

Teratology References and Resources

Numerous journal articles are published every month regarding exposures during pregnancy and lactation which encompass the fields of teratology, pharmacology, developmental biology, epidemiology, obstetrics and gynecology, and genetics. The ability to counsel patients and health care providers appropriately with the most up-to-date and pertinent information about exposures during pregnancy and lactation requires frequent reviews of the recent literature. The following references and resources are useful tools in finding pertinent literature regarding various drug, chemical, or other exposures during pregnancy and lactation.

General Teratology and Lactation Textbooks

Briggs GG, Freeman RK and Yaffe SJ: *Drugs in Pregnancy and Lactation*. 7th ed. Baltimore: Williams & Wilkins. 2005. This reference contains over 700 monographs on fetal risks associated with prenatal exposure to drugs. The monographs also provide information regarding risks associated with the use of these drugs during lactation. Most of the information is based on human studies, although animal studies are included for a few of the monographs. Quarterly updates are available by subscription.

Folb PI and Graham Dukes MN (eds). *Drug Safety in Pregnancy*. Amsterdam: Elsevier Science Publishers BV. 1990. This book provides a comprehensive review of the clinical literature pertaining to the safety of drugs for the fetus and pregnant woman. Animal and pharmacological data are included when relevant to the understanding of fetal toxicity. Material is presented according to categories of drugs.

Friedman JM and Polifka JE: *Teratogenic Effects of Drugs. A Resource for Clinicians*. Baltimore: Johns Hopkins University Press. 1994. This book was designed to assist physicians and other health care professionals in counseling pregnant women who have concerns about the possible effects of drugs and other agents on their developing babies. Risk assessments based on a consensus of ratings by the authors and five internationally recognized authorities in clinical teratology are provided for each agent in the book.

Friedman JM and Polifka JE: *The Effects of Drugs on the Fetus and Nursing Infant. A Handbook for Health Care Professionals*. Baltimore: Johns Hopkins University Press, 1996. This handbook contains monographs for approximately 250 commonly used agents. The monographs are derived from the TERIS database and summarize the available teratology literature. Assessment of teratogenic risk and an estimate of the quality and quantity on which the risk estimate is based are also provided. Information on the effects of these drugs on the nursing infant is also included.

Friedman JM and Polifka JE: *The Effects of Neurologic and Psychiatric Drugs on the Fetus and Nursing Infant. A Handbook for Health Care Professionals*. Baltimore: Johns Hopkins University Press, 1998. This book contains summaries and risk assessments from the TERIS database on drugs commonly used to treat neurologic and psychiatric illnesses. Information on the effects of these drugs on the nursing infant is also included.

Gilstrap LC and Little BE: *Drugs and Pregnancy*. New York: Elsevier. 1992. This book provides

clinicians with useful guidelines for clinical evaluation and patient counseling as well as information regarding the reproductive effects of commonly used medications, occupational agents, and substances of abuse.

Hale TW: *Medications and Mothers' Milk*. 12th ed. Amarillo: Pharmasoft. 2006. This book contains summaries of breastmilk transfer and possible infant risk associated with medications during lactation. Hale categorizes medications into his own lactation risk categories that are modeled after the FDA pregnancy categories.

Koren G (ed). *Maternal-Fetal Toxicology: A Clinician's Guide*. 3rd ed. New York: Marcel Dekker, Inc. 2001. This book provides practical information for health care practitioners counseling pregnant women regarding pregnancy exposures. In addition to briefly summarizing the relevant data on the teratogenic effects of various environmental and physical agents, the book includes a list of teratogen information programs. The editor's approach to counseling pregnant women regarding teratogenic risks is also described.

Lawrence, RA and Lawrence RM, *Breastfeeding: A Guide for the Medical Profession*, Elsevier, 8th Edition, 2015. This book informs on every aspect of breastfeeding, from basic data on the anatomical, physiological, biochemical, nutritional, immunological, and psychological aspects of human lactation, to the problems of clinical management of breastfeeding.

Schaefer C, Peters P and Miller RK (eds). *Drugs During Pregnancy and Lactation*. 3rd ed. Academic Press, 2015. This reference book is structured according to indication group, rather than alphabetically, facilitating the ability to compare drugs for a given ailment. It contains expanded chapters on antiepileptics, psychopharmacological agents, disease modifying drugs, and cancer therapy. It also contains essential information on herbs, vitamins, and nutritional supplements during pregnancy.

Schardein JL: *Chemically Induced Birth Defects*. 3rd ed. New York: Marcel Dekker. Inc. 2000. This comprehensive reference book reviews available animal and human studies on the teratogenic effects of drugs and chemicals. Emphasis is placed on studies in which exposures took place during the period of organogenesis.

Scialli AR: *A Clinical Guide to Reproductive and Developmental Toxicology*. Boca Raton: CRC Press, 1992. This is an excellent resource for clinicians who want to have a better understanding of the principles of teratology and toxicology, the research methods used in teratology, and the regulatory and legal issues surrounding teratogenic risk assessment and counseling. The book also provides information regarding occupational, paternal, and breastfeeding exposures.

Scialli AR, Lione A, Boyle Padgett GK: *Reproductive Effects of Chemical, Physical, and Biologic Agents*. Baltimore: Johns Hopkins University Press. 1995. This book contains information on the reproductive toxicology of over 2800 physical and chemical agents. The summaries include information on the effects of these agents on male and female fertility and the infants of breast-feeding mothers as well as on embryonic and fetal development.

Shepard TH and Lemire RJ: *Catalog of Teratogenic Agents*. 11th ed. Baltimore: Johns Hopkins University Press. 2004. Shepard's Catalog provides a comprehensive compilation of animal and human research on the teratogenicity of chemical and environmental agents. The Catalog

contains information on over 2500 agents and includes many references from the Japanese as well as the American and European literature.

Electronic Databases

REPROTEXT: Reproductive Hazard Reference by Betty Dabney. Available on CDROM as part of the Reprorisk Module (see below). This database includes reviews of the reproductive, carcinogenic, and genetic effects of acute and chronic exposures to over 600 commonly encountered industrial chemicals. The reviews include a numerical scale that ranks the general toxicity and a "grade-card" scale that suggests the level of reproductive hazard associated with each chemical.

REPROTOX: Reproductive Hazard Information by Anthony R. Scialli. Available online, in a disk-based version for MS-DOS personal computers, and CD-ROM format from the Reproductive Toxicology Center, Columbia Hospital for Women Medical Center, Washington, DC. Reprottox provides comprehensive information on the effects of drugs and chemicals that covers all aspects of reproduction, including fertility, male exposures, and lactation. The database is also available on the Internet as part of the Reprorisk Module (see below) or as a stand-alone product. This is a frequently updated version of the book by Dr. Scialli and his associates described above.

SHEPARD'S CATALOG OF TERATOGENIC AGENTS by Thomas H. Shepard. Available online from the Department of Pediatrics, Box 356320 University of Washington, Seattle, WA 98195. The database, which contains information on more than 2700 drugs and chemicals, is also available online and in a disk-based version for MSDOS personal computers in conjunction with the TERIS database and as part of the Reprorisk Module (see both below). This is a frequently updated version of the Shepard's Catalog described above.

TERIS: Teratogen Information System by JM Friedman and Janine E. Polifka. Available online and in a disk-based version for MS-DOS personal computers from Janine E. Polifka, TERIS Box 357920, University of Washington, Seattle, WA 98195-7920, and as part of the Reprorisk Module (see below). This is a frequently updated version of the book by Friedman and Polifka described above, and 90% of the agents referenced are medications. TERIS focuses on information regarding the teratogenicity, transplacental carcinogenesis, embryonic or fetal death, and fetal and perinatal pharmacologic effects of the agents on the system. Other aspects of reproductive toxicology, such as male-mediated effects and alterations of fertility are excluded.

REPRORISK MODULE: This is a commercially available database that contains electronic versions of Reprotext, REPROTOX, Shepard's Catalog of Teratogenic Agents, and TERIS. The system is available in CD-ROM format from Micromedex, Inc., 6200 S. Syracuse Way, Suite 300, Englewood, CO 80111-4740; however, an internet version is now available to subscribers.

MICROMEDEX, INC.: Micromedex is a comprehensive resource for toxicology, pharmacology, emergency and acute care, patient education, occupational medicine, chemical safety, and industrial regulatory compliance. Micromedex has an international editorial board comprised of more than 450 experts in the medical community. Micromedex knowledge bases are available

through a variety of delivery methods, such as PC, CD-ROM, UNIX® systems, DEC® and IBM mainframes, gateways, and Intranet/Internet applications. Some of the databases distributed by Micromedex are the Reprorisk Module® (see above), Drugdex®, Martindale, PDR®, Poisindex®, TOMES®, and MSDS Products.

LACTMED: This free online database is a division of the TOXNET database provided by the US National Library of Medicine, and is available at <http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?LACT>. LACTMED is a searchable database providing summaries of studies relating to breastmilk transfer and infant effects of many medications during lactation.