chilcott, Duramed, Mylan, Endogenerics, and Watson) for use as a skeletal muscle relaxant. The pharmacokinetics of cyclobenzaprine metabolism have been well studied (e.g., Katz, et al., page 219, supra). No indications of organ toxicity were found in cyclobenzaprine-treated patients at recommended doses. Toxic effects were reported, however, for three individuals who ingested between 260 to 900 mg of cyclobenzaprine. [Katz, et al., "Cyclobenzaprine in the Treatment of Acute Muscle Spasm: Review of a Decade of Clinical Experience," Clinical Therapeutics 10:216-228 (1988)].

  Web site: http://www.delphion.com/details?pn=US06541523__

- **Methods of treating fibromyalgia**

  Inventor(s): Kranzler; Jay D. (La Jolla, CA), Rao; Srinivas G. (San Diego, CA)

  Assignee(s): Cypress Bioscience, Inc. (San Diego, CA)

  Patent Number: 6,602,911

  Date filed: December 19, 2001

Abstract: The present invention provides a method of treating fibromyalgia syndrome (FMS), chronic fatigue syndrome (CFS), and pain in an animal subject. The method generally involves administering a therapeutically effective amount of a dual serotonin norepinephrine reuptake inhibitor compound or a pharmaceutically acceptable salt thereof, wherein said dual serotonin norepinephrine reuptake inhibitor compound is characterized by a non-tricyclic structure and an equal or greater inhibition of norepinephrine reuptake than serotonin reuptake. In particular, the use of milnacipran to treat FMS, CFS, and pain is disclosed.

Excerpt(s): The present invention relates to methods for the treatment of fibromyalgia syndrome, chronic fatigue syndrome, and pain. In particular, the present invention relates to methods of treating fibromyalgia syndrome, chronic fatigue syndrome, and pain with a sub-class of dual serotonin norepinephrine reuptake inhibitors characterized by a non-tricyclic structure and inhibit the reuptake of norepinephrine to an equal or greater extent than they inhibit the reuptake of serotonin. Fibromyalgia syndrome (FMS) is the most frequent cause of chronic, widespread pain, estimated to affect 2-4% of the population. FMS is characterized by a generalized heightened perception of sensory stimuli. Patients with FMS display abnormalities in pain perception in the form of both allodynia (pain with innocuous stimulation) and hyperalgesia (increased sensitivity to painful stimuli). The syndrome, as defined by the American College of Rheumatology's criteria, involves the presence of pain for over 3 months duration in all four quadrants of the body, as well as along the spine. In addition, pain is elicited at 11 out of 18 "tender points" upon palpation. Other associated symptoms include fatigue, nonrestorative sleep, and memory difficulties. Chronic fatigue syndrome (CFS) is a debilitating disorder characterized by profound tiredness or fatigue. Patients with CFS may become exhausted with only light physical exertion, and must often function at a level of activity substantially lower than their capacity before the onset of illness. In addition to the key defining characteristic of fatigue, CFS patients generally report various nonspecific symptoms, including weakness, muscle aches and pains, excessive sleep, malaise, fever, sore throat, tender lymph nodes, impaired memory and/or mental concentration, insomnia, and depression. Like patients with FMS, patients with CFS suffer from disordered sleep, localized tenderness, and complaints of diffuse pain and fatigue.

Web site: http://www.delphion.com/details?pn=US06602911__

- **Therapeutic treatment of fibromyalgia**

Inventor(s): Bennett; Robert M. (Portland, OR)

Assignee(s): Research Corporation Technologies, Inc. (Tucson, AZ)

Patent Number: 5,378,686

Date filed: September 21, 1992

Abstract: Disclosed is a therapeutic regime for treating patients with fibromyalgia (FM) and other syndromes characterized by non-restorative sleep and musculoskeletal pain. Supplemental growth hormone (GH) is administered and somatomedin-C (SMC) levels monitored until SMC levels reach optimal levels and musculoskeletal pain and fatiguability symptoms subside.

Excerpt(s): The present invention relates to the discovery of a link between sleep anomaly-induced suboptimal secretion of growth hormone and the treatment of syndromes such as fibromyalgia which are manifested by non-restorative sleep and muscle pain. Several publications are referenced herein. disclosures of these publications

are hereby incorporated herein by reference in their entirety, unless otherwise noted. Over the past decade there has been a growing realization that the fibromyalgia syndrome represents a very common cause of widespread musculoskeletal pain and fatiguability (A-C). According to a recent position paper by the American College of Rheumatology, fibromyalgia is now the second most common cause for rheumatology referrals after rheumatoid arthritis (D).

Web site: http://www.delphion.com/details?pn=US05378686__

- **Treating fibromyalgia and chronic fatigue syndrome**

  Inventor(s): Robertson; David W. (Galesburg, MI), Ashley; Thomas M. (Portage, MI), McCall; Robert B. (Kalamazoo, MI), Marshall; Robert Clyde (Mattawan, MI)

  Assignee(s): Pharmacia & Upjohn Company (Kalamazoo, MI)

  Patent Number: 6,448,258

  Date filed: April 17, 2001

  Abstract: The present invention provides for methods for the treatment of fibromyalgia syndrome or chronic fatigue syndrome by the administration of heterocyclic amine-type compounds or a salt of any said compound.

  Excerpt(s): The present invention relates to the use of neuromuscular agents, and the pharmacologically acceptable salts thereof, for the treatment of nervous system disorders, and more particularly to the use of compounds of U.S. Pat. Nos. 5,273,975, 5,436,240, 5,594,024, 5,462,947, and 4,526,892 for the treatment of symptoms of fibromyalgia syndrome and chronic fatigue syndrome. Chronic fatigue syndrome (CFS), also referred to as chronic fatigue immune disorders syndrome, yuppie flu; fatigue-chronic, and chronic fatigue and immune dysfunction syndrome, is a clinically defined condition characterized by profound tiredness or fatigue. In addition, patients with CFS generally report various nonspecific symptoms, including weakness, muscle aches and pains, excessive sleep, malaise, fever, sore throat, tender lymph nodes, impaired memory and/or mental concentration, insomnia, and depression. The exact cause of CFS is unknown and, to date, there are no specific tests to confirm the diagnosis of CFS, though a variety of tests are usually done to exclude other possible causes of the symptoms. Fibromyalgia syndrome (FMS), also referred to as fibromyalgia, fibromyositis, fibrositis, or myofasical pain syndrome, is a rheumatic condition generally characterized by widespread pain in fibrous tissues, muscles, tendons, and other connective tissues, fatigue, headaches, lack of restorative sleep, and numbness. Thus, FMS shares many clinical features with CFS. Similar to CFS, there are no specific diagnostic tests for FMS.

  Web site: http://www.delphion.com/details?pn=US06448258__

- **Treatment of fibromyalgia**

  Inventor(s): Sorensen; Stephen M. (Cincinnati, OH)

  Assignee(s): Merrell Dow Pharmaceuticals Inc. (Cincinnati, OH)

  Patent Number: 4,877,798

  Date filed: October 18, 1988

Abstract: The present invention relates to a method for relieving or alleviating the symptomatology associated with fibromyalgia comprising administering to a patient a compound as described by Formula I.

Excerpt(s): The present invention relates to a method for the treatment of fibromyalgia. Fibromyalgia is a chronic disease afflicting up to 6 million persons in the United States. Patients suffering from this disease are afflicted with numerous symptoms such as, for example, widespread generalized musculoskeletal pains, aching, fatigue, morning stiffness, and a sleep disturbance which can be characterized as an inadequacy of stage 4 sleep. Often, patients are afflicted with these symptoms for years. The medical community has not discovered the cause of this disease, nor have they discovered a cure. Clinicians have attempted to treat the symptoms of this disease with nonsteroidal anti-inflammatory agents, corticosteroids, and injections of local anesthetics. Unfortunately, none of these treatments have been successful in relieving or alleviating patients symptoms.

Web site: http://www.delphion.com/details?pn=US04877798__

- **Treatment of fibromyalgia and related disorders**

Inventor(s): Andrus; G. Merrill (Orem, UT), Arffmann; Kathleen (New York City, NY)

Assignee(s): Designed Nutritional Products, Inc. (Vineyard, UT)

Patent Number: 5,895,787

Date filed: October 8, 1997

Abstract: A method of treating fibromyalgia-like complaints (i.e., fibromyalgia, chronic fatigue syndrome and irritable bowel syndrome) in a patient, the method comprising: administering to the patient an 1H-indole-3-methanol compound (e.g., 1H-indole-3-methanol, ascorbigen, bis(3-indolyl) methane, indolo›3,2-b(carbazole)!, 2-(indol-3-ylmethyl)-3,3'-diindolylmethane, 5,6,11,12,17,18-hexahydrocyclonona›, 1,2-b;4,5-b';7,8-b"!triindole, 1H-indol-3-yl methoxy methane, ethoxy 1H-indol-3-yl ethoxy methane, other ethers of 1H-indole-3-methanol) in a medically acceptable manner in a pharmaceutically effective amount on a regular basis. It has been found that the administration of such indoles, particularly, 1H-indole-3-methanol, greatly mitigates the most severe symptoms of fibromyalgia. Patients with fibromyalgia have reported a decrease in pain, less fatigue, improved sleep patterns, and an improved sense of well being resulting from the oral administration of pharmaceutically effective amounts of an 1H-indole-3-methanol compound each day.

Excerpt(s): This invention generally relates to the use of various naturally occurring compounds to treat a disease, and, more particularly, to the use of the natural product indole-3-methanol and related compounds to alleviate the symptoms of fibromyalgia and related disorders. Fibromyalgia generally is understood as a condition including widespread chronic muscle pain, fatigue, and abnormal sleep patterns. See, e.g., Wolfe et al., "The Fibromyalgia Syndrome: A Consensus Report on Fibromyalgia and Disability", The Journal of Rheumatology, 23(3):534-539 (1996). It afflicts perhaps 2% of the population of the United States. Fibromyalgia varies in its effects on those who suffer from it, but in severe cases, it is completely debilitating. Fibromyalgia is closely related to chronic fatigue and irritable bowel syndromes, and some believe that these are all just different facets of the same underlying disorder. Women are 10 to 20 times more likely to get fibromyalgia than men. Fibromyalgia signs and symptoms include: widespread pain (97.6% of the patients), tenderness in >11/18 "tender points"

(90.1%), fatigue (81.4%), morning stiffness (77.0%), sleep disturbance (74.6%), parethesias (62.8%), headache (52.8%), anxiety (47.8%), dysmenorrhea (40.6%), sicca symptoms (35.8%), depression (31.5%), irritable bowel syndrome (29.6%), urinary urgency (26.3%), and Raynaud's phenomenon (16.7%).

Web site: http://www.delphion.com/details?pn=US05895787__

- **Treatment of fibromyalgia with low doses of interferon**

  Inventor(s): Sherwood; Edward (Lago Vista, TX), Richards; Alan B. (Amarillo, TX)

  Assignee(s): Amarillo Biosciences, Inc. (Amarillo, TX)

  Patent Number: 6,036,949

  Date filed: March 5, 1998

  Abstract: A method is described for using interferon in the treatment of human patients afflicted with fibromyalgia to alleviate one or more symptoms associated with that disease state. Fibromyalgia positive patients treated buccally, sublingually or by oral ingestion administration of low doses of interferon enjoy a reduction in clinical symptoms of the disease.

  Excerpt(s): The present invention relates to a composition and method for treatment of patients afflicted with fibromyalgia. More particularly, this invention is directed to a composition and method for relieving symptoms associated with chronic fibromyalgia in human patients by administering low doses of interferon. Fibromyalgia is a common disabling disorder characterized by chronic musculoskeletal aches and pain, stiffness, general fatigue, and sleep abnormalities including diminished stage four sleep. Examination of affected patients reveals increased tenderness at muscle and tendon insertion sites, known as "tender points". Fibromyalgia patients experience severe morning stiffness and a generalized decreased of overall physical function, and they are often prone to headaches, memory and concentration problems, dizziness, numbness and tingling, and crampy abdominal or pelvic pain. Fibromyalgia affects 2-4% of the population and is most frequently found in women between 20 and 50 years old, though it can also affect men, the elderly and minors. Diagnosis of fibromyalgia is often overlooked due to the general nature of the symptoms and the lack of diagnostic lab or x-ray abnormalities. The disorder is often concomitant with, masked by or confused with other diseases such as rheumatoid arthritis, chronic fatigue syndrome or irritable bowl syndrome. A physician can positively diagnosis fibromyalgia syndrome by finding the symptoms of generalized musculoskeletal pain and pain at more than 11 of 18 defined characteristic "tender points" when finger pressure of about 4 kg is applied to the area, which test is known as the "tender point index".

  Web site: http://www.delphion.com/details?pn=US06036949__

- **Treatment of fibromyalgia with ubiquinone 10 and succinic acid**

  Inventor(s): Sneed; Paul A. (Route 3, Box 08 C5, Cisco, TX 76437)

  Assignee(s): none reported

  Patent Number: 6,348,506

  Date filed: February 9, 2001

Abstract: A method is described for using a combination of ubiquinone 10 and succinic acid in the treatment of human patients afflicted with fibromyalgia to alleviate one or more symptoms associated with that disease state. Fibromyalgia positive patients treated buccally, sublingually or by oral ingestion administration of ubiquinone 10 and succinic acid enjoy a reduction in clinical symptoms of the disease.

Excerpt(s): The present invention relates to a composition and method for treatment of patients afflicted with fibromyalgia. More particularly, this invention is directed to a composition and method for relieving symptoms associated with fibromyalgia in human patients by administering a combination of ubiquinone 10 and succinic acid. Fibromyalgia is a common disabling disorder characterized by chronic musculoskeletal aches and pain, stiffness, and sleep abnormalities including diminished stage four sleep. Examination of affected patients reveals increased tenderness at muscle and tendon insertion sites, known as "tender points." Fibromyalgia patients experience severe morning stiffness and a generalized decreased of overall physical function, and they arc often prone to headaches, memory and concentration problems, dizziness, numbness and tingling, and crampy abdominal or pelvic pain. Fibromyalgia affects 2-4% of the population and is most frequently found in women between 20 and 50 years old, although it can also affect men, the elderly and minors. Diagnosis of fibromyalgia is often overlooked due to the general nature of the symptoms and the lack of diagnostic lab or x-ray abnormalities. The disorder is often concomitant with, masked by or confused with other diseases such as rheumatoid arthritis, chronic fatigue syndrome or irritable bowl syndrome. However, chronic fatigue syndrome (CFS) can be distinguished from fibromyalgia because patients with CFS are likely to have symptoms of viral illnesses such as fever, sore throat, and lymph node pain. A physician can positively diagnose fibromyalgia syndrome by finding the symptoms of musculoskeletal pain throughout the body and pain at more than 11 of 18 symmetrically distributed characteristic "tender points" when a finger pressure of about 4 kg is applied to the area, which test is known as the "tender point index," or when tender points are detected with dolorimetry.

Web site: http://www.delphion.com/details?pn=US06348506__

- **Use of androgen therapy in fibromyalgia and chronic fatigue syndrome**

Inventor(s): White; Hillary D. (South Pomfret, VT)

Assignee(s): Trustees of Dartmouth College (Hanover, NH)

Patent Number: 5,935,949

Date filed: March 10, 1999

Abstract: A method of using androgen therapy to alleviate symptoms associated with chronic fatigue syndrome and fibromyalgia syndrome is provided.

Excerpt(s): Androgens are derivatives of cyclopentanoperhydrophenanthrene. Endogenous androgens are C-19 steroids with two angular methyl groups. Testosterone is the primary endogenous androgen. Endogenous androgens are responsible for the normal growth and development of the male sex organs and the maintenance of secondary sex characteristics. These effects include the growth and maturation of prostate, seminal vesicles, penis and scrotum, the development of male hair distribution, such as beard, pubic, chest and axillary hair, laryngeal enlargement, vocal chord thickening, alterations in body musculature and fat distribution. Androgens are responsible for the growth spurt of adolescence and for the eventual termination of

linear growth which is brought about by fusion of the epiphyseal growth centers. Androgens such as testosterone slowly decrease as both women and men age. In males, androgens are indicated as a replacement therapy for conditions associated with a deficiency or absence of endogenous testosterone such as primary hypogonadism and hypogonadotropic hypogonadism. Androgens may also be used to stimulate puberty in selected males with clearly delayed puberty. Testosterone therapy has also been suggested to ameliorate some of the signs and symptoms of frailty in men beyond 50 years of age (Morley et al., Gen. Geriatr. Med., 1997, 13(4):685-95).

Web site: http://www.delphion.com/details?pn=US05935949__

- **Use of dopamine D2/D3 receptor agonists to treat fibromyalgia**

  Inventor(s): Holman; Andrew J. (19658 Marine View Dr. SW., Seattle, WA 98166)

  Assignee(s): none reported

  Patent Number: 6,300,365

  Date filed: May 7, 2001

  Abstract: The present invention is directed to methods for the treatment of human patients afflicted with fibromyalgia using a non-ergot dopamine receptor D2/D3 agonist. In particular, patients are treated with a therapeutically effective amount of tetrahydro-benzthiazole or 3(H)-indolone compounds that are dopamine agonists. More specifically, the compounds 2-amino-6-n-propylamino-4,5,6,7-tetrahydrobenzo-thiazole or 4-[2-(dipropylamino)-ethyl]-1,3-dihydro-2H-indol-2-one are administered to fibromyalgia patients to reduce the musculoskeletal pain symptoms associated with fibromyalgia.

  Excerpt(s): The present invention relates to methods for the treatment of fibromyalgia using non-ergot dopamine D.sub.2 /D.sub.3 agonists. More specifically, tetrahydro-benzthiazoles, in particular, 2-amino-6-n-propylamino-4,5,6,7-tetrahydrobenzo-thiazole or the (-)-enantiomers thereof, and certain 3(H)-indolone derivatives, in particular, 4-[2-(dipropylamino)-ethyl]-1,3-dihydro-2H-indol-2-one, and the pharmacologically acceptable salts thereof, alone or in association with a pharmaceutically acceptable carrier, can be used to treat fibromyalgia patients. Fibromyalgia is a common disabling disorder characterized by chronic musculoskeletal aches and pain, stiffness, general fatigue, and sleep abnormalities including diminished stage four sleep. Fibromyalgia is a chronic, painful disorder commonly seen in rheumatology practice and is often viewed as a musculoskeletal pain process. Fibromyalgia is characterized as a reproducible, neurosensory processing abnormality associated with fatigue, and generalized muscular spasm, which most rheumatologists suspect is related to stage IV sleep deprivation. Examination of affected patients reveals increased tenderness at muscle and tendon insertion sites, known as "tender points". Fibromyalgia patients experience severe morning stiffness and a generalized decreased of overall physical function, and they are often prone to headaches, memory and concentration problems, dizziness, numbness and tingling, and crampy abdominal or pelvic pain. Fibromyalgia affects 2-4% of the population and is most frequently found in women between 20 and 50 years old, though it can also affect men, the elderly and minors. Diagnosis of fibromyalgia is often overlooked due to the general nature of the symptoms and the lack of diagnostic lab or x-ray abnormalities. The disorder is often concomitant with, masked by or confused with other diseases such as rheumatoid arthritis, chronic fatigue syndrome or irritable bowl syndrome. A physician can positively diagnose fibromyalgia syndrome by finding the symptoms of generalized musculoskeletal pain and pain at

more than 11 of 18 defined characteristic "tender points" when finger pressure of about 4 kg is applied to the area. The total pain score for all 18 tender points is referred to as the "tender point index" of that patient. The efficacy of a particular fibromyalgia therapy is demonstrated by a observation of a statistically significant improvement in a patient's tender point index.

Web site: http://www.delphion.com/details?pn=US06300365__

- **Use of serotonin antagonists for treating fibromyalgia**

  Inventor(s): Muller; Wolfgang (Binningen, CH), Stratz; Thomas (Bad Sackingen, DE)

  Assignee(s): Novartis AG (Basel, CH)

  Patent Number: 5,985,866

  Date filed: May 18, 1998

  Abstract: 5-HT.sub.3 antagonists are useful in the treatment of fibromyalgia.

  Excerpt(s): This invention relates to a new use of 5HT.sub.3 antagonists. These compounds are also referred to hereinafter as compounds of the invention. Other classes of the compounds of the invention are known from e.g. European patent publications 13138A, 200444A, and 214772A and British Patent publication 2153821.

  Web site: http://www.delphion.com/details?pn=US05985866__

Patent Applications on Fibromyalgia

As of December 2000, U.S. patent applications are open to public viewing.[10] Applications are patent requests which have yet to be granted. (The process to achieve a patent can take several years.) The following patent applications have been filed since December 2000 relating to fibromyalgia:

- **Compounds for treating fibromyalgia and chronic fatigue syndrome**

  Inventor(s): Ashley, Thomas M. (Portage, MI), McCall, Robert B. (Kalamazoo, MI), Robertson, David W. (Galesburg, MI), Marshall, Robert Clyde; (Mattawan, MI)

  Correspondence: Pharmacia & Upjohn Company; Global Intellectual Property; 301 Henrietta Street; Kalamazoo; MI; 49001; US

  Patent Application Number: 20020143010

  Date filed: May 30, 2002

  Abstract: The present invention provides for methods for the treatment of fibromyalgia syndrome or chronic fatigue syndrome by the administration of heterocyclic amine-type compounds, substituted phenylazacycloalkane-ty- pe compounds, or cabergoline-type compounds, or a salt of any said compound.

  Excerpt(s): This application claims the benefit of the following U.S. provisional applications: Serial No. 60/198,959 filed Apr. 21, 2000 and Serial No. 60/200,569 filed Apr. 28, 2000, under 35 U.S.C.sctn.119(e)(1). The present invention relates to the use of neuromuscular agents, and the pharmacologically acceptable salts thereof, for the

[10] This has been a common practice outside the United States prior to December 2000.

treatment of nervous system disorders, and more particularly to the use of compounds of U.S. Pat. Nos. 5,273,975, 5,436,240, 5,594,024, 5,462,947, and 4,526,892 for the treatment of symptoms of fibromyalgia syndrome and chronic fatigue syndrome. Chronic fatigue syndrome (CFS), also referred to as chronic fatigue immune disorders syndrome, yuppie flu; fatigue--chronic, and chronic fatigue and immune dysfunction syndrome, is a clinically defined condition characterized by profound tiredness or fatigue. In addition, patients with CFS generally report various nonspecific symptoms, including weakness, muscle aches and pains, excessive sleep, malaise, fever, sore throat, tender lymph nodes, impaired memory and/or mental concentration, insomnia, and depression. The exact cause of CFS is unknown and, to date, there are no specific tests to confirm the diagnosis of CFS, though a variety of tests are usually done to exclude other possible causes of the symptoms.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Flupirtine in the treatment of fibromyalgia and related conditions**

  Inventor(s): Stoll, Andrew L. (Lincoln, MA)

  Correspondence: PILLSBURY WINTHROP LLP; 1600 TYSONS BOULEVARD; MCLEAN; VA; 22102; US

  Patent Application Number: 20020018809

  Date filed: March 24, 2000

  Abstract: The present invention is directed to a method for treating the symptoms associated with fibromyalgia and related conditions by administering flupirtine.

  Excerpt(s): The present invention is directed to medical treatments for fibromyalgia and related conditions. Specifically, the invention is directed to the administration of the drug flupirtine as a means for alleviating the symptoms associated with these disorders. Fibromyalgia is a chronic condition characterized by pain in muscles, fascia and joints. Other symptoms typically include sleep disturbances, chronic fatigue and major depression. The etiology and pathophysiology of fibromyalgia are unknown, but it is clear that the central nervous system is involved. Patients may obtain a degree of relief from analgesic drugs, antidepressants and adjunctive treatments such as moderate exercise, proper diet and stress reduction techniques. Table 1 summarizes the studies that have been carried out in an effort to find an effective drug treatment. Despite the efforts that have been made, there is still no treatment that is effective in the majority of patients with fibromyalgia. Thus, there is a clear need for new therapies designed to alleviate the suffering of patients with this, and closely related, conditions.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Methods for treating fibromyalgia**

  Inventor(s): Voet, Martin A. (San Juan Capistrano, CA)

  Correspondence: STOUT, UXA, BUYAN & MULLINS LLP; 4 VENTURE, SUITE 300; IRVINE; CA; 92618; US

  Patent Application Number: 20030054975

  Date filed: September 17, 2001

Abstract: Methods for treating fibromyalgia may include administering a therapeutically effective amount of a Clostridial toxin to a peripheral location on the body of a patient. This peripheral location is other than the site on the body where the pain emanates.

Excerpt(s): The underlying pathophysiology and pathology of fibromyalgia is not well understood. Radiographic and histological examinations of regions associated with tenderness reveal no abnormalities. Blood chemistries, CBC, erythrocyte sedimentation rate (ESR), as well as other immunologic manifestations commonly known for other diseases (i.e. autoantibodies in Lupus), are normally negative unless there is another underlying disorder. The source of the pain appears to be somewhat unclear. Nociceptors are present in the interstitial space between muscle fibers, in particular, on blood vessels. Studies have reported intramuscular microcirculation abnormalities as well as a decrease in energy-rich phosphates in fibromyalgia musculature, Raj et al, Pain Digest, 8(6), 357-363 (1998)). These abnormalities may be important for producing muscle associated pain since 1) impaired microcirculation results in insufficient delivery of oxygen to localized muscle regions which results in sub-optimal working capacity of the musculature which may lead to exhaustion of some motor units; and 2) reduced energy-rich phosphates (ATP and phosphorylcreatine) means that demands of working muscles are not met by the energy supply, which may cause localized muscular strain, weakness, fatigue and pain. Fibromyalgia tender points are characterized by allodynia (a state where a normally non-painful stimulus elicits a painful perception). Muscular dysfunction, either mechanical or metabolic, can lead to a state of sensitization of the nociceptive sensory inputs into the spinal cord altering the neurochemical balance important for nociceptive control. The process of nociception may be accomplished by a controlled release of various pro-nociceptive and anti-nociceptive agents in the nervous system. These agents include excitatory amino acids, neuropeptides, biogenic amines, nitric oxide, and prostaglandins. One important pro-nociceptive mediator is the neuropeptide substance P, which is found to be consistently elevated in the cerebrospinal fluid of fibromyalgia patients. Substance P may be released by sensory afferents arising from the muscle into the dorsal horn of the spinal cord to interact with neurokinin-1 receptors. Activation of spinal neurons by substance P prepares the neurons for an inceptive pain signal, thereby facilitating nociceptive perception. Injection of substance P into animals causes allodynia by increasing the number of afferent neurons that are activated (e.g. discharge one or more action potentials) in response to a certain nociceptive stimulus and reducing the voltage threshold needed for their activation.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Methods of treating fibromyalgia**

Inventor(s): Kranzler, Jay D. (La Jolla, CA), Rao, Srinivas G. (San Diego, CA)

Correspondence: PATREA L. PABST; HOLLAND & KNIGHT LLP; ONE ATLANIC CENTER, SUITE 2000; 1201 WEST PEACHTREE STREET N.E. ATLANTA; GA; 30309-3400; US

Patent Application Number: 20030130353

Date filed: December 19, 2001

Abstract: The present invention provides a method of treating fibromyalgia syndrome (FMS), chronic fatigue syndrome (CFS), and pain in an animal subject. The method generally involves administering a therapeutically effective amount of a dual serotonin norepinephrine reuptake inhibitor compound or a pharmaceutically acceptable salt

thereof, wherein said dual serotonin norepinephrine reuptake inhibitor compound is characterized by a non-tricyclic structure and an equal or greater inhibition of norepinephrine reuptake than serotonin reuptake. In particular, the use of milnacipran to treat FMS, CFS, and pain is disclosed.

Excerpt(s): The present invention relates to methods for the treatment of fibromyalgia syndrome, chronic fatigue syndrome, and pain. In particular, the present invention relates to methods of treating fibromyalgia syndrome, chronic fatigue syndrome, and pain with a sub-class of dual serotonin norepinephrine reuptake inhibitors characterized by a non-tricyclic structure and inhibit the reuptake of norepinephrine to an equal or greater extent than they inhibit the reuptake of serotonin. Fibromyalgia syndrome (FMS) is the most frequent cause of chronic, widespread pain, estimated to affect 2-4% of the population. FMS is characterized by a generalized heightened perception of sensory stimuli. Patients with FMS display abnormalities in pain perception in the form of both allodynia (pain with innocuous stimulation) and hyperalgesia (increased sensitivity to painful stimuli). The syndrome, as defined by the American College of Rheumatology's criteria, involves the presence of pain for over 3 months duration in all four quadrants of the body, as well as along the spine. In addition, pain is elicited at 11 out of 18 "tender points" upon palpation. Other associated symptoms include fatigue, nonrestorative sleep, and memory difficulties. Chronic fatigue syndrome (CFS) is a debilitating disorder characterized by profound tiredness or fatigue. Patients with CFS may become exhausted with only light physical exertion, and must often function at a level of activity substantially lower than their capacity before the onset of illness. In addition to the key defining characteristic of fatigue, CFS patients generally report various nonspecific symptoms, including weakness, muscle aches and pains, excessive sleep, malaise, fever, sore throat, tender lymph nodes, impaired memory and/or mental concentration, insomnia, and depression. Like patients with FMS, patients with CFS suffer from disordered sleep, localized tenderness, and complaints of diffuse pain and fatigue.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Treatment of fibromyalgia and related fatigue syndromes using antagonists or paritcal agonists of 5HT1a receptors**

  Inventor(s): Keeling, P.W.N. (Dublin, IE), Dinan, T.G. (Cobh, IE)

  Correspondence: John J. McDonnell; McDonnell Boehnen Hulbert & Berghoff; 32nd Floor; 300 S. Wacker Drive; Chicago; IL; 60606; US

  Patent Application Number: 20020165263

  Date filed: February 20, 2002

  Abstract: The present invention provides a method for treating fibromyalgia and/or chronic fatigue syndrome by administering an antagonist or partial agonist of 5HT1a receptors.

  Excerpt(s): The present invention provides a method for treating fibromyalgia and related chronic fatigue syndromes by administering an antagonist or partial agonist of 5HT1a receptors. Fibromyalgia is a common clinical condition presenting with musculoskeletal pain and tenderness often accompanied by fatigue (Goldberg D L 1995 Curr Opin Rheumatol 7, 127-135). It is seen both in Primary Care and in Rheumatology Clinics. No specific treatment for the condition is available and it is frequently regarded as a functional disorder which can run a chronic course. Fibromyalgia and chronic fatigue syndromes share many clinical characteristics. A majority of the patients are

women and usually in their thirties or forties on initial presentation. Over eighty percent in both diagnostic categories complain of fatigue, myalgia, arthralgia, recurrent headache and sleep difficulties (Moldofsky, 1993 Ciba Symposium 173 p 262-279).

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Treatment of fibromyalgia with ubiquinone 10 and succinic acid**

  Inventor(s): Sneed, Paul A. (Cisco, TX)

  Correspondence: Barnes & Thornburg; 11 S. Meridian St. Indianapolis; IN; 46204; US

  Patent Application Number: 20020058712

  Date filed: January 8, 2002

  Abstract: A method is described for using a combination of ubiquinone 10 and succinic acid in the treatment of human patients afflicted with fibromyalgia to alleviate one or more symptoms associated with that disease state. Fibromyalgia positive patients treated buccally, sublingually or by oral ingestion administration of ubiquinone 10 and succinic acid enjoy a reduction in clinical symptoms of the disease.

  Excerpt(s): This application claims priority under 35 U.S.C.sctn.119(e) to U.S. Provisional Application No. 60/181,314, filed Feb. 9, 2000, which is expressly incorporated by reference herein. The present invention relates to a composition and method for treatment of patients afflicted with fibromyalgia. More particularly, this invention is directed to a composition and method for relieving symptoms associated with fibromyalgia in human patients by administering a combination of ubiquinone 10 and succinic acid. Fibromyalgia is a common disabling disorder characterized by chronic musculoskeletal aches and pain, stiffness, general fatigue, and sleep abnormalities including diminished stage four sleep. Examination of affected patients reveals increased tenderness at muscle and tendon insertion sites, known as "tender points." Fibromyalgia patients experience severe morning stiffness and a generalized decreased of overall physical function, and they are often prone to headaches, memory and concentration problems, dizziness, numbness and tingling, and crampy abdominal or pelvic pain. Fibromyalgia affects 2-4% of the population and is most frequently found in women between 20 and 50 years old, although it can also affect men, the elderly and minors.

  Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

- **Use of substance P antagonists for the treatment of chronic fatigue syndrome and/or fibromyalgia and use of NK-1 receptor antagonists for the treatment of chronic fatigue syndrome**

  Inventor(s): Farber, Lothar; (Heroldsberg, DE), Mueller, Wolfgang; (Binningen, CH), Stratz, Thomas; (Bad Sackingen, DE)

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  Patent Application Number: 20030092735

  Date filed: August 16, 2002

  Abstract: The invention relates to the pharmaceutical use of specific substance P antagonists, in particular 1-acylpiperidine substance P antagonists, especially N-

benzoyl-2-benzyl-4-(azanaphthoyl-amino)-piperidines, e.g. of formula 1wherein X and Y are each independently of the other N and/or CH and the ring A is unsubstituted or mono- or poly-substituted by substituents selected from the group consisting of lower alkyl, lower alkoxy, halogen, nitro and trifluoromethyl; and pharmnaceutically acceptable salts thereof for treatment of chronic fatigue syndrome (CFS) in the absence of serotonin agonist/selective serotonin reuptake inhibitory therapy, or for the treatment of fibromyalgia or associated functional symptoms.

Excerpt(s): This invention relates to substance P antagonists, in particular to 1-acylpiperidine substance P antagonists, and more specifically to new pharmaceuticals uses of such compounds. Substance P antagonists and their pharmaceutical use for treatment of gastrointestinal disorders, inflammatory disorders, central nervous system disorders and pain are described in, for instance, WO 90/05525, WO 91/09844 and WO 91/18899. 1-acylpiperidines and more particularly N-benzoyl-2-benzyl-4-azanaphthoyl-amino piperidines and their activities as substance P antagonists are described in European patent EP 0532456 B and published European patent application EP 0739892 A and European patent EP 0707006 B respectively. The disclosures of EP 0532456 B, EP 0707006 B and EP 0739892 A are incorporated by reference in the teaching of the present application. WO 96/24353 (Eli Lilly) descibes a method for the treatment and prevention of a psychiatric disorder in a mammal which comprises administering to a mammal in need thereof an effective amount of a combination of a tachykinin receptor antagonist and either a serotonin agonist or a selective serotonin reuptake inhibitor. Chronic fatigue syndrome is listed amongst the numerous psychiatric disorders which are identified as candidates for treatment by this method.

Web site: http://appft1.uspto.gov/netahtml/PTO/search-bool.html

Keeping Current

In order to stay informed about patents and patent applications dealing with fibromyalgia, you can access the U.S. Patent Office archive via the Internet at the following Web address: **http://www.uspto.gov/patft/index.html**. You will see two broad options: (1) Issued Patent, and (2) Published Applications. To see a list of issued patents, perform the following steps: Under "Issued Patents," click "Quick Search." Then, type "fibromyalgia" (or synonyms) into the "Term 1" box. After clicking on the search button, scroll down to see the various patents which have been granted to date on fibromyalgia.

You can also use this procedure to view pending patent applications concerning fibromyalgia. Simply go back to the following Web address: **http://www.uspto.gov/patft/index.html**. Select "Quick Search" under "Published Applications." Then proceed with the steps listed above.

CHAPTER 7. BOOKS ON FIBROMYALGIA

Overview

This chapter provides bibliographic book references relating to fibromyalgia. In addition to online booksellers such as **www.amazon.com** and **www.bn.com**, excellent sources for book titles on fibromyalgia include the Combined Health Information Database and the National Library of Medicine. Your local medical library also may have these titles available for loan.

Book Summaries: Federal Agencies

The Combined Health Information Database collects various book abstracts from a variety of healthcare institutions and federal agencies. To access these summaries, go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. You will need to use the "Detailed Search" option. To find book summaries, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer. For the format option, select "Monograph/Book." Now type "fibromyalgia" (or synonyms) into the "For these words:" box. You should check back periodically with this database which is updated every three months. The following is a typical result when searching for books on fibromyalgia:

- **Arthritis Helpbook: A Tested Self-Management Program for Coping With Arthritis and Fibromyalgia. Fifth Edition. [Como convivir con su artritis: una guia para una vida activa y saludable]**

  Source: Cambridge, MA: Perseus Books. 2000. 380 p.

  Contact: Available from Perseus Books. Group Customer Service Department, 5500 Central Avenue, Boulder, CO 80301. (800) 386-5656. Fax (303) 449-3356. Email: westview.orders@perseusbooks.com. Website: www.perseusbooks.com. ISBN 073820224X. PRICE: $18.00 plus shipping. Spanish version available from Bull Publishing. P.O. Box 208, Palo Alto, CA 94302-0208. (800) 676-2855. Fax (650) 327-3300. PRICE: $16.95 plus shipping; bulk discounts available.

  Summary: This book for individuals with arthritis and fibromyalgia presents a successful program for coping with these conditions. Chapters define arthritis; describe rheumatoid arthritis, osteoarthritis, and fibromyalgia and explain how to treat them;

outline ways of preventing and dealing with osteoporosis; discuss various types of painful localized conditions; and explain how to become an arthritis self manager. Chapters also identify popular techniques for minimizing arthritis pain, present guidelines for developing a physical fitness program, describe flexibility and strengthening exercises and aerobic activities, offer suggestions for dealing with everyday problems, and provide help for dealing with depression and fatigue. Other topics include coping with emotional and interpersonal issues, establishing good nutrition habits, and using available medical resources. An appendix lists the international locations of the Arthritis Foundation and the Arthritis Society. 47 references, 11 tables, and numerous illustrations.

- **Fibromyalgia and Chronic Myofascial Pain Syndrome: A Survival Manual**

  Source: Oakland, CA: New Harbinger Publications, Inc. 1996. 421 p.

  Contact: Available from New Harbinger Publications, Inc., 5674 Shattuck Avenue, Oakland, CA 94609. (800) 748-6273. PRICE: $19.95 in the U.S., $28.95 in Canada.

  Summary: This guide for individuals with fibromyalgia syndrome (FMS) and chronic mysofascial pain syndrome (MPS) offers them comprehensive information for managing these conditions. Part one defines these conditions, discusses myofascial trigger points, and examines coexisting conditions and perpetuating factors that must be taken into account for diagnosis and treatment. Part two answers questions about common symptoms. Part three addresses the issues of chronic pain and discusses the sleep factor, irritable bowel syndrome, flares, and pregnancy. Part four provides information about the power of the mind to counteract physical symptoms. Part five examines the medications available to treat FMS and chronic MPS symptoms, explains how to balance nutritional needs and use bodywork to relieve symptoms, and describes alternative therapies. Part six provides suggestions for improving conditions at home, in the workplace, and in travel situations. Other topics include the rights of individuals with a disability and the special challenges faced by children with FMS or chronic MPS. In addition, guidelines are presented for building an effective support structure and finding the best primary care physician. Appendices list the names of agencies to contact for further information, suggestions for further reading, and the names of suppliers of useful health care items. Numerous references and 45 figures.

- **Fibromyalgia Help Book. Practical Guide to Living Better With Fibromyalgia**

  Source: St. Paul, MN: Smith House Press. 1996. 253 p.

  Contact: Available from Smith House Press, P.O. Box 17948, St. Paul, MN 55117. (888) 220-5402. (888) 220-5401 (fax). PRICE: $18.95 in the U.S., $26.95 in Canada.

  Summary: This book for health professionals and individuals with fibromyalgia serves as a guide for effectively managing the syndrome. It discusses the etiology of the condition and the symptoms that characterize the disorder. The book explains how the diagnosis of fibromyalgia is made and how to overcome the obstacles posed by the syndrome. Specifically, guidelines are offered for building an effective patient-physician relationship; developing an exercise program; getting a good night's sleep; making lifestyle adjustments; dealing with employment issues; coping with concentration problems; and managing widespread pain, fatigue, stress, and flare-ups. It describes the biomedical mechanisms that are associated with fibromyalgia and identifies the approaches being taken to study these mechanisms. In addition, the book lists resources and offers information on starting a support group. 50 references and 16 figures.

- **Post-traumatic Fibromyalgia. A Medical Perspective**

  Source: Columbus, OH: Anadem Publishing. 1996. 135 p.

  Contact: Available from Anadem Publishing, 3620 North High Street, Columbus, OH 43214. (614) 262-2539. (800) 633-0055. (614) 262-6630 (fax).

  Summary: This book for individuals with fibromyalgia seeks to enhance awareness of posttraumatic fibromyalgia from a medical perspective. Chapters define fibromyalgia, describe types of fibromyalgia, address the issue of whether there is a controversy regarding the existence of fibromyalgia, present an overview of posttraumatic fibromyalgia, discuss whiplash injury, review the components of the medical history in posttraumatic fibromyalgia, provide common physical examination findings, identify tests useful in diagnosing posttraumatic fibromyalgia, and discuss the diagnosis of posttraumatic fibromyalgia. Additional chapters focus on the mechanisms of posttraumatic fibromyalgia, the treatment of this condition, the prognosis for individuals with posttraumatic fibromyalgia, and the categories of special situations in posttraumatic fibromyalgia. Final chapters explain who is a fibromyalgia expert, summarize common questions asked of a medical witness in litigation concerning posttraumatic fibromyalgia, and consider the future of fibromyalgia. 3 figures and 6 tables.

- **Essential Arthritis Cookbook: Kitchen Basics for People with Arthritis, Fibromyalgia and Other Chronic Pain and Fatigue**

  Source: Mankato, MN: Appletree Press, Inc. 1995. 286 p.

  Contact: Available from Appletree Press, Inc. 151 Good Counsel Drive, Suite 125, Mankato, MN 56001. (800) 322-5679 or (507) 345-4848. Fax (507) 345-3002. PRICE: $24.95 plus shipping and handling. ISBN 0962047163.

  Summary: This cookbook for people with arthritis, fibromyalgia, and other chronic pain and fatigue explains how nutrition affects arthritis and other musculoskeletal diseases and uses this information to provide guidelines and recipes for good health. Chapters cover topics such as the relationship between diet and arthritis; the impact of diet on the reduction of pain, swelling, and stiffness; and the effect of various arthritis medications on vitamin and mineral levels in the body. Other chapters offer suggestions for developing an energy-saving plan, making cooking more relaxing, protecting joints from damaging forces, selecting appropriate tools, and planning meals. In addition, the book provides more than 120 recipes in the categories of appetizers, soups, salads, main dishes, vegetables, side dishes, breads, and desserts. The recipes are easy to prepare and require few ingredients and minimal cleanup. Appendixes offer suggestions for making eating easier for people whose illness or condition has made eating difficult, and provide advice for using convenience foods. 14 figures. 25 tables. 7 references.

Book Summaries: Online Booksellers

Commercial Internet-based booksellers, such as Amazon.com and Barnes&Noble.com, offer summaries which have been supplied by each title's publisher. Some summaries also include customer reviews. Your local bookseller may have access to in-house and commercial databases that index all published books (e.g. Books in Print®). **IMPORTANT NOTE:** Online booksellers typically produce search results for medical and non-medical books. When searching for "fibromyalgia" at online booksellers' Web sites, you may

discover non-medical books that use the generic term "fibromyalgia" (or a synonym) in their titles. The following is indicative of the results you might find when searching for "fibromyalgia" (sorted alphabetically by title; follow the hyperlink to view more details at Amazon.com):

- **A Clinician's Guide to Controversial Illnesses: Chronic Fatigue Syndrome, Fibromyalgia, and Multiple Chemical Sensitivities** by Renee R. Taylor, et al (2001); ISBN: 156887068X; http://www.amazon.com/exec/obidos/ASIN/156887068X/icongroupinterna
- **A Meditaiton to Help With Fibromyalgia & Chronic Fatigue** by Belleruth Naparstek (2002); ISBN: 1881405575; http://www.amazon.com/exec/obidos/ASIN/1881405575/icongroupinterna
- **All About Fibromyalgia** by Daniel J. Wallace, Janice Brock Wallace (2002); ISBN: 0195147537; http://www.amazon.com/exec/obidos/ASIN/0195147537/icongroupinterna
- **Alternative Medicine Guide to Chronic Fatigue, Fibromyalgia and Environmental Illness** by Burton Goldberg, Editors of Alternative Medicine Digest (1998); ISBN: 1887299114; http://www.amazon.com/exec/obidos/ASIN/1887299114/icongroupinterna
- **Alternative Treatments for Fibromyalgia & Chronic Fatigue Syndrome: Insights from Practitioners and Patients** by Mari Skelly, et al; ISBN: 0897932714; http://www.amazon.com/exec/obidos/ASIN/0897932714/icongroupinterna
- **America Exhausted: Breakthrough Treatments of Fatigue and Fibromyalgia** by Edward J. Conley; ISBN: 0965254410; http://www.amazon.com/exec/obidos/ASIN/0965254410/icongroupinterna
- **Autogenic Training: A Mind-Body Approach to the Treatment of Fibromyalgia and Chronic Pain Syndrome** by Micah R. Sadigh Ph.D. (Editor); ISBN: 0789012561; http://www.amazon.com/exec/obidos/ASIN/0789012561/icongroupinterna
- **Betrayal by the Brain: The Neurologic Basis of Chronic Fatigue Syndrome, Fibromyalgia Syndrome, and Related Neural Network Disorders** by Jay A. Goldstein (1996); ISBN: 1560249811; http://www.amazon.com/exec/obidos/ASIN/1560249811/icongroupinterna
- **CFIDS, Fibromyalgia, and the Virus-Allergy Link: Hidden Viruses, Allergies, and Uncommon Fatigue/Pain Disorders** by R. Bruce Duncan (2001); ISBN: 0789010739; http://www.amazon.com/exec/obidos/ASIN/0789010739/icongroupinterna
- **Chronic Fatigue Syndrome, Fibromyalgia, and Other Invisible Illnesses** by Katrina Berne, et al; ISBN: 0897932803; http://www.amazon.com/exec/obidos/ASIN/0897932803/icongroupinterna
- **Chronic Fatigue, Fibromyalgia, and Lyme Disease** by Burton Goldberg, Larry, Jr. Trivieri (2003); ISBN: 1587611910; http://www.amazon.com/exec/obidos/ASIN/1587611910/icongroupinterna
- **Chronic Illness and Uncertainty: A Personal and Professional Guide to Poorly Understood Syndromes, What We Know and Don't Know About Fibromyalgia, Chronic Fatigue, Migraine, depressio** by Don L., Md. Goldenberg; ISBN: 0965610209; http://www.amazon.com/exec/obidos/ASIN/0965610209/icongroupinterna

- **Chronic Muscle Pain Syndrome: Understanding and Treating Fibrositis-The Body's Powerful Reaction to Deep-Rooted Stress** by Paul Davidson; ISBN: 0394568605; http://www.amazon.com/exec/obidos/ASIN/0394568605/icongroupinterna
- **Clinical Overview and Pathogenesis of the Fibromyalgia Syndrome, Myofascial Pain Syndrome, and Other Pain Syndromes** by I. Jon Russell (Editor) (1996); ISBN: 1560248335; http://www.amazon.com/exec/obidos/ASIN/1560248335/icongroupinterna
- **Coping With Fibromyalgia (Red Book)** by Beth Ediger (1993); ISBN: 0969578504; http://www.amazon.com/exec/obidos/ASIN/0969578504/icongroupinterna
- **Curing Fibromyalgia Naturally With Chinese Medicine** by Bob Flaws (2000); ISBN: 1891845098; http://www.amazon.com/exec/obidos/ASIN/1891845098/icongroupinterna
- **Dear World, Fibromyalgia People Speak Out: Everything You Ever Wanted to Know About Fibromyalgia from the People Who Suffer from It** by Dawna L. Vance, Jan McDonald (Contributor) (2000); ISBN: 0595134270; http://www.amazon.com/exec/obidos/ASIN/0595134270/icongroupinterna
- **Fibromyalgia** by Bigelow; ISBN: 1565611810; http://www.amazon.com/exec/obidos/ASIN/1565611810/icongroupinterna
- **Fibromyalgia : A Handbook for Self Care and Treatment** by Janet A. Hueme, Janet A. Hulme (2001); ISBN: 1928812015; http://www.amazon.com/exec/obidos/ASIN/1928812015/icongroupinterna
- **Fibromyalgia : A Journey Toward Healing** by Chanchal Cabrera; ISBN: 0658003054; http://www.amazon.com/exec/obidos/ASIN/0658003054/icongroupinterna
- **Fibromyalgia : Simple Relief through Movement** by Stacie L. Bigelow (Author); ISBN: 0471348023; http://www.amazon.com/exec/obidos/ASIN/0471348023/icongroupinterna
- **Fibromyalgia and Chronic Fatigue : Acutherapy and Holistic Approaches** by Sunny Cooper; ISBN: 096745770X; http://www.amazon.com/exec/obidos/ASIN/096745770X/icongroupinterna
- **Fibromyalgia and Chronic Myofascial Pain: A Survival Manual (2nd Edition)** by Devin J. Starlanyl, Mary Ellen Copeland; ISBN: 1572242388; http://www.amazon.com/exec/obidos/ASIN/1572242388/icongroupinterna
- **Fibromyalgia and Female Sexuality** by Marline Emmal; ISBN: 1552125807; http://www.amazon.com/exec/obidos/ASIN/1552125807/icongroupinterna
- **Fibromyalgia and Muscle Pain: What Causes It, How It Feels and What to Do About It** by Leon Chaitow (1996); ISBN: 0722530986; http://www.amazon.com/exec/obidos/ASIN/0722530986/icongroupinterna
- **Fibromyalgia and Muscle Pain: Your Self-Treatment Guide: What Causes It, How It Feels and What to Do About It** by Leon Chaitow (2001); ISBN: 0007115024; http://www.amazon.com/exec/obidos/ASIN/0007115024/icongroupinterna
- **Fibromyalgia and the MindBodySpirit Connection : 7 Steps for Living a Healthy Life with Widespread Muscular Pain and Fatigue** by M.D. William B. Salt II, M.D. Edwin H. Season; ISBN: 0965703878; http://www.amazon.com/exec/obidos/ASIN/0965703878/icongroupinterna

- **Fibromyalgia Cookbook Vol. 1: A Daily Guide to Becoming Healthy Again** by Mary Moeller, Karl Moeller (Editor); ISBN: 0966019091; http://www.amazon.com/exec/obidos/ASIN/0966019091/icongroupinterna
- **Fibromyalgia Cookbook: A Daily Guide To Becoming Healthy Again** by Mary Moeller, et al; ISBN: 0966019083; http://www.amazon.com/exec/obidos/ASIN/0966019083/icongroupinterna
- **Fibromyalgia Fatigue and You (1)** by Michael C. Kelly (Editor), Kelly Michael; ISBN: 0953307107; http://www.amazon.com/exec/obidos/ASIN/0953307107/icongroupinterna
- **Fibromyalgia for Dummies** by Roland Staud (Author), Christine A. Adamec (Author); ISBN: 0764554417; http://www.amazon.com/exec/obidos/ASIN/0764554417/icongroupinterna
- **Fibromyalgia in Myofascial Pain Syndromes (International Practice and Research)** by A.T. Masi; ISBN: 0702018678; http://www.amazon.com/exec/obidos/ASIN/0702018678/icongroupinterna
- **Fibromyalgia Relief : The SAM-e Solution** by Joseph K. Egbebike, Bob Calleja (Illustrator); ISBN: 0963984128; http://www.amazon.com/exec/obidos/ASIN/0963984128/icongroupinterna
- **Fibromyalgia Supporter** by Mark J. Pellegrino (1997); ISBN: 1890018112; http://www.amazon.com/exec/obidos/ASIN/1890018112/icongroupinterna
- **Fibromyalgia Syndrome- Fighting the Devil With T** by Marilyn Sue (2002); ISBN: 1401023797; http://www.amazon.com/exec/obidos/ASIN/1401023797/icongroupinterna
- **Fibromyalgia Syndrome- Fighting the Devil With the Patience of Job: A Victim's Point of View & Survivor's Guide** by Marilyn Sue (2002); ISBN: 1401023800; http://www.amazon.com/exec/obidos/ASIN/1401023800/icongroupinterna
- **Fibromyalgia Syndrome Getting Healthy** by Jeanne L. Melvin (1996); ISBN: 1569000417; http://www.amazon.com/exec/obidos/ASIN/1569000417/icongroupinterna
- **Fibromyalgia Syndrome: A Practitioner's Guide to Treatment** by Leon Chaitow (2003); ISBN: 0443062277; http://www.amazon.com/exec/obidos/ASIN/0443062277/icongroupinterna
- **Fibromyalgia Syndrome: Physical Therapy Management** by Kathryn Stogner Henderson, Stogner (1999); ISBN: 0127845801; http://www.amazon.com/exec/obidos/ASIN/0127845801/icongroupinterna
- **Fibromyalgia, Chronic Fatigue Syndrome, and Repetitive Strain Injury: Current Concepts in Diagnosis, Management, Disability, and Health Economics (Journal of Skeletal Pain, Vol 3, No 2)** by Andrew Chalmers (Editor), et al (1995); ISBN: 1560247444; http://www.amazon.com/exec/obidos/ASIN/1560247444/icongroupinterna
- **Fibromyalgia, You & ME** by Michael C. Kelly; ISBN: 0861214528; http://www.amazon.com/exec/obidos/ASIN/0861214528/icongroupinterna
- **Fibromyalgia: A Comprehensive Approach What You Can Do About Chronic Pain and Fatigue** by Miryam Ehrlich Williamson, et al; ISBN: 0802774849; http://www.amazon.com/exec/obidos/ASIN/0802774849/icongroupinterna

- **Fibromyalgia: A Handbook for Self Care & Treatment** by Janet A. Hulme; ISBN: 0964484803;
  http://www.amazon.com/exec/obidos/ASIN/0964484803/icongroupinterna
- **Fibromyalgia: A Leading Expert's Guide to Understanding and Getting Relief from the Pain That Won't Go Away** by Don L. Goldenberg; ISBN: 039952780X;
  http://www.amazon.com/exec/obidos/ASIN/039952780X/icongroupinterna
- **Fibromyalgia: A Natural Approach** by Christine Hinton Craggs, Christine Craggs Hinton (2003); ISBN: 1569753695;
  http://www.amazon.com/exec/obidos/ASIN/1569753695/icongroupinterna
- **Fibromyalgia: An Essential Guide for Patients and Their Families** by Daniel J., Md. Wallace, Janice Brock Wallace (2003); ISBN: 0195149319;
  http://www.amazon.com/exec/obidos/ASIN/0195149319/icongroupinterna
- **Fibromyalgia: An Intergrative Approach (The Intergrative Health Series)** by Milton, Dr Hammerly, Milton Hammerly; ISBN: 1580623298;
  http://www.amazon.com/exec/obidos/ASIN/1580623298/icongroupinterna
- **Fibromyalgia: Beginning the Road to Recovery** by Mary Moeller, Woodland Publishing (2000); ISBN: 1580540880;
  http://www.amazon.com/exec/obidos/ASIN/1580540880/icongroupinterna
- **Fibromyalgia: Exploring the Possibilities, Vol. 1: Sumatriptan: Exploring the Possibilities** by Barbara A. Gibson (1994); ISBN: 0963897012;
  http://www.amazon.com/exec/obidos/ASIN/0963897012/icongroupinterna
- **Fibromyalgia: Fighting Back (Blue Book)** by Bev Spencer; ISBN: 0969578520;
  http://www.amazon.com/exec/obidos/ASIN/0969578520/icongroupinterna
- **Fibromyalgia: Hope from a Completely New Perspective** by William Glasser; ISBN: 0967844428;
  http://www.amazon.com/exec/obidos/ASIN/0967844428/icongroupinterna
- **Fibromyalgia: Managing the Pain** by Mark J. Pellegrino (1997); ISBN: 1890018104;
  http://www.amazon.com/exec/obidos/ASIN/1890018104/icongroupinterna
- **Fibromyalgia: My Journey to Wellness** by Claire Musickant (2001); ISBN: 0963975218;
  http://www.amazon.com/exec/obidos/ASIN/0963975218/icongroupinterna
- **Fibromyalgia: Nutritional Approach** by William, Ph.D. Hennen, Woodland Publishing (1999); ISBN: 1580540511;
  http://www.amazon.com/exec/obidos/ASIN/1580540511/icongroupinterna
- **Fibromyalgia: Relief from Chronic Muscle Pain** by Paul Davidson (Illustrator); ISBN: 0965349322;
  http://www.amazon.com/exec/obidos/ASIN/0965349322/icongroupinterna
- **Fibromyalgia: Stretching Your Way Out of Pain** by Gaye Grissom-Sandler, Michael Palumbo (Photographer); ISBN: 0963897039;
  http://www.amazon.com/exec/obidos/ASIN/0963897039/icongroupinterna
- **Fibromyalgia: The New Integrative Approach: How to Combine the Best of Traditional and Alternative Therapies (Integrative Health Series)** by Milton, MD Hammerly (2000); ISBN: 1580624642;
  http://www.amazon.com/exec/obidos/ASIN/1580624642/icongroupinterna

- **Fibromyalgia: Understanding and Getting Relief from Pain That Won't Go Away** by Don L. Goldenberg; ISBN: 0749923067; http://www.amazon.com/exec/obidos/ASIN/0749923067/icongroupinterna
- **Fibromyalgia: You Are Not Crazy** by Dawn Smith (2003); ISBN: 1553958179; http://www.amazon.com/exec/obidos/ASIN/1553958179/icongroupinterna
- **Fighting Fibromyalgia** by Zoltan P. Rona (2002); ISBN: 1553120191; http://www.amazon.com/exec/obidos/ASIN/1553120191/icongroupinterna
- **Freedom from Fibromyalgia : The 5-Week Program Proven to Conquer Pain** by Nancy, M.D. Selfridge, Franklynn Peterson (2001); ISBN: 0812933753; http://www.amazon.com/exec/obidos/ASIN/0812933753/icongroupinterna
- **From Fatigued to Fantastic!: A Manual for Moving Beyond Chronic Fatigue & Fibromyalgia** by Jacob Teitelbaum (1996); ISBN: 0963759973; http://www.amazon.com/exec/obidos/ASIN/0963759973/icongroupinterna
- **From Fatigued to Fantastic!: A Proven Program to Regain Vibrant Health, Based on a New Scientific Study Showing Effective Treatment for Chronic Fatigue and Fibromyalgia** by Jacob Teitelbaum (2001); ISBN: 1583330976; http://www.amazon.com/exec/obidos/ASIN/1583330976/icongroupinterna
- **Gentle Medicine : Treating Chronic Fatigue and Fibromyalgia Successfully with Natural Medicine** by Lily G. Casura; ISBN: 0970651805; http://www.amazon.com/exec/obidos/ASIN/0970651805/icongroupinterna
- **Healing Joint Pain Naturally: Safe and Effective Ways to Treat Arthritis, Fibromyalgia, and Other Joint Diseases** by Ellen Hodgson Brown (2001); ISBN: 076790561X; http://www.amazon.com/exec/obidos/ASIN/076790561X/icongroupinterna
- **Health Journeys: A Meditation to Help with Fibromyalgia & Chronic Fatigue** by Belleruth Naparstek, Steven M. Kohn; ISBN: 1881405516; http://www.amazon.com/exec/obidos/ASIN/1881405516/icongroupinterna
- **I Conquered Fibromyalgia and Turned Horror Moans Back Into Hormones** by Pam Fitzgerald, Linda Yates (Contributor); ISBN: 0970391609; http://www.amazon.com/exec/obidos/ASIN/0970391609/icongroupinterna
- **I Was Poisoned By My Body, The Odyssey of a Doctor Who Reversed Fibromyalgia, Leaky Gut Syndrome, and Multiple Chemical Sensitivity - Naturally!** by Gloria Gilbere, et al; ISBN: 0967605091; http://www.amazon.com/exec/obidos/ASIN/0967605091/icongroupinterna
- **If There s Nothing Wrong With Me, Then Why Do I Feel So Bad: The Neurologic Basis of Fibromyalgia, Chronic Fatigue Syndrome and Related Disorders** by Martin A. Duclos (2002); ISBN: 0595248497; http://www.amazon.com/exec/obidos/ASIN/0595248497/icongroupinterna
- **Inside Fibromyalgia With Mark J. Pellegrino, MD** by David Shumick, et al (2001); ISBN: 1890018368; http://www.amazon.com/exec/obidos/ASIN/1890018368/icongroupinterna
- **Laugh at Your Muscles II: A Second Light Look at Fibromyalgia** by Mark J. Pellegrino, Barbara Dawkins (1997); ISBN: 1890018155; http://www.amazon.com/exec/obidos/ASIN/1890018155/icongroupinterna

- **Laugh at Your Muscles: A Light Look at Fibromyalgia** by Mark J. Pellegrino (1995); ISBN: 0964689146;
  http://www.amazon.com/exec/obidos/ASIN/0964689146/icongroupinterna
- **Lifting the Bull: Overcoming Chronic Back Pain Fibromyalgia and Environmental Illness** by Diane Dawber (1999); ISBN: 1550821997;
  http://www.amazon.com/exec/obidos/ASIN/1550821997/icongroupinterna
- **Living Better With Fibromyalgia** by Arthritis Foundation Staff; ISBN: 0912423102;
  http://www.amazon.com/exec/obidos/ASIN/0912423102/icongroupinterna
- **Living Life Free from Pain: Treating Arthritis, Joint Pain, Muscle Pain, and Fibromyalgia With Maharishi Vedic Medicine** by Kumuda, Md Reddy, Cynthia Lane; ISBN: 1929297173;
  http://www.amazon.com/exec/obidos/ASIN/1929297173/icongroupinterna
- **Living Well with Chronic Fatigue Syndrome and Fibromyalgia : What Your Doctor Doesn't Tell You.That You Need to Know** by Mary J. Shomon (Author) (2004); ISBN: 0060521252;
  http://www.amazon.com/exec/obidos/ASIN/0060521252/icongroupinterna
- **Living with Fibromyalgia** by Christine Graggs-Hinton, et al (2000); ISBN: 0859698319;
  http://www.amazon.com/exec/obidos/ASIN/0859698319/icongroupinterna
- **Making Sense of Fibromyalgia** by Daniel J. Wallace, Janice Brock Wallace; ISBN: 0195116119;
  http://www.amazon.com/exec/obidos/ASIN/0195116119/icongroupinterna
- **Malic Acid & Magnesium for Fibromyalgia & Chronic Pain Syndrome** by Billie J. Sahley (1999); ISBN: 1889391158;
  http://www.amazon.com/exec/obidos/ASIN/1889391158/icongroupinterna
- **Malic Acid and Magnesium for Fibromyalgia and Chronic Pain Syndrome** by Billie Jay Sahley (1998); ISBN: 1889391131;
  http://www.amazon.com/exec/obidos/ASIN/1889391131/icongroupinterna
- **Managing Fibromyalgia: A Six-Week Course on Self Care** by Barbara Penner (1997); ISBN: 0964484838;
  http://www.amazon.com/exec/obidos/ASIN/0964484838/icongroupinterna
- **Muscle Pain Syndromes and Fibromyalgia: Pressure Algometry for Quantification of Diagnosis and Treatment Outcome (Journal of Musculoskeletal Pain, V. 6, No. 1)** by Andrew A. Fischer (Editor), B.C.) World Congress on Pain 1996 Vancouver (1998); ISBN: 0789005107;
  http://www.amazon.com/exec/obidos/ASIN/0789005107/icongroupinterna
- **Muscle Pain, Myofascial Pain, and Fibromyalgia: Recent Advances (Journal of Musculoskeletal Pain, V. 7, No. 1/2)** by Leonardo Vecchiet (Editor), et al (1999); ISBN: 0789007959;
  http://www.amazon.com/exec/obidos/ASIN/0789007959/icongroupinterna
- **Musculoskeletal Pain, Myofascial Pain Syndrome, & the Fibromyalgia Syndrome: Proceedings from the Second World Congress on Myofascial Pain & Fibromyal** by Soren Jacobsen (Designer), et al (1993); ISBN: 1560245085;
  http://www.amazon.com/exec/obidos/ASIN/1560245085/icongroupinterna
- **Musculoskeletal Pain, Myofascial Pain Syndrome, and the Fibromyalgia Syndrome** by Soren, Md Jacobsen, Bente, M.D. Danneskiold-Samsoe (1993); ISBN: 1560244852;
  http://www.amazon.com/exec/obidos/ASIN/1560244852/icongroupinterna

- **Myofascial Pain and Fibromyalgia (Advances in Pain Research and Therapy, Vol 17)** by James R. Fricton, Essam A. Awad (Editor); ISBN: 0881676144; http://www.amazon.com/exec/obidos/ASIN/0881676144/icongroupinterna
- **Myofascial Pain and Fibromyalgia Syndromes: A Clinical Guide to Diagnosis and Management** by Peter Baldry, et al (2001); ISBN: 0443070032; http://www.amazon.com/exec/obidos/ASIN/0443070032/icongroupinterna
- **Myofascial Pain and Fibromyalgia: Trigger Point Management** by Edward S. Rachlin (Editor), Isabel S. Rachlin (Editor); ISBN: 0323011551; http://www.amazon.com/exec/obidos/ASIN/0323011551/icongroupinterna
- **Myopain '95: Abstracts from the 3rd World Congress on Myofascial Pain and Fibromyalgia San Antonio, Texas, USA July 30-August 3, 1995 (Journal of Musculoskeletal Pain, Vol 3, Supplement No, 1)** by I. Jon Russell (Editor) (1995); ISBN: 0789000008; http://www.amazon.com/exec/obidos/ASIN/0789000008/icongroupinterna
- **Myopain '98: Abstracts from the 4th World Congress on Myofascial Pain and Fibromyalgia, Silvi Marina, (Te) Italy, August 24-August 27, 1998 (Journal of Musculoskeletal Pain, V. 6, Suppl. No. 2)** by Leonardo Vecchiet, Maria Adele Giamberardino (1998); ISBN: 0789005492; http://www.amazon.com/exec/obidos/ASIN/0789005492/icongroupinterna
- **Natural Choices for Fibromyalgia: Discover Your Personal Method for Pain Relief** by Jane, Ph.D. Oelke, Jane Oelke; ISBN: 0971551200; http://www.amazon.com/exec/obidos/ASIN/0971551200/icongroupinterna
- **Natural Treatments for Fibromyalgia: An A to Z Guide** by Kenna Simmons (2003); ISBN: 0912423420; http://www.amazon.com/exec/obidos/ASIN/0912423420/icongroupinterna
- **New Hope for People with Fibromyalgia** by Theresa Foy Digeronimo, Joseph E., MD Scherger; ISBN: 0761520988; http://www.amazon.com/exec/obidos/ASIN/0761520988/icongroupinterna
- **One & the Same: Connecting Fibromyalgia, Chronic Fatigue Syndrome, Candidiasis & Immune System Dysfunction** by Teresa L. Eakman (2003); ISBN: 1412003474; http://www.amazon.com/exec/obidos/ASIN/1412003474/icongroupinterna
- **Overcoming Fibromyalgia** by Mary Moeller (2001); ISBN: 0966019075; http://www.amazon.com/exec/obidos/ASIN/0966019075/icongroupinterna
- **Pain-Free with Magnet Therapy: Discover how Magnets can Help Relieve Arthritis, Sports Injuries, Fibromyalgia, and Chronic Pain** by Lara Owen; ISBN: 0761520864; http://www.amazon.com/exec/obidos/ASIN/0761520864/icongroupinterna
- **Parting the Fog: The Personal Side of Fibromyalgia/Chronic Fatigue Syndrome** by Sue Jones; ISBN: 0971217505; http://www.amazon.com/exec/obidos/ASIN/0971217505/icongroupinterna
- **Patches of Sunshine: A Daily Devotional for Fibromyalgia Patients** by Nancy Sonneman (2001); ISBN: 1588517292; http://www.amazon.com/exec/obidos/ASIN/1588517292/icongroupinterna
- **Progress in Fibromyalgia and Myofascial Pain (Pain Research and Clinical Management, Vol 6)** by H. Vaeroy, et al; ISBN: 0444895361; http://www.amazon.com/exec/obidos/ASIN/0444895361/icongroupinterna

- **Prolo Your Fibromyalgia Pain Away! Curing the Disabling Pain of Fibromyalgia with Prolotherapy** by Ross A. Hauser, Marion A. Hauser; ISBN: 0966101049; http://www.amazon.com/exec/obidos/ASIN/0966101049/icongroupinterna
- **Reversing Fibromyalgia: The Whole-Health Approach to Overcoming Fibromyalgia Through Nutrition, Exercise, Supplements and Other Lifestyle Factors** by Joe M., Dr Elrod, Joe M., Ed.D. Elrod; ISBN: 158054326X; http://www.amazon.com/exec/obidos/ASIN/158054326X/icongroupinterna
- **Speeding Up to Normal: Metabolic Solutions to Fibromyalgia** by John C. Lowe, Jackie G. Yellin (Editor) (2003); ISBN: 0914609033; http://www.amazon.com/exec/obidos/ASIN/0914609033/icongroupinterna
- **Supplements for Fibromyalgia** by Joe M., Ph.D. Elrod, Joe M., Ed.D. Elrod (1998); ISBN: 1580540341; http://www.amazon.com/exec/obidos/ASIN/1580540341/icongroupinterna
- **Taking Charge of Fibromyalgia** by Julie Kelly, et al; ISBN: 096657740X; http://www.amazon.com/exec/obidos/ASIN/096657740X/icongroupinterna
- **Taking Control of Tmj: Your Total Wellness Program for Recovering from Tempromandibular Joint Pain, Whiplash, Fibromyalgia, and Related Disorders** by Robert O. Uppgaard DDS (1999); ISBN: 1572241268; http://www.amazon.com/exec/obidos/ASIN/1572241268/icongroupinterna
- **The 2002 Official Patient's Sourcebook on Fibromyalgia** by Icon Health Publications (2002); ISBN: 0597833737; http://www.amazon.com/exec/obidos/ASIN/0597833737/icongroupinterna
- **The Arthritis Foundation's Guide to Good Living With Fibromyalgia** by The Arthritis Foundation (Editor), Arthritis Foundation; ISBN: 0912423269; http://www.amazon.com/exec/obidos/ASIN/0912423269/icongroupinterna
- **The Arthritis Helpbook: A Tested Self-Management Program for Coping with Arthritis and Fibromyalgia** by Kate Lorig, et al; ISBN: 073820224X; http://www.amazon.com/exec/obidos/ASIN/073820224X/icongroupinterna
- **The Bible Cure For Chronic Fatigue And Fibromyalgia** by Don Colbert (2000); ISBN: 0884196801; http://www.amazon.com/exec/obidos/ASIN/0884196801/icongroupinterna
- **The Cfids/Fibromyalgia Toolkit: A Practical Self-Help Guide** by Bruce F. Campbell (2000); ISBN: 0595146481; http://www.amazon.com/exec/obidos/ASIN/0595146481/icongroupinterna
- **The Clinical Neurobiology of Fibromyalgia and Myofascial Pain: Therapeutic Implications (Journal of Musculoskeletal Pain, V. 10, Nos. 1/2)** by Ore World Congress on Myofascial Pain and Fibromyalgia 2001 Portland, Robert M. Bennett (2002); ISBN: 0789017423; http://www.amazon.com/exec/obidos/ASIN/0789017423/icongroupinterna
- **The Essential Arthritis Cookbook : Kitchen Basics for People With Arthritis, Fibromyalgia and Other Chronic Pain and Fatigue** by Sarah L. Morgan (Editor), et al; ISBN: 1891011014; http://www.amazon.com/exec/obidos/ASIN/1891011014/icongroupinterna
- **The Fibromyalgia Advocate** by Devin J. Starlanyl (Introduction), Hal Blatman (1999); ISBN: 1572241217; http://www.amazon.com/exec/obidos/ASIN/1572241217/icongroupinterna

- **The Fibromyalgia and Chronic Fatigue Resource Book and Life Planner Workbook** by Dawn Hughes; ISBN: 1581126859; http://www.amazon.com/exec/obidos/ASIN/1581126859/icongroupinterna
- **The Fibromyalgia Chef: How to Beat the Fifty Conditions That Affect People Over Fifty** by Jack J. Kleid, Mark J. Pellegrino (1997); ISBN: 1890018163; http://www.amazon.com/exec/obidos/ASIN/1890018163/icongroupinterna
- **The Fibromyalgia Cookbook: More Than 120 Easy and Delicious Recipes** by Shelley Ann Smith, Alison Bested; ISBN: 1581822707; http://www.amazon.com/exec/obidos/ASIN/1581822707/icongroupinterna
- **The Fibromyalgia Handbook** by Harris H. McIlwain, Debra Fulghum Bruce; ISBN: 0805061150; http://www.amazon.com/exec/obidos/ASIN/0805061150/icongroupinterna
- **The Fibromyalgia Handbook** by Barbara A. Gibson (1995); ISBN: 0963897020; http://www.amazon.com/exec/obidos/ASIN/0963897020/icongroupinterna
- **The Fibromyalgia Handbook, 3rd Edition: A 7-Step Program to Halt and Even Reverse Fibromyalgia** by Harris H. McIlwain (Author), Debra Fulghum (Author); ISBN: 0805072411; http://www.amazon.com/exec/obidos/ASIN/0805072411/icongroupinterna
- **The Fibromyalgia Healing Diet** by Christine Craggs-Hinton (2001); ISBN: 0859698637; http://www.amazon.com/exec/obidos/ASIN/0859698637/icongroupinterna
- **The Fibromyalgia Help Book: Practical Guide to Living Better With Fibromyalgia** by Jenny Fransen, I. Jon Russell (1997); ISBN: 0961522143; http://www.amazon.com/exec/obidos/ASIN/0961522143/icongroupinterna
- **The Fibromyalgia Nutrition Guide: Contains Valuable Dietary Guidelines, Recipes, and More for Overcoming Fibromyalgia, Chronic Fatigue Sydrome.** by Mary Moeller, Joe M., Ed.D. Elrod; ISBN: 1580540538; http://www.amazon.com/exec/obidos/ASIN/1580540538/icongroupinterna
- **The Fibromyalgia Recipe Book** by Shelle Velekei, et al; ISBN: 0968663303; http://www.amazon.com/exec/obidos/ASIN/0968663303/icongroupinterna
- **The Fibromyalgia Relief Book: 213 Ideas for Improving Your Quality of Life** by Miryam Ehrlich Williamson, et al (1998); ISBN: 0802775535; http://www.amazon.com/exec/obidos/ASIN/0802775535/icongroupinterna
- **The Fibromyalgia Relief Handbook** by Chet Cunningham (2000); ISBN: 1887053131; http://www.amazon.com/exec/obidos/ASIN/1887053131/icongroupinterna
- **The Fibromyalgia Survivor** by Mark J. Pellegrino, David Schumick (Illustrator); ISBN: 096468912X; http://www.amazon.com/exec/obidos/ASIN/096468912X/icongroupinterna
- **The Fibromyalgia Syndrome: Current Research and Future Directions in Epidemiology, Pathogenesis, and Treatment** by Stanley R. Pillemer (Editor) (1994); ISBN: 1560247142; http://www.amazon.com/exec/obidos/ASIN/1560247142/icongroupinterna
- **The First Year--Fibromyalgia: An Essential Guide for the Newly Diagnosed (The First Year Series)** by Claudia Craig Marek (2003); ISBN: 1569245215; http://www.amazon.com/exec/obidos/ASIN/1569245215/icongroupinterna

- **The Good Living With Fibromyalgia Workbook: Activities for a Better Life (Guide to Good Living Series)** by Bethany Afshar (2002); ISBN: 0912423358; http://www.amazon.com/exec/obidos/ASIN/0912423358/icongroupinterna
- **The Message of the Crucifixion: A Spiritual Guide to Living with Myalgic Encephalomyelitis, Chronic Fatigue Syndrome, Fibromyalgia Version: Vime** by Michael Midgley; ISBN: 0952593033; http://www.amazon.com/exec/obidos/ASIN/0952593033/icongroupinterna
- **The Metabolic Treatment of Fibromyalgia** by John C. Lowe, et al; ISBN: 0914609025; http://www.amazon.com/exec/obidos/ASIN/0914609025/icongroupinterna
- **The Neuroscience and Endocrinology of Fibromyalgia** by Stanley R. Pillemer (Editor) (1999); ISBN: 0789006839; http://www.amazon.com/exec/obidos/ASIN/0789006839/icongroupinterna
- **The Psychopathology of Functional Somatic Syndromes: Neurobiology and Illness Behavior in Chronic Fatigue Syndrome, Fibromyalgia, Gulf War Illness, Irritable Bowel Syndrome, and Premenstrual Syndrome** by Peter Manu (2004); ISBN: 0789012596; http://www.amazon.com/exec/obidos/ASIN/0789012596/icongroupinterna
- **The Sam-E Handbook: The Fast, Natural Way to Relieve the Pain of Arthritis, Alleviate the Discomfort of Fibromyalgia, and Boost Your Energy** by Nancy Stedman; ISBN: 0609806548; http://www.amazon.com/exec/obidos/ASIN/0609806548/icongroupinterna
- **Understanding Fibromyalgia: A Guide for Family and Friends** by Betty Dotterer, Paul, M. D. Davidson (1996); ISBN: 0965349306; http://www.amazon.com/exec/obidos/ASIN/0965349306/icongroupinterna
- **Understanding Post-Traumatic Fibromyalgia** by Mark J. Pellegrino (1996); ISBN: 0964689189; http://www.amazon.com/exec/obidos/ASIN/0964689189/icongroupinterna
- **We Laughed, We Cried: Life With Fibromyalgia** by Kit Gardiser (Editor), Kathleen Kerry (Editor) (1995); ISBN: 0963000217; http://www.amazon.com/exec/obidos/ASIN/0963000217/icongroupinterna
- **What Your Doctor May Not Tell You About Fibromyalgia : The Revolutionary Treatment That Can Reverse The Disease** by R. Paul St. Amand, Claudia Craig Marek (1999); ISBN: 0446675121; http://www.amazon.com/exec/obidos/ASIN/0446675121/icongroupinterna
- **What Your Doctor May Not Tell You About Fibromyalgia Fatigue: The Powerful Program That Helps You Boost Your Energy and Reclaim Your Life** by M.D. R. Paul St. Amand, Claudia Craig Marek (2003); ISBN: 0446677302; http://www.amazon.com/exec/obidos/ASIN/0446677302/icongroupinterna
- **What Your Doctor May Not Tell You about Pediatric Fibromyalgia [DOWNLOAD: ADOBE READER]** by Dr R. Paul St Armand, Claudia Craig-Marek (2001); ISBN: B00005B4KP; http://www.amazon.com/exec/obidos/ASIN/B00005B4KP/icongroupinterna
- **What Your Doctor May Not Tell You about Pediatric Fibromyalgia [DOWNLOAD: MICROSOFT READER]** by M.D. R. Paul St. Amand, Claudia Craig Marek (2001); ISBN: B00005B4KW; http://www.amazon.com/exec/obidos/ASIN/B00005B4KW/icongroupinterna

- **What Your Doctor May Not Tell You About Pediatric Fibromyalgia: The Program that Helps Boost Your Child's Energy Level** by R. Paul St. Amand, et al (2002); ISBN: 0446679941;
  http://www.amazon.com/exec/obidos/ASIN/0446679941/icongroupinterna
- **When the Pain is Real!! Fibromyalgia: The Chronic Muscle Pain Syndrome** by Teresa Kruckenberg; ISBN: 0646267590;
  http://www.amazon.com/exec/obidos/ASIN/0646267590/icongroupinterna
- **Women Living with Fibromyalgia** by Mari Skelly, et al; ISBN: 0897933427;
  http://www.amazon.com/exec/obidos/ASIN/0897933427/icongroupinterna
- **Your Personal Guide to Living Well With Fibromyalgia** by Arthritis Foundation, Longstreet (1997); ISBN: 1563523825;
  http://www.amazon.com/exec/obidos/ASIN/1563523825/icongroupinterna

The National Library of Medicine Book Index

The National Library of Medicine at the National Institutes of Health has a massive database of books published on healthcare and biomedicine. Go to the following Internet site, **http://locatorplus.gov/**, and then select "Search LOCATORplus." Once you are in the search area, simply type "fibromyalgia" (or synonyms) into the search box, and select "books only." From there, results can be sorted by publication date, author, or relevance. The following was recently catalogued by the National Library of Medicine:[11]

- **Arthritis, fibrositis and gout; a handbook for the general practitioner.** Author: Buckley, Charles William,; Year: 1962; London, H. K. Lewis, 1938
- **Betrayal by the brain: the neurologic basis of chronic fatigue syndrome, fibromyalgia syndrome, and related neural network disorders** Author: Goldstein, Jay A.; Year: 1954; New York: Haworth Medical Press, c1996; ISBN: 1560249773
  http://www.amazon.com/exec/obidos/ASIN/1560249773/icongroupinterna
- **CFIDS, fibromyalgia, and the virus-allergy link: new therapy for chronic functional illnesses** Author: Duncan, R. Bruce.; Year: 2000; New York: Haworth Medical Press, c2001; ISBN: 0789010720
  http://www.amazon.com/exec/obidos/ASIN/0789010720/icongroupinterna
- **Chronic arthritis and fibrositis; diagnosis and treatment, by Bernard Langdon Wyatt.** Author: Wyatt, Bernard Langdon,; Year: 1945; Baltimore, W. Wood; company, 1933
- **Fibromyalgia & chronic myofascial pain syndrome: a survival manual** Author: Starlanyl, Devin.; Year: 1994; Oakland, CA: New Harbinger Publications, c1996; ISBN: 1572240466
  http://www.amazon.com/exec/obidos/ASIN/1572240466/icongroupinterna
- **Fibromyalgia: the controversy continues** Author: Zeller, Kathleen R.; Year: 1965; [Dallas?: University of Texas Southwestern Medical Center, 1993]

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[11] In addition to LOCATORPlus, in collaboration with authors and publishers, the National Center for Biotechnology Information (NCBI) is currently adapting biomedical books for the Web. The books may be accessed in two ways: (1) by searching directly using any search term or phrase (in the same way as the bibliographic database PubMed), or (2) by following the links to PubMed abstracts. Each PubMed abstract has a "Books" button that displays a facsimile of the abstract in which some phrases are hypertext links. These phrases are also found in the books available at NCBI. Click on hyperlinked results in the list of books in which the phrase is found. Currently, the majority of the links are between the books and PubMed. In the future, more links will be created between the books and other types of information, such as gene and protein sequences and macromolecular structures. See **http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?db=Books**.

- **Fibromyalgia syndrome: proceedings: the Palm Springs Fibromyalgia Syndrome Symposium, Palm Springs, CA, March 18-20, 1988.**; Year: 1989; Toronto, Ont. Buffalo, N.Y.: Journal of Rheumatology Pub. Co., [1989]
- **Myofascial pain and fibromyalgia: trigger point management** Author: Rachlin, Edward S.; Year: 1995; St. Louis: Mosby, c1994; ISBN: 0801668174 http://www.amazon.com/exec/obidos/ASIN/0801668174/icongroupinterna
- **The concise encyclopedia of fibromyalgia and myofascial pain** Author: Patarca-Montero, Roberto.; Year: 1958; New York: Haworth Medical Press, c2002; ISBN: 0789015277 http://www.amazon.com/exec/obidos/ASIN/0789015277/icongroupinterna
- **The Fibrositis** Author: Bennett, Robert M. (Robert Martin),; Year: 1986; New York, N.Y.: Technical Pub., c1986
- **Trigger treatment of functional ailments of the skin, muscles, internal organs, and emotional states; the role of myodysneuria (rheumatism, fibrositis) in neuroses, including behavior disorders in children, and fatigue and nervousness.** Author: Gutstein, Richard R.,; Year: 1976; Ann Arbor, Ann Arbor Publishers [c1962]

Chapters on Fibromyalgia

In order to find chapters that specifically relate to fibromyalgia, an excellent source of abstracts is the Combined Health Information Database. You will need to limit your search to book chapters and fibromyalgia using the "Detailed Search" option. Go to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. To find book chapters, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Book Chapter." Type "fibromyalgia" (or synonyms) into the "For these words:" box. The following is a typical result when searching for book chapters on fibromyalgia:

- **Chapter 8-E: Musculoskeletal Signs and Symptoms: Fibromyalgia and Diffuse Pain Syndromes**

  Source: in Klippel, J.H., et al., eds. Primer on the Rheumatic Diseases. 12th ed. Atlanta, GA: Arthritis Foundation. 2001. p. 188-193.

  Contact: Available from Arthritis Foundation. P.O. Box 1616, Alpharetta, GA 30009-1616. (800) 207-8633. Fax (credit card orders only) (770) 442-9742. Website: www.arthritis.org. PRICE: $69.95 plus shipping and handling. ISBN: 0912423293.

  Summary: This chapter provides health professionals with information on the etiology, pathogenesis, clinical features, and management of fibromyalgia and diffuse pain syndromes. One hypothesis of the etiology of fibromyalgia holds that the condition may be expressed when a genetically susceptible person comes in contact with certain environmental exposures that can trigger the development of symptoms. Environmental exposures that are generally accepted to be triggers include physical trauma, infections, emotional distress, endocrine disorders, and immune stimulation. Many researchers believe that the primary abnormality leading to the expression of symptoms in fibromyalgia and related conditions is aberrant central nervous system function. Evidence suggests that many patients who have fibromyalgia have abnormalities in sensory processing and in autonomic nervous system function and that the hypothalamic pituitary axis functions abnormally in subsets of persons who have fibromyalgia. In addition, psychobehavioral factors may contribute to the pathogenesis

of fibromyalgia. Although the American College of Rheumatology (ACR) criteria for fibromyalgia require a person to have a history of chronic widespread pain involving all four quadrants of the body and the presence of 11 of 18 tender points on physical examination, at least half of the people who have the clinical diagnosis of fibromyalgia will not conform to this definition. Rigid adherence to the ACR criteria in clinical practice will skew the diagnosis of fibromyalgia toward older women with poor aerobic fitness and high levels of stress. In addition to pain and tenderness, most people have a high prevalence of nondefining symptoms, including fatigue, mental difficulties, allergic symptoms, and functional disorders of the visceral organs. Once the diagnosis of fibromyalgia has been made, the first step involves educating the person about fibromyalgia and discussing the goals and rationale of treatment. Pharmacologic agents that have demonstrated short term benefit in treating fibromyalgia symptoms are tricyclic compounds. Many clinicians believe that treatment programs combining pharmacologic therapy with extensive use of such nonpharmacologic therapies as cognitive behavioral therapy and aerobic exercise are the most effective approaches to treatment. Various complementary therapies are also used to treat fibromyalgia, including trigger point injections, myofascial release therapy, acupuncture, and chiropractic manipulation. 3 figures, 1 table, and 20 references.

Directories

In addition to the references and resources discussed earlier in this chapter, a number of directories relating to fibromyalgia have been published that consolidate information across various sources. The Combined Health Information Database lists the following, which you may wish to consult in your local medical library:[12]

- **North American Directory of Fibromyalgia Support Services, 1999 ed**

  Source: Linden, VA: National Fibromyalgia Partnership. 2001. 114 p.

  Contact: Available from National Fibromyalgia Partnership. 140 Zinn Way, Linden, VA 22642-5609. Toll-free phone (866) 725-4404. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org. PRICE: $16.00 for nonmembers; $13.00 for members and support group leaders.

  Summary: This directory is a working tool for the leadership or staff members of fibromyalgia self-help and support organizations and a resource for patients, medical professionals, health and human services organizations, and the general public. The directory provides concise information about a range of service providers throughout the United States and Canada. Organizations located in the United States are arranged by zip code within each State, and those in Canada are arranged alphabetically within each province. Each organization entry includes the name of the organization and its

[12] You will need to limit your search to “Directory” and “fibromyalgia” using the "Detailed Search" option. Go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. To find directories, use the drop boxes at the bottom of the search page where “You may refine your search by.” For publication date, select “All Years.” Select your preferred language and the format option “Directory.” Type “fibromyalgia” (or synonyms) into the “For these words:” box. You should check back periodically with this database as it is updated every three months.

mailing address, telephone number, and telephone hours. Fax number, email address, and website are also provided if available. In addition, each entry includes a brief description of the organization and its services.

CHAPTER 8. MULTIMEDIA ON FIBROMYALGIA

Overview

In this chapter, we show you how to keep current on multimedia sources of information on fibromyalgia. We start with sources that have been summarized by federal agencies, and then show you how to find bibliographic information catalogued by the National Library of Medicine.

Video Recordings

An excellent source of multimedia information on fibromyalgia is the Combined Health Information Database. You will need to limit your search to "Videorecording" and "fibromyalgia" using the "Detailed Search" option. Go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. To find video productions, use the drop boxes at the bottom of the search page where "You may refine your search by." Select the dates and language you prefer, and the format option "Videorecording (videotape, videocassette, etc.)." Type "fibromyalgia" (or synonyms) into the "For these words:" box. The following is a typical result when searching for video recordings on fibromyalgia:

- **Chronic Myofascial Pain Syndrome. A Guide to the Trigger Points**

  Contact: Available from New Harbinger Publications, Inc., 5674 Shattuck Avenue, Oakland, CA 94609. PRICE: $49.95 in the U.S.

  Summary: This videorecording for health professionals and individuals with chronic myofascial pain syndrome is a companion to a book on fibromyalgia and chronic myofascial pain syndrome, and it serves as a guide to trigger points. The video begins by demonstrating trigger points and their specific pain patterns, focusing on the head; shoulder and neck; elbow to finger; torso; lower back and pelvis; hip, thigh, and knee; and the lower leg and foot. It identifies perpetuating factors, including Morton's foot, paradoxical breathing, and repetitious exercise. In addition, the video offers guidelines for assessing the severity of one's condition, presents examples of self-care physical therapy techniques, and provides suggestions for designing a treatment program.

Bibliography: Multimedia on Fibromyalgia

The National Library of Medicine is a rich source of information on healthcare-related multimedia productions including slides, computer software, and databases. To access the multimedia database, go to the following Web site: **http://locatorplus.gov/**. Select "Search LOCATORplus." Once in the search area, simply type in fibromyalgia (or synonyms). Then, in the option box provided below the search box, select "Audiovisuals and Computer Files." From there, you can choose to sort results by publication date, author, or relevance. The following multimedia has been indexed on fibromyalgia (for more information, follow the hyperlink indicated):

- **A practical approach to fibromyalgia [videorecording]** Source: Peggy Schlesinger; Year: 1996; Format: Videorecording; Secaucus, N.J.: Network for Continuing Medical Education, 1996
- **Fibromyalgia [videorecording]** Source: [presented by] Marshfield Clinic, St. Joseph's Hospital, Marshfield Medical Research Foundation; Year: 1993; Format: Videorecording; Marshfield, WI: Video Network, [1993]
- **Fibromyalgia [videorecording]** Source: a co-production of Multimedia Communications and Physician Education and Development; Year: 2000; Format: Videorecording; Oakland, CA: Kaiser Foundation Health Plan, c2000

CHAPTER 9. PERIODICALS AND NEWS ON FIBROMYALGIA

Overview

In this chapter, we suggest a number of news sources and present various periodicals that cover fibromyalgia.

News Services and Press Releases

One of the simplest ways of tracking press releases on fibromyalgia is to search the news wires. In the following sample of sources, we will briefly describe how to access each service. These services only post recent news intended for public viewing.

PR Newswire

To access the PR Newswire archive, simply go to **http://www.prnewswire.com/**. Select your country. Type "fibromyalgia" (or synonyms) into the search box. You will automatically receive information on relevant news releases posted within the last 30 days. The search results are shown by order of relevance.

Reuters Health

The Reuters' Medical News and Health eLine databases can be very useful in exploring news archives relating to fibromyalgia. While some of the listed articles are free to view, others are available for purchase for a nominal fee. To access this archive, go to **http://www.reutershealth.com/en/index.html** and search by "fibromyalgia" (or synonyms). The following was recently listed in this archive for fibromyalgia:

- **Investigational fibromyalgia drug successful in phase II study**
  Source: Reuters Medical News
  Date: March 21, 2003
  http://www.reutershealth.com/archive/2003/03/21/professional/links/20030321drgd009.html

- **Drug relieves fibromyalgia pain: study**
  Source: Reuters Health eLine
  Date: March 21, 2003

- **Cypress fibromyalgia drug successful in phase II study**
  Source: Reuters Industry Breifing
  Date: March 21, 2003

- **Fibromyalgia less painful for older patients: study**
  Source: Reuters Health eLine
  Date: September 19, 2002

- **Aerobic exercise effective in treating fibromyalgia**
  Source: Reuters Health eLine
  Date: July 26, 2002

- **Behavior therapy boosts functioning in fibromyalgia**
  Source: Reuters Health eLine
  Date: July 10, 2002

- **Physiologic factors involved in fibromyalgia, contradicting psychogenic attribution**
  Source: Reuters Medical News
  Date: June 19, 2002

- **Brain scans document fibromyalgia pain**
  Source: Reuters Health eLine
  Date: June 17, 2002

- **Muscle strengthening program improves disease activity in fibromyalgia**
  Source: Reuters Medical News
  Date: June 14, 2002

- **IV lidocaine promising in fibromyalgia**
  Source: Reuters Industry Breifing
  Date: April 25, 2002

- **Prozac may offer short-term fibromyalgia relief**
  Source: Reuters Health eLine
  Date: March 21, 2002

- **Strength training may ease fibromyalgia symptoms**
  Source: Reuters Health eLine
  Date: February 27, 2002

- **Cypress starts phase II trial of drug for fibromyalgia syndrome**
  Source: Reuters Industry Breifing
  Date: February 25, 2002

- **Changes in weather unrelated to fibromyalgia pain**
  Source: Reuters Health eLine
  Date: February 12, 2002

- **Group therapy may help fibromyalgia patients**
  Source: Reuters Health eLine
  Date: January 25, 2002

- **Exercise may boost mood in fibromyalgia patients**
  Source: Reuters Health eLine
  Date: January 16, 2002

- **Brain scans show increased pain sensitivity in fibromyalgia**
  Source: Reuters Medical News
  Date: November 16, 2001

- **Brain scans show pain sensitivity in fibromyalgia**
  Source: Reuters Health eLine
  Date: November 15, 2001

- **Acupuncture may help relieve fibromyalgia symptoms**
  Source: Reuters Health eLine
  Date: November 12, 2001

- **Fibromyalgia often seen in patients with transformed migraine**
  Source: Reuters Medical News
  Date: October 26, 2001

- **Altering the diet may ease fibromyalgia**
  Source: Reuters Health eLine
  Date: October 25, 2001

- **Fibromyalgia improves over time; exercise helps**
  Source: Reuters Health eLine
  Date: September 17, 2001

- **Exercise deemed most effective for relieving fibromyalgia**
  Source: Reuters Medical News
  Date: September 14, 2001

- **Extracapsular silicone from breast implants might increase risk of fibromyalgia**
  Source: Reuters Medical News
  Date: June 08, 2001

- **Extracapsular silicone from breast implants linked to fibromyalgia**
  Source: Reuters Medical News
  Date: May 01, 2001

- **Cypress Bioscience, Georgetown University sign fibromyalgia research pact**
  Source: Reuters Industry Breifing
  Date: April 02, 2001

- **Antidepressants may help fibromyalgia patients**
  Source: Reuters Health eLine
  Date: March 19, 2001

- **Meditation may help fibromyalgia patients**
  Source: Reuters Health eLine
  Date: March 14, 2001

- **"Mind-body therapies" may have limited role in treatment of fibromyalgia**
  Source: Reuters Medical News
  Date: January 22, 2001

- **Exercise benefits fibromyalgia patients**
  Source: Reuters Health eLine
  Date: December 25, 2000

- **Fibromyalgia not linked to fatigue in Sjogren's syndrome**
  Source: Reuters Medical News
  Date: November 14, 2000

- **Childhood sexual abuse increases women's risk of fibromyalgia**
  Source: Reuters Medical News
  Date: November 07, 2000

- **Abused women at risk for fibromyalgia**
  Source: Reuters Health eLine
  Date: November 06, 2000

- **Bentley licenses patent for possible chronic fatigue, fibromyalgia treatment**
  Source: Reuters Industry Breifing
  Date: November 01, 2000

- **Study helps explain fibromyalgia**
  Source: Reuters Health eLine
  Date: October 31, 2000

- **Fibromyalgia patients have longer "pain memories"**
  Source: Reuters Medical News
  Date: October 31, 2000

- **Joint hypermobility may be misdiagnosed as primary fibromyalgia**
  Source: Reuters Medical News
  Date: August 17, 2000

- **Chlorella pyrenoidosa relieves fibromyalgia symptoms**
  Source: Reuters Medical News
  Date: July 05, 2000

- **No end to controversy over trauma-induced fibromyalgia**
  Source: Reuters Industry Breifing
  Date: July 04, 2000

- **Gulf war service not associated with SLE, ALS or fibromyalgia**
  Source: Reuters Medical News
  Date: June 12, 2000

- **Few patients in Belgium attribute chronic fatigue or fibromyalgia to physical causes alone**
  Source: Reuters Medical News
  Date: May 17, 2000

- **Growth Hormone Deficiency Linked To Fibromyalgia Symptoms**
  Source: Reuters Medical News
  Date: April 15, 1998

- **Metabolic Abnormalities Of Quadriceps Detected In Fibromyalgia**
  Source: Reuters Medical News
  Date: April 03, 1998

- **Cognitive Behavioral Therapy A Beneficial Adjunct In Fibromyalgia**
  Source: Reuters Medical News
  Date: March 24, 1998

- **Fibromyalgia Identified As Risk Factor For Osteoporosis**
  Source: Reuters Medical News
  Date: January 28, 1998

- **Primary Juvenile Fibromyalgia Not A Psychogenic Condition**
  Source: Reuters Medical News
  Date: April 23, 1997

- **Intravenous Lidocaine Temporarily Relieves Fibromyalgia Pain**
  Source: Reuters Medical News
  Date: February 05, 1997

- **Brain Chemical Tied To Fibromyalgia**
  Source: Reuters Health eLine
  Date: October 21, 1996

- **Fluoxetine and Amitriptyline Effective In Treatment Of Fibromyalgia**
  Source: Reuters Medical News
  Date: October 10, 1995

The NIH

Within MEDLINEplus, the NIH has made an agreement with the New York Times Syndicate, the AP News Service, and Reuters to deliver news that can be browsed by the public. Search news releases at **http://www.nlm.nih.gov/medlineplus/alphanews_a.html**. MEDLINEplus allows you to browse across an alphabetical index. Or you can search by date at the following Web page: **http://www.nlm.nih.gov/medlineplus/newsbydate.html**. Often, news items are indexed by MEDLINEplus within its search engine.

Business Wire

Business Wire is similar to PR Newswire. To access this archive, simply go to **http://www.businesswire.com/**. You can scan the news by industry category or company name.

Market Wire

Market Wire is more focused on technology than the other wires. To browse the latest press releases by topic, such as alternative medicine, biotechnology, fitness, healthcare, legal, nutrition, and pharmaceuticals, access Market Wire's Medical/Health channel at **http://www.marketwire.com/mw/release_index?channel=MedicalHealth**. Or simply go to Market Wire's home page at **http://www.marketwire.com/mw/home**, type "fibromyalgia" (or synonyms) into the search box, and click on "Search News." As this service is technology oriented, you may wish to use it when searching for press releases covering diagnostic procedures or tests.

Search Engines

Medical news is also available in the news sections of commercial Internet search engines. See the health news page at Yahoo (**http://dir.yahoo.com/Health/News_and_Media/**), or

you can use this Web site's general news search page at **http://news.yahoo.com/**. Type in "fibromyalgia" (or synonyms). If you know the name of a company that is relevant to fibromyalgia, you can go to any stock trading Web site (such as **http://www.etrade.com/**) and search for the company name there. News items across various news sources are reported on indicated hyperlinks. Google offers a similar service at **http://news.google.com/**.

BBC

Covering news from a more European perspective, the British Broadcasting Corporation (BBC) allows the public free access to their news archive located at **http://www.bbc.co.uk/**. Search by "fibromyalgia" (or synonyms).

Newsletter Articles

Use the Combined Health Information Database, and limit your search criteria to "newsletter articles." Again, you will need to use the "Detailed Search" option. Go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. Go to the bottom of the search page where "You may refine your search by." Select the dates and language that you prefer. For the format option, select "Newsletter Article." Type "fibromyalgia" (or synonyms) into the "For these words:" box. You should check back periodically with this database as it is updated every three months. The following is a typical result when searching for newsletter articles on fibromyalgia:

- **Post-Traumatic Fibromyalgia**

  Source: Fibromyalgia Aware. p. 24-27. September-October 2002.

  Contact: Available from National Fibromyalgia Association. 2238 N. Glassell Street, Orange, CA 92865. (714) 921-0150.

  Summary: This newsletter article discusses post-traumatic fibromyalgia, a type of fibromyalgia caused by injury. Studies show that fibromyalgia develops after whiplash injuries caused by car accidents, work-related injuries, sports or recreational injuries, fractures, surgery, and head injuries. Medical literature shows examples of persistant pain after trauma. Studies have found that fibromyalgia develops in 25 percent of patients with neck injuries and 2 percent of patients with leg injuries. Most traumatic injuries heal within six weeks to six months but if pain is still present after that time it is likely that fibromyalgia will develop. Post-traumatic fibromyalgia is a result of changes in pain pathways. The central nervous system becomes sensitized so that spontaneous pain is generated, and amplified and normal sensory input is interpreted as painful. The patient with post-traumatic pain may develop the soft tissue tender points that are used to diagnose fibromyalgia not preceded by trauma.

- **Atlas Vertebral Subluxation Syndrome [and] Its Relationship to Fibromyalgia, The**

  Source: Fibromyalgia Frontiers. 9(2): 7-9. 2001.

  Contact: Available from National Fibromyalgia Partnership, Inc. 140 Zinn Way, Linden, VA 22642-5609. (866) 725-4404 toll-free. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org.

Summary: This newsletter article provides health professionals with information on the relationship between Atlas Vertebral Subluxation Syndrome and fibromyalgia. New evidence is pointing to a neurological component to fibromyalgia. The article contends that Atlas Vertebral Subluxation Syndrome is the link between the nervous system and fibromyalgia. When the weight of the head is not perfectly centered on top of the neck, most directly the atlas, the shift of weight can cause body imbalance, a biomechanical distortion through the rest of the spine and skeletal structure. This structural imbalance may result in a spinal cord compression syndrome and create biomechanical, muscular, and neurological changes. The article presents the major mechanisms by which a misalignment of the upper cervical area of the spine can produce nerve interference and possible nerve dysfunction and lists symptoms of Atlas Vertebral Subluxation Syndrome that may parallel those of fibromyalgia. In addition, the article explains how Atlas Vertebral Subluxation Syndrome is diagnosed and comments on treatment outcome. 2 figures and 4 references.

- **Central Sensitivity Syndromes: A Unified Concept for Fibromyalgia and Other Similar Maladies**

  Source: Fibromyalgia Frontiers. 9(3): 3-8,33-34. 2001.

  Contact: Available from National Fibromyalgia Partnership, Inc. 140 Zinn Way, Linden, VA 22642-5609. (866) 725-4404 toll-free. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org.

  Summary: This newsletter article provides health professionals with information on central sensitivity syndrome (CSS). Fibromyalgia syndrome (FMS) and similar conditions, for example, myofascial pain syndrome, irritable bowel syndrome, chronic fatigue syndrome, headaches, and restless legs syndrome, share several characteristics, including pain, poor sleep, fatigue, hyperalgesia, and an absence of structural tissue pathology. These syndromes are bound by a common pathophysiological mechanism, that is, neurohormonal dysfunctions, which is generally different from those seen in psychiatric diseases. Central nervous system (CNS) sensitivity, either intrinsic or due to CNS neuroplasticity secondary to peripheral stimuli, results in amplified, widespread, and persistent pain. This central sensitivity seems to be the most important aberration among the neuroendocrine dysfunctions. Thus, FMS and other overlapping syndromes as a group have been called CSS. The article reviews the history of the concept of CSS, presents CSS as a conceptual paradigm, and discusses its significance. 1 figure and 72 references. (AA-M).

- **Fibromyalgia [and] Chronic Fatigue Syndrome: Related Syndromes?**

  Source: FM Aware. 3(2): 15-16. Summer 2000.

  Contact: Available from National Fibromyalgia Awareness Campaign. c/o Community Partners, 606 S. Olive Street, Suite 2400, Los Angeles, CA 90014.

  Summary: This newsletter article provides people who have fibromyalgia syndrome (FMS) or chronic fatigue syndrome (CFS) with information on the possible relationship between these disorders. Many doctors and researchers are convinced that FMS and CFS are different manifestations of the same underlying disorder. Although both have been acknowledged as real physical diseases, neither one has a known cause or cure. The article presents the features of and diagnostic criteria for these disorders and outlines the similarities and differences between them. One researcher views FMS and CFS as part of a large spectrum of conditions that he calls Dysregulation Spectrum syndrome. Other researchers have shown that FMS and CFS overlap in patients by as much as 75

percent. Studies have also revealed that many associated disorders and underlying abnormalities are common to both illnesses. More research is needed about both conditions before it can definitively be determined that FMS and CFS are manifestations of a similar disease mechanism.

- **Fibromyalgia Syndrome: Feeling More Pain**

  Source: Harvard Health Letter. 24(12): 4-5. October 1999.

  Contact: Available from Harvard Health Letter, P.O. Box 380, Department BI, Boston, MA 02117. (800) 829-9045 or (617) 432-1485. E-mail: harvardmed@palmcoastd.com.

  Summary: This newsletter article provides people who have fibromyalgia with information on the causes, diagnosis, and treatment of this disorder. Although many people think that fibromyalgia is a muscle disease, researchers say that it is actually a disorder of pain perception caused by changes in the central nervous system itself that lead to heightened pain. The existence of pain and tenderness in 11 of 18 spots in the muscles of the neck, arm, back, hip, leg, and foot help doctors validate a diagnosis based on a history of chronic pain, fatigue, symptoms associated with sleep disturbance, and headaches. Women, especially older women, are much more likely to have fibromyalgia than men. Although a discrete cause for fibromyalgia has not been found, research has shown that people who have fibromyalgia have abnormal levels of various hormones, including low levels of human growth hormone. In addition, the central sensitization theory of chronic pain may also help explain fibromyalgia. Effective treatment begins with giving people who have fibromyalgia a firm diagnosis and making sure they stay active. Tricyclic antidepressants seem to work for some patients, but their effectiveness may wear off. Exercise seems to help patients more than simple stretching and relaxation. Cognitive-behavioral treatment and stress reduction programs may be used to help patients cope with their condition. 1 table.

- **[Fibromyalgia, Myofascial Pain Syndrome, or All of the Above]**

  Source: Fibromyalgia Frontiers. 7(7): 1-2,4-7. November-December 1999.

  Contact: Available from National Fibromyalgia Partnership. 140 Zinn Way, Linden, VA 22642-5609. Toll-free phone (866) 725-4404. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org.

  Summary: This newsletter article provides people who have fibromyalgia with information on the working clinical definitions of fibromyalgia syndrome (FMS) and myofascial pain syndrome (MFPS), the differences and similarities between these conditions, and their causes. In patients with FMS, at least 11 of 18 tender points are demonstrated when carefully and reproducibly palpated with consistent pressure. Sleep may be adequate but is nonrestorative. FMS seems to affect the entire body and is not restricted to a specific region. In MFPS, trigger points are found in taut bands within a muscle after careful palpation. When a trigger point is palpated, the patient often notes pain at the tender point site, as well as pain in a reference zone. Important concepts in the proper diagnosis of FMS and MFPS are listening to the patient while taking a complete history and doing an appropriate physical examination. All pharmacologic and nonpharmacologic treatment regimens should be considered for patients with FMS. The clinical aim of treatment in patients who have MFPS is to restore normal resting length, as well as adequate strength and endurance, to affected muscles. This is achieved by inactivating tender points through heat and gentle stretching. Other methods of inactivation include injection, ischemic pressure, or, occasionally, acupuncture. Medications are of relatively limited use in patients who have pure MFPS. The

bioimploded posture of many MFPS patients must also be corrected for treatments to be successful in the long term. A better understanding of the sympathetic nervous system will lead to additional knowledge about FMS and MFPS. 2 references.

- **CNS Myalgia: A New Paradigm for Fibromyalgia**

  Source: Fibromyalgia Frontiers. 7(5): 1-3,5. September-October 1999.

  Contact: Available from National Fibromyalgia Partnership. 140 Zinn Way, Linden, VA 22642-5609. Toll-free phone (866) 725-4404. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org.

  Summary: This newsletter article provides health professionals and people who have fibromyalgia with the views of a team of North American researchers who participated in a seminar sponsored by the Fibromyalgia Association of Greater Washington. One member of the team views fibromyalgia (FM) as a largely neurological condition that may first involve an injury to the muscles or soft tissues but is sustained thereafter by brain defenses that continue to compensate for the insult that has been received. This researcher argues that FM can be more accurately described as central nervous system myalgia. Another researcher has found that patients with FM seem to experience puzzling muscle cocontractions. For example, a simple turn of the head seems to fire muscles at rest in distant parts of the body in an inappropriate manner. This researcher also believes that the generalized body pain indicative of fibromyalgia indicates brain involvement. He has found characteristic spikes in patients with FM similar to those seen in patients with viral infections. Unlike patients with viral infections who return to normal once their virus is resolved, patients with FM seem to get stuck in this brain state. The third member of the team has observed the effects of the Flexyx Neurotherapy System (FNS) on patients with fibromyalgia. The team is currently embarking on a large, double blind, placebo controlled study that will examine the effects of FNS on patients with fibromyalgia.

- **Americans With Disabilities Act [ADA]: What Persons With Fibromyalgia Need To Know**

  Source: Fibromyalgia Frontiers. 7(1): 9-13. January-February 1999.

  Contact: Available from National Fibromyalgia Partnership. 140 Zinn Way, Linden, VA 22642-5609. Toll-free phone (866) 725-4404. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org.

  Summary: This newsletter article uses a question and answer format to provide people who have fibromyalgia with information on their basic rights under the employment provisions of the Americans with Disabilities Act (ADA). This civil rights law passed in 1990 prohibits discrimination against people who have disabilities with regard to employment; state and local government programs, services, and transportation; public accommodations; and telecommunications. The article explains which employers are covered by the ADA, who is protected from employment discrimination under the ADA, and who is a qualified individual with a disability under the ADA. Other topics include what a reasonable accommodation is, who decides what is reasonable, when to disclose information about fibromyalgia to a prospective or current employer, and how to inform an employer about fibromyalgia. The article also provides some examples of reasonable accommodations and presents some sample accommodation scenarios pertinent to people who have chronic pain and fibromyalgia syndrome. The article then answers questions about the legality of being asked by a prospective employer to take a physical examination and of an employer's establishing specific attendance and leave

policies. In addition, the article discusses undue hardship, tax deductions or credits for businesses hiring people with disabilities, challenges to an unlawful employment practice, and available resources. 2 tables.

- **Understanding Fibromyalgia**

  Source: Fibromyalgia Frontiers. 6(6): 1-4,7-10. November-December 1998.

  Contact: Available from National Fibromyalgia Partnership. 140 Zinn Way, Linden, VA 22642-5609. Toll-free phone (866) 725-4404. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org.

  Summary: This newsletter article provides people who have fibromyalgia with information on this chronic pain state in which the nerve stimuli causing pain originate mainly in the muscles. In humans, the components of pain are an unconscious reflex avoidance reaction that occurs before the actual awareness of the pain sensation and the actual experience of the pain itself. Pain has both sensory and affective or evaluative components. In people who have chronic pain, the linear relationship between nociception and pain experience is inappropriate or even absent. The phenomenon of windup, in which repeated stimulation of a peripheral nerve results in a progressive buildup of the amplitude of the electrical response recorded in second order dorsal horn neurons, is crucial to understanding chronic pain via the mechanism of central sensitization. Central sensitization is an increased activation of second order neurons in the spinal cord resulting from injury or inflammation induced activation of peripheral nociceptors. Nociceptive specific and wide dynamic range neurons are involved in central sensitization. The central nervous system of people who have ongoing pain or have had previous pain experiences may be permanently altered as a result of changes that can now be understood at the physiological, molecular, and structural levels. The emotional components of pain include past experiences, genetic factors, general state of health, the presence of depression and other psychological diagnoses, coping mechanisms, and beliefs and fears about the diagnosis. 4 figures and 28 references.

- **Fibromyalgia Syndrome. Coping With Loss**

  Source: Observer. 49(1):1,4; Spring 1997.

  Contact: Arthritis Foundation, Rocky Mountain Chapter.

  Summary: This newsletter article for individuals with fibromyalgia syndrome (FMS) offers suggestions for coping with the feelings of loss they may experience. FMS sufferers need to acknowledge that significant loss accompanies FMS because failure to do so may result in them taxing their physical and emotional resources. Healthy ways to express grief over the losses that FMS brings include participating in self help groups, writing in a journal about feelings of sadness and anger, creating a scrapbook of photographs to honor the memories from an active life, and talking with a physician or qualified mental health professional.

- **Fibromyalgia Syndrome: Approaches to Management**

  Source: Bulletin on the Rheumatic Diseases. 45(3):1-4. May 1996.

  Contact: Arthritis Foundation, 1314 Spring Street, NW, Atlanta, GA 30309. (404) 872-7100. Fax (404) 872-9559.

  Summary: This newsletter article for health professionals discusses therapeutic approaches to controlling the symptoms of fibromyalgia syndrome (FMS). The

prominent symptom of FMS is widespread pain in muscles, ligaments, bursae, and tendons. FMS may coexist with rheumatic and other conditions. No single treatment is effective in controlling the symptoms of FMS. A management approach that includes many different components is described. This approach involves having an accepting attitude toward patients with the disorder, conducting a comprehensive clinical evaluation to establish an accurate diagnosis, educating the patient so that he or she can be actively involved in the process of self care, introducing the patient to a routine progressive exercise program, and using medications. The issue of follow-up visits following the diagnosis is also addressed. 5 references and 1 table.

- **Disturbances of Hearing And Balance in Fibromyalgia**

  Source: Fibromyalgia Frontiers. 4(2): 1-2, 12-13. Spring 1996.

  Contact: Available from Fibromyalgia Association of Greater Washington, Inc. 12210 Fairfax Towne Center, Suite 500, Fairfax, VA 22033. (703) 790-2324.

  Summary: This article summarizes disturbances of hearing and balance in fibromyalgia, an enigmatic syndrome of unknown etiology and pathophysiology. Widespread and chronic muscular pain is a cardinal symptom, but fatigue and symptoms of autonomic dysfunction are common, as are other symptoms including sleep disturbances, headache, disturbed memory, difficulties with concentration, vertigo/dizziness, and tinnitus. The author reports on a group of 168 patients with chronic pain (141 women, 27 men). The author performed an otological examination and reports on the patient histories, including questions about vertigo, dizziness, and disturbances of equilibrium and hearing. Balance problems were very common, being present in four-fifths of the patients with fibromyalgia. The author concludes that disequilibrium should be included as an important symptom of fibromyalgia, along with chronic muscular pain and fatigue. 1 figure.

- **Fibromyalgia, Myofascial Pain Syndrome, or All of the Above**

  Source: Fibromyalgia Frontiers. 7(7): 1-2, 4, 7. November-December 1999.

  Contact: Available from Fibromyalgia Association of Greater Washington, Inc. 13203 Valley Drive, Woodbridge, VA 22191-1531.

  Summary: People with chronic pain frequently see many practitioners in their quest for a diagnosis of their disorders and relief from their symptoms. Too often, the patient is seen by a practitioner who uses the terms fibromyalgia syndrome (FMS) and myofascial pain syndrome (MFPS) interchangeably, demonstrating a lack of understanding of the significant differences in symptoms, signs, treatment, and prognosis between these two conditions. In this newsletter article, the author presents working clinical definitions of these two conditions, followed by a discussion of their differences and similarities. The author notes that a complicating issue is that patients with FMS almost always also have MFPS. The reverse can occur, but is much less common. The most important components of proper diagnosis in these conditions are listening to the patient while taking a complete history and doing an appropriate physical examination, including an extensive palpation of appropriate muscles (consistent with the patient's complaint). The treatment regimens include medications, exercise, improved sleep, and diagnosis of concomitant diseases. The author also theorizes about the underlying causes of FMS and MFPS.

Academic Periodicals covering Fibromyalgia

Numerous periodicals are currently indexed within the National Library of Medicine's PubMed database that are known to publish articles relating to fibromyalgia. In addition to these sources, you can search for articles covering fibromyalgia that have been published by any of the periodicals listed in previous chapters. To find the latest studies published, go to **http://www.ncbi.nlm.nih.gov/pubmed**, type the name of the periodical into the search box, and click "Go."

If you want complete details about the historical contents of a journal, you can also visit the following Web site: **http://www.ncbi.nlm.nih.gov/entrez/jrbrowser.cgi**. Here, type in the name of the journal or its abbreviation, and you will receive an index of published articles. At **http://locatorplus.gov/**, you can retrieve more indexing information on medical periodicals (e.g. the name of the publisher). Select the button "Search LOCATORplus." Then type in the name of the journal and select the advanced search option "Journal Title Search."

APPENDICES

APPENDIX A. PHYSICIAN RESOURCES

Overview

In this chapter, we focus on databases and Internet-based guidelines and information resources created or written for a professional audience.

NIH Guidelines

Commonly referred to as "clinical" or "professional" guidelines, the National Institutes of Health publish physician guidelines for the most common diseases. Publications are available at the following by relevant Institute[13]:

- Office of the Director (OD); guidelines consolidated across agencies available at **http://www.nih.gov/health/consumer/conkey.htm**
- National Institute of General Medical Sciences (NIGMS); fact sheets available at **http://www.nigms.nih.gov/news/facts/**
- National Library of Medicine (NLM); extensive encyclopedia (A.D.A.M., Inc.) with guidelines: **http://www.nlm.nih.gov/medlineplus/healthtopics.html**
- National Cancer Institute (NCI); guidelines available at **http://www.cancer.gov/cancerinfo/list.aspx?viewid=5f35036e-5497-4d86-8c2c-714a9f7c8d25**
- National Eye Institute (NEI); guidelines available at **http://www.nei.nih.gov/order/index.htm**
- National Heart, Lung, and Blood Institute (NHLBI); guidelines available at **http://www.nhlbi.nih.gov/guidelines/index.htm**
- National Human Genome Research Institute (NHGRI); research available at **http://www.genome.gov/page.cfm?pageID=10000375**
- National Institute on Aging (NIA); guidelines available at **http://www.nia.nih.gov/health/**

[13] These publications are typically written by one or more of the various NIH Institutes.

- National Institute on Alcohol Abuse and Alcoholism (NIAAA); guidelines available at **http://www.niaaa.nih.gov/publications/publications.htm**
- National Institute of Allergy and Infectious Diseases (NIAID); guidelines available at **http://www.niaid.nih.gov/publications/**
- National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS); fact sheets and guidelines available at **http://www.niams.nih.gov/hi/index.htm**
- National Institute of Child Health and Human Development (NICHD); guidelines available at **http://www.nichd.nih.gov/publications/pubskey.cfm**
- National Institute on Deafness and Other Communication Disorders (NIDCD); fact sheets and guidelines at **http://www.nidcd.nih.gov/health/**
- National Institute of Dental and Craniofacial Research (NIDCR); guidelines available at **http://www.nidr.nih.gov/health/**
- National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK); guidelines available at **http://www.niddk.nih.gov/health/health.htm**
- National Institute on Drug Abuse (NIDA); guidelines available at **http://www.nida.nih.gov/DrugAbuse.html**
- National Institute of Environmental Health Sciences (NIEHS); environmental health information available at **http://www.niehs.nih.gov/external/facts.htm**
- National Institute of Mental Health (NIMH); guidelines available at **http://www.nimh.nih.gov/practitioners/index.cfm**
- National Institute of Neurological Disorders and Stroke (NINDS); neurological disorder information pages available at **http://www.ninds.nih.gov/health_and_medical/disorder_index.htm**
- National Institute of Nursing Research (NINR); publications on selected illnesses at **http://www.nih.gov/ninr/news-info/publications.html**
- National Institute of Biomedical Imaging and Bioengineering; general information at **http://grants.nih.gov/grants/becon/becon_info.htm**
- Center for Information Technology (CIT); referrals to other agencies based on keyword searches available at **http://kb.nih.gov/www_query_main.asp**
- National Center for Complementary and Alternative Medicine (NCCAM); health information available at **http://nccam.nih.gov/health/**
- National Center for Research Resources (NCRR); various information directories available at **http://www.ncrr.nih.gov/publications.asp**
- Office of Rare Diseases; various fact sheets available at **http://rarediseases.info.nih.gov/html/resources/rep_pubs.html**
- Centers for Disease Control and Prevention; various fact sheets on infectious diseases available at **http://www.cdc.gov/publications.htm**

NIH Databases

In addition to the various Institutes of Health that publish professional guidelines, the NIH has designed a number of databases for professionals.[14] Physician-oriented resources provide a wide variety of information related to the biomedical and health sciences, both past and present. The format of these resources varies. Searchable databases, bibliographic citations, full-text articles (when available), archival collections, and images are all available. The following are referenced by the National Library of Medicine:[15]

- **Bioethics:** Access to published literature on the ethical, legal, and public policy issues surrounding healthcare and biomedical research. This information is provided in conjunction with the Kennedy Institute of Ethics located at Georgetown University, Washington, D.C.: **http://www.nlm.nih.gov/databases/databases_bioethics.html**
- **HIV/AIDS Resources:** Describes various links and databases dedicated to HIV/AIDS research: **http://www.nlm.nih.gov/pubs/factsheets/aidsinfs.html**
- **NLM Online Exhibitions:** Describes "Exhibitions in the History of Medicine": **http://www.nlm.nih.gov/exhibition/exhibition.html**. Additional resources for historical scholarship in medicine: **http://www.nlm.nih.gov/hmd/hmd.html**
- **Biotechnology Information:** Access to public databases. The National Center for Biotechnology Information conducts research in computational biology, develops software tools for analyzing genome data, and disseminates biomedical information for the better understanding of molecular processes affecting human health and disease: **http://www.ncbi.nlm.nih.gov/**
- **Population Information:** The National Library of Medicine provides access to worldwide coverage of population, family planning, and related health issues, including family planning technology and programs, fertility, and population law and policy: **http://www.nlm.nih.gov/databases/databases_population.html**
- **Cancer Information:** Access to cancer-oriented databases: **http://www.nlm.nih.gov/databases/databases_cancer.html**
- **Profiles in Science:** Offering the archival collections of prominent twentieth-century biomedical scientists to the public through modern digital technology: **http://www.profiles.nlm.nih.gov/**
- **Chemical Information:** Provides links to various chemical databases and references: **http://sis.nlm.nih.gov/Chem/ChemMain.html**
- **Clinical Alerts:** Reports the release of findings from the NIH-funded clinical trials where such release could significantly affect morbidity and mortality: **http://www.nlm.nih.gov/databases/alerts/clinical_alerts.html**
- **Space Life Sciences:** Provides links and information to space-based research (including NASA): **http://www.nlm.nih.gov/databases/databases_space.html**
- **MEDLINE:** Bibliographic database covering the fields of medicine, nursing, dentistry, veterinary medicine, the healthcare system, and the pre-clinical sciences: **http://www.nlm.nih.gov/databases/databases_medline.html**

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[14] Remember, for the general public, the National Library of Medicine recommends the databases referenced in MEDLINE*plus* (**http://medlineplus.gov/** or **http://www.nlm.nih.gov/medlineplus/databases.html**).

[15] See **http://www.nlm.nih.gov/databases/databases.html**.

- **Toxicology and Environmental Health Information (TOXNET):** Databases covering toxicology and environmental health: **http://sis.nlm.nih.gov/Tox/ToxMain.html**
- **Visible Human Interface:** Anatomically detailed, three-dimensional representations of normal male and female human bodies: **http://www.nlm.nih.gov/research/visible/visible_human.html**

The NLM Gateway[16]

The NLM (National Library of Medicine) Gateway is a Web-based system that lets users search simultaneously in multiple retrieval systems at the U.S. National Library of Medicine (NLM). It allows users of NLM services to initiate searches from one Web interface, providing one-stop searching for many of NLM's information resources or databases.[17] To use the NLM Gateway, simply go to the search site at **http://gateway.nlm.nih.gov/gw/Cmd**. Type "fibromyalgia" (or synonyms) into the search box and click "Search." The results will be presented in a tabular form, indicating the number of references in each database category.

Results Summary

Category	Items Found
Journal Articles	3033
Books / Periodicals / Audio Visual	76
Consumer Health	32
Meeting Abstracts	11
Other Collections	1
Total	3153

HSTAT[18]

HSTAT is a free, Web-based resource that provides access to full-text documents used in healthcare decision-making.[19] These documents include clinical practice guidelines, quick-reference guides for clinicians, consumer health brochures, evidence reports and technology assessments from the Agency for Healthcare Research and Quality (AHRQ), as well as AHRQ's Put Prevention Into Practice.[20] Simply search by "fibromyalgia" (or synonyms) at the following Web site: **http://text.nlm.nih.gov**.

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[16] Adapted from NLM: **http://gateway.nlm.nih.gov/gw/Cmd?Overview.x**.

[17] The NLM Gateway is currently being developed by the Lister Hill National Center for Biomedical Communications (LHNCBC) at the National Library of Medicine (NLM) of the National Institutes of Health (NIH).

[18] Adapted from HSTAT: **http://www.nlm.nih.gov/pubs/factsheets/hstat.html**.

[19] The HSTAT URL is **http://hstat.nlm.nih.gov/**.

[20] Other important documents in HSTAT include: the National Institutes of Health (NIH) Consensus Conference Reports and Technology Assessment Reports; the HIV/AIDS Treatment Information Service (ATIS) resource documents; the Substance Abuse and Mental Health Services Administration's Center for Substance Abuse Treatment (SAMHSA/CSAT) Treatment Improvement Protocols (TIP) and Center for Substance Abuse Prevention (SAMHSA/CSAP) Prevention Enhancement Protocols System (PEPS); the Public Health Service (PHS) Preventive Services Task Force's *Guide to Clinical Preventive Services*; the independent, nonfederal Task Force on Community Services' *Guide to Community Preventive Services*; and the Health Technology Advisory Committee (HTAC) of the Minnesota Health Care Commission (MHCC) health technology evaluations.

Coffee Break: Tutorials for Biologists[21]

Coffee Break is a general healthcare site that takes a scientific view of the news and covers recent breakthroughs in biology that may one day assist physicians in developing treatments. Here you will find a collection of short reports on recent biological discoveries. Each report incorporates interactive tutorials that demonstrate how bioinformatics tools are used as a part of the research process. Currently, all Coffee Breaks are written by NCBI staff.[22] Each report is about 400 words and is usually based on a discovery reported in one or more articles from recently published, peer-reviewed literature.[23] This site has new articles every few weeks, so it can be considered an online magazine of sorts. It is intended for general background information. You can access the Coffee Break Web site at the following hyperlink: **http://www.ncbi.nlm.nih.gov/Coffeebreak/**.

Other Commercial Databases

In addition to resources maintained by official agencies, other databases exist that are commercial ventures addressing medical professionals. Here are some examples that may interest you:

- **CliniWeb International:** Index and table of contents to selected clinical information on the Internet; see **http://www.ohsu.edu/cliniweb/**.
- **Medical World Search:** Searches full text from thousands of selected medical sites on the Internet; see **http://www.mwsearch.com/**.

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[21] Adapted from **http://www.ncbi.nlm.nih.gov/Coffeebreak/Archive/FAQ.html**.

[22] The figure that accompanies each article is frequently supplied by an expert external to NCBI, in which case the source of the figure is cited. The result is an interactive tutorial that tells a biological story.

[23] After a brief introduction that sets the work described into a broader context, the report focuses on how a molecular understanding can provide explanations of observed biology and lead to therapies for diseases. Each vignette is accompanied by a figure and hypertext links that lead to a series of pages that interactively show how NCBI tools and resources are used in the research process.

APPENDIX B. PATIENT RESOURCES

Overview

Official agencies, as well as federally funded institutions supported by national grants, frequently publish a variety of guidelines written with the patient in mind. These are typically called "Fact Sheets" or "Guidelines." They can take the form of a brochure, information kit, pamphlet, or flyer. Often they are only a few pages in length. Since new guidelines on fibromyalgia can appear at any moment and be published by a number of sources, the best approach to finding guidelines is to systematically scan the Internet-based services that post them.

Patient Guideline Sources

The remainder of this chapter directs you to sources which either publish or can help you find additional guidelines on topics related to fibromyalgia. Due to space limitations, these sources are listed in a concise manner. Do not hesitate to consult the following sources by either using the Internet hyperlink provided, or, in cases where the contact information is provided, contacting the publisher or author directly.

The National Institutes of Health

The NIH gateway to patients is located at **http://health.nih.gov/**. From this site, you can search across various sources and institutes, a number of which are summarized below.

Topic Pages: MEDLINEplus

The National Library of Medicine has created a vast and patient-oriented healthcare information portal called MEDLINEplus. Within this Internet-based system are "health topic pages" which list links to available materials relevant to fibromyalgia. To access this system, log on to **http://www.nlm.nih.gov/medlineplus/healthtopics.html**. From there you can either search using the alphabetical index or browse by broad topic areas. Recently, MEDLINEplus listed the following when searched for "fibromyalgia":

- Guides on fibromyalgia

  Fibromyalgia
  http://www.nlm.nih.gov/medlineplus/fibromyalgia.html

  Myositis
  http://www.nlm.nih.gov/medlineplus/myositis.html

- Other guides

  Arthritis
  http://www.nlm.nih.gov/medlineplus/arthritis.html

  Autoimmune Diseases
  http://www.nlm.nih.gov/medlineplus/autoimmunediseases.html

  Bursitis
  http://www.nlm.nih.gov/medlineplus/bursitis.html

  Carpal Tunnel Syndrome
  http://www.nlm.nih.gov/medlineplus/carpaltunnelsyndrome.html

  Chronic Fatigue Syndrome
  http://www.nlm.nih.gov/medlineplus/chronicfatiguesyndrome.html

  Heart Valve Diseases
  http://www.nlm.nih.gov/medlineplus/heartvalvediseases.html

  Hepatitis C
  http://www.nlm.nih.gov/medlineplus/hepatitisc.html

  Interstitial Cystitis
  http://www.nlm.nih.gov/medlineplus/interstitialcystitis.html

  Juvenile Rheumatoid Arthritis
  http://www.nlm.nih.gov/medlineplus/juvenilerheumatoidarthritis.html

  Lupus
  http://www.nlm.nih.gov/medlineplus/lupus.html

  Movement Disorders
  http://www.nlm.nih.gov/medlineplus/movementdisorders.html

  Muscle Disorders
  http://www.nlm.nih.gov/medlineplus/muscledisorders.html

  Neck Disorders and Injuries
  http://www.nlm.nih.gov/medlineplus/neckdisordersandinjuries.html

  Neuromuscular Disorders
  http://www.nlm.nih.gov/medlineplus/neuromusculardisorders.html

  Osteoarthritis
  http://www.nlm.nih.gov/medlineplus/osteoarthritis.html

  Reflex Sympathetic Dystrophy
  http://www.nlm.nih.gov/medlineplus/reflexsympatheticdystrophy.html

  Rheumatoid Arthritis
  http://www.nlm.nih.gov/medlineplus/rheumatoidarthritis.html

Rheumatoid Arthritis
http://www.nlm.nih.gov/medlineplus/tutorials/rheumatoidarthritisloader.html

Scleroderma
http://www.nlm.nih.gov/medlineplus/scleroderma.html

Within the health topic page dedicated to fibromyalgia, the following was listed:

- General/Overviews

  Fibromyalgia
  http://www.nlm.nih.gov/medlineplus/tutorials/fibromyalgialoader.html

  Fibromyalgia
  Source: Mayo Foundation for Medical Education and Research
  http://www.mayoclinic.com/invoke.cfm?id=DS00079

  Fibromyalgia: What It Is and How To Manage It
  Source: American Academy of Family Physicians
  http://familydoctor.org/handouts/070.html

- Treatment

  Fibromyalgia Medications
  Source: Arthritis Foundation
  http://www.arthritis.org/conditions/DrugGuide/about_fibromyalgia.asp

- Alternative Therapy

  Meditation
  Source: Arthritis Foundation
  http://www.arthritis.org/resources/arthritistoday/2001_archives/2001_01_02_meditation.asp

- Specific Conditions/Aspects

  Botox: Can It Treat Fibromyalgia?
  Source: Mayo Foundation for Medical Education and Research
  http://www.mayoclinic.com/invoke.cfm?id=AN00540

  What's in a Name: Fibromyalgia Versus Chronic Fatigue Syndrome (CFS)
  Source: Arthritis Foundation
  http://www.arthritis.org/resources/news/news_fibro_cfs.asp

- Law and Policy

  Americans With Disabilities Act: What Persons With Fibromyalgia Need to Know
  http://www.fmpartnership.org/documents/Disabilact.PDF

- Men

  It's a Guy Thing: Men with Fibromyalgia
  Source: National Fibromyalgia Association
  http://fmaware.org/patient/coping/men.htm

- Organizations

  American College of Rheumatology
  http://www.rheumatology.org/

  Arthritis Foundation
  http://www.arthritis.org/

  National Fibromyalgia Association
  http://fmaware.org/index.html

  National Fibromyalgia Partnership
  http://www.fmpartnership.org/FMPartnership.htm

  National Institute of Arthritis and Musculoskeletal and Skin Diseases
  http://www.niams.nih.gov/

- Research

  Progress and Opportunities in Fibromyalgia
  Source: Arthritis Foundation
  http://www.arthritis.org/research/research_program/Fibromyalgia/default.asp

You may also choose to use the search utility provided by MEDLINEplus at the following Web address: **http://www.nlm.nih.gov/medlineplus/**. Simply type a keyword into the search box and click "Search." This utility is similar to the NIH search utility, with the exception that it only includes materials that are linked within the MEDLINEplus system (mostly patient-oriented information). It also has the disadvantage of generating unstructured results. We recommend, therefore, that you use this method only if you have a very targeted search.

The Combined Health Information Database (CHID)

CHID Online is a reference tool that maintains a database directory of thousands of journal articles and patient education guidelines on fibromyalgia. CHID offers summaries that describe the guidelines available, including contact information and pricing. CHID's general Web site is **http://chid.nih.gov/**. To search this database, go to **http://chid.nih.gov/detail/detail.html**. In particular, you can use the advanced search options to look up pamphlets, reports, brochures, and information kits. The following was recently posted in this archive:

- **Fibromyalgia Syndrome (FMS): A Patient's Guide**

  Source: Tucson, AZ: Fibromyalgia Network. 2000. 6 p.

  Contact: Available from Fibromyalgia Network. P.O. Box 31750, Tucson, AZ 85751-1750. (800) 853-2929 or (520) 290-5508. Fax (520) 290-5550. Website: www.fmnetnews.com. PRICE: Single copy free; bulk orders available at cost.

  Summary: This pamphlet uses a question and answer format to provide people who have fibromyalgia syndrome (FMS) with information on the etiology, symptoms, diagnosis, and treatment of this widespread musculoskeletal pain and fatigue disorder. FMS affects more women than men. Although the cause of FMS remains unknown, many triggering events are thought to awaken an underlying physiological abnormality, including infection, trauma, and the development of another disorder. Theories about

the underlying physiological abnormality pertain to alterations in pain related chemical transmitters, immune system function, sleep physiology, and hormonal control. Symptoms and associated syndromes include pain, fatigue, sleep disorder, irritable bowel syndrome, chronic headaches, temporomandibular joint dysfunction syndrome, and multiple chemical sensitivities. Diagnosis is based on the finding of widespread pain in all four quadrants of the body for a minimum duration of 3 months and at least 11 of 18 tender points. Treatment is aimed at improving the quality of sleep and reducing pain. Lifestyle adjustments may help a patient conserve energy and minimize pain.

- **Getting the Most Out of Your Medicines: A Guide for Patients With FMS/CFS (Fibromyalgia Syndrome/Chronic Fatigue Syndrome)**

  Source: Tucson, AZ: Fibromyalgia Network. 2000. 82 p.

  Contact: Available from Fibromyalgia Network. P.O. Box 31750, Tucson, AZ 85751-1750. (800) 853-2929 or (520) 290-5508. Fax (520) 290-5550. Website: www.fmnetnews.com. PRICE: $10.00.

  Summary: This booklet provides people who have fibromyalgia syndrome (FMS) and chronic fatigue syndrome (CFS) with information on medications used to improve sleep, reduce pain, and minimize fatigue. The booklet explains the role of the central nervous system in controlling pain, sleep, and neuroendocrine/stress functions. This is followed by a discussion of the mechanism of action, dosage, and side effects of various drugs, including tricyclic antidepressants, benzodiazepines, muscle relaxants, sleeping aids, selective serotonin reuptake inhibitors, mild stimulants and neuromodulating drugs, nonsteroidal anti-inflammatory drugs, immune system modulators, calcium and sodium channel blockers, pain relievers, and antiyeast regimens. Other treatment modalities discussed include combination therapies, trigger point injections, and nutritive supplements. In addition, the booklet describes common associated syndromes and their treatment, including temporomandibular dysfunction syndrome, chronic headaches, irritable bowel and bladder syndromes, and dysautonomia. The booklet concludes with information on medicines for the future. A list of additional information resources is included. 6 figures, 4 tables, and 82 references.

- **Fibromyalgia Syndrome**

  Source: Atlanta, GA: Arthritis Foundation. 1997. 12 p.

  Contact: Available from Arthritis Foundation. P.O. Box 1616, Alpharetta, GA 30009-1616. (800) 207-8633. Fax (credit card orders only) (770) 442-9742. http://www.arthritis.org. PRICE: Single copy free from local Arthritis Foundation chapter (call 800-283-7800 for closest local chapter); bulk orders may be purchased from address above.

  Summary: This brochure for people with fibromyalgia syndrome uses a question and answer format to provide information on the symptoms, diagnosis, triggers, and treatment of this condition. It discusses how fibromyalgia mainly affects muscles and their attachments to bones, and can be triggered by physical or emotional trauma, or both. The syndrome is diagnosed on the basis of the medical history and a physical examination; widespread pain in combination with tenderness at specific locations is the key to diagnosis. It explains that treatment includes medications to diminish pain and improve sleep, exercise programs, relaxation techniques and other measures to ease muscle tension, and educational programs to help patients understand and manage

their condition. The brochure also provides information on the Arthritis Foundation. 2 figures.

- **Managing Fibromyalgia: Getting Past the Pain**

  Source: San Bruno, CA: StayWell Company. 1997. 6 p.

  Contact: Available from StayWell Company. 1100 Grundy Lane, San Bruno, CA 94066-3030. (800) 333-3032. Website: www.staywell.com. PRICE: Call or write for current pricing on single and bulk orders.

  Summary: This brochure provides people who have fibromyalgia with information on managing this chronic disorder that causes muscle pain and body stiffness. Symptoms include the presence of tender points, a burning or throbbing pain in many parts of the body, stiffness or aching all over the body, trouble sleeping, constant tiredness, headaches, and bowel problems. People who have fibromyalgia can feel better by following a treatment plan that includes gentle exercise and good sleep habits. Other ways to feel better include reducing or managing stress, maintaining health, and consulting a doctor about sleep problems. Medications also may be used to promote sleep and relieve pain.

- **Temporomandibular Joint Dysfunction and Its Relationship to the Fibromyalgia Patient**

  Source: Washington, DC: Fibromyalgia Association of Greater Washington. 1994. [2 p.].

  Contact: Available from Fibromyalgia Association of Greater Washington (FMAGW). 13203 Valley Drive, Woodbridge, VA 22191. (703) 790-2324. PRICE: Single copy free.

  Summary: This brochure outlines the relationship of temporomandibular joint dysfunction (TMD) and fibromylagia syndrome. The brochure stresses that TMD is a complex problem even for the otherwise healthy patient, but when it is combined with the multiple symptoms of a patient with fibromyalgia syndrome, it becomes difficult to diagnose and treat effectively without a team approach involving multiple disciplines. Because of the intricate neural pathways in and around the TM join and reflex referral arcs to far distant areas, the picture of TMD becomes complex when it is combined with the symptoms of fibromyalgia. The causes of TMD are varied and may include trauma, loss of teeth, improperly fitted dental appliances, improper orthodontic therapy, a variety of degenerative joint disease, growth and developmental problems, tumors, and bruxism (toothgrinding). Treatment ranges from simple appliance therapy along with warm, moist compresses, a soft diet and anti-inflammatory medication, to a multidisciplinary approach involving special x-rays, computerized measurement of jaw and muscle relationships and function, and specialized appliances along with physical therapy, and rheumatological evaluation. The brochure concludes that a dentist specializing in TMD or MPD (myofascial pain dysfunction) is necessary to determine the most appropriate therapy for each patient based on the presentation, severity, and dimensions of his or her symptoms and the nature of the problems present.

- **Juvenile Fibromyalgia Packet**

  Source: Linden, VA: National Fibromyalgia Partnership, Inc. 2001. [packet of several articles and booklets].

  Contact: Available from National Fibromyalgia Partnership, Inc. 140 Zinn Way, Linden, VA 22642-5609. (866) 725-4404 toll-free. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org. PRICE: $5.00.

Summary: This information packet, which consists of a booklet, several articles, a bibliography, and a resource list, provides school personnel and children who have fibromyalgia and their parents with information on this chronic disease. The booklet presents guidelines for schools so that personnel can construct an appropriate servicing plan for students who have chronic fatigue and immune dysfunction syndrome or fibromyalgia. The booklet addresses educational issues and accommodation, identifies children at risk, and provides a checklist for school nurses and others who evaluate problems in children in the school setting. One article describes the characteristics of fibromyalgia in children and the special issues confronting children who have this disorder. Another article offers suggestions on parenting a child who has fibromyalgia. A third article focuses on diagnosing and treating fibromyalgia in children, managing a child's condition, and dealing with educational issues. Another article uses fantasy to educate children who have fibromyalgia on how to see their disability. The bibliography, compiled from a search of Entrez-PubMed (MEDLINE), lists articles on fibromyalgia and related diseases in children. The resource list presents organizations and Web sites that can be of help to young people with fibromyalgia and related conditions.

- **Men and Fibromyalgia Packet**

  Source: Linden, VA: National Fibromyalgia Partnership, Inc. 2001. [packet of several articles and booklets].

  Contact: Available from National Fibromyalgia Partnership, Inc. 140 Zinn Way, Linden, VA 22642-5609. (866) 725-4404 toll-free. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org. PRICE: $2.00.

  Summary: This information packet, which consists of several articles, a bibliography, and a resource list, provides men who have fibromyalgia with information on this chronic disease. One article presents comments from men who have fibromyalgia. Their comments demonstrate the isolation, frustration, and embarrassment they feel. Another article reports on an informal research study on fibromyalgia in men conducted by a person with a website devoted to fibromyalgia. Findings are presented in terms of the ages of the men affected; the causes or onset of fibromyalgia; the symptoms reported; other accompanying illnesses; medications and other treatments being used; exercise routines reported; and family, social, and sexual issues. The third article presents a personal account of a father who has fibromyalgia. The bibliography, compiled from a search of Entrez-PubMed (MEDLINE), lists articles on fibromyalgia, particularly those relevant to men. The resource list presents websites that can be of help to men who have fibromyalgia.

- **ABCs of Fibromyalgia: Explaining FM to Your Child**

  Source: Linden, VA: National Fibromyalgia Partnership, Inc. 1997. [1 booklet and 1 newsletter article].

  Contact: Available from National Fibromyalgia Partnership, Inc. 140 Zinn Way, Linden, VA 22642-5609. (866) 725-4404 toll-free. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org. PRICE: $8.00.

  Summary: This information packet, which consists of a newsletter article and a booklet, provides people with fibromyalgia with information on explaining this disorder to their children. The newsletter article presents a personal account of living with fibromyalgia and being a parent. The booklet, written for children ages 2 to 6, helps them learn about fibromyalgia by telling the story of a child whose mother has an invisible monster

named fibromonster. The child in the story explains how fibromonster makes the mother feel.

- **FM Monograph: Fibromyalgia Symptoms, Diagnosis, Treatment, and Research, 2001 ed. [FM Monograph: Fibromialgia sintomas, diagnostico, tratamientos e investigacion]**

  Source: Linden, VA: National Fibromyalgia Partnership. 2001. 21 p.

  Contact: Available from National Fibromyalgia Partnership. 140 Zinn Way, Linden, VA 22642-5609. Toll-free phone (866) 725-4404. Fax (540) 622-2998. E-mail: mail@fmpartnership.org. Website: www.fmpartnership.org. PRICE: $3.00 each; $2.50 each for 20 or more.

  Summary: This monograph, which is available in both English and Spanish, provides people who have fibromyalgia syndrome (FMS) with an overview of this chronic condition. Although FMS is most prevalent in adult women, it can also occur in children, men, and the elderly. Symptoms or syndromes associated with FMS include pain and fatigue, stiffness, increased headaches or facial pain, sleep disturbances, gastrointestinal complaints, genitourinary problems, paresthesia, temperature sensitivity, skin complaints, chest symptoms, disequilibrium, cognitive disorders, leg sensations, environmental sensitivity, and depression and anxiety. The official American College of Rheumatology (ACR) diagnostic criteria for FMS are a history of chronic, widespread, musculoskeletal pain for longer than 3 months in all 4 quadrants of the body and pain in 11 of 18 tender point sites on digital palpation. A complete medical history and physical examination by a physician are crucial for a correct diagnosis since routine laboratory and x-ray testing is usually normal in patients with FMS. Although there are limitations to the ACR criteria, these criteria, in conjunction with differential diagnosis, are still the most widely used diagnostic tool for FMS. The cause of FMS is currently unknown; however, research has shown that FMS often develops after a physical trauma. Not all cases of FMS can be considered posttraumatic fibromyalgia, so researchers continue to explore other possible causes, including heredity, infection, and abnormal levels of neurotransmitters or neurochemicals. Although FMS was once viewed as a discrete medical entity, FMS is being seen as a condition that overlaps significantly with certain other systemic illnesses. Among the most commonly used treatment strategies for FMS, used alone or in combination, are medications such as tricyclic agents, selective serotonin reuptake inhibitors, nonsteroidal anti-inflammatory drugs, analgesics, benzodiazepines, and certain sleep medications; physical modalities such as massage, myofascial release, trigger point therapy, craniosacral therapy, electroencephalogram drive stimulation, chiropractic, osteopathy, stretching, and aerobic exercise; and complementary therapies such as postural training, occupational therapy, relaxation therapy, nutrition, acupuncture, cognitive behavioral therapy, and commonsense measures. In the United Sates, the National Institutes of Health (NIH) is responsible for funding FMS research. Within the NIH, the institute most active in FMS research is the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). The monograph includes a list of organizations providing information on fibromyalgia related disorders. 31 references.

- **Information for Patients Living With Fibromyalgia**

  Source: American Family Physician. 62(7): 1587. October 1, 2000.

Contact: American Academy of Family Physicians. 11400 Tomahawk Creek Parkway, Leawood, KS 66211-2672. (800) 274-2237 or (913) 906-6000. E-mail: fp@aafp.org. Website: www.aafp.org.

Summary: This journal article uses a question and answer format to provide people who have fibromyalgia with information on its etiology, diagnosis, and treatment. This common condition causes pain in the muscles, joints, ligaments, and tendons. Although the cause of fibromyalgia is unknown, theories focus on not sleeping well and not exercising. Diagnosis is based on symptoms and physical examination. Treatment is aimed at relieving symptoms. Therapeutic options include taking medications to aid in sleep and relieve pain, eating well, exercising, and joining a support group. The article includes sources of additional information.

- **Fibromyalgia**

  Source: American College of Rheumatology. 2000. 2 p.

  Contact: American College of Rheumatology. 1800 Century Place, Suite 250, Atlanta, GA 30345. (404) 633-3777. Website: www.rheumatology.org. Email: acr@rheumatology.org.

  Summary: This fact sheet provides an overview of fibromyalgia, a condition of unknown origin that causes pain, stiffness, and fatigue in the muscles, tendons, and other soft tissue. Fibromyalgia may develop on its own or secondary to such conditions as rheumatoid arthritis or Lyme disease. This disease most often affects women, especially women of childbearing age. Diagnosis is based on the patient's description of ongoing, widespread pain, and pain and tenderness at specific tender point sites in the muscles. Although there is no cure, physical therapy, exercise, occupational therapy, and drug therapy are often beneficial.

- **Questions and Answers About Fibromyalgia**

  Source: Bethesda, MD: National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) Information Clearinghouse. 1997. 5 p.

  Contact: Available from National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) Information Clearinghouse. 1 AMS Circle, Bethesda, MD 20892-3675. (877) 226-4267 or (301) 495-4484. Fax (301) 718-6366. TTY (301) 565-2966. E-mail: NIAMSInfo@mail.nih.gov. Website: www.niams.nih.gov. PRICE: 1 to 25 copies free. Order Number: AR-91QA (fact sheet), or AR-91L QA (large print fact sheet).

  Summary: This fact sheet for people with fibromyalgia uses a question and answer format to provide information. It describes the symptoms of this chronic disorder, possible causes, how a doctor makes a diagnosis, and management of the syndrome. The fact sheet also describes current research on the causes and treatments for fibromyalgia by the National Institute of Arthritis and Musculoskeletal and Skin Diseases. It then refers the reader to voluntary health organizations that can provide additional information about fibromyalgia. A large print version of this fact sheet is also available.

- **Fibromyalgia: What It Is and How to Manage It**

  Source: American Family Physician. 52(3):853-854. September 1995.

  Contact: American Academy of Family Physicians. 11400 Tomahawk Creek Parkway, Leawood, KS 66211-2672. (800) 274-2237 or (913) 906-6000. E-mail: fp@aafp.org. Website: www.aafp.org.

Summary: This patient information sheet explains what fibromyalgia is, how it is diagnosed, and the drug therapy and patient actions designed to reveal the symptoms. The sheet indicates that fibromyalgia is a condition that causes pain in the muscles, joints, ligaments, and tendons. Increased sensitivity to pain is the main symptom. Drugs such as amitriptyline or cyclobenzaprine are used to reduce pain and other symptoms and improve sleep. Some of the most effective treatments for fibromyalgia are exercise and cutting back on alcohol and caffeine because stress and poor sleep make symptoms worse.

- **FMS/CFS (Fibromyalgia Syndrome/Chronic Fatigue Syndrome) in Young People Information Packet: A Guide for Parents**

  Source: Tucson, AZ: Fibromyalgia Network. 1994. 41 p.

  Contact: Available from Fibromyalgia Network. P.O. Box 31750, Tucson, AZ 85751-1750. (800) 853-2929 or (520) 290-5508. Fax (520) 290-5550. Website: www.fmnetnews.com. PRICE: Single copy free.

  Summary: This booklet provides children who have fibromyalgia syndrome (FMS)/chronic fatigue syndrome (CFS), their parents, and their caregivers with basic information on FMS/CFS and suggests ways of managing these syndromes. The booklet begins with a section on understanding FMS/CFS. Topics include the symptoms and diagnosis of FMS/CFS, FMS and CFS diagnostic criteria, difficulties in diagnosing children, the need for a diagnosis, and signs that prompt parents to seek a diagnosis. The booklet then focuses on treatment issues. The treatment of FMS/CFS begins by helping family members understand the diagnosis and be aware of what the symptoms entail. Possible therapies that may help minimize symptoms include rest, relaxation therapy, physical therapy, digestive aids, and medications for improving sleep. Managing the illness involves helping a child find new pastimes that can be enjoyed despite limits on activity, knowing when to protect a child and knowing when to stand back, encouraging visits from friends, involving the family, and participating in a child or partner self help group. In addition, the booklet addresses the issue of education. Topics include testing for special education purposes, scheduling, giving students who have FMS/CFS special classroom considerations, maintaining student involvement with the school, tutoring a child, keeping school records, communicating with the school, and getting outside help. 3 appendices.

The National Guideline Clearinghouse™

The National Guideline Clearinghouse™ offers hundreds of evidence-based clinical practice guidelines published in the United States and other countries. You can search this site located at **http://www.guideline.gov/** by using the keyword "fibromyalgia" (or synonyms). The following was recently posted:

- **Fibromyalgia**

  Source: Washington State Department of Labor and Industries - State/Local Government Agency [U.S.]; 1999; 5 pages

  http://www.guideline.gov/summary/summary.aspx?doc_id=1906&nbr=1132&string=fibromyalgia

Healthfinder™

Healthfinder™ is sponsored by the U.S. Department of Health and Human Services and offers links to hundreds of other sites that contain healthcare information. This Web site is located at **http://www.healthfinder.gov**. Again, keyword searches can be used to find guidelines. The following was recently found in this database:

- **Fibromyalgia Research: Challenges and Opportunities**

  Summary: This article discusses research studies in fibromyalgia, the breakthroughs that have been made so far towards finding a cure and efforts to manage the disease in the interim.

  Source: National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health

  http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=6199

- **Fibromyalgia Syndrome**

  Summary: Fibromyalgia Syndrome (FMS) is a disorder causing pain, tenderness, and stiffness in the muscles.

  Source: American Occupational Therapy Association

  http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=7314

- **Questions and Answers About Fibromyalgia**

  Summary: This consumer health information fact sheet answers basic questions about fibromyalgia -- what is it; how is it diagnosed; and what are the treatment options.

  Source: National Institute of Arthritis and Musculoskeletal and Skin Diseases, National Institutes of Health

  http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=3776

The NIH Search Utility

The NIH search utility allows you to search for documents on over 100 selected Web sites that comprise the NIH-WEB-SPACE. Each of these servers is "crawled" and indexed on an ongoing basis. Your search will produce a list of various documents, all of which will relate in some way to fibromyalgia. The drawbacks of this approach are that the information is not organized by theme and that the references are often a mix of information for professionals and patients. Nevertheless, a large number of the listed Web sites provide useful background information. We can only recommend this route, therefore, for relatively rare or specific disorders, or when using highly targeted searches. To use the NIH search utility, visit the following Web page: **http://search.nih.gov/index.html**.

NORD (The National Organization of Rare Disorders, Inc.)

NORD provides an invaluable service to the public by publishing short yet comprehensive guidelines on over 1,000 diseases. NORD primarily focuses on rare diseases that might not be covered by the previously listed sources. NORD's Web address is

http://www.rarediseases.org/. A complete guide on fibromyalgia can be purchased from NORD for a nominal fee.

Additional Web Sources

A number of Web sites are available to the public that often link to government sites. These can also point you in the direction of essential information. The following is a representative sample:

- AOL: **http://search.aol.com/cat.adp?id=168&layer=&from=subcats**
- Family Village: **http://www.familyvillage.wisc.edu/specific.htm**
- Google: **http://directory.google.com/Top/Health/Conditions_and_Diseases/**
- Med Help International: **http://www.medhelp.org/HealthTopics/A.html**
- Open Directory Project: **http://dmoz.org/Health/Conditions_and_Diseases/**
- Yahoo.com: **http://dir.yahoo.com/Health/Diseases_and_Conditions/**
- WebMD®Health: **http://my.webmd.com/health_topics**

Associations and Fibromyalgia

The following is a list of associations that provide information on and resources relating to fibromyalgia:

- **American Autoimmune Related Diseases Association, Inc**

  Telephone: (586) 776-3900

  Fax: (586) 776-3903

  Email: aarda@aarda.org

  Web Site: http://www.aarda.org/

  Background: The American Autoimmune Related Diseases Association, Inc. (AARDA) is a national not-for-profit voluntary health agency dedicated to bringing a national focus to autoimmunity, a major cause of serious chronic diseases. The Association was founded for the purposes of supporting research to find a cure for autoimmune diseases and providing services to affected individuals. In addition, the Association s goals include increasing the public s awareness that autoimmunity is the cause of more than 80 serious chronic diseases; bringing national focus and collaborative effort among state and national voluntary health groups that represent autoimmune diseases; and serving as a national advocate for individuals and families affected by the physical, emotional, and financial effects of autoimmune disease. The American Autoimmune Related Diseases Association produces educational and support materials including fact sheets, brochures, pamphlets, and a newsletter entitled 'In Focus.'.

  Relevant area(s) of interest: Fibromyalgia

- **American Chronic Pain Association**

  Telephone: (916) 632-0922 Toll-free: (800) 533-3231

  Fax: (916) 632-3208

Email: ACPA@Pacbell.net

Web Site: http://www.theacpa.org

Background: The American Chronic Pain Association is a nonprofit self-help organization that provides assistance and hope to individuals with chronic pain. Established in 1980, the American Chronic Pain Association operates support groups throughout the United States and offers its members positive and constructive methods for dealing with chronic pain. Groups usually consist of approximately 10 members who learn useful techniques for pain management through discussion, mutual support, and informational exchanges. Educational materials produced by the American Chronic Pain Association include 'Help and Hope' pamphlets and brochures, guidelines for the selection of a pain unit, the 'American Chronic Pain Association Member Workbook,' tapes, and the 'American Chronic Pain Association Chronicle.'.

Relevant area(s) of interest: Fibromyalgia

- **Back Pain Association of America, Inc**

  Telephone: (410) 255-3633

  Fax: (410) 255-7338

  Email: backpainassoc@MSN.COM

  Background: The Back Pain Association of America, Inc. (BPAA) is a national nonprofit organization dedicated to providing information and support to people who are affected by back and neck pain, their family members, friends, and health care professionals. Established in 1991 and consisting of nearly 4,000 members, BPAA offers programs and information to help affected individuals learn more about their spinal disorders and ways to cope with them. The organization also has a program to help individuals prevent back injuries. BPAA publishes a self-titled quarterly newsletter that helps readers stay informed of updated information and new forms of treatment. The organization s 'Friends Across America' networking program enables affected individuals to exchange information and support via telephone. BPAA also has a physician referral service as well as an information service for physicians who treat back and neck pain. In addition, the Association also promotes research and offers a variety of fact sheets including 'The Relationship Between Nerve Damage and Leg Pain,' 'Urinary Problems and Diseases of the Spine,' 'Arachnoiditis, Questions and Answers,' and 'A Guide to Abdominal and Stretching Exercises.'.

  Relevant area(s) of interest: Fibromyalgia

- **CF Alliance**

  Telephone: (845) 548-0313

  Fax: (845) 792-0880

  Email: CF_ALLIANCE@yahoo.com

  Web Site: http://GROUPS.YAHOO.COM/GROUP/CFPenPal

  Background: The CF Alliance is a free international penpal program and support group for people affected by chronic fatigue syndrome, **fibromyalgia,** and related illnesses. It serves an international community, including the United Kingdom, France, Germany, Auxtralia, and New Zealand. Chronic fatigue syndrome is characterized by fatigue severe enough to reduce daily activities by at least 50 percent. **Fibromyalgia** is a chronic disorder characterized by pain throughout much of the body. Other diseases addressed

by this organization include multiple chemical sensitivity, myalgic encephalomyelitis, irritable bowel syndrome and Raynaud's phenomenon.

- **Fibromyalgia Alliance of America, Inc**

  Telephone: (614) 457-4222 Toll-free: (888) 717-6711

  Fax: (614) 457-2729

  Email: Masaathoff@aol.com or FMSinfo@aol.com

  Background: The **Fibromyalgia** Alliance of America, Inc. is a professional self-help not-for-profit organization dedicated to improving the lives of people affected by **fibromyalgia.** Established in 1986, the Alliance provides state-of-the-art knowledge concerning **fibromyalgia** to the medical community; supports research into the causes of **fibromyalgia** and effective treatments for **fibromyalgia;** educates the public and private sector about **fibromyalgia;** and provides information and support to affected individuals, their families, and others. The **Fibromyalgia** Alliance produces educational and support materials including a quarterly newsletter, brochures, pamphlets, audio and vidieo tapes, and books on **fibromyalgia** and chronic illness. The Alliance also sponsors national patient conferences.

  Relevant area(s) of interest: Fibromyalgia

- **Fibromyalgia Association UK**

  Telephone: 01384-820052

  Fax: 01384-869467

  Email: fms@cableinet.co.uk

  Web Site: http://www.community-care.org.uk/charity/fmauk.html

  Background: The **Fibromyalgia** Association UK is an international voluntary organization in the United Kingdom dedicated to providing information, support, and resources to individuals affected by **fibromyalgia,** a chronic condition characterized by musculoskeletal pain, stiffness, and spasm and associated sleep disturbances. The exact cause of **fibromyalgia** is unknown. However, the condition appears to develop after certain infections or injuries, for example, or may occur due to or in association with other underlying conditions or disorders, such as rheumatoid arthritis. The **Fibromyalgia** Association UK provides understandable information on **fibromyalgia** and promotes networking opportunities that enable affected individuals and family members to exchange mutual support and information. The Association also has a web site on the Internet that discusses the organization's history and mission, provides information on **fibromyalgia,** and offers linkage to additional support groups, newsgroups, FAQs ('frequently asked questions') on the condition, and related web sites.

- **National CFIDS Foundation, Inc**

  Telephone: (781) 449-3535

  Fax: (781) 449-8606

  Email: gailronda@aol.com

  Web Site: http://www.ncf-net.org

Background: The National CFIDS Foundation, Inc. is an all-volunteer group dedicated to finding the cause and subsequent treatment of myalgic encephalomyelitis, also known as chronic fatigue syndrome and chronic fatigue immune dysfunction syndrome as well as related illnesses. The goals of are to serve as an advocate for those affected by chronic fatigue syndrome, fund research, and provide accurate and timely information about this disease. Established in 1987, the National CFIDS Foundation is a voluntary, not-for-profit organization providing educational materials, patient networking, patient advocacy and other services throughout the United States.

Relevant area(s) of interest: Fibromyalgia

- **National Chronic Fatigue and Fibromyalgia Association**

  Telephone: (816) 313-2000

  Fax: (816) 524-6782

  Email: support@dancingeyes.org.uk

  Background: The National Chronic Fatigue Syndrome and **Fibromyalgia** Association is a voluntary health organization that was incorporated in 1988. The Association was formed to educate and inform the public about the nature and impact of Chronic Fatigue Syndrome and related disorders. In 1993, **Fibromyalgia** was added to the organization's educational efforts. The primary focus of The National Chronic Fatigue Syndrome and **Fibromyalgia** Association is to offer scientifically accurate information to people with Chronic Fatigue Syndrome and **Fibromyalgia.** Brochures, booklets, and videos are available from the organization. A periodic newsletter and fact sheet are also produced and distributed by the organization.

  Relevant area(s) of interest: Fibromyalgia

- **North American Chronic Pain Association of Canada**

  Telephone: 905 793-5230 Toll-free: (800) 616-7246

  Fax: (905) 793-8781

  Email: nacpac@sympatico.ca

  Web Site: http://www3.sympatico.ca/nacpac

  Background: The North American Chronic Pain Association of Canada (NACPAC) is a nonprofit self-help organization dedicated to providing assistance and hope to individuals with chronic pain. NACPAC defines chronic pain as any frequent or continuous pain that has lasted more than a few months. This includes, but is not limited to, lower back pain, **fibromyalgia,** arthritis, headaches and migraines, and neck and shoulder pain. NACPAC was established in 1986 and currently consists of approximately 1,000 members. NACPAC brings together affected individuals through mutual support groups operating throughout Canada. Where no group exists, NACPAC provides materials and guidance on how to establish a support group. Members are encouraged by their peers to share ways of coping with chronic pain and to live full, productive lives. Group leaders are individuals who have themselves learned to function well despite their pain. NACPAC also empowers people to make informed choices; supports education and research in the field of chronic pain; and networks with organizations of similar purpose. The Association provides education about pain related problems through a series of brochures, pamphlets, and a quarterly newsletter entitled 'NACPAC Track.' In addition, speakers, videotapes, and books are available to assist members to learn about their pain problems in layperson s language.

NACPAC also provides referrals to other organizations and maintains a web site at http://www3.sympatico.ca/nacpac.

Relevant area(s) of interest: Fibromyalgia

- **Ontario Fibromyalgia Association**

  Telephone: (416) 979-7228 Toll-free: (800) 321-1433

  Fax: (416) 979-8366

  Email: info@on.arthritis.ca

  Web Site: http://www.arthritis.ca

  Background: The Ontario **Fibromyalgia** Association, one of five specific disease associations of The Arthritis Society of Canada, is a not-for-profit organization dedicated to promoting and supporting research on **fibromyalgia** and providing information and support to affected individuals, family members, and health care professionals. **Fibromyalgia** is a chronic disorder characterized by pain throughout much of the body. Established in 1986, the Ontario **Fibromyalgia** Association has several chapters and offers more than 40 support groups in Ontario for affected individuals, family members, and friends. The Association also promotes patient advocacy and offers a variety of materials to affected individuals, family members, health care professionals, and the general public. These materials include a quarterly newsletter entitled 'Tender Points,' reports, guides, booklets, brochures, pamphlets, videos, and assistive devices.

  Relevant area(s) of interest: Fibromyalgia

Finding Associations

There are several Internet directories that provide lists of medical associations with information on or resources relating to fibromyalgia. By consulting all of associations listed in this chapter, you will have nearly exhausted all sources for patient associations concerned with fibromyalgia.

The National Health Information Center (NHIC)

The National Health Information Center (NHIC) offers a free referral service to help people find organizations that provide information about fibromyalgia. For more information, see the NHIC's Web site at **http://www.health.gov/NHIC/** or contact an information specialist by calling 1-800-336-4797.

Directory of Health Organizations

The Directory of Health Organizations, provided by the National Library of Medicine Specialized Information Services, is a comprehensive source of information on associations. The Directory of Health Organizations database can be accessed via the Internet at **http://www.sis.nlm.nih.gov/Dir/DirMain.html**. It is composed of two parts: DIRLINE and Health Hotlines.

The DIRLINE database comprises some 10,000 records of organizations, research centers, and government institutes and associations that primarily focus on health and biomedicine. To access DIRLINE directly, go to the following Web site: **http://dirline.nlm.nih.gov/**. Simply type in "fibromyalgia" (or a synonym), and you will receive information on all relevant organizations listed in the database.

Health Hotlines directs you to toll-free numbers to over 300 organizations. You can access this database directly at **http://www.sis.nlm.nih.gov/hotlines/**. On this page, you are given the option to search by keyword or by browsing the subject list. When you have received your search results, click on the name of the organization for its description and contact information.

The Combined Health Information Database

Another comprehensive source of information on healthcare associations is the Combined Health Information Database. Using the "Detailed Search" option, you will need to limit your search to "Organizations" and "fibromyalgia". Type the following hyperlink into your Web browser: **http://chid.nih.gov/detail/detail.html**. To find associations, use the drop boxes at the bottom of the search page where "You may refine your search by." For publication date, select "All Years." Then, select your preferred language and the format option "Organization Resource Sheet." Type "fibromyalgia" (or synonyms) into the "For these words:" box. You should check back periodically with this database since it is updated every three months.

The National Organization for Rare Disorders, Inc.

The National Organization for Rare Disorders, Inc. has prepared a Web site that provides, at no charge, lists of associations organized by health topic. You can access this database at the following Web site: **http://www.rarediseases.org/search/orgsearch.html**. Type "fibromyalgia" (or a synonym) into the search box, and click "Submit Query."

APPENDIX C. FINDING MEDICAL LIBRARIES

Overview

In this Appendix, we show you how to quickly find a medical library in your area.

Preparation

Your local public library and medical libraries have interlibrary loan programs with the National Library of Medicine (NLM), one of the largest medical collections in the world. According to the NLM, most of the literature in the general and historical collections of the National Library of Medicine is available on interlibrary loan to any library. If you would like to access NLM medical literature, then visit a library in your area that can request the publications for you.[24]

Finding a Local Medical Library

The quickest method to locate medical libraries is to use the Internet-based directory published by the National Network of Libraries of Medicine (NN/LM). This network includes 4626 members and affiliates that provide many services to librarians, health professionals, and the public. To find a library in your area, simply visit **http://nnlm.gov/members/adv.html** or call 1-800-338-7657.

Medical Libraries in the U.S. and Canada

In addition to the NN/LM, the National Library of Medicine (NLM) lists a number of libraries with reference facilities that are open to the public. The following is the NLM's list and includes hyperlinks to each library's Web site. These Web pages can provide information on hours of operation and other restrictions. The list below is a small sample of

[24] Adapted from the NLM: **http://www.nlm.nih.gov/psd/cas/interlibrary.html**.

libraries recommended by the National Library of Medicine (sorted alphabetically by name of the U.S. state or Canadian province where the library is located)[25]:

- **Alabama:** Health InfoNet of Jefferson County (Jefferson County Library Cooperative, Lister Hill Library of the Health Sciences), **http://www.uab.edu/infonet/**
- **Alabama:** Richard M. Scrushy Library (American Sports Medicine Institute)
- **Arizona:** Samaritan Regional Medical Center: The Learning Center (Samaritan Health System, Phoenix, Arizona), **http://www.samaritan.edu/library/bannerlibs.htm**
- **California:** Kris Kelly Health Information Center (St. Joseph Health System, Humboldt), **http://www.humboldt1.com/~kkhic/index.html**
- **California:** Community Health Library of Los Gatos, **http://www.healthlib.org/orgresources.html**
- **California:** Consumer Health Program and Services (CHIPS) (County of Los Angeles Public Library, Los Angeles County Harbor-UCLA Medical Center Library) - Carson, CA, **http://www.colapublib.org/services/chips.html**
- **California:** Gateway Health Library (Sutter Gould Medical Foundation)
- **California:** Health Library (Stanford University Medical Center), **http://www-med.stanford.edu/healthlibrary/**
- **California:** Patient Education Resource Center - Health Information and Resources (University of California, San Francisco), **http://sfghdean.ucsf.edu/barnett/PERC/default.asp**
- **California:** Redwood Health Library (Petaluma Health Care District), **http://www.phcd.org/rdwdlib.html**
- **California:** Los Gatos PlaneTree Health Library, **http://planetreesanjose.org/**
- **California:** Sutter Resource Library (Sutter Hospitals Foundation, Sacramento), **http://suttermedicalcenter.org/library/**
- **California:** Health Sciences Libraries (University of California, Davis), **http://www.lib.ucdavis.edu/healthsci/**
- **California:** ValleyCare Health Library & Ryan Comer Cancer Resource Center (ValleyCare Health System, Pleasanton), **http://gaelnet.stmarys-ca.edu/other.libs/gbal/east/vchl.html**
- **California:** Washington Community Health Resource Library (Fremont), **http://www.healthlibrary.org/**
- **Colorado:** William V. Gervasini Memorial Library (Exempla Healthcare), **http://www.saintjosephdenver.org/yourhealth/libraries/**
- **Connecticut:** Hartford Hospital Health Science Libraries (Hartford Hospital), **http://www.harthosp.org/library/**
- **Connecticut:** Healthnet: Connecticut Consumer Health Information Center (University of Connecticut Health Center, Lyman Maynard Stowe Library), **http://library.uchc.edu/departm/hnet/**

[25] Abstracted from **http://www.nlm.nih.gov/medlineplus/libraries.html**.

- **Connecticut:** Waterbury Hospital Health Center Library (Waterbury Hospital, Waterbury), **http://www.waterburyhospital.com/library/consumer.shtml**
- **Delaware:** Consumer Health Library (Christiana Care Health System, Eugene du Pont Preventive Medicine & Rehabilitation Institute, Wilmington), **http://www.christianacare.org/health_guide/health_guide_pmri_health_info.cfm**
- **Delaware:** Lewis B. Flinn Library (Delaware Academy of Medicine, Wilmington), **http://www.delamed.org/chls.html**
- **Georgia:** Family Resource Library (Medical College of Georgia, Augusta), **http://cmc.mcg.edu/kids_families/fam_resources/fam_res_lib/frl.htm**
- **Georgia:** Health Resource Center (Medical Center of Central Georgia, Macon), **http://www.mccg.org/hrc/hrchome.asp**
- **Hawaii:** Hawaii Medical Library: Consumer Health Information Service (Hawaii Medical Library, Honolulu), **http://hml.org/CHIS/**
- **Idaho:** DeArmond Consumer Health Library (Kootenai Medical Center, Coeur d'Alene), **http://www.nicon.org/DeArmond/index.htm**
- **Illinois:** Health Learning Center of Northwestern Memorial Hospital (Chicago), **http://www.nmh.org/health_info/hlc.html**
- **Illinois:** Medical Library (OSF Saint Francis Medical Center, Peoria), **http://www.osfsaintfrancis.org/general/library/**
- **Kentucky:** Medical Library - Services for Patients, Families, Students & the Public (Central Baptist Hospital, Lexington), **http://www.centralbap.com/education/community/library.cfm**
- **Kentucky:** University of Kentucky - Health Information Library (Chandler Medical Center, Lexington), **http://www.mc.uky.edu/PatientEd/**
- **Louisiana:** Alton Ochsner Medical Foundation Library (Alton Ochsner Medical Foundation, New Orleans), **http://www.ochsner.org/library/**
- **Louisiana:** Louisiana State University Health Sciences Center Medical Library-Shreveport, **http://lib-sh.lsuhsc.edu/**
- **Maine:** Franklin Memorial Hospital Medical Library (Franklin Memorial Hospital, Farmington), **http://www.fchn.org/fmh/lib.htm**
- **Maine:** Gerrish-True Health Sciences Library (Central Maine Medical Center, Lewiston), **http://www.cmmc.org/library/library.html**
- **Maine:** Hadley Parrot Health Science Library (Eastern Maine Healthcare, Bangor), **http://www.emh.org/hll/hpl/guide.htm**
- **Maine:** Maine Medical Center Library (Maine Medical Center, Portland), **http://www.mmc.org/library/**
- **Maine:** Parkview Hospital (Brunswick), **http://www.parkviewhospital.org/**
- **Maine:** Southern Maine Medical Center Health Sciences Library (Southern Maine Medical Center, Biddeford), **http://www.smmc.org/services/service.php3?choice=10**
- **Maine:** Stephens Memorial Hospital's Health Information Library (Western Maine Health, Norway), **http://www.wmhcc.org/Library/**

- **Manitoba, Canada:** Consumer & Patient Health Information Service (University of Manitoba Libraries), **http://www.umanitoba.ca/libraries/units/health/reference/chis.html**
- **Manitoba, Canada:** J.W. Crane Memorial Library (Deer Lodge Centre, Winnipeg), **http://www.deerlodge.mb.ca/crane_library/about.asp**
- **Maryland:** Health Information Center at the Wheaton Regional Library (Montgomery County, Dept. of Public Libraries, Wheaton Regional Library), **http://www.mont.lib.md.us/healthinfo/hic.asp**
- **Massachusetts:** Baystate Medical Center Library (Baystate Health System), **http://www.baystatehealth.com/1024/**
- **Massachusetts:** Boston University Medical Center Alumni Medical Library (Boston University Medical Center), **http://med-libwww.bu.edu/library/lib.html**
- **Massachusetts:** Lowell General Hospital Health Sciences Library (Lowell General Hospital, Lowell), **http://www.lowellgeneral.org/library/HomePageLinks/WWW.htm**
- **Massachusetts:** Paul E. Woodard Health Sciences Library (New England Baptist Hospital, Boston), **http://www.nebh.org/health_lib.asp**
- **Massachusetts:** St. Luke's Hospital Health Sciences Library (St. Luke's Hospital, Southcoast Health System, New Bedford), **http://www.southcoast.org/library/**
- **Massachusetts:** Treadwell Library Consumer Health Reference Center (Massachusetts General Hospital), **http://www.mgh.harvard.edu/library/chrcindex.html**
- **Massachusetts:** UMass HealthNet (University of Massachusetts Medical School, Worchester), **http://healthnet.umassmed.edu/**
- **Michigan:** Botsford General Hospital Library - Consumer Health (Botsford General Hospital, Library & Internet Services), **http://www.botsfordlibrary.org/consumer.htm**
- **Michigan:** Helen DeRoy Medical Library (Providence Hospital and Medical Centers), **http://www.providence-hospital.org/library/**
- **Michigan:** Marquette General Hospital - Consumer Health Library (Marquette General Hospital, Health Information Center), **http://www.mgh.org/center.html**
- **Michigan:** Patient Education Resouce Center - University of Michigan Cancer Center (University of Michigan Comprehensive Cancer Center, Ann Arbor), **http://www.cancer.med.umich.edu/learn/leares.htm**
- **Michigan:** Sladen Library & Center for Health Information Resources - Consumer Health Information (Detroit), **http://www.henryford.com/body.cfm?id=39330**
- **Montana:** Center for Health Information (St. Patrick Hospital and Health Sciences Center, Missoula)
- **National:** Consumer Health Library Directory (Medical Library Association, Consumer and Patient Health Information Section), **http://caphis.mlanet.org/directory/index.html**
- **National:** National Network of Libraries of Medicine (National Library of Medicine) - provides library services for health professionals in the United States who do not have access to a medical library, **http://nnlm.gov/**
- **National:** NN/LM List of Libraries Serving the Public (National Network of Libraries of Medicine), **http://nnlm.gov/members/**

- **Nevada:** Health Science Library, West Charleston Library (Las Vegas-Clark County Library District, Las Vegas), **http://www.lvccld.org/special_collections/medical/index.htm**
- **New Hampshire:** Dartmouth Biomedical Libraries (Dartmouth College Library, Hanover), **http://www.dartmouth.edu/~biomed/resources.htmld/conshealth.htmld/**
- **New Jersey:** Consumer Health Library (Rahway Hospital, Rahway), **http://www.rahwayhospital.com/library.htm**
- **New Jersey:** Dr. Walter Phillips Health Sciences Library (Englewood Hospital and Medical Center, Englewood), **http://www.englewoodhospital.com/links/index.htm**
- **New Jersey:** Meland Foundation (Englewood Hospital and Medical Center, Englewood), **http://www.geocities.com/ResearchTriangle/9360/**
- **New York:** Choices in Health Information (New York Public Library) - NLM Consumer Pilot Project participant, **http://www.nypl.org/branch/health/links.html**
- **New York:** Health Information Center (Upstate Medical University, State University of New York, Syracuse), **http://www.upstate.edu/library/hic/**
- **New York:** Health Sciences Library (Long Island Jewish Medical Center, New Hyde Park), **http://www.lij.edu/library/library.html**
- **New York:** ViaHealth Medical Library (Rochester General Hospital), **http://www.nyam.org/library/**
- **Ohio:** Consumer Health Library (Akron General Medical Center, Medical & Consumer Health Library), **http://www.akrongeneral.org/hwlibrary.htm**
- **Oklahoma:** The Health Information Center at Saint Francis Hospital (Saint Francis Health System, Tulsa), **http://www.sfh-tulsa.com/services/healthinfo.asp**
- **Oregon:** Planetree Health Resource Center (Mid-Columbia Medical Center, The Dalles), **http://www.mcmc.net/phrc/**
- **Pennsylvania:** Community Health Information Library (Milton S. Hershey Medical Center, Hershey), **http://www.hmc.psu.edu/commhealth/**
- **Pennsylvania:** Community Health Resource Library (Geisinger Medical Center, Danville), **http://www.geisinger.edu/education/commlib.shtml**
- **Pennsylvania:** HealthInfo Library (Moses Taylor Hospital, Scranton), **http://www.mth.org/healthwellness.html**
- **Pennsylvania:** Hopwood Library (University of Pittsburgh, Health Sciences Library System, Pittsburgh), **http://www.hsls.pitt.edu/guides/chi/hopwood/index_html**
- **Pennsylvania:** Koop Community Health Information Center (College of Physicians of Philadelphia), **http://www.collphyphil.org/kooppg1.shtml**
- **Pennsylvania:** Learning Resources Center - Medical Library (Susquehanna Health System, Williamsport), **http://www.shscares.org/services/lrc/index.asp**
- **Pennsylvania:** Medical Library (UPMC Health System, Pittsburgh), **http://www.upmc.edu/passavant/library.htm**
- **Quebec, Canada:** Medical Library (Montreal General Hospital), **http://www.mghlib.mcgill.ca/**

- **South Dakota:** Rapid City Regional Hospital Medical Library (Rapid City Regional Hospital), **http://www.rcrh.org/Services/Library/Default.asp**
- **Texas:** Houston HealthWays (Houston Academy of Medicine-Texas Medical Center Library), **http://hhw.library.tmc.edu/**
- **Washington:** Community Health Library (Kittitas Valley Community Hospital), **http://www.kvch.com/**
- **Washington:** Southwest Washington Medical Center Library (Southwest Washington Medical Center, Vancouver), **http://www.swmedicalcenter.com/body.cfm?id=72**

ONLINE GLOSSARIES

The Internet provides access to a number of free-to-use medical dictionaries. The National Library of Medicine has compiled the following list of online dictionaries:

- ADAM Medical Encyclopedia (A.D.A.M., Inc.), comprehensive medical reference: **http://www.nlm.nih.gov/medlineplus/encyclopedia.html**
- MedicineNet.com Medical Dictionary (MedicineNet, Inc.): **http://www.medterms.com/Script/Main/hp.asp**
- Merriam-Webster Medical Dictionary (Inteli-Health, Inc.): **http://www.intelihealth.com/IH/**
- Multilingual Glossary of Technical and Popular Medical Terms in Eight European Languages (European Commission) - Danish, Dutch, English, French, German, Italian, Portuguese, and Spanish: **http://allserv.rug.ac.be/~rvdstich/eugloss/welcome.html**
- On-line Medical Dictionary (CancerWEB): **http://cancerweb.ncl.ac.uk/omd/**
- Rare Diseases Terms (Office of Rare Diseases): **http://ord.aspensys.com/asp/diseases/diseases.asp**
- Technology Glossary (National Library of Medicine) - Health Care Technology: **http://www.nlm.nih.gov/nichsr/ta101/ta10108.htm**

Beyond these, MEDLINEplus contains a very patient-friendly encyclopedia covering every aspect of medicine (licensed from A.D.A.M., Inc.). The ADAM Medical Encyclopedia can be accessed at **http://www.nlm.nih.gov/medlineplus/encyclopedia.html**. ADAM is also available on commercial Web sites such as drkoop.com (**http://www.drkoop.com/**) and Web MD (**http://my.webmd.com/adam/asset/adam_disease_articles/a_to_z/a**). The NIH suggests the following Web sites in the ADAM Medical Encyclopedia when searching for information on fibromyalgia:

- **Basic Guidelines for Fibromyalgia**

  Fibromyalgia
  Web site: http://www.nlm.nih.gov/medlineplus/ency/article/000427.htm

- **Signs & Symptoms for Fibromyalgia**

  Anxiety
  Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003211.htm

  Depression
  Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003213.htm

  Fatigue
  Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003088.htm

  Headache
  Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003024.htm

Joint pain
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003261.htm

Muscle
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003193.htm

Muscle pain
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003178.htm

Sleep disturbances
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003210.htm

Stress
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003211.htm

Swelling
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003103.htm

Tiredness
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003088.htm

Weakness
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003174.htm

- **Diagnostics and Tests for Fibromyalgia**

Aldolase
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003566.htm

ANA
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003535.htm

CBC
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003642.htm

Complete blood count
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003642.htm

CPK
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003503.htm

Creatine phosphokinase
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003503.htm

Erythrocyte sedimentation rate
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003638.htm

ESR
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003638.htm

Rheumatoid factor
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003548.htm

Sedimentation rate
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003638.htm

T3
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003687.htm

T3 resin uptake
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003688.htm

T4
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003517.htm

TSH
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/003684.htm

- **Background Topics for Fibromyalgia**

Aerobic
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/002221.htm

Exercise
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/001941.htm

Incidence
Web site: http://www.nlm.nih.gov/medlineplus/ency/article/002387.htm

Online Dictionary Directories

The following are additional online directories compiled by the National Library of Medicine, including a number of specialized medical dictionaries:

- Medical Dictionaries: Medical & Biological (World Health Organization): **http://www.who.int/hlt/virtuallibrary/English/diction.htm#Medical**
- MEL-Michigan Electronic Library List of Online Health and Medical Dictionaries (Michigan Electronic Library): **http://mel.lib.mi.us/health/health-dictionaries.html**
- Patient Education: Glossaries (DMOZ Open Directory Project): **http://dmoz.org/Health/Education/Patient_Education/Glossaries/**
- Web of Online Dictionaries (Bucknell University): **http://www.yourdictionary.com/diction5.html#medicine**

FIBROMYALGIA DICTIONARY

The definitions below are derived from official public sources, including the National Institutes of Health [NIH] and the European Union [EU].

5-Hydroxytryptophan: Precursor of serotonin used as antiepileptic and antidepressant. [NIH]

Abdominal: Having to do with the abdomen, which is the part of the body between the chest and the hips that contains the pancreas, stomach, intestines, liver, gallbladder, and other organs. [NIH]

Abdominal Pain: Sensation of discomfort, distress, or agony in the abdominal region. [NIH]

Aberrant: Wandering or deviating from the usual or normal course. [EU]

Abscess: Accumulation of purulent material in tissues, organs, or circumscribed spaces, usually associated with signs of infection. [NIH]

Accommodation: Adjustment, especially that of the eye for various distances. [EU]

Acetaminophen: Analgesic antipyretic derivative of acetanilide. It has weak anti-inflammatory properties and is used as a common analgesic, but may cause liver, blood cell, and kidney damage. [NIH]

Acetylcholine: A neurotransmitter. Acetylcholine in vertebrates is the major transmitter at neuromuscular junctions, autonomic ganglia, parasympathetic effector junctions, a subset of sympathetic effector junctions, and at many sites in the central nervous system. It is generally not used as an administered drug because it is broken down very rapidly by cholinesterases, but it is useful in some ophthalmological applications. [NIH]

Acidity: The quality of being acid or sour; containing acid (hydrogen ions). [EU]

Acidosis: A pathologic condition resulting from accumulation of acid or depletion of the alkaline reserve (bicarbonate content) in the blood and body tissues, and characterized by an increase in hydrogen ion concentration. [EU]

Acoustic: Having to do with sound or hearing. [NIH]

Action Potentials: The electric response of a nerve or muscle to its stimulation. [NIH]

Acupuncture Analgesia: Analgesia produced by the insertion of acupuncture needles at certain points in the body. These activate the small myelinated nerve fibers in the muscle which transmit impulses to the spinal cord and then activate three centers - the spinal cord, midbrain and pituitary hypothalamus - to produce analgesia. [NIH]

Adaptation: 1. The adjustment of an organism to its environment, or the process by which it enhances such fitness. 2. The normal ability of the eye to adjust itself to variations in the intensity of light; the adjustment to such variations. 3. The decline in the frequency of firing of a neuron, particularly of a receptor, under conditions of constant stimulation. 4. In dentistry, (a) the proper fitting of a denture, (b) the degree of proximity and interlocking of restorative material to a tooth preparation, (c) the exact adjustment of bands to teeth. 5. In microbiology, the adjustment of bacterial physiology to a new environment. [EU]

Adenosine: A nucleoside that is composed of adenine and d-ribose. Adenosine or adenosine derivatives play many important biological roles in addition to being components of DNA and RNA. Adenosine itself is a neurotransmitter. [NIH]

Adjustment: The dynamic process wherein the thoughts, feelings, behavior, and biophysiological mechanisms of the individual continually change to adjust to the environment. [NIH]

Adjuvant: A substance which aids another, such as an auxiliary remedy; in immunology, nonspecific stimulator (e.g., BCG vaccine) of the immune response. [EU]

Adolescence: The period of life beginning with the appearance of secondary sex characteristics and terminating with the cessation of somatic growth. The years usually referred to as adolescence lie between 13 and 18 years of age. [NIH]

Adrenal Cortex: The outer layer of the adrenal gland. It secretes mineralocorticoids, androgens, and glucocorticoids. [NIH]

Adrenal Glands: Paired glands situated in the retroperitoneal tissues at the superior pole of each kidney. [NIH]

Adrenal Medulla: The inner part of the adrenal gland; it synthesizes, stores and releases catecholamines. [NIH]

Adrenergic: Activated by, characteristic of, or secreting epinephrine or substances with similar activity; the term is applied to those nerve fibres that liberate norepinephrine at a synapse when a nerve impulse passes, i.e., the sympathetic fibres. [EU]

Adrenergic Uptake Inhibitors: Drugs that block the transport of adrenergic transmitters into axon terminals or into storage vesicles within terminals. The tricyclic antidepressants (antidepressive agents, tricyclic) and amphetamines are among the therapeutically important drugs that may act via inhibition of adrenergic transport. Many of these drugs also block transport of serotonin. [NIH]

Adverse Effect: An unwanted side effect of treatment. [NIH]

Aerobic: In biochemistry, reactions that need oxygen to happen or happen when oxygen is present. [NIH]

Aerobic Exercise: A type of physical activity that includes walking, jogging, running, and dancing. Aerobic training improves the efficiency of the aerobic energy-producing systems that can improve cardiorespiratory endurance. [NIH]

Afferent: Concerned with the transmission of neural impulse toward the central part of the nervous system. [NIH]

Afferent Pathways: Nerve structures through which impulses are conducted from a peripheral part toward a nerve center. [NIH]

Affinity: 1. Inherent likeness or relationship. 2. A special attraction for a specific element, organ, or structure. 3. Chemical affinity; the force that binds atoms in molecules; the tendency of substances to combine by chemical reaction. 4. The strength of noncovalent chemical binding between two substances as measured by the dissociation constant of the complex. 5. In immunology, a thermodynamic expression of the strength of interaction between a single antigen-binding site and a single antigenic determinant (and thus of the stereochemical compatibility between them), most accurately applied to interactions among simple, uniform antigenic determinants such as haptens. Expressed as the association constant (K litres mole -1), which, owing to the heterogeneity of affinities in a population of antibody molecules of a given specificity, actually represents an average value (mean intrinsic association constant). 6. The reciprocal of the dissociation constant. [EU]

Agonist: In anatomy, a prime mover. In pharmacology, a drug that has affinity for and stimulates physiologic activity at cell receptors normally stimulated by naturally occurring substances. [EU]

Airway: A device for securing unobstructed passage of air into and out of the lungs during general anesthesia. [NIH]

Aldosterone: (11 beta)-11,21-Dihydroxy-3,20-dioxopregn-4-en-18-al. A hormone secreted by the adrenal cortex that functions in the regulation of electrolyte and water balance by

increasing the renal retention of sodium and the excretion of potassium. [NIH]

Alertness: A state of readiness to detect and respond to certain specified small changes occurring at random intervals in the environment. [NIH]

Algorithms: A procedure consisting of a sequence of algebraic formulas and/or logical steps to calculate or determine a given task. [NIH]

Alimentary: Pertaining to food or nutritive material, or to the organs of digestion. [EU]

Alkaline: Having the reactions of an alkali. [EU]

Alkaloid: A member of a large group of chemicals that are made by plants and have nitrogen in them. Some alkaloids have been shown to work against cancer. [NIH]

Allergen: An antigenic substance capable of producing immediate-type hypersensitivity (allergy). [EU]

Allergic Rhinitis: Inflammation of the nasal mucous membrane associated with hay fever; fits may be provoked by substances in the working environment. [NIH]

Allylamine: Possesses an unusual and selective cytotoxicity for vascular smooth muscle cells in dogs and rats. Useful for experiments dealing with arterial injury, myocardial fibrosis or cardiac decompensation. [NIH]

Alpha-1: A protein with the property of inactivating proteolytic enzymes such as leucocyte collagenase and elastase. [NIH]

Alternative medicine: Practices not generally recognized by the medical community as standard or conventional medical approaches and used instead of standard treatments. Alternative medicine includes the taking of dietary supplements, megadose vitamins, and herbal preparations; the drinking of special teas; and practices such as massage therapy, magnet therapy, spiritual healing, and meditation. [NIH]

Ameliorating: A changeable condition which prevents the consequence of a failure or accident from becoming as bad as it otherwise would. [NIH]

Amine: An organic compound containing nitrogen; any member of a group of chemical compounds formed from ammonia by replacement of one or more of the hydrogen atoms by organic (hydrocarbon) radicals. The amines are distinguished as primary, secondary, and tertiary, according to whether one, two, or three hydrogen atoms are replaced. The amines include allylamine, amylamine, ethylamine, methylamine, phenylamine, propylamine, and many other compounds. [EU]

Amino acid: Any organic compound containing an amino (-NH2 and a carboxyl (- COOH) group. The 20 a-amino acids listed in the accompanying table are the amino acids from which proteins are synthesized by formation of peptide bonds during ribosomal translation of messenger RNA; all except glycine, which is not optically active, have the L configuration. Other amino acids occurring in proteins, such as hydroxyproline in collagen, are formed by posttranslational enzymatic modification of amino acids residues in polypeptide chains. There are also several important amino acids, such as the neurotransmitter y-aminobutyric acid, that have no relation to proteins. Abbreviated AA. [EU]

Amino Acid Sequence: The order of amino acids as they occur in a polypeptide chain. This is referred to as the primary structure of proteins. It is of fundamental importance in determining protein conformation. [NIH]

Amitriptyline: Tricyclic antidepressant with anticholinergic and sedative properties. It appears to prevent the re-uptake of norepinephrine and serotonin at nerve terminals, thus potentiating the action of these neurotransmitters. Amitriptyline also appears to antaganize cholinergic and alpha-1 adrenergic responses to bioactive amines. [NIH]

Ammonia: A colorless alkaline gas. It is formed in the body during decomposition of organic materials during a large number of metabolically important reactions. [NIH]

Amphetamine: A powerful central nervous system stimulant and sympathomimetic. Amphetamine has multiple mechanisms of action including blocking uptake of adrenergics and dopamine, stimulation of release of monamines, and inhibiting monoamine oxidase. Amphetamine is also a drug of abuse and a psychotomimetic. The l- and the d,l-forms are included here. The l-form has less central nervous system activity but stronger cardiovascular effects. The d-form is dextroamphetamine. [NIH]

Amplification: The production of additional copies of a chromosomal DNA sequence, found as either intrachromosomal or extrachromosomal DNA. [NIH]

Amygdala: Almond-shaped group of basal nuclei anterior to the inferior horn of the lateral ventricle of the brain, within the temporal lobe. The amygdala is part of the limbic system. [NIH]

Anaerobic: 1. Lacking molecular oxygen. 2. Growing, living, or occurring in the absence of molecular oxygen; pertaining to an anaerobe. [EU]

Anaerobic Threshold: The oxygen consumption level above which aerobic energy production is supplemented by anaerobic mechanisms during exercise, resulting in a sustained increase in lactate concentration and metabolic acidosis. The anaerobic threshold is affected by factors that modify oxygen delivery to the tissues; it is low in patients with heart disease. Methods of measurement include direct measure of lactate concentration, direct measurement of bicarbonate concentration, and gas exchange measurements. [NIH]

Anaesthesia: Loss of feeling or sensation. Although the term is used for loss of tactile sensibility, or of any of the other senses, it is applied especially to loss of the sensation of pain, as it is induced to permit performance of surgery or other painful procedures. [EU]

Anal: Having to do with the anus, which is the posterior opening of the large bowel. [NIH]

Analgesic: An agent that alleviates pain without causing loss of consciousness. [EU]

Analog: In chemistry, a substance that is similar, but not identical, to another. [NIH]

Anatomical: Pertaining to anatomy, or to the structure of the organism. [EU]

Androgens: A class of sex hormones associated with the development and maintenance of the secondary male sex characteristics, sperm induction, and sexual differentiation. In addition to increasing virility and libido, they also increase nitrogen and water retention and stimulate skeletal growth. [NIH]

Anemia: A reduction in the number of circulating erythrocytes or in the quantity of hemoglobin. [NIH]

Anesthesia: A state characterized by loss of feeling or sensation. This depression of nerve function is usually the result of pharmacologic action and is induced to allow performance of surgery or other painful procedures. [NIH]

Anesthetics: Agents that are capable of inducing a total or partial loss of sensation, especially tactile sensation and pain. They may act to induce general anesthesia, in which an unconscious state is achieved, or may act locally to induce numbness or lack of sensation at a targeted site. [NIH]

Angina: Chest pain that originates in the heart. [NIH]

Angina Pectoris: The symptom of paroxysmal pain consequent to myocardial ischemia usually of distinctive character, location and radiation, and provoked by a transient stressful situation during which the oxygen requirements of the myocardium exceed the capacity of the coronary circulation to supply it. [NIH]

Angiotensinogen: An alpha-globulin of which a fragment of 14 amino acids is converted by renin to angiotensin I, the inactive precursor of angiotensin II. It is a member of the serpin superfamily. [NIH]

Animal model: An animal with a disease either the same as or like a disease in humans. Animal models are used to study the development and progression of diseases and to test new treatments before they are given to humans. Animals with transplanted human cancers or other tissues are called xenograft models. [NIH]

Anions: Negatively charged atoms, radicals or groups of atoms which travel to the anode or positive pole during electrolysis. [NIH]

Anomalies: Birth defects; abnormalities. [NIH]

Antagonism: Interference with, or inhibition of, the growth of a living organism by another living organism, due either to creation of unfavorable conditions (e. g. exhaustion of food supplies) or to production of a specific antibiotic substance (e. g. penicillin). [NIH]

Antibacterial: A substance that destroys bacteria or suppresses their growth or reproduction. [EU]

Antibiotic: A drug used to treat infections caused by bacteria and other microorganisms. [NIH]

Antibodies: Immunoglobulin molecules having a specific amino acid sequence by virtue of which they interact only with the antigen that induced their synthesis in cells of the lymphoid series (especially plasma cells), or with an antigen closely related to it. [NIH]

Antibody: A type of protein made by certain white blood cells in response to a foreign substance (antigen). Each antibody can bind to only a specific antigen. The purpose of this binding is to help destroy the antigen. Antibodies can work in several ways, depending on the nature of the antigen. Some antibodies destroy antigens directly. Others make it easier for white blood cells to destroy the antigen. [NIH]

Anticholinergic: An agent that blocks the parasympathetic nerves. Called also parasympatholytic. [EU]

Antidepressant: A drug used to treat depression. [NIH]

Anti-Dyskinesia Agents: Drugs used in the treatment of movement disorders. Most of these act centrally on dopaminergic or cholinergic systems. Among the most important clinically are those used for the treatment of Parkinson disease (antiparkinson agents) and those for the tardive dyskinesias. [NIH]

Antiemetic: An agent that prevents or alleviates nausea and vomiting. Also antinauseant. [EU]

Antiepileptic: An agent that combats epilepsy. [EU]

Antigen: Any substance which is capable, under appropriate conditions, of inducing a specific immune response and of reacting with the products of that response, that is, with specific antibody or specifically sensitized T-lymphocytes, or both. Antigens may be soluble substances, such as toxins and foreign proteins, or particulate, such as bacteria and tissue cells; however, only the portion of the protein or polysaccharide molecule known as the antigenic determinant (q.v.) combines with antibody or a specific receptor on a lymphocyte. Abbreviated Ag. [EU]

Anti-inflammatory: Having to do with reducing inflammation. [NIH]

Anti-Inflammatory Agents: Substances that reduce or suppress inflammation. [NIH]

Antineoplastic: Inhibiting or preventing the development of neoplasms, checking the maturation and proliferation of malignant cells. [EU]

Antipyretic: An agent that relieves or reduces fever. Called also antifebrile, antithermic and febrifuge. [EU]

Antitussive: An agent that relieves or prevents cough. [EU]

Antiviral: Destroying viruses or suppressing their replication. [EU]

Anus: The opening of the rectum to the outside of the body. [NIH]

Anxiety: Persistent feeling of dread, apprehension, and impending disaster. [NIH]

Anxiety Disorders: Disorders in which anxiety (persistent feelings of apprehension, tension, or uneasiness) is the predominant disturbance. [NIH]

Anxiolytic: An anxiolytic or antianxiety agent. [EU]

Apnea: A transient absence of spontaneous respiration. [NIH]

Aponeurosis: Tendinous expansion consisting of a fibrous or membranous sheath which serves as a fascia to enclose or bind a group of muscles. [NIH]

Apoptosis: One of the two mechanisms by which cell death occurs (the other being the pathological process of necrosis). Apoptosis is the mechanism responsible for the physiological deletion of cells and appears to be intrinsically programmed. It is characterized by distinctive morphologic changes in the nucleus and cytoplasm, chromatin cleavage at regularly spaced sites, and the endonucleolytic cleavage of genomic DNA (DNA fragmentation) at internucleosomal sites. This mode of cell death serves as a balance to mitosis in regulating the size of animal tissues and in mediating pathologic processes associated with tumor growth. [NIH]

Aptitude: The ability to acquire general or special types of knowledge or skill. [NIH]

Aqueous: Having to do with water. [NIH]

Arachidonic Acid: An unsaturated, essential fatty acid. It is found in animal and human fat as well as in the liver, brain, and glandular organs, and is a constituent of animal phosphatides. It is formed by the synthesis from dietary linoleic acid and is a precursor in the biosynthesis of prostaglandins, thromboxanes, and leukotrienes. [NIH]

Arginine: An essential amino acid that is physiologically active in the L-form. [NIH]

Aromatic: Having a spicy odour. [EU]

Arterial: Pertaining to an artery or to the arteries. [EU]

Arteries: The vessels carrying blood away from the heart. [NIH]

Arterioles: The smallest divisions of the arteries located between the muscular arteries and the capillaries. [NIH]

Arteriovenous: Both arterial and venous; pertaining to or affecting an artery and a vein. [EU]

Arteritis: Inflammation of an artery. [NIH]

Artery: Vessel-carrying blood from the heart to various parts of the body. [NIH]

Arthralgia: Pain in the joint. [NIH]

Articular: Of or pertaining to a joint. [EU]

Aspartate: A synthetic amino acid. [NIH]

Assay: Determination of the amount of a particular constituent of a mixture, or of the biological or pharmacological potency of a drug. [EU]

Astrocytes: The largest and most numerous neuroglial cells in the brain and spinal cord. Astrocytes (from "star" cells) are irregularly shaped with many long processes, including those with "end feet" which form the glial (limiting) membrane and directly and indirectly contribute to the blood brain barrier. They regulate the extracellular ionic and chemical

environment, and "reactive astrocytes" (along with microglia) respond to injury. Astrocytes have high- affinity transmitter uptake systems, voltage-dependent and transmitter-gated ion channels, and can release transmitter, but their role in signaling (as in many other functions) is not well understood. [NIH]

Atopic: Pertaining to an atopen or to atopy; allergic. [EU]

Atrial: Pertaining to an atrium. [EU]

Atrioventricular: Pertaining to an atrium of the heart and to a ventricle. [EU]

Atrium: A chamber; used in anatomical nomenclature to designate a chamber affording entrance to another structure or organ. Usually used alone to designate an atrium of the heart. [EU]

Atrophy: Decrease in the size of a cell, tissue, organ, or multiple organs, associated with a variety of pathological conditions such as abnormal cellular changes, ischemia, malnutrition, or hormonal changes. [NIH]

Attenuation: Reduction of transmitted sound energy or its electrical equivalent. [NIH]

Atypical: Irregular; not conformable to the type; in microbiology, applied specifically to strains of unusual type. [EU]

Auditory: Pertaining to the sense of hearing. [EU]

Autoantibodies: Antibodies that react with self-antigens (autoantigens) of the organism that produced them. [NIH]

Autoantigens: Endogenous tissue constituents that have the ability to interact with autoantibodies and cause an immune response. [NIH]

Autoimmune disease: A condition in which the body recognizes its own tissues as foreign and directs an immune response against them. [NIH]

Autoimmunity: Process whereby the immune system reacts against the body's own tissues. Autoimmunity may produce or be caused by autoimmune diseases. [NIH]

Autonomic: Self-controlling; functionally independent. [EU]

Autonomic Nervous System: The enteric, parasympathetic, and sympathetic nervous systems taken together. Generally speaking, the autonomic nervous system regulates the internal environment during both peaceful activity and physical or emotional stress. Autonomic activity is controlled and integrated by the central nervous system, especially the hypothalamus and the solitary nucleus, which receive information relayed from visceral afferents; these and related central and sensory structures are sometimes (but not here) considered to be part of the autonomic nervous system itself. [NIH]

Autonomic Neuropathy: A disease of the nerves affecting mostly the internal organs such as the bladder muscles, the cardiovascular system, the digestive tract, and the genital organs. These nerves are not under a person's conscious control and function automatically. Also called visceral neuropathy. [NIH]

Axillary: Pertaining to the armpit area, including the lymph nodes that are located there. [NIH]

Axonal: Condition associated with metabolic derangement of the entire neuron and is manifest by degeneration of the distal portion of the nerve fiber. [NIH]

Axons: Nerve fibers that are capable of rapidly conducting impulses away from the neuron cell body. [NIH]

Back Injuries: General or unspecified injuries to the posterior part of the trunk. It includes injuries to the muscles of the back. [NIH]

Back Pain: Acute or chronic pain located in the posterior regions of the trunk, including the thoracic, lumbar, sacral, or adjacent regions. [NIH]

Bacteria: Unicellular prokaryotic microorganisms which generally possess rigid cell walls, multiply by cell division, and exhibit three principal forms: round or coccal, rodlike or bacillary, and spiral or spirochetal. [NIH]

Bacterial Physiology: Physiological processes and activities of bacteria. [NIH]

Baroreflex: A negative feedback system which buffers short-term changes in blood pressure. Increased pressure stretches blood vessels which activates pressoreceptors (baroreceptors) in the vessel walls. The net response of the central nervous system is a reduction of central sympathetic outflow. This reduces blood pressure both by decreasing peripheral vascular resistance and by lowering cardiac output. Because the baroreceptors are tonically active, the baroreflex can compensate rapidly for both increases and decreases in blood pressure. [NIH]

Basal Ganglia: Large subcortical nuclear masses derived from the telencephalon and located in the basal regions of the cerebral hemispheres. [NIH]

Base: In chemistry, the nonacid part of a salt; a substance that combines with acids to form salts; a substance that dissociates to give hydroxide ions in aqueous solutions; a substance whose molecule or ion can combine with a proton (hydrogen ion); a substance capable of donating a pair of electrons (to an acid) for the formation of a coordinate covalent bond. [EU]

Behavior Therapy: The application of modern theories of learning and conditioning in the treatment of behavior disorders. [NIH]

Benign: Not cancerous; does not invade nearby tissue or spread to other parts of the body. [NIH]

Benzene: Toxic, volatile, flammable liquid hydrocarbon biproduct of coal distillation. It is used as an industrial solvent in paints, varnishes, lacquer thinners, gasoline, etc. Benzene causes central nervous system damage acutely and bone marrow damage chronically and is carcinogenic. It was formerly used as parasiticide. [NIH]

Benzodiazepines: A two-ring heterocyclic compound consisting of a benzene ring fused to a diazepine ring. Permitted is any degree of hydrogenation, any substituents and any H-isomer. [NIH]

Beta-Endorphin: A peptide consisting of amino acid sequence 61-91 of the endogenous pituitary hormone beta-lipotropin. The first four amino acids show a common tetrapeptide sequence with methionine- and leucine enkephalin. The compound shows opiate-like activity. Injection of beta-endorphin induces a profound analgesia of the whole body for several hours. This action is reversed after administration of naloxone. [NIH]

Bilateral: Affecting both the right and left side of body. [NIH]

Bile: An emulsifying agent produced in the liver and secreted into the duodenum. Its composition includes bile acids and salts, cholesterol, and electrolytes. It aids digestion of fats in the duodenum. [NIH]

Biochemical: Relating to biochemistry; characterized by, produced by, or involving chemical reactions in living organisms. [EU]

Biogenic Amines: A group of naturally occurring amines derived by enzymatic decarboxylation of the natural amino acids. Many have powerful physiological effects (e.g., histamine, serotonin, epinephrine, tyramine). Those derived from aromatic amino acids, and also their synthetic analogs (e.g., amphetamine), are of use in pharmacology. [NIH]

Biological response modifier: BRM. A substance that stimulates the body's response to infection and disease. [NIH]

Biological therapy: Treatment to stimulate or restore the ability of the immune system to fight infection and disease. Also used to lessen side effects that may be caused by some cancer treatments. Also known as immunotherapy, biotherapy, or biological response modifier (BRM) therapy. [NIH]

Biotechnology: Body of knowledge related to the use of organisms, cells or cell-derived constituents for the purpose of developing products which are technically, scientifically and clinically useful. Alteration of biologic function at the molecular level (i.e., genetic engineering) is a central focus; laboratory methods used include transfection and cloning technologies, sequence and structure analysis algorithms, computer databases, and gene and protein structure function analysis and prediction. [NIH]

Bipolar Disorder: A major affective disorder marked by severe mood swings (manic or major depressive episodes) and a tendency to remission and recurrence. [NIH]

Bladder: The organ that stores urine. [NIH]

Bloating: Fullness or swelling in the abdomen that often occurs after meals. [NIH]

Blood Coagulation: The process of the interaction of blood coagulation factors that results in an insoluble fibrin clot. [NIH]

Blood Glucose: Glucose in blood. [NIH]

Blood Platelets: Non-nucleated disk-shaped cells formed in the megakaryocyte and found in the blood of all mammals. They are mainly involved in blood coagulation. [NIH]

Blood pressure: The pressure of blood against the walls of a blood vessel or heart chamber. Unless there is reference to another location, such as the pulmonary artery or one of the heart chambers, it refers to the pressure in the systemic arteries, as measured, for example, in the forearm. [NIH]

Blood vessel: A tube in the body through which blood circulates. Blood vessels include a network of arteries, arterioles, capillaries, venules, and veins. [NIH]

Body Fluids: Liquid components of living organisms. [NIH]

Body Mass Index: One of the anthropometric measures of body mass; it has the highest correlation with skinfold thickness or body density. [NIH]

Body Regions: Anatomical areas of the body. [NIH]

Bolus: A single dose of drug usually injected into a blood vessel over a short period of time. Also called bolus infusion. [NIH]

Bolus infusion: A single dose of drug usually injected into a blood vessel over a short period of time. Also called bolus. [NIH]

Bone scan: A technique to create images of bones on a computer screen or on film. A small amount of radioactive material is injected into a blood vessel and travels through the bloodstream; it collects in the bones and is detected by a scanner. [NIH]

Bowel: The long tube-shaped organ in the abdomen that completes the process of digestion. There is both a small and a large bowel. Also called the intestine. [NIH]

Bowel Movement: Body wastes passed through the rectum and anus. [NIH]

Bradycardia: Excessive slowness in the action of the heart, usually with a heart rate below 60 beats per minute. [NIH]

Bradykinin: A nonapeptide messenger that is enzymatically produced from kallidin in the blood where it is a potent but short-lived agent of arteriolar dilation and increased capillary permeability. Bradykinin is also released from mast cells during asthma attacks, from gut walls as a gastrointestinal vasodilator, from damaged tissues as a pain signal, and may be a neurotransmitter. [NIH]

Brain Stem: The part of the brain that connects the cerebral hemispheres with the spinal cord. It consists of the mesencephalon, pons, and medulla oblongata. [NIH]

Branch: Most commonly used for branches of nerves, but applied also to other structures. [NIH]

Breakdown: A physical, metal, or nervous collapse. [NIH]

Breast Implants: Implants used to reconstruct and/or cosmetically enhance the female breast. They have an outer shell or envelope of silicone elastomer and are filled with either saline or silicone gel. The outer shell may be either smooth or textured. [NIH]

Bronchi: The larger air passages of the lungs arising from the terminal bifurcation of the trachea. [NIH]

Bronchitis: Inflammation (swelling and reddening) of the bronchi. [NIH]

Bruxism: A disorder characterized by grinding and clenching of the teeth. [NIH]

Buccal: Pertaining to or directed toward the cheek. In dental anatomy, used to refer to the buccal surface of a tooth. [EU]

Buffers: A chemical system that functions to control the levels of specific ions in solution. When the level of hydrogen ion in solution is controlled the system is called a pH buffer. [NIH]

Bulimia: Episodic binge eating. The episodes may be associated with the fear of not being able to stop eating, depressed mood, or self-deprecating thoughts (binge-eating disorder) and may frequently be terminated by self-induced vomiting (bulimia nervosa). [NIH]

Bupivacaine: A widely used local anesthetic agent. [NIH]

Buprenorphine: A derivative of the opioid alkaloid thebaine that is a more potent and longer lasting analgesic than morphine. It appears to act as a partial agonist at mu and kappa opioid receptors and as an antagonist at delta receptors. The lack of delta-agonist activity has been suggested to account for the observation that buprenorphine tolerance may not develop with chronic use. [NIH]

Bursitis: Inflammation of a bursa, occasionally accompanied by a calcific deposit in the underlying supraspinatus tendon; the most common site is the subdeltoid bursa. [EU]

Caffeine: A methylxanthine naturally occurring in some beverages and also used as a pharmacological agent. Caffeine's most notable pharmacological effect is as a central nervous system stimulant, increasing alertness and producing agitation. It also relaxes smooth muscle, stimulates cardiac muscle, stimulates diuresis, and appears to be useful in the treatment of some types of headache. Several cellular actions of caffeine have been observed, but it is not entirely clear how each contributes to its pharmacological profile. Among the most important are inhibition of cyclic nucleotide phosphodiesterases, antagonism of adenosine receptors, and modulation of intracellular calcium handling. [NIH]

Calcification: Deposits of calcium in the tissues of the breast. Calcification in the breast can be seen on a mammogram, but cannot be detected by touch. There are two types of breast calcification, macrocalcification and microcalcification. Macrocalcifications are large deposits and are usually not related to cancer. Microcalcifications are specks of calcium that may be found in an area of rapidly dividing cells. Many microcalcifications clustered together may be a sign of cancer. [NIH]

Calcitonin: A peptide hormone that lowers calcium concentration in the blood. In humans, it is released by thyroid cells and acts to decrease the formation and absorptive activity of osteoclasts. Its role in regulating plasma calcium is much greater in children and in certain diseases than in normal adults. [NIH]

Calcitonin Gene-Related Peptide: Calcitonin gene-related peptide. A 37-amino acid peptide

derived from the calcitonin gene. It occurs as a result of alternative processing of mRNA from the calcitonin gene. The neuropeptide is widely distributed in neural tissue of the brain, gut, perivascular nerves, and other tissue. The peptide produces multiple biological effects and has both circulatory and neurotransmitter modes of action. In particular, it is a potent endogenous vasodilator. [NIH]

Calcium: A basic element found in nearly all organized tissues. It is a member of the alkaline earth family of metals with the atomic symbol Ca, atomic number 20, and atomic weight 40. Calcium is the most abundant mineral in the body and combines with phosphorus to form calcium phosphate in the bones and teeth. It is essential for the normal functioning of nerves and muscles and plays a role in blood coagulation (as factor IV) and in many enzymatic processes. [NIH]

Calcium Pyrophosphate: Diphosphoric acid, calcium salt. An inorganic pyrophosphate which affects calcium metabolism in mammals. Abnormalities in its metabolism occur in some human diseases, notably hypophosphatasia and pseudogout. [NIH]

Calculi: An abnormal concretion occurring mostly in the urinary and biliary tracts, usually composed of mineral salts. Also called stones. [NIH]

Callus: A callosity or hard, thick skin; the bone-like reparative substance that is formed round the edges and fragments of broken bone. [NIH]

Capsaicin: Cytotoxic alkaloid from various species of Capsicum (pepper, paprika), of the Solanaceae. [NIH]

Carbohydrate: An aldehyde or ketone derivative of a polyhydric alcohol, particularly of the pentahydric and hexahydric alcohols. They are so named because the hydrogen and oxygen are usually in the proportion to form water, (CH2O)n. The most important carbohydrates are the starches, sugars, celluloses, and gums. They are classified into mono-, di-, tri-, poly- and heterosaccharides. [EU]

Carbon Dioxide: A colorless, odorless gas that can be formed by the body and is necessary for the respiration cycle of plants and animals. [NIH]

Carcinogenic: Producing carcinoma. [EU]

Cardiac: Having to do with the heart. [NIH]

Cardiac Output: The volume of blood passing through the heart per unit of time. It is usually expressed as liters (volume) per minute so as not to be confused with stroke volume (volume per beat). [NIH]

Cardiopulmonary: Having to do with the heart and lungs. [NIH]

Cardiorespiratory: Relating to the heart and lungs and their function. [EU]

Cardioselective: Having greater activity on heart tissue than on other tissue. [EU]

Cardiovascular: Having to do with the heart and blood vessels. [NIH]

Cardiovascular System: The heart and the blood vessels by which blood is pumped and circulated through the body. [NIH]

Carotene: The general name for a group of pigments found in green, yellow, and leafy vegetables, and yellow fruits. The pigments are fat-soluble, unsaturated aliphatic hydrocarbons functioning as provitamins and are converted to vitamin A through enzymatic processes in the intestinal wall. [NIH]

Carpal Tunnel Syndrome: A median nerve injury inside the carpal tunnel that results in symptoms of pain, numbness, tingling, clumsiness, and a lack of sweating, which can be caused by work with certain hand and wrist postures. [NIH]

Carrier Proteins: Transport proteins that carry specific substances in the blood or across cell

membranes. [NIH]

Case report: A detailed report of the diagnosis, treatment, and follow-up of an individual patient. Case reports also contain some demographic information about the patient (for example, age, gender, ethnic origin). [NIH]

Case series: A group or series of case reports involving patients who were given similar treatment. Reports of case series usually contain detailed information about the individual patients. This includes demographic information (for example, age, gender, ethnic origin) and information on diagnosis, treatment, response to treatment, and follow-up after treatment. [NIH]

Catecholamine: A group of chemical substances manufactured by the adrenal medulla and secreted during physiological stress. [NIH]

Catheter: A flexible tube used to deliver fluids into or withdraw fluids from the body. [NIH]

Cations: Postively charged atoms, radicals or groups of atoms which travel to the cathode or negative pole during electrolysis. [NIH]

Caudal: Denoting a position more toward the cauda, or tail, than some specified point of reference; same as inferior, in human anatomy. [EU]

Caudate Nucleus: Elongated gray mass of the neostriatum located adjacent to the lateral ventricle of the brain. [NIH]

Causal: Pertaining to a cause; directed against a cause. [EU]

Cell: The individual unit that makes up all of the tissues of the body. All living things are made up of one or more cells. [NIH]

Cell Death: The termination of the cell's ability to carry out vital functions such as metabolism, growth, reproduction, responsiveness, and adaptability. [NIH]

Cell Division: The fission of a cell. [NIH]

Cell membrane: Cell membrane = plasma membrane. The structure enveloping a cell, enclosing the cytoplasm, and forming a selective permeability barrier; it consists of lipids, proteins, and some carbohydrates, the lipids thought to form a bilayer in which integral proteins are embedded to varying degrees. [EU]

Cell Survival: The span of viability of a cell characterized by the capacity to perform certain functions such as metabolism, growth, reproduction, some form of responsiveness, and adaptability. [NIH]

Central Nervous System: The main information-processing organs of the nervous system, consisting of the brain, spinal cord, and meninges. [NIH]

Central Nervous System Infections: Pathogenic infections of the brain, spinal cord, and meninges. DNA virus infections; RNA virus infections; bacterial infections; mycoplasma infections; Spirochaetales infections; fungal infections; protozoan infections; helminthiasis; and prion diseases may involve the central nervous system as a primary or secondary process. [NIH]

Cerebellum: Part of the metencephalon that lies in the posterior cranial fossa behind the brain stem. It is concerned with the coordination of movement. [NIH]

Cerebral: Of or pertaining of the cerebrum or the brain. [EU]

Cerebral Cortex: The thin layer of gray matter on the surface of the cerebral hemisphere that develops from the telencephalon and folds into gyri. It reaches its highest development in man and is responsible for intellectual faculties and higher mental functions. [NIH]

Cerebral hemispheres: The two halves of the cerebrum, the part of the brain that controls muscle functions of the body and also controls speech, emotions, reading, writing, and

learning. The right hemisphere controls muscle movement on the left side of the body, and the left hemisphere controls muscle movement on the right side of the body. [NIH]

Cerebrospinal: Pertaining to the brain and spinal cord. [EU]

Cerebrospinal fluid: CSF. The fluid flowing around the brain and spinal cord. Cerebrospinal fluid is produced in the ventricles in the brain. [NIH]

Cerebrum: The largest part of the brain. It is divided into two hemispheres, or halves, called the cerebral hemispheres. The cerebrum controls muscle functions of the body and also controls speech, emotions, reading, writing, and learning. [NIH]

Cervical: Relating to the neck, or to the neck of any organ or structure. Cervical lymph nodes are located in the neck; cervical cancer refers to cancer of the uterine cervix, which is the lower, narrow end (the "neck") of the uterus. [NIH]

Cervix: The lower, narrow end of the uterus that forms a canal between the uterus and vagina. [NIH]

Character: In current usage, approximately equivalent to personality. The sum of the relatively fixed personality traits and habitual modes of response of an individual. [NIH]

Chemotherapy: Treatment with anticancer drugs. [NIH]

Chest Pain: Pressure, burning, or numbness in the chest. [NIH]

Child Rearing: The training or bringing-up of children by parents or parent-substitutes. It is used also for child rearing practices in different societies, at different economic levels, in different ethnic groups, etc. It differs from parenting in that in child rearing the emphasis is on the act of training or bringing up the child and the interaction between the parent and child, while parenting emphasizes the responsibility and qualities of exemplary behavior of the parent. [NIH]

Chin: The anatomical frontal portion of the mandible, also known as the mentum, that contains the line of fusion of the two separate halves of the mandible (symphysis menti). This line of fusion divides inferiorly to enclose a triangular area called the mental protuberance. On each side, inferior to the second premolar tooth, is the mental foramen for the passage of blood vessels and a nerve. [NIH]

Chiropractic: A system of treating bodily disorders by manipulation of the spine and other parts, based on the belief that the cause is the abnormal functioning of a nerve. [NIH]

Cholesterol: The principal sterol of all higher animals, distributed in body tissues, especially the brain and spinal cord, and in animal fats and oils. [NIH]

Cholinergic: Resembling acetylcholine in pharmacological action; stimulated by or releasing acetylcholine or a related compound. [EU]

Chromatin: The material of chromosomes. It is a complex of DNA, histones, and nonhistone proteins (chromosomal proteins, non-histone) found within the nucleus of a cell. [NIH]

Chromosomal: Pertaining to chromosomes. [EU]

Chromosome: Part of a cell that contains genetic information. Except for sperm and eggs, all human cells contain 46 chromosomes. [NIH]

Chronic: A disease or condition that persists or progresses over a long period of time. [NIH]

Chronic Disease: Disease or ailment of long duration. [NIH]

Chronic Fatigue Syndrome: Fatigue caused by the combined effects of different types of prolonged fatigue. [NIH]

Chronic Obstructive Pulmonary Disease: Collective term for chronic bronchitis and emphysema. [NIH]

Circadian: Repeated more or less daily, i. e. on a 23- to 25-hour cycle. [NIH]

Circadian Rhythm: The regular recurrence, in cycles of about 24 hours, of biological processes or activities, such as sensitivity to drugs and stimuli, hormone secretion, sleeping, feeding, etc. This rhythm seems to be set by a 'biological clock' which seems to be set by recurring daylight and darkness. [NIH]

Cisplatin: An inorganic and water-soluble platinum complex. After undergoing hydrolysis, it reacts with DNA to produce both intra and interstrand crosslinks. These crosslinks appear to impair replication and transcription of DNA. The cytotoxicity of cisplatin correlates with cellular arrest in the G2 phase of the cell cycle. [NIH]

Civil Rights: Legal guarantee protecting the individual from attack on personal liberties, right to fair trial, right to vote, and freedom from discrimination on the basis of race, religion, national origin, age, or gender. [NIH]

Clinical study: A research study in which patients receive treatment in a clinic or other medical facility. Reports of clinical studies can contain results for single patients (case reports) or many patients (case series or clinical trials). [NIH]

Clinical trial: A research study that tests how well new medical treatments or other interventions work in people. Each study is designed to test new methods of screening, prevention, diagnosis, or treatment of a disease. [NIH]

Cloning: The production of a number of genetically identical individuals; in genetic engineering, a process for the efficient replication of a great number of identical DNA molecules. [NIH]

Cochlear: Of or pertaining to the cochlea. [EU]

Cochlear Diseases: Diseases of the cochlea, the part of the inner ear that is concerned with hearing. [NIH]

Codeine: An opioid analgesic related to morphine but with less potent analgesic properties and mild sedative effects. It also acts centrally to suppress cough. [NIH]

Coenzyme: An organic nonprotein molecule, frequently a phosphorylated derivative of a water-soluble vitamin, that binds with the protein molecule (apoenzyme) to form the active enzyme (holoenzyme). [EU]

Cofactor: A substance, microorganism or environmental factor that activates or enhances the action of another entity such as a disease-causing agent. [NIH]

Cognition: Intellectual or mental process whereby an organism becomes aware of or obtains knowledge. [NIH]

Cognitive behavior therapy: A system of psychotherapy based on the premise that distorted or dysfunctional thinking, which influences a person's mood or behavior, is common to all psychosocial problems. The focus of therapy is to identify the distorted thinking and to replace it with more rational, adaptive thoughts and beliefs. [NIH]

Cognitive restructuring: A method of identifying and replacing fear-promoting, irrational beliefs with more realistic and functional ones. [NIH]

Cognitive Therapy: A direct form of psychotherapy based on the interpretation of situations (cognitive structure of experiences) that determine how an individual feels and behaves. It is based on the premise that cognition, the process of acquiring knowledge and forming beliefs, is a primary determinant of mood and behavior. The therapy uses behavioral and verbal techniques to identify and correct negative thinking that is at the root of the aberrant behavior. [NIH]

Cohort Studies: Studies in which subsets of a defined population are identified. These

groups may or may not be exposed to factors hypothesized to influence the probability of the occurrence of a particular disease or other outcome. Cohorts are defined populations which, as a whole, are followed in an attempt to determine distinguishing subgroup characteristics. [NIH]

Colitis: Inflammation of the colon. [NIH]

Collagen: A polypeptide substance comprising about one third of the total protein in mammalian organisms. It is the main constituent of skin, connective tissue, and the organic substance of bones and teeth. Different forms of collagen are produced in the body but all consist of three alpha-polypeptide chains arranged in a triple helix. Collagen is differentiated from other fibrous proteins, such as elastin, by the content of proline, hydroxyproline, and hydroxylysine; by the absence of tryptophan; and particularly by the high content of polar groups which are responsible for its swelling properties. [NIH]

Collapse: 1. A state of extreme prostration and depression, with failure of circulation. 2. Abnormal falling in of the walls of any part of organ. [EU]

Colon: The long, coiled, tubelike organ that removes water from digested food. The remaining material, solid waste called stool, moves through the colon to the rectum and leaves the body through the anus. [NIH]

Combination Therapy: Association of 3 drugs to treat AIDS (AZT + DDC or DDI + protease inhibitor). [NIH]

Common Bile Duct: The largest biliary duct. It is formed by the junction of the cystic duct and the hepatic duct. [NIH]

Comorbidity: The presence of co-existing or additional diseases with reference to an initial diagnosis or with reference to the index condition that is the subject of study. Comorbidity may affect the ability of affected individuals to function and also their survival; it may be used as a prognostic indicator for length of hospital stay, cost factors, and outcome or survival. [NIH]

Complement: A term originally used to refer to the heat-labile factor in serum that causes immune cytolysis, the lysis of antibody-coated cells, and now referring to the entire functionally related system comprising at least 20 distinct serum proteins that is the effector not only of immune cytolysis but also of other biologic functions. Complement activation occurs by two different sequences, the classic and alternative pathways. The proteins of the classic pathway are termed 'components of complement' and are designated by the symbols C1 through C9. C1 is a calcium-dependent complex of three distinct proteins C1q, C1r and C1s. The proteins of the alternative pathway (collectively referred to as the properdin system) and complement regulatory proteins are known by semisystematic or trivial names. Fragments resulting from proteolytic cleavage of complement proteins are designated with lower-case letter suffixes, e.g., C3a. Inactivated fragments may be designated with the suffix 'i', e.g. C3bi. Activated components or complexes with biological activity are designated by a bar over the symbol e.g. C1 or C4b,2a. The classic pathway is activated by the binding of C1 to classic pathway activators, primarily antigen-antibody complexes containing IgM, IgG1, IgG3; C1q binds to a single IgM molecule or two adjacent IgG molecules. The alternative pathway can be activated by IgA immune complexes and also by nonimmunologic materials including bacterial endotoxins, microbial polysaccharides, and cell walls. Activation of the classic pathway triggers an enzymatic cascade involving C1, C4, C2 and C3; activation of the alternative pathway triggers a cascade involving C3 and factors B, D and P. Both result in the cleavage of C5 and the formation of the membrane attack complex. Complement activation also results in the formation of many biologically active complement fragments that act as anaphylatoxins, opsonins, or chemotactic factors. [EU]

Complementary and alternative medicine: CAM. Forms of treatment that are used in

addition to (complementary) or instead of (alternative) standard treatments. These practices are not considered standard medical approaches. CAM includes dietary supplements, megadose vitamins, herbal preparations, special teas, massage therapy, magnet therapy, spiritual healing, and meditation. [NIH]

Complementary medicine: Practices not generally recognized by the medical community as standard or conventional medical approaches and used to enhance or complement the standard treatments. Complementary medicine includes the taking of dietary supplements, megadose vitamins, and herbal preparations; the drinking of special teas; and practices such as massage therapy, magnet therapy, spiritual healing, and meditation. [NIH]

Compliance: Distensibility measure of a chamber such as the lungs (lung compliance) or bladder. Compliance is expressed as a change in volume per unit change in pressure. [NIH]

Compress: A plug used to occludate an orifice in the control of bleeding, or to mop up secretions; an absorbent pad. [NIH]

Compulsive Behavior: The behavior of performing an act persistently and repetitively without it leading to reward or pleasure. The act is usually a small, circumscribed behavior, almost ritualistic, yet not pathologically disturbing. Examples of compulsive behavior include twirling of hair, checking something constantly, not wanting pennies in change, straightening tilted pictures, etc. [NIH]

Computational Biology: A field of biology concerned with the development of techniques for the collection and manipulation of biological data, and the use of such data to make biological discoveries or predictions. This field encompasses all computational methods and theories applicable to molecular biology and areas of computer-based techniques for solving biological problems including manipulation of models and datasets. [NIH]

Computed tomography: CT scan. A series of detailed pictures of areas inside the body, taken from different angles; the pictures are created by a computer linked to an x-ray machine. Also called computerized tomography and computerized axial tomography (CAT) scan. [NIH]

Computerized tomography: A series of detailed pictures of areas inside the body, taken from different angles; the pictures are created by a computer linked to an x-ray machine. Also called computerized axial tomography (CAT) scan and computed tomography (CT scan). [NIH]

Concomitant: Accompanying; accessory; joined with another. [EU]

Conduction: The transfer of sound waves, heat, nervous impulses, or electricity. [EU]

Confounding: Extraneous variables resulting in outcome effects that obscure or exaggerate the "true" effect of an intervention. [NIH]

Conjunctiva: The mucous membrane that lines the inner surface of the eyelids and the anterior part of the sclera. [NIH]

Connective Tissue: Tissue that supports and binds other tissues. It consists of connective tissue cells embedded in a large amount of extracellular matrix. [NIH]

Connective Tissue: Tissue that supports and binds other tissues. It consists of connective tissue cells embedded in a large amount of extracellular matrix. [NIH]

Connective Tissue Cells: A group of cells that includes fibroblasts, cartilage cells, adipocytes, smooth muscle cells, and bone cells. [NIH]

Consciousness: Sense of awareness of self and of the environment. [NIH]

Constipation: Infrequent or difficult evacuation of feces. [NIH]

Contraindications: Any factor or sign that it is unwise to pursue a certain kind of action or

treatment, e. g. giving a general anesthetic to a person with pneumonia. [NIH]

Control group: In a clinical trial, the group that does not receive the new treatment being studied. This group is compared to the group that receives the new treatment, to see if the new treatment works. [NIH]

Controlled clinical trial: A clinical study that includes a comparison (control) group. The comparison group receives a placebo, another treatment, or no treatment at all. [NIH]

Controlled study: An experiment or clinical trial that includes a comparison (control) group. [NIH]

Conventional therapy: A currently accepted and widely used treatment for a certain type of disease, based on the results of past research. Also called conventional treatment. [NIH]

Conventional treatment: A currently accepted and widely used treatment for a certain type of disease, based on the results of past research. Also called conventional therapy. [NIH]

Coordination: Muscular or motor regulation or the harmonious cooperation of muscles or groups of muscles, in a complex action or series of actions. [NIH]

Cor: The muscular organ that maintains the circulation of the blood. c. adiposum a heart that has undergone fatty degeneration or that has an accumulation of fat around it; called also fat or fatty, heart. c. arteriosum the left side of the heart, so called because it contains oxygenated (arterial) blood. c. biloculare a congenital anomaly characterized by failure of formation of the atrial and ventricular septums, the heart having only two chambers, a single atrium and a single ventricle, and a common atrioventricular valve. c. bovinum (L. 'ox heart') a greatly enlarged heart due to a hypertrophied left ventricle; called also c. taurinum and bucardia. c. dextrum (L. 'right heart') the right atrium and ventricle. c. hirsutum, c. villosum. c. mobile (obs.) an abnormally movable heart. c. pendulum a heart so movable that it seems to be hanging by the great blood vessels. c. pseudotriloculare biatriatum a congenital cardiac anomaly in which the heart functions as a three-chambered heart because of tricuspid atresia, the right ventricle being extremely small or rudimentary and the right atrium greatly dilated. Blood passes from the right to the left atrium and thence disease due to pulmonary hypertension secondary to disease of the lung, or its blood vessels, with hypertrophy of the right ventricle. [EU]

Cornea: The transparent part of the eye that covers the iris and the pupil and allows light to enter the inside. [NIH]

Coronary: Encircling in the manner of a crown; a term applied to vessels; nerves, ligaments, etc. The term usually denotes the arteries that supply the heart muscle and, by extension, a pathologic involvement of them. [EU]

Coronary Thrombosis: Presence of a thrombus in a coronary artery, often causing a myocardial infarction. [NIH]

Corpus: The body of the uterus. [NIH]

Corpus Luteum: The yellow glandular mass formed in the ovary by an ovarian follicle that has ruptured and discharged its ovum. [NIH]

Cortex: The outer layer of an organ or other body structure, as distinguished from the internal substance. [EU]

Cortical: Pertaining to or of the nature of a cortex or bark. [EU]

Cortices: The outer layer of an organ; used especially of the cerebrum and cerebellum. [NIH]

Corticosteroid: Any of the steroids elaborated by the adrenal cortex (excluding the sex hormones of adrenal origin) in response to the release of corticotrophin (adrenocorticotropic hormone) by the pituitary gland, to any of the synthetic equivalents of these steroids, or to angiotensin II. They are divided, according to their predominant biological activity, into

three major groups: glucocorticoids, chiefly influencing carbohydrate, fat, and protein metabolism; mineralocorticoids, affecting the regulation of electrolyte and water balance; and C19 androgens. Some corticosteroids exhibit both types of activity in varying degrees, and others exert only one type of effect. The corticosteroids are used clinically for hormonal replacement therapy, for suppression of ACTH secretion by the anterior pituitary, as antineoplastic, antiallergic, and anti-inflammatory agents, and to suppress the immune response. Called also adrenocortical hormone and corticoid. [EU]

Corticotropin-Releasing Hormone: A neuropeptide released by the hypothalamus that stimulates the release of corticotropin by the anterior pituitary gland. [NIH]

Cortisol: A steroid hormone secreted by the adrenal cortex as part of the body's response to stress. [NIH]

Cortisone: A natural steroid hormone produced in the adrenal gland. It can also be made in the laboratory. Cortisone reduces swelling and can suppress immune responses. [NIH]

Cranial: Pertaining to the cranium, or to the anterior (in animals) or superior (in humans) end of the body. [EU]

Craniocerebral Trauma: Traumatic injuries involving the cranium and intracranial structures (i.e., brain; cranial nerves; meninges; and other structures). Injuries may be classified by whether or not the skull is penetrated (i.e., penetrating vs. nonpenetrating) or whether there is an associated hemorrhage. [NIH]

Criterion: A standard by which something may be judged. [EU]

Curare: Plant extracts from several species, including Strychnos toxifera, S. castelnaei, S. crevauxii, and Chondodendron tomentosum, that produce paralysis of skeletal muscle and are used adjunctively with general anesthesia. These extracts are toxic and must be used with the administration of artificial respiration. [NIH]

Curative: Tending to overcome disease and promote recovery. [EU]

Cutaneous: Having to do with the skin. [NIH]

Cyclic: Pertaining to or occurring in a cycle or cycles; the term is applied to chemical compounds that contain a ring of atoms in the nucleus. [EU]

Cytokine: Small but highly potent protein that modulates the activity of many cell types, including T and B cells. [NIH]

Cytoplasm: The protoplasm of a cell exclusive of that of the nucleus; it consists of a continuous aqueous solution (cytosol) and the organelles and inclusions suspended in it (phaneroplasm), and is the site of most of the chemical activities of the cell. [EU]

Cytotoxic: Cell-killing. [NIH]

Cytotoxic chemotherapy: Anticancer drugs that kill cells, especially cancer cells. [NIH]

Decarboxylation: The removal of a carboxyl group, usually in the form of carbon dioxide, from a chemical compound. [NIH]

Decompression: Decompression external to the body, most often the slow lessening of external pressure on the whole body (especially in caisson workers, deep sea divers, and persons who ascend to great heights) to prevent decompression sickness. It includes also sudden accidental decompression, but not surgical (local) decompression or decompression applied through body openings. [NIH]

Degenerative: Undergoing degeneration : tending to degenerate; having the character of or involving degeneration; causing or tending to cause degeneration. [EU]

Deletion: A genetic rearrangement through loss of segments of DNA (chromosomes), bringing sequences, which are normally separated, into close proximity. [NIH]

Delivery of Health Care: The concept concerned with all aspects of providing and distributing health services to a patient population. [NIH]

Dendrites: Extensions of the nerve cell body. They are short and branched and receive stimuli from other neurons. [NIH]

Density: The logarithm to the base 10 of the opacity of an exposed and processed film. [NIH]

Dentate Gyrus: Gray matter situated above the gyrus hippocampi. It is composed of three layers. The molecular layer is continuous with the hippocampus in the hippocampal fissure. The granular layer consists of closely arranged spherical or oval neurons, called granule cells, whose axons pass through the polymorphic layer ending on the dendrites of pyramidal cells in the hippocampus. [NIH]

Depersonalization: Alteration in the perception of the self so that the usual sense of one's own reality is lost, manifested in a sense of unreality or self-estrangement, in changes of body image, or in a feeling that one does not control his own actions and speech; seen in depersonalization disorder, schizophrenic disorders, and schizotypal personality disorder. Some do not draw a distinction between depersonalization and derealization, using depersonalization to include both. [EU]

Depressive Disorder: An affective disorder manifested by either a dysphoric mood or loss of interest or pleasure in usual activities. The mood disturbance is prominent and relatively persistent. [NIH]

Derealization: Is characterized by the loss of the sense of reality concerning one's surroundings. [NIH]

Dermatitis: Any inflammation of the skin. [NIH]

Dermis: A layer of vascular connective tissue underneath the epidermis. The surface of the dermis contains sensitive papillae. Embedded in or beneath the dermis are sweat glands, hair follicles, and sebaceous glands. [NIH]

Dexamethasone: (11 beta,16 alpha)-9-Fluoro-11,17,21-trihydroxy-16-methylpregna-1,4-diene-3,20-dione. An anti-inflammatory glucocorticoid used either in the free alcohol or esterified form in treatment of conditions that respond generally to cortisone. [NIH]

Dextromethorphan: The d-isomer of the codeine analog of levorphanol. Dextromethorphan shows high affinity binding to several regions of the brain, including the medullary cough center. This compound is a NMDA receptor antagonist (receptors, N-methyl-D-aspartate) and acts as a non-competitive channel blocker. It is used widely as an antitussive agent, and is also used to study the involvement of glutamate receptors in neurotoxicity. [NIH]

Diagnostic procedure: A method used to identify a disease. [NIH]

Diarrhea: Passage of excessively liquid or excessively frequent stools. [NIH]

Diastolic: Of or pertaining to the diastole. [EU]

Diathesis: A constitution or condition of the body which makes the tissues react in special ways to certain extrinsic stimuli and thus tends to make the person more than usually susceptible to certain diseases. [EU]

Diencephalon: The paired caudal parts of the prosencephalon from which the thalamus, hypothalamus, epithalamus, and subthalamus are derived. [NIH]

Digestion: The process of breakdown of food for metabolism and use by the body. [NIH]

Digestive system: The organs that take in food and turn it into products that the body can use to stay healthy. Waste products the body cannot use leave the body through bowel movements. The digestive system includes the salivary glands, mouth, esophagus, stomach, liver, pancreas, gallbladder, small and large intestines, and rectum. [NIH]

Digestive tract: The organs through which food passes when food is eaten. These organs are the mouth, esophagus, stomach, small and large intestines, and rectum. [NIH]

Direct: 1. Straight; in a straight line. 2. Performed immediately and without the intervention of subsidiary means. [EU]

Discrete: Made up of separate parts or characterized by lesions which do not become blended; not running together; separate. [NIH]

Discrimination: The act of qualitative and/or quantitative differentiation between two or more stimuli. [NIH]

Dissociation: 1. The act of separating or state of being separated. 2. The separation of a molecule into two or more fragments (atoms, molecules, ions, or free radicals) produced by the absorption of light or thermal energy or by solvation. 3. In psychology, a defense mechanism in which a group of mental processes are segregated from the rest of a person's mental activity in order to avoid emotional distress, as in the dissociative disorders (q.v.), or in which an idea or object is segregated from its emotional significance; in the first sense it is roughly equivalent to splitting, in the second, to isolation. 4. A defect of mental integration in which one or more groups of mental processes become separated off from normal consciousness and, thus separated, function as a unitary whole. [EU]

Distal: Remote; farther from any point of reference; opposed to proximal. In dentistry, used to designate a position on the dental arch farther from the median line of the jaw. [EU]

Diuresis: Increased excretion of urine. [EU]

Diurnal: Occurring during the day. [EU]

Dizziness: An imprecise term which may refer to a sense of spatial disorientation, motion of the environment, or lightheadedness. [NIH]

Dopamine: An endogenous catecholamine and prominent neurotransmitter in several systems of the brain. In the synthesis of catecholamines from tyrosine, it is the immediate precursor to norepinephrine and epinephrine. Dopamine is a major transmitter in the extrapyramidal system of the brain, and important in regulating movement. A family of dopaminergic receptor subtypes mediate its action. Dopamine is used pharmacologically for its direct (beta adrenergic agonist) and indirect (adrenergic releasing) sympathomimetic effects including its actions as an inotropic agent and as a renal vasodilator. [NIH]

Dopamine Agonists: Drugs that bind to and activate dopamine receptors. [NIH]

Dorsal: 1. Pertaining to the back or to any dorsum. 2. Denoting a position more toward the back surface than some other object of reference; same as posterior in human anatomy; superior in the anatomy of quadrupeds. [EU]

Double-blind: Pertaining to a clinical trial or other experiment in which neither the subject nor the person administering treatment knows which treatment any particular subject is receiving. [EU]

Doxepin: A dibenzoxepin tricyclic compound. It displays a range of pharmacological actions including maintaining adrenergic innervation. Its mechanism of action is not fully understood, but it appears to block reuptake of monoaminergic neurotransmitters into presynaptic terminals. It also possesses anticholinergic activity and modulates antagonism of histamine H(1)- and H(2)-receptors. [NIH]

Drive: A state of internal activity of an organism that is a necessary condition before a given stimulus will elicit a class of responses; e.g., a certain level of hunger (drive) must be present before food will elicit an eating response. [NIH]

Drug Combinations: Single preparations containing two or more active agents, for the purpose of their concurrent administration as a fixed dose mixture. It is differentiated from

combination drug therapy in which two or more drugs are administered separately for a combined effect. [NIH]

Drug Tolerance: Progressive diminution of the susceptibility of a human or animal to the effects of a drug, resulting from its continued administration. It should be differentiated from drug resistance wherein an organism, disease, or tissue fails to respond to the intended effectiveness of a chemical or drug. It should also be differentiated from maximum tolerated dose and no-observed-adverse-effect level. [NIH]

Duct: A tube through which body fluids pass. [NIH]

Duodenum: The first part of the small intestine. [NIH]

Dynorphins: A class of opioid peptides including dynorphin A, dynorphin B, and smaller fragments of these peptides. Dynorphins prefer kappa-opioid receptors (receptors, opioid, kappa) and have been shown to play a role as central nervous system transmitters. [NIH]

Dyskinesias: Abnormal involuntary movements which primarily affect the extremities, trunk, or jaw that occur as a manifestation of an underlying disease process. Conditions which feature recurrent or persistent episodes of dyskinesia as a primary manifestation of disease may be referred to as dyskinesia syndromes (movement disorders). Dyskinesias are also a relatively common manifestation of basal ganglia diseases. [NIH]

Dysmenorrhea: Painful menstruation. [NIH]

Dyspepsia: Impaired digestion, especially after eating. [NIH]

Dysphoric: A feeling of unpleasantness and discomfort. [NIH]

Dyspnea: Difficult or labored breathing. [NIH]

Dystonia: Disordered tonicity of muscle. [EU]

Dystrophy: Any disorder arising from defective or faulty nutrition, especially the muscular dystrophies. [EU]

Eczema: A pruritic papulovesicular dermatitis occurring as a reaction to many endogenous and exogenous agents (Dorland, 27th ed). [NIH]

Efficacy: The extent to which a specific intervention, procedure, regimen, or service produces a beneficial result under ideal conditions. Ideally, the determination of efficacy is based on the results of a randomized control trial. [NIH]

Elastic: Susceptible of resisting and recovering from stretching, compression or distortion applied by a force. [EU]

Elastin: The protein that gives flexibility to tissues. [NIH]

Electroacupuncture: A form of acupuncture using low frequency electrically stimulated needles to produce analgesia and anesthesia and to treat disease. [NIH]

Electrolyte: A substance that dissociates into ions when fused or in solution, and thus becomes capable of conducting electricity; an ionic solute. [EU]

Electromagnetic Fields: Fields representing the joint interplay of electric and magnetic forces. [NIH]

Electromyography: Recording of the changes in electric potential of muscle by means of surface or needle electrodes. [NIH]

Electrophysiological: Pertaining to electrophysiology, that is a branch of physiology that is concerned with the electric phenomena associated with living bodies and involved in their functional activity. [EU]

Elementary Particles: Individual components of atoms, usually subatomic; subnuclear particles are usually detected only when the atomic nucleus decays and then only

transiently, as most of them are unstable, often yielding pure energy without substance, i.e., radiation. [NIH]

Embryo: The prenatal stage of mammalian development characterized by rapid morphological changes and the differentiation of basic structures. [NIH]

Emphysema: A pathological accumulation of air in tissues or organs. [NIH]

Empiric: Empirical; depending upon experience or observation alone, without using scientific method or theory. [EU]

Empirical: A treatment based on an assumed diagnosis, prior to receiving confirmatory laboratory test results. [NIH]

Encephalitis: Inflammation of the brain due to infection, autoimmune processes, toxins, and other conditions. Viral infections (see encephalitis, viral) are a relatively frequent cause of this condition. [NIH]

Encephalomyelitis: A general term indicating inflammation of the brain and spinal cord, often used to indicate an infectious process, but also applicable to a variety of autoimmune and toxic-metabolic conditions. There is significant overlap regarding the usage of this term and encephalitis in the literature. [NIH]

Endemic: Present or usually prevalent in a population or geographical area at all times; said of a disease or agent. Called also endemial. [EU]

Endocrine System: The system of glands that release their secretions (hormones) directly into the circulatory system. In addition to the endocrine glands, included are the chromaffin system and the neurosecretory systems. [NIH]

Endocrinology: A subspecialty of internal medicine concerned with the metabolism, physiology, and disorders of the endocrine system. [NIH]

Endogenous: Produced inside an organism or cell. The opposite is external (exogenous) production. [NIH]

Endometrial: Having to do with the endometrium (the layer of tissue that lines the uterus). [NIH]

Endometriosis: A condition in which tissue more or less perfectly resembling the uterine mucous membrane (the endometrium) and containing typical endometrial granular and stromal elements occurs aberrantly in various locations in the pelvic cavity. [NIH]

Endometrium: The layer of tissue that lines the uterus. [NIH]

Endorphins: One of the three major groups of endogenous opioid peptides. They are large peptides derived from the pro-opiomelanocortin precursor. The known members of this group are alpha-, beta-, and gamma-endorphin. The term endorphin is also sometimes used to refer to all opioid peptides, but the narrower sense is used here; opioid peptides is used for the broader group. [NIH]

Endothelial cell: The main type of cell found in the inside lining of blood vessels, lymph vessels, and the heart. [NIH]

Endothelium: A layer of epithelium that lines the heart, blood vessels (endothelium, vascular), lymph vessels (endothelium, lymphatic), and the serous cavities of the body. [NIH]

Endothelium-derived: Small molecule that diffuses to the adjacent muscle layer and relaxes it. [NIH]

Endotoxin: Toxin from cell walls of bacteria. [NIH]

Enkephalin: A natural opiate painkiller, in the hypothalamus. [NIH]

Entorhinal Cortex: Cortex where the signals are combined with those from other sensory

systems. [NIH]

Environmental Exposure: The exposure to potentially harmful chemical, physical, or biological agents in the environment or to environmental factors that may include ionizing radiation, pathogenic organisms, or toxic chemicals. [NIH]

Environmental Health: The science of controlling or modifying those conditions, influences, or forces surrounding man which relate to promoting, establishing, and maintaining health. [NIH]

Enzymatic: Phase where enzyme cuts the precursor protein. [NIH]

Enzyme: A protein that speeds up chemical reactions in the body. [NIH]

Eosinophilia: Abnormal increase in eosinophils in the blood, tissues or organs. [NIH]

Eosinophils: Granular leukocytes with a nucleus that usually has two lobes connected by a slender thread of chromatin, and cytoplasm containing coarse, round granules that are uniform in size and stainable by eosin. [NIH]

Epidemic: Occurring suddenly in numbers clearly in excess of normal expectancy; said especially of infectious diseases but applied also to any disease, injury, or other health-related event occurring in such outbreaks. [EU]

Epidemiological: Relating to, or involving epidemiology. [EU]

Epidural: The space between the wall of the spinal canal and the covering of the spinal cord. An epidural injection is given into this space. [NIH]

Epinephrine: The active sympathomimetic hormone from the adrenal medulla in most species. It stimulates both the alpha- and beta- adrenergic systems, causes systemic vasoconstriction and gastrointestinal relaxation, stimulates the heart, and dilates bronchi and cerebral vessels. It is used in asthma and cardiac failure and to delay absorption of local anesthetics. [NIH]

Epiphyseal: Pertaining to or of the nature of an epiphysis. [EU]

Erectile: The inability to get or maintain an erection for satisfactory sexual intercourse. Also called impotence. [NIH]

Ergot: Cataract due to ergot poisoning caused by eating of rye cereals contaminated by a fungus. [NIH]

Erythrocytes: Red blood cells. Mature erythrocytes are non-nucleated, biconcave disks containing hemoglobin whose function is to transport oxygen. [NIH]

Esophageal: Having to do with the esophagus, the muscular tube through which food passes from the throat to the stomach. [NIH]

Esophagus: The muscular tube through which food passes from the throat to the stomach. [NIH]

Estradiol: The most potent mammalian estrogenic hormone. It is produced in the ovary, placenta, testis, and possibly the adrenal cortex. [NIH]

Estrogen: One of the two female sex hormones. [NIH]

Ethnic Groups: A group of people with a common cultural heritage that sets them apart from others in a variety of social relationships. [NIH]

Evoke: The electric response recorded from the cerebral cortex after stimulation of a peripheral sense organ. [NIH]

Evoked Potentials: The electric response evoked in the central nervous system by stimulation of sensory receptors or some point on the sensory pathway leading from the receptor to the cortex. The evoked stimulus can be auditory, somatosensory, or visual,

although other modalities have been reported. Event-related potentials is sometimes used synonymously with evoked potentials but is often associated with the execution of a motor, cognitive, or psychophysiological task, as well as with the response to a stimulus. [NIH]

Excitability: Property of a cardiac cell whereby, when the cell is depolarized to a critical level (called threshold), the membrane becomes permeable and a regenerative inward current causes an action potential. [NIH]

Excitation: An act of irritation or stimulation or of responding to a stimulus; the addition of energy, as the excitation of a molecule by absorption of photons. [EU]

Excitatory: When cortical neurons are excited, their output increases and each new input they receive while they are still excited raises their output markedly. [NIH]

Excitatory Amino Acid Agonists: Drugs that bind to and activate excitatory amino acid receptors. [NIH]

Excitatory Amino Acids: Endogenous amino acids released by neurons as excitatory neurotransmitters. Glutamic acid is the most common excitatory neurotransmitter in the brain. Aspartic acid has been regarded as an excitatory transmitter for many years, but the extent of its role as a transmitter is unclear. [NIH]

Exercise Test: Controlled physical activity, more strenuous than at rest, which is performed in order to allow assessment of physiological functions, particularly cardiovascular and pulmonary, but also aerobic capacity. Maximal (most intense) exercise is usually required but submaximal exercise is also used. The intensity of exercise is often graded, using criteria such as rate of work done, oxygen consumption, and heart rate. Physiological data obtained from an exercise test may be used for diagnosis, prognosis, and evaluation of disease severity, and to evaluate therapy. Data may also be used in prescribing exercise by determining a person's exercise capacity. [NIH]

Exercise Therapy: Motion of the body or its parts to relieve symptoms or to improve function, leading to physical fitness, but not physical education and training. [NIH]

Exercise Tolerance: The exercise capacity of an individual as measured by endurance (maximal exercise duration and/or maximal attained work load) during an exercise test. [NIH]

Exhaustion: The feeling of weariness of mind and body. [NIH]

Exogenous: Developed or originating outside the organism, as exogenous disease. [EU]

Extensor: A muscle whose contraction tends to straighten a limb; the antagonist of a flexor. [NIH]

Extracellular: Outside a cell or cells. [EU]

Extracellular Matrix: A meshwork-like substance found within the extracellular space and in association with the basement membrane of the cell surface. It promotes cellular proliferation and provides a supporting structure to which cells or cell lysates in culture dishes adhere. [NIH]

Extracellular Space: Interstitial space between cells, occupied by fluid as well as amorphous and fibrous substances. [NIH]

Extrapyramidal: Outside of the pyramidal tracts. [EU]

Extremity: A limb; an arm or leg (membrum); sometimes applied specifically to a hand or foot. [EU]

Facial: Of or pertaining to the face. [EU]

Facial Pain: Pain in the facial region including orofacial pain and craniofacial pain. Associated conditions include local inflammatory and neoplastic disorders and neuralgic

syndromes involving the trigeminal, facial, and glossopharyngeal nerves. Conditions which feature recurrent or persistent facial pain as the primary manifestation of disease are referred to as facial pain syndromes. [NIH]

Family Planning: Programs or services designed to assist the family in controlling reproduction by either improving or diminishing fertility. [NIH]

Fat: Total lipids including phospholipids. [NIH]

Fatigue: The state of weariness following a period of exertion, mental or physical, characterized by a decreased capacity for work and reduced efficiency to respond to stimuli. [NIH]

Fatty acids: A major component of fats that are used by the body for energy and tissue development. [NIH]

Fentanyl: A narcotic opioid drug that is used in the treatment of pain. [NIH]

Fibroblasts: Connective tissue cells which secrete an extracellular matrix rich in collagen and other macromolecules. [NIH]

Fibrosis: Any pathological condition where fibrous connective tissue invades any organ, usually as a consequence of inflammation or other injury. [NIH]

Fibrositis: Aching, soreness or stiffness of muscles; often caused by inexpedient work postures. [NIH]

Fissure: Any cleft or groove, normal or otherwise; especially a deep fold in the cerebral cortex which involves the entire thickness of the brain wall. [EU]

Fixation: 1. The act or operation of holding, suturing, or fastening in a fixed position. 2. The condition of being held in a fixed position. 3. In psychiatry, a term with two related but distinct meanings : (1) arrest of development at a particular stage, which like regression (return to an earlier stage), if temporary is a normal reaction to setbacks and difficulties but if protracted or frequent is a cause of developmental failures and emotional problems, and (2) a close and suffocating attachment to another person, especially a childhood figure, such as one's mother or father. Both meanings are derived from psychoanalytic theory and refer to 'fixation' of libidinal energy either in a specific erogenous zone, hence fixation at the oral, anal, or phallic stage, or in a specific object, hence mother or father fixation. 4. The use of a fixative (q.v.) to preserve histological or cytological specimens. 5. In chemistry, the process whereby a substance is removed from the gaseous or solution phase and localized, as in carbon dioxide fixation or nitrogen fixation. 6. In ophthalmology, direction of the gaze so that the visual image of the object falls on the fovea centralis. 7. In film processing, the chemical removal of all undeveloped salts of the film emulsion, leaving only the developed silver to form a permanent image. [EU]

Flatus: Gas passed through the rectum. [NIH]

Flexor: Muscles which flex a joint. [NIH]

Fluoxetine: The first highly specific serotonin uptake inhibitor. It is used as an antidepressant and often has a more acceptable side-effects profile than traditional antidepressants. [NIH]

Fold: A plication or doubling of various parts of the body. [NIH]

Follicular Phase: The period of the menstrual cycle that begins with menstruation and ends with ovulation. [NIH]

Forearm: The part between the elbow and the wrist. [NIH]

Fossa: A cavity, depression, or pit. [NIH]

Frontal Lobe: The anterior part of the cerebral hemisphere. [NIH]

Functional Disorders: Disorders such as irritable bowel syndrome. These conditions result from poor nerve and muscle function. Symptoms such as gas, pain, constipation, and diarrhea come back again and again, but there are no signs of disease or damage. Emotional stress can trigger symptoms. Also called motility disorders. [NIH]

Fungus: A general term used to denote a group of eukaryotic protists, including mushrooms, yeasts, rusts, moulds, smuts, etc., which are characterized by the absence of chlorophyll and by the presence of a rigid cell wall composed of chitin, mannans, and sometimes cellulose. They are usually of simple morphological form or show some reversible cellular specialization, such as the formation of pseudoparenchymatous tissue in the fruiting body of a mushroom. The dimorphic fungi grow, according to environmental conditions, as moulds or yeasts. [EU]

Gallbladder: The pear-shaped organ that sits below the liver. Bile is concentrated and stored in the gallbladder. [NIH]

Ganglia: Clusters of multipolar neurons surrounded by a capsule of loosely organized connective tissue located outside the central nervous system. [NIH]

Ganglion: 1. A knot, or knotlike mass. 2. A general term for a group of nerve cell bodies located outside the central nervous system; occasionally applied to certain nuclear groups within the brain or spinal cord, e.g. basal ganglia. 3. A benign cystic tumour occurring on a aponeurosis or tendon, as in the wrist or dorsum of the foot; it consists of a thin fibrous capsule enclosing a clear mucinous fluid. [EU]

Gangliosides: Protein kinase C's inhibitor which reduces ischemia-related brain damage. [NIH]

Gas: Air that comes from normal breakdown of food. The gases are passed out of the body through the rectum (flatus) or the mouth (burp). [NIH]

Gas exchange: Primary function of the lungs; transfer of oxygen from inhaled air into the blood and of carbon dioxide from the blood into the lungs. [NIH]

Gastric: Having to do with the stomach. [NIH]

Gastric Juices: Liquids produced in the stomach to help break down food and kill bacteria. [NIH]

Gastric Mucosa: Surface epithelium in the stomach that invaginates into the lamina propria, forming gastric pits. Tubular glands, characteristic of each region of the stomach (cardiac, gastric, and pyloric), empty into the gastric pits. The gastric mucosa is made up of several different kinds of cells. [NIH]

Gastrin: A hormone released after eating. Gastrin causes the stomach to produce more acid. [NIH]

Gastrointestinal: Refers to the stomach and intestines. [NIH]

Gastrointestinal tract: The stomach and intestines. [NIH]

Gene: The functional and physical unit of heredity passed from parent to offspring. Genes are pieces of DNA, and most genes contain the information for making a specific protein. [NIH]

Gene Expression: The phenotypic manifestation of a gene or genes by the processes of gene action. [NIH]

General practitioner: A medical practitioner who does not specialize in a particular branch of medicine or limit his practice to a specific class of diseases. [NIH]

Genetics: The biological science that deals with the phenomena and mechanisms of heredity. [NIH]

Genital: Pertaining to the genitalia. [EU]

Genitourinary: Pertaining to the genital and urinary organs; urogenital; urinosexual. [EU]

Genomics: The systematic study of the complete DNA sequences (genome) of organisms. [NIH]

Germ Cells: The reproductive cells in multicellular organisms. [NIH]

Ginger: Deciduous plant rich in volatile oil (oils, volatile). It is used as a flavoring agent and has many other uses both internally and topically. [NIH]

Ginseng: An araliaceous genus of plants that contains a number of pharmacologically active agents used as stimulants, sedatives, and tonics, especially in traditional medicine. [NIH]

Gland: An organ that produces and releases one or more substances for use in the body. Some glands produce fluids that affect tissues or organs. Others produce hormones or participate in blood production. [NIH]

Gliosis: The production of a dense fibrous network of neuroglia; includes astrocytosis, which is a proliferation of astrocytes in the area of a degenerative lesion. [NIH]

Glossopharyngeal Nerve: The 9th cranial nerve. The glossopharyngeal nerve is a mixed motor and sensory nerve; it conveys somatic and autonomic efferents as well as general, special, and visceral afferents. Among the connections are motor fibers to the stylopharyngeus muscle, parasympathetic fibers to the parotid glands, general and taste afferents from the posterior third of the tongue, the nasopharynx, and the palate, and afferents from baroreceptors and chemoreceptors of the carotid sinus. [NIH]

Glucocorticoid: A compound that belongs to the family of compounds called corticosteroids (steroids). Glucocorticoids affect metabolism and have anti-inflammatory and immunosuppressive effects. They may be naturally produced (hormones) or synthetic (drugs). [NIH]

Glucose: D-Glucose. A primary source of energy for living organisms. It is naturally occurring and is found in fruits and other parts of plants in its free state. It is used therapeutically in fluid and nutrient replacement. [NIH]

Glutamate: Excitatory neurotransmitter of the brain. [NIH]

Glutamic Acid: A non-essential amino acid naturally occurring in the L-form. Glutamic acid (glutamate) is the most common excitatory neurotransmitter in the central nervous system. [NIH]

Glycerol: A trihydroxy sugar alcohol that is an intermediate in carbohydrate and lipid metabolism. It is used as a solvent, emollient, pharmaceutical agent, and sweetening agent. [NIH]

Glycerophospholipids: Derivatives of phosphatidic acid in which the hydrophobic regions are composed of two fatty acids and a polar alcohol is joined to the C-3 position of glycerol through a phosphodiester bond. They are named according to their polar head groups, such as phosphatidylcholine and phosphatidylethanolamine. [NIH]

Glycine: A non-essential amino acid. It is found primarily in gelatin and silk fibroin and used therapeutically as a nutrient. It is also a fast inhibitory neurotransmitter. [NIH]

Glycolysis: The pathway by which glucose is catabolized into two molecules of pyruvic acid with the generation of ATP. [NIH]

Glycoprotein: A protein that has sugar molecules attached to it. [NIH]

Gonad: A sex organ, such as an ovary or a testicle, which produces the gametes in most multicellular animals. [NIH]

Gonadal: Pertaining to a gonad. [EU]

Gonadotropin: The water-soluble follicle stimulating substance, by some believed to

originate in chorionic tissue, obtained from the serum of pregnant mares. It is used to supplement the action of estrogens. [NIH]

Gout: Hereditary metabolic disorder characterized by recurrent acute arthritis, hyperuricemia and deposition of sodium urate in and around the joints, sometimes with formation of uric acid calculi. [NIH]

Governing Board: The group in which legal authority is vested for the control of health-related institutions and organizations. [NIH]

Grafting: The operation of transfer of tissue from one site to another. [NIH]

Gram-negative: Losing the stain or decolorized by alcohol in Gram's method of staining, a primary characteristic of bacteria having a cell wall composed of a thin layer of peptidoglycan covered by an outer membrane of lipoprotein and lipopolysaccharide. [EU]

Gram-positive: Retaining the stain or resisting decolorization by alcohol in Gram's method of staining, a primary characteristic of bacteria whose cell wall is composed of a thick layer of peptidologlycan with attached teichoic acids. [EU]

Granisetron: A serotonin receptor (5HT-3 selective) antagonist that has been used as an antiemetic for cancer chemotherapy patients. [NIH]

Granulocytes: Leukocytes with abundant granules in the cytoplasm. They are divided into three groups: neutrophils, eosinophils, and basophils. [NIH]

Granuloma: A relatively small nodular inflammatory lesion containing grouped mononuclear phagocytes, caused by infectious and noninfectious agents. [NIH]

Gravis: Eruption of watery blisters on the skin among those handling animals and animal products. [NIH]

Growth: The progressive development of a living being or part of an organism from its earliest stage to maturity. [NIH]

Growth factors: Substances made by the body that function to regulate cell division and cell survival. Some growth factors are also produced in the laboratory and used in biological therapy. [NIH]

Guanylate Cyclase: An enzyme that catalyzes the conversion of GTP to 3',5'-cyclic GMP and pyrophosphate. It also acts on ITP and dGTP. (From Enzyme Nomenclature, 1992) EC 4.6.1.2. [NIH]

Habitual: Of the nature of a habit; according to habit; established by or repeated by force of habit, customary. [EU]

Haptens: Small antigenic determinants capable of eliciting an immune response only when coupled to a carrier. Haptens bind to antibodies but by themselves cannot elicit an antibody response. [NIH]

Hay Fever: A seasonal variety of allergic rhinitis, marked by acute conjunctivitis with lacrimation and itching, regarded as an allergic condition triggered by specific allergens. [NIH]

Headache: Pain in the cranial region that may occur as an isolated and benign symptom or as a manifestation of a wide variety of conditions including subarachnoid hemorrhage; craniocerebral trauma; central nervous system infections; intracranial hypertension; and other disorders. In general, recurrent headaches that are not associated with a primary disease process are referred to as headache disorders (e.g., migraine). [NIH]

Headache Disorders: Common conditions characterized by persistent or recurrent headaches. Headache syndrome classification systems may be based on etiology (e.g., vascular headache, post-traumatic headaches, etc.), temporal pattern (e.g., cluster headache,

paroxysmal hemicrania, etc.), and precipitating factors (e.g., cough headache). [NIH]

Health Behavior: Behaviors expressed by individuals to protect, maintain or promote their health status. For example, proper diet, and appropriate exercise are activities perceived to influence health status. Life style is closely associated with health behavior and factors influencing life style are socioeconomic, educational, and cultural. [NIH]

Health Care Costs: The actual costs of providing services related to the delivery of health care, including the costs of procedures, therapies, and medications. It is differentiated from health expenditures, which refers to the amount of money paid for the services, and from fees, which refers to the amount charged, regardless of cost. [NIH]

Health Expenditures: The amounts spent by individuals, groups, nations, or private or public organizations for total health care and/or its various components. These amounts may or may not be equivalent to the actual costs (health care costs) and may or may not be shared among the patient, insurers, and/or employers. [NIH]

Health Promotion: Encouraging consumer behaviors most likely to optimize health potentials (physical and psychosocial) through health information, preventive programs, and access to medical care. [NIH]

Health Services: Services for the diagnosis and treatment of disease and the maintenance of health. [NIH]

Health Status: The level of health of the individual, group, or population as subjectively assessed by the individual or by more objective measures. [NIH]

Helicobacter: A genus of gram-negative, spiral-shaped bacteria that is pathogenic and has been isolated from the intestinal tract of mammals, including humans. [NIH]

Hemicrania: An ache or a pain in one side of the head, as in migraine. [NIH]

Hemoglobin: One of the fractions of glycosylated hemoglobin A1c. Glycosylated hemoglobin is formed when linkages of glucose and related monosaccharides bind to hemoglobin A and its concentration represents the average blood glucose level over the previous several weeks. HbA1c levels are used as a measure of long-term control of plasma glucose (normal, 4 to 6 percent). In controlled diabetes mellitus, the concentration of glycosylated hemoglobin A is within the normal range, but in uncontrolled cases the level may be 3 to 4 times the normal conentration. Generally, complications are substantially lower among patients with Hb levels of 7 percent or less than in patients with HbA1c levels of 9 percent or more. [NIH]

Hemorrhage: Bleeding or escape of blood from a vessel. [NIH]

Hemostasis: The process which spontaneously arrests the flow of blood from vessels carrying blood under pressure. It is accomplished by contraction of the vessels, adhesion and aggregation of formed blood elements, and the process of blood or plasma coagulation. [NIH]

Hepatitis: Inflammation of the liver and liver disease involving degenerative or necrotic alterations of hepatocytes. [NIH]

Hepatocytes: The main structural component of the liver. They are specialized epithelial cells that are organized into interconnected plates called lobules. [NIH]

Hereditary: Of, relating to, or denoting factors that can be transmitted genetically from one generation to another. [NIH]

Heredity: 1. The genetic transmission of a particular quality or trait from parent to offspring. 2. The genetic constitution of an individual. [EU]

Herpes: Any inflammatory skin disease caused by a herpesvirus and characterized by the formation of clusters of small vesicles. When used alone, the term may refer to herpes

simplex or to herpes zoster. [EU]

Herpes Zoster: Acute vesicular inflammation. [NIH]

Heterogeneity: The property of one or more samples or populations which implies that they are not identical in respect of some or all of their parameters, e. g. heterogeneity of variance. [NIH]

Hippocampus: A curved elevation of gray matter extending the entire length of the floor of the temporal horn of the lateral ventricle (Dorland, 28th ed). The hippocampus, subiculum, and dentate gyrus constitute the hippocampal formation. Sometimes authors include the entorhinal cortex in the hippocampal formation. [NIH]

Histamine: 1H-Imidazole-4-ethanamine. A depressor amine derived by enzymatic decarboxylation of histidine. It is a powerful stimulant of gastric secretion, a constrictor of bronchial smooth muscle, a vasodilator, and also a centrally acting neurotransmitter. [NIH]

Homeopathic remedies: Small doses of medicines, herbs, or both that are believed to stimulate the immune system. [NIH]

Homeostasis: The processes whereby the internal environment of an organism tends to remain balanced and stable. [NIH]

Homogeneous: Consisting of or composed of similar elements or ingredients; of a uniform quality throughout. [EU]

Homologous: Corresponding in structure, position, origin, etc., as (a) the feathers of a bird and the scales of a fish, (b) antigen and its specific antibody, (c) allelic chromosomes. [EU]

Hormonal: Pertaining to or of the nature of a hormone. [EU]

Hormone: A substance in the body that regulates certain organs. Hormones such as gastrin help in breaking down food. Some hormones come from cells in the stomach and small intestine. [NIH]

Hormone therapy: Treatment of cancer by removing, blocking, or adding hormones. Also called endocrine therapy. [NIH]

Human growth hormone: A protein hormone, secreted by the anterior lobe of the pituitary, which promotes growth of the whole body by stimulating protein synthesis. The human gene has already been cloned and successfully expressed in bacteria. [NIH]

Humeral: 1. Of, relating to, or situated in the region of the humerus: brachial. 2. Of or belonging to the shoulder. 3. Of, relating to, or being any of several body parts that are analogous in structure, function, or location to the humerus or shoulder. [EU]

Hybrid: Cross fertilization between two varieties or, more usually, two species of vines, see also crossing. [NIH]

Hybridization: The genetic process of crossbreeding to produce a hybrid. Hybrid nucleic acids can be formed by nucleic acid hybridization of DNA and RNA molecules. Protein hybridization allows for hybrid proteins to be formed from polypeptide chains. [NIH]

Hybridomas: Cells artificially created by fusion of activated lymphocytes with neoplastic cells. The resulting hybrid cells are cloned and produce pure or "monoclonal" antibodies or T-cell products, identical to those produced by the immunologically competent parent, and continually grow and divide as the neoplastic parent. [NIH]

Hydrogen: The first chemical element in the periodic table. It has the atomic symbol H, atomic number 1, and atomic weight 1. It exists, under normal conditions, as a colorless, odorless, tasteless, diatomic gas. Hydrogen ions are protons. Besides the common H1 isotope, hydrogen exists as the stable isotope deuterium and the unstable, radioactive isotope tritium. [NIH]

Hydrogenation: Specific method of reduction in which hydrogen is added to a substance by the direct use of gaseous hydrogen. [NIH]

Hydroxylysine: A hydroxylated derivative of the amino acid lysine that is present in certain collagens. [NIH]

Hydroxyproline: A hydroxylated form of the imino acid proline. A deficiency in ascorbic acid can result in impaired hydroxyproline formation. [NIH]

Hyperalgesia: Excessive sensitiveness or sensibility to pain. [EU]

Hyperreflexia: Exaggeration of reflexes. [EU]

Hypersensitivity: Altered reactivity to an antigen, which can result in pathologic reactions upon subsequent exposure to that particular antigen. [NIH]

Hypertension: Persistently high arterial blood pressure. Currently accepted threshold levels are 140 mm Hg systolic and 90 mm Hg diastolic pressure. [NIH]

Hyperthyroidism: Excessive functional activity of the thyroid gland. [NIH]

Hypertrophy: General increase in bulk of a part or organ, not due to tumor formation, nor to an increase in the number of cells. [NIH]

Hyperuricemia: A buildup of uric acid (a byproduct of metabolism) in the blood; a side effect of some anticancer drugs. [NIH]

Hypesthesia: Absent or reduced sensitivity to cutaneous stimulation. [NIH]

Hypnotherapy: Sleeping-cure. [NIH]

Hypnotic: A drug that acts to induce sleep. [EU]

Hypoglycemia: Abnormally low blood sugar [NIH]

Hypoglycemic: An orally active drug that produces a fall in blood glucose concentration. [NIH]

Hypogonadism: Condition resulting from or characterized by abnormally decreased functional activity of the gonads, with retardation of growth and sexual development. [NIH]

Hypotension: Abnormally low blood pressure. [NIH]

Hypothalamic: Of or involving the hypothalamus. [EU]

Hypothalamus: Ventral part of the diencephalon extending from the region of the optic chiasm to the caudal border of the mammillary bodies and forming the inferior and lateral walls of the third ventricle. [NIH]

Hypothyroidism: Deficiency of thyroid activity. In adults, it is most common in women and is characterized by decrease in basal metabolic rate, tiredness and lethargy, sensitivity to cold, and menstrual disturbances. If untreated, it progresses to full-blown myxoedema. In infants, severe hypothyroidism leads to cretinism. In juveniles, the manifestations are intermediate, with less severe mental and developmental retardation and only mild symptoms of the adult form. When due to pituitary deficiency of thyrotropin secretion it is called secondary hypothyroidism. [EU]

Hypovolemia: An abnormally low volume of blood circulating through the body. It may result in hypovolemic shock. [NIH]

Ibuprofen: A nonsteroidal anti-inflammatory agent with analgesic properties used in the therapy of rheumatism and arthritis. [NIH]

Id: The part of the personality structure which harbors the unconscious instinctive desires and strivings of the individual. [NIH]

Idiopathic: Describes a disease of unknown cause. [NIH]

Illusion: A false interpretation of a genuine percept. [NIH]

Immune function: Production and action of cells that fight disease or infection. [NIH]

Immune response: The activity of the immune system against foreign substances (antigens). [NIH]

Immune system: The organs, cells, and molecules responsible for the recognition and disposal of foreign ("non-self") material which enters the body. [NIH]

Immunity: Nonsusceptibility to the invasive or pathogenic effects of foreign microorganisms or to the toxic effect of antigenic substances. [NIH]

Immunization: Deliberate stimulation of the host's immune response. Active immunization involves administration of antigens or immunologic adjuvants. Passive immunization involves administration of immune sera or lymphocytes or their extracts (e.g., transfer factor, immune RNA) or transplantation of immunocompetent cell producing tissue (thymus or bone marrow). [NIH]

Immunoassay: Immunochemical assay or detection of a substance by serologic or immunologic methods. Usually the substance being studied serves as antigen both in antibody production and in measurement of antibody by the test substance. [NIH]

Immunogenic: Producing immunity; evoking an immune response. [EU]

Immunologic: The ability of the antibody-forming system to recall a previous experience with an antigen and to respond to a second exposure with the prompt production of large amounts of antibody. [NIH]

Immunology: The study of the body's immune system. [NIH]

Immunosuppressive: Describes the ability to lower immune system responses. [NIH]

Impairment: In the context of health experience, an impairment is any loss or abnormality of psychological, physiological, or anatomical structure or function. [NIH]

Implantation: The insertion or grafting into the body of biological, living, inert, or radioactive material. [EU]

Impotence: The inability to perform sexual intercourse. [NIH]

In vitro: In the laboratory (outside the body). The opposite of in vivo (in the body). [NIH]

In vivo: In the body. The opposite of in vitro (outside the body or in the laboratory). [NIH]

Incision: A cut made in the body during surgery. [NIH]

Incontinence: Inability to control the flow of urine from the bladder (urinary incontinence) or the escape of stool from the rectum (fecal incontinence). [NIH]

Indicative: That indicates; that points out more or less exactly; that reveals fairly clearly. [EU]

Induction: The act or process of inducing or causing to occur, especially the production of a specific morphogenetic effect in the developing embryo through the influence of evocators or organizers, or the production of anaesthesia or unconsciousness by use of appropriate agents. [EU]

Infarction: A pathological process consisting of a sudden insufficient blood supply to an area, which results in necrosis of that area. It is usually caused by a thrombus, an embolus, or a vascular torsion. [NIH]

Infection: 1. Invasion and multiplication of microorganisms in body tissues, which may be clinically unapparent or result in local cellular injury due to competitive metabolism, toxins, intracellular replication, or antigen-antibody response. The infection may remain localized, subclinical, and temporary if the body's defensive mechanisms are effective. A local infection may persist and spread by extension to become an acute, subacute, or chronic

clinical infection or disease state. A local infection may also become systemic when the microorganisms gain access to the lymphatic or vascular system. 2. An infectious disease. [EU]

Inflammation: A pathological process characterized by injury or destruction of tissues caused by a variety of cytologic and chemical reactions. It is usually manifested by typical signs of pain, heat, redness, swelling, and loss of function. [NIH]

Inflammatory bowel disease: A general term that refers to the inflammation of the colon and rectum. Inflammatory bowel disease includes ulcerative colitis and Crohn's disease. [NIH]

Ingestion: Taking into the body by mouth [NIH]

Initiation: Mutation induced by a chemical reactive substance causing cell changes; being a step in a carcinogenic process. [NIH]

Innervation: 1. The distribution or supply of nerves to a part. 2. The supply of nervous energy or of nerve stimulus sent to a part. [EU]

Inorganic: Pertaining to substances not of organic origin. [EU]

Inotropic: Affecting the force or energy of muscular contractions. [EU]

Insight: The capacity to understand one's own motives, to be aware of one's own psychodynamics, to appreciate the meaning of symbolic behavior. [NIH]

Insomnia: Difficulty in going to sleep or getting enough sleep. [NIH]

Insulator: Material covering the metal conductor of the lead. It is usually polyurethane or silicone. [NIH]

Insulin: A protein hormone secreted by beta cells of the pancreas. Insulin plays a major role in the regulation of glucose metabolism, generally promoting the cellular utilization of glucose. It is also an important regulator of protein and lipid metabolism. Insulin is used as a drug to control insulin-dependent diabetes mellitus. [NIH]

Insulin-dependent diabetes mellitus: A disease characterized by high levels of blood glucose resulting from defects in insulin secretion, insulin action, or both. Autoimmune, genetic, and environmental factors are involved in the development of type I diabetes. [NIH]

Insulin-like: Muscular growth factor. [NIH]

Interferon: A biological response modifier (a substance that can improve the body's natural response to disease). Interferons interfere with the division of cancer cells and can slow tumor growth. There are several types of interferons, including interferon-alpha, -beta, and -gamma. These substances are normally produced by the body. They are also made in the laboratory for use in treating cancer and other diseases. [NIH]

Interferon-alpha: One of the type I interferons produced by peripheral blood leukocytes or lymphoblastoid cells when exposed to live or inactivated virus, double-stranded RNA, or bacterial products. It is the major interferon produced by virus-induced leukocyte cultures and, in addition to its pronounced antiviral activity, it causes activation of NK cells. [NIH]

Interleukin-2: Chemical mediator produced by activated T lymphocytes and which regulates the proliferation of T cells, as well as playing a role in the regulation of NK cell activity. [NIH]

Interleukin-6: Factor that stimulates the growth and differentiation of human B-cells and is also a growth factor for hybridomas and plasmacytomas. It is produced by many different cells including T-cells, monocytes, and fibroblasts. [NIH]

Internal Medicine: A medical specialty concerned with the diagnosis and treatment of diseases of the internal organ systems of adults. [NIH]

Interstitial: Pertaining to or situated between parts or in the interspaces of a tissue. [EU]

Intervertebral: Situated between two contiguous vertebrae. [EU]

Intervertebral Disk Displacement: An intervertebral disk in which the nucleus pulposus has protruded through surrounding fibrocartilage. This occurs most frequently in the lower lumbar region. [NIH]

Intestinal: Having to do with the intestines. [NIH]

Intestine: A long, tube-shaped organ in the abdomen that completes the process of digestion. There is both a large intestine and a small intestine. Also called the bowel. [NIH]

Intoxication: Poisoning, the state of being poisoned. [EU]

Intracellular: Inside a cell. [NIH]

Intracranial Hypertension: Increased pressure within the cranial vault. This may result from several conditions, including hydrocephalus; brain edema; intracranial masses; severe systemic hypertension; pseudotumor cerebri; and other disorders. [NIH]

Intramuscular: IM. Within or into muscle. [NIH]

Intramuscular injection: IM. Injection into a muscle. [NIH]

Intravenous: IV. Into a vein. [NIH]

Intrinsic: Situated entirely within or pertaining exclusively to a part. [EU]

Invasive: 1. Having the quality of invasiveness. 2. Involving puncture or incision of the skin or insertion of an instrument or foreign material into the body; said of diagnostic techniques. [EU]

Involuntary: Reaction occurring without intention or volition. [NIH]

Ionizing: Radiation comprising charged particles, e. g. electrons, protons, alpha-particles, etc., having sufficient kinetic energy to produce ionization by collision. [NIH]

Ions: An atom or group of atoms that have a positive or negative electric charge due to a gain (negative charge) or loss (positive charge) of one or more electrons. Atoms with a positive charge are known as cations; those with a negative charge are anions. [NIH]

Ischemia: Deficiency of blood in a part, due to functional constriction or actual obstruction of a blood vessel. [EU]

Isometric Contraction: Muscular contractions characterized by increase in tension without change in length. [NIH]

Joint: The point of contact between elements of an animal skeleton with the parts that surround and support it. [NIH]

Kainic Acid: (2S-(2 alpha,3 beta,4 beta))-2-Carboxy-4-(1-methylethenyl)-3-pyrrolidineacetic acid. Ascaricide obtained from the red alga Digenea simplex. It is a potent excitatory amino acid agonist at some types of excitatory amino acid receptors and has been used to discriminate among receptor types. Like many excitatory amino acid agonists it can cause neurotoxicity and has been used experimentally for that purpose. [NIH]

Kb: A measure of the length of DNA fragments, 1 Kb = 1000 base pairs. The largest DNA fragments are up to 50 kilobases long. [NIH]

Keratoconjunctivitis: Simultaneous inflammation of the cornea and conjunctiva. [NIH]

Keratoconjunctivitis Sicca: Drying and inflammation of the conjunctiva as a result of insufficient lacrimal secretion. When found in association with xerostomia and polyarthritis, it is called Sjogren's syndrome. [NIH]

Ketamine: A cyclohexanone derivative used for induction of anesthesia. Its mechanism of

action is not well understood, but ketamine can block NMDA receptors (receptors, N-Methyl-D-Aspartate) and may interact with sigma receptors. [NIH]

Kidney stone: A stone that develops from crystals that form in urine and build up on the inner surfaces of the kidney, in the renal pelvis, or in the ureters. [NIH]

Laceration: 1. The act of tearing. 2. A torn, ragged, mangled wound. [EU]

Lacrimal: Pertaining to the tears. [EU]

Lactation: The period of the secretion of milk. [EU]

Large Intestine: The part of the intestine that goes from the cecum to the rectum. The large intestine absorbs water from stool and changes it from a liquid to a solid form. The large intestine is 5 feet long and includes the appendix, cecum, colon, and rectum. Also called colon. [NIH]

Laryngeal: Having to do with the larynx. [NIH]

Larynx: An irregularly shaped, musculocartilaginous tubular structure, lined with mucous membrane, located at the top of the trachea and below the root of the tongue and the hyoid bone. It is the essential sphincter guarding the entrance into the trachea and functioning secondarily as the organ of voice. [NIH]

Laser therapy: The use of an intensely powerful beam of light to kill cancer cells. [NIH]

Latency: The period of apparent inactivity between the time when a stimulus is presented and the moment a response occurs. [NIH]

Latent: Phoria which occurs at one distance or another and which usually has no troublesome effect. [NIH]

Leg Injuries: General or unspecified injuries involving the leg. [NIH]

Lethargy: Abnormal drowsiness or stupor; a condition of indifference. [EU]

Leucine: An essential branched-chain amino acid important for hemoglobin formation. [NIH]

Leukocytes: White blood cells. These include granular leukocytes (basophils, eosinophils, and neutrophils) as well as non-granular leukocytes (lymphocytes and monocytes). [NIH]

Levorphanol: A narcotic analgesic that may be habit-forming. It is nearly as effective orally as by injection. [NIH]

Libido: The psychic drive or energy associated with sexual instinct in the broad sense (pleasure and love-object seeking). It may also connote the psychic energy associated with instincts in general that motivate behavior. [NIH]

Library Services: Services offered to the library user. They include reference and circulation. [NIH]

Lidocaine: A local anesthetic and cardiac depressant used as an antiarrhythmia agent. Its actions are more intense and its effects more prolonged than those of procaine but its duration of action is shorter than that of bupivacaine or prilocaine. [NIH]

Ligament: A band of fibrous tissue that connects bones or cartilages, serving to support and strengthen joints. [EU]

Ligation: Application of a ligature to tie a vessel or strangulate a part. [NIH]

Limbic: Pertaining to a limbus, or margin; forming a border around. [EU]

Limbic System: A set of forebrain structures common to all mammals that is defined functionally and anatomically. It is implicated in the higher integration of visceral, olfactory, and somatic information as well as homeostatic responses including fundamental survival behaviors (feeding, mating, emotion). For most authors, it includes the amygdala, epithalamus, gyrus cinguli, hippocampal formation (see hippocampus), hypothalamus,

parahippocampal gyrus, septal nuclei, anterior nuclear group of thalamus, and portions of the basal ganglia. (Parent, Carpenter's Human Neuroanatomy, 9th ed, p744; NeuroNames, http://rprcsgi.rprc.washington.edu/neuronames/index.html (September 2, 1998)). [NIH]

Linkage: The tendency of two or more genes in the same chromosome to remain together from one generation to the next more frequently than expected according to the law of independent assortment. [NIH]

Lipid: Fat. [NIH]

Liver: A large, glandular organ located in the upper abdomen. The liver cleanses the blood and aids in digestion by secreting bile. [NIH]

Liver scan: An image of the liver created on a computer screen or on film. A radioactive substance is injected into a blood vessel and travels through the bloodstream. It collects in the liver, especially in abnormal areas, and can be detected by the scanner. [NIH]

Lobe: A portion of an organ such as the liver, lung, breast, or brain. [NIH]

Local Government: Smallest political subdivisions within a country at which general governmental functions are carried-out. [NIH]

Localization: The process of determining or marking the location or site of a lesion or disease. May also refer to the process of keeping a lesion or disease in a specific location or site. [NIH]

Localized: Cancer which has not metastasized yet. [NIH]

Locomotion: Movement or the ability to move from one place or another. It can refer to humans, vertebrate or invertebrate animals, and microorganisms. [NIH]

Locomotor: Of or pertaining to locomotion; pertaining to or affecting the locomotive apparatus of the body. [EU]

Longitudinal study: Also referred to as a "cohort study" or "prospective study"; the analytic method of epidemiologic study in which subsets of a defined population can be identified who are, have been, or in the future may be exposed or not exposed, or exposed in different degrees, to a factor or factors hypothesized to influence the probability of occurrence of a given disease or other outcome. The main feature of this type of study is to observe large numbers of subjects over an extended time, with comparisons of incidence rates in groups that differ in exposure levels. [NIH]

Low Back Pain: Acute or chronic pain in the lumbar or sacral regions, which may be associated with musculo-ligamentous sprains and strains; intervertebral disk displacement; and other conditions. [NIH]

Lower Body Negative Pressure: External decompression applied to the lower body. It is used to study orthostatic intolerance and the effects of gravitation and acceleration, to produce simulated hemorrhage in physiologic research, to assess cardiovascular function, and to reduce abdominal stress during childbirth. [NIH]

Lumbago: Pain in the lumbar region. [EU]

Lumbar: Pertaining to the loins, the part of the back between the thorax and the pelvis. [EU]

Lupus: A form of cutaneous tuberculosis. It is seen predominantly in women and typically involves the nasal, buccal, and conjunctival mucosa. [NIH]

Luteal Phase: The period of the menstrual cycle that begins with ovulation and ends with menstruation. [NIH]

Lutein Cells: The cells of the corpus luteum which are derived from the granulosa cells and the theca cells of the Graafian follicle. [NIH]

Lymph: The almost colorless fluid that travels through the lymphatic system and carries

cells that help fight infection and disease. [NIH]

Lymph node: A rounded mass of lymphatic tissue that is surrounded by a capsule of connective tissue. Also known as a lymph gland. Lymph nodes are spread out along lymphatic vessels and contain many lymphocytes, which filter the lymphatic fluid (lymph). [NIH]

Lymphatic: The tissues and organs, including the bone marrow, spleen, thymus, and lymph nodes, that produce and store cells that fight infection and disease. [NIH]

Lymphatic system: The tissues and organs that produce, store, and carry white blood cells that fight infection and other diseases. This system includes the bone marrow, spleen, thymus, lymph nodes and a network of thin tubes that carry lymph and white blood cells. These tubes branch, like blood vessels, into all the tissues of the body. [NIH]

Lymphedema: Edema due to obstruction of lymph vessels or disorders of the lymph nodes. [NIH]

Lymphocyte: A white blood cell. Lymphocytes have a number of roles in the immune system, including the production of antibodies and other substances that fight infection and diseases. [NIH]

Lymphoid: Referring to lymphocytes, a type of white blood cell. Also refers to tissue in which lymphocytes develop. [NIH]

Lytic: 1. Pertaining to lysis or to a lysin. 2. Producing lysis. [EU]

Magnetic Resonance Imaging: Non-invasive method of demonstrating internal anatomy based on the principle that atomic nuclei in a strong magnetic field absorb pulses of radiofrequency energy and emit them as radiowaves which can be reconstructed into computerized images. The concept includes proton spin tomographic techniques. [NIH]

Magnetic Resonance Spectroscopy: Spectroscopic method of measuring the magnetic moment of elementary particles such as atomic nuclei, protons or electrons. It is employed in clinical applications such as NMR Tomography (magnetic resonance imaging). [NIH]

Malaise: A vague feeling of bodily discomfort. [EU]

Malformation: A morphologic defect resulting from an intrinsically abnormal developmental process. [EU]

Malignancy: A cancerous tumor that can invade and destroy nearby tissue and spread to other parts of the body. [NIH]

Malingering: Simulation of symptoms of illness or injury with intent to deceive in order to obtain a goal, e.g., a claim of physical illness to avoid jury duty. [NIH]

Malnutrition: A condition caused by not eating enough food or not eating a balanced diet. [NIH]

Mammogram: An x-ray of the breast. [NIH]

Mandibular Nerve: A branch of the trigeminal (5th cranial) nerve. The mandibular nerve carries motor fibers to the muscles of mastication and sensory fibers to the teeth and gingivae, the face in the region of the mandible, and parts of the dura. [NIH]

Manic: Affected with mania. [EU]

Manifest: Being the part or aspect of a phenomenon that is directly observable : concretely expressed in behaviour. [EU]

Masseter Muscle: A masticatory muscle whose action is closing the jaws. [NIH]

Mastication: The act and process of chewing and grinding food in the mouth. [NIH]

Masticatory: 1. subserving or pertaining to mastication; affecting the muscles of mastication.

2. a remedy to be chewed but not swallowed. [EU]

Maxillary: Pertaining to the maxilla : the irregularly shaped bone that with its fellow forms the upper jaw. [EU]

Median Nerve: A major nerve of the upper extremity. In humans, the fibers of the median nerve originate in the lower cervical and upper thoracic spinal cord (usually C6 to T1), travel via the brachial plexus, and supply sensory and motor innervation to parts of the forearm and hand. [NIH]

Mediate: Indirect; accomplished by the aid of an intervening medium. [EU]

Mediator: An object or substance by which something is mediated, such as (1) a structure of the nervous system that transmits impulses eliciting a specific response; (2) a chemical substance (transmitter substance) that induces activity in an excitable tissue, such as nerve or muscle; or (3) a substance released from cells as the result of the interaction of antigen with antibody or by the action of antigen with a sensitized lymphocyte. [EU]

Medical Records: Recording of pertinent information concerning patient's illness or illnesses. [NIH]

Medicament: A medicinal substance or agent. [EU]

MEDLINE: An online database of MEDLARS, the computerized bibliographic Medical Literature Analysis and Retrieval System of the National Library of Medicine. [NIH]

Medullary: Pertaining to the marrow or to any medulla; resembling marrow. [EU]

Meiosis: A special method of cell division, occurring in maturation of the germ cells, by means of which each daughter nucleus receives half the number of chromosomes characteristic of the somatic cells of the species. [NIH]

Membrane: A very thin layer of tissue that covers a surface. [NIH]

Membrane Lipids: Lipids, predominantly phospholipids, cholesterol and small amounts of glycolipids found in membranes including cellular and intracellular membranes. These lipids may be arranged in bilayers in the membranes with integral proteins between the layers and peripheral proteins attached to the outside. Membrane lipids are required for active transport, several enzymatic activities and membrane formation. [NIH]

Memory: Complex mental function having four distinct phases: (1) memorizing or learning, (2) retention, (3) recall, and (4) recognition. Clinically, it is usually subdivided into immediate, recent, and remote memory. [NIH]

Meninges: The three membranes that cover and protect the brain and spinal cord. [NIH]

Menopause: Permanent cessation of menstruation. [NIH]

Menstrual Cycle: The period of the regularly recurring physiologic changes in the endometrium occurring during the reproductive period in human females and some primates and culminating in partial sloughing of the endometrium (menstruation). [NIH]

Menstruation: The normal physiologic discharge through the vagina of blood and mucosal tissues from the nonpregnant uterus. [NIH]

Mental: Pertaining to the mind; psychic. 2. (L. mentum chin) pertaining to the chin. [EU]

Mental Disorders: Psychiatric illness or diseases manifested by breakdowns in the adaptational process expressed primarily as abnormalities of thought, feeling, and behavior producing either distress or impairment of function. [NIH]

Mental Health: The state wherein the person is well adjusted. [NIH]

Mental Processes: Conceptual functions or thinking in all its forms. [NIH]

Meta-Analysis: A quantitative method of combining the results of independent studies

(usually drawn from the published literature) and synthesizing summaries and conclusions which may be used to evaluate therapeutic effectiveness, plan new studies, etc., with application chiefly in the areas of research and medicine. [NIH]

Metabolic disorder: A condition in which normal metabolic processes are disrupted, usually because of a missing enzyme. [NIH]

Metabolite: Any substance produced by metabolism or by a metabolic process. [EU]

Methanol: A colorless, flammable liquid used in the manufacture of formaldehyde and acetic acid, in chemical synthesis, antifreeze, and as a solvent. Ingestion of methanol is toxic and may cause blindness. [NIH]

Methionine: A sulfur containing essential amino acid that is important in many body functions. It is a chelating agent for heavy metals. [NIH]

MI: Myocardial infarction. Gross necrosis of the myocardium as a result of interruption of the blood supply to the area; it is almost always caused by atherosclerosis of the coronary arteries, upon which coronary thrombosis is usually superimposed. [NIH]

Microbe: An organism which cannot be observed with the naked eye; e. g. unicellular animals, lower algae, lower fungi, bacteria. [NIH]

Microbiology: The study of microorganisms such as fungi, bacteria, algae, archaea, and viruses. [NIH]

Microcalcifications: Tiny deposits of calcium in the breast that cannot be felt but can be detected on a mammogram. A cluster of these very small specks of calcium may indicate that cancer is present. [NIH]

Microcirculation: The vascular network lying between the arterioles and venules; includes capillaries, metarterioles and arteriovenous anastomoses. Also, the flow of blood through this network. [NIH]

Microdialysis: A technique for measuring extracellular concentrations of substances in tissues, usually in vivo, by means of a small probe equipped with a semipermeable membrane. Substances may also be introduced into the extracellular space through the membrane. [NIH]

Microglia: The third type of glial cell, along with astrocytes and oligodendrocytes (which together form the macroglia). Microglia vary in appearance depending on developmental stage, functional state, and anatomical location; subtype terms include ramified, perivascular, ameboid, resting, and activated. Microglia clearly are capable of phagocytosis and play an important role in a wide spectrum of neuropathologies. They have also been suggested to act in several other roles including in secretion (e.g., of cytokines and neural growth factors), in immunological processing (e.g., antigen presentation), and in central nervous system development and remodeling. [NIH]

Mineralocorticoids: A group of corticosteroids primarily associated with the regulation of water and electrolyte balance. This is accomplished through the effect on ion transport in renal tubules, resulting in retention of sodium and loss of potassium. Mineralocorticoid secretion is itself regulated by plasma volume, serum potassium, and angiotensin II. [NIH]

Mitosis: A method of indirect cell division by means of which the two daughter nuclei normally receive identical complements of the number of chromosomes of the somatic cells of the species. [NIH]

Mobility: Capability of movement, of being moved, or of flowing freely. [EU]

Moclobemide: A reversible inhibitor of monoamine oxidase type A (RIMA) that has antidepressive properties. [NIH]

Modeling: A treatment procedure whereby the therapist presents the target behavior which the learner is to imitate and make part of his repertoire. [NIH]

Modification: A change in an organism, or in a process in an organism, that is acquired from its own activity or environment. [NIH]

Molecular: Of, pertaining to, or composed of molecules : a very small mass of matter. [EU]

Molecular Structure: The location of the atoms, groups or ions relative to one another in a molecule, as well as the number, type and location of covalent bonds. [NIH]

Molecule: A chemical made up of two or more atoms. The atoms in a molecule can be the same (an oxygen molecule has two oxygen atoms) or different (a water molecule has two hydrogen atoms and one oxygen atom). Biological molecules, such as proteins and DNA, can be made up of many thousands of atoms. [NIH]

Monitor: An apparatus which automatically records such physiological signs as respiration, pulse, and blood pressure in an anesthetized patient or one undergoing surgical or other procedures. [NIH]

Monoamine: Enzyme that breaks down dopamine in the astrocytes and microglia. [NIH]

Monoamine Oxidase: An enzyme that catalyzes the oxidative deamination of naturally occurring monoamines. It is a flavin-containing enzyme that is localized in mitochondrial membranes, whether in nerve terminals, the liver, or other organs. Monoamine oxidase is important in regulating the metabolic degradation of catecholamines and serotonin in neural or target tissues. Hepatic monoamine oxidase has a crucial defensive role in inactivating circulating monoamines or those, such as tyramine, that originate in the gut and are absorbed into the portal circulation. (From Goodman and Gilman's, The Pharmacological Basis of Therapeutics, 8th ed, p415) EC 1.4.3.4. [NIH]

Monocytes: Large, phagocytic mononuclear leukocytes produced in the vertebrate bone marrow and released into the blood; contain a large, oval or somewhat indented nucleus surrounded by voluminous cytoplasm and numerous organelles. [NIH]

Mononuclear: A cell with one nucleus. [NIH]

Mood Disorders: Those disorders that have a disturbance in mood as their predominant feature. [NIH]

Morphine: The principal alkaloid in opium and the prototype opiate analgesic and narcotic. Morphine has widespread effects in the central nervous system and on smooth muscle. [NIH]

Morphology: The science of the form and structure of organisms (plants, animals, and other forms of life). [NIH]

Motility: The ability to move spontaneously. [EU]

Motion Sickness: Sickness caused by motion, as sea sickness, train sickness, car sickness, and air sickness. [NIH]

Motor nerve: An efferent nerve conveying an impulse that excites muscular contraction. [NIH]

Movement Disorders: Syndromes which feature dyskinesias as a cardinal manifestation of the disease process. Included in this category are degenerative, hereditary, post-infectious, medication-induced, post-inflammatory, and post-traumatic conditions. [NIH]

Mucinous: Containing or resembling mucin, the main compound in mucus. [NIH]

Mucins: A secretion containing mucopolysaccharides and protein that is the chief constituent of mucus. [NIH]

Mucosa: A mucous membrane, or tunica mucosa. [EU]

Mucus: The viscous secretion of mucous membranes. It contains mucin, white blood cells, water, inorganic salts, and exfoliated cells. [NIH]

Multicenter study: A clinical trial that is carried out at more than one medical institution. [NIH]

Multiple sclerosis: A disorder of the central nervous system marked by weakness, numbness, a loss of muscle coordination, and problems with vision, speech, and bladder control. Multiple sclerosis is thought to be an autoimmune disease in which the body's immune system destroys myelin. Myelin is a substance that contains both protein and fat (lipid) and serves as a nerve insulator and helps in the transmission of nerve signals. [NIH]

Muscle Fibers: Large single cells, either cylindrical or prismatic in shape, that form the basic unit of muscle tissue. They consist of a soft contractile substance enclosed in a tubular sheath. [NIH]

Muscle relaxant: An agent that specifically aids in reducing muscle tension, as those acting at the polysynaptic neurons of motor nerves (e.g. meprobamate) or at the myoneural junction (curare and related compounds). [EU]

Muscle tension: A force in a material tending to produce extension; the state of being stretched. [NIH]

Muscular Dystrophies: A general term for a group of inherited disorders which are characterized by progressive degeneration of skeletal muscles. [NIH]

Musculature: The muscular apparatus of the body, or of any part of it. [EU]

Musculoskeletal Diseases: Diseases of the muscles and their associated ligaments and other connective tissue and of the bones and cartilage viewed collectively. [NIH]

Musculoskeletal System: Themuscles, bones, and cartilage of the body. [NIH]

Myalgia: Pain in a muscle or muscles. [EU]

Myasthenia: Muscular debility; any constitutional anomaly of muscle. [EU]

Myelin: The fatty substance that covers and protects nerves. [NIH]

Myocardial infarction: Gross necrosis of the myocardium as a result of interruption of the blood supply to the area; it is almost always caused by atherosclerosis of the coronary arteries, upon which coronary thrombosis is usually superimposed. [NIH]

Myocardium: The muscle tissue of the heart composed of striated, involuntary muscle known as cardiac muscle. [NIH]

Myofascial Pain Syndromes: Muscular pain in numerous body regions that can be reproduced by pressure on trigger points, localized hardenings in skeletal muscle tissue. Pain is referred to a location distant from the trigger points. A prime example is the temporomandibular joint dysfunction syndrome. [NIH]

Myopathy: Any disease of a muscle. [EU]

Myositis: Inflammation of a voluntary muscle. [EU]

Naive: Used to describe an individual who has never taken a certain drug or class of drugs (e. g., AZT-naive, antiretroviral-naive), or to refer to an undifferentiated immune system cell. [NIH]

Naloxone: A specific opiate antagonist that has no agonist activity. It is a competitive antagonist at mu, delta, and kappa opioid receptors. [NIH]

Narcolepsy: A condition of unknown cause characterized by a periodic uncontrollable tendency to fall asleep. [NIH]

Narcotic: 1. Pertaining to or producing narcosis. 2. An agent that produces insensibility or

stupor, applied especially to the opioids, i.e. to any natural or synthetic drug that has morphine-like actions. [EU]

Nausea: An unpleasant sensation in the stomach usually accompanied by the urge to vomit. Common causes are early pregnancy, sea and motion sickness, emotional stress, intense pain, food poisoning, and various enteroviruses. [NIH]

NCI: National Cancer Institute. NCI, part of the National Institutes of Health of the United States Department of Health and Human Services, is the federal government's principal agency for cancer research. NCI conducts, coordinates, and funds cancer research, training, health information dissemination, and other programs with respect to the cause, diagnosis, prevention, and treatment of cancer. Access the NCI Web site at http://cancer.gov. [NIH]

Neck Injuries: General or unspecified injuries to the neck. It includes injuries to the skin, muscles, and other soft tissues of the neck. [NIH]

Neck Pain: Discomfort or more intense forms of pain that are localized to the cervical region. This term generally refers to pain in the posterior or lateral regions of the neck. [NIH]

Need: A state of tension or dissatisfaction felt by an individual that impels him to action toward a goal he believes will satisfy the impulse. [NIH]

Neoplasm: A new growth of benign or malignant tissue. [NIH]

Neoplastic: Pertaining to or like a neoplasm (= any new and abnormal growth); pertaining to neoplasia (= the formation of a neoplasm). [EU]

Neostigmine: A cholinesterase inhibitor used in the treatment of myasthenia gravis and to reverse the effects of muscle relaxants such as gallamine and tubocurarine. Neostigmine, unlike physostigmine, does not cross the blood-brain barrier. [NIH]

Neostriatum: The phylogenetically newer part of the corpus striatum consisting of the caudate nucleus and putamen. It is often called simply the striatum. [NIH]

Nerve: A cordlike structure of nervous tissue that connects parts of the nervous system with other tissues of the body and conveys nervous impulses to, or away from, these tissues. [NIH]

Nerve Endings: Specialized terminations of peripheral neurons. Nerve endings include neuroeffector junction(s) by which neurons activate target organs and sensory receptors which transduce information from the various sensory modalities and send it centrally in the nervous system. Presynaptic nerve endings are presynaptic terminals. [NIH]

Nerve Fibers: Slender processes of neurons, especially the prolonged axons that conduct nerve impulses. [NIH]

Nerve Growth Factor: Nerve growth factor is the first of a series of neurotrophic factors that were found to influence the growth and differentiation of sympathetic and sensory neurons. It is comprised of alpha, beta, and gamma subunits. The beta subunit is responsible for its growth stimulating activity. [NIH]

Nervous System: The entire nerve apparatus composed of the brain, spinal cord, nerves and ganglia. [NIH]

Nervousness: Excessive excitability and irritability, with mental and physical unrest. [EU]

Networks: Pertaining to a nerve or to the nerves, a meshlike structure of interlocking fibers or strands. [NIH]

Neural: 1. Pertaining to a nerve or to the nerves. 2. Situated in the region of the spinal axis, as the neutral arch. [EU]

Neural Pathways: Neural tracts connecting one part of the nervous system with another. [NIH]

Neurites: In tissue culture, hairlike projections of neurons stimulated by growth factors and

other molecules. These projections may go on to form a branched tree of dendrites or a single axon or they may be reabsorbed at a later stage of development. "Neurite" may refer to any filamentous or pointed outgrowth of an embryonal or tissue-culture neural cell. [NIH]

Neuritis: A general term indicating inflammation of a peripheral or cranial nerve. Clinical manifestation may include pain; paresthesias; paresis; or hypesthesia. [NIH]

Neuroblastoma: Cancer that arises in immature nerve cells and affects mostly infants and children. [NIH]

Neuroeffector Junction: The synapse between a neuron (presynaptic) and an effector cell other than another neuron (postsynaptic). Neuroeffector junctions include synapses onto muscles and onto secretory cells. [NIH]

Neuroendocrine: Having to do with the interactions between the nervous system and the endocrine system. Describes certain cells that release hormones into the blood in response to stimulation of the nervous system. [NIH]

Neuroendocrinology: The study of the anatomical and functional relationships between the nervous system and the endocrine system. [NIH]

Neurogenic: Loss of bladder control caused by damage to the nerves controlling the bladder. [NIH]

Neuroleptic: A term coined to refer to the effects on cognition and behaviour of antipsychotic drugs, which produce a state of apathy, lack of initiative, and limited range of emotion and in psychotic patients cause a reduction in confusion and agitation and normalization of psychomotor activity. [EU]

Neurologic: Having to do with nerves or the nervous system. [NIH]

Neurology: A medical specialty concerned with the study of the structures, functions, and diseases of the nervous system. [NIH]

Neuromuscular: Pertaining to muscles and nerves. [EU]

Neuromuscular Agents: Drugs used for their actions on skeletal muscle. Included are agents that act directly on skeletal muscle, those that alter neuromuscular transmission (neuromuscular blocking agents), and drugs that act centrally as skeletal muscle relaxants (central muscle relaxants). Drugs used in the treatment of movement disorders are anti-dyskinesia agents. [NIH]

Neuromuscular Blocking Agents: Drugs that interrupt transmission of nerve impulses at the skeletal neuromuscular junction. They can be of two types, competitive, stabilizing blockers (neuromuscular nondepolarizing agents) or noncompetitive, depolarizing agents (neuromuscular depolarizing agents). Both prevent acetylcholine from triggering the muscle contraction and they are used as anesthesia adjuvants, as relaxants during electroshock, in convulsive states, etc. [NIH]

Neuronal: Pertaining to a neuron or neurons (= conducting cells of the nervous system). [EU]

Neurons: The basic cellular units of nervous tissue. Each neuron consists of a body, an axon, and dendrites. Their purpose is to receive, conduct, and transmit impulses in the nervous system. [NIH]

Neuropathy: A problem in any part of the nervous system except the brain and spinal cord. Neuropathies can be caused by infection, toxic substances, or disease. [NIH]

Neuropeptide: A member of a class of protein-like molecules made in the brain. Neuropeptides consist of short chains of amino acids, with some functioning as neurotransmitters and some functioning as hormones. [NIH]

Neuropharmacology: The branch of pharmacology dealing especially with the action of

drugs upon various parts of the nervous system. [NIH]

Neuropsychological Tests: Tests designed to assess neurological function associated with certain behaviors. They are used in diagnosing brain dysfunction or damage and central nervous system disorders or injury. [NIH]

Neuroses: Functional derangement due to disorders of the nervous system which does not affect the psychic personality of the patient. [NIH]

Neurotoxicity: The tendency of some treatments to cause damage to the nervous system. [NIH]

Neurotransmitter: Any of a group of substances that are released on excitation from the axon terminal of a presynaptic neuron of the central or peripheral nervous system and travel across the synaptic cleft to either excite or inhibit the target cell. Among the many substances that have the properties of a neurotransmitter are acetylcholine, norepinephrine, epinephrine, dopamine, glycine, y-aminobutyrate, glutamic acid, substance P, enkephalins, endorphins, and serotonin. [EU]

Neurotrophins: A nerve growth factor. [NIH]

Niacin: Water-soluble vitamin of the B complex occurring in various animal and plant tissues. Required by the body for the formation of coenzymes NAD and NADP. Has pellagra-curative, vasodilating, and antilipemic properties. [NIH]

Nitric Oxide: A free radical gas produced endogenously by a variety of mammalian cells. It is synthesized from arginine by a complex reaction, catalyzed by nitric oxide synthase. Nitric oxide is endothelium-derived relaxing factor. It is released by the vascular endothelium and mediates the relaxation induced by some vasodilators such as acetylcholine and bradykinin. It also inhibits platelet aggregation, induces disaggregation of aggregated platelets, and inhibits platelet adhesion to the vascular endothelium. Nitric oxide activates cytosolic guanylate cyclase and thus elevates intracellular levels of cyclic GMP. [NIH]

Nitrogen: An element with the atomic symbol N, atomic number 7, and atomic weight 14. Nitrogen exists as a diatomic gas and makes up about 78% of the earth's atmosphere by volume. It is a constituent of proteins and nucleic acids and found in all living cells. [NIH]

Nociceptors: Peripheral receptors for pain. Nociceptors include receptors which are sensitive to painful mechanical stimuli, extreme heat or cold, and chemical stimuli. All nociceptors are free nerve endings. [NIH]

Nonulcer Dyspepsia: Constant pain or discomfort in the upper GI tract. Symptoms include burning, nausea, and bloating, but no ulcer. Possibly caused by muscle spasms. [NIH]

Nonverbal Communication: Transmission of emotions, ideas, and attitudes between individuals in ways other than the spoken language. [NIH]

Norepinephrine: Precursor of epinephrine that is secreted by the adrenal medulla and is a widespread central and autonomic neurotransmitter. Norepinephrine is the principal transmitter of most postganglionic sympathetic fibers and of the diffuse projection system in the brain arising from the locus ceruleus. It is also found in plants and is used pharmacologically as a sympathomimetic. [NIH]

Nortriptyline: A metabolite of amitryptyline that is also used as an antidepressive agent. Nortriptyline is used in major depression, dysthymia, and atypical depressions. [NIH]

Nuclear: A test of the structure, blood flow, and function of the kidneys. The doctor injects a mildly radioactive solution into an arm vein and uses x-rays to monitor its progress through the kidneys. [NIH]

Nuclei: A body of specialized protoplasm found in nearly all cells and containing the

chromosomes. [NIH]

Nucleic acid: Either of two types of macromolecule (DNA or RNA) formed by polymerization of nucleotides. Nucleic acids are found in all living cells and contain the information (genetic code) for the transfer of genetic information from one generation to the next. [NIH]

Nucleic Acid Hybridization: The process whereby two single-stranded polynucleotides form a double-stranded molecule, with hydrogen bonding between the complementary bases in the two strains. [NIH]

Nucleus: A body of specialized protoplasm found in nearly all cells and containing the chromosomes. [NIH]

Nurse Practitioners: Nurses who are specially trained to assume an expanded role in providing medical care under the supervision of a physician. [NIH]

Observational study: An epidemiologic study that does not involve any intervention, experimental or otherwise. Such a study may be one in which nature is allowed to take its course, with changes in one characteristic being studied in relation to changes in other characteristics. Analytical epidemiologic methods, such as case-control and cohort study designs, are properly called observational epidemiology because the investigator is observing without intervention other than to record, classify, count, and statistically analyze results. [NIH]

Occupational Therapy: The field concerned with utilizing craft or work activities in the rehabilitation of patients. Occupational therapy can also refer to the activities themselves. [NIH]

Ocular: 1. Of, pertaining to, or affecting the eye. 2. Eyepiece. [EU]

Odds Ratio: The ratio of two odds. The exposure-odds ratio for case control data is the ratio of the odds in favor of exposure among cases to the odds in favor of exposure among noncases. The disease-odds ratio for a cohort or cross section is the ratio of the odds in favor of disease among the exposed to the odds in favor of disease among the unexposed. The prevalence-odds ratio refers to an odds ratio derived cross-sectionally from studies of prevalent cases. [NIH]

Omega-3 fatty acid: A type of fat obtained in the diet and involved in immunity. [NIH]

Ondansetron: A competitive serotonin type 3 receptor antagonist. It is effective in the treatment of nausea and vomiting caused by cytotoxic chemotherapy drugs, including cisplatin, and it has reported anxiolytic and neuroleptic properties. [NIH]

On-line: A sexually-reproducing population derived from a common parentage. [NIH]

Opacity: Degree of density (area most dense taken for reading). [NIH]

Ophthalmic: Pertaining to the eye. [EU]

Opiate: A remedy containing or derived from opium; also any drug that induces sleep. [EU]

Opioid Peptides: The endogenous peptides with opiate-like activity. The three major classes currently recognized are the enkephalins, the dynorphins, and the endorphins. Each of these families derives from different precursors, proenkephalin, prodynorphin, and pro-opiomelanocortin, respectively. There are also at least three classes of opioid receptors, but the peptide families do not map to the receptors in a simple way. [NIH]

Opium: The air-dried exudate from the unripe seed capsule of the opium poppy, Papaver somniferum, or its variant, P. album. It contains a number of alkaloids, but only a few - morphine, codeine, and papaverine - have clinical significance. Opium has been used as an analgesic, antitussive, antidiarrheal, and antispasmodic. [NIH]

Optic Chiasm: The X-shaped structure formed by the meeting of the two optic nerves. At the optic chiasm the fibers from the medial part of each retina cross to project to the other side of the brain while the lateral retinal fibers continue on the same side. As a result each half of the brain receives information about the contralateral visual field from both eyes. [NIH]

Organogenesis: Clonal propagation which involves culturing explants from roots, leaves, or stems to form undifferentiated callus tissue; after the cells form shoots, they are separated and rooted. Alternatively, if the callus is put in liquid culture, somatic embryos form. [NIH]

Orofacial: Of or relating to the mouth and face. [EU]

Orthostatic: Pertaining to or caused by standing erect. [EU]

Osteoarthritis: A progressive, degenerative joint disease, the most common form of arthritis, especially in older persons. The disease is thought to result not from the aging process but from biochemical changes and biomechanical stresses affecting articular cartilage. In the foreign literature it is often called osteoarthrosis deformans. [NIH]

Osteoclasts: A large multinuclear cell associated with the absorption and removal of bone. An odontoclast, also called cementoclast, is cytomorphologically the same as an osteoclast and is involved in cementum resorption. [NIH]

Osteoporosis: Reduction of bone mass without alteration in the composition of bone, leading to fractures. Primary osteoporosis can be of two major types: postmenopausal osteoporosis and age-related (or senile) osteoporosis. [NIH]

Outpatient: A patient who is not an inmate of a hospital but receives diagnosis or treatment in a clinic or dispensary connected with the hospital. [NIH]

Ovaries: The pair of female reproductive glands in which the ova, or eggs, are formed. The ovaries are located in the pelvis, one on each side of the uterus. [NIH]

Ovary: Either of the paired glands in the female that produce the female germ cells and secrete some of the female sex hormones. [NIH]

Ovulation: The discharge of a secondary oocyte from a ruptured graafian follicle. [NIH]

Ovum: A female germ cell extruded from the ovary at ovulation. [NIH]

Oxygen Consumption: The oxygen consumption is determined by calculating the difference between the amount of oxygen inhaled and exhaled. [NIH]

Oxytocin: A nonapeptide posterior pituitary hormone that causes uterine contractions and stimulates lactation. [NIH]

Pacemaker: An object or substance that influences the rate at which a certain phenomenon occurs; often used alone to indicate the natural cardiac pacemaker or an artificial cardiac pacemaker. In biochemistry, a substance whose rate of reaction sets the pace for a series of interrelated reactions. [EU]

Pain Threshold: Amount of stimulation required before the sensation of pain is experienced. [NIH]

Palliative: 1. Affording relief, but not cure. 2. An alleviating medicine. [EU]

Palliative therapy: Treatment given to relieve symptoms caused by advanced cancer. Palliative therapy does not alter the course of a disease but improves the quality of life. [NIH]

Palpation: Application of fingers with light pressure to the surface of the body to determine consistence of parts beneath in physical diagnosis; includes palpation for determining the outlines of organs. [NIH]

Pancreas: A mixed exocrine and endocrine gland situated transversely across the posterior abdominal wall in the epigastric and hypochondriac regions. The endocrine portion is

comprised of the Islets of Langerhans, while the exocrine portion is a compound acinar gland that secretes digestive enzymes. [NIH]

Pancreatic: Having to do with the pancreas. [NIH]

Pancreatic Ducts: Ducts that collect pancreatic juice from the pancreas and supply it to the duodenum. [NIH]

Panic: A state of extreme acute, intense anxiety and unreasoning fear accompanied by disorganization of personality function. [NIH]

Panic Disorder: A type of anxiety disorder characterized by unexpected panic attacks that last minutes or, rarely, hours. Panic attacks begin with intense apprehension, fear or terror and, often, a feeling of impending doom. Symptoms experienced during a panic attack include dyspnea or sensations of being smothered; dizziness, loss of balance or faintness; choking sensations; palpitations or accelerated heart rate; shakiness; sweating; nausea or other form of abdominal distress; depersonalization or derealization; paresthesias; hot flashes or chills; chest discomfort or pain; fear of dying and fear of not being in control of oneself or going crazy. Agoraphobia may also develop. Similar to other anxiety disorders, it may be inherited as an autosomal dominant trait. [NIH]

Paradoxical: Occurring at variance with the normal rule. [EU]

Paralysis: Loss of ability to move all or part of the body. [NIH]

Parasympathetic Nervous System: The craniosacral division of the autonomic nervous system. The cell bodies of the parasympathetic preganglionic fibers are in brain stem nuclei and in the sacral spinal cord. They synapse in cranial autonomic ganglia or in terminal ganglia near target organs. The parasympathetic nervous system generally acts to conserve resources and restore homeostasis, often with effects reciprocal to the sympathetic nervous system. [NIH]

Paresis: A general term referring to a mild to moderate degree of muscular weakness, occasionally used as a synonym for paralysis (severe or complete loss of motor function). In the older literature, paresis often referred specifically to paretic neurosyphilis. "General paresis" and "general paralysis" may still carry that connotation. Bilateral lower extremity paresis is referred to as paraparesis. [NIH]

Paresthesia: Subjective cutaneous sensations (e.g., cold, warmth, tingling, pressure, etc.) that are experienced spontaneously in the absence of stimulation. [NIH]

Paroxysmal: Recurring in paroxysms (= spasms or seizures). [EU]

Partnership Practice: A voluntary contract between two or more doctors who may or may not share responsibility for the care of patients, with proportional sharing of profits and losses. [NIH]

Parturition: The act or process of given birth to a child. [EU]

Patch: A piece of material used to cover or protect a wound, an injured part, etc.: a patch over the eye. [NIH]

Pathogenesis: The cellular events and reactions that occur in the development of disease. [NIH]

Pathologic: 1. Indicative of or caused by a morbid condition. 2. Pertaining to pathology (= branch of medicine that treats the essential nature of the disease, especially the structural and functional changes in tissues and organs of the body caused by the disease). [EU]

Pathologic Processes: The abnormal mechanisms and forms involved in the dysfunctions of tissues and organs. [NIH]

Pathologies: The study of abnormality, especially the study of diseases. [NIH]

Pathophysiology: Altered functions in an individual or an organ due to disease. [NIH]

Patient Advocacy: Promotion and protection of the rights of patients, frequently through a legal process. [NIH]

Patient Education: The teaching or training of patients concerning their own health needs. [NIH]

Patient Participation: Patient involvement in the decision-making process in matters pertaining to health. [NIH]

Pelvic: Pertaining to the pelvis. [EU]

Pelvis: The lower part of the abdomen, located between the hip bones. [NIH]

Penis: The external reproductive organ of males. It is composed of a mass of erectile tissue enclosed in three cylindrical fibrous compartments. Two of the three compartments, the corpus cavernosa, are placed side-by-side along the upper part of the organ. The third compartment below, the corpus spongiosum, houses the urethra. [NIH]

Pepsin: An enzyme made in the stomach that breaks down proteins. [NIH]

Pepsin A: Formed from pig pepsinogen by cleavage of one peptide bond. The enzyme is a single polypeptide chain and is inhibited by methyl 2-diaazoacetamidohexanoate. It cleaves peptides preferentially at the carbonyl linkages of phenylalanine or leucine and acts as the principal digestive enzyme of gastric juice. [NIH]

Peptic: Pertaining to pepsin or to digestion; related to the action of gastric juices. [EU]

Peptic Ulcer: Ulcer that occurs in those portions of the alimentary tract which come into contact with gastric juice containing pepsin and acid. It occurs when the amount of acid and pepsin is sufficient to overcome the gastric mucosal barrier. [NIH]

Peptide: Any compound consisting of two or more amino acids, the building blocks of proteins. Peptides are combined to make proteins. [NIH]

Perceived risk: Estimate or evaluation of risk as observed through personal experience or personal study, and personal evaluation of consequences. [NIH]

Perception: The ability quickly and accurately to recognize similarities and differences among presented objects, whether these be pairs of words, pairs of number series, or multiple sets of these or other symbols such as geometric figures. [NIH]

Pericardium: The fibroserous sac surrounding the heart and the roots of the great vessels. [NIH]

Periodicity: The tendency of a phenomenon to recur at regular intervals; in biological systems, the recurrence of certain activities (including hormonal, cellular, neural) may be annual, seasonal, monthly, daily, or more frequently (ultradian). [NIH]

Peripheral blood: Blood circulating throughout the body. [NIH]

Peripheral Nervous System: The nervous system outside of the brain and spinal cord. The peripheral nervous system has autonomic and somatic divisions. The autonomic nervous system includes the enteric, parasympathetic, and sympathetic subdivisions. The somatic nervous system includes the cranial and spinal nerves and their ganglia and the peripheral sensory receptors. [NIH]

Peripheral Neuropathy: Nerve damage, usually affecting the feet and legs; causing pain, numbness, or a tingling feeling. Also called "somatic neuropathy" or "distal sensory polyneuropathy." [NIH]

Perivascular: Situated around a vessel. [EU]

Peroneal Nerve: The lateral of the two terminal branches of the sciatic nerve. The peroneal (or fibular) nerve provides motor and sensory innervation to parts of the leg and foot. [NIH]

PH: The symbol relating the hydrogen ion (H+) concentration or activity of a solution to that of a given standard solution. Numerically the pH is approximately equal to the negative logarithm of H+ concentration expressed in molarity. pH 7 is neutral; above it alkalinity increases and below it acidity increases. [EU]

Phantom: Used to absorb and/or scatter radiation equivalently to a patient, and hence to estimate radiation doses and test imaging systems without actually exposing a patient. It may be an anthropomorphic or a physical test object. [NIH]

Pharmacist: A person trained to prepare and distribute medicines and to give information about them. [NIH]

Pharmacokinetic: The mathematical analysis of the time courses of absorption, distribution, and elimination of drugs. [NIH]

Pharmacologic: Pertaining to pharmacology or to the properties and reactions of drugs. [EU]

Pharmacotherapy: A regimen of using appetite suppressant medications to manage obesity by decreasing appetite or increasing the feeling of satiety. These medications decrease appetite by increasing serotonin or catecholamine—two brain chemicals that affect mood and appetite. [NIH]

Phosphates: Inorganic salts of phosphoric acid. [NIH]

Phospholipids: Lipids containing one or more phosphate groups, particularly those derived from either glycerol (phosphoglycerides; glycerophospholipids) or sphingosine (sphingolipids). They are polar lipids that are of great importance for the structure and function of cell membranes and are the most abundant of membrane lipids, although not stored in large amounts in the system. [NIH]

Phosphorus: A non-metallic element that is found in the blood, muscles, nevers, bones, and teeth, and is a component of adenosine triphosphate (ATP; the primary energy source for the body's cells.) [NIH]

Phosphorylated: Attached to a phosphate group. [NIH]

Physical Examination: Systematic and thorough inspection of the patient for physical signs of disease or abnormality. [NIH]

Physical Fitness: A state of well-being in which performance is optimal, often as a result of physical conditioning which may be prescribed for disease therapy. [NIH]

Physical Therapy: The restoration of function and the prevention of disability following disease or injury with the use of light, heat, cold, water, electricity, ultrasound, and exercise. [NIH]

Physiologic: Having to do with the functions of the body. When used in the phrase "physiologic age," it refers to an age assigned by general health, as opposed to calendar age. [NIH]

Physiology: The science that deals with the life processes and functions of organismus, their cells, tissues, and organs. [NIH]

Pigments: Any normal or abnormal coloring matter in plants, animals, or micro-organisms. [NIH]

Pilot study: The initial study examining a new method or treatment. [NIH]

Piperidines: A family of hexahydropyridines. Piperidine itself is found in the pepper plant as the alkaloid piperine. [NIH]

Pituitary Gland: A small, unpaired gland situated in the sella turcica tissue. It is connected to the hypothalamus by a short stalk. [NIH]

Placebo Effect: An effect usually, but not necessarily, beneficial that is attributable to an

expectation that the regimen will have an effect, i.e., the effect is due to the power of suggestion. [NIH]

Placenta: A highly vascular fetal organ through which the fetus absorbs oxygen and other nutrients and excretes carbon dioxide and other wastes. It begins to form about the eighth day of gestation when the blastocyst adheres to the decidua. [NIH]

Plants: Multicellular, eukaryotic life forms of the kingdom Plantae. They are characterized by a mainly photosynthetic mode of nutrition; essentially unlimited growth at localized regions of cell divisions (meristems); cellulose within cells providing rigidity; the absence of organs of locomotion; absense of nervous and sensory systems; and an alteration of haploid and diploid generations. [NIH]

Plasma: The clear, yellowish, fluid part of the blood that carries the blood cells. The proteins that form blood clots are in plasma. [NIH]

Plasma cells: A type of white blood cell that produces antibodies. [NIH]

Platelet Aggregation: The attachment of platelets to one another. This clumping together can be induced by a number of agents (e.g., thrombin, collagen) and is part of the mechanism leading to the formation of a thrombus. [NIH]

Platelets: A type of blood cell that helps prevent bleeding by causing blood clots to form. Also called thrombocytes. [NIH]

Plethysmography: Recording of change in the size of a part as modified by the circulation in it. [NIH]

Plexus: A network or tangle; a general term for a network of lymphatic vessels, nerves, or veins. [EU]

Pneumonia: Inflammation of the lungs. [NIH]

Poisoning: A condition or physical state produced by the ingestion, injection or inhalation of, or exposure to a deleterious agent. [NIH]

Polyarthritis: An inflammation of several joints together. [EU]

Polymorphism: The occurrence together of two or more distinct forms in the same population. [NIH]

Polymyalgia Rheumatica: A syndrome in the elderly characterized by proximal joint and muscle pain, high erythrocyte sedimentation rate, and a self-limiting course. Pain is usually accompanied by evidence of an inflammatory reaction. Women are affected twice as commonly as men and Caucasians more frequently than other groups. The condition is frequently associated with temporal arteritis and some theories pose the possibility that the two diseases arise from a single etiology or even that they are the same entity. [NIH]

Pons: The part of the central nervous system lying between the medulla oblongata and the mesencephalon, ventral to the cerebellum, and consisting of a pars dorsalis and a pars ventralis. [NIH]

Pontine: A brain region involved in the detection and processing of taste. [NIH]

Population Control: Includes mechanisms or programs which control the numbers of individuals in a population of humans or animals. [NIH]

Portal Pressure: The venous pressure measured in the portal vein. [NIH]

Posterior: Situated in back of, or in the back part of, or affecting the back or dorsal surface of the body. In lower animals, it refers to the caudal end of the body. [EU]

Postmenopausal: Refers to the time after menopause. Menopause is the time in a woman's life when menstrual periods stop permanently; also called "change of life." [NIH]

Postoperative: After surgery. [NIH]

Postsynaptic: Nerve potential generated by an inhibitory hyperpolarizing stimulation. [NIH]

Post-traumatic: Occurring as a result of or after injury. [EU]

Post-traumatic stress disorder: A psychological disorder that develops in some individuals after a major traumatic experience such as war, rape, domestic violence, or accident. [NIH]

Postural: Pertaining to posture or position. [EU]

Potassium: An element that is in the alkali group of metals. It has an atomic symbol K, atomic number 19, and atomic weight 39.10. It is the chief cation in the intracellular fluid of muscle and other cells. Potassium ion is a strong electrolyte and it plays a significant role in the regulation of fluid volume and maintenance of the water-electrolyte balance. [NIH]

Potentiating: A degree of synergism which causes the exposure of the organism to a harmful substance to worsen a disease already contracted. [NIH]

Practicability: A non-standard characteristic of an analytical procedure. It is dependent on the scope of the method and is determined by requirements such as sample throughout and costs. [NIH]

Practice Guidelines: Directions or principles presenting current or future rules of policy for the health care practitioner to assist him in patient care decisions regarding diagnosis, therapy, or related clinical circumstances. The guidelines may be developed by government agencies at any level, institutions, professional societies, governing boards, or by the convening of expert panels. The guidelines form a basis for the evaluation of all aspects of health care and delivery. [NIH]

Precipitating Factors: Factors associated with the definitive onset of a disease, illness, accident, behavioral response, or course of action. Usually one factor is more important or more obviously recognizable than others, if several are involved, and one may often be regarded as "necessary". Examples include exposure to specific disease; amount or level of an infectious organism, drug, or noxious agent, etc. [NIH]

Precursor: Something that precedes. In biological processes, a substance from which another, usually more active or mature substance is formed. In clinical medicine, a sign or symptom that heralds another. [EU]

Predisposition: A latent susceptibility to disease which may be activated under certain conditions, as by stress. [EU]

Prednisolone: A glucocorticoid with the general properties of the corticosteroids. It is the drug of choice for all conditions in which routine systemic corticosteroid therapy is indicated, except adrenal deficiency states. [NIH]

Prednisone: A synthetic anti-inflammatory glucocorticoid derived from cortisone. It is biologically inert and converted to prednisolone in the liver. [NIH]

Prefrontal Cortex: The rostral part of the frontal lobe, bounded by the inferior precentral fissure in humans, which receives projection fibers from the mediodorsal nucleus of the thalamus. The prefrontal cortex receives afferent fibers from numerous structures of the diencephalon, mesencephalon, and limbic system as well as cortical afferents of visual, auditory, and somatic origin. [NIH]

Premenopausal: Refers to the time before menopause. Menopause is the time of life when a women's menstrual periods stop permanently; also called "change of life." [NIH]

Pressoreceptors: Receptors in the vascular system, particularly the aorta and carotid sinus, which are sensitive to stretch of the vessel walls. [NIH]

Presumptive: A treatment based on an assumed diagnosis, prior to receiving confirmatory

laboratory test results. [NIH]

Presynaptic: Situated proximal to a synapse, or occurring before the synapse is crossed. [EU]

Presynaptic Terminals: The distal terminations of axons which are specialized for the release of neurotransmitters. Also included are varicosities along the course of axons which have similar specializations and also release transmitters. Presynaptic terminals in both the central and peripheral nervous systems are included. [NIH]

Prevalence: The total number of cases of a given disease in a specified population at a designated time. It is differentiated from incidence, which refers to the number of new cases in the population at a given time. [NIH]

Private Practice: Practice of a health profession by an individual, offering services on a person-to-person basis, as opposed to group or partnership practice. [NIH]

Private Sector: That distinct portion of the institutional, industrial, or economic structure of a country that is controlled or owned by non-governmental, private interests. [NIH]

Probe: An instrument used in exploring cavities, or in the detection and dilatation of strictures, or in demonstrating the potency of channels; an elongated instrument for exploring or sounding body cavities. [NIH]

Procaine: A local anesthetic of the ester type that has a slow onset and a short duration of action. It is mainly used for infiltration anesthesia, peripheral nerve block, and spinal block. (From Martindale, The Extra Pharmacopoeia, 30th ed, p1016). [NIH]

Progesterone: Pregn-4-ene-3,20-dione. The principal progestational hormone of the body, secreted by the corpus luteum, adrenal cortex, and placenta. Its chief function is to prepare the uterus for the reception and development of the fertilized ovum. It acts as an antiovulatory agent when administered on days 5-25 of the menstrual cycle. [NIH]

Progression: Increase in the size of a tumor or spread of cancer in the body. [NIH]

Progressive: Advancing; going forward; going from bad to worse; increasing in scope or severity. [EU]

Projection: A defense mechanism, operating unconsciously, whereby that which is emotionally unacceptable in the self is rejected and attributed (projected) to others. [NIH]

Prolactin: Pituitary lactogenic hormone. A polypeptide hormone with a molecular weight of about 23,000. It is essential in the induction of lactation in mammals at parturition and is synergistic with estrogen. The hormone also brings about the release of progesterone from lutein cells, which renders the uterine mucosa suited for the embedding of the ovum should fertilization occur. [NIH]

Proline: A non-essential amino acid that is synthesized from glutamic acid. It is an essential component of collagen and is important for proper functioning of joints and tendons. [NIH]

Promoter: A chemical substance that increases the activity of a carcinogenic process. [NIH]

Prone: Having the front portion of the body downwards. [NIH]

Pro-Opiomelanocortin: A precursor protein, MW 30,000, synthesized mainly in the anterior pituitary gland but also found in the hypothalamus, brain, and several peripheral tissues. It incorporates the amino acid sequences of ACTH and beta-lipotropin. These two hormones, in turn, contain the biologically active peptides MSH, corticotropin-like intermediate lobe peptide, alpha-lipotropin, endorphins, and methionine enkephalin. [NIH]

Prophase: The first phase of cell division, in which the chromosomes become visible, the nucleus starts to lose its identity, the spindle appears, and the centrioles migrate toward opposite poles. [NIH]

Propranolol: A widely used non-cardioselective beta-adrenergic antagonist. Propranolol is

used in the treatment or prevention of many disorders including acute myocardial infarction, arrhythmias, angina pectoris, hypertension, hypertensive emergencies, hyperthyroidism, migraine, pheochromocytoma, menopause, and anxiety. [NIH]

Prospective Studies: Observation of a population for a sufficient number of persons over a sufficient number of years to generate incidence or mortality rates subsequent to the selection of the study group. [NIH]

Prospective study: An epidemiologic study in which a group of individuals (a cohort), all free of a particular disease and varying in their exposure to a possible risk factor, is followed over a specific amount of time to determine the incidence rates of the disease in the exposed and unexposed groups. [NIH]

Prostaglandins: A group of compounds derived from unsaturated 20-carbon fatty acids, primarily arachidonic acid, via the cyclooxygenase pathway. They are extremely potent mediators of a diverse group of physiological processes. [NIH]

Prostate: A gland in males that surrounds the neck of the bladder and the urethra. It secretes a substance that liquifies coagulated semen. It is situated in the pelvic cavity behind the lower part of the pubic symphysis, above the deep layer of the triangular ligament, and rests upon the rectum. [NIH]

Protease: Proteinase (= any enzyme that catalyses the splitting of interior peptide bonds in a protein). [EU]

Protein S: The vitamin K-dependent cofactor of activated protein C. Together with protein C, it inhibits the action of factors VIIIa and Va. A deficiency in protein S can lead to recurrent venous and arterial thrombosis. [NIH]

Proteins: Polymers of amino acids linked by peptide bonds. The specific sequence of amino acids determines the shape and function of the protein. [NIH]

Protocol: The detailed plan for a clinical trial that states the trial's rationale, purpose, drug or vaccine dosages, length of study, routes of administration, who may participate, and other aspects of trial design. [NIH]

Protons: Stable elementary particles having the smallest known positive charge, found in the nuclei of all elements. The proton mass is less than that of a neutron. A proton is the nucleus of the light hydrogen atom, i.e., the hydrogen ion. [NIH]

Proximal: Nearest; closer to any point of reference; opposed to distal. [EU]

Pruritic: Pertaining to or characterized by pruritus. [EU]

Psychiatric: Pertaining to or within the purview of psychiatry. [EU]

Psychiatry: The medical science that deals with the origin, diagnosis, prevention, and treatment of mental disorders. [NIH]

Psychic: Pertaining to the psyche or to the mind; mental. [EU]

Psychoactive: Those drugs which alter sensation, mood, consciousness or other psychological or behavioral functions. [NIH]

Psychogenic: Produced or caused by psychic or mental factors rather than organic factors. [EU]

Psychological Tests: Standardized tests designed to measure abilities, as in intelligence, aptitude, and achievement tests, or to evaluate personality traits. [NIH]

Psychology: The science dealing with the study of mental processes and behavior in man and animals. [NIH]

Psychology, Clinical: The branch of psychology concerned with psychological methods of recognizing and treating behavior disorders. [NIH]

Psychopharmacology: The study of the effects of drugs on mental and behavioral activity. [NIH]

Psychotherapy: A generic term for the treatment of mental illness or emotional disturbances primarily by verbal or nonverbal communication. [NIH]

Psychotropic: Exerting an effect upon the mind; capable of modifying mental activity; usually applied to drugs that effect the mental state. [EU]

Puberty: The period during which the secondary sex characteristics begin to develop and the capability of sexual reproduction is attained. [EU]

Public Health: Branch of medicine concerned with the prevention and control of disease and disability, and the promotion of physical and mental health of the population on the international, national, state, or municipal level. [NIH]

Public Policy: A course or method of action selected, usually by a government, from among alternatives to guide and determine present and future decisions. [NIH]

Pulmonary: Relating to the lungs. [NIH]

Pulmonary hypertension: Abnormally high blood pressure in the arteries of the lungs. [NIH]

Pulse: The rhythmical expansion and contraction of an artery produced by waves of pressure caused by the ejection of blood from the left ventricle of the heart as it contracts. [NIH]

Punishment: The application of an unpleasant stimulus or penalty for the purpose of eliminating or correcting undesirable behavior. [NIH]

Pyridostigmine Bromide: A cholinesterase inhibitor with a slightly longer duration of action than neostigmine. It is used in the treatment of myasthenia gravis and to reverse the actions of muscle relaxants. [NIH]

Quality of Life: A generic concept reflecting concern with the modification and enhancement of life attributes, e.g., physical, political, moral and social environment. [NIH]

Race: A population within a species which exhibits general similarities within itself, but is both discontinuous and distinct from other populations of that species, though not sufficiently so as to achieve the status of a taxon. [NIH]

Radiation: Emission or propagation of electromagnetic energy (waves/rays), or the waves/rays themselves; a stream of electromagnetic particles (electrons, neutrons, protons, alpha particles) or a mixture of these. The most common source is the sun. [NIH]

Radioactive: Giving off radiation. [NIH]

Radioimmunoassay: Classic quantitative assay for detection of antigen-antibody reactions using a radioactively labeled substance (radioligand) either directly or indirectly to measure the binding of the unlabeled substance to a specific antibody or other receptor system. Non-immunogenic substances (e.g., haptens) can be measured if coupled to larger carrier proteins (e.g., bovine gamma-globulin or human serum albumin) capable of inducing antibody formation. [NIH]

Radiological: Pertaining to radiodiagnostic and radiotherapeutic procedures, and interventional radiology or other planning and guiding medical radiology. [NIH]

Radiology: A specialty concerned with the use of x-ray and other forms of radiant energy in the diagnosis and treatment of disease. [NIH]

Random Allocation: A process involving chance used in therapeutic trials or other research endeavor for allocating experimental subjects, human or animal, between treatment and control groups, or among treatment groups. It may also apply to experiments on inanimate objects. [NIH]

Randomization: Also called random allocation. Is allocation of individuals to groups, e.g., for experimental and control regimens, by chance. Within the limits of chance variation, random allocation should make the control and experimental groups similar at the start of an investigation and ensure that personal judgment and prejudices of the investigator do not influence allocation. [NIH]

Randomized: Describes an experiment or clinical trial in which animal or human subjects are assigned by chance to separate groups that compare different treatments. [NIH]

Randomized clinical trial: A study in which the participants are assigned by chance to separate groups that compare different treatments; neither the researchers nor the participants can choose which group. Using chance to assign people to groups means that the groups will be similar and that the treatments they receive can be compared objectively. At the time of the trial, it is not known which treatment is best. It is the patient's choice to be in a randomized trial. [NIH]

Randomized Controlled Trials: Clinical trials that involve at least one test treatment and one control treatment, concurrent enrollment and follow-up of the test- and control-treated groups, and in which the treatments to be administered are selected by a random process, such as the use of a random-numbers table. Treatment allocations using coin flips, odd-even numbers, patient social security numbers, days of the week, medical record numbers, or other such pseudo- or quasi-random processes, are not truly randomized and trials employing any of these techniques for patient assignment are designated simply controlled clinical trials. [NIH]

Rape: Unlawful sexual intercourse without consent of the victim. [NIH]

Reaction Time: The time from the onset of a stimulus until the organism responds. [NIH]

Reassurance: A procedure in psychotherapy that seeks to give the client confidence in a favorable outcome. It makes use of suggestion, of the prestige of the therapist. [NIH]

Receptor: A molecule inside or on the surface of a cell that binds to a specific substance and causes a specific physiologic effect in the cell. [NIH]

Receptors, Serotonin: Cell-surface proteins that bind serotonin and trigger intracellular changes which influence the behavior of cells. Several types of serotonin receptors have been recognized which differ in their pharmacology, molecular biology, and mode of action. [NIH]

Rectal: By or having to do with the rectum. The rectum is the last 8 to 10 inches of the large intestine and ends at the anus. [NIH]

Rectum: The last 8 to 10 inches of the large intestine. [NIH]

Recurrence: The return of a sign, symptom, or disease after a remission. [NIH]

Refer: To send or direct for treatment, aid, information, de decision. [NIH]

Reflex: An involuntary movement or exercise of function in a part, excited in response to a stimulus applied to the periphery and transmitted to the brain or spinal cord. [NIH]

Refraction: A test to determine the best eyeglasses or contact lenses to correct a refractive error (myopia, hyperopia, or astigmatism). [NIH]

Refractory: Not readily yielding to treatment. [EU]

Regeneration: The natural renewal of a structure, as of a lost tissue or part. [EU]

Regimen: A treatment plan that specifies the dosage, the schedule, and the duration of treatment. [NIH]

Relaxant: 1. Lessening or reducing tension. 2. An agent that lessens tension. [EU]

Relaxation Techniques: The use of muscular relaxation techniques in treatment. [NIH]

Relaxin: Hormone produced by the ovaries during pregnancy that loosens ligaments that hold the hip bones together. [NIH]

Reliability: Used technically, in a statistical sense, of consistency of a test with itself, i. e. the extent to which we can assume that it will yield the same result if repeated a second time. [NIH]

Remission: A decrease in or disappearance of signs and symptoms of cancer. In partial remission, some, but not all, signs and symptoms of cancer have disappeared. In complete remission, all signs and symptoms of cancer have disappeared, although there still may be cancer in the body. [NIH]

Renal pelvis: The area at the center of the kidney. Urine collects here and is funneled into the ureter, the tube that connects the kidney to the bladder. [NIH]

Renin: An enzyme which is secreted by the kidney and is formed from prorenin in plasma and kidney. The enzyme cleaves the Leu-Leu bond in angiotensinogen to generate angiotensin I. EC 3.4.23.15. (Formerly EC 3.4.99.19). [NIH]

Research Design: A plan for collecting and utilizing data so that desired information can be obtained with sufficient precision or so that an hypothesis can be tested properly. [NIH]

Research Support: Financial support of research activities. [NIH]

Respiration: The act of breathing with the lungs, consisting of inspiration, or the taking into the lungs of the ambient air, and of expiration, or the expelling of the modified air which contains more carbon dioxide than the air taken in (Blakiston's Gould Medical Dictionary, 4th ed.). This does not include tissue respiration (= oxygen consumption) or cell respiration (= cell respiration). [NIH]

Restless legs: Legs characterized by or showing inability to remain at rest. [EU]

Restoration: Broad term applied to any inlay, crown, bridge or complete denture which restores or replaces loss of teeth or oral tissues. [NIH]

Retinoids: Derivatives of vitamin A. Used clinically in the treatment of severe cystic acne, psoriasis, and other disorders of keratinization. Their possible use in the prophylaxis and treatment of cancer is being actively explored. [NIH]

Retrograde: 1. Moving backward or against the usual direction of flow. 2. Degenerating, deteriorating, or catabolic. [EU]

Retroperitoneal: Having to do with the area outside or behind the peritoneum (the tissue that lines the abdominal wall and covers most of the organs in the abdomen). [NIH]

Retrospective: Looking back at events that have already taken place. [NIH]

Reverse Transcriptase Polymerase Chain Reaction: A variation of the PCR technique in which cDNA is made from RNA via reverse transcription. The resultant cDNA is then amplified using standard PCR protocols. [NIH]

Rheumatic Diseases: Disorders of connective tissue, especially the joints and related structures, characterized by inflammation, degeneration, or metabolic derangement. [NIH]

Rheumatism: A group of disorders marked by inflammation or pain in the connective tissue structures of the body. These structures include bone, cartilage, and fat. [NIH]

Rheumatoid: Resembling rheumatism. [EU]

Rheumatoid arthritis: A form of arthritis, the cause of which is unknown, although infection, hypersensitivity, hormone imbalance and psychologic stress have been suggested as possible causes. [NIH]

Rheumatology: A subspecialty of internal medicine concerned with the study of inflammatory or degenerative processes and metabolic derangement of connective tissue

structures which pertain to a variety of musculoskeletal disorders, such as arthritis. [NIH]

Rhythmicity: Regular periodicity. [NIH]

Risk factor: A habit, trait, condition, or genetic alteration that increases a person's chance of developing a disease. [NIH]

Ritanserin: A selective and potent serotonin-2 antagonist that is effective in the treatment of a variety of syndromes related to anxiety and depression. The drug also improves the subjective quality of sleep and decreases portal pressure. [NIH]

Rye: A hardy grain crop, Secale cereale, grown in northern climates. It is the most frequent host to ergot (claviceps), the toxic fungus. Its hybrid with wheat is triticale, another grain. [NIH]

Saliva: The clear, viscous fluid secreted by the salivary glands and mucous glands of the mouth. It contains mucins, water, organic salts, and ptylin. [NIH]

Salivary: The duct that convey saliva to the mouth. [NIH]

Salivary glands: Glands in the mouth that produce saliva. [NIH]

Saponins: Sapogenin glycosides. A type of glycoside widely distributed in plants. Each consists of a sapogenin as the aglycon moiety, and a sugar. The sapogenin may be a steroid or a triterpene and the sugar may be glucose, galactose, a pentose, or a methylpentose. Sapogenins are poisonous towards the lower forms of life and are powerful hemolytics when injected into the blood stream able to dissolve red blood cells at even extreme dilutions. [NIH]

Scans: Pictures of structures inside the body. Scans often used in diagnosing, staging, and monitoring disease include liver scans, bone scans, and computed tomography (CT) or computerized axial tomography (CAT) scans and magnetic resonance imaging (MRI) scans. In liver scanning and bone scanning, radioactive substances that are injected into the bloodstream collect in these organs. A scanner that detects the radiation is used to create pictures. In CT scanning, an x-ray machine linked to a computer is used to produce detailed pictures of organs inside the body. MRI scans use a large magnet connected to a computer to create pictures of areas inside the body. [NIH]

Scatter: The extent to which relative success and failure are divergently manifested in qualitatively different tests. [NIH]

Schizoid: Having qualities resembling those found in greater degree in schizophrenics; a person of schizoid personality. [NIH]

Schizophrenia: A mental disorder characterized by a special type of disintegration of the personality. [NIH]

Schizotypal Personality Disorder: A personality disorder in which there are oddities of thought (magical thinking, paranoid ideation, suspiciousness), perception (illusions, depersonalization), speech (digressive, vague, overelaborate), and behavior (inappropriate affect in social interactions, frequently social isolation) that are not severe enough to characterize schizophrenia. [NIH]

Sciatic Nerve: A nerve which originates in the lumbar and sacral spinal cord (L4 to S3) and supplies motor and sensory innervation to the lower extremity. The sciatic nerve, which is the main continuation of the sacral plexus, is the largest nerve in the body. It has two major branches, the tibial nerve and the peroneal nerve. [NIH]

Scleroderma: A chronic disorder marked by hardening and thickening of the skin. Scleroderma can be localized or it can affect the entire body (systemic). [NIH]

Sclerosis: A pathological process consisting of hardening or fibrosis of an anatomical structure, often a vessel or a nerve. [NIH]

Screening: Checking for disease when there are no symptoms. [NIH]

Scrotum: In males, the external sac that contains the testicles. [NIH]

Secretion: 1. The process of elaborating a specific product as a result of the activity of a gland; this activity may range from separating a specific substance of the blood to the elaboration of a new chemical substance. 2. Any substance produced by secretion. [EU]

Secretory: Secreting; relating to or influencing secretion or the secretions. [NIH]

Sedative: 1. Allaying activity and excitement. 2. An agent that allays excitement. [EU]

Sedentary: 1. Sitting habitually; of inactive habits. 2. Pertaining to a sitting posture. [EU]

Sediment: A precipitate, especially one that is formed spontaneously. [EU]

Sedimentation: The act of causing the deposit of sediment, especially by the use of a centrifugal machine. [EU]

Self Administration: Administration of a drug or chemical by the individual under the direction of a physician. It includes administration clinically or experimentally, by human or animal. [NIH]

Self Care: Performance of activities or tasks traditionally performed by professional health care providers. The concept includes care of oneself or one's family and friends. [NIH]

Self Medication: The self administration of medication not prescribed by a physician or in a manner not directed by a physician. [NIH]

Sella: A deep depression in the shape of a Turkish saddle in the upper surface of the body of the sphenoid bone in the deepest part of which is lodged the hypophysis cerebri. [NIH]

Semen: The thick, yellowish-white, viscid fluid secretion of male reproductive organs discharged upon ejaculation. In addition to reproductive organ secretions, it contains spermatozoa and their nutrient plasma. [NIH]

Seminal vesicles: Glands that help produce semen. [NIH]

Senile: Relating or belonging to old age; characteristic of old age; resulting from infirmity of old age. [NIH]

Sensibility: The ability to receive, feel and appreciate sensations and impressions; the quality of being sensitive; the extend to which a method gives results that are free from false negatives. [NIH]

Sensitization: 1. Administration of antigen to induce a primary immune response; priming; immunization. 2. Exposure to allergen that results in the development of hypersensitivity. 3. The coating of erythrocytes with antibody so that they are subject to lysis by complement in the presence of homologous antigen, the first stage of a complement fixation test. [EU]

Sensory loss: A disease of the nerves whereby the myelin or insulating sheath of myelin on the nerves does not stay intact and the messages from the brain to the muscles through the nerves are not carried properly. [NIH]

Sensory Thresholds: The minimum amount of stimulus energy necessary to elicit a sensory response. [NIH]

Sequencing: The determination of the order of nucleotides in a DNA or RNA chain. [NIH]

Serologic: Analysis of a person's serum, especially specific immune or lytic serums. [NIH]

Serotonin: A biochemical messenger and regulator, synthesized from the essential amino acid L-tryptophan. In humans it is found primarily in the central nervous system, gastrointestinal tract, and blood platelets. Serotonin mediates several important physiological functions including neurotransmission, gastrointestinal motility, hemostasis, and cardiovascular integrity. Multiple receptor families (receptors, serotonin) explain the

broad physiological actions and distribution of this biochemical mediator. [NIH]

Serotonin Agonists: Agents that have an affinity for serotonin receptors and are able to mimic the effects of serotonin by stimulating the physiologic activity at the cell receptors. These compounds are used as antidepressants, anxiolytics, and in the treatment of migraine. [NIH]

Serotonin Antagonists: Drugs that bind to but do not activate serotonin receptors, thereby blocking the actions of serotonin or serotonin agonists. [NIH]

Serotonin Uptake Inhibitors: Compounds that specifically inhibit the reuptake of serotonin in the brain. This increases the serotonin concentration in the synaptic cleft which then activates serotonin receptors to a greater extent. These agents have been used in treatment of depression, panic disorder, obsessive-compulsive behavior, and alcoholism, as analgesics, and to treat obesity and bulimia. Many of the adrenergic uptake inhibitors also inhibit serotonin uptake; they are not included here. [NIH]

Serum: The clear liquid part of the blood that remains after blood cells and clotting proteins have been removed. [NIH]

Serum Albumin: A major plasma protein that serves in maintaining the plasma colloidal osmotic pressure and transporting large organic anions. [NIH]

Sex Characteristics: Those characteristics that distinguish one sex from the other. The primary sex characteristics are the ovaries and testes and their related hormones. Secondary sex characteristics are those which are masculine or feminine but not directly related to reproduction. [NIH]

Shock: The general bodily disturbance following a severe injury; an emotional or moral upset occasioned by some disturbing or unexpected experience; disruption of the circulation, which can upset all body functions: sometimes referred to as circulatory shock. [NIH]

Sibutramine: A drug used for the management of obesity that helps reduce food intake and is indicated for weight loss and maintenance of weight loss when used in conjunction with a reduced-calorie diet. It works to suppress the appetite primarily by inhibiting the reuptake of the neurotransmitters norepinephrine and serotonin. Side effects include dry mouth, headache, constipation, insomnia, and a slight increase in average blood pressure. In some patients it causes a higher blood pressure increase. [NIH]

Sicca: Failure of lacrimal secretion, keratoconjunctivitis sicca, failure of secretion of the salivary glands and mucous glands of the upper respiratory tract and polyarthritis. [NIH]

Side effect: A consequence other than the one(s) for which an agent or measure is used, as the adverse effects produced by a drug, especially on a tissue or organ system other than the one sought to be benefited by its administration. [EU]

Signs and Symptoms: Clinical manifestations that can be either objective when observed by a physician, or subjective when perceived by the patient. [NIH]

Skeletal: Having to do with the skeleton (boney part of the body). [NIH]

Skeleton: The framework that supports the soft tissues of vertebrate animals and protects many of their internal organs. The skeletons of vertebrates are made of bone and/or cartilage. [NIH]

Skull: The skeleton of the head including the bones of the face and the bones enclosing the brain. [NIH]

Sleep apnea: A serious, potentially life-threatening breathing disorder characterized by repeated cessation of breathing due to either collapse of the upper airway during sleep or absence of respiratory effort. [NIH]

Sleep Deprivation: The state of being deprived of sleep under experimental conditions, due to life events, or from a wide variety of pathophysiologic causes such as medication effect, chronic illness, psychiatric illness, or sleep disorder. [NIH]

Small intestine: The part of the digestive tract that is located between the stomach and the large intestine. [NIH]

Smooth muscle: Muscle that performs automatic tasks, such as constricting blood vessels. [NIH]

Social Behavior: Any behavior caused by or affecting another individual, usually of the same species. [NIH]

Social Environment: The aggregate of social and cultural institutions, forms, patterns, and processes that influence the life of an individual or community. [NIH]

Social Security: Government sponsored social insurance programs. [NIH]

Social Support: Support systems that provide assistance and encouragement to individuals with physical or emotional disabilities in order that they may better cope. Informal social support is usually provided by friends, relatives, or peers, while formal assistance is provided by churches, groups, etc. [NIH]

Sodium: An element that is a member of the alkali group of metals. It has the atomic symbol Na, atomic number 11, and atomic weight 23. With a valence of 1, it has a strong affinity for oxygen and other nonmetallic elements. Sodium provides the chief cation of the extracellular body fluids. Its salts are the most widely used in medicine. (From Dorland, 27th ed) Physiologically the sodium ion plays a major role in blood pressure regulation, maintenance of fluid volume, and electrolyte balance. [NIH]

Sodium Oxybate: The sodium salt of 4-hydroxybutyric acid. Anesthetic used for both induction and maintenance. It may cause bradycardia and dyskinesias. [NIH]

Soft tissue: Refers to muscle, fat, fibrous tissue, blood vessels, or other supporting tissue of the body. [NIH]

Solitary Nucleus: Gray matter located in the dorsomedial part of the medulla oblongata associated with the solitary tract. The solitary nucleus receives inputs from most organ systems including the terminations of the facial, glossopharyngeal, and vagus nerves. It is a major coordinator of autonomic nervous system regulation of cardiovascular, respiratory, gustatory, gastrointestinal, and chemoreceptive aspects of homeostasis. The solitary nucleus is also notable for the large number of neurotransmitters which are found therein. [NIH]

Solvent: 1. Dissolving; effecting a solution. 2. A liquid that dissolves or that is capable of dissolving; the component of a solution that is present in greater amount. [EU]

Soma: The body as distinct from the mind; all the body tissue except the germ cells; all the axial body. [NIH]

Somatic: 1. Pertaining to or characteristic of the soma or body. 2. Pertaining to the body wall in contrast to the viscera. [EU]

Somatostatin: A polypeptide hormone produced in the hypothalamus, and other tissues and organs. It inhibits the release of human growth hormone, and also modulates important physiological functions of the kidney, pancreas, and gastrointestinal tract. Somatostatin receptors are widely expressed throughout the body. Somatostatin also acts as a neurotransmitter in the central and peripheral nervous systems. [NIH]

Sound wave: An alteration of properties of an elastic medium, such as pressure, particle displacement, or density, that propagates through the medium, or a superposition of such alterations. [NIH]

Spasm: An involuntary contraction of a muscle or group of muscles. Spasms may involve

skeletal muscle or smooth muscle. [NIH]

Spasticity: A state of hypertonicity, or increase over the normal tone of a muscle, with heightened deep tendon reflexes. [EU]

Spatial disorientation: Loss of orientation in space where person does not know which way is up. [NIH]

Specialist: In medicine, one who concentrates on 1 special branch of medical science. [NIH]

Species: A taxonomic category subordinate to a genus (or subgenus) and superior to a subspecies or variety, composed of individuals possessing common characters distinguishing them from other categories of individuals of the same taxonomic level. In taxonomic nomenclature, species are designated by the genus name followed by a Latin or Latinized adjective or noun. [EU]

Specificity: Degree of selectivity shown by an antibody with respect to the number and types of antigens with which the antibody combines, as well as with respect to the rates and the extents of these reactions. [NIH]

Spectrum: A charted band of wavelengths of electromagnetic vibrations obtained by refraction and diffraction. By extension, a measurable range of activity, such as the range of bacteria affected by an antibiotic (antibacterial s.) or the complete range of manifestations of a disease. [EU]

Sperm: The fecundating fluid of the male. [NIH]

Sphincter: A ringlike band of muscle fibres that constricts a passage or closes a natural orifice; called also musculus sphincter. [EU]

Sphincter of Oddi: The muscle between the common bile duct and pancreatic ducts. [NIH]

Spinal cord: The main trunk or bundle of nerves running down the spine through holes in the spinal bone (the vertebrae) from the brain to the level of the lower back. [NIH]

Spinal Cord Compression: Acute and chronic conditions characterized by external mechanical compression of the spinal cord due to extramedullary neoplasm; epidural abscess; spinal fractures; bony deformities of the vertebral bodies; and other conditions. Clinical manifestations vary with the anatomic site of the lesion and may include localized pain, weakness, sensory loss, incontinence, and impotence. [NIH]

Spinal Fractures: Broken bones in the vertebral column. [NIH]

Spondylitis: Inflammation of the vertebrae. [EU]

Sporadic: Neither endemic nor epidemic; occurring occasionally in a random or isolated manner. [EU]

Sprains and Strains: A collective term for muscle and ligament injuries without dislocation or fracture. A sprain is a joint injury in which some of the fibers of a supporting ligament are ruptured but the continuity of the ligament remains intact. A strain is an overstretching or overexertion of some part of the musculature. [NIH]

Staging: Performing exams and tests to learn the extent of the cancer within the body, especially whether the disease has spread from the original site to other parts of the body. [NIH]

Staphylococcus: A genus of gram-positive, facultatively anaerobic, coccoid bacteria. Its organisms occur singly, in pairs, and in tetrads and characteristically divide in more than one plane to form irregular clusters. Natural populations of Staphylococcus are membranes of warm-blooded animals. Some species are opportunistic pathogens of humans and animals. [NIH]

Statistically significant: Describes a mathematical measure of difference between groups.

The difference is said to be statistically significant if it is greater than what might be expected to happen by chance alone. [NIH]

Steroid: A group name for lipids that contain a hydrogenated cyclopentanoperhydrophenanthrene ring system. Some of the substances included in this group are progesterone, adrenocortical hormones, the gonadal hormones, cardiac aglycones, bile acids, sterols (such as cholesterol), toad poisons, saponins, and some of the carcinogenic hydrocarbons. [EU]

Stimulant: 1. Producing stimulation; especially producing stimulation by causing tension on muscle fibre through the nervous tissue. 2. An agent or remedy that produces stimulation. [EU]

Stimulus: That which can elicit or evoke action (response) in a muscle, nerve, gland or other excitable issue, or cause an augmenting action upon any function or metabolic process. [NIH]

Stomach: An organ of digestion situated in the left upper quadrant of the abdomen between the termination of the esophagus and the beginning of the duodenum. [NIH]

Stress: Forcibly exerted influence; pressure. Any condition or situation that causes strain or tension. Stress may be either physical or psychologic, or both. [NIH]

Stress management: A set of techniques used to help an individual cope more effectively with difficult situations in order to feel better emotionally, improve behavioral skills, and often to enhance feelings of control. Stress management may include relaxation exercises, assertiveness training, cognitive restructuring, time management, and social support. It can be delivered either on a one-to-one basis or in a group format. [NIH]

Stroke: Sudden loss of function of part of the brain because of loss of blood flow. Stroke may be caused by a clot (thrombosis) or rupture (hemorrhage) of a blood vessel to the brain. [NIH]

Stromal: Large, veil-like cell in the bone marrow. [NIH]

Stupor: Partial or nearly complete unconsciousness, manifested by the subject's responding only to vigorous stimulation. Also, in psychiatry, a disorder marked by reduced responsiveness. [EU]

Subacute: Somewhat acute; between acute and chronic. [EU]

Subarachnoid: Situated or occurring between the arachnoid and the pia mater. [EU]

Subclinical: Without clinical manifestations; said of the early stage(s) of an infection or other disease or abnormality before symptoms and signs become apparent or detectable by clinical examination or laboratory tests, or of a very mild form of an infection or other disease or abnormality. [EU]

Subcutaneous: Beneath the skin. [NIH]

Subiculum: A region of the hippocampus that projects to other areas of the brain. [NIH]

Sublingual: Located beneath the tongue. [EU]

Subspecies: A category intermediate in rank between species and variety, based on a smaller number of correlated characters than are used to differentiate species and generally conditioned by geographical and/or ecological occurrence. [NIH]

Substance P: An eleven-amino acid neurotransmitter that appears in both the central and peripheral nervous systems. It is involved in transmission of pain, causes rapid contractions of the gastrointestinal smooth muscle, and modulates inflammatory and immune responses. [NIH]

Sulfur: An element that is a member of the chalcogen family. It has an atomic symbol S, atomic number 16, and atomic weight 32.066. It is found in the amino acids cysteine and methionine. [NIH]

Supplementation: Adding nutrients to the diet. [NIH]

Support group: A group of people with similar disease who meet to discuss how better to cope with their cancer and treatment. [NIH]

Suppression: A conscious exclusion of disapproved desire contrary with repression, in which the process of exclusion is not conscious. [NIH]

Supraspinal: Above the spinal column or any spine. [NIH]

Sympathetic Nervous System: The thoracolumbar division of the autonomic nervous system. Sympathetic preganglionic fibers originate in neurons of the intermediolateral column of the spinal cord and project to the paravertebral and prevertebral ganglia, which in turn project to target organs. The sympathetic nervous system mediates the body's response to stressful situations, i.e., the fight or flight reactions. It often acts reciprocally to the parasympathetic system. [NIH]

Sympathomimetic: 1. Mimicking the effects of impulses conveyed by adrenergic postganglionic fibres of the sympathetic nervous system. 2. An agent that produces effects similar to those of impulses conveyed by adrenergic postganglionic fibres of the sympathetic nervous system. Called also adrenergic. [EU]

Symphysis: A secondary cartilaginous joint. [NIH]

Symptomatic: Having to do with symptoms, which are signs of a condition or disease. [NIH]

Symptomatology: 1. That branch of medicine with treats of symptoms; the systematic discussion of symptoms. 2. The combined symptoms of a disease. [EU]

Synapse: The region where the processes of two neurons come into close contiguity, and the nervous impulse passes from one to the other; the fibers of the two are intermeshed, but, according to the general view, there is no direct contiguity. [NIH]

Synapsis: The pairing between homologous chromosomes of maternal and paternal origin during the prophase of meiosis, leading to the formation of gametes. [NIH]

Synaptic: Pertaining to or affecting a synapse (= site of functional apposition between neurons, at which an impulse is transmitted from one neuron to another by electrical or chemical means); pertaining to synapsis (= pairing off in point-for-point association of homologous chromosomes from the male and female pronuclei during the early prophase of meiosis). [EU]

Synchrony: The normal physiologic sequencing of atrial and ventricular activation and contraction. [NIH]

Synergistic: Acting together; enhancing the effect of another force or agent. [EU]

Syringomyelia: The presence in the spinal cord of elongated central fluid containing cavities surrounded by gliosis. [NIH]

Systemic: Affecting the entire body. [NIH]

Systemic lupus erythematosus: SLE. A chronic inflammatory connective tissue disease marked by skin rashes, joint pain and swelling, inflammation of the kidneys, inflammation of the fibrous tissue surrounding the heart (i.e., the pericardium), as well as other problems. Not all affected individuals display all of these problems. May be referred to as lupus. [NIH]

Systolic: Indicating the maximum arterial pressure during contraction of the left ventricle of the heart. [EU]

Telecommunications: Transmission of information over distances via electronic means. [NIH]

Temporal: One of the two irregular bones forming part of the lateral surfaces and base of the skull, and containing the organs of hearing. [NIH]

Temporal Lobe: Lower lateral part of the cerebral hemisphere. [NIH]

Temporomandibular Joint Dysfunction Syndrome: A symptom complex consisting of pain, muscle tenderness, clicking in the joint, and limitation or alteration of mandibular movement. The symptoms are subjective and manifested primarily in the masticatory muscles rather than the temporomandibular joint itself. Etiologic factors are uncertain but include occlusal dysharmony and psychophysiologic factors. [NIH]

Tendinitis: Inflammation of tendons and of tendon-muscle attachments. [EU]

Tendon: A discrete band of connective tissue mainly composed of parallel bundles of collagenous fibers by which muscles are attached, or two muscles bellies joined. [NIH]

Tennis Elbow: A condition characterized by pain in or near the lateral humeral epicondyle or in the forearm extensor muscle mass as a result of unusual strain. It occurs in tennis players as well as housewives, artisans, and violinists. [NIH]

Testicles: The two egg-shaped glands found inside the scrotum. They produce sperm and male hormones. Also called testes. [NIH]

Testis: Either of the paired male reproductive glands that produce the male germ cells and the male hormones. [NIH]

Testosterone: A hormone that promotes the development and maintenance of male sex characteristics. [NIH]

Tetani: Causal agent of tetanus. [NIH]

Tetanic: Having the characteristics of, or relating to tetanus. [NIH]

Tetanus: A disease caused by tetanospasmin, a powerful protein toxin produced by Clostridium tetani. Tetanus usually occurs after an acute injury, such as a puncture wound or laceration. Generalized tetanus, the most common form, is characterized by tetanic muscular contractions and hyperreflexia. Localized tetanus presents itself as a mild condition with manifestations restricted to muscles near the wound. It may progress to the generalized form. [NIH]

Thalamus: Paired bodies containing mostly gray substance and forming part of the lateral wall of the third ventricle of the brain. The thalamus represents the major portion of the diencephalon and is commonly divided into cellular aggregates known as nuclear groups. [NIH]

Therapeutics: The branch of medicine which is concerned with the treatment of diseases, palliative or curative. [NIH]

Thermal: Pertaining to or characterized by heat. [EU]

Thiamine: 3-((4-Amino-2-methyl-5-pyrimidinyl)methyl)-5-(2-hydroxyethyl)-4-methylthiazolium chloride. [NIH]

Thigh: A leg; in anatomy, any elongated process or part of a structure more or less comparable to a leg. [NIH]

Third Ventricle: A narrow cleft inferior to the corpus callosum, within the diencephalon, between the paired thalami. Its floor is formed by the hypothalamus, its anterior wall by the lamina terminalis, and its roof by ependyma. It communicates with the fourth ventricle by the cerebral aqueduct, and with the lateral ventricles by the interventricular foramina. [NIH]

Thoracic: Having to do with the chest. [NIH]

Thorax: A part of the trunk between the neck and the abdomen; the chest. [NIH]

Threshold: For a specified sensory modality (e. g. light, sound, vibration), the lowest level (absolute threshold) or smallest difference (difference threshold, difference limen) or intensity of the stimulus discernible in prescribed conditions of stimulation. [NIH]

Thrombin: An enzyme formed from prothrombin that converts fibrinogen to fibrin. (Dorland, 27th ed) EC 3.4.21.5. [NIH]

Thrombomodulin: A cell surface glycoprotein of endothelial cells that binds thrombin and serves as a cofactor in the activation of protein C and its regulation of blood coagulation. [NIH]

Thrombosis: The formation or presence of a blood clot inside a blood vessel. [NIH]

Thyroid: A gland located near the windpipe (trachea) that produces thyroid hormone, which helps regulate growth and metabolism. [NIH]

Thyroid Gland: A highly vascular endocrine gland consisting of two lobes, one on either side of the trachea, joined by a narrow isthmus; it produces the thyroid hormones which are concerned in regulating the metabolic rate of the body. [NIH]

Thyroid Hormones: Hormones secreted by the thyroid gland. [NIH]

Thyrotropin: A peptide hormone secreted by the anterior pituitary. It promotes the growth of the thyroid gland and stimulates the synthesis of thyroid hormones and the release of thyroxine by the thyroid gland. [NIH]

Tibial Nerve: The medial terminal branch of the sciatic nerve. The tibial nerve fibers originate in lumbar and sacral spinal segments (L4 to S2). They supply motor and sensory innervation to parts of the calf and foot. [NIH]

Time Management: Planning and control of time to improve efficiency and effectiveness. [NIH]

Tin: A trace element that is required in bone formation. It has the atomic symbol Sn, atomic number 50, and atomic weight 118.71. [NIH]

Tinnitus: Sounds that are perceived in the absence of any external noise source which may take the form of buzzing, ringing, clicking, pulsations, and other noises. Objective tinnitus refers to noises generated from within the ear or adjacent structures that can be heard by other individuals. The term subjective tinnitus is used when the sound is audible only to the affected individual. Tinnitus may occur as a manifestation of cochlear diseases; vestibulocochlear nerve diseases; intracranial hypertension; craniocerebral trauma; and other conditions. [NIH]

Tissue: A group or layer of cells that are alike in type and work together to perform a specific function. [NIH]

Tissue Culture: Maintaining or growing of tissue, organ primordia, or the whole or part of an organ in vitro so as to preserve its architecture and/or function (Dorland, 28th ed). Tissue culture includes both organ culture and cell culture. [NIH]

Tolerance: 1. The ability to endure unusually large doses of a drug or toxin. 2. Acquired drug tolerance; a decreasing response to repeated constant doses of a drug or the need for increasing doses to maintain a constant response. [EU]

Tomography: Imaging methods that result in sharp images of objects located on a chosen plane and blurred images located above or below the plane. [NIH]

Tone: 1. The normal degree of vigour and tension; in muscle, the resistance to passive elongation or stretch; tonus. 2. A particular quality of sound or of voice. 3. To make permanent, or to change, the colour of silver stain by chemical treatment, usually with a heavy metal. [EU]

Tonic: 1. Producing and restoring the normal tone. 2. Characterized by continuous tension. 3. A term formerly used for a class of medicinal preparations believed to have the power of restoring normal tone to tissue. [EU]

Tonicity: The normal state of muscular tension. [NIH]

Tonus: A state of slight tension usually present in muscles even when they are not undergoing active contraction. [NIH]

Tooth Preparation: Procedures carried out with regard to the teeth or tooth structures preparatory to specified dental therapeutic and surgical measures. [NIH]

Tourniquet: A device, band or elastic tube applied temporarily to press upon an artery to stop bleeding; a device to compress a blood vessel in order to stop bleeding. [NIH]

Toxic: Having to do with poison or something harmful to the body. Toxic substances usually cause unwanted side effects. [NIH]

Toxicity: The quality of being poisonous, especially the degree of virulence of a toxic microbe or of a poison. [EU]

Toxicodendron: A genus (formerly Rhus) of shrubs, vines, or trees that yields a highly allergenic oleoresin which causes a severe contact dermatitis. The most toxic species are Toxicodendron vernix (poison sumac), T. diversilobum (poison oak), and T. radicans (poison ivy). T. vernicifera yields a useful varnish from which certain enzymes (laccases) are obtained. [NIH]

Toxicology: The science concerned with the detection, chemical composition, and pharmacologic action of toxic substances or poisons and the treatment and prevention of toxic manifestations. [NIH]

Toxin: A poison; frequently used to refer specifically to a protein produced by some higher plants, certain animals, and pathogenic bacteria, which is highly toxic for other living organisms. Such substances are differentiated from the simple chemical poisons and the vegetable alkaloids by their high molecular weight and antigenicity. [EU]

Toxoid: The material resulting from the treatment of toxin in such a way that the toxic properties are inactivated whilst the antigenic potency remains intact. [NIH]

Trace element: Substance or element essential to plant or animal life, but present in extremely small amounts. [NIH]

Trachea: The cartilaginous and membranous tube descending from the larynx and branching into the right and left main bronchi. [NIH]

Transcutaneous: Transdermal. [EU]

Transdermal: Entering through the dermis, or skin, as in administration of a drug applied to the skin in ointment or patch form. [EU]

Transfection: The uptake of naked or purified DNA into cells, usually eukaryotic. It is analogous to bacterial transformation. [NIH]

Translation: The process whereby the genetic information present in the linear sequence of ribonucleotides in mRNA is converted into a corresponding sequence of amino acids in a protein. It occurs on the ribosome and is unidirectional. [NIH]

Translational: The cleavage of signal sequence that directs the passage of the protein through a cell or organelle membrane. [NIH]

Transmitter: A chemical substance which effects the passage of nerve impulses from one cell to the other at the synapse. [NIH]

Trauma: Any injury, wound, or shock, must frequently physical or structural shock, producing a disturbance. [NIH]

Treatment Outcome: Evaluation undertaken to assess the results or consequences of management and procedures used in combating disease in order to determine the efficacy, effectiveness, safety, practicability, etc., of these interventions in individual cases or series. [NIH]

Trees: Woody, usually tall, perennial higher plants (Angiosperms, Gymnosperms, and some Pterophyta) having usually a main stem and numerous branches. [NIH]

Triad: Trivalent. [NIH]

Tricuspid Atresia: Absence of the orifice between the right atrium and ventricle, with the presence of an atrial defect through which all the systemic venous return reaches the left heart. As a result, there is left ventricular hypertrophy because the right ventricle is absent or not functional. [NIH]

Tricyclic: Containing three fused rings or closed chains in the molecular structure. [EU]

Trigeminal: Cranial nerve V. It is sensory for the eyeball, the conjunctiva, the eyebrow, the skin of face and scalp, the teeth, the mucous membranes in the mouth and nose, and is motor to the muscles of mastication. [NIH]

Trigeminal Ganglion: The semilunar-shaped ganglion containing the cells of origin of most of the sensory fibers of the trigeminal nerve. It is situated within the dural cleft on the cerebral surface of the petrous portion of the temporal bone and gives off the ophthalmic, maxillary, and part of the mandibular nerves. [NIH]

Trigeminal Nerve: The 5th and largest cranial nerve. The trigeminal nerve is a mixed motor and sensory nerve. The larger sensory part forms the ophthalmic, mandibular, and maxillary nerves which carry afferents sensitive to external or internal stimuli from the skin, muscles, and joints of the face and mouth and from the teeth. Most of these fibers originate from cells of the trigeminal ganglion and project to the trigeminal nucleus of the brain stem. The smaller motor part arises from the brain stem trigeminal motor nucleus and innervates the muscles of mastication. [NIH]

Tryptophan: An essential amino acid that is necessary for normal growth in infants and for nitrogen balance in adults. It is a precursor serotonin and niacin. [NIH]

Tumor Necrosis Factor: Serum glycoprotein produced by activated macrophages and other mammalian mononuclear leukocytes which has necrotizing activity against tumor cell lines and increases ability to reject tumor transplants. It mimics the action of endotoxin but differs from it. It has a molecular weight of less than 70,000 kDa. [NIH]

Tumour: 1. Swelling, one of the cardinal signs of inflammations; morbid enlargement. 2. A new growth of tissue in which the multiplication of cells is uncontrolled and progressive; called also neoplasm. [EU]

Tyramine: An indirect sympathomimetic. Tyramine does not directly activate adrenergic receptors, but it can serve as a substrate for adrenergic uptake systems and monoamine oxidase so it prolongs the actions of adrenergic transmitters. It also provokes transmitter release from adrenergic terminals. Tyramine may be a neurotransmitter in some invertebrate nervous systems. [NIH]

Tyrosine: A non-essential amino acid. In animals it is synthesized from phenylalanine. It is also the precursor of epinephrine, thyroid hormones, and melanin. [NIH]

Ubiquinone: A lipid-soluble benzoquinone which is involved in electron transport in mitochondrial preparations. The compound occurs in the majority of aerobic organisms, from bacteria to higher plants and animals. [NIH]

Ulcer: A localized necrotic lesion of the skin or a mucous surface. [NIH]

Ulcerative colitis: Chronic inflammation of the colon that produces ulcers in its lining. This condition is marked by abdominal pain, cramps, and loose discharges of pus, blood, and mucus from the bowel. [NIH]

Unconscious: Experience which was once conscious, but was subsequently rejected, as the "personal unconscious". [NIH]

Ureters: Tubes that carry urine from the kidneys to the bladder. [NIH]

Urethra: The tube through which urine leaves the body. It empties urine from the bladder. [NIH]

Uric: A kidney stone that may result from a diet high in animal protein. When the body breaks down this protein, uric acid levels rise and can form stones. [NIH]

Urinary: Having to do with urine or the organs of the body that produce and get rid of urine. [NIH]

Urine: Fluid containing water and waste products. Urine is made by the kidneys, stored in the bladder, and leaves the body through the urethra. [NIH]

Urogenital: Pertaining to the urinary and genital apparatus; genitourinary. [EU]

Uterine Contraction: Contraction of the uterine muscle. [NIH]

Uterus: The small, hollow, pear-shaped organ in a woman's pelvis. This is the organ in which a fetus develops. Also called the womb. [NIH]

Vaccine: A substance or group of substances meant to cause the immune system to respond to a tumor or to microorganisms, such as bacteria or viruses. [NIH]

Vagina: The muscular canal extending from the uterus to the exterior of the body. Also called the birth canal. [NIH]

Vascular: Pertaining to blood vessels or indicative of a copious blood supply. [EU]

Vascular Resistance: An expression of the resistance offered by the systemic arterioles, and to a lesser extent by the capillaries, to the flow of blood. [NIH]

Vasoconstriction: Narrowing of the blood vessels without anatomic change, for which constriction, pathologic is used. [NIH]

Vasodilator: An agent that widens blood vessels. [NIH]

VE: The total volume of gas either inspired or expired in one minute. [NIH]

Vegetative: 1. Concerned with growth and with nutrition. 2. Functioning involuntarily or unconsciously, as the vegetative nervous system. 3. Resting; denoting the portion of a cell cycle during which the cell is not involved in replication. 4. Of, pertaining to, or characteristic of plants. [EU]

Vein: Vessel-carrying blood from various parts of the body to the heart. [NIH]

Venlafaxine: An antidepressant drug that is being evaluated for the treatment of hot flashes in women who have breast cancer. [NIH]

Venous: Of or pertaining to the veins. [EU]

Venter: Belly. [NIH]

Ventral: 1. Pertaining to the belly or to any venter. 2. Denoting a position more toward the belly surface than some other object of reference; same as anterior in human anatomy. [EU]

Ventricle: One of the two pumping chambers of the heart. The right ventricle receives oxygen-poor blood from the right atrium and pumps it to the lungs through the pulmonary artery. The left ventricle receives oxygen-rich blood from the left atrium and pumps it to the body through the aorta. [NIH]

Ventricular: Pertaining to a ventricle. [EU]

Venules: The minute vessels that collect blood from the capillary plexuses and join together to form veins. [NIH]

Vertebrae: A bony unit of the segmented spinal column. [NIH]

Vertebral: Of or pertaining to a vertebra. [EU]

Vertigo: An illusion of movement; a sensation as if the external world were revolving around the patient (objective vertigo) or as if he himself were revolving in space (subjective vertigo). The term is sometimes erroneously used to mean any form of dizziness. [EU]

Vestibular: Pertaining to or toward a vestibule. In dental anatomy, used to refer to the tooth surface directed toward the vestibule of the mouth. [EU]

Vestibule: A small, oval, bony chamber of the labyrinth. The vestibule contains the utricle and saccule, organs which are part of the balancing apparatus of the ear. [NIH]

Vestibulocochlear Nerve: The 8th cranial nerve. The vestibulocochlear nerve has a cochlear part (cochlear nerve) which is concerned with hearing and a vestibular part (vestibular nerve) which mediates the sense of balance and head position. The fibers of the cochlear nerve originate from neurons of the spiral ganglion and project to the cochlear nuclei (cochlear nucleus). The fibers of the vestibular nerve arise from neurons of Scarpa's ganglion and project to the vestibular nuclei. [NIH]

Vestibulocochlear Nerve Diseases: Diseases of the vestibular and/or cochlear (acoustic) nerves, which join to form the vestibulocochlear nerve. Vestibular neuritis, cochlear neuritis, and acoustic neuromas are relatively common conditions that affect these nerves. Clinical manifestations vary with which nerve is primarily affected, and include hearing loss, vertigo, and tinnitus. [NIH]

Veterinary Medicine: The medical science concerned with the prevention, diagnosis, and treatment of diseases in animals. [NIH]

Viral: Pertaining to, caused by, or of the nature of virus. [EU]

Virulence: The degree of pathogenicity within a group or species of microorganisms or viruses as indicated by case fatality rates and/or the ability of the organism to invade the tissues of the host. [NIH]

Virus: Submicroscopic organism that causes infectious disease. In cancer therapy, some viruses may be made into vaccines that help the body build an immune response to, and kill, tumor cells. [NIH]

Visceral: , from viscus a viscus) pertaining to a viscus. [EU]

Visceral Afferents: The sensory fibers innervating the viscera. [NIH]

Vitamin A: A substance used in cancer prevention; it belongs to the family of drugs called retinoids. [NIH]

Vitro: Descriptive of an event or enzyme reaction under experimental investigation occurring outside a living organism. Parts of an organism or microorganism are used together with artificial substrates and/or conditions. [NIH]

Vivo: Outside of or removed from the body of a living organism. [NIH]

Volition: Voluntary activity without external compulsion. [NIH]

War: Hostile conflict between organized groups of people. [NIH]

White blood cell: A type of cell in the immune system that helps the body fight infection and disease. White blood cells include lymphocytes, granulocytes, macrophages, and others. [NIH]

Windpipe: A rigid tube, 10 cm long, extending from the cricoid cartilage to the upper border of the fifth thoracic vertebra. [NIH]

Withdrawal: 1. A pathological retreat from interpersonal contact and social involvement, as may occur in schizophrenia, depression, or schizoid avoidant and schizotypal personality disorders. 2. (DSM III-R) A substance-specific organic brain syndrome that follows the cessation of use or reduction in intake of a psychoactive substance that had been regularly

used to induce a state of intoxication. [EU]

Xenograft: The cells of one species transplanted to another species. [NIH]

Xerostomia: Decreased salivary flow. [NIH]

X-ray: High-energy radiation used in low doses to diagnose diseases and in high doses to treat cancer. [NIH]

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