Blood Transfusions

A Medical Dictionary, Bibliography,
and Annotated Research Guide to
Internet References

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and Philip M. Parker, Ph.D., Editors

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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 blood transfusions 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 blood transfusions, 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 blood transfusions, 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 blood transfusions. 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 blood transfusions, 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 blood transfusions.

The Editors

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

CHAPTER 1. STUDIES ON BLOOD TRANSFUSIONS

Overview

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

The Combined Health Information Database

The Combined Health Information Database summarizes studies across numerous federal agencies. To limit your investigation to research studies and blood transfusions, 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 "blood transfusions" (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:

- **Long-Term Results of Spousal Renal Donor Transplants with Donor-Specific Blood Transfusions**

  Source: Transplantation Proceedings. 33(7-8): 3417-3419. November 2001.

  Contact: Available from Elsevier Science Inc. 655 Avenue of the Americas, New York, NY 10010. (212) 633-3730. Website: www.elsevier.com.

  Summary: Donor specific **blood transfusion** (DST) has been considered as one of the effective ways of inducing specific immunologic tolerance. Recent studies have shown that graft (the transplanted organ) survival rates of renal transplants between spouses are higher than those using cadaveric kidneys and similar to those using one haplo-identical ones. In this article, the authors report on their study of the effects of DST on

the outcome of renal transplants between spouses as compared to those between one haplo-identical pairs. From 1991 to 1998, 15 patients (spousal group) and 132 patients (one-haplo group) received their first renal transplants; all of them received DST 4 weeks before transplantation. There was no difference in the incidence of accelerated or acute rejection between the two groups. However, the incidence of chronic rejection 3 months posttransplant tended to be lower in the spousal group than in the one-haplo group (3 out of 15 in the spousal group and 46 out of 136 in the one-haplo group). One, three, and five year graft survival rates were 100 percent, 100 percent, and 100 percent in the spousal group, and 97.7 percent, 92.3 percent, and 85.7 percent in the one-haplo group. The authors conclude that the mechanisms underlying the beneficial effect of DST is still unclear. 2 figures. 1 table. 11 references.

- **Blood Transfusion and the Risks of Infectious Disease**

  Source: Patient Care. 32(16): 112, 115. October 15, 1998.

  Contact: Available from Medical Economics. 5 Paragon Drive, Montvale, NJ 07645. (800) 432-4570. Fax (201) 573-4956.

  Summary: The chance of acquiring HIV infection or hepatitis from a **blood transfusion** is much less than the risk of some everyday common activities. This article discusses **blood transfusion** and the risks of infectious disease. The authors note that relentless, widespread negative publicity about the potentially infectious nature of donated blood has contributed to an atmosphere in which **blood transfusions** are now expected to be accompanied by zero risk. No other area of medicine has adopted such a goal or been as scrutinized (and vilified) as transfusion medicine. The authors compare the estimates for the risk per unit of blood from U.S. blood donors to risks of everyday living, including dying in an auto crash, drowning, choking to death, dying in surgery, and dying from poisoning. These figures demonstrate that everyday risks are generally much greater than the risks of contracting an infectious disease from **blood transfusion.** The authors go on to discuss ways to make **blood transfusion** even safer, primarily by using autologous blood donation (the patient donates blood ahead of time for her or his own needs). The authors conclude that the risk from **blood transfusion** will never be reduced to zero unless and until an effective artificial blood becomes widely available for transfusion. 1 table. 3 references.

Federally Funded Research on Blood Transfusions

The U.S. Government supports a variety of research studies relating to blood transfusions. 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 blood transfusions.

[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).

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 blood transfusions. The following is typical of the type of information found when searching the CRISP database for blood transfusions:

- **Project Title: A QTL FOR FETAL HEMOGLOBIN AND F CELLS ON CHROMOSOME 8Q**

  Principal Investigator & Institution: Thein, Swee L.; U of L King's College London London, Wc2r 2Ls

  Timing: Fiscal Year 2002; Project Start 30-SEP-2001; Project End 31-AUG-2004

  Summary: (provided by applicant): Current treatment for Sickle cell disease (SCD) and beta thalassemia is, at best, symptomatic involving **blood transfusions,** the use of drugs to remove iron and to control pain, and in cases with HLA-compatible siblings, bone marrow transplantation. Our studies and others, have shown that in both disorders, high levels of fetal hemoglobin (Hb F, alpha1gamma2) have a major beneficial effect. The ability to produce Hb F in response to disease varies enormously from patient to patient, and is one of the major factors underlying the remarkable diversity in the severity of these disorders. This has prompted an intense search for approaches to augment fetal hemoglobin production in patients with SCD and beta thalassemia, one of which involves the use of drugs such as hydroxyurea and butyrate analogues. However, these agents are limited by their toxicity and they are effective in only a proportion of patients. The long term objective of this proposal is to obtain a better understanding of the genetic factors which modify fetal hemoglobin and F cell (FC) levels in normal adults and in response to disease. We have demonstrated for the first time that Hb F and F cell levels are highly heritable and transmitted as a complex genetic trait, influenced by several factors including a common sequence variant (C to T) in the Ggamma-promoter region, referred to as the Xmn1-Ggamma site. In earlier studies, as part of a systematic search for loci that may regulate gamma globin gene expression in beta thalassemia and SCD, we have identified an extensive kindred which includes individuals with beta thalassemia and hereditary persistence of fetal hemoglobin (HPFH). A quantitative trait locus (QTL) modifying fetal Hb production has been mapped to chromosome 6q23 in this kindred but variance components analysis revealed that a significant amount of FC variance remained unaccounted for. Furthermore, other QTLs for Hb F and FC have been implicated in different family studies. The presence of the Xmn1-Ggamma site is a major determinant for FC levels, and its location suggests that it is involved in transcriptional activation of the Ggamma globin gene. A linkage re-analysis of the genome-wide data in the kindred was carried out under a two-locus genetic model, with one of the loci being the Xmn1-Ggamma site. A new locus on chromosome 8q has now been identified using this method. Now, in an integrated program, we propose to isolate and characterize the 8q QTL by three approaches: (1) positional (candidate) gene cloning, (2) functional cloning by complementation assays in transgenic mice, and (3) differential gene expression analysis, in parallel with the 6q project. The delineation of these genetic factors should increase our understanding of the trans-acting factors for the fine tuning in the control of Hb F production after birth in normal adults and in response to disease with implications for pharmacogenomics. The discovery of these factors may also suggest new approaches for therapeutic augmentation of fetal hemoglobin production in patients with SCD and beta thalassemia.

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

- **Project Title: AMINOCAPROIC ACID AND BLEEDING IN SPINAL SURGERY**

  Principal Investigator & Institution: Berenholtz, Sean M.; Anesthesiology/Crit Care Med; Johns Hopkins University 3400 N Charles St Baltimore, Md 21218

  Timing: Fiscal Year 2002; Project Start 01-SEP-2002; Project End 31-AUG-2007

  Summary: (provided by applicant): The candidate, Sean Berenholtz, is on the faculty at Johns Hopkins University, in the Division of Adult Critical Care Medicine (CCM), Department of Anesthesiology/CCM. His goal is to become an independent clinician scientist focused on applying rigorous research design to quality improvement in the intensive care unit, with an emphasis on evaluating alternatives to allogeneic **blood transfusion** in critically ill patients. To realize this goal, he will enroll in a formal advanced degree program in clinical investigation and he will receive structured mentoring by senior investigators for the conduct of supervised, innovative research. The specific aims and related hypothesis of the proposed research are: 1. To identify preoperative patient or hospital characteristics that predict allogeneic transfusion in adult patients undergoing spine surgery in Maryland from 1997 to 2000. We will analyze hospital discharge data for adult patients in non-federal acute care hospitals in Maryland who had a primary procedure code for spine surgery from 1997 to 2000 (n=3988). We hypothesize that preoperative patient characteristics, including advanced age and the presence of cardiac disease, are associated with an increased incidence of allogeneic transfusion. 2. To determine the association of allogeneic **blood transfusion** with clinical and economic outcomes following high-volume surgeries at Johns Hopkins Hospital. We will conduct a prospective review of data from the Johns Hopkins discharge database. We hypothesize that there is a dose-response association between anincreased number of allogeneic transfusions and an increased incidence of postoperative complications, including nosocomial infections, ICU length of stay, and hospital costs. 3. Assess the efficacy and safety of epsilon aminocaproic acid (EACA) in reducing allogeneic **blood transfusion** requirements in 170 patients undergoing spine surgery at Johns Hopkins Hospital. We will conduct a randomized controlled trial of EACA versus placebo in 170 patients undergoing spine surgery and we have completed a pilot study demonstrating the feasibility of this approach. We hypothesize that patients receiving EACA will require 30% fewer allogeneic **blood transfusions** than patients receiving placebo. 4. Evaluate the impact of EACA on economic outcomes, including hospital length of stay (LOS) and direct costs of hospital care in patients undergoing spine surgery at Johns Hopkins Hospital. We hypothesize that thedirect costs of EACA are less than those in the control group. Completion of the proposed research will significantly advance our knowledge of who is likely to require allogeneic transfusion, the complications associated with transfusion, and strategies to reduce transfusion exposure. These projects and the career development plan described will build a foundation for a successful career as an independent investigator.

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

- **Project Title: DEVICE FOR PROMOTING SURVIVAL OF CONGESTED TISSUE FLAPS**

  Principal Investigator & Institution: Russell, John A.; Spectrocon, Llc 2701 Van Hise Ave, Ste Fc Madison, Wi 53705

  Timing: Fiscal Year 2004; Project Start 01-FEB-2002; Project End 31-MAR-2006

  Summary: (provided by applicant): New technology is needed for the treatment of venous congestion, a serious complication of reconstructive surgery. Currently, live leeches are used, but are psychologically traumatic to patients, and are often ineffective

in preventing tissue death. Because there are no other alternatives for treating venous congestion, a mechanical device for this purpose represents an innovative concept. The long-term goal of this research is to develop AutoFIow, a fully automated medical device for treating venous congestion. In Phase I, we demonstrated the feasibility of developing and using AutoFIow in a pig model. In Phase II, our aims are: (1) to miniaturize AutoFIow, (2) to reduce the number of bleeding sites required for AutoFIow treatment by increasing bleeding time per applied wound; methods of treating endothelial and interstitial edema will be incorporated for this purpose, and (3) to incorporate blood autotransfusion capability. Crucial refinements in size will expand the use of AutoFIow to tissue configurations not currently supported by our prototype, such as fingers, and to potential use in children. Miniaturization and increased bleeding time per wound will result in decreased potential for tissue damage. By incorporating methods of returning autologous blood to the patient, the **blood transfusions** frequently required by live leech therapy will be eliminated. Miniaturization, longer wound bleeding times, and autotransfusion will create a large functional divide between use of AutoFIow and medicinal leeches, and will establish AutoFlow as the universally preferred method for the treatment for venous congestion in the marketplace.

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

- **Project Title: ENGRAFTING SENSITIZED HOSTS WITH NONABLATIVE REGIMENS**

  Principal Investigator & Institution: Nash, Richard A.; Associate Member; Fred Hutchinson Cancer Research Center Box 19024, 1100 Fairview Ave N Seattle, Wa 98109

  Timing: Fiscal Year 2002; Project Start 01-SEP-1999; Project End 31-JUL-2004

  Summary: Engraftment has been established in nonsensitized major histocompatibility complex (MHC)-matched recipients with nonmyeloablative conditioning regimens. Recipients previously transfused with blood products become sensitized to donor minor histocompatibility antigens, increasing the risk of graft rejection. Patients with inherited red blood cell diseases require **blood transfusions** and have a higher probability of graft rejection. In this proposal, nonmyeloablative conditioning regimens will be developed for sensitized recipients which 1) lack the toxicities characteristic of myeloablative regimens, and 2) could be safely administered in an outpatient setting. The development of the nonmyeloablative regimen for sensitized patients will be based on two hypotheses: 1) host-versus-graft (HVG) reactions of sensitized recipients can be suppressed with immunosuppressive agents other than high-dose chemoradiotherapy; 2) T cells from the graft can suppress the host immune system including sensitized immune effector cells. These hypotheses will be tested and nonmyeloablative regimens will be developed in a preclinical canine model of transfusion-induced sensitization. Sensitizing recipients with **blood transfusions** prior to transplant results in uniform graft rejection with conventional high-dose conditioning. In Aim 1, it will be determined if further stepwise intensification of pretransplant immunosuppression in addition to CSP will successfully promote engraftment in a dose de-escalation study of TBI. Posttransplant immunosuppression (MMF/CSP) will be assessed separately to determine if it prevents graft rejection in sensitized recipients at TBI 920 cGy. If effective, intensification of posttransplant immunosuppression will be done at the maximal TBI dose at which graft rejection occurs at the completion of Aim 1A. In Aim 2, it will be determined if promoting GVH will achieve engraftment by suppressing sensitized host T cells and "creating space" in the marrow. If these studies are successful, then donor T cells will be ex vivo expanded and transduced with a "suicide (HSVtk) gene" for prevention of severe GVHD. In Aim 3, the optimal immunosuppressive regimen will be

combined with a GVH enhancing regimen. The ultimate goal of this proposal is the elimination of cytotoxic agents from the conditioning regimen. By lessening the morbidity and mortality associated with conventional conditioning, these studies could significantly change the management of selected inherited red blood cell diseases.

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

- **Project Title: FOCUS**

  Principal Investigator & Institution: Carson, Jeffrey L.; Richard C. Reynolds Professor of Medicin; Medicine; Univ of Med/Dent Nj-R W Johnson Med Sch Robert Wood Johnson Medical Sch Piscataway, Nj 088545635

  Timing: Fiscal Year 2003; Project Start 01-SEP-2003; Project End 31-AUG-2008

  Summary: (provided by applicant); Red blood cell transfusions are an extremely common medical intervention in both the United States and worldwide; over 11 million units are transfused in the United States. Between 60% and 70% of all blood is transfused in the surgical setting. Despite the common use of red blood cell transfusions, the threshold for transfusion has not been adequately evaluated and is very controversial. A decade ago the standard of care was to administer a peri-operative transfusion whenever the hemoglobin (Hgb) level fell below 10 g/dl (the "10/30 rule"). Concerns about the safety of blood, especially with respect to HIV and hepatitis, and the absence of data to support a 10 g/dl threshold led to current standard of care today to administer **blood transfusions** based on the presence of symptoms and not a specific Hgb/hematocrit level. However, there are no randomized clinical trials in surgical patients that have tested the efficacy and safety of withholding blood until the patient develops symptoms or the "10/30" approach to transfusion. Patients with underlying cardiovascular disease are at greatest risk of adverse effects from reduced Hgb levels. We propose to conduct a multi-center randomized trial to test if a more aggressive transfusion strategy that maintains postoperative Hgb levels above 10 g/dl improves patient outcome as compared to a more conservative strategy that withholds **blood transfusion** until the patient develops symptoms of anemia. Eligible patients for the trial will have undergone surgical repair for a hip fracture and have a postoperative Hgb level below 10 g/dl within three days of surgery. Only patients with cardiovascular disease will be entered into the study. Patients will be randomized to one of the two transfusion strategies. The 10 g/dl threshold strategy will use enough red blood cell units to maintain Hgb levels at or above 10 g/dl through hospital discharge. Symptomatic transfusion strategy patients will receive red blood cell transfusions for symptoms of anemia, although transfusion is also permitted but not required if the Hgb level falls below 8 g/dl. Outcomes will include functional recovery (primary outcome: ability to walk ten feet across a room without human assistance at 60-days post-randomization), long-term survival, nursing home placement, and postoperative complications (death in hospital or within 30 days, pneumonia, myocardial infarction, thromboembolism, stroke, delirium). We will randomize 2,600 patients from 25 centers over a 3.5-year period. This will allow us to detect a 16% relative risk reduction in the loss of ability to walk independently with power about 0.90. A pilot study in 84 patients demonstrated the feasibility of the study. Ambulation at 60 days is known to be highly predictive of ultimate functional outcome as well as of mortality at one year. Because inability to walk again has such important implications for quality office, and because, unfortunately, it is a common problem, it far outweighs the remote chance of viral infection or other complications from transfusion in these elderly patients. Also, this study will measure the frequency and 95% confidence intervals of the medical errors that are important in this patient population and are poorly documented in the

literature. The medical errors that will be measured are: transfusion errors (blood transfusion to the wrong patient, mislabeling of samples for type and cross match, use of whole blood instead of packed red cells), failure to use thromboembolism prophylaxis, incorrect antibiotic prophylaxis, wrong site surgery and femoral shaft fracture.

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

- **Project Title: FOCUS DATA COORDINATING CENTER**

  Principal Investigator & Institution: Terrin, Michael L.; President; Maryland Medical Research Institute, Inc 600 Wyndhurst Ave Baltimore, Md 21210

  Timing: Fiscal Year 2003; Project Start 10-JUL-2003; Project End 30-JUN-2008

  Summary: (FROM THE APPLICATION): Over 11 million units are transfused in the United States. Despite the common use of red blood cell transfusions, the threshold for transfusion has not been adequately evaluated. A decade ago the standard of care was to administer a peri-operative transfusion whenever the hemoglobin level fell below 10 g/dl (the "10/30 rule"). Concerns about the safety of blood, especially with respect to HIV and hepatitis, and the absence of data to support a 10 g/dl threshold led to current standard of care to administer **blood transfusions** based on the presence of symptoms and not a specific hemoglobin/hematocrit level. However, there are no randomized clinical trials in surgical patients that have tested the efficacy and safety of withholding blood until the patient develops symptoms or the 10/30 approach to transfusion and limited evidence for patients with underlying cardiovascular disease are at greatest risk of adverse effects from reduced hemoglobin levels. We propose to conduct a multi-center randomized trial to test if a more aggressive transfusion strategy that maintains postoperative hemoglobin levels above 10 g/dl improves patient outcome as compared to a more conservative strategy that withholds **blood transfusion** until the patient develops symptoms of anemia. Patients eligible for the trial will have undergone surgical repair for a hip fracture and have a postoperative hemoglobin level below 10 g/dl within three days of surgery. Only patients with cardiovascular disease will be entered into the study. Symptomatic transfusion strategy patients will receive red blood cell transfusions for symptoms of anemia, although transfusion is also permitted but not required if the hemoglobin level falls below 8 g/dl. Outcomes will include functional recovery (primary outcome: ability to walk ten feet across a room without human assistance at 60-days post-randomization), long-term survival, nursing home placement, and postoperative complications (death in hospital or within 30 days, pneumonia, myocardial infarction, thromboembolism, stroke). We will randomize 2,600 patients over a 3.5-year period to detect a reduction in the loss of ability to walk independently from 43% to 36% (16% relative risk reduction) with power about 0.90. Also, this study will measure the frequency and 95% confidence intervals of the medical errors that are important in this patient population. The medical errors that will be measured are: transfusion errors (blood transfusion to the wrong patient, mislabeling of samples for type and cross match, use of whole blood instead of packed red cells), failure to use thromboembolism prophylaxis, incorrect antibiotic prophylaxis, wrong site surgery, and femoral shaft fracture.

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

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

  Principal Investigator & Institution: Kelch, Robert P.; Professor and Chairman; Clinical Research Center; University of Iowa Iowa City, Ia 52242

  Timing: Fiscal Year 2002; Project Start 01-DEC-1977; Project End 30-NOV-2002

Summary: The objective of the General Clinical Research Center is to provide a high quality physical and intellectual environment in which clinical investigation is conducted with maximum regard for patient welfare and safety. The Center complements and extends the research resources of the College of Medicine, fosters interdisciplinary activity and serve as an educational resource for students, house-staff and faculty. Areas of investigation include women's health, therapy of prostate cancer, bone loss in anorexia, cochlear implants, gene transfer in cystic fibrosis, and homocysteine and atherosclerosis. Neonatal research includes immunologic effects of placental **blood transfusions,** pharmacokinetics of erythropoietin and the genetics of preeclampsia. The Center also supports multicenter trials evaluating the prevention of type I diabetes, experimental drug therapies in HIV infection, the genetics of alcoholism, treatment of ocular melanoma and medical therapy of prostatic hypertrophy.

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

- **Project Title: GENETIC HETEROGENEITY AND PROTEIN FUNCTION IN DBA**

  Principal Investigator & Institution: Sieff, Colin A.; Associate Professor; Dana-Farber Cancer Institute 44 Binney St Boston, Ma 02115

  Timing: Fiscal Year 2002; Project Start 15-AUG-2001; Project End 31-JUL-2004

  Summary: Diamond Blackfan anemia (DBA) is a congenital anemia that develops at birth or soon after, and is due to failure of production of erythrocytes and their precursors, with normal or near normal myeloid and platelet lineages. Patients can emit completely on corticosteroids or may become resistant to treatment, and then require regular **blood transfusions,** or bone marrow transplant if a histocompatible sibling donor is available. DBA patients are at increased risk of developing leukemia and other malignancies. DBA is inherited in about 10-15 percent of cases, mostly as an autosomal dominant. Recent genetic studies have led to the the surprising identification of mutations in a ribosomal protein gene, RPS19, on chromosome 19q13.2, in about 25 percent of both familial and sporadic cases (DBA1). Linkage analysis in multiplex DBA families shows strong evidence for another gene on chromosome 8p (DBA2) in about 40 percent of families, and other pedigrees do not show evidence for linkage to either chromosome 8p or 19q, indicating further genetic heterogeneity. The long term objective of this proposal is to identify and isolate the DBA2 gene. Therefore the specific aims are to (1), further define the chromosome 8p genetic map by ascertaining more families to search by linkage and haplotype analysis for recombinations in the flanking regions, and screen by cytogenetic techniques for deletions and translocations; (2) use cDNA arrays of the genes and expressed sequence tags (ESTs) in the critical region to define candidate genes by examining their pattern of expressed RNAs in erythroid cells, and by comparing the hybridization of normal and patient genomic DNA to these arrays to look for loss of heterozygosity; and (3), test candidate genes identified either as a result of progress in aim 1 and/or aim 2 for mutations in chromosome 8 linked families by SSCP, PCR heterozygosity screening and sequence analysis. Knowledge of additional genes that cause DBA may offer new insights into the molecular regulation of erythropoiesis and the process of stem cell commitment to the erythroid lineage, and it is possible that the protein encoded by the gene on chromosome 8p interacts with RPS19 in a novel pathway. Furthermore, the increased risk of malignancy in these patients suggests that the protein may act as a tumor suppressor. Thus isolating the genes that cause DBA may be important not only for devising new treatment for these patients but also for a better understanding of the regulation of erythropoiesis and the development of malignancy.

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

- **Project Title: INCREASING BLOOD AND CORD BLOOD DONATION IN BLACKS**

  Principal Investigator & Institution: Debaun, Michael R.; Assistant Professor; Pediatrics; Washington University Lindell and Skinker Blvd St. Louis, Mo 63130

  Timing: Fiscal Year 2002; Project Start 20-SEP-2002; Project End 30-JUN-2007

  Summary: (provided by applicant): The overall goal of the project is to expand the Charles Drew Community Blood Donor Program from the St. Louis Metropolitan area to the Kansas City Metropolitan area and to increase the number of cord blood stem cell donors to the St. Louis Cord Blood Bank from the St. Louis African-American community. **Blood transfusion** therapy is a widespread treatment option for patients who experience sequelae associated with sickle cell disease. The most serious complication regarding **blood transfusion** therapy for primary and secondary prevention of stroke in children with sickle cell disease is red blood cell alloimmunization, which occurs in approximately 20% of patients receiving this therapy. In the case of alloimmunization to red blood cells, future **blood transfusion** therapy may be difficult to implement because of inability to find compatible blood. For this purpose the St. Louis Metropolitan area Charles Drew Community Blood Donor Program was established in partnership with the American Red Cross Missouri-Illinois Region to increase the number of African-American blood donors and to identify directed donors who match the recipients. Three institutions will participate in this proposed study, Washington University School of Medicine, St. Louis University School of Medicine, and University of Missouri Medical School - Kansas City. We will test the following hypothesis: 1) In a metropolitan area where no previous effort has been made to recruit African-Americans, increasing the awareness of the benefit of donating blood for children with sickle cell disease, will increase the first time donation rate of African-Americans by 300% over three years, based on using the first six months of blood donations of the program as the baseline rate of donation, 2) Highlighting the potential benefit of cord blood donations for children with sickle cell disease in the St. Louis community will result in at least a 10%(approximately 400) of the eligible AA births donating cord blood to St. Louis Cord Blood Bank after the third year of the Charles Drew Cord Blood Donor Program. We will evaluate the impact of the Charles Drew Blood and Cord Blood Donor Programs with following Aims: 1) To determine if the Charles Drew Community Blood Donor Program can be successfully expanded to another metropolitan area, 2) To determine if the successful strategy used by the Charles Drew Community Blood Donor Program to increase the number of African-American blood donors can be expanded to increase the number of African-American cord blood donations within the St. Louis Metropolitan area, and 3) To determine the effectiveness of Charles Drew Blood Donor Program In decreases the morbidity associated with **blood transfusions** therapy for children with strokes. We believe after completion of this project, the strategies used for expanding both blood and cord blood donations in the African-American communities, will not only improve the quality of life for children and adults with sickle cell disease, but will also serve as model to increase blood and cord blood stem cell donations in other African-American communities across the nation.

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

- **Project Title: INDUCTION OF HBF BY PROLYL HYDROXYLASE INHIBITORS**

  Principal Investigator & Institution: Klaus, Stephen J.; Fibrogen, Inc. 225 Gateway Blvd South San Francisco, Ca 94080

  Timing: Fiscal Year 2004; Project Start 13-APR-2004; Project End 30-SEP-2004

Summary: (provided by applicant): Sickle cell disease (SCD) and beta-thalassemia are mostly inherited beta-hemoglobinopathies that lead to chronic anemia. Both diseases are characterized by insufficient or defective expression of the beta chain of adult hemoglobin (Hb), leading to insufficient oxygen delivery to peripheral tissues. Inadequate oxygen levels in tissues causes the episodic vasoocclusive crises that cause ischemic pain and damage, often necessitating **blood transfusions.** It has been recognized for decades that a means to mitigate the pathophysiology of these diseases, and in particular SCD, is to substitute the mutant adult Hb with fetal Hb (HbF). HbF is normally not expressed during adulthood due to silencing. The ability to induce fetal hemoglobin expression during adulthood has recently been achieved by pharmacological means, and led to the approval of hydroxyurea (HU) to treat patients with SCD. Although HU is the current standard of care for SCD, it has an unclear mechanism of action, and the use of HU is hindered by dose-limiting toxicity and the fact that many SCD patients respond poorly or not at all. Furthermore, HU displays little efficacy for beta-thalassemia. Therapeutic options to treat beta-hemoglobinopathy remain a large, unmet medical need worldwide. FibroGen has proprietary libraries of prolyl hydroxylase (PH) inhibitors that activate the transcription factor hypoxia-inducible factor, which may play a role in regulating expression of the gamma-globin gene that comprises HbF. Preliminary data shows that PH inhibitors lead to increased HbF expression in vitro and are additive to the HbF-inducing effects of HU. We propose to screen our existing libraries of PH inhibitors to identify and optimize the pharmacophore associated with induction of HbF expression. The ultimate goal is to select and test lead candidates in non-human primates for induction of HbF in vivo. Ultimately, this will enable identification of an HbF-inducing compound that can be tested alone or in combination with HU to mitigate the pathophysiology associated with SCD and other beta-hemoglobinopathies.

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- **Project Title: MECHANISM OF HTLV-1 ACTIVATION OF THE SRF PATHWAY.**

  Principal Investigator & Institution: Shuh, Maureen; Biological Sciences; Loyola University in New Orleans 6363 St Charles Ave New Orleans, La 70118

  Timing: Fiscal Year 2003; Project Start 01-AUG-2003; Project End 31-JUL-2006

  Summary: (provided by applicant): Human T cell lymphotrophic virus type I (HTLV-I) is the etiologic agent of two diseases: HTLV-I-associated myelopathy/tropical spastic paraparesis (HAM/TSP) and adult T cell leukemia (ATL). The 3' end of the virus encodes a 353 amino acid, 40 kiloDalton, phosphoprotein known as Tax. Tax activates the transcription of viral and host genes somehow by modulating the activity of transcription factors which recognize the CREB, NF-kappaB, and SRF promoter elements. In each case, Tax not only interacts with the transcription factor-DNA complex but also with associated factors. For example, Tax interacts with both CREB and the coactivator CBP, resulting in viral gene expression. There is strong evidence that Tax plays a critical role in viral oncogenesis in ATL patients. ATL is rapidly aggressive and chemotherapy-resistant T cell cancer, ultimately resulting in the patient's death within an average of 6 months. An estimated 10-20 million people in the world are infected with HTLV-I, and transmission primarily occurs through human breast milk and to a lesser extent, **blood transfusions,** IV drug use, and sexual contact. Once the patient is diagnosed with ATL, the survival probability of the patient is extremely small since there is no known cure for the cancer. Laboratory studies have shown that Tax induces the immortalization of primary cells and causes the formation of soft agar colonies and tumors in nude mice. The goal of the proposal is to determine the mechanism(s) of Tax

activation of the SRF transcription pathway. Published data indicates that the Tax-CREB interactions are important for viral gene expression and that the Tax-NF-kappaB interactions are important for maintenance of the transformed phenotype. We hypothesize that the Tax-SRF interactions are essential for initiation of the transformed phenotype. To understand the role of Tax in the SRF pathway, we will determine the mechanism of Tax activation of the serum response element (SRE). Tax activation of promoters containing an SRE must require that the positive regulators are active and negative regulators are inactive, and the events must occur constitutively. Our approach will be to examine the effects of Tax on three aspects of SRF function: assembly of the basic transcription complex on the promoter, activity of the MAPK pathway (positive regulator), and activity of the inhibitor Id (negative regulator).

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- **Project Title: METHODS FOR ROUTINE BACTERIAL SCREENING OF DONATED BLOOD**

  Principal Investigator & Institution: Rosen, David I.; Physical Sciences, Inc. 20 New England Business Center Andover, Ma 01810

  Timing: Fiscal Year 2002; Project Start 15-SEP-1999; Project End 30-JUN-2003

  Summary: (provided by applicant): Bacterial contamination of transfused blood products is a well-recognized source of sepsis and remains a serious concern to blood bank and transfusion center personnel. Despite these concerns there currently exists no widely accepted, practical and reliable method for routinely screening banked blood for potentially harmful levels of bacterial contamination. The development of such a method(s) would greatly reduce the risk of bacterial sepsis due to **blood transfusions** and further ensure the overall safety of the nation's blood supply. Physical Sciences Inc. proposes, in conjunction with our R&D collaborators, to develop and demonstrate two methodologies for the rapid and routine screening of banked blood products (i.e., red blood cells and platelets) for potentially dangerous levels of bacterial contamination. The proposed independent, but potentially complementary, approaches, already shown to be feasible, entail: 1) a method based on visible/NIR spectroscopy to directly monitor the bagged product (no aliquots of the blood need be withdrawn) for harmful levels of bacterial growth, and 2) an automated epifluorescence microscopy-based technique to assay a small sample of the blood product for bacteria. The Phase II effort will design and develop clinical prototype blood product screening instruments based on these technologies and extensively test them for their sensitivity, specificity and ease of use for bacterial detection in red blood cells (RBC's) and platelets. PROPOSED COMMERCIAL APPLICATION: A rapid, reliable and widely accepted method(s) to routinely screen donated blood products for potentially hazardous bacterial contamination prior to their transfusion would make an important contribution to the safety of the nation's blood supply. Once demonstrated to be reliable and cost-effective, the proposed methodology and associated instrumentation should have significant commercial potential. Effective point-of --use bacterial testing of platelets may also allow platelet shelf life to be extended from 5 to 7 days, thus increasing nation's platelet supply dramatically.

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

- **Project Title: MR OF HEART IRON: T2*/T2 CALIBRATION & APPLICATION**

  Principal Investigator & Institution: Pennell, Dudley J.; U of L Imperial Col of Sci/Technlgy/Med London, Sw7 2Az

  Timing: Fiscal Year 2003; Project Start 15-SEP-2003; Project End 30-JUN-2007

Summary: (provided by applicant): Beta-Thalassemia major (thalassemia) is a common genetic condition causing profound anemia which is very widespread in the world, particularly in countries where malaria has been prevalent, because single copies of the gene, which are insufficient to cause the major disease, offer protection against malaria. Some 93 million worldwide carry one copy of this gene, and one-quarter of children will inherit the major condition if 2 carriers reproduce. About 60,000 children are born annually with thalassemia and treatment is invasive and expensive. Regular **blood transfusions** are required to keep the children alive, but this leads to iron overload in the tissues which causes death at a young age in many sufferers. Treatment with iron chelation is helpful, but requires sometimes daily injections and is very expensive especially in developing countries. In 70% of cases, death is due to heart failure, the onset of which is difficult to predict and often has a rapid downhill course. Therefore our long term aim is to prevent death from heart failure caused by myocardial iron overload in thalassemia by using magnetic resonance (MR) imaging to identify early iron loading, and establish effective and well tolerated myocardial chelation regimes. Thus there is great scope for helping large numbers of sufferers, and also finding more acceptable and cost-effective treatments. In this grant application, we have 4 major aims: first, to understand how iron affects the signal from the MR scanner; second, to optimize MR acquisition sequences so that measurements taken from the images accurately reflect the magnetic relaxation in the tissues; third, to calibrate the MR relaxation measurements against both heart and liver, so that we understand how the measurements made by the scanner relate to the amount of iron in these organs; fourth, to roll-out MR sequences to 6 sites world-wide and validate their use, so that these sites can in principle act as local distributors of the expertise within their own regions, whilst promoting research into improved care in thalassemia. These centers are Philadelphia (USA), Cagliari (Italy), Athens (Greece), Nicosia (Cyprus), Mumbai (India) and Singapore.

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- **Project Title: NEONATAL ANEMIA--PATHOPHYSIOLOGY AND TREATMENT**

  Principal Investigator & Institution: Strauss, Ronald G.; Professor of Pathology/Pediatrics; Pathology; University of Iowa Iowa City, Ia 52242

  Timing: Fiscal Year 2002; Project Start 01-JUL-1992; Project End 31-MAR-2004

  Summary: This application is a competitive renewal of our previous Program Project Grant (PPG) entitled "Neonatal Anemia: Pathophysiology and Treatment." The renewal is based on hypotheses developed from findings of the original PPG plus new tissues arising in neonatal hematology and transfusion medicine. Although all objectives of the original PPG have been achieve with progress reported (512 manuscripts published, 7 submitted for review, and 15 in preparation), it is important to continue studies of neonatal anemia in a PPG setting because: 1) medical science has yet to achieve a comprehensive understanding of the physiology of neonatal erythropoiesis and the pathophysiology of the anemia of prematurity; and 2) severe, transfusion-dependent anemia continues to be a problem faced daily by preterm infants-for which the efficacy, toxicity and optimal use of therapies are not clearly defined. The theme of our PPG is to optimize management of neonatal anemia- particularly, severe anemia in preterm infants that requires red blood cell (RBC) transfusions. Two strategic goals and eight objectives will be met by three projects and a core. To optimize use of recombinant human erythropoietin (EPO) in treating neonatal anemia. Project #1 will continue to investigate the physiology, pharmacokinetics (PK) and pharmacodynamics (PD) of EPO-utilizing novel methods that employ biotinylated EPO. To investigate the role of iron

(Fe) availability and protein nutrition in the pathophysiology of the anemia of prematurity and to define their requirements in treating and possibly preventing neonatal anemia, Project #2 will investigate the effect of protein and graded oral Fe intakes on erythropoiesis, the effects of RBC transfusions and EPO on Fe therapy, and the efficacy and safety of intravenous Fe therapy. To determine the benefits of autologous placental **blood transfusions** containing mature RBCs and hematopoietic/immunologic progenitor cells, Project #3 will study the effects of delayed umbilical cord clamping or the equivalent transfusions of placental blood on maintaining neonatal blood and RBC volumes and hematopoietic/immunological development. The Core will provide administrative, statistical and research support and biotinylation laboratory services to all projects. To accomplish these goals, additional investigators, with expertise in new areas, have been recruited to complement the ongoing efforts of our established PPG group.

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- **Project Title: NONHUMAN PRIMATE MODEL OF CYTOMEGALOVIRUS ASSOCIATED DISEASE**

  Principal Investigator & Institution: Wong, Scott W.; Associate Scientist; Oregon Health & Science University Portland, or 972393098

  Timing: Fiscal Year 2002

  Summary: We initially intended to develop an animal model for cytomegalovirus (CMV)-associated disease by chemically immunosuppressing three rhesus macaques. Our immunosuppression regimen (anti-rhesus CD3 MAb, cyclosporin and cytoxan) was designed to mimic immunosuppression in human organ transplantation recipients that develop CMV-associated disease. Unfortunately, none of the macaques demonstrated reactivation in the peripheral blood compartment as defined by PCR amplification of DNA derived from peripheral blood mononuclear cells. During the past year, we experimentally infected two of these three with a simian immunodeficiency virus (SIV) isolate in an attempt to reactivate CMV in the peripheral blood compartment. From these in vivo studies the following observations were made. 1) Experimental infection of rhesus macaques with SIV EvT3 did not result in the reactivation of CMV in the peripheral blood compartment. Studies in HIV-infected patients have shown that human CMV load in the peripheral blood compartment increases prior to clinical signs of CMV-associated diseases. Thus, our studies suggest that SIV infection alone is insufficient at stimulating widespread CMV dissemination. 2) SIV infection was associated with localized CMV disease that caused significant morbidity resulting in the termination of one macaque. Thus, conditions that mediate widespread CMV dissemination need to be determined. We believe there are two possibilities to potentially explain the lack of widespread CMV reactivation in the two macaques. First, an additional stimulus may be required for CMV reactivation. In solid organ and bone marrow transplants, the organ or bone marrow is derived from an allogenic donor. Hence, a concomitant allogenic stimulus may be required for CMV reactivation, such as a **blood transfusion.** HIV patients receive **blood transfusions** during the course of their disease. The second possibility is that the immunosuppression was not severe enough for reactivation, as the CD8+ T cell remained stable in the macaques. Cytotoxic T lymphocytes are known to play a significant role in maintaining CMV in both humans and rhesus macaques. We believe that additional treatments, such as anti-CD8 monoclonal antibodies, should provide the stimulus for widespread CMV reactivation. FUNDING Center-supported project PUBLICATIONS Swanson R, Bergquam E, Wong

SW. Characterization of rhesus cytomegalovirus genes associated with anti-viral susceptibility. Virology 240:338-348, 1998.

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

- **Project Title: OPTIMIZING STROKE PREVENTION IN SC ANEMIA CHILDREN**

  Principal Investigator & Institution: Adams, Robert J.; Associate Professor; Neurology; Medical College of Georgia 1120 15Th St Augusta, Ga 30912

  Timing: Fiscal Year 2002; Project Start 15-JUL-1994; Project End 30-JUN-2005

  Summary: (Adapted from the applicant's abstract) Stroke occurs in approximately 11% of children with homozygous sickle cell anemia by 20 years of age. Recently, The Stroke Prevention Trial in Sickle Cell Anemia (STOP) showed that high-risk patients can be identified with transcranial Doppler (TCD) ultrasound and that periodic **blood transfusions** can reduce the annual incidence of first time stroke in high-risk patients from 10% to 200 cm/sec) or clinical stroke. Patients who revert to high risk will be offered return to transfusion. TCD, magnetic resonance studies, key laboratory measures and endpoints will be read and/or adjudicated using centralized blinded procedures proved successful in STOP. Assuming the annual endpoint rate on transfusion remains at 10% after halting transfusion. This research will optimize the primary prevention strategy proven effective in STOP with significant potential for children with sickle cell anemia.

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

- **Project Title: OPTIMIZING STROKE PREVENTION IN SICKLE CELL ANEMIA**

  Principal Investigator & Institution: Brambilla, Donald J.; Principal Research Scientist; New England Research Institutes, Inc. 9 Galen St Watertown, Ma 02472

  Timing: Fiscal Year 2002; Project Start 15-JUL-1994; Project End 30-JUN-2005

  Summary: (Adapted from the applicant's abstract) Stroke occurs in approximately 11% of children with homozygous sickle cell anemia by 20 years of age. Recently, The Stroke Prevention Trial in Sickle Cell Anemia (STOP) showed that high-risk patients can be identified with transcranial Doppler (TCD) ultrasound and that periodic **blood transfusions** can reduce the annual incidence of first time stroke in high-risk patients from 10% to 200 cm/sec) or clinical stroke. Patients who revert to high risk will be offered return to transfusion. TCD, magnetic resonance studies, key laboratory measures and endpoints will be read and/or adjudicated using centralized blinded procedures proved successful in STOP. Assuming the annual endpoint rate on transfusion remains at 10% after halting transfusion. This research will optimize the primary prevention strategy proven effective in STOP with significant potential for children with sickle cell anemia.

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

- **Project Title: ORAL THERAPEUTIC FOR BETA-THALASSEMIA**

  Principal Investigator & Institution: Faller, Douglas V.; Director, Cancer Research Center; Gene Regulation Laboratories 233 Needham St, Ste 300 Newton, Ma 02464

  Timing: Fiscal Year 2003; Project Start 01-SEP-2003; Project End 31-AUG-2004

  Summary: (provided by applicant): The beta thalassemias are genetic disorders caused by molecular mutations affecting the genes for adult hemoglobin and are among the most common genetic diseases worldwide, although they comprise an orphan condition in the U.S. The beta thalassemia syndromes are characterized by excess alpha globin

chains, which are toxic to the developing red blood cell and cause rapid apoptosis, resulting in severe anemia and early mortality from complications of **blood transfusions,** including infections and iron overload. Pharmacologic reactivation of the genes for fetal globin can compensate for the deficient beta globin chains, and this approach has been successfully demonstrated with a short chain fatty acid, arginine butyrate, given intravenously, and a derivative, sodium phenylbutyrate, which requires large drug quantities that are difficult for patient to tolerate. A more tolerable oral therapeutic which both stimulate fetal globin and erythropoiesis is needed for long-term therapy of most patients. The investigators have developed a new-generation short chain fatty acid derivative (ST7), which stimulates both fetal globin gene expression and erythropoiesis in anemic and non-anemic animal models, and enhances proliferation and survival of erythroid cells, including cultured thalassemic erythroid progenitor cells. This lead candidate is orally-bioavailable with PK profiles at low oral doses which are superior to previous short chain fatty acid therapies. The investigators propose in this application: 1) to perform the medicinal formulation required for a new IND; and 2) to refine low-dose regimens for subsequent clinical trials in humans. These are tasks required for development of ST7 as a new oral therapeutic for treatment of patients with beta thalassemia

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- **Project Title: PLASMA HYPERVISCOSITY FOR CARDIOVASCULAR COLLAPSE**

  Principal Investigator & Institution: Tsai, Amy G.; La Jolla Bioengineering Institute 505 Coast Blvd South San Diego, Ca 920374616

  Timing: Fiscal Year 2004; Project Start 01-JAN-2004; Project End 31-DEC-2007

  Summary: (provided by applicant): The long-term objective of this project is to demonstrate that hypervious fluids are efficacious in the treatment and improved survival from traumatic hemorrhagic shock. It is proposed to develop a treatment for hypovolemic cardiovascular collapse based on the infusion of high viscosity plasma expanders, which provide a novel small-volume resuscitation that recovers microvascular perfusion for extended periods until surgical control of bleeding is possible. The central hypothesis is that in conditions of hypotension, and cardiovascular collapse, high viscosity plasma restores moderate levels of mean arterial blood pressure needed to ensure open capillaries and tissue perfusion. Our data shows that open capillaries are critical to tissue survival, and viscogenic plasma expanders with tailored oncotic pressure properties restore microvascular function and rescue the organism from hypovolemic cardiovascular collapse. In the case of uncontrolled bleeding, these solutions provide limited-volume resuscitation with maximum microvascular perfusion and a gradual increase in blood pressure thereby minimizing re-bleeding, leading to important savings of **blood transfusions,** providing a new approach for dealing with conditions in which reduced tissue perfusion jeopardizes tissue survival in field conditions. In this project, a microcirculatory assessment in the hamster window preparation will be used with sophisticated and state of the art measurements of macro and microhemodynaimcs, including local pO2 levels, capillary pressure, and nitric oxide release. The properties of a transfusion fluid in terms of viscosity and oncotic properties which best recovers cardiovascular collapse will be identified in a lethal uncontrolled bleeding model.

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- **Project Title: REDUCING MORTALITY FROM ACUTE HEMORRHAGE IN TRAUMA**

  Principal Investigator & Institution: Hess, John R.; Associate Director; Pathology; University of Maryland Balt Prof School Baltimore, Md 21201

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

  Summary: (provided by applicant): Trauma is the most frequent cause of death of Americans under the age of 35. Trauma is responsible for eight out of ten deaths in adolescents and young adults ages 15-24. Trauma from motor vehicle crashes, penetrating injuries, and falls are responsible for 93,000 deaths each year in the United States. Of the injured admitted to hospitals, 250,000 receive **blood transfusions.** Annually, trauma patients in the U.S. receive almost 2,000,000 units of red blood cells, which represents about 18% of the national total. Hemorrhage is the most frequent cause of trauma death. It is the predominant cause of deaths from trauma in the pre-hospital setting, a major cause of death in Emergency Departments, and the major cause of death during emergency surgery. Many deaths from acute hemorrhage are preventable. Autopsy series from civilian and military settings indicate that 10 to 20% of deaths from hemorrhage are potentially preventable with better techniques for hemorrhage control. Examples of commonly fatal injuries due to hemorrhage that are difficult to control by traditional techniques include high-grade liver injuries and open ring pelvic fractures. There are, however, several new drugs and biologics recently developed to control acute hemorrhage that hold promise of reducing death from hemorrhagic shock. These drugs and devices require clinical testing in critically injured trauma patients. The University of Maryland Medical Center Program in Trauma Research seeks to build a Core Clinical Center in the proposed NHLBI Transfusion Medicine and Hemostasis Clinical Research Network to advance the clinical safety and efficacy testing of new drugs and devices to reduce mortality from acute hemorrhage in trauma. We have assembled a highly qualified team to Investigate these new drugs and devices. Two clinical trials are proposed. The first trial is to determine if rFVIIa can reduce mortality and RBC use in trauma patients with acute hemorrhage, receiving 10 or more units of RBCs. The second trial is to determine the safety and efficacy of the Dry Fibrin Sealant Dressing to control hemorrhage and reduce mortality in trauma patients with severe (AAST Grade 4 & 5) liver injury. These trials represent the best available scientific opportunity to reduce the high mortality associated with massive hemorrhage trauma care. Reducing death from acute hemorrhage in trauma care will be a major step forward in reducing overall trauma mortality.

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

- **Project Title: REGULATION OF HEME UPTAKE AND TRANSPORT IN CACO-2 CELLS**

  Principal Investigator & Institution: Uc, Aliye; Pediatrics; University of Iowa Iowa City, Ia 52242

  Timing: Fiscal Year 2003; Project Start 15-MAR-2003; Project End 30-NOV-2007

  Summary: (provided by applicant): The overall goal of this proposal includes a plan to foster the career development of Dr. Aliye Uc while undertaking the investigation of intestinal heme uptake and transport through the intestines. Dr. Uc's long term career goal is to develop the research skills and experience to become an independent clinician scientist, capable of making meaningful contribution to biomedical sciences. This award would allow her to fulfill her immediate goals for furthering her understanding of heme-intestinal epithelial cell interactions at a molecular level through course work and

attaining new research skills in cellular and molecular biology. This award would enable Dr. Uc to continue her investigation on the interactions of heme with the intestinal epithelium, its effect on electrolyte transport and possible role of oxidative stress in modulating this function. This career development plan would take place at the University of Iowa, an ideal environment for Dr. Uc's development as a clinical scientist, with Dr. Bradley E. Britigan serving as her primary mentor and Dr. John B. Stokes acting as co-mentor. This environment will provide Dr. Uc both resources and full access to critical expertise, needed to make significant contribution in the area of her research interest. The proposed research project investigates the cellular mechanisms involved in absorption and transcellular transport of heme in a well-established intestinal epithelial cell model, Caco-2 cells. Heme provides the majority of body's iron, but little is known about its absorption through the intestines. It is hypothesized that heme is acquired and transported in both directions (apical to basolateral and vice versa) by the intestinal epithelial cells via an active process that is also involved in electrolyte transport. This concept will be tested by the pursuit of the following Specific Aims: 1) Determine the mechanisms involved in intestinal epithelial heme uptake and the role of HO-1, intracellular heme and iron levels in regulating this process; 2) Determine the mechanisms involved in transcellular intestinal epithelial cell heme transport and the role of HO-1, intracellular heme and iron levels in regulating this process; and 3) Determine the electrolyte transporter(s) associated with the transport of heme. These studies will provide new insight into understanding heme transport through intestines in normal and disease states (e.g., hereditary hemochromatosis, iron overload secondary to blood transfusions) and explore the role of intestinal epithelial cell bi-directional heme movement on the regulation of iron stores.

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- **Project Title: TRANSFUSION BIOLOGY AND MEDICINE**

  Principal Investigator & Institution: Toy, Pearl T.; Professor; Laboratory Medicine; University of California San Francisco 500 Parnassus Ave San Francisco, Ca 941222747

  Timing: Fiscal Year 2002; Project Start 01-FEB-1996; Project End 31-DEC-2005

  Summary: Transfusion support plays an increasingly prominent role in modern medical care. **Blood transfusions** are essential not only to save the lives of bleeding trauma victims, but also to the successful outcome of many complex treatments of cancer patients and patients undergoing transplant, cardiac or spine surgery. An estimated 12 million units of blood per year are collected in the United States for transfusion. Many questions remain regarding transfusion biology and medicine. The purpose of this SCOR program to continue to address some of these questions with a group of interrelated, collaborative projects. The areas of emphases in response to the RFA are cytokines, red blood cell transfusion, and immunomodulatory aspects of transfusion. In the area of cytokines, Project 2 proposes to use a novel mouse model developed in the previous grant to study molecular mechanisms of cytokine signaling in megacryocytopoiesis and Project 3 proposes to use gene-knockout mice to study src tyrosine kinases in cytokine signaling in hematopoiesis, In the area of red blood cell transfusions, Project 4 proposes to use the acute isovolemic hemodilution model developed in the previous grant to study the effects of acute anemia on the nervous system, heart and subcutaneous tissue in normal humans. These data will provide a scientific base to determine the indications for red blood cell transfusion. In the area of immunomodulatory aspects of transfusion, Project 6 proposes to study the persistence of donor cells in transfusion recipients and in liver transplant recipients, and Project 7 proposes to study B cells in autoimmunity and in tolerance to platelet alloimmunization.

Project 5 was deleted in the last competitive review and Project 1 is being discontinued. The remaining five projects are supported by Administrative Core A and Biostatistics Core B. To grapple with these questions in Transfusion Medicine, we brought together a new multi-disciplinary team in the previous grant. The team has made novel findings and has developed novel experimental systems. In the renewal, we propose to use these novel systems to further study how blood is made and how blood affects different organs in health and disease. The ultimate goals of this program are to make optimal use of blood products, to evaluate and possibly modify the immune effects and understand and possibly stimulate blood production so as to reduce transfusion needs.

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- **Project Title: TRANSFUSION TRANSMISSION OF CELL-ASSOCIATED INFECTIONS**

  Principal Investigator & Institution: Hillyer, Christopher D.; Professor; Pathology and Lab Medicine; Emory University 1784 North Decatur Road Atlanta, Ga 30322

  Timing: Fiscal Year 2002; Project Start 01-SEP-2000; Project End 31-JUL-2004

  Summary: The focus of this resubmitted application is to determine the cellular site and mechanisms of reactivation of cytomegalovirus (CMV). Human CMV (HCMV) infections are life-long and the virus persists in a latent state in monocytes, although other cellular sites are also thought to exist. During **blood transfusion** and organ transplantation, HCMV reactivation can cause severe disease in immunocompromised individuals. Therefore, determination of the parameters (including types and numbers of cells, and immune responses) that permit HCMV transmission during **blood transfusions** (TT) and organ transplantation is clinically important. The transfer of latently infected monocytes is hypothesized to be the mechanism of HCMV transmission and reactivation during **blood transfusions.** However, the exact cell number or type of infected cells required for transmission during **blood transfusions** or organ transplantation is unclear. In addition, the processes involved in cellular activation that result in CMV reactivation from latency are also unknown. The applicants propose two specific aims to analyze these aspects of CMV transfusion/reactivation using a MCMV/mouse model. In the first specific aim, the investigator will identify the cellular sites of infection and latency in MCMV infected donor mice. For these studies, serial dilutions of purified leukocyte subsets will be made and the viral burden quantitated prior to transfusion into syngeneic and allogeneic recipients. Through the removal of specific leukocyte subpopulations prior to transfusion he will test the hypotheses that a) only latently infected monocytes are able to transmit MCMV, b) transmission of MCMV by transfusion is inefficient, and c) MCMV-infected blood depleted monocytes is CMV safe. The second specific aim has been refocused from the original proposal. In this part of the project, the investigator will utilize the optimized MCMV transfusion model described in the first specific aim to evaluate recipient factors that modulate the efficiency of MCMV reactivation. These factors include allogeneic leukocyte interactions mediated by CD4 and CD8 T-lymphocytes, NK cells, and the effects of g IFN. He predicts that allogeneic leukocyte interactions mediate reactivation of MCMV in the recipient and that g IFN inhibits this process.

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

- **Project Title: TRAUMA-RELATED ERYTHROPOIETIC SUPPRESSION**

  Principal Investigator & Institution: Livingston, David H.; Surgery; Univ of Med/Dent Nj Newark Newark, Nj 07107

Timing: Fiscal Year 2002; Project Start 05-SEP-2000; Project End 31-AUG-2004

Summary: The long-term goal of this proposal is to elucidate the mechanism(s) of the persistent anemia observed following severe trauma. Blood loss is commonplace after trauma and repeated and multiple transfusions given over several weeks are often necessary to correct a persistent anemia in critically injured patients. **Blood transfusions** are immunosuppressive, carry the risk of transmitting blood-borne infectious agents and are costly. Thus, the ability to correct this anemia would be of great clinical importance. These investigators and others have shown that endogenous erythropoietin levels are elevated after injury, so the etiology and mechanism of this post-injury anemia are likely to reside within the bone marrow (BM). Successful erythropoiesis requires interaction between hematopoietic progenitor cells and the BM stroma (the supporting matrix of the BM) within the BM microenvironment. To elucidate the mechanisms of post-injury anemia, this proposal will investigate: (aim 1) the effect of trauma on the growth and differentiation of BM progenitor cells. In these studies bone marrow and peripheral blood from trauma patients and age matched healthy volunteers will be obtained and the number and phenotype of the progenitor cells determined. These cells will be cultured and assessed for their ability to proliferate and differentiate into red blood cells. Adhesion receptors which anchor these cells in the BM will also be evaluated. The results of these experiments will be correlated to the patient demographics and outcome; (aim 2) the effect of trauma on the ability of the BM stroma to grow and support hematopoiesis. In this aim, BM from trauma patients and age matched controls will be cultured to determine whether the BM stroma can grow to confluence in a monolayer. Failure of the stroma to grow in culture been demonstrated to correlate with BM failure in hematologic diseases. Stromal monolayers will be cultured with BM progenitors to assess whether they can support erythropoiesis and whether they produce extracellular matrix proteins which help anchor the progenitor cells to the BM; (aim 3) The effect of plasma on BM hematopoietic cellular progenitors, BM stroma, or both. In these studies plasma obtained from trauma patients will be added to cultures of hematopoietic progenitors or BM stroma and the growth will be compared to cultures grown with normal plasma. A strength of the proposal is that a BM aspirate for an individual patient can be utilized for both BM progenitor cell and stromal cultures. In addition the effect of plasma from this patient will also be studied; thus reults can be correlated with patient demographics and known outcomes. This proposal is novel; there app[ear to have been no detailed studies of BM erythropoietic function in trauma patients. Understanding the mechanisms behind post-trauma anemia will allow therapeutic interventions improving endogenous erythropoiesis to be targeted.

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

- **Project Title: YOUNG ADULT VERY LOW BIRTHWEIGHT--NEONATAL BLOOD TRANSFU**

  Principal Investigator & Institution: Hack, Maureen; Professor of Pediatrics; Case Western Reserve University 10900 Euclid Ave Cleveland, Oh 44106

  Timing: Fiscal Year 2002

  Summary: Prior to 1986 risk factors for hepatitis C, or non A, non B hepatitis as it was then called, included transfusions of blood and blood products, needle sharing and intravenous drug abuse, health care employment with frequent exposure to blood, sexual contact with, or household exposure to a person who had hepatitis C, and possibly sexual contact. The overall prevalence of hepatitis C infection ranges from 0.5% for low risk blood donors to 60%-90% for drug users and hemophiliacs who have

received multiple **blood transfusions.** Five to 15% of persons transfused prior to 1986 contracted hepatitis C. In examining these results, it is important to take into account that the majority of reports between 1990 and 1992 pertain to results obtained using first generation type radioimmunoassay tests, which, as noted above, have a poor sensitivity and predictive value. There is very little known of the natural history of HCV infections in childhood. High risk groups include children requiring multiple **blood transfusions** and/or pooled blood products, as well as those born to Hepatitis C positive mothers. It is postulated that the natural history and risk of progression to liver disease in children will vary depending on the underlying condition for which the blood products were received, but that it is likely that 40% of infected children will develop chronic hepatitis with progression at some time to cirrhosis, and that they will be at increased risk of developing hepatocellular carcinoma. This progression may extend over 30 to 40 years. The Specific Aims are: 1) to examine the prevalence of Hepatitis C infection in a cohort of very low birthweight young adults. 2) to estimate the risk of hepatitis C infection according to the total volume of blood received, and the number of different donors. 3) among Hepatitis C positive VLBW subjects, to identify the neonatal risk factors and childhood and adolescent health and behavioral risk factors associated with both the development of Hepatitis C liver disease and its severity. 4) to refer the Hepatitis C positive VLBW subjects for the best possible treatment currently available, to prevent the development of disease and/or deterioration of the liver associated with viral infection. 5) to inform the Hepatitis C positive VLBW subjects of the results of their tests, and to counsel them concerning health risk behaviors (such as drinking alcohol) and hepatotoxic medications, and precautions they might need to take to prevent transmission to close intimate partners. Hypotheses: 1) That 10-15% of the very low birthweight subjects who received neonatal **blood transfusions** will be Hepatitis C positive at 20 years of age. 2) That the probability of testing Hepatitis C positive will depend on the number of transfusions from different donors and the total volume of blood received during the neonatal and behavioral risk factors. We propose, initially, a pilot study to examine the prevalence of Hepatitis C infection among the 20 year-old subjects in our main study born in 1977 who received blood (n=87). If the hypothesized Hepatitis C infection rate of 10-15% is found, we plan to extend the study to examine the prevalence of Hepatitis C infection among the total cohort of 20 year-old very low birthweight subjects who received blood (n=198/156 seen at age 20). All subjects will be screened with the anti-HCV 3.0 enzyme immunoassay. We also plan to test for ALT as an indicator of ongoing hepatitis associated with HCV infection and for other transfusion-transmitted disease associated markers including HbsAg, anti-HBc and HIV. The pilot project will be implemented by initially sending a letter to the subjects who received neonatal **blood transfusions** informing them that they received blood as infants, that prior to 1986 blood was not screened for Hepatitis C, and that the Center for Disease Control suggests screening all persons who received **blood transfusions** prior to this time. Blood tests will be free of charge. Since the subjects were seen a year ago, the only additional information which will be required is an update on health and a question as to whether they ever received **blood transfusions** after the neonatal period. The subjects will be informed of the results, and if positive for Hepatitis C they will be referred for counseling and further testing for potential liver disease. "

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 "blood transfusions" (or synonyms) into the search box. This search gives you access to full-text articles. The following is a sample of items found for blood transfusions in the PubMed Central database:

- **A criterion audit of women's awareness of blood transfusion in pregnancy.** by Khadra M, Rigby C, Warren P, Leighton N, Johanson R.; 2002; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=131039
- **Acute hepatitis B infection associated with blood transfusion in England and Wales, 1991-7: review of database.** by Soldan K, Ramsay M, Collins M.; 1999 Jan 9; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=27683
- **Antibodies against gamma-globulin after repeated blood transfusions in man.** by Allen JC, Kunkel HG.; 1966 Jan; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=292664
- **Effect of a flow chart on use of blood transfusions in primary total hip and knee replacement: prospective before and after study.** by Muller U, Exadaktylos A, Roeder C, Pisan M, Eggli S, Juni P.; 2004 Apr 17; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=390213
- **Limiting excessive postoperative blood transfusion after cardiac procedures. A review.** by Ferraris VA, Ferraris SP.; 1995; http://www.pubmedcentral.gov/picrender.fcgi?tool=pmcentrez&action=stream&blobtype=pdf&artid=325257
- **Mechanical methods of reducing blood transfusion in cardiac surgery: randomised controlled trial.** by McGill N, O'Shaughnessy D, Pickering R, Herbertson M, Gill R.; 2002 Jun 1; http://www.pubmedcentral.gov/articlerender.fcgi?tool=pmcentrez&artid=113763

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]

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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.

[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.

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

- **A case of fatal West Nile virus meningoencephalitis associated with receipt of blood transfusions after open heart surgery.**
  Author(s): Armstrong WS, Bashour CA, Smedira NG, Heupler FA, Hoeltge GA, Mawhorter SD, Sudheendra V, Gordon SM.
  Source: The Annals of Thoracic Surgery. 2003 August; 76(2): 605-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12902115

- **A pilot randomised controlled trial of peripheral fractional oxygen extraction to guide blood transfusions in preterm infants.**
  Author(s): Wardle SP, Garr R, Yoxall CW, Weindling AM.
  Source: Archives of Disease in Childhood. Fetal and Neonatal Edition. 2002 January; 86(1): F22-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11815543

- **A point of contention: the scriptural basis for the Jehovah's Witnesses' refusal of blood transfusions.**
  Author(s): Spencer JR.
  Source: Christian Bioethics. 2002 April; 8(1): 63-90.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12956153

- **A prospective, randomized trial of pretransplant blood transfusions in cadaver kidney transplant candidates. Leuven Collaborative Group for Transplantation.**
  Author(s): Vanrenterghem Y, Waer M, Roels L, Coosemans W, Christaens MR, Opelz G.
  Source: Transplant International : Official Journal of the European Society for Organ Transplantation. 1994; 7 Suppl 1: S243-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11271215

- **A retrospective review of blood transfusions in cancer patients with anemia.**
  Author(s): Estrin JT, Schocket L, Kregenow R, Henry DH.
  Source: The Oncologist. 1999; 4(4): 318-24.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10476543

- **Acute rejection after renal transplantation is reduced by approximately 50% by prior therapeutic blood transfusions, even in tacrolimus-treated patients.**
  Author(s): Higgins RM, Raymond NT, Krishnan NS, Veerasamy M, Rahmati M, Lam FT, Kashi H, West N.
  Source: Transplantation. 2004 February 15; 77(3): 469-71.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14966430

- **Administration of blood transfusions to adults in general hospital settings: a review of the literature.**
  Author(s): Wilkinson J, Wilkinson C.
  Source: Journal of Clinical Nursing. 2001 March; 10(2): 161-70. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11820336

- **Advanced directives, the right to die and the common law: recent problems with blood transfusions.**
  Author(s): Stewart C.
  Source: Melb Univ Law Rev. 1999 April; 23(1): 161-83.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12678066

- **Alternatives to allogeneic blood transfusions.**
  Author(s): Mulier M.
  Source: Acta Anaesthesiol Belg. 2002; 53(2): 119-24. Review. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12146099

- **An apparent paradoxical effect of pretransplant blood transfusions. Its association with decreased anti-HLA antibody formation following unsuccessful renal transplantation.**
  Author(s): Lobo PI.
  Source: Transplantation. 1984 June; 37(6): 562-4.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6375015

- **An incidental case of thrombus formation in a patient with a portacath inserted for regular blood transfusions.**
  Author(s): Westwood MA, Wainscoat JS, Mohiaddin R.
  Source: Heart (British Cardiac Society). 2003 March; 89(3): 244.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12591814

- **Anomaly of the des-Arg9-bradykinin metabolism associated with severe hypotensive reactions during blood transfusions: a preliminary study.**
  Author(s): Cyr M, Hume HA, Champagne M, Sweeney JD, Blais C Jr, Gervais N, Adam A.
  Source: Transfusion. 1999 October; 39(10): 1084-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10532602

- **Anticipating blood transfusions in the home: a safe and efficient approach.**
  Author(s): O'Gara K, Rock-Horvath M.
  Source: Oncology Nursing Forum. 1999 June; 26(5): 832-3. Erratum In: Oncol Nurs Forum 1999 September; 26(8): 1283.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10382177

- **Are allogeneic blood transfusions acceptable in elective surgery in colorectal carcinoma?**
  Author(s): Marquet RL, Busch OR, Jeekel J, Heiss MM, Amato AC.
  Source: European Journal of Cancer (Oxford, England : 1990). 1999 March; 35(3): 352-60. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10448283

- **Association of leukocyte-depleted blood transfusions with infectious complications after cardiac surgery.**
  Author(s): Sharma AD, Slaughter TF, Clements FM, Sreeram G, Newman MF, Phillips-Bute B, Bredehoeft SJ, Smith PK, Stafford-Smith M.
  Source: Surgical Infections. 2002 Summer; 3(2): 127-33.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12519479

- **Autoantibody formation after alloimmunization: are blood transfusions a risk factor for autoimmune hemolytic anemia?**
  Author(s): Young PP, Uzieblo A, Trulock E, Lublin DM, Goodnough LT.
  Source: Transfusion. 2004 January; 44(1): 67-72.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14692969

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  Author(s): Machave YV.
  Source: Indian J Pediatr. 2001 February; 68(2): 141-4. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11284182

- **Blood transfusions and blood sampling during red blood cell mean life span determinations.**
  Author(s): Smith TA, Treleaven JG, McCready VR.
  Source: European Journal of Nuclear Medicine. 2000 February; 27(2): 240.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10755733

- **Blood transfusions and elective surgery: a custodial function of an Ohio juvenile court.**
  Author(s): Zaremski MJ.
  Source: Clevel State Law Rev. 1974 Spring; 23(2): 231-44. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11664328

- **Blood transfusions and mortality among critically ill patients.**
  Author(s): Ahmed S, Kupfer Y, Tessler S.
  Source: Jama : the Journal of the American Medical Association. 2003 March 12; 289(10): 1242-3; Author Reply 1243.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12633176

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  Author(s): Rathore SS, Krumholz HM.
  Source: Jama : the Journal of the American Medical Association. 2003 March 12; 289(10): 1242.
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- **Blood transfusions and mortality among critically ill patients.**
  Author(s): Karkouti K, Beattie WS, Wijeysundera DN, McCluskey SA.
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  Author(s): Chow EJ, Holly EA.
  Source: Epidemiologic Reviews. 2002; 24(2): 269-79. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12762097

- **Blood transfusions and results after curative resection for gastric cancer.**
  Author(s): Bortul M, Calligaris L, Roseano M, Leggeri A.
  Source: Suppl Tumori. 2003 September-October; 2(5): S27-30.
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- **Blood transfusions and risk of non-Hodgkin's lymphoma subtypes and chronic lymphocytic leukemia.**
  Author(s): Cerhan JR, Wallace RB, Dick F, Kemp J, Parker AS, Zheng W, Sellers TA, Folsom AR.
  Source: Cancer Epidemiology, Biomarkers & Prevention : a Publication of the American Association for Cancer Research, Cosponsored by the American Society of Preventive Oncology. 2001 April; 10(4): 361-8.
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- **Blood transfusions and survival after surgery for breast cancer.**
  Author(s): Foster RS Jr, Foster JC, Costanza MC.
  Source: Archives of Surgery (Chicago, Ill. : 1960). 1984 October; 119(10): 1138-40.
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  Author(s): Doyle DJ.
  Source: American Journal of Therapeutics. 2002 September-October; 9(5): 417-24.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12237734

- **Blood transfusions as a risk factor for non-Hodgkin's lymphoma in the San Francisco Bay Area: a population-based study.**
  Author(s): Chow EJ, Holly EA.
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  Source: The American Surgeon. 2002 July; 68(7): 566-72.
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- **Blood transfusions in bimaxillary orthognathic surgery: are they necessary?**
  Author(s): Gong SG, Krishnan V, Waack D.
  Source: Int J Adult Orthodon Orthognath Surg. 2002; 17(4): 314-7.
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  Author(s): Pysz M.
  Source: Journal of Surgical Oncology. 2000 December; 75(4): 258-63.
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  Author(s): Roy R, Beaudoin R, Roberge F, Lachance JG, Pelletier G.
  Source: Tissue Antigens. 1984 April; 23(4): 203-9.
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  Author(s): Kabra NS, Kirpalani H.
  Source: Indian Pediatrics. 2002 July; 39(7): 619-24.
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  Author(s): Kouri RP.
  Source: Rev Droit. 1974; 5: 156-76. No Abstract Available.
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  Author(s): Weil MH.
  Source: Critical Care Medicine. 2003 September; 31(9): 2397-8. Review.
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  Source: Lancet. 2003 July 26; 362(9380): 332.
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  Source: Trends in Molecular Medicine. 2001 January; 7(1): 2-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11427984

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  Author(s): Lorenzo M, Davis JW, Negin S, Kaups K, Parks S, Brubaker D, Tyroch A.
  Source: American Journal of Surgery. 1998 April; 175(4): 308-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9568658

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  Source: The Journal of Pediatrics. 1993 December; 123(6): 1016-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8229510

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  Author(s): Surgenor DM, Wallace EL, Hale SG, Gilpatrick MW.
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  Author(s): Fergusson D, Hebert PC, Lee SK, Walker CR, Barrington KJ, Joseph L, Blajchman MA, Shapiro S.
  Source: Jama : the Journal of the American Medical Association. 2003 April 16; 289(15): 1950-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12697797

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  Author(s): Roback JD.
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  Source: Seminars in Surgical Oncology. 1994 May-June; 10(3): 195-9. Review.
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  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10975381

- **Soluble HLA class I, HLA class II, and Fas ligand in blood components: a possible key to explain the immunomodulatory effects of allogeneic blood transfusions.**
  Author(s): Ghio M, Contini P, Mazzei C, Brenci S, Barberis G, Filaci G, Indiveri F, Puppo F.
  Source: Blood. 1999 March 1; 93(5): 1770-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10029607

- **Spectrum of viral hepatitis in thalassemic children receiving multiple blood transfusions.**
  Author(s): Irshad M, Peter S.
  Source: Indian J Gastroenterol. 2002 September-October; 21(5): 183-4.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12416747

- **Strategies for reducing blood transfusions in hepatic resection.**
  Author(s): Matsumata T, Itasaka H, Shirabe K, Shimada M, Yanaga K, Sugimachi K.
  Source: Hpb Surg. 1994; 8(1): 1-6; Discussion 6-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7993858

- **Successful cadaver kidney transplantation in patients highly sensitized by blood transfusions. Unimportance of the most reactive serum in the pretransplant crossmatch.**
  Author(s): Norman DJ, Barry JM, Wetzsteon PJ.
  Source: Transplantation. 1985 March; 39(3): 253-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3883589

- **Successful renal transplantation of patients sensitized following deliberate unrelated blood transfusions.**
  Author(s): Martin S, Dyer PA, Harris R, Manos J, Mallick NP, Gokal R, Johnson RW.
  Source: Transplantation. 1985 March; 39(3): 256-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3883590

- **Successful transplantation of cyclosporine-treated haploidentical living-related renal recipients without blood transfusions.**
  Author(s): Flechner SM, Kerman RH, Van Buren C, Kahan BD.
  Source: Transplantation. 1984 January; 37(1): 73-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6229913

- **Supplementing iron intravenously in pregnancy. A way to avoid blood transfusions.**
  Author(s): Hallak M, Sharon AS, Diukman R, Auslender R, Abramovici H.
  Source: J Reprod Med. 1997 February; 42(2): 99-103.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9058345

- **Suppression of lymphocyte reactivity by blood transfusions in uremic patients. III. Regulation of cell-mediated lympholysis.**
  Author(s): Klatzmann D, Gluckman JC, Chapuis F, Foucault C.
  Source: Transplantation. 1984 September; 38(3): 222-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6236589

- **The annual cost of blood transfusions in the UK.**
  Author(s): Varney SJ, Guest JF.
  Source: Transfusion Medicine (Oxford, England). 2003 August; 13(4): 205-18.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12880391

- **The annual cost of blood transfusions in the United Kingdom.**
  Author(s): Guest JF, Munro V, Cookson RF.
  Source: Clinical and Laboratory Haematology. 1998 April; 20(2): 111-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9681222

- **The combination of platelet-enriched autologous plasma with bovine collagen and thrombin decreases the need for multiple blood transfusions in trauma patients with retroperitoneal bleeding.**
  Author(s): Bochicchio G, Dunne J, Bochicchio K, Scalea T.
  Source: The Journal of Trauma. 2004 January; 56(1): 76-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14749569

- **The effect of haemosiderosis and blood transfusions on the T2 relaxation time and 1/T2 relaxation rate of liver tissue.**
  Author(s): Salo S, Alanen A, Leino R, Bondestam S, Komu M.
  Source: The British Journal of Radiology. 2002 January; 75(889): 24-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11806954

- **The effect of in vitro use of heparin in blood transfusions during dialysis on dialyzer clotting.**
  Author(s): Lowrey SJ, Femea PL.
  Source: Aannt J. 1984 April; 11(2): 26-9. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6561962

- **The effect of pretransplant blood transfusions on renal allograft survival in patients on cyclosporine.**
  Author(s): Gardner B, Harris KR, Tate DG, Digard NJ, Gosling DC, Searle M, Slapak M.
  Source: Transplantation Proceedings. 1984 October; 16(5): 1172-3.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6385368

- **The efficacy of predeposited autologous blood transfusions in general pediatric surgery.**
  Author(s): Taguchi T, Suita S, Nakao M, Yamanouchi T, Inaba S.
  Source: Surgery Today. 2000; 30(9): 773-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11039703

- **The feasibility and advisability of administering home blood transfusions to the terminally ill patient.**
  Author(s): Singer Y, Shvartzman P.
  Source: Journal of Palliative Care. 1998 Autumn; 14(3): 46-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9770921

- **The importance of H2 haplotype sharing in the induction of specific unresponsiveness by pretransplant blood transfusions.**
  Author(s): Niimi M, Roelen DL, Witzke O, van Rood JJ, Claas FH, Wood KJ.
  Source: Transplantation. 2000 February 15; 69(3): 411-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10706052

- **The influence of HLA-A,B and -DR matching and pregraft blood transfusions on graft and patient survival after renal transplantation in a single centre.**
  Author(s): Ting A, Morris PJ.
  Source: Tissue Antigens. 1984 October; 24(4): 256-64.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6393428

- **The Jehovah's Witnesses' refusal for blood transfusions: the jurisprudence and the medico-legal debate in Italy.**
  Author(s): Fineschi V, Albano MG, Turillazzi E.
  Source: Med Sci Law. 2001 April; 41(2): 141-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11368395

- **The place of artificial oxygen carriers in reducing allogeneic blood transfusions and augmenting tissue oxygenation.**
  Author(s): Spahn DR, Kocian R.
  Source: Canadian Journal of Anaesthesia = Journal Canadien D'anesthesie. 2003 June-July; 50(6 Suppl): S41-7. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14629052

- **The right of a patient to refuse blood transfusions: a dilemma of conscience and law for patient, physician and hospital.**
  Author(s): Silbermann BD.
  Source: Univ San Fernando Valley Law Review. 1974; 3(1): 91-104. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11664351

- **The role of blood transfusions and iron intake on retinopathy of prematurity.**
  Author(s): Dani C, Reali MF, Bertini G, Martelli E, Pezzati M, Rubaltelli FF.
  Source: Early Human Development. 2001 April; 62(1): 57-63.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11245995

- **Their life is in the blood: Jehovah's Witnesses, blood transfusions and the courts.**
  Author(s): Moore ML.
  Source: North Ky Law Rev. 1983; 10(2): 281-304. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11649715

- **Tranexamic acid reduces blood loss and blood transfusions in primary total hip arthroplasty: a prospective randomized double-blind study in 40 patients.**
  Author(s): Husted H, Blond L, Sonne-Holm S, Holm G, Jacobsen TW, Gebuhr P.
  Source: Acta Orthopaedica Scandinavica. 2003 December; 74(6): 665-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14763696

- **Treatment of Ebola hemorrhagic fever with blood transfusions from convalescent patients. International Scientific and Technical Committee.**
  Author(s): Mupapa K, Massamba M, Kibadi K, Kuvula K, Bwaka A, Kipasa M, Colebunders R, Muyembe-Tamfum JJ.
  Source: The Journal of Infectious Diseases. 1999 February; 179 Suppl 1: S18-23.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9988160

- **Understanding leukocyte reduction in blood transfusions.**
  Author(s): Hadaway L.
  Source: Nursing. 1999 October; 29(10): 74.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10797680

- **Unexpected hypopotassemia after multiple blood transfusions during an operation.**
  Author(s): Bruining HA, Boelhouwer RU, Ong GK.
  Source: Neth J Surg. 1986 April; 38(2): 48-51.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3714078

- **Unnecessary blood transfusions in elective colorectal cancer surgery.**
  Author(s): Tartter PI, Barron DM.
  Source: Transfusion. 1985 March-April; 25(2): 113-5.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=3984004

- **Unrelated donor-specific blood transfusions in human renal transplantation.**
  Author(s): Ruzany F, Moraes JR, de Queiroz Faria L, de Moraes Souza ER, Iwaki Y.
  Source: Transplantation. 1983 January; 35(1): 101-2.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=6337429

- **Update of the University of California at San Francisco experience with donor-specific blood transfusions.**
  Author(s): Salvatierra O Jr, Iwaki Y, Vincenti F, Amend W, Terasaki P, Garovoy M, Duca R, Hopper S, Feduska N.
  Source: Transplantation Proceedings. 1982 June; 14(2): 363-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7051480

- **Update on neonatal blood transfusions.**
  Author(s): Seidel W.
  Source: Nebr Med J. 1993 June; 78(6): 158-9. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8341378

- **Uremic patients immunized with planned blood transfusions: detection of HLA antibodies with the cytotoxic test and an indirect rosette microassay.**
  Author(s): Indiveri F, Fagiolo U, Pellegrino MA, Ferrone S.
  Source: Transplantation Proceedings. 1979 March; 11(1): 167-70.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=377624

- **Use of blood transfusions by helicopter emergency medical services: is it safe?**
  Author(s): Dalton AM.
  Source: Injury. 1993 September; 24(8): 509-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8244539

- **Use of clinical judgement to guide administration of blood transfusions in Malawi.**
  Author(s): Bates I, Mundy C, Pendame R, Kadewele G, Gilks C, Squire S.
  Source: Transactions of the Royal Society of Tropical Medicine and Hygiene. 2001 September-October; 95(5): 510-2.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11706662

- **Utility of surveillance bacterial cultures in neonatal exchange blood transfusions.**
  Author(s): Pillay T, Pillay DG, Hoosen AA, Adhikari M, Nowbath V.
  Source: The Journal of Hospital Infection. 1995 September; 31(1): 67-71.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7499823

- **Variations in blood transfusions among newborn intensive care units. SNAP II Study Group.**
  Author(s): Bednarek FJ, Weisberger S, Richardson DK, Frantz ID 3rd, Shah B, Rubin LP.
  Source: The Journal of Pediatrics. 1998 November; 133(5): 601-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9821414

- **Warning on blood transfusions and AIDS evoked less public fear than expected.**
  Author(s): McLaughlin N.
  Source: Modern Healthcare. 1987 May 8; 17(10): 86.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10314219

- **WBC-reduced blood transfusions and clinical outcome in children with acute lymphoid leukemia.**
  Author(s): Rios JA, Korones DN, Heal JM, Blumberg N.
  Source: Transfusion. 2001 July; 41(7): 873-7.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11452154

- **What is the current status of the law concerning the right of parents who are Jehovah's Witnesses to refuse blood transfusions for their minor children?**
  Author(s): Kaunitz KK.
  Source: Hosp Med Staff. 1980 October; 9(10): 22-5. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10248675

CHAPTER 2. NUTRITION AND BLOOD TRANSFUSIONS

Overview

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

Finding Nutrition Studies on Blood Transfusions

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 "blood transfusions" (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 "blood transfusions" (or a synonym):

- **Autologous blood transfusions in children and young adults with low body weight undergoing spinal surgery.**
  Author(s): Alfred I. duPont Institute, Wilmington, DE 19899.
  Source: MacEwen, G D Bennett, E Guille, J T J-Pediatr-Orthopage 1990 Nov-December; 10(6): 750-3 0271-6798
- **The use of recombinant erythropoietin in the reduction of blood transfusion rates in craniosynostosis repair in infants and children.**
  Author(s): Craniofacial Center and Texas Oncology Pediatrics, North Texas Hospital for Children, Medical City Dallas Hospital, 7777 Forest Lane, Dallas, TX 75230, USA. Cranio700@aol.com
  Source: Fearon, Jeffrey A Weinthal, Joel Plast-Reconstr-Surg. 2002 June; 109(7): 2190-6 0032-1052

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 blood transfusions; 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:

- **Minerals**

  L-Carnitine
  Source: Healthnotes, Inc.; www.healthnotes.com

CHAPTER 3. ALTERNATIVE MEDICINE AND BLOOD TRANSFUSIONS

Overview

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

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 blood transfusions 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 "blood transfusions" (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 blood transfusions:

- **"In God we trust": when parents refuse medical treatment for their children based upon their sincere religious beliefs.**
  Author(s): Plastine LM.
  Source: Const Law J. 1993 Spring; 3(1): 123-60. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12083094

- **A pregnant mother's right to refuse treatment beneficial to her fetus: refusing blood transfusions.**
  Author(s): Filkins JA.
  Source: Spec Law Dig Health Care Law. 1999 November; (248): 9-31. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10747455

- **Alternatives to standard blood transfusion: availability and promise.**
  Author(s): Prowse CV.
  Source: Transfusion Medicine (Oxford, England). 1999 December; 9(4): 287-99. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10583882

- **An analysis of Novak v. Cobb County Kennestone Hospital Authority. Eleventh Circuit finds no liability for a hospital that sought court ordered blood transfusion for a minor over his parents objection.**
  Author(s): Geldart MD.
  Source: Benders Health Care Law Mon. 1996 June; : 13-6. No Abstract Available.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10184579

- **Anesthetic management of the patient who refuses blood transfusions.**
  Author(s): Dupuis JF, Nguyen DT.
  Source: International Anesthesiology Clinics. 1998 Summer; 36(3): 117-31. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10812420

- **Benefits and complications of regular blood transfusion in patients with beta-thalassaemia major.**
  Author(s): Prati D.
  Source: Vox Sanguinis. 2000; 79(3): 129-37. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11111230

- **Blood transfusion and the pregnant Jehovah's witness patient: avoiding a dilemma.**
  Author(s): Schonholz DH.
  Source: The Mount Sinai Journal of Medicine, New York. 1999 September; 66(4): 277-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10477484

- **Effect of HLA-DR-shared blood transfusion on the clinical outcome of heart transplantation.**
  Author(s): van der Mast BJ, Balk AH.
  Source: Transplantation. 1997 May 27; 63(10): 1514-9.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9175819

- **Erythropoietin with iron supplementation to prevent allogeneic blood transfusion in total hip joint arthroplasty. A randomized, controlled trial.**
  Author(s): Feagan BG, Wong CJ, Kirkley A, Johnston DW, Smith FC, Whitsitt P, Wheeler SL, Lau CY.
  Source: Annals of Internal Medicine. 2000 December 5; 133(11): 845-54.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11103054

- **Hepatitis C virus-polymerase chain reaction minipool testing: 3 years in the largest Swiss blood transfusion service.**
  Author(s): Stolz M, Gilgen M, Niederhauser C.
  Source: Vox Sanguinis. 2003 February; 84(2): 105-10.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=12609016

- **How can autologous blood transfusions help our patients?**
  Author(s): Seal J.
  Source: Br J Perioper Nurs. 2000 April; 10(4): 194-8. Review.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11111444

- **Hydroxyurea as an alternative to blood transfusions for the prevention of recurrent stroke in children with sickle cell disease.**
  Author(s): Ware RE, Zimmerman SA, Schultz WH.
  Source: Blood. 1999 November 1; 94(9): 3022-6.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10556185

- **Immunomodulatory effects of pretransplant donor blood transfusion on T-cell-independent xenoreactive immunity.**
  Author(s): Xia G, Ji P, Rutgeerts O, Vandeputte M, Waer M.
  Source: Transplantation. 2000 April 27; 69(8): 1695-704.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10836383

- **Isobutyl-nitrite-induced methemoglobinemia; treatment with an exchange blood transfusion during hyperbaric oxygenation.**
  Author(s): Jansen T, Barnung S, Mortensen CR, Jansen EC.
  Source: Acta Anaesthesiologica Scandinavica. 2003 November; 47(10): 1300-1.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=14616332

- **Jehovah's Witnesses and blood transfusion.**
  Author(s): Wilcox P.
  Source: Lancet. 1999 February 27; 353(9154): 757-8.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10073551

- **Jehovah's Witnesses and blood transfusions.**
  Author(s): Muramoto O.
  Source: Lancet. 1998 September 5; 352(9130): 824.
  http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9737325

- **Jehovah's Witnesses and blood transfusions.**
  Author(s): Doyle DJ.

Source: Cmaj : Canadian Medical Association Journal = Journal De L'association Medicale Canadienne. 1998 March 24; 158(6): 717-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=9538849

- **Jehovah's Witnesses--the blood transfusion taboo.**
Author(s): Singelenberg R.
Source: Journal of Medical Ethics. 2001 April; 27(2): 138.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11314161

- **Law, blood transfusions and Jehovah's Witnesses.**
Author(s): Letsoalo JL.
Source: Med Law. 1998; 17(4): 633-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=10396924

- **Refusal of potentially life-saving blood transfusions by Jehovah's Witnesses: should doctors explain that not all JWs think it's religiously required?**
Author(s): Gillon R.
Source: Journal of Medical Ethics. 2000 October; 26(5): 299-301.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11055028

- **Report on the Tenth International Platelet Genotyping and Serology Workshop on behalf of the International Society of Blood Transfusion.**
Author(s): Panzer S.
Source: Vox Sanguinis. 2001 January; 80(1): 72-8.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11339073

- **The right to refuse treatment and blood transfusion.**
Author(s): Csapody T.
Source: Bull Med Ethics. 2001 February; (165): 13-6.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=11831259

- **The use of erythropoietin in a patient having major oral and maxillofacial surgery and refusing blood transfusion.**
Author(s): Pogrel MA, McDonald A.
Source: Journal of Oral and Maxillofacial Surgery : Official Journal of the American Association of Oral and Maxillofacial Surgeons. 1995 August; 53(8): 943-5.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=7629627

- **What went wrong: multiple perspectives on an adolescent's decision to refuse blood transfusions.**
Author(s): Lawry K, Slomka J, Goldfarb J.

Source: Clinical Pediatrics. 1996 June; 35(6): 317-21.
http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=pubmed&dopt=Abstract&list_uids=8782956

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 blood transfusions; 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**

  AIDS and HIV
  Source: Integrative Medicine Communications; www.drkoop.com

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

  Epstein-Barr Virus
  Source: Integrative Medicine Communications; www.drkoop.com

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

Hepatitis
Source: Healthnotes, Inc.; www.healthnotes.com

HIV and AIDS
Source: Integrative Medicine Communications; www.drkoop.com

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

Pulmonary Edema
Source: Integrative Medicine Communications; www.drkoop.com

Sickle Cell Anemia
Source: Healthnotes, Inc.; www.healthnotes.com

- **Alternative Therapy**

Cell Therapy
Source: Healthnotes, Inc.; www.healthnotes.com

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 BLOOD TRANSFUSIONS

Overview

In this chapter, we will give you a bibliography on recent dissertations relating to blood transfusions. 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 "blood transfusions" (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on blood transfusions, we have not necessarily excluded non-medical dissertations in this bibliography.

Dissertations on Blood Transfusions

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 blood transfusions. 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:

- **ETHICAL ISSUES IN COMPULSORY MEDICAL TREATMENT: A STUDY OF JEHOVAH'S WITNESSES AND BLOOD TRANSFUSION (BIOETHICS, EUTHANASIA)** by WILLIAMS, JOEL STEPHEN, PHD from Baylor University, 1987, 324 pages
  http://wwwlib.umi.com/dissertations/fullcit/8807155

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. PATENTS ON BLOOD TRANSFUSIONS

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.[8] 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 "blood transfusions" (or a synonym) in their titles. To accurately reflect the results that you might find while conducting research on blood transfusions, we have not necessarily excluded non-medical patents in this bibliography.

Patents on Blood Transfusions

By performing a patent search focusing on blood transfusions, 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.

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[8]Adapted from the United States Patent and Trademark Office:
http://www.uspto.gov/web/offices/pac/doc/general/whatis.htm.

The following is an example of the type of information that you can expect to obtain from a patent search on blood transfusions:

- **Apparatus for direct blood transfusion**

  Inventor(s): Gurtovoi; Isaak Mordkovich (ULITSA Pavla Dybenko, 4, kv. 42, Sevastopol, SU), Gurtovoi; Mark Isaakovich (ULITSA Korolenko, 18, kv. 10, Sevastopol, SU), Khlopkov; Evgeny Nikolaevich (ULITSA Serafimovicha, 28, kv. 32, Sevastopol, SU)

  Assignee(s): none reported

  Patent Number: 3,983,871

  Date filed: May 14, 1975

  Abstract: An apparatus for direct **blood transfusion** which comprises two needles with tubes connected thereto. One needle is introduced into the donor's blood system, while the other into the recipient's blood system. In order to provide for the delivery of blood from the donor to the recipient via said tubes, the apparatus is equipped with a vessel containing a medicamental liquid compatible with blood and mounted at a height sufficient for creating a hydrostatic head of the medicamental liquid exceeding the blood pressure in the recipient's vasculature. The apparatus also comprises a distributing means built around at least four proportioning vessels vertically mounted in a housing and rigidly coupled therewith. The housing is disposed between the upper and lower disks of a stator in coaxial relationship therewith. The housing is made rotatable in one direction with respect to the stator. The upper disk and the lower disk of the stator each have at least four holes formed therein. As the housing turns, each of the proportioning vessels passes successively through at least four positions. In each position each proportioning vessel is so disposed with respect to the stator that its inlet and outlet register with said holes formed in the stator disks, so that the proportioning vessel occupying the first position has its inlet communicating with the tube connected to the needle introduced into the donor's blood system. The outlet of this proportioning vessel communicates with the air cushion in the vessel with the medicamental liquid. The proportioning vessel occupying the second position has its outlet communicating with the tube connected to the needle introduced into the recipient's blood system. The proportioning vessel occupying the third position has its inlet communicating with the vessel with the medicamental liquid. The outlet of this vessel and the inlet of the proportioning vessel occupying the second position communicate one with the other with the aid of a two-way cock which serves either to connect the foregoing vessels or else to connect the vessel with the medicamental liquid and the proportioning occupying the second position. The proportioning vessel occupying the fourth position has its inlet communicating with the atmosphere and its outlet with the vessel for the spent medicamental liquid.

  Excerpt(s): The present invention relates to medical equipment, and, more particularly, to an apparatus for direct **blood transfusion.** The apparatus of the present invention may be advantageously employed for direct **blood transfusion** as well as for introducing various medicamental liquids into the recipient's blood system. There exist a variety of widely known apparatus for direct **blood transfusion** which usually comprise two needles coupled with tubes, one needle being introduced into the donor's blood system, while the other into the recipient's blood system, as well as a means for delivering blood from the donor to the recipient via said tubes. In order to prevent or combat blood clotting in the tubes, the latter must be regularly washed. To this end, the known apparatus are provided with a vessel (or several vessels) containing a

medicamental liquid compatible with blood. The known apparatus also incorporate a distributing means, usually formed as a cock, which communicates with the above-described tubes as well as with the vessel containing the medicamental liquid. When the distributing means is set to one position, blood is delivered via the tubes from the donor to the recipient; with the distributing means set to the other position, said tubes undergo washing.

Web site: http://www.delphion.com/details?pn=US03983871__

- **Blood transfusion tubes and devices for use in contact with human blood**

  Inventor(s): Murayama; Ken (Ootsu, JP), Tanaka; Masakazu (Ootsu, JP)

  Assignee(s): Toyo Boseki Kabushiki Kaisha (Osaka, JP)

  Patent Number: 4,465,480

  Date filed: December 21, 1981

  Abstract: Devices such as **blood transfusion** tubes, which can be contacted with human blood at reduced risk of blood clotting, made of a segmented polyether polyurethane urea obtained by chain extending an isocyanate-terminated prepolymer with a diamine having a branch at at least one.alpha.-carbon atom, such as 1,2-propylene diamine or 1,4-cyclohexylene diamine.

  Excerpt(s): The present invention relates to **blood transfusion** tubes, or devices for use in direct or indirect contact with human blood, consisting of or coated with an antithrombogenic polymer. The object of the present invention is to provide **blood transfusion** tubes, or devices for use in direct or indirect contact with human blood which are able to prevent or remarkably delay blood clotting without particular use of an anticoagulant. In recent years, high polymer materials have been used for artificial organs such as artificial kidneys, artificial lungs, circulatory assist devices, artificial blood vessels, etc. and for many medical appliances such as injectors, blood bags, cardinal catheters, etc. However, one of the great problems concerned with them is that the high polymer materials cause various undesirable biological interactions of biological systems with foreign surfaces, and in the case of their contact with blood, they bring about blood clotting, thus causing various disturbances.

  Web site: http://www.delphion.com/details?pn=US04465480__

- **Electronic apparatus for blood transfusion**

  Inventor(s): Le Boeuf; Guy (Le Bourg, 86800 Lavoux, FR)

  Assignee(s): none reported

  Patent Number: 6,099,492

  Date filed: April 27, 1998

  Abstract: A **blood transfusion** device has at least one blood accelerating pump, a variable volume reservoir, at least one single-use blood supply bag, a platen, a blood reheater, a single-use blood reheater bag, a filtration system and a perfusion line. The variable volume reservoir varies in volume using an accordion-like bellows or a flexible pocket acted upon by the blood accelerating pump. The single-use blood supply bag contains concentrated corpuscles, plasma, or a solution of albumin. The blood supply bag is disposed between two plates precisely spaced apart. The platen is acted upon by

the accordion-like bellows or the flexible pocket to slide in parallel to the two plates, and is disposed between the variable volume reservoir and the blood supply bag. The blood reheater includes an assembly of two double plates, each double plate having a preheating plate heated to a constant temperature slightly less than 38.degree., and a heating plate heated to a variable volume controlled by a temperature detector at an outlet of the **blood transfusion** apparatus. The single-use blood reheater bag is disposed between each of the two double plates and communicates, via an inlet member, with the single-use blood supply bag. The filtration system is disposed at an outlet of the **blood transfusion** apparatus, and the perfusion line is connected to an outlet of the filtration system by conical couplings, and is terminated in a trocar.

Excerpt(s): From the beginning of **blood transfusions,** their technique has been improved. First of all there was the preservation of blood in sterile bags of about 300 cm.sup.3 at a temperature of +4.degree. C. 1/ pumps for accelerating the blood, to treat as rapidly as possible a hemorrhage which, when it is massive, can lead to death. These pumps of the peristaltic type in the first instance manual have been subsequently controlled by an electric motor of variable speed, electronically controlled. 2/ blood reheaters: doctors have noted that massive transfusions of cold blood lead to about 8% mortality, which is avoided with blood reheated to 37.degree. C. Moreover, clinical studies have shown that the transfusion with reheated blood decreases the transfused volume by about 30%, which decreases the risks of infection (AIDS, Hepatitis B, etc.) and is more comfortable for the patient who is no loner chilled after the procedure.

Web site: http://www.delphion.com/details?pn=US06099492__

- **Emergency burn treatment pack**

  Inventor(s): Power; Ronald A. (2110 230th St., Torrance, CA 90501)

  Assignee(s): none reported

  Patent Number: 3,986,505

  Date filed: August 1, 1975

  Abstract: A first aid package for emergency use in the field for treating and transporting seriously burned patients. The first aid package comprises a soft resilient water absorbent foam material placed on a flexible waterproof outer covering having a pair of interlocking portions. A sterile sheet is placed over the resilient foam material and the sheet and the foam are saturated with an aqueous solution. The burn patient is placed on the sterile sheet and completely covered by the sterile sheet thereby enclosing the patient in a sterile atmosphere. An aqueous solution is then poured over the sheet so as to completely saturate the sheet and the uppermost portion of the patient. The cooperating interlocking portions of the flexible waterproof covering are placed completely around the sheet and the patient and locked into position thereby maintaining the patient in a sterile moist atmosphere. Openings are provided in the waterproof covering to provide access to the patient's arms and legs for intravenous **blood transfusions** should that be necessary. A pair of flexible straps located on each side of the waterproof outer covering provide the means for transporting the patient while in the sterile and moist protective cocoon environment.

  Excerpt(s): This invention is concerned with an apparatus and method of providing emergency treatment to burn patients in the field. The treatment of burn patients in a hospital is concerned primarily with keeping the patient comfortable, keeping the patient cool, and providing a sterile atmosphere about the patient. It is well known that

burn patients with third degree burns on the major portions of their body suffer primarily from infection caused by non-sterile materials contacting the open flesh and by the loss of fluids from their body as the result of lost skin.

Web site: http://www.delphion.com/details?pn=US03986505__

- **High capacity blood transfusion micro filter**

  Inventor(s): Swank; Roy L. (Portland, OR)

  Assignee(s): Pioneer Filters, Inc. (Beaverton, OR)

  Patent Number: 4,116,845

  Date filed: August 1, 1977

  Abstract: A high capacity **blood transfusion** micro filter comprises a case having inlet and outlet ports, upper and lower chambers, inward projections in the upper chamber and a quantity of woolly blood filter material contained in both chambers. The woolly material in the upper chamber is of less density than that in the lower chamber and is fluffed out into the spaces between the projections to provide filter areas of still lower density. Baffle means direct the flow of blood centrally in both upper and lower chambers.

  Excerpt(s): This invention pertains to blood filters. It relates particularly to continuous high volume blood filtering devices of the class employed principally in making **blood transfusions.** It presently is routine medical practice when making **blood transfusions** to employ blood bank blood. As is well known, this is prepared by withdrawing blood from donors, adding heparin and other preservatives, and then storing the blood under carefully controlled conditions until its use is required. In the use of the blood, there have been observed in the patient complications, sometimes serious, which have been recognized as being a function of blood storage duration. Accordingly, it has been common practice to discard blood bank blood after it has been stored for a predetermined time.

  Web site: http://www.delphion.com/details?pn=US04116845__

- **Method of preventing AIDS transmission resulting from blood transfusions**

  Inventor(s): Lewis; Peter J. (London, GB2)

  Assignee(s): Merrell Dow Pharmaceuticals, Inc. (Cincinnati, OH)

  Patent Number: 5,039,688

  Date filed: April 14, 1989

  Abstract: Quaternary ammonium salts such as the benzalkonium chlorides and cetylpyridinium chloride can prevent the transmission of AIDS-causing virus through **blood transfusions** and through the use of blood products prepared using the blood of an AIDS infected individual.

  Excerpt(s): This invention relates to the prevention of the transmission of AIDS-causing virus through **blood transfusions** and through the use of blood products where the blood donor is infected with an AIDS-causing virus. A great deal of research is currently underway to develop treatments and cures for viral infections in humans and in animals. Notably the incidence of AIDS and ARC in humans is increasing at an alarming

rate. The five year survival rate for those with AIDS is dispiriting and AIDS patients, whose immune systems have been seriously impaired by the infection, suffer from numerous opportunistic infections including Kaposi's sarcoma and Pneumocystis carninii pneumonia. No cure is known and current treatments are largely without adequate proof of efficacy and have numerous untoward side effects. Fear of the disease has resulted in social ostracism of and discrimination against those having or suspected of having the disease. A significant problem in preventing the spread of AIDS is that the disease can be transferred from an infected individual by way of a **blood transfusion** or through the use of blood products, such as the coagulation factor VIII used by many hemophiliacs and such as blood serum and blood plasma, using blood donated from an individual infected with an AIDS-causing virus. The problem is confounded because intravenous drug users, who as a class have a high incidence of AIDS, are also quite likely to be blood donors. While an effective test has been developed which detects HIV-1 virus in blood donated for transfusions, some transmission of disease still occurs through blood tranfusions. For example, some individuals are highly infectious for up to six months before the test will indicate presence of AIDS-causing virus in the blood of such individuals. Moreover, a second AIDS-causing virus, HIV-2, is not detected by the present blood test. While the risk of contracting AIDS from transfusion is quite low because testing has become routine, it would be highly desirable to further reduce the risk of transmission of AIDS-causing virus resulting from **blood transfusions.**

Web site: http://www.delphion.com/details?pn=US05039688__

Patent Applications on Blood Transfusions

As of December 2000, U.S. patent applications are open to public viewing.[9] 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 blood transfusions:

- **Blood transfusion system**

  Inventor(s): Chattopadhyay, Kashi Das; (Chandigarh, IN), Gupta, Jitender; (Chandigarh, IN), Raj, Pirthi; (Chandigarh, IN), Verma, Sanjeev; (Chandigarh, IN)

  Correspondence: Brian Kinnear; Holland & Hart; Suite 3200; 555 17th Street; Denver; CO; 80201; US

  Patent Application Number: 20030181841

  Date filed: March 22, 2002

  Abstract: The present invention provides a **blood transfusion** system having valve circuit, for transfusion of blood to a patient, said system comprising a Y-Shaped connector comprising of three arm [7, 16(a) and 16(b)] and a junction (9), wherein arm 7 is connected to the patient at its one end and to the junction (9) at its other end, arm 16(a) is connected to the junction (9) at its one end and to a waste-blood suction syringe (10) at its other end through a valve (11), an outlet is being provided in the arm 16(a) between the valve 11 and the waste-blood suction syringe for dispensing the waste blood, arm 16(b) is connected to the junction (9) at its one end and to a fresh-blood supplying syringe (13) at its other end through a valve (14), a fresh-blood supplying means is being connected in the arm 16(b) between the valve 14 and the fresh-blood

[9] This has been a common practice outside the United States prior to December 2000.

supplying syringe through a valve (15), and syringes (10 and 13) are being operated synchronously.

Excerpt(s): The present invention provides a **blood transfusion** system having valve circuit for transfusion of blood to a patient. Blood transfusion is used to exchange the infected blood with fresh blood of Neo-nates who are suffering from jaundice, have some other blood related diseases and for babies whose mothers have 0 (Rh negative) blood group. The **blood transfusion** requires continuous repetitive cycles of suction of about 5 to 20 ml of infected blood along with simultaneous infusion of same quantity of fresh blood. The **blood transfusions** are done through the disposable valve and syringes arrangement. The instrument based on this process i.e. **Blood Transfusion** controller will have several advantages like accuracy and precision in **blood transfusion** at predetermined rate and initiation of various alarms so as to attract the attention of operator in case of malfunctioning. The main object of the present invention is to provide a **blood transfusion** system with valve circuit which obviates the drawbacks as detailed above.

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 blood transfusions, 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 "blood transfusions" (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 blood transfusions.

You can also use this procedure to view pending patent applications concerning blood transfusions. Simply go back to **http://www.uspto.gov/patft/index.html**. Select "Quick Search" under "Published Applications." Then proceed with the steps listed above.

CHAPTER 6. BOOKS ON BLOOD TRANSFUSIONS

Overview

This chapter provides bibliographic book references relating to blood transfusions. In addition to online booksellers such as **www.amazon.com** and **www.bn.com**, excellent sources for book titles on blood transfusions 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 "blood transfusions" (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 blood transfusions:

- **Catching AIDS**

  Source: Understanding and Preventing AIDS: A Book for Everyone. 2nd Edition.

  Contact: Health Alert Press, PO Box 2060, Cambridge, MA, 02238-2060, (617) 497-4190.

  Summary: After reviewing the mechanics of the transmission of Human immunodeficiency virus (HIV) infection, this chapter describes confirmed and suspected methods of HIV transmission. It notes that most cases of HIV infection have been transmitted through sexual contact, intravenous drug use with infected needles, and passage of the virus from infected mother to fetus. Because HIV is found in blood and body fluids, transmission through contact with these is also a possibility. In health care settings, **blood transfusions,** hemodialysis, organ and tissue transplants, artificial insemination, and contact with infected health care workers may be linked with HIV

transmission. AIDS is not spread through casual contact, but a variety of cofactors may affect transmission.

- **Questions and Answers About AIDS**

  Source: AIDS: Facts and Issues.

  Contact: Rutgers University Press, 109 Church St, New Brunswick, NJ, 08901, (908) 932-7365.

  Summary: This book chapter, in question-and-answer format, provides an explanation of what Acquired immunodeficiency syndrome (AIDS) is, who is at risk, the symptoms, and more specific topics. These include discussions about infections and illness resulting from AIDS. The Human immunodeficiency virus (HIV), the test for it, and related subjects are also presented. Hemophiliacs, **blood transfusions,** the hepatitis vaccine, and special precautions for health care workers are included. Special sections about heterosexuals, women, and children are presented.

- **Dragon Within the Gates: The Once and Future AIDS Epidemic**

  Contact: Carroll & Graf, 260 Fifth Ave, New York, NY, 10001, (212) 889-8772.

  Summary: This book on the AIDS epidemic begins with a detailed description on the origin of HIV/AIDS in Africa and the means by which it spread throughout the world. Next, the author describes his experiences with issues related to HIV/AIDS as the Commissioner of Health of New York City from 1986 to 1990, which includes HIV transmission through **blood transfusions,** organ donations, artificial insemination, AIDS orphans, and the effect of AIDS education. He discusses testing issues and the possible mutation of HIV. He also examines the impact of AIDS on certain populations groups -- homosexuals, bisexuals, women, children, and injecting drug users. He addresses treatment questions and advocates prevention through rigorous public health actions, increased knowledge about the virus, and expanded access to needed health and social services for HIV-infected individuals. The politics of AIDS and the gay community are covered, and in particular "infection versus civil rights". Heterosexual transmission is touched on, as is the epidemiological issues of HIV/AIDS. The author relates his experiences with the Fifth Annual conference on AIDS, the AIDS Coalition to Unleash Power (ACT-UP), and a New York City needle exchange program. In the final chapter, the interaction of drug abuse, prostitution, and AIDS is addressed.

- **AIDS and the Blood Supply**

  Source: AIDS: Facts and Issues.

  Contact: Rutgers University Press, 109 Church St, New Brunswick, NJ, 08901, (908) 932-7365.

  Summary: This chapter begins by discussing fears about blood, the effects of shared needles among IV drug abusers, as well as blood and blood products. Methods of treating hemophilia, pasteurization, and making blood safe are also considered. A blood test for AIDS antibody, as well as autologous **blood transfusions,** and the fallacy of the dedicated donor are included. The discussion concludes with safety considerations and a summary.

- **Preventing Emerging Infectious Diseases: A Strategy for the 21st Century**

  Source: Atlanta, GA: U.S. Department of Health and Human Services. Centers for Disease Control and Prevention. 1998. 75 p.

  Contact: Available from Office of Health Communication, National Center for Infectious Diseases, Centers for Disease Control and Prevention. Mailstop C-14, 1600 Clifton Road, Atlanta, GA 30333. Fax (404) 639-4194. PRICE: Single copy free.

  Summary: This document describes the plan of the Centers for Disease Control and Prevention (CDC) for combating infectious diseases over the next 5 years. The plan is organized under four goals: surveillance and response, applied research, infrastructure and training, and prevention and control. For goal one, objectives call for strengthening surveillance and response in the United States and internationally, as well as improving methods for gathering and evaluating surveillance data on infectious diseases. They also emphasize that surveillance data are critical not only for detecting outbreaks, but also for improving public health practice and medical treatment. For goal two, objectives include improving tools for identifying and understanding emerging infectious diseases; determining risk factors for infectious diseases, as well as infectious risk factors for chronic diseases; and conducting research to develop and evaluate prevention and control strategies. The public health infrastructure is the underlying foundation that supports the planning, delivery, and evaluation of public health activities and practices. For goal three, objectives and activities focus on enhancing epidemiologic and laboratory capacity in the United States and internationally. In the United States, this requires CDC to improve its ability to communicate electronically with its partners and to strengthen its capacity to serve as a reference center for diagnosing infectious diseases and testing drug resistance. Objectives and activities also address the need to enhance the Nation's capacity to respond to outbreaks, including those caused by bioterrorism, and to provide training opportunities to ensure that today's workers and future generations are able to respond to emerging threats. All of CDC's efforts are ultimately directed toward the fourth goal: prevention and control. CDC will work with many partners to implement, support, and evaluate disease prevention in the United States and internationally. As part of this effort, CDC will conduct demonstration programs and will develop, evaluate, and promote strategies to help health care providers and others change behaviors that facilitate disease transmission. Target areas for all four goals include developing and using vaccines and preventing emerging infectious diseases, antimicrobial resistance, food-and waterborne diseases, vectorborne and zoonotic diseases, diseases transmitted through **blood transfusions** or products, chronic diseases caused by infectious agents, diseases of people with impaired host defenses, diseases of pregnant women and newborns, and diseases of travelers, immigrants, and refugees. The document includes specific strategies in each goal area, anticipated outcomes, and the immediate past history (1994-1997) in these areas. Also included are references, tables, figures, sidebars (in boxes), a list of acronyms, and a subject index. 45 boxes. 94 references.

- **Meeting AIDS With Compassion: AIDS Care and Prevention in Agomanya, Ghana**

  Contact: TALC, PO Box 49, St. Albans.

  Summary: This monograph details the effect that Acquired immunodeficiency syndrome (AIDS) has had on Ghana, particularly the Manya-Krobo District. It explains the Krobo culture, the functions of St. Martin's Clinic, and the origin of the clinic's program. The monograph also examines home-based care, an ante-natal clinic, and a maternity clinic. The role of the Catholic church is examined, as are the safety of **blood**

transfusions, condom use, and treatments by herbalists and faith healers. The monograph also looks at the need for employment, vocational training, funding, and staff training.

- **AIDS : The Second Decade**

  Contact: National Academy Press, 2101 Constitution Ave NW, Box 285, Washington, DC, 20055, (202) 334-3313.

  Summary: This monograph examines the shifting trends of the epidemic of Acquired immunodeficiency syndrome (AIDS), caused by Human immunodeficiency virus (HIV), in the United States, and details the challenges to medical and social workers in the next decade. The first chapter discusses the changing epidemiology of AIDS in the United States and highlights the emerging incidence of AIDS among women as a new risk. The continuing challenges of HIV prevention among homosexual men, Intravenous drug users (IVDU's), and women are described. The maintenance of risk-reduction behavior is emphasized, and the impediments to improved intervention outlined. The third chapter explores issues unique to adolescents and AIDS, including epidemiology of AIDS among adolescents, risk factors among the population, effective intervention, and the level of knowledge about AIDS. A discussion of interventions for female sex workers focuses on the epidemiology of AIDS among sex workers, patterns of prostitution, intervention programs, and future needs and options. Although the risk of HIV transmission through **blood transfusions** has been reduced to an extremely low level, the greater diversity in risk groups in the next decade will require greater screening precautions and the risk of potential blood shortages resulting from a diminished pool of donors. Finally, the monograph examines methodological issues related to AIDS-seroprevalence studies, sexual behavior studies, drug-using behavior studies, and ethnographic studies.

- **Womancare: Sexually Transmitted Diseases**

  Contact: University of Pittsburgh, Magee - Womens Hospital, Health Center, 300 Halket St, Pittsburgh, PA, 15213-3180, (412) 641-1000.

  Summary: This monograph presents basic information about the spread of Sexually transmitted diseases (STD's) and their prevention with a focus on women and infants as the high-risk group. STD's which can be spread only through sexual contact, such as genital warts, gonorrhea, and syphilis, are covered. Those which can also be transmitted through IV-needle sharing, **blood transfusions,** or the perinatal route include Acquired immunodeficiency syndrome (AIDS), hepatitis, herpes-virus group infections, plus relevant bacterial, fungal, and parasitic infections. For each disease, the causative agent, symptoms, and diagnosis is described, together with with the respective treatment, if available. Preventive measures include barrier methods of contraception, avoiding casual sexual contacts, and vaccination, in particular for hepatitis.

- **Understanding and Preventing AIDS**

  Contact: Children's Press, 5440 N Cumberland Ave, Chicago, IL, 60656, (773) 693-0800.

  Summary: This monograph presents information for adolescents about Acquired immunodeficiency syndrome (AIDS), its transmission and prevention. First, it tells the story of Ryan White and his fight for legal rights to attend school. Then, it relates the history of the epidemic, tracking its origins to Africa, and its affects on the immune system. It explains how fluids infected with the Human immunodeficiency virus (HIV) can be transmitted through sexual contact, drug use, or **blood transfusions.** It also

provides types of casual contact in everyday living that do not transmit HIV. The monograph discusses AIDS as the newest epidemic and compares it with previous epidemics, such as the bubonic plague and cholera. It then presents cases of several Persons with AIDS (PWA's) in a hospital ward in Northeast Washington. Risk-reduction measures to prevent contracting AIDS are also described.

- **Lynda Madaras Talks to Teens About AIDS: An Essential Guide for Parents, Teachers, and Young People**

  Contact: Newmarket Press, 18 E 48th St, New York, NY, 10017, (212) 832-3575.

  Summary: This monograph teaches teenagers about Acquired immunodeficiency syndrome (AIDS) and its prevention. It presents facts about social, medical, and ethical aspects of AIDS and dispels rumors, especially those about who gets AIDS, symptoms, and different modes of transmission. Abstinence and safer sex practices are discussed as methods of preventing Human immunodeficiency virus (HIV) transmission. Drug use, **blood transfusions,** and mother to infant passage are noted as other methods of transmission. Encouraging teenagers to talk to other teenagers about AIDS is advocated as one way to maintain the current low rate of teen infection. Further information on AIDS can be obtained from a listing at the end of this book of hotlines and organizations that provide printed or audiovisual materials.

- **Securite Transfusionnelle Dans Les Pays En Voie De Developpement**

  Contact: EEC AIDS Task Force, Joseph-II St, Brussels.

  Summary: This report describes the policies and strategies adopted by the numbers of the Commission of European Communities to assure a safer blood supply in the Third World countries. In those countries, 5 to 10 percent of AIDS infections are still caused by **blood transfusions.** To improve that situation, the AIDS Task Force of the Commission has initiated programs in 28 developing countries. Each program sets out at the donor level and attempts to recruit a stable pool of low-risk donors. Next, the blood supply itself is screened for infectious agents such as hepatitis viruses and HIV. However, since the testing is not entirely reliable (especially in countries where a high AIDS incidence exists already), physicians are also encouraged to rely on alternatives to donor transfusions such as vitamin and iron treatments and auto-transfusions. Last, the program also assists in the acquisition of safe equipment, blood storage facilities, and medical buildings. In addition to these strategies, the conference participants also consider ethical, legal, and economic problems related to **blood transfusions.** Descriptions of programs in specific countries, a list of conference participants, and a bibliography are appended.

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 "blood transfusions" at online booksellers' Web sites, you may discover non-medical books that use the generic term "blood transfusions" (or a synonym) in their titles. The following is indicative of the results you might find when searching for

"blood transfusions" (sorted alphabetically by title; follow the hyperlink to view more details at Amazon.com):

- **21st Century Complete Medical Guide to Blood Transfusion and Donation, Authoritative NIH, CDC, and FDA Documents, Clinical References, and Practical Information for Patients and Physicians (Two CD-ROM Superset)** by PM Medical Health News; ISBN: 1592486959; http://www.amazon.com/exec/obidos/ASIN/1592486959/icongroupinterna
- **Applications of Molecular Biology to Blood Transfusion Medicine** by George Garratty, American Association of Blood Banks; ISBN: 1563950928; http://www.amazon.com/exec/obidos/ASIN/1563950928/icongroupinterna
- **Applications of Molecular Biology to Blood Transfusion Medicine** by G. Garratly; ISBN: 3805567073; http://www.amazon.com/exec/obidos/ASIN/3805567073/icongroupinterna
- **Commission of Inquiry into Health Services from the second interim report on Blood Transfusion Services** by South Africa; ISBN: 0621102237; http://www.amazon.com/exec/obidos/ASIN/0621102237/icongroupinterna
- **Cryopreservation and Low Temperature Biology in Blood Transfusion (Developments in Hematology and Immunology, 24)** by C. Thomas Smit Sibinga, P.C. Das; ISBN: 0792309081; http://www.amazon.com/exec/obidos/ASIN/0792309081/icongroupinterna
- **Ethical Issues and the Religious and Historical Basis for the Objection of Jehovah's Witnesses to Blood Transfusion Therapy (Studies in Religion and Society (New York, N.Y.), V. 63.)** by Andre Carbonneau; ISBN: 0773465421; http://www.amazon.com/exec/obidos/ASIN/0773465421/icongroupinterna
- **Guidelines for Quality Assurance Programmes for Blood Transfusion Services**; ISBN: 9241544481; http://www.amazon.com/exec/obidos/ASIN/9241544481/icongroupinterna
- **Guidelines for the Blood Transfusion Services in the United Kingdom, 1989** by W. Wagstaff, Great Britain; ISBN: 0113212755; http://www.amazon.com/exec/obidos/ASIN/0113212755/icongroupinterna
- **Handbook of Blood Transfusion Therapy** by J. A. F. Napier; ISBN: 0471953784; http://www.amazon.com/exec/obidos/ASIN/0471953784/icongroupinterna
- **Handbook of Transfusion Medicine: Blood Transfusion Services of the United Kingdom**; ISBN: 0113224273; http://www.amazon.com/exec/obidos/ASIN/0113224273/icongroupinterna
- **Infectious disease testing for blood transfusions : January 1975 through October 1994 : 1888 citations (SuDoc HE 20.3615/2:94-10)** by Martha Glock; ISBN: B00010LRRY; http://www.amazon.com/exec/obidos/ASIN/B00010LRRY/icongroupinterna
- **International Society of Blood Transfusion 24th Congress, Makuhari, Messe/Japan, March-April, 1996 - Plenary and Educational Lectures (Journal - Vox Sanguinis , Vol 70, Suppl. 3)** by K. Ito; ISBN: 3805563213; http://www.amazon.com/exec/obidos/ASIN/3805563213/icongroupinterna
- **Management of blood transfusion services**; ISBN: 9241544066; http://www.amazon.com/exec/obidos/ASIN/9241544066/icongroupinterna

- **Manual of Clinical Blood Transfusion (Manual Series)** by Branko Brozovic, Milica Brozovic; ISBN: 0443028745; http://www.amazon.com/exec/obidos/ASIN/0443028745/icongroupinterna
- **Microbiology in Blood Transfusion (Institute of Medical Laboratory Sciences Monographs)** by John A.J. Barbara; ISBN: 072360648X; http://www.amazon.com/exec/obidos/ASIN/072360648X/icongroupinterna
- **Practical blood transfusion (Series in laboratory medicine)** by Douglas W Huestis; ISBN: 0316379514; http://www.amazon.com/exec/obidos/ASIN/0316379514/icongroupinterna
- **Quality Assurance and Blood Transfusion Method** by M.J. Seghatchian, G.A. Rock; ISBN: 0849358132; http://www.amazon.com/exec/obidos/ASIN/0849358132/icongroupinterna
- **Quality Control in Blood Transfusion Services**; ISBN: 928710851X; http://www.amazon.com/exec/obidos/ASIN/928710851X/icongroupinterna
- **Report of the Expert Group on the Blood Transfusion Service Board** by Ireland; ISBN: 070761595X; http://www.amazon.com/exec/obidos/ASIN/070761595X/icongroupinterna
- **Report of the Tribunal of Inquiry into the Blood Transfusion Service Board** by Tribunal of Inquiry into the Blood Transfusion Service Board; ISBN: 0707638372; http://www.amazon.com/exec/obidos/ASIN/0707638372/icongroupinterna
- **Role of Leucocyte Development in Blood Transfusion Practice** by Blanka Brozovic; ISBN: 063202626X; http://www.amazon.com/exec/obidos/ASIN/063202626X/icongroupinterna
- **Survey of Blood Transfusion Services of Central and Eastern European Countries and Their Co-Operaito** by Hans-Jhorg Heiniger; ISBN: 9287124000; http://www.amazon.com/exec/obidos/ASIN/9287124000/icongroupinterna
- **The Northern Ireland Blood Transfusion Service (Special Agency) (Establishment and Constitution) Order (Northern Ireland) 1994: Health and Personal Social Services (Statutory Rule: 1994: 175)**; ISBN: 0337911754; http://www.amazon.com/exec/obidos/ASIN/0337911754/icongroupinterna
- **Transfusion Medicine Handbook: Blood Transfusion Services of the United Kingdom** by Brian McClelland; ISBN: 0113216408; http://www.amazon.com/exec/obidos/ASIN/0113216408/icongroupinterna
- **Transplantation and Blood Transfusion (Developments in Hematology and Immunology, 10)** by C.Th. Smit Sibinga, et al; ISBN: 0898386861; http://www.amazon.com/exec/obidos/ASIN/0898386861/icongroupinterna
- **White Cells and Platelets in Blood Transfusion (Developments in Hematology and Immunology, 19)** by C. Smit Sibinga, et al; ISBN: 0898389763; http://www.amazon.com/exec/obidos/ASIN/0898389763/icongroupinterna

Chapters on Blood Transfusions

In order to find chapters that specifically relate to blood transfusions, an excellent source of abstracts is the Combined Health Information Database. You will need to limit your search to book chapters and blood transfusions 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 "blood transfusions" (or synonyms) into the "For these words:" box. The following is a typical result when searching for book chapters on blood transfusions:

- **Renal Transplantation in Children**

  Source: in Massry, S.G. and Glassock, R.J., eds. Massry and Glassock's Textbook of Nephrology. 4th ed. Philadelphia, PA: Lippincott Williams and Wilkins. 2001. p. 1702-1710.

  Contact: Available from Lippincott Williams and Wilkins. P.O. Box 1600, Hagerstown, MD 21741. (800) 638-3030 or (301) 223-2300. Fax (301) 223-2365. Website: lww.com. PRICE: $350.00 plus shipping and handling. ISBN: 0683304887.

  Summary: A successful renal (kidney) transplant can take away the burden of dialysis and return the patient to a relatively unencumbered life. However, achieving renal rehabilitation for the patient requires prolonged survival of both the patient and the graft with minimal complications due to the surgery or to the lifetime of immunosuppressive medications that are currently needed to sustain the transplanted kidney. This chapter on renal transplantation in children is from a comprehensive nephrology textbook that covers all areas of the discipline from anatomy to dialysis and transplantation in both pediatric (children) and adult patients. After an introduction reviewing the changes in pediatric kidney transplantation, the author discusses the importance of the child's primary diagnosis in predicting graft survival as well as recurrence of the original disease. The author then covers indications and contraindications for transplant in children, including preemptive transplantation (before dialysis becomes necessary); pretransplant **blood transfusions;** histocompatibility issues; induction therapy (prophylactic use of anti T cell antibody to reduce the development of first rejection episodes); maintenance immunosuppression (with cyclosporine, tacrolimus, and adjunct therapies); allograft rejection; and graft survival. The chapter concludes with a brief section on growth following transplantation, a major difference between adult and child kidney patients. The author notes that there are limited studies about growth posttransplantation, but steroids used for immunosuppressive therapy are usually blamed for inhibited growth. Steroids can be withdrawn from children posttransplantation; however, acute rejection tends to occur shortly afterward in many of these patients. 4 tables. 6 references.

- **Complications of Chronic Dialysis Therapy**

  Source: in Gutch, C.F.; Stoner, M.H.; Corea, A.L. Review of Hemodialysis for Nurses and Dialysis Personnel. 6th ed. St. Louis, MO: Mosby. 1999. p. 192-212.

  Contact: Available from Harcourt Publishers. Foots Cray High Street, Sidcup, Kent DA14 5HP UK. 02083085700. Fax 02083085702. E-mail: cservice@harcourt.com. Website: www.harcourt-international.com. PRICE: $37.95 plus shipping and handling. ISBN: 0815120990.

  Summary: Chronic dialysis therapy has extended the lives of hundreds of thousands of patients. The treatment, however, can be associated with significant acute and chronic complications. This chapter on the complications of chronic dialysis therapy is from a nursing text that poses questions and then answers those questions with the aim of giving a good understanding of the basic principles, basic diseases, and basic problems in the treatment of kidney patients by dialysis. Many complications in patients with end

stage renal disease (ESRD) are part of the uremic syndrome and are unrelated to the dialysis treatment itself. Dialysis related complications include central nervous system (CNS) abnormalities (headache, weakness, fatigue, apathy, nausea), hypotension (low blood pressure), fluid overload (edema), hypertension (high blood pressure), congestive heart failure, arrhythmias, muscle cramping, chills and fever (febrile reactions), allergic reactions, and itching (pruritis). The author discusses medical problems associated with ESRD, including anemia and its treatment (often with erythropoietin or transfusions), the complications of **blood transfusions,** renal osteodystrophy (bone disease related to abnormalities of calcium and phosphorus metabolism), joint disorders (including pseudogout, which is related to elevated uric acid levels), dialysis amyloidosis, carpal tunnel syndrome (CTS), gastrointestinal problems (peptic ulcer disease, constipation, and ascites, or fluid collection in the peritoneal cavity), hepatitis, neuropathy, reproduction problems, and insomnia (inability to sleep). The authors concludes with a discussion of dialysis in the elderly, the role of exercise for dialysis patients, dialysis for people with diabetes mellitus, and the psychological consequences of long term dialysis.

- **Impact of Recipient Age on Renal Allograft Outcome**

  Source: in Tejani, A.H. and Fine, R.N., eds. Pediatric Renal Transplantation. New York, NY: Wiley-Liss. 1994. p. 165-185.

  Contact: Available from John Wiley and Sons, Inc. 1 Wiley Drive, Somerset, NJ 08875-1272. (800) 225-5945. PRICE: $99.95 (as of 1995). ISBN: 0471591203.

  Summary: In this chapter, from a medical text about pediatric renal transplantation, the authors examine the impact of recipient age on renal allograft outcome. After a brief introductory section, the authors present data on renal transplantation success rates in children, from registries including the American Human Renal Transplant Registry; the Canadian Organ Replacement Register; the UCLA Transplant Registry; the North American Pediatric Renal Transplantation Cooperative Study; and the Hospital for Sick Children and other centers. Other topics include the factors influencing graft survival rates, including nonimmunologic factors, anastomosis time, vascular thrombosis, and immunologic factors; anencephalic kidneys and young donors; viral infections; and factors that do not appear responsible for the differences in graft survival based on recipient age, including HLA matching, **blood transfusions,** race, effect of pretransplant therapy, and center effect. 6 tables. 120 references.

- **Open Prostatectomy in Benign Prostatic Hypertrophy**

  Source: in Narayan, P. Benign Prostatic Hyperplasia. London, England: Churchill Livingstone. 2000. p. 369-379.

  Contact: Available from Harcourt Publishers. Foots Cray High Street, Sidcup, Kent DA14 5HP UK. 02083085700. Fax 02083085702. E-mail: cservice@harcourt.com. Website: www.harcourt-international.com. PRICE: $149.00 plus shipping and handling. ISBN: 0443056374.

  Summary: This chapter on the use of open prostatectomy (removal of the prostate) in the clinical management of benign prostatic hyperplasia (BPH) is from a textbook that compiles data and commentary from the world's leading experts in this field. Simple prostatectomy is an efficient, highly effective, and safe surgical treatment for benign obstructive prostatic disease. Successful surgical outcomes remain reliant on proper patient selection and adherence to proven surgical principles. The frequency of this procedure has decreased with the advent of improved endoscopic instruments, drug therapy, and minimally invasive procedures, together with early detection and

treatment of incipient BPH. The authors discuss patient assessment and indications, the preoperative management of the patient, selection of open prostatectomy procedure, the transvesical (suprapubic) prostatectomy, transcapsular (retropubic) prostatectomy, and the complications of open prostatectomy. The authors estimate that open prostatectomy is a procedure which is required in approximately 3 to 5 percent of patients with obstructive BPH. The open prostatectomy techniques have surgical morbidity (complications) associated with an abdominal incision, requirement of anesthesia, possible **blood transfusions,** and wound related problems; other complications can include postoperative urinary incontinence and erectile dysfunction. Each step of the surgical procedures under discussion is illustrated with line drawings. 12 figures. 4 tables. 20 references.

- **Donor and Recipient Selection**

  Source: in Suki, W.N.; Massry, S.G., eds. Therapy of Renal Diseases and Related Disorders, 2nd ed. Hingham, MA: Kluwer Academic Publishers. 1991. p. 867-885.

  Contact: Available from Kluwer Academic Publishers. P.O. Box 358, Accord Station, Hingham, MA 02018. (617) 871-6600. PRICE: $315. ISBN: 0792306767.

  Summary: This chapter, from a medical text on the therapy of renal disease and related disorders, discusses donor and recipient selection for kidney transplantation. The author stresses that the proper evaluation of every potential recipient and donor is critical to ensuring the best clinical outcome and the best utilization of a limited resource. Topics covered include the indications and contraindications for transplantation, causes of renal failure, pretransplant evaluation of the potential recipient, pretransplant surgical preparation, the use of pretransplant **blood transfusions,** selection of renal donors, pretransplant evaluation of the potential living donor, cadaveric donors, the role of tissue typing, and the problem of viral infections. 3 figures. 6 tables. 157 references.

- **Immune Barrier**

  Source: Cambridge, MA: Harvard University Press. 1991. 22 p.

  Contact: Available from Harvard University Press. 79 Garden Street, Cambridge, MA 02138-9983. (617) 495-2577 or (617) 495-2480. PRICE: $24.95 plus shipping and handling. ISBN: 067464235X.

  Summary: This chapter, from a patient education book about organ transplantation, discusses the immunologic issues involved in transplantation. Topics include general problems with organ rejection; the role of the lymphocytes, including their characteristics of specificity, memory, and tolerance; B and T lymphocytes; humoral and cellular immunity; antigens; transplantation antigens; the immune response to transplanted organs, including hyperacute rejection, acute rejection, and chronic rejection; matching donor and recipient; ABO blood group compatibility; HLA matching of related living donors; HLA matching of cadaveric donors; crossmatch testing; sensitization; and **blood transfusions.** The chapter presents detailed medical information about these topics in clear, easy-to-understand language designed for the layperson.

CHAPTER 7. MULTIMEDIA ON BLOOD TRANSFUSIONS

Overview

In this chapter, we show you how to keep current on multimedia sources of information on blood transfusions. 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 blood transfusions is the Combined Health Information Database. You will need to limit your search to "Videorecording" and "blood transfusions" 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 "blood transfusions" (or synonyms) into the "For these words:" box. The following is a typical result when searching for video recordings on blood transfusions:

- **Blood Transfusion Risks and Benefits**

  Contact: American Association of Blood Banks, 8101 Glenbrook Rd, Bethesda, MD, 20814-2749, (301) 907-6977, http://www.aabb.org.

  Summary: The narrator of this videorecording says that according to an opinion poll, 55 per cent of the public in the United States believes that a **blood transfusion** will cause Acquired immunodeficiency syndrome (AIDS), which results from infection by the Human immunodeficiency virus (HIV). Actually, careful screening of donors and blood has virtually eliminated the risk of HIV infection from **blood transfusions,** according to Dr. Harvey Klein, Chief of the Department of Transfusion Medicine at the National Institutes of Health (NIH). He says that of the 13 million units of blood given each year to over four million recipients, possibly 40 to 100 units might be infected with HIV. He adds that it is often possible to make a pre-surgical deposit of your own blood, for what is known as an autologous transfusion. Scenes of laboratories and blood donor centers are accompanied by narration, which tells the viewer that many modern medical

procedures, such as methods of saving extremely premature babies, would be impossible without a source of blood. Dr. Klein says that coronary artery bypass operations and organ transplantation depend on donated blood. Blood today is divided into its components: red cells, white cells, and platelets. Dr. Naomi Luban, of the Children's Hospital Medical Center in Washington, DC, describes how rapidly a child in sickle-cell anemia crisis improves after receiving a transfusion of red blood cells. The narrator concludes with the statement that a steady supply of blood is essential in today's medical science.

- **Blood Transfusions Today**

  Contact: Modern Talking Picture Service, 5000 Park St N, St. Petersburg, FL, 33709, (813) 541-5763.

  Summary: This is a videorecording of a lecture by, and an interview with, a doctor who is doing research in **blood transfusions** and blood substitutes. He stresses the need for blood donors and the fact that Human immunodeficiency virus (HIV), the etiological agent of Acquired immunodeficiency syndrome (AIDS), cannot be transmitted to blood donors. He explains that the screening procedures for donated blood, including self-screening by donors from high-risk groups, have made receiving donated blood a relatively safe procedure. Other screening procedures include testing blood for antibodies to HIV, and testing for hepatitis and other bloodborne diseases. The doctor discusses the history of **blood transfusions** and alternatives to person-to-person transfusion, including donating and storing blood for personal use at some later time. Developments such as transfusion to a fetus, and the use of blood components rather than whole blood, are explored. Future research on methods to inactivate HIV in blood and the potential for synthetic blood are examined. The increasing need for blood as the population of the United States ages is also examined.

Audio Recordings

The Combined Health Information Database contains abstracts on audio productions. To search CHID, go directly to the following hyperlink: **http://chid.nih.gov/detail/detail.html**. To find audio 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 "Sound Recordings." Type "blood transfusions" (or synonyms) into the "For these words:" box. The following is a typical result when searching for sound recordings on blood transfusions:

- **AIDS and Other Transmissible Diseases: Protecting Yourself in the Operating Room**

  Contact: California Medical Association, Audio Digest Foundation, 1577 E Chevy Chase Dr, Glendale, CA, 91206, (213) 245-8505.

  Summary: This sound recording, along with accompanying pre-test and post-test questions, is part of an ongoing series of educational activities. The first speaker, Elizabeth A. Donegan, Assistant Professor of Clinical Laboratory Medicine, University of California, San Francisco, School of Medicine, discusses the major infections transmitted by **blood transfusions** which include cytomegalovirus (CMV), Human immunodeficiency virus (HIV) infection, and HTLV-1. Nancy B. Bjerke, Major, United States Air Force, in North Carolina, and course supervisor/instructor of Sheppard Air Force Base in Texas, talks about the mechanisms for health care worker protection. Her

presentation deals with the most frequent occupational injuries to health-care workers, disease transmission, safety precautions and hepatitis B immunization for health-care workers. The third speaker, Arnold J. Berry, Associate Professor of Anesthesiology, Emory University School of Medicine in Atlanta, looks at disease transmission in the operating room. His presentation deals with the implementation of universal precautions, risks to anesthesiologists other than Acquired immunodeficiency syndrome (AIDS) and Hepatitis B, specific recommendations for anesthesia equipment, handwashing, and infections from intravenous lines. The final speaker, C. Daniel Sooy, Assistant Professor of Otolaryngology, University of California in San Francisco, School of Medicine; and Director of Otolaryngology Clinic, San Francisco General Hospital, discusses policies for protecting the anesthesiologist. This presentation includes universal precautions, preoperative testing for HIV, and exposed health care workers.

CHAPTER 8. PERIODICALS AND NEWS ON BLOOD TRANSFUSIONS

Overview

In this chapter, we suggest a number of news sources and present various periodicals that cover blood transfusions.

News Services and Press Releases

One of the simplest ways of tracking press releases on blood transfusions 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 "blood transfusions" (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 blood transfusions. 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 "blood transfusions" (or synonyms). The following was recently listed in this archive for blood transfusions:

- **West Nile from blood transfusion still possible**
  Source: Reuters Health eLine
  Date: April 08, 2004

- **Possible vCJD transfer by blood transfusion in UK**
  Source: Reuters Health eLine
  Date: December 17, 2003

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 "blood transfusions" (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 "blood transfusions" (or synonyms). If you know the name of a company that is relevant to blood transfusions, 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 "blood transfusions" (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 "blood transfusions" (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 blood transfusions:

- **Statement of the Alzheimer's Association Regarding a Research Paper on Desferrioxamine (Desferal or DFO)**

  Source: Advocate. Alzheimer's Association of Greater Washington, DC Chapter. [Newsletter] 1, 7. June 1991.

  Contact: Available from Alzheimer's Association of Greater Washington, DC Chapter. 7910 Woodmont Avenue, Suite 1100, Bethesda, MD 20814. (301) 652-6446. PRICE: Call for price information.

  Summary: This article discusses the response of the Alzheimer's Association to a research paper on desferrioxamine (Desferal or DFO). Desferal is a drug that is currently approved only for the treatment of iron intoxication or to remove iron overload following repeated **blood transfusions** in patients with thalassemia. In the current study, the drug was administered only to healthy, younger patients. It is not clear what effect Desferal might have on older patients with Alzheimer's disease and other medical conditions. Because there are significant questions about the design of the research study and the mode of action and potential toxicity of Desferal, further studies are required to decide whether Desferal has any potential for the treatment of Alzheimer's Disease.

Academic Periodicals covering Blood Transfusions

Numerous periodicals are currently indexed within the National Library of Medicine's PubMed database that are known to publish articles relating to blood transfusions. In addition to these sources, you can search for articles covering blood transfusions 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."

CHAPTER 9. RESEARCHING MEDICATIONS

Overview

While a number of hard copy or CD-ROM resources are available for researching medications, a more flexible method is to use Internet-based databases. Broadly speaking, there are two sources of information on approved medications: public sources and private sources. We will emphasize free-to-use public sources.

U.S. Pharmacopeia

Because of historical investments by various organizations and the emergence of the Internet, it has become rather simple to learn about the medications recommended for blood transfusions. One such source is the United States Pharmacopeia. In 1820, eleven physicians met in Washington, D.C. to establish the first compendium of standard drugs for the United States. They called this compendium the U.S. Pharmacopeia (USP). Today, the USP is a non-profit organization consisting of 800 volunteer scientists, eleven elected officials, and 400 representatives of state associations and colleges of medicine and pharmacy. The USP is located in Rockville, Maryland, and its home page is located at **http://www.usp.org/**. The USP currently provides standards for over 3,700 medications. The resulting USP DI® Advice for the Patient® can be accessed through the National Library of Medicine of the National Institutes of Health. The database is partially derived from lists of federally approved medications in the Food and Drug Administration's (FDA) Drug Approvals database, located at **http://www.fda.gov/cder/da/da.htm**.

While the FDA database is rather large and difficult to navigate, the Phamacopeia is both user-friendly and free to use. It covers more than 9,000 prescription and over-the-counter medications. To access this database, simply type the following hyperlink into your Web browser: **http://www.nlm.nih.gov/medlineplus/druginformation.html**. To view examples of a given medication (brand names, category, description, preparation, proper use, precautions, side effects, etc.), simply follow the hyperlinks indicated within the United States Pharmacopeia (USP).

Below, we have compiled a list of medications associated with blood transfusions. If you would like more information on a particular medication, the provided hyperlinks will direct you to ample documentation (e.g. typical dosage, side effects, drug-interaction risks, etc.).

The following drugs have been mentioned in the Pharmacopeia and other sources as being potentially applicable to blood transfusions:

Deferoxamine

- **Systemic - U.S. Brands:** Desferal
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/203185.html

Lamivudine and Zidovudine

- **Systemic - U.S. Brands:** Combivir
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/203386.html

Rh o(D) Immune Globulin

- **D - U.S. Brands:** BayRho-D Full Dose; BayRho-D Mini-Dose; MICRhoGAM; RhoGAM; WinRho SDF
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202720.html

Zidovudine

- **Systemic - U.S. Brands:** Retrovir
  http://www.nlm.nih.gov/medlineplus/druginfo/uspdi/202602.html

Commercial Databases

In addition to the medications listed in the USP above, a number of commercial sites are available by subscription to physicians and their institutions. Or, you may be able to access these sources from your local medical library.

Mosby's Drug Consult™

Mosby's Drug Consult™ database (also available on CD-ROM and book format) covers 45,000 drug products including generics and international brands. It provides prescribing information, drug interactions, and patient information. Subscription information is available at the following hyperlink: **http://www.mosbysdrugconsult.com/**.

PDR*health*

The PDR*health* database is a free-to-use, drug information search engine that has been written for the public in layman's terms. It contains FDA-approved drug information adapted from the Physicians' Desk Reference (PDR) database. PDR*health* can be searched by brand name, generic name, or indication. It features multiple drug interactions reports. Search PDR*health* at **http://www.pdrhealth.com/drug_info/index.html**.

Other Web Sites

Drugs.com (**www.drugs.com**) reproduces the information in the Pharmacopeia as well as commercial information. You may also want to consider the Web site of the Medical Letter,

Inc. (**http://www.medletter.com/**) which allows users to download articles on various drugs and therapeutics for a nominal fee.

If you have any questions about a medical treatment, the FDA may have an office near you. Look for their number in the blue pages of the phone book. You can also contact the FDA through its toll-free number, 1-888-INFO-FDA (1-888-463-6332), or on the World Wide Web at **www.fda.gov**.

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[10]:

- 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/**

[10] 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.[11] 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:[12]

- **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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[11] 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**).

[12] 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[13]

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.[14] To use the NLM Gateway, simply go to the search site at **http://gateway.nlm.nih.gov/gw/Cmd**. Type "blood transfusions" (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	56466
Books / Periodicals / Audio Visual	1812
Consumer Health	901
Meeting Abstracts	666
Other Collections	103
Total	59948

HSTAT[15]

HSTAT is a free, Web-based resource that provides access to full-text documents used in healthcare decision-making.[16] 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.[17] Simply search by "blood transfusions" (or synonyms) at the following Web site: **http://text.nlm.nih.gov**.

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[13] Adapted from NLM: **http://gateway.nlm.nih.gov/gw/Cmd?Overview.x**.

[14] 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).

[15] Adapted from HSTAT: **http://www.nlm.nih.gov/pubs/factsheets/hstat.html**.

[16] The HSTAT URL is **http://hstat.nlm.nih.gov/**.

[17] 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[18]

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.[19] 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.[20] 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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[18] Adapted from **http://www.ncbi.nlm.nih.gov/Coffeebreak/Archive/FAQ.html**.

[19] 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.

[20] 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 blood transfusions 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 blood transfusions. 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 blood transfusions. 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 "blood transfusions":

Anemia
http://www.nlm.nih.gov/medlineplus/anemia.html

Blood and Blood Disorders
http://www.nlm.nih.gov/medlineplus/bloodandblooddisorders.html

Blood Transfusion and Donation
http://www.nlm.nih.gov/medlineplus/bloodtransfusionanddonation.html

Infection Control
http://www.nlm.nih.gov/medlineplus/infectioncontrol.html

Sickle Cell Anemia
http://www.nlm.nih.gov/medlineplus/sicklecellanemia.html

Within the health topic page dedicated to blood transfusions, the following was listed:

- General/Overviews

All About Blood
Source: American Association of Blood Banks
http://www.aabb.org/All_About_Blood/FAQs/aabb_faqs.htm

JAMA Patient Page: Blood Donation
Source: American Medical Association
http://www.medem.com/medlb/article_detaillb.cfm?article_ID=ZZZYOYJT20D&sub_cat=395

- Specific Conditions/Aspects

Apheresis
Source: American Red Cross
http://www.redcross.org/services/biomed/0%2C1082%2C0_554_%2C00.html

Blood Frequently Asked Questions: Person's Suitability to Donate Blood
Source: Food and Drug Administration
http://www.fda.gov/cber/faq/bldfaq.htm

Blood Transfusions - Knowing Your Options
Source: America's Blood Centers
http://www.americasblood.org/index.cfm?fuseaction=display.showPage&pageID=247

Donated Blood: Can It Transmit Genetic Diseases?
Source: Mayo Foundation for Medical Education and Research
http://www.mayoclinic.com/invoke.cfm?id=AN00776

FDA Issues Guidance on Severe Acute Respiratory Syndrome to Further Safeguard the Blood Supply
Source: Food and Drug Administration
http://www.fda.gov/bbs/topics/ANSWERS/2003/ANS01215.html

Leukocyte Reduction
Source: American Red Cross
http://www.redcross.org/services/biomed/blood/supply/ulr/factsheet.html

Monkeypox Virus Infections and Blood and Plasma Donors
Source: Center for Biologics Evaluation and Research, Food and Drug Administration
http://www.fda.gov/cber/infosheets/monkeypox.htm

PBSC (Peripheral Blood Stem Cell) Donation Frequently Asked Questions
Source: National Marrow Donor Program
http://www.marrow.org/FAQS/pbsc_faqs.html

Plasma, Serum, Whole Blood: What Do These Terms Mean?
Source: Mayo Foundation for Medical Education and Research
http://www.mayoclinic.com/invoke.cfm?id=AN00675

Receiving a Blood Transfusion: What Every Patient Should Know
Source: American Association of Blood Banks
http://www.aabb.org/All_About_Blood/Receiving_Blood/receive.htm

Umbilical Cord Blood
Source: March of Dimes Birth Defects Foundation
http://www.marchofdimes.com/professionals/681_1160.asp

Universal Blood Donor Type: What Does It Mean?
Source: Mayo Foundation for Medical Education and Research
http://www.mayoclinic.com/invoke.cfm?id=HQ00949

West Nile Virus: Blood Transfusion, Organ Donation and Blood Donation Screening Information: Questions and Answers
Source: National Center for Infectious Diseases
http://www.cdc.gov/ncidod/dvbid/westnile/qa/transfusion.htm

What to Expect When Donating Blood
Source: American Red Cross
http://www.redcross.org/services/biomed/0%2C1082%2C0_553_%2C00.html

- Children

  Truth About Transfusions
  Source: Nemours Foundation
  http://kidshealth.org/kid/feel_better/things/transfusions.html

- From the National Institutes of Health

  Everyone Can Give the Gift of Life
  Source: National Heart, Lung, and Blood Institute
  http://www.nhlbi.nih.gov/health/public/blood/transfusion/g_life_e.htm

- Law and Policy

  American Red Cross Agrees to Revised Consent Decree to Improve Blood Safety
  Source: Food and Drug Administration
  http://www.fda.gov/bbs/topics/NEWS/2003/NEW00891.html

- Organizations

  American Association of Blood Banks
  http://www.aabb.org/

American Red Cross
http://www.redcross.org/

America's Blood Centers
http://www.americasblood.org/

National Heart, Lung, and Blood Institute
http://www.nhlbi.nih.gov/

- Prevention/Screening

Blood Donation Eligibility Guidelines
Source: American Red Cross
http://www.redcross.org/services/biomed/0%2C1082%2C0_557_%2C00.html

Keeping Blood Transfusions Safe: FDA's Multi-Layered Protections for Donated Blood
Source: Food and Drug Administration
http://www.fda.gov/opacom/factsheets/justthefacts/15blood.html

- Research

FDA Approves First Nucleic Acid Test (NAT) System to Screen Whole Blood Donors for Infections with HIV and Hepatitis C
Source: Food and Drug Administration
http://www.fda.gov/bbs/topics/ANSWERS/2002/ANS01140.html

Update on FDA's Continuing Investigation of Particulate Matter in Blood Shows Normal Blood Components and No Evidence for an Increase in Adverse Events
Source: Food and Drug Administration
http://www.fda.gov/bbs/topics/NEWS/2003/NEW00874.html

- Statistics

American Red Cross Blood Donation Statistics
Source: American Red Cross
http://www.redcross.org/services/biomed/blood/supply/stats.html

- Teenagers

Blood
Source: Nemours Foundation
http://kidshealth.org/teen/your_body/body_basics/blood.html

Blood Transfusions
Source: Nemours Foundation
http://kidshealth.org/teen/your_body/medical_care/transfusions.html

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 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 "blood transfusions" (or synonyms). The following was recently posted:

- **Perioperative blood transfusion for elective surgery. A national clinical guideline**

  Source: Scottish Intercollegiate Guidelines Network - National Government Agency [Non-U.S.]; 2001 October; 32 pages

  http://www.guideline.gov/summary/summary.aspx?doc_id=3077&nbr=2303&string=blood+AND+transfusions

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:

- **Blood Information**

  Summary: Visit this site for documents form National Heart, Lung, and Blood Institute (NHLBI) on blood diseases and blood transfusion safety for patients and the general public.

  Source: National Heart, Lung, and Blood Institute, National Institutes of Health

  http://www.healthfinder.gov/scripts/recordpass.asp?RecordType=0&RecordID=702

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 blood transfusions. 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**.

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**

Finding Associations

There are several Internet directories that provide lists of medical associations with information on or resources relating to blood transfusions. By consulting all of associations listed in this chapter, you will have nearly exhausted all sources for patient associations concerned with blood transfusions.

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 blood transfusions. 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 "blood transfusions" (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 "blood transfusions". 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 "blood transfusions" (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 "blood transfusions" (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.[21]

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

[21] 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)[22]:

- **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/**

[22] 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**).

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**

BLOOD TRANSFUSIONS DICTIONARY

The definitions below are derived from official public sources, including the National Institutes of Health [NIH] and the European Union [EU].

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]

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]

Acute renal: A condition in which the kidneys suddenly stop working. In most cases, kidneys can recover from almost complete loss of function. [NIH]

Adenocarcinoma: A malignant epithelial tumor with a glandular organization. [NIH]

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]

Adrenal Glands: Paired glands situated in the retroperitoneal tissues at the superior pole of each kidney. [NIH]

Adverse Effect: An unwanted side effect of treatment. [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]

Agar: A complex sulfated polymer of galactose units, extracted from Gelidium cartilagineum, Gracilaria confervoides, and related red algae. It is used as a gel in the preparation of solid culture media for microorganisms, as a bulk laxative, in making emulsions, and as a supporting medium for immunodiffusion and immunoelectrophoresis. [NIH]

Albumin: 1. Any protein that is soluble in water and moderately concentrated salt solutions and is coagulable by heat. 2. Serum albumin; the major plasma protein (approximately 60 per cent of the total), which is responsible for much of the plasma colloidal osmotic pressure and serves as a transport protein carrying large organic anions, such as fatty acids, bilirubin, and many drugs, and also carrying certain hormones, such as cortisol and thyroxine, when their specific binding globulins are saturated. Albumin is synthesized in the liver. Low serum levels occur in protein malnutrition, active inflammation and serious hepatic and renal disease. [EU]

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]

Alleles: Mutually exclusive forms of the same gene, occupying the same locus on homologous chromosomes, and governing the same biochemical and developmental process. [NIH]

Allergen: An antigenic substance capable of producing immediate-type hypersensitivity (allergy). [EU]

Allium: A genus of liliaceous herbs containing onions (Allium cepa), garlic (Allium sativum), and others; many produce pungent, often bacteriostatic and physiologically active compounds and are used as food, condiment, and medicament, the latter in traditional medicine. [NIH]

Allogeneic: Taken from different individuals of the same species. [NIH]

Allogeneic bone marrow transplantation: A procedure in which a person receives stem cells, the cells from which all blood cells develop, from a compatible, though not genetically identical, donor. [NIH]

Allograft: An organ or tissue transplant between two humans. [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]

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]

Amino Acids: Organic compounds that generally contain an amino (-NH2) and a carboxyl (-COOH) group. Twenty alpha-amino acids are the subunits which are polymerized to form proteins. [NIH]

Amino Acids: Organic compounds that generally contain an amino (-NH2) and a carboxyl (-COOH) group. Twenty alpha-amino acids are the subunits which are polymerized to form proteins. [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]

Amplification: The production of additional copies of a chromosomal DNA sequence, found as either intrachromosomal or extrachromosomal DNA. [NIH]

Ampulla: A sac-like enlargement of a canal or duct. [NIH]

Amyloidosis: A group of diseases in which protein is deposited in specific organs (localized amyloidosis) or throughout the body (systemic amyloidosis). Amyloidosis may be either primary (with no known cause) or secondary (caused by another disease, including some types of cancer). Generally, primary amyloidosis affects the nerves, skin, tongue, joints, heart, and liver; secondary amyloidosis often affects the spleen, kidneys, liver, and adrenal glands. [NIH]

Anaemia: A reduction below normal in the number of erythrocytes per cu. mm., in the quantity of haemoglobin, or in the volume of packed red cells per 100 ml. of blood which occurs when the equilibrium between blood loss (through bleeding or destruction) and

blood production is disturbed. [EU]

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]

Anaphylatoxins: The family of peptides C3a, C4a, C5a, and C5a des-arginine produced in the serum during complement activation. They produce smooth muscle contraction, mast cell histamine release, affect platelet aggregation, and act as mediators of the local inflammatory process. The order of anaphylatoxin activity from strongest to weakest is C5a, C3a, C4a, and C5a des-arginine. The latter is the so-called "classical" anaphylatoxin but shows no spasmogenic activity though it contains some chemotactic ability. [NIH]

Anastomosis: A procedure to connect healthy sections of tubular structures in the body after the diseased portion has been surgically removed. [NIH]

Anemia: A reduction in the number of circulating erythrocytes or in the quantity of hemoglobin. [NIH]

Anemic: Hypoxia due to reduction of the oxygen-carrying capacity of the blood as a result of a decrease in the total hemoglobin or an alteration of the hemoglobin constituents. [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]

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]

Annealing: The spontaneous alignment of two single DNA strands to form a double helix. [NIH]

Anorexia: Lack or loss of appetite for food. Appetite is psychologic, dependent on memory and associations. Anorexia can be brought about by unattractive food, surroundings, or company. [NIH]

Antibiotic: A drug used to treat infections caused by bacteria and other microorganisms. [NIH]

Antibiotic Prophylaxis: Use of antibiotics before, during, or after a diagnostic, therapeutic, or surgical procedure to prevent infectious complications. [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]

Anticoagulant: A drug that helps prevent blood clots from forming. Also called a blood thinner. [NIH]

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]

Antigen-Antibody Complex: The complex formed by the binding of antigen and antibody molecules. The deposition of large antigen-antibody complexes leading to tissue damage causes immune complex diseases. [NIH]

Antimicrobial: Killing microorganisms, or suppressing their multiplication or growth. [EU]

Antineoplastic: Inhibiting or preventing the development of neoplasms, checking the maturation and proliferation of malignant cells. [EU]

Antioxidant: A substance that prevents damage caused by free radicals. Free radicals are highly reactive chemicals that often contain oxygen. They are produced when molecules are split to give products that have unpaired electrons. This process is called oxidation. [NIH]

Antiseptic: A substance that inhibits the growth and development of microorganisms without necessarily killing them. [EU]

Anus: The opening of the rectum to the outside of the body. [NIH]

Aorta: The main trunk of the systemic arteries. [NIH]

Apathy: Lack of feeling or emotion; indifference. [EU]

Aplastic anaemia: A form of anaemia generally unresponsive to specific antianaemia therapy, often accompanied by granulocytopenia and thrombocytopenia, in which the bone marrow may not necessarily be acellular or hypoplastic but fails to produce adequate numbers of peripheral blood elements. The term actually is all-inclusive and most probably encompasses several clinical syndromes. [EU]

Aplastic anemia: A condition in which the bone marrow is unable to produce blood cells. [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]

Aqueous: Having to do with water. [NIH]

Arginine: An essential amino acid that is physiologically active in the L-form. [NIH]

Arginine butyrate: A substance that is being studied as a treatment for cancer. [NIH]

Arterial: Pertaining to an artery or to the arteries. [EU]

Arteries: The vessels carrying blood away from the heart. [NIH]

Arteriolar: Pertaining to or resembling arterioles. [EU]

Arterioles: The smallest divisions of the arteries located between the muscular arteries and the capillaries. [NIH]

Artery: Vessel-carrying blood from the heart to various parts of the body. [NIH]

Arthroplasty: Surgical reconstruction of a joint to relieve pain or restore motion. [NIH]

Artificial Eye: Usually made of artificial plastic material or glass to which small quantities of

metallic oxides have been added in order to imitate the features and coloring of the various parts of t he human eye; a prosthesis made of glass, plastic, or similar material. [NIH]

Artificial Limbs: Prosthetic replacements for arms, legs, and parts therof. [NIH]

Artificial Organs: Devices intended to replace non-functioning organs. They may be temporary or permanent. Since they are intended always to function as the natural organs they are replacing, they should be differentiated from prostheses and implants and specific types of prostheses which, though also replacements for body parts, are frequently cosmetic (artificial eye) as well as functional (artificial limbs). [NIH]

Ascites: Accumulation or retention of free fluid within the peritoneal cavity. [NIH]

Aspirate: Fluid withdrawn from a lump, often a cyst, or a nipple. [NIH]

Assay: Determination of the amount of a particular constituent of a mixture, or of the biological or pharmacological potency of a drug. [EU]

Asymptomatic: Having no signs or symptoms of disease. [NIH]

Atmospheric Pressure: The pressure at any point in an atmosphere due solely to the weight of the atmospheric gases above the point concerned. [NIH]

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]

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]

Autologous: Taken from an individual's own tissues, cells, or DNA. [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]

Bactericidal: Substance lethal to bacteria; substance capable of killing bacteria. [NIH]

Bacteriostatic: 1. Inhibiting the growth or multiplication of bacteria. 2. An agent that inhibits the growth or multiplication of bacteria. [EU]

Bacterium: Microscopic organism which may have a spherical, rod-like, or spiral unicellular or non-cellular body. Bacteria usually reproduce through asexual processes. [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]

Basement Membrane: Ubiquitous supportive tissue adjacent to epithelium and around smooth and striated muscle cells. This tissue contains intrinsic macromolecular components such as collagen, laminin, and sulfated proteoglycans. As seen by light microscopy one of its subdivisions is the basal (basement) lamina. [NIH]

Benign: Not cancerous; does not invade nearby tissue or spread to other parts of the body. [NIH]

Benign prostatic hyperplasia: A benign (noncancerous) condition in which an overgrowth of prostate tissue pushes against the urethra and the bladder, blocking the flow of urine. Also called benign prostatic hypertrophy or BPH. [NIH]

Beta-Thalassemia: A disorder characterized by reduced synthesis of the beta chains of

hemoglobin. There is retardation of hemoglobin A synthesis in the heterozygous form (thalassemia minor), which is asymptomatic, while in the homozygous form (thalassemia major, Cooley's anemia, Mediterranean anemia, erythroblastic anemia), which can result in severe complications and even death, hemoglobin A synthesis is absent. [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]

Bile Pigments: Pigments that give a characteristic color to bile including: bilirubin, biliverdine, and bilicyanin. [NIH]

Bilirubin: A bile pigment that is a degradation product of heme. [NIH]

Bioavailable: The ability of a drug or other substance to be absorbed and used by the body. Orally bioavailable means that a drug or other substance that is taken by mouth can be absorbed and used by the body. [NIH]

Biochemical: Relating to biochemistry; characterized by, produced by, or involving chemical reactions in living organisms. [EU]

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]

Bioterrorism: The use of biological agents in terrorism. This includes the malevolent use of bacteria, viruses, or toxins against people, animals, or plants. [NIH]

Biotinylation: Incorporation of biotinyl groups into molecules. [NIH]

Biotransformation: The chemical alteration of an exogenous substance by or in a biological system. The alteration may inactivate the compound or it may result in the production of an active metabolite of an inactive parent compound. The alteration may be either non-synthetic (oxidation-reduction, hydrolysis) or synthetic (glucuronide formation, sulfate conjugation, acetylation, methylation). This also includes metabolic detoxication and clearance. [NIH]

Bladder: The organ that stores urine. [NIH]

Bleeding Time: Duration of blood flow after skin puncture. This test is used as a measure of capillary and platelet function. [NIH]

Blood Cell Count: A count of the number of leukocytes and erythrocytes per unit volume in a sample of venous blood. A complete blood count (CBC) also includes measurement of the hemoglobin, hematocrit, and erythrocyte indices. [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 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 Substitutes: Substances that can carry oxygen to and carbon dioxide away from the tissues when introduced into the blood stream. They are used to replace hemoglobin in

severe hemorrhage and also to perfuse isolated organs. The best known are perfluorocarbon emulsions and various hemoglobin solutions. [NIH]

Blood transfusion: The administration of blood or blood products into a blood vessel. [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]

Blood Viscosity: The internal resistance of the blood to shear forces. The in vitro measure of whole blood viscosity is of limited clinical utility because it bears little relationship to the actual viscosity within the circulation, but an increase in the viscosity of circulating blood can contribute to morbidity in patients suffering from disorders such as sickle cell anemia and polycythemia. [NIH]

Body Fluids: Liquid components of living organisms. [NIH]

Bone Marrow: The soft tissue filling the cavities of bones. Bone marrow exists in two types, yellow and red. Yellow marrow is found in the large cavities of large bones and consists mostly of fat cells and a few primitive blood cells. Red marrow is a hematopoietic tissue and is the site of production of erythrocytes and granular leukocytes. Bone marrow is made up of a framework of connective tissue containing branching fibers with the frame being filled with marrow cells. [NIH]

Bone Marrow Transplantation: The transference of bone marrow from one human or animal to another. [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]

Bypass: A surgical procedure in which the doctor creates a new pathway for the flow of body fluids. [NIH]

Cadaver: A dead body, usually a human body. [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]

Capillary: Any one of the minute vessels that connect the arterioles and venules, forming a network in nearly all parts of the body. Their walls act as semipermeable membranes for the interchange of various substances, including fluids, between the blood and tissue fluid; called also vas capillare. [EU]

Capillary Permeability: Property of blood capillary walls that allows for the selective exchange of substances. Small lipid-soluble molecules such as carbon dioxide and oxygen move freely by diffusion. Water and water-soluble molecules cannot pass through the endothelial walls and are dependent on microscopic pores. These pores show narrow areas (tight junctions) which may limit large molecule movement. [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]

Carcinoma: Cancer that begins in the skin or in tissues that line or cover internal organs. [NIH]

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]

Cardiopulmonary Bypass: Diversion of the flow of blood from the entrance of the right atrium directly to the aorta (or femoral artery) via an oxygenator thus bypassing both the heart and lungs. [NIH]

Cardiovascular: Having to do with the heart and blood vessels. [NIH]

Cardiovascular disease: Any abnormal condition characterized by dysfunction of the heart and blood vessels. CVD includes atherosclerosis (especially coronary heart disease, which can lead to heart attacks), cerebrovascular disease (e.g., stroke), and hypertension (high blood pressure). [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-Control Studies: Studies which start with the identification of persons with a disease of interest and a control (comparison, referent) group without the disease. The relationship of an attribute to the disease is examined by comparing diseased and non-diseased persons with regard to the frequency or levels of the attribute in each group. [NIH]

Catheters: A small, flexible tube that may be inserted into various parts of the body to inject or remove liquids. [NIH]

Cause of Death: Factors which produce cessation of all vital bodily functions. They can be analyzed from an epidemiologic viewpoint. [NIH]

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]

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]

Centrifugation: A method of separating organelles or large molecules that relies upon differential sedimentation through a preformed density gradient under the influence of a gravitational field generated in a centrifuge. [NIH]

Cerebral: Of or pertaining of the cerebrum or the brain. [EU]

Cerebral Palsy: Refers to a motor disability caused by a brain dysfunction. [NIH]

Cerebrovascular: Pertaining to the blood vessels of the cerebrum, or brain. [EU]

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]

Cetylpyridinium: Cationic bactericidal surfactant used as a topical antiseptic for skin, wounds, mucous membranes, instruments, etc.; and also as a component in mouthwash and lozenges. [NIH]

Chelation: Combination with a metal in complexes in which the metal is part of a ring. [EU]

Chemotactic Factors: Chemical substances that attract or repel cells or organisms. The concept denotes especially those factors released as a result of tissue injury, invasion, or immunologic activity, that attract leukocytes, macrophages, or other cells to the site of infection or insult. [NIH]

Chemotherapy: Treatment with anticancer drugs. [NIH]

Chlorides: Inorganic compounds derived from hydrochloric acid that contain the Cl- ion. [NIH]

Cholera: An acute diarrheal disease endemic in India and Southeast Asia whose causative agent is vibrio cholerae. This condition can lead to severe dehydration in a matter of hours unless quickly treated. [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]

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]

Cirrhosis: A type of chronic, progressive liver disease. [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]

Clear cell carcinoma: A rare type of tumor of the female genital tract in which the inside of the cells looks clear when viewed under a microscope. [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]

Coagulation: 1. The process of clot formation. 2. In colloid chemistry, the solidification of a sol into a gelatinous mass; an alteration of a disperse phase or of a dissolved solid which causes the separation of the system into a liquid phase and an insoluble mass called the clot or curd. Coagulation is usually irreversible. 3. In surgery, the disruption of tissue by physical means to form an amorphous residuum, as in electrocoagulation and photocoagulation. [EU]

Cochlea: The part of the internal ear that is concerned with hearing. It forms the anterior part of the labyrinth, is conical, and is placed almost horizontally anterior to the vestibule. [NIH]

Cochlear: Of or pertaining to the cochlea. [EU]

Cochlear Implants: Electronic devices implanted beneath the skin with electrodes to the cochlear nerve to create sound sensation in persons with sensorineural deafness. [NIH]

Cochlear Nerve: The cochlear part of the 8th cranial nerve (vestibulocochlear nerve). The cochlear nerve fibers originate from neurons of the spiral ganglion and project peripherally to cochlear hair cells and centrally to the cochlear nuclei (cochlear nucleus) of the brain stem. They mediate the sense of hearing. [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]

Colloidal: Of the nature of a colloid. [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]

Colorectal: Having to do with the colon or the rectum. [NIH]

Colorectal Cancer: Cancer that occurs in the colon (large intestine) or the rectum (the end of the large intestine). A number of digestive diseases may increase a person's risk of colorectal cancer, including polyposis and Zollinger-Ellison Syndrome. [NIH]

Colorectal Surgery: A surgical specialty concerned with the diagnosis and treatment of disorders and abnormalities of the colon, rectum, and anal canal. [NIH]

Communicable disease: A disease that can be transmitted by contact between persons. [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]

Complementation: The production of a wild-type phenotype when two different mutations are combined in a diploid or a heterokaryon and tested in trans-configuration. [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]

Conception: The onset of pregnancy, marked by implantation of the blastocyst; the formation of a viable zygote. [EU]

Concomitant: Accompanying; accessory; joined with another. [EU]

Confidence Intervals: A range of values for a variable of interest, e.g., a rate, constructed so that this range has a specified probability of including the true value of the variable. [NIH]

Congestion: Excessive or abnormal accumulation of blood in a part. [EU]

Congestive heart failure: Weakness of the heart muscle that leads to a buildup of fluid in body tissues. [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]

Consciousness: Sense of awareness of self and of the environment. [NIH]

Constipation: Infrequent or difficult evacuation of feces. [NIH]

Contamination: The soiling or pollution by inferior material, as by the introduction of organisms into a wound, or sewage into a stream. [EU]

Contraception: Use of agents, devices, methods, or procedures which diminish the likelihood of or prevent conception. [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]

Convulsions: A general term referring to sudden and often violent motor activity of cerebral or brainstem origin. Convulsions may also occur in the absence of an electrical cerebral discharge (e.g., in response to hypotension). [NIH]

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 Artery Bypass: Surgical therapy of ischemic coronary artery disease achieved by grafting a section of saphenous vein, internal mammary artery, or other substitute between the aorta and the obstructed coronary artery distal to the obstructive lesion. [NIH]

Coronary heart disease: A type of heart disease caused by narrowing of the coronary arteries that feed the heart, which needs a constant supply of oxygen and nutrients carried by the blood in the coronary arteries. When the coronary arteries become narrowed or clogged by fat and cholesterol deposits and cannot supply enough blood to the heart, CHD results. [NIH]

Coronary Thrombosis: Presence of a thrombus in a coronary artery, often causing a myocardial infarction. [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]

Cortisol: A steroid hormone secreted by the adrenal cortex as part of the body's response to stress. [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]

Culture Media: Any liquid or solid preparation made specifically for the growth, storage, or transport of microorganisms or other types of cells. The variety of media that exist allow for the culturing of specific microorganisms and cell types, such as differential media, selective media, test media, and defined media. Solid media consist of liquid media that have been solidified with an agent such as agar or gelatin. [NIH]

Curative: Tending to overcome disease and promote recovery. [EU]

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]

Cyclosporine: A drug used to help reduce the risk of rejection of organ and bone marrow transplants by the body. It is also used in clinical trials to make cancer cells more sensitive to anticancer drugs. [NIH]

Cyst: A sac or capsule filled with fluid. [NIH]

Cytokine: Small but highly potent protein that modulates the activity of many cell types, including T and B cells. [NIH]

Cytomegalovirus: A genus of the family Herpesviridae, subfamily Betaherpesvirinae, infecting the salivary glands, liver, spleen, lungs, eyes, and other organs, in which they produce characteristically enlarged cells with intranuclear inclusions. Infection with Cytomegalovirus is also seen as an opportunistic infection in AIDS. [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]

Deamination: The removal of an amino group (NH2) from a chemical compound. [NIH]

Degenerative: Undergoing degeneration : tending to degenerate; having the character of or involving degeneration; causing or tending to cause degeneration. [EU]

Dehydration: The condition that results from excessive loss of body water. [NIH]

Deletion: A genetic rearrangement through loss of segments of DNA (chromosomes), bringing sequences, which are normally separated, into close proximity. [NIH]

Delirium: (DSM III-R) an acute, reversible organic mental disorder characterized by reduced ability to maintain attention to external stimuli and disorganized thinking as manifested by rambling, irrelevant, or incoherent speech; there are also a reduced level of consciousness, sensory misperceptions, disturbance of the sleep-wakefulness cycle and level of psychomotor activity, disorientation to time, place, or person, and memory impairment. Delirium may be caused by a large number of conditions resulting in derangement of cerebral metabolism, including systemic infection, poisoning, drug intoxication or withdrawal, seizures or head trauma, and metabolic disturbances such as hypoxia, hypoglycaemia, fluid, electrolyte, or acid-base imbalances, or hepatic or renal failure. Called also acute confusional state and acute brain syndrome. [EU]

Denaturation: Rupture of the hydrogen bonds by heating a DNA solution and then cooling it rapidly causes the two complementary strands to separate. [NIH]

DES: Diethylstilbestrol. A synthetic hormone that was prescribed from the early 1940s until

1971 to help women with complications of pregnancy. DES has been linked to an increased risk of clear cell carcinoma of the vagina in daughters of women who used DES. DES may also increase the risk of breast cancer in women who used DES. [NIH]

Desensitization: The prevention or reduction of immediate hypersensitivity reactions by administration of graded doses of allergen; called also hyposensitization and immunotherapy. [EU]

Developing Countries: Countries in the process of change directed toward economic growth, that is, an increase in production, per capita consumption, and income. The process of economic growth involves better utilization of natural and human resources, which results in a change in the social, political, and economic structures. [NIH]

Diabetes Mellitus: A heterogeneous group of disorders that share glucose intolerance in common. [NIH]

Diagnostic Errors: Incorrect diagnoses after clinical examination or technical diagnostic procedures. [NIH]

Diagnostic procedure: A method used to identify a disease. [NIH]

Dialysate: A cleansing liquid used in the two major forms of dialysis--hemodialysis and peritoneal dialysis. [NIH]

Dialyzer: A part of the hemodialysis machine. (See hemodialysis under dialysis.) The dialyzer has two sections separated by a membrane. One section holds dialysate. The other holds the patient's blood. [NIH]

Diastolic: Of or pertaining to the diastole. [EU]

Diffusion: The tendency of a gas or solute to pass from a point of higher pressure or concentration to a point of lower pressure or concentration and to distribute itself throughout the available space; a major mechanism of biological transport. [NIH]

Digestion: The process of breakdown of food for metabolism and use by the body. [NIH]

Dilation: A process by which the pupil is temporarily enlarged with special eye drops (mydriatic); allows the eye care specialist to better view the inside of the eye. [NIH]

Diploid: Having two sets of chromosomes. [NIH]

Direct: 1. Straight; in a straight line. 2. Performed immediately and without the intervention of subsidiary means. [EU]

Discrimination: The act of qualitative and/or quantitative differentiation between two or more stimuli. [NIH]

Disease Transmission: The transmission of infectious disease or pathogens. When transmission is within the same species, the mode can be horizontal (disease transmission, horizontal) or vertical (disease transmission, vertical). [NIH]

Disease Transmission, Horizontal: The transmission of infectious disease or pathogens from one individual to another in the same generation. [NIH]

Disease Transmission, Vertical: The transmission of infectious disease or pathogens from one generation to another. It includes transmission in utero or intrapartum by exposure to blood and secretions, and postpartum exposure via breastfeeding. [NIH]

Disorientation: The loss of proper bearings, or a state of mental confusion as to time, place, or identity. [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]

Dose-dependent: Refers to the effects of treatment with a drug. If the effects change when

the dose of the drug is changed, the effects are said to be dose dependent. [NIH]

Dose-limiting: Describes side effects of a drug or other treatment that are serious enough to prevent an increase in dose or level of that treatment. [NIH]

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]

Drug Interactions: The action of a drug that may affect the activity, metabolism, or toxicity of another drug. [NIH]

Drug Resistance: Diminished or failed response of an organism, disease or tissue to the intended effectiveness of a chemical or drug. It should be differentiated from drug tolerance which is the progressive diminution of the susceptibility of a human or animal to the effects of a drug, as a result of continued administration. [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]

Duodenum: The first part of the small intestine. [NIH]

Eclampsia: Onset of convulsions or coma in a previously diagnosed pre-eclamptic patient. [NIH]

Edema: Excessive amount of watery fluid accumulated in the intercellular spaces, most commonly present in subcutaneous tissue. [NIH]

Effector: It is often an enzyme that converts an inactive precursor molecule into an active second messenger. [NIH]

Effector cell: A cell that performs a specific function in response to a stimulus; usually used to describe cells in the immune system. [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]

Elastin: The protein that gives flexibility to tissues. [NIH]

Elective: Subject to the choice or decision of the patient or physician; applied to procedures that are advantageous to the patient but not urgent. [EU]

Electrocoagulation: Electrosurgical procedures used to treat hemorrhage (e.g., bleeding ulcers) and to ablate tumors, mucosal lesions, and refractory arrhythmias. [NIH]

Electrolyte: A substance that dissociates into ions when fused or in solution, and thus becomes capable of conducting electricity; an ionic solute. [EU]

Electrons: Stable elementary particles having the smallest known negative charge, present in all elements; also called negatrons. Positively charged electrons are called positrons. The numbers, energies and arrangement of electrons around atomic nuclei determine the chemical identities of elements. Beams of electrons are called cathode rays or beta rays, the latter being a high-energy biproduct of nuclear decay. [NIH]

Embryo: The prenatal stage of mammalian development characterized by rapid morphological changes and the differentiation of basic structures. [NIH]

Emergency Medical Services: Services specifically designed, staffed, and equipped for the emergency care of patients. [NIH]

Emergency Treatment: First aid or other immediate intervention for accidents or medical

conditions requiring immediate care and treatment before definitive medical and surgical management can be procured. [NIH]

Emulsion: A preparation of one liquid distributed in small globules throughout the body of a second liquid. The dispersed liquid is the discontinuous phase, and the dispersion medium is the continuous phase. When oil is the dispersed liquid and an aqueous solution is the continuous phase, it is known as an oil-in-water emulsion, whereas when water or aqueous solution is the dispersed phase and oil or oleaginous substance is the continuous phase, it is known as a water-in-oil emulsion. Pharmaceutical emulsions for which official standards have been promulgated include cod liver oil emulsion, cod liver oil emulsion with malt, liquid petrolatum emulsion, and phenolphthalein in liquid petrolatum emulsion. [EU]

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]

Endemic: Present or usually prevalent in a population or geographical area at all times; said of a disease or agent. Called also endemial. [EU]

Endogenous: Produced inside an organism or cell. The opposite is external (exogenous) production. [NIH]

Endoscope: A thin, lighted tube used to look at tissues inside the body. [NIH]

Endoscopic: A technique where a lateral-view endoscope is passed orally to the duodenum for visualization of the ampulla of Vater. [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]

Endotoxins: Toxins closely associated with the living cytoplasm or cell wall of certain microorganisms, which do not readily diffuse into the culture medium, but are released upon lysis of the cells. [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]

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]

Epidermal: Pertaining to or resembling epidermis. Called also epidermic or epidermoid. [EU]

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]

Epithelial: Refers to the cells that line the internal and external surfaces of the body. [NIH]

Epithelial Cells: Cells that line the inner and outer surfaces of the body. [NIH]

Epithelium: One or more layers of epithelial cells, supported by the basal lamina, which covers the inner or outer surfaces of the body. [NIH]

Erectile: The inability to get or maintain an erection for satisfactory sexual intercourse. Also called impotence. [NIH]

Erection: The condition of being made rigid and elevated; as erectile tissue when filled with blood. [EU]

ERV: The expiratory reserve volume is the largest volume of gas that can be expired from the end-expiratory level. [NIH]

Erythroblasts: Immature, nucleated erythrocytes occupying the stage of erythropoiesis that follows formation of erythroid progenitor cells and precedes formation of reticulocytes. Popularly called normoblasts. [NIH]

Erythrocytes: Red blood cells. Mature erythrocytes are non-nucleated, biconcave disks containing hemoglobin whose function is to transport oxygen. [NIH]

Erythroid Progenitor Cells: Committed, erythroid stem cells derived from myeloid stem cells. The progenitor cells develop in two phases: erythroid burst-forming units (BFU-E) followed by erythroid colony-forming units (CFU-E). BFU-E differentiate into CFU-E on stimulation by erythropoietin, and then further differentiate into erythroblasts when stimulated by other factors. [NIH]

Erythropoiesis: The production of erythrocytes. [EU]

Erythropoietin: Glycoprotein hormone, secreted chiefly by the kidney in the adult and the liver in the fetus, that acts on erythroid stem cells of the bone marrow to stimulate proliferation and differentiation. [NIH]

Escalation: Progressive use of more harmful drugs. [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]

Evacuation: An emptying, as of the bowels. [EU]

Evoke: The electric response recorded from the cerebral cortex after stimulation of a peripheral sense organ. [NIH]

Exhaustion: The feeling of weariness of mind and body. [NIH]

Exogenous: Developed or originating outside the organism, as exogenous disease. [EU]

Expander: Any of several colloidal substances of high molecular weight. used as a blood or plasma substitute in transfusion for increasing the volume of the circulating blood. called also extender. [NIH]

Expiratory: The volume of air which leaves the breathing organs in each expiration. [NIH]

Expiratory Reserve Volume: The extra volume of air that can be expired with maximum effort beyond the level reached at the end of a normal, quiet expiration. Common abbreviation is ERV. [NIH]

Expressed Sequence Tags: Sequence tags derived from cDNAs. Expressed sequence tags (ESTs) are partial DNA sequences from clones. [NIH]

Extender: Any of several colloidal substances of high molecular weight, used as a blood or plasma substitute in transfusion for increasing the volume of the circulating blood. [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 Matrix Proteins: Macromolecular organic compounds that contain carbon, hydrogen, oxygen, nitrogen, and usually, sulfur. These macromolecules (proteins) form an intricate meshwork in which cells are embedded to construct tissues. Variations in the relative types of macromolecules and their organization determine the type of extracellular matrix, each adapted to the functional requirements of the tissue. The two main classes of macromolecules that form the extracellular matrix are: glycosaminoglycans, usually linked to proteins (proteoglycans), and fibrous proteins (e.g., collagen, elastin, fibronectins and laminin). [NIH]

Extracellular Space: Interstitial space between cells, occupied by fluid as well as amorphous and fibrous substances. [NIH]

Extracorporeal: Situated or occurring outside the body. [EU]

Extracorporeal Circulation: Diversion of blood flow through a circuit located outside the body but continuous with the bodily circulation. [NIH]

Extraction: The process or act of pulling or drawing out. [EU]

Extremity: A limb; an arm or leg (membrum); sometimes applied specifically to a hand or foot. [EU]

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]

Febrile: Pertaining to or characterized by fever. [EU]

Feces: The excrement discharged from the intestines, consisting of bacteria, cells exfoliated from the intestines, secretions, chiefly of the liver, and a small amount of food residue. [EU]

Femoral: Pertaining to the femur, or to the thigh. [EU]

Femoral Artery: The main artery of the thigh, a continuation of the external iliac artery. [NIH]

Femur: The longest and largest bone of the skeleton, it is situated between the hip and the knee. [NIH]

Ferritin: An iron-containing protein complex that is formed by a combination of ferric iron with the protein apoferritin. [NIH]

Fetal Hemoglobin: The major component of hemoglobin in the fetus. This hemoglobin has two alpha and two gamma polypeptide subunits in comparison to normal adult hemoglobin, which has two alpha and two beta polypeptide subunits. Fetal hemoglobin concentrations can be elevated (usually above 0.5%) in children and adults affected by leukemia and several types of anemia. [NIH]

Fetus: The developing offspring from 7 to 8 weeks after conception until birth. [NIH]

Fibrin: A protein derived from fibrinogen in the presence of thrombin, which forms part of the blood clot. [NIH]

Fibrinogen: Plasma glycoprotein clotted by thrombin, composed of a dimer of three non-identical pairs of polypeptide chains (alpha, beta, gamma) held together by disulfide bonds. Fibrinogen clotting is a sol-gel change involving complex molecular arrangements: whereas

fibrinogen is cleaved by thrombin to form polypeptides A and B, the proteolytic action of other enzymes yields different fibrinogen degradation products. [NIH]

Fibrinolytic: Pertaining to, characterized by, or causing the dissolution of fibrin by enzymatic action [EU]

Fibrinolytic Agents: Fibrinolysin or agents that convert plasminogen to fibrinolysin (plasmin). [NIH]

Fibronectins: Glycoproteins found on the surfaces of cells, particularly in fibrillar structures. The proteins are lost or reduced when these cells undergo viral or chemical transformation. They are highly susceptible to proteolysis and are substrates for activated blood coagulation factor VIII. The forms present in plasma are called cold-insoluble globulins. [NIH]

Fibrosis: Any pathological condition where fibrous connective tissue invades any organ, usually as a consequence of inflammation or other injury. [NIH]

Filtration: The passage of a liquid through a filter, accomplished by gravity, pressure, or vacuum (suction). [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]

Foetal: Of or pertaining to a fetus; pertaining to in utero development after the embryonic period. [EU]

Foramen: A natural hole of perforation, especially one in a bone. [NIH]

Forearm: The part between the elbow and the wrist. [NIH]

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]

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]

Gastric: Having to do with the stomach. [NIH]

Gastric Juices: Liquids produced in the stomach to help break down food and kill bacteria. [NIH]

Gastrointestinal: Refers to 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]

Genetic Engineering: Directed modification of the gene complement of a living organism by such techniques as altering the DNA, substituting genetic material by means of a virus, transplanting whole nuclei, transplanting cell hybrids, etc. [NIH]

Genetic testing: Analyzing DNA to look for a genetic alteration that may indicate an increased risk for developing a specific disease or disorder. [NIH]

Genetics: The biological science that deals with the phenomena and mechanisms of heredity. [NIH]

Genital: Pertaining to the genitalia. [EU]

Genotype: The genetic constitution of the individual; the characterization of the genes. [NIH]

Gestation: The period of development of the young in viviparous animals, from the time of fertilization of the ovum until birth. [EU]

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]

Glomerular: Pertaining to or of the nature of a glomerulus, especially a renal glomerulus. [EU]

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]

Glucose Intolerance: A pathological state in which the fasting plasma glucose level is less than 140 mg per deciliter and the 30-, 60-, or 90-minute plasma glucose concentration following a glucose tolerance test exceeds 200 mg per deciliter. This condition is seen frequently in diabetes mellitus but also occurs with other diseases. [NIH]

Glucuronic Acid: Derivatives of uronic acid found throughout the plant and animal kingdoms. They detoxify drugs and toxins by conjugating with them to form glucuronides in the liver which are more water-soluble metabolites that can be easily eliminated from the body. [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]

Glycosaminoglycans: Heteropolysaccharides which contain an N-acetylated hexosamine in a characteristic repeating disaccharide unit. The repeating structure of each disaccharide involves alternate 1,4- and 1,3-linkages consisting of either N-acetylglucosamine or N-acetylgalactosamine. [NIH]

Gonadal: Pertaining to a gonad. [EU]

Gonorrhea: Acute infectious disease characterized by primary invasion of the urogenital tract. The etiologic agent, Neisseria gonorrhoeae, was isolated by Neisser in 1879. [NIH]

Governing Board: The group in which legal authority is vested for the control of health-related institutions and organizations. [NIH]

Grade: The grade of a tumor depends on how abnormal the cancer cells look under a microscope and how quickly the tumor is likely to grow and spread. Grading systems are

different for each type of cancer. [NIH]

Graft: Healthy skin, bone, or other tissue taken from one part of the body and used to replace diseased or injured tissue removed from another part of the body. [NIH]

Graft Rejection: An immune response with both cellular and humoral components, directed against an allogeneic transplant, whose tissue antigens are not compatible with those of the recipient. [NIH]

Graft Survival: The survival of a graft in a host, the factors responsible for the survival and the changes occurring within the graft during growth in the host. [NIH]

Grafting: The operation of transfer of tissue from one site to another. [NIH]

Granulocytopenia: A deficiency in the number of granulocytes, a type of white blood cell. [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]

Haemodialysis: The removal of certain elements from the blood by virtue of the difference in the rates of their diffusion through a semipermeable membrane, e.g., by means of a haemodialyzer. [EU]

Handwashing: The act of cleansing the hands with water or other liquid, with or without the inclusion of soap or other detergent, for the purpose of removing soil or microorganisms. [NIH]

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]

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]

Heart attack: A seizure of weak or abnormal functioning of the heart. [NIH]

Heart failure: Loss of pumping ability by the heart, often accompanied by fatigue, breathlessness, and excess fluid accumulation in body tissues. [NIH]

Heart Transplantation: The transference of a heart from one human or animal to another. [NIH]

Hematocrit: Measurement of the volume of packed red cells in a blood specimen by centrifugation. The procedure is performed using a tube with graduated markings or with automated blood cell counters. It is used as an indicator of erythrocyte status in disease. For example, anemia shows a low hematocrit, polycythemia, high values. [NIH]

Hematologic Diseases: Disorders of the blood and blood forming tissues. [NIH]

Hematology: A subspecialty of internal medicine concerned with morphology, physiology, and pathology of the blood and blood-forming tissues. [NIH]

Hematopoiesis: The development and formation of various types of blood cells. [NIH]

Hemochromatosis: A disease that occurs when the body absorbs too much iron. The body

stores the excess iron in the liver, pancreas, and other organs. May cause cirrhosis of the liver. Also called iron overload disease. [NIH]

Hemodialysis: The use of a machine to clean wastes from the blood after the kidneys have failed. The blood travels through tubes to a dialyzer, which removes wastes and extra fluid. The cleaned blood then flows through another set of tubes back into the body. [NIH]

Hemodilution: Reduction of blood viscosity usually by the addition of cell free solutions. Used clinically l) in states of impaired microcirculation, 2) for replacement of intraoperative blood loss without homologous blood transfusion, and 3) in cardiopulmonary bypass and hypothermia. [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]

Hemoglobin A: Normal adult human hemoglobin. The globin moiety consists of two alpha and two beta chains. [NIH]

Hemoglobin C: A commonly occurring abnormal hemoglobin in which lysine replaces a glutamic acid residue at the sixth position of the beta chains. It results in reduced plasticity of erythrocytes. [NIH]

Hemoglobin H: An abnormal hemoglobin composed of four beta chains. It is caused by the reduced synthesis of the alpha chain. This abnormality results in alpha-thalassemia. [NIH]

Hemoglobin M: A group of abnormal hemoglobins in which amino acid substitutions take place in either the alpha or beta chains but near the heme iron. This results in facilitated oxidation of the hemoglobin to yield excess methemoglobin which leads to cyanosis. [NIH]

Hemoglobinopathies: A group of inherited disorders characterized by structural alterations within the hemoglobin molecule. [NIH]

Hemolytic: A disease that affects the blood and blood vessels. It destroys red blood cells, cells that cause the blood to clot, and the lining of blood vessels. HUS is often caused by the Escherichia coli bacterium in contaminated food. People with HUS may develop acute renal failure. [NIH]

Hemophilia: Refers to a group of hereditary disorders in which affected individuals fail to make enough of certain proteins needed to form blood clots. [NIH]

Hemorrhage: Bleeding or escape of blood from a vessel. [NIH]

Heparin: Heparinic acid. A highly acidic mucopolysaccharide formed of equal parts of sulfated D-glucosamine and D-glucuronic acid with sulfaminic bridges. The molecular weight ranges from six to twenty thousand. Heparin occurs in and is obtained from liver, lung, mast cells, etc., of vertebrates. Its function is unknown, but it is used to prevent blood clotting in vivo and vitro, in the form of many different salts. [NIH]

Hepatic: Refers to the liver. [NIH]

Hepatitis: Inflammation of the liver and liver disease involving degenerative or necrotic alterations of hepatocytes. [NIH]

Hepatitis A: Hepatitis caused by hepatovirus. It can be transmitted through fecal contamination of food or water. [NIH]

Hepatitis Viruses: Any of the viruses that cause inflammation of the liver. They include both DNA and RNA viruses as well viruses from humans and animals. [NIH]

Hepatocellular: Pertaining to or affecting liver cells. [EU]

Hepatocellular carcinoma: A type of adenocarcinoma, the most common type of liver tumor. [NIH]

Hepatocytes: The main structural component of the liver. They are specialized epithelial cells that are organized into interconnected plates called lobules. [NIH]

Hepatotoxic: Toxic to liver cells. [EU]

Hepatovirus: A genus of Picornaviridae causing infectious hepatitis naturally in humans and experimentally in other primates. It is transmitted through fecal contamination of food or water. [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]

Histocompatibility: The degree of antigenic similarity between the tissues of different individuals, which determines the acceptance or rejection of allografts. [NIH]

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]

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]

Hospital Charges: The prices a hospital sets for its services. Hospital costs (the direct and indirect expenses incurred by the hospital in providing the services) are one factor in the determination of hospital charges. Other factors may include, for example, profits, competition, and the necessity of recouping the costs of uncompensated care. [NIH]

Hospital Costs: The expenses incurred by a hospital in providing care. The hospital costs attributed to a particular patient care episode include the direct costs plus an appropriate proportion of the overhead for administration, personnel, building maintenance, equipment, etc. Hospital costs are one of the factors which determine hospital charges (the price the hospital sets for its services). [NIH]

Humoral: Of, relating to, proceeding from, or involving a bodily humour - now often used of endocrine factors as opposed to neural or somatic. [EU]

Humour: 1. A normal functioning fluid or semifluid of the body (as the blood, lymph or bile) especially of vertebrates. 2. A secretion that is itself an excitant of activity (as certain hormones). [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]

Hydrochloric Acid: A strong corrosive acid that is commonly used as a laboratory reagent. It is formed by dissolving hydrogen chloride in water. Gastric acid is the hydrochloric acid component of gastric juice. [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]

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]

Hydroxyurea: An antineoplastic agent that inhibits DNA synthesis through the inhibition of ribonucleoside diphosphate reductase. [NIH]

Hyperbaric: Characterized by greater than normal pressure or weight; applied to gases under greater than atmospheric pressure, as hyperbaric oxygen, or to a solution of greater specific gravity than another taken as a standard of reference. [EU]

Hyperbaric oxygen: Oxygen that is at an atmospheric pressure higher than the pressure at sea level. Breathing hyperbaric oxygen to enhance the effectiveness of radiation therapy is being studied. [NIH]

Hyperbilirubinemia: Pathologic process consisting of an abnormal increase in the amount of bilirubin in the circulating blood, which may result in jaundice. [NIH]

Hyperglycaemia: Abnormally increased content of sugar in the blood. [EU]

Hypersensitivity: Altered reactivity to an antigen, which can result in pathologic reactions upon subsequent exposure to that particular antigen. [NIH]

Hypersensitivity, Immediate: Hypersensitivity reactions which occur within minutes of exposure to challenging antigen due to the release of histamine which follows the antigen-antibody reaction and causes smooth muscle contraction and increased vascular permeability. [NIH]

Hypertension: Persistently high arterial blood pressure. Currently accepted threshold levels are 140 mm Hg systolic and 90 mm Hg diastolic pressure. [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]

Hypoglycaemia: An abnormally diminished concentration of glucose in the blood, which may lead to tremulousness, cold sweat, piloerection, hypothermia, and headache, accompanied by irritability, confusion, hallucinations, bizarre behaviour, and ultimately, convulsions and coma. [EU]

Hypotension: Abnormally low blood pressure. [NIH]

Hypotensive: Characterized by or causing diminished tension or pressure, as abnormally low blood pressure. [EU]

Hypothermia: Lower than normal body temperature, especially in warm-blooded animals; in man usually accidental or unintentional. [NIH]

Hypoxia: Reduction of oxygen supply to tissue below physiological levels despite adequate perfusion of the tissue by blood. [EU]

Immune response: The activity of the immune system against foreign substances (antigens). [NIH]

Immune Sera: Serum that contains antibodies. It is obtained from an animal that has been immunized either by antigen injection or infection with microorganisms containing the antigen. [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]

Immunocompromised: Having a weakened immune system caused by certain diseases or treatments. [NIH]

Immunodeficiency: The decreased ability of the body to fight infection and disease. [NIH]

Immunodeficiency syndrome: The inability of the body to produce an immune response. [NIH]

Immunodiffusion: Technique involving the diffusion of antigen or antibody through a semisolid medium, usually agar or agarose gel, with the result being a precipitin reaction. [NIH]

Immunoelectrophoresis: A technique that combines protein electrophoresis and double immunodiffusion. In this procedure proteins are first separated by gel electrophoresis (usually agarose), then made visible by immunodiffusion of specific antibodies. A distinct elliptical precipitin arc results for each protein detectable by the antisera. [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]

Immunologic Factors: Biologically active substances whose activities affect or play a role in the functioning of the immune system. [NIH]

Immunosuppression: Deliberate prevention or diminution of the host's immune response. It may be nonspecific as in the administration of immunosuppressive agents (drugs or radiation) or by lymphocyte depletion or may be specific as in desensitization or the simultaneous administration of antigen and immunosuppressive drugs. [NIH]

Immunosuppressive: Describes the ability to lower immune system responses. [NIH]

Immunosuppressive Agents: Agents that suppress immune function by one of several mechanisms of action. Classical cytotoxic immunosuppressants act by inhibiting DNA synthesis. Others may act through activation of suppressor T-cell populations or by inhibiting the activation of helper cells. While immunosuppression has been brought about in the past primarily to prevent rejection of transplanted organs, new applications involving mediation of the effects of interleukins and other cytokines are emerging. [NIH]

Immunosuppressive therapy: Therapy used to decrease the body's immune response, such

as drugs given to prevent transplant rejection. [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]

Incidental: 1. Small and relatively unimportant, minor; 2. Accompanying, but not a major part of something; 3. (To something) Liable to occur because of something or in connection with something (said of risks, responsibilities, .) [EU]

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]

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]

Induction therapy: Treatment designed to be used as a first step toward shrinking the cancer and in evaluating response to drugs and other agents. Induction therapy is followed by additional therapy to eliminate whatever cancer remains. [NIH]

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]

Informed Consent: Voluntary authorization, given to the physician by the patient, with full comprehension of the risks involved, for diagnostic or investigative procedures and medical and surgical treatment. [NIH]

Infusion: A method of putting fluids, including drugs, into the bloodstream. Also called intravenous infusion. [NIH]

Ingestion: Taking into the body by mouth [NIH]

Inhalation: The drawing of air or other substances into the lungs. [EU]

Initiation: Mutation induced by a chemical reactive substance causing cell changes; being a step in a carcinogenic process. [NIH]

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]

Intensive Care: Advanced and highly specialized care provided to medical or surgical patients whose conditions are life-threatening and require comprehensive care and constant monitoring. It is usually administered in specially equipped units of a health care facility. [NIH]

Intensive Care Units: Hospital units providing continuous surveillance and care to acutely ill patients. [NIH]

Interleukins: Soluble factors which stimulate growth-related activities of leukocytes as well as other cell types. They enhance cell proliferation and differentiation, DNA synthesis, secretion of other biologically active molecules and responses to immune and inflammatory stimuli. [NIH]

Intermittent: Occurring at separated intervals; having periods of cessation of activity. [EU]

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]

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]

Intravenous: IV. Into a vein. [NIH]

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]

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]

Jaundice: A clinical manifestation of hyperbilirubinemia, consisting of deposition of bile pigments in the skin, resulting in a yellowish staining of the skin and mucous membranes. [NIH]

Jurisprudence: The application of the principles of law and justice to health and medicine. [NIH]

Kallidin: A decapeptide bradykinin homolog produced by the action of tissue and glandular kallikreins on low-molecular-weight kininogen. It is a smooth-muscle stimulant and hypotensive agent that functions through vasodilatation. [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]

Kidney Disease: Any one of several chronic conditions that are caused by damage to the cells of the kidney. People who have had diabetes for a long time may have kidney damage. Also called nephropathy. [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]

Kidney Transplantation: The transference of a kidney from one human or animal to

another. [NIH]

Kinetic: Pertaining to or producing motion. [EU]

Labile: 1. Gliding; moving from point to point over the surface; unstable; fluctuating. 2. Chemically unstable. [EU]

Laminin: Large, noncollagenous glycoprotein with antigenic properties. It is localized in the basement membrane lamina lucida and functions to bind epithelial cells to the basement membrane. Evidence suggests that the protein plays a role in tumor invasion. [NIH]

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]

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]

Laxative: An agent that acts to promote evacuation of the bowel; a cathartic or purgative. [EU]

Length of Stay: The period of confinement of a patient to a hospital or other health facility. [NIH]

Lesion: An area of abnormal tissue change. [NIH]

Lethal: Deadly, fatal. [EU]

Leukemia: Cancer of blood-forming tissue. [NIH]

Leukocyte Count: A count of the number of white blood cells per unit volume in venous blood. A differential leukocyte count measures the relative numbers of the different types of white cells. [NIH]

Ligament: A band of fibrous tissue that connects bones or cartilages, serving to support and strengthen joints. [EU]

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]

Lipid Peroxidation: Peroxidase catalyzed oxidation of lipids using hydrogen peroxide as an electron acceptor. [NIH]

Liver: A large, glandular organ located in the upper abdomen. The liver cleanses the blood and aids in digestion by secreting bile. [NIH]

Living Donors: Non-cadaveric providers of organs for transplant to related or non-related recipients. [NIH]

Localized: Cancer which has not metastasized yet. [NIH]

Loss of Heterozygosity: The loss of one allele at a specific locus, caused by a deletion mutation; or loss of a chromosome from a chromosome pair. It is detected when heterozygous markers for a locus appear monomorphic because one of the alleles was deleted. When this occurs at a tumor suppressor gene locus where one of the alleles is already abnormal, it can result in neoplastic transformation. [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]

Lymphoblastic: One of the most aggressive types of non-Hodgkin lymphoma. [NIH]

Lymphocyte Depletion: Immunosuppression by reduction of circulating lymphocytes or by T-cell depletion of bone marrow. The former may be accomplished in vivo by thoracic duct drainage or administration of antilymphocyte serum. The latter is performed ex vivo on bone marrow before its transplantation. [NIH]

Lymphocytes: White blood cells formed in the body's lymphoid tissue. The nucleus is round or ovoid with coarse, irregularly clumped chromatin while the cytoplasm is typically pale blue with azurophilic (if any) granules. Most lymphocytes can be classified as either T or B (with subpopulations of each); those with characteristics of neither major class are called null cells. [NIH]

Lymphocytic: Referring to lymphocytes, a type of white blood cell. [NIH]

Lymphoid: Referring to lymphocytes, a type of white blood cell. Also refers to tissue in which lymphocytes develop. [NIH]

Lymphoma: A general term for various neoplastic diseases of the lymphoid tissue. [NIH]

Lysine: An essential amino acid. It is often added to animal feed. [NIH]

Lytic: 1. Pertaining to lysis or to a lysin. 2. Producing lysis. [EU]

Major Histocompatibility Complex: The genetic region which contains the loci of genes which determine the structure of the serologically defined (SD) and lymphocyte-defined (LD) transplantation antigens, genes which control the structure of the immune response-associated (Ia) antigens, the immune response (Ir) genes which control the ability of an animal to respond immunologically to antigenic stimuli, and genes which determine the structure and/or level of the first four components of complement. [NIH]

Malaria: A protozoan disease caused in humans by four species of the genus Plasmodium (P. falciparum (malaria, falciparum), P. vivax (malaria, vivax), P. ovale, and P. malariae) and transmitted by the bite of an infected female mosquito of the genus Anopheles. Malaria is endemic in parts of Asia, Africa, Central and South America, Oceania, and certain Caribbean islands. It is characterized by extreme exhaustion associated with paroxysms of high fever, sweating, shaking chills, and anemia. Malaria in animals is caused by other species of plasmodia. [NIH]

Malaria, Falciparum: Malaria caused by Plasmodium falciparum. This is the severest form of malaria and is associated with the highest levels of parasites in the blood. This disease is characterized by irregularly recurring febrile paroxysms that in extreme cases occur with acute cerebral, renal, or gastrointestinal manifestations. [NIH]

Malaria, Vivax: Malaria caused by Plasmodium vivax. This form of malaria is less severe than malaria, falciparum, but there is a higher probability for relapses to occur. Febrile paroxysms often occur every other day. [NIH]

Malignancy: A cancerous tumor that can invade and destroy nearby tissue and spread to other parts of the body. [NIH]

Malignant: Cancerous; a growth with a tendency to invade and destroy nearby tissue and spread to other parts of the body. [NIH]

Malnutrition: A condition caused by not eating enough food or not eating a balanced diet.

[NIH]

Mammary: Pertaining to the mamma, or breast. [EU]

Mastectomy: Surgery to remove the breast (or as much of the breast tissue as possible). [NIH]

Mechanical ventilation: Use of a machine called a ventilator or respirator to improve the exchange of air between the lungs and the atmosphere. [NIH]

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 Errors: Errors or mistakes committed by health professionals which result in harm to the patient. They include errors in diagnosis (diagnostic errors), errors in the administration of drugs and other medications (medication errors), errors in the performance of surgical procedures, in the use of other types of therapy, in the use of equipment, and in the interpretation of laboratory findings. Medical errors are differentiated from malpractice in that the former are regarded as honest mistakes or accidents while the latter is the result of negligence, reprehensible ignorance, or criminal intent. [NIH]

Medicament: A medicinal substance or agent. [EU]

Medication Errors: Errors in prescribing, dispensing, or administering medication with the result that the patient fails to receive the correct drug or the indicated proper drug dosage. [NIH]

MEDLINE: An online database of MEDLARS, the computerized bibliographic Medical Literature Analysis and Retrieval System of the National Library of Medicine. [NIH]

Melanin: The substance that gives the skin its color. [NIH]

Melanocytes: Epidermal dendritic pigment cells which control long-term morphological color changes by alteration in their number or in the amount of pigment they produce and store in the pigment containing organelles called melanosomes. Melanophores are larger cells which do not exist in mammals. [NIH]

Melanoma: A form of skin cancer that arises in melanocytes, the cells that produce pigment. Melanoma usually begins in a mole. [NIH]

Membrane: A very thin layer of tissue that covers a surface. [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]

Meningitis: Inflammation of the meninges. When it affects the dura mater, the disease is termed pachymeningitis; when the arachnoid and pia mater are involved, it is called leptomeningitis, or meningitis proper. [EU]

Meningoencephalitis: An inflammatory process involving the brain (encephalitis) and meninges (meningitis), most often produced by pathogenic organisms which invade the central nervous system, and occasionally by toxins, autoimmune disorders, and other

conditions. [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]

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]

Microbe: An organism which cannot be observed with the naked eye; e. g. unicellular animals, lower algae, lower fungi, bacteria. [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]

Microscopy: The application of microscope magnification to the study of materials that cannot be properly seen by the unaided eye. [NIH]

Minor Histocompatibility Antigens: Allelic alloantigens often responsible for weak graft rejection in cases when (major) histocompatibility has been established by standard tests. In the mouse they are coded by more than 500 genes at up to 30 minor histocompatibility loci. The most well-known minor histocompatibility antigen in mammals is the H-Y antigen. [NIH]

Minor Histocompatibility Loci: Genetic loci responsible for the encoding of histocompatibility antigens other than those encoded by the major histocompatibility complex. The antigens encoded by these genes are often responsible for graft rejection in cases where histocompatibility has been established by standard tests. The location of some of these loci on the X and Y chromosomes explains why grafts from males to females may be rejected while grafts from females to males are accepted. In the mouse roughly 30 minor histocompatibility loci have been recognized, comprising more than 500 genes. [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]

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]

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]

Monoclonal: An antibody produced by culturing a single type of cell. It therefore consists of a single species of immunoglobulin molecules. [NIH]

Monoclonal antibodies: Laboratory-produced substances that can locate and bind to cancer cells wherever they are in the body. Many monoclonal antibodies are used in cancer detection or therapy; each one recognizes a different protein on certain cancer cells.

Monoclonal antibodies can be used alone, or they can be used to deliver drugs, toxins, or radioactive material directly to a tumor. [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]

Morphology: The science of the form and structure of organisms (plants, animals, and other forms of life). [NIH]

Motion Sickness: Sickness caused by motion, as sea sickness, train sickness, car sickness, and air sickness. [NIH]

Multivariate Analysis: A set of techniques used when variation in several variables has to be studied simultaneously. In statistics, multivariate analysis is interpreted as any analytic method that allows simultaneous study of two or more dependent variables. [NIH]

Muscular Diseases: Acquired, familial, and congenital disorders of skeletal muscle and smooth muscle. [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]

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]

Necrosis: A pathological process caused by the progressive degradative action of enzymes that is generally associated with severe cellular trauma. It is characterized by mitochondrial swelling, nuclear flocculation, uncontrolled cell lysis, and ultimately cell death. [NIH]

Needle Sharing: Usage of a single needle among two or more people for injecting drugs. Needle sharing is a high-risk behavior for contracting infectious disease. [NIH]

Neonatal: Pertaining to the first four weeks after birth. [EU]

Neonatal period: The first 4 weeks after birth. [NIH]

Neoplasm: A new growth of benign or malignant tissue. [NIH]

Nephrology: A subspecialty of internal medicine concerned with the anatomy, physiology, and pathology of the kidney. [NIH]

Nervous System: The entire nerve apparatus composed of the brain, spinal cord, nerves and ganglia. [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]

Neuroblastoma: Cancer that arises in immature nerve cells and affects mostly infants and children. [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]

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]

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]

Nosocomial: Pertaining to or originating in the hospital, said of an infection not present or incubating prior to admittance to the hospital, but generally occurring 72 hours after admittance; the term is usually used to refer to patient disease, but hospital personnel may also acquire nosocomial infection. [EU]

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]

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]

Oncotic: Pertaining to, caused by, or marked by swelling. [EU]

Opportunistic Infections: An infection caused by an organism which becomes pathogenic under certain conditions, e.g., during immunosuppression. [NIH]

Organ Transplantation: Transference of an organ between individuals of the same species or between individuals of different species. [NIH]

Organelles: Specific particles of membrane-bound organized living substances present in eukaryotic cells, such as the mitochondria; the golgi apparatus; endoplasmic reticulum; lysomomes; plastids; and vacuoles. [NIH]

Osmotic: Pertaining to or of the nature of osmosis (= the passage of pure solvent from a solution of lesser to one of greater solute concentration when the two solutions are separated by a membrane which selectively prevents the passage of solute molecules, but is permeable to the solvent). [EU]

Osteogenic sarcoma: A malignant tumor of the bone. Also called osteosarcoma. [NIH]

Osteosarcoma: A cancer of the bone that affects primarily children and adolescents. Also

called osteogenic sarcoma. [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]

Oxidation: The act of oxidizing or state of being oxidized. Chemically it consists in the increase of positive charges on an atom or the loss of negative charges. Most biological oxidations are accomplished by the removal of a pair of hydrogen atoms (dehydrogenation) from a molecule. Such oxidations must be accompanied by reduction of an acceptor molecule. Univalent o. indicates loss of one electron; divalent o., the loss of two electrons. [EU]

Oxidative Stress: A disturbance in the prooxidant-antioxidant balance in favor of the former, leading to potential damage. Indicators of oxidative stress include damaged DNA bases, protein oxidation products, and lipid peroxidation products (Sies, Oxidative Stress, 1991, pxv-xvi). [NIH]

Oxygen Consumption: The oxygen consumption is determined by calculating the difference between the amount of oxygen inhaled and exhaled. [NIH]

Oxygenation: The process of supplying, treating, or mixing with oxygen. No:1245 - oxygenation the process of supplying, treating, or mixing with oxygen. [EU]

Oxygenator: An apparatus by which oxygen is introduced into the blood during circulation outside the body, as during open heart surgery. [NIH]

Palliative: 1. Affording relief, but not cure. 2. An alleviating medicine. [EU]

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]

Paradoxical: Occurring at variance with the normal rule. [EU]

Paralysis: Loss of ability to move all or part of the body. [NIH]

Paraparesis: Mild to moderate loss of bilateral lower extremity motor function, which may be a manifestation of spinal cord diseases; peripheral nervous system diseases; muscular diseases; intracranial hypertension; parasagittal brain lesions; and other conditions. [NIH]

Parasite: An animal or a plant that lives on or in an organism of another species and gets at least some of its nutrition from that other organism. [NIH]

Parasitic: Having to do with or being a parasite. A parasite is an animal or a plant that lives on or in an organism of another species and gets at least some of its nutrients from it. [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]

Pathophysiology: Altered functions in an individual or an organ due to disease. [NIH]

Patient Education: The teaching or training of patients concerning their own health needs. [NIH]

Patient Selection: Criteria and standards used for the determination of the appropriateness of the inclusion of patients with specific conditions in proposed treatment plans and the criteria used for the inclusion of subjects in various clinical trials and other research protocols. [NIH]

Pelvic: Pertaining to the pelvis. [EU]

Pelvis: The lower part of the abdomen, located between the hip bones. [NIH]

Pepsin: An enzyme made in the stomach that breaks down proteins. [NIH]

Peptic: Pertaining to pepsin or to digestion; related to the action of gastric juices. [EU]

Peptic Ulcer: An ulceration of the mucous membrane of the esophagus, stomach or duodenum, caused by the action of the acid gastric juice. [NIH]

Perfusion: Bathing an organ or tissue with a fluid. In regional perfusion, a specific area of the body (usually an arm or a leg) receives high doses of anticancer drugs through a blood vessel. Such a procedure is performed to treat cancer that has not spread. [NIH]

Perinatal: Pertaining to or occurring in the period shortly before and after birth; variously defined as beginning with completion of the twentieth to twenty-eighth week of gestation and ending 7 to 28 days after birth. [EU]

Perineal: Pertaining to the perineum. [EU]

Perioperative: Around the time of surgery; usually lasts from the time of going into the hospital or doctor's office for surgery until the time the patient goes home. [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 Nervous System Diseases: Diseases of the peripheral nerves external to the brain and spinal cord, which includes diseases of the nerve roots, ganglia, plexi, autonomic nerves, sensory nerves, and motor nerves. [NIH]

Peritoneal: Having to do with the peritoneum (the tissue that lines the abdominal wall and covers most of the organs in the abdomen). [NIH]

Peritoneal Cavity: The space enclosed by the peritoneum. It is divided into two portions, the greater sac and the lesser sac or omental bursa, which lies behind the stomach. The two sacs are connected by the foramen of Winslow, or epiploic foramen. [NIH]

Peritoneal Dialysis: Dialysis fluid being introduced into and removed from the peritoneal cavity as either a continuous or an intermittent procedure. [NIH]

Peritoneum: Endothelial lining of the abdominal cavity, the parietal peritoneum covering the inside of the abdominal wall and the visceral peritoneum covering the bowel, the mesentery, and certain of the organs. The portion that covers the bowel becomes the serosal layer of the bowel wall. [NIH]

Petrolatum: A colloidal system of semisolid hydrocarbons obtained from petroleum. It is used as an ointment base, topical protectant, and lubricant. [NIH]

Pharmacodynamics: The study of the biochemical and physiological effects of drugs and the mechanisms of their actions, including the correlation of actions and effects of drugs with their chemical structure; also, such effects on the actions of a particular drug or drugs. [EU]

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]

Phenolphthalein: An acid-base indicator which is colorless in acid solution, but turns pink to red as the solution becomes alkaline. It is used medicinally as a cathartic. [NIH]

Phenotype: The outward appearance of the individual. It is the product of interactions

between genes and between the genotype and the environment. This includes the killer phenotype, characteristic of yeasts. [NIH]

Phenylalanine: An aromatic amino acid that is essential in the animal diet. It is a precursor of melanin, dopamine, noradrenalin, and thyroxine. [NIH]

Phenylbutyrate: An anticancer drug that belongs to the family of drugs called differentiating agents. [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]

Photocoagulation: Using a special strong beam of light (laser) to seal off bleeding blood vessels such as in the eye. The laser can also burn away blood vessels that should not have grown in the eye. This is the main treatment for diabetic retinopathy. [NIH]

Physiology: The science that deals with the life processes and functions of organismus, their cells, tissues, and organs. [NIH]

Pigment: A substance that gives color to tissue. Pigments are responsible for the color of skin, eyes, and hair. [NIH]

Pilot study: The initial study examining a new method or treatment. [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]

Plague: An acute infectious disease caused by Yersinia pestis that affects humans, wild rodents, and their ectoparasites. This condition persists due to its firm entrenchment in sylvatic rodent-flea ecosystems throughout the world. Bubonic plague is the most common form. [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]

Plasma expander: Artificial plasma extender. [EU]

Plasma protein: One of the hundreds of different proteins present in blood plasma, including carrier proteins (such albumin, transferrin, and haptoglobin), fibrinogen and other coagulation factors, complement components, immunoglobulins, enzyme inhibitors, precursors of substances such as angiotension and bradykinin, and many other types of proteins. [EU]

Plasticity: In an individual or a population, the capacity for adaptation: a) through gene changes (genetic plasticity) or b) through internal physiological modifications in response to changes of environment (physiological plasticity). [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]

Platelet Count: A count of the number of platelets per unit volume in a sample of venous blood. [NIH]

Platelets: A type of blood cell that helps prevent bleeding by causing blood clots to form. Also called thrombocytes. [NIH]

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]

Polymerase: An enzyme which catalyses the synthesis of DNA using a single DNA strand as a template. The polymerase copies the template in the 5'-3'direction provided that sufficient quantities of free nucleotides, dATP and dTTP are present. [NIH]

Polymerase Chain Reaction: In vitro method for producing large amounts of specific DNA or RNA fragments of defined length and sequence from small amounts of short oligonucleotide flanking sequences (primers). The essential steps include thermal denaturation of the double-stranded target molecules, annealing of the primers to their complementary sequences, and extension of the annealed primers by enzymatic synthesis with DNA polymerase. The reaction is efficient, specific, and extremely sensitive. Uses for the reaction include disease diagnosis, detection of difficult-to-isolate pathogens, mutation analysis, genetic testing, DNA sequencing, and analyzing evolutionary relationships. [NIH]

Polypeptide: A peptide which on hydrolysis yields more than two amino acids; called tripeptides, tetrapeptides, etc. according to the number of amino acids contained. [EU]

Polyposis: The development of numerous polyps (growths that protrude from a mucous membrane). [NIH]

Polysaccharide: A type of carbohydrate. It contains sugar molecules that are linked together chemically. [NIH]

Postoperative: After surgery. [NIH]

Postoperative Complications: Pathologic processes that affect patients after a surgical procedure. They may or may not be related to the disease for which the surgery was done, and they may or may not be direct results of the surgery. [NIH]

Postoperative Period: The period following a surgical operation. [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]

Preclinical: Before a disease becomes clinically recognizable. [EU]

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]

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]

Preeclampsia: A toxaemia of late pregnancy characterized by hypertension, edema, and proteinuria, when convulsions and coma are associated, it is called eclampsia. [EU]

Preoperative: Preceding an operation. [EU]

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]

Primary Prevention: Prevention of disease or mental disorders in susceptible individuals or populations through promotion of health, including mental health, and specific protection, as in immunization, as distinguished from the prevention of complications or after-effects of existing disease. [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]

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]

Prophylaxis: An attempt to prevent disease. [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]

Prostatectomy: Complete or partial surgical removal of the prostate. Three primary approaches are commonly employed: suprapubic - removal through an incision above the pubis and through the urinary bladder; retropubic - as for suprapubic but without entering the urinary bladder; and transurethral (transurethral resection of prostate). [NIH]

Prostatic Hyperplasia: Enlargement or overgrowth of the prostate gland as a result of an increase in the number of its constituent cells. [NIH]

Prostheses and Implants: Artificial substitutes for body parts, and materials inserted into tissue for functional, cosmetic, or therapeutic purposes. Prostheses can be functional, as in the case of artificial arms and legs, or cosmetic, as in the case of an artificial eye. Implants, all surgically inserted or grafted into the body, tend to be used therapeutically. Experimental implants is available for those used experimentally. [NIH]

Prostitution: The practice of indulging in promiscuous sexual relations for money. [NIH]

Protein C: A vitamin-K dependent zymogen present in the blood, which, upon activation by thrombin and thrombomodulin exerts anticoagulant properties by inactivating factors Va and VIIIa at the rate-limiting steps of thrombin formation. [NIH]

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]

Proteinuria: The presence of protein in the urine, indicating that the kidneys are not working properly. [NIH]

Proteoglycans: Glycoproteins which have a very high polysaccharide content. [NIH]

Proteolytic: 1. Pertaining to, characterized by, or promoting proteolysis. 2. An enzyme that promotes proteolysis (= the splitting of proteins by hydrolysis of the peptide bonds with formation of smaller polypeptides). [EU]

Prothrombin: A plasma protein that is the inactive precursor of thrombin. It is converted to

thrombin by a prothrombin activator complex consisting of factor Xa, factor V, phospholipid, and calcium ions. Deficiency of prothrombin leads to hypoprothrombinemia. [NIH]

Protozoan: 1. Any individual of the protozoa; protozoon. 2. Of or pertaining to the protozoa; protozoal. [EU]

Proximal: Nearest; closer to any point of reference; opposed to distal. [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 Health Practice: The activities and endeavors of the public health services in a community on any 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]

Publishing: "The business or profession of the commercial production and issuance of literature" (Webster's 3d). It includes the publisher, publication processes, editing and editors. Production may be by conventional printing methods or by electronic publishing. [NIH]

Pulmonary: Relating to the lungs. [NIH]

Pulmonary Artery: The short wide vessel arising from the conus arteriosus of the right ventricle and conveying unaerated blood to the lungs. [NIH]

Pulmonary Edema: An accumulation of an excessive amount of watery fluid in the lungs, may be caused by acute exposure to dangerous concentrations of irritant gasses. [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]

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]

Radiation therapy: The use of high-energy radiation from x-rays, gamma rays, neutrons, and other sources to kill cancer cells and shrink tumors. Radiation may come from a machine outside the body (external-beam radiation therapy), or it may come from radioactive material placed in the body in the area near cancer cells (internal radiation therapy, implant radiation, or brachytherapy). Systemic radiation therapy uses a radioactive substance, such as a radiolabeled monoclonal antibody, that circulates throughout the body. Also called radiotherapy. [NIH]

Radical prostatectomy: Surgery to remove the entire prostate. The two types of radical prostatectomy are retropubic prostatectomy and perineal prostatectomy. [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]

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]

Reactivation: The restoration of activity to something that has been inactivated. [EU]

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]

Recombinant: A cell or an individual with a new combination of genes not found together in either parent; usually applied to linked genes. [EU]

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]

Red blood cells: RBCs. Cells that carry oxygen to all parts of the body. Also called erythrocytes. [NIH]

Refer: To send or direct for treatment, aid, information, de decision. [NIH]

Regimen: A treatment plan that specifies the dosage, the schedule, and the duration of treatment. [NIH]

Registries: The systems and processes involved in the establishment, support, management, and operation of registers, e.g., disease registers. [NIH]

Relative risk: The ratio of the incidence rate of a disease among individuals exposed to a specific risk factor to the incidence rate among unexposed individuals; synonymous with risk ratio. Alternatively, the ratio of the cumulative incidence rate in the exposed to the cumulative incidence rate in the unexposed (cumulative incidence ratio). The term relative risk has also been used synonymously with odds ratio. This is because the odds ratio and relative risk approach each other if the disease is rare (5 percent of population) and the number of subjects is large. [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 Dialysis: Removal of certain elements from the blood based on the difference in their rates of diffusion through a semipermeable membrane. [NIH]

Renal failure: Progressive renal insufficiency and uremia, due to irreversible and progressive renal glomerular tubular or interstitial disease. [NIH]

Renal Osteodystrophy: Decalcification of bone due to hyperparathyroidism secondary to chronic kidney disease. [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]

Resection: Removal of tissue or part or all of an organ by surgery. [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]

Respirator: A mechanical device that helps a patient breathe; a mechanical ventilator. [NIH]

Resuscitation: The restoration to life or consciousness of one apparently dead; it includes such measures as artificial respiration and cardiac massage. [EU]

Retina: The ten-layered nervous tissue membrane of the eye. It is continuous with the optic nerve and receives images of external objects and transmits visual impulses to the brain. Its outer surface is in contact with the choroid and the inner surface with the vitreous body. The outer-most layer is pigmented, whereas the inner nine layers are transparent. [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]

Retinopathy: 1. Retinitis (= inflammation of the retina). 2. Retinosis (= degenerative, noninflammatory condition of the retina). [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]

Retropubic: A potential space between the urinary bladder and the symphisis and body of the pubis. [NIH]

Retropubic prostatectomy: Surgery to remove the prostate through an incision made in the abdominal wall. [NIH]

Retrospective: Looking back at events that have already taken place. [NIH]

Ribonucleoside Diphosphate Reductase: An enzyme of the oxidoreductase class that catalyzes the formation of 2'-deoxyribonucleotides from the corresponding ribonucleotides using NADPH as the ultimate electron donor. The deoxyribonucleoside diphosphates are used in DNA synthesis. (From Dorland, 27th ed) EC 1.17.4.1. [NIH]

Right to Die: The right of the patient or the patient's representative to make decisions with regard to the patient's dying. [NIH]

Risk factor: A habit, trait, condition, or genetic alteration that increases a person's chance of developing a disease. [NIH]

Risk patient: Patient who is at risk, because of his/her behaviour or because of the type of

person he/she is. [EU]

Salivary: The duct that convey saliva to the mouth. [NIH]

Salivary glands: Glands in the mouth that produce saliva. [NIH]

Saphenous: Applied to certain structures in the leg, e. g. nerve vein. [NIH]

Saphenous Vein: The vein which drains the foot and leg. [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]

Sarcoma: A connective tissue neoplasm formed by proliferation of mesodermal cells; it is usually highly malignant. [NIH]

Saturate: Means fatty acids without double bond. [NIH]

Screening: Checking for disease when there are no symptoms. [NIH]

Seizures: Clinical or subclinical disturbances of cortical function due to a sudden, abnormal, excessive, and disorganized discharge of brain cells. Clinical manifestations include abnormal motor, sensory and psychic phenomena. Recurrent seizures are usually referred to as epilepsy or "seizure disorder." [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]

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]

Sepsis: The presence of bacteria in the bloodstream. [NIH]

Sequence Analysis: A multistage process that includes the determination of a sequence (protein, carbohydrate, etc.), its fragmentation and analysis, and the interpretation of the resulting sequence information. [NIH]

Sequencing: The determination of the order of nucleotides in a DNA or RNA chain. [NIH]

Seroconversion: The change of a serologic test from negative to positive, indicating the development of antibodies in response to infection or immunization. [EU]

Serologic: Analysis of a person's serum, especially specific immune or lytic serums. [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]

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]

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]

Small intestine: The part of the digestive tract that is located between the stomach and the large intestine. [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 Welfare: Organized institutions which provide services to ameliorate conditions of need or social pathology in the community. [NIH]

Social Work: The use of community resources, individual case work, or group work to promote the adaptive capacities of individuals in relation to their social and economic environments. It includes social service agencies. [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]

Soft tissue: Refers to muscle, fat, fibrous tissue, blood vessels, or other supporting tissue of the 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]

Spastic: 1. Of the nature of or characterized by spasms. 2. Hypertonic, so that the muscles are stiff and the movements awkward. 3. A person exhibiting spasticity, such as occurs in spastic paralysis or in cerebral palsy. [EU]

Spasticity: A state of hypertonicity, or increase over the normal tone of a muscle, with heightened deep tendon reflexes. [EU]

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]

Sperm: The fecundating fluid of the male. [NIH]

Spherocytes: Small, abnormal spherical red blood cells with more than the normal amount of hemoglobin. [NIH]

Spherocytosis: A condition in which there are abnormally thick, almost spherical, red blood cells or spherocytes in the blood. [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 Diseases: Pathologic conditions which feature spinal cord damage or dysfunction, including disorders involving the meninges and perimeningeal spaces surrounding the spinal cord. Traumatic injuries, vascular diseases, infections, and inflammatory/autoimmune processes may affect the spinal cord. [NIH]

Spirochete: Lyme disease. [NIH]

Spleen: An organ that is part of the lymphatic system. The spleen produces lymphocytes,

filters the blood, stores blood cells, and destroys old blood cells. It is located on the left side of the abdomen near the stomach. [NIH]

Splenectomy: An operation to remove the spleen. [NIH]

Sporadic: Neither endemic nor epidemic; occurring occasionally in a random or isolated manner. [EU]

Stem Cells: Relatively undifferentiated cells of the same lineage (family type) that retain the ability to divide and cycle throughout postnatal life to provide cells that can become specialized and take the place of those that die or are lost. [NIH]

Sterile: Unable to produce children. [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]

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]

Stool: The waste matter discharged in a bowel movement; feces. [NIH]

Strand: DNA normally exists in the bacterial nucleus in a helix, in which two strands are coiled together. [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]

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]

Stroke Volume: The amount of blood pumped out of the heart per beat not to be confused with cardiac output (volume/time). [NIH]

Stroma: The middle, thickest layer of tissue in the cornea. [NIH]

Stromal: Large, veil-like cell in the bone marrow. [NIH]

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]

Suction: The removal of secretions, gas or fluid from hollow or tubular organs or cavities by means of a tube and a device that acts on negative pressure. [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]

Surfactant: A fat-containing protein in the respiratory passages which reduces the surface tension of pulmonary fluids and contributes to the elastic properties of pulmonary tissue. [NIH]

Survival Rate: The proportion of survivors in a group, e.g., of patients, studied and followed over a period, or the proportion of persons in a specified group alive at the beginning of a time interval who survive to the end of the interval. It is often studied using life table methods. [NIH]

Symphysis: A secondary cartilaginous joint. [NIH]

Symptomatic: Having to do with symptoms, which are signs of a condition or disease. [NIH]

Syphilis: A contagious venereal disease caused by the spirochete Treponema pallidum. [NIH]

Systemic: Affecting the entire body. [NIH]

Systolic: Indicating the maximum arterial pressure during contraction of the left ventricle of the heart. [EU]

Taboo: Any negative tradition or behavior that is generally regarded as harmful to social welfare and forbidden within a cultural or social group. [NIH]

Tacrolimus: A macrolide isolated from the culture broth of a strain of Streptomyces tsukubaensis that has strong immunosuppressive activity in vivo and prevents the activation of T-lymphocytes in response to antigenic or mitogenic stimulation in vitro. [NIH]

Thalassemia: A group of hereditary hemolytic anemias in which there is decreased synthesis of one or more hemoglobin polypeptide chains. There are several genetic types with clinical pictures ranging from barely detectable hematologic abnormality to severe and fatal anemia. [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]

Thigh: A leg; in anatomy, any elongated process or part of a structure more or less comparable to a leg. [NIH]

Thoracic: Having to do with 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]

Thrombocytes: Blood cells that help prevent bleeding by causing blood clots to form. Also called platelets. [NIH]

Thrombocytopenia: A decrease in the number of blood platelets. [NIH]

Thromboembolism: Obstruction of a vessel by a blood clot that has been transported from a distant site by the blood stream. [NIH]

Thrombolytic: 1. Dissolving or splitting up a thrombus. 2. A thrombolytic agent. [EU]

Thrombolytic Therapy: Use of infusions of fibrinolytic agents to destroy or dissolve thrombi in blood vessels or bypass grafts. [NIH]

Thrombosis: The formation or presence of a blood clot inside a blood vessel. [NIH]

Thymus: An organ that is part of the lymphatic system, in which T lymphocytes grow and multiply. The thymus is in the chest behind the breastbone. [NIH]

Thyroid: A gland located near the windpipe (trachea) that produces thyroid hormone, which helps regulate growth and metabolism. [NIH]

Thyroxine: An amino acid of the thyroid gland which exerts a stimulating effect on thyroid metabolism. [NIH]

Tissue: A group or layer of cells that are alike in type and work together to perform a specific function. [NIH]

Tissue Survival: The span of viability of a tissue or an organ. [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]

Topical: On the surface of the body. [NIH]

Toxaemia: 1. The condition resulting from the spread of bacterial products (toxins) by the bloodstream. 2. A condition resulting from metabolic disturbances, e.g. toxaemia of pregnancy. [EU]

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]

Toxicokinetics: Study of the absorption, distribution, metabolism, and excretion of test substances. [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]

Transcription Factors: Endogenous substances, usually proteins, which are effective in the initiation, stimulation, or termination of the genetic transcription process. [NIH]

Transfection: The uptake of naked or purified DNA into cells, usually eukaryotic. It is analogous to bacterial transformation. [NIH]

Transfer Factor: Factor derived from leukocyte lysates of immune donors which can transfer both local and systemic cellular immunity to nonimmune recipients. [NIH]

Transfusion: The infusion of components of blood or whole blood into the bloodstream. The blood may be donated from another person, or it may have been taken from the person earlier and stored until needed. [NIH]

Transmitter: A chemical substance which effects the passage of nerve impulses from one cell to the other at the synapse. [NIH]

Transplantation: Transference of a tissue or organ, alive or dead, within an individual, between individuals of the same species, or between individuals of different species. [NIH]

Transurethral: Performed through the urethra. [EU]

Transurethral resection: Surgery performed with a special instrument inserted through the urethra. Also called TUR. [NIH]

Transurethral Resection of Prostate: Resection of the prostate using a cystoscope passed through the urethra. [NIH]

Trauma: Any injury, wound, or shock, must frequently physical or structural shock, producing a disturbance. [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 suppressor gene: Genes in the body that can suppress or block the development of cancer. [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]

Ulceration: 1. The formation or development of an ulcer. 2. An ulcer. [EU]

Umbilical Arteries: Either of a pair of arteries originating from the internal iliac artery and passing through the umbilical cord to carry blood from the fetus to the placenta. [NIH]

Umbilical Cord: The flexible structure, giving passage to the umbilical arteries and vein, which connects the embryo or fetus to the placenta. [NIH]

Universal Precautions: Prudent standard preventive measures to be taken by professional and other health personnel in contact with persons afflicted with a communicable disease, to avoid contracting the disease by contagion or infection. Precautions are especially applicable in the diagnosis and care of AIDS patients. [NIH]

Urea: A compound (CO(NH2)2), formed in the liver from ammonia produced by the deamination of amino acids. It is the principal end product of protein catabolism and constitutes about one half of the total urinary solids. [NIH]

Uremia: The illness associated with the buildup of urea in the blood because the kidneys are not working effectively. Symptoms include nausea, vomiting, loss of appetite, weakness, and mental confusion. [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]

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]

Vaccination: Administration of vaccines to stimulate the host's immune response. This includes any preparation intended for active immunological prophylaxis. [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]

Vasodilator: An agent that widens blood vessels. [NIH]

Vein: Vessel-carrying blood from various parts of the body to the heart. [NIH]

Venereal: Pertaining or related to or transmitted by sexual contact. [EU]

Venous: Of or pertaining to the veins. [EU]

Venous blood: Blood that has given up its oxygen to the tissues and carries carbon dioxide

back for gas exchange. [NIH]

Ventilation: 1. In respiratory physiology, the process of exchange of air between the lungs and the ambient air. Pulmonary ventilation (usually measured in litres per minute) refers to the total exchange, whereas alveolar ventilation refers to the effective ventilation of the alveoli, in which gas exchange with the blood takes place. 2. In psychiatry, verbalization of one's emotional problems. [EU]

Venules: The minute vessels that collect blood from the capillary plexuses and join together to form veins. [NIH]

Veterinary Medicine: The medical science concerned with the prevention, diagnosis, and treatment of diseases in animals. [NIH]

Vibrio: A genus of Vibrionaceae, made up of short, slightly curved, motile, gram-negative rods. Various species produce cholera and other gastrointestinal disorders as well as abortion in sheep and cattle. [NIH]

Vibrio cholerae: The etiologic agent of cholera. [NIH]

Viral: Pertaining to, caused by, or of the nature of virus. [EU]

Viral Hepatitis: Hepatitis caused by a virus. Five different viruses (A, B, C, D, and E) most commonly cause this form of hepatitis. Other rare viruses may also cause hepatitis. [NIH]

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]

Viscosity: A physical property of fluids that determines the internal resistance to shear forces. [EU]

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]

Wakefulness: A state in which there is an enhanced potential for sensitivity and an efficient responsiveness to external stimuli. [NIH]

Warts: Benign epidermal proliferations or tumors; some are viral in origin. [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]

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]

X-ray: High-energy radiation used in low doses to diagnose diseases and in high doses to treat cancer. [NIH]

Yeasts: A general term for single-celled rounded fungi that reproduce by budding. Brewers' and bakers' yeasts are Saccharomyces cerevisiae; therapeutic dried yeast is dried yeast. [NIH]

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