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Linda S. Erdreich, Ph.D.
Senior Managing Scientist

Professional Profile

Dr. Linda S. Erdreich is a Senior Managing Scientist in Exponent's Health Sciences Center for Epidemiology, Biostatistics, and Computational Biology. She is an epidemiologist with 28 years of experience in environmental epidemiology and health risk assessment. She specializes in assessing epidemiological research and integrating this information with that from other disciplines for qualitative and quantitative risk assessments. She has prepared risk assessments for environmental and occupational chemicals, radiofrequency energy, electric and magnetic fields (EMF), and stray voltage. Dr. Erdreich has also prepared analyses of complex epidemiological evidence suitable for communication with interested parties of various backgrounds, including other scientists, executives, elected officials, and the general public. She has been particularly active in updating standards regarding non-ionizing radiation, both low frequencies (EMF) and radio frequencies. Dr. Erdreich has provided support to government agencies and private clients in health risk assessment and epidemiology.

Prior to joining Exponent, Dr. Erdreich was a Principal Scientist with Bailey Research Associates, where she specialized in epidemiologic research and analysis. Before that, Dr. Erdreich managed a research program in risk assessment at the U.S. Environmental Protection Agency and contributed to the development of risk assessment methods and guidelines. Dr. Erdreich has served on advisory committees to government, regulatory organizations, and industry regarding health risk assessments of chemicals and electromagnetic fields. Dr. Erdreich is also an adjunct associate professor at the Robert Wood Johnson Medical School in New Jersey.

Academic Credentials and Professional Honors

Ph.D., Epidemiology, University of Oklahoma, 1979
M.S., Biostatistics and Epidemiology, University of Oklahoma, 1977
M.Ed., Science Education, Temple University, 1968
B.A., Biological Sciences, Temple University, 1964

Fellow, American College of Epidemiology

U.S. Environmental Protection Agency: Special Achievement Award for Development of EPA's Proposed Risk Assessment Guidelines, 1984; Certificate of Achievement, Mentor: Research Apprenticeship Program, 1983; Special Achievement Award for Development of Methodologic Approaches to Risk Assessment Essential to the Agency, 1982

U.S. Public Health Service Traineeship, 1975–1979; Graduate Dean's Research Prize, University of Oklahoma, 1978

Publications

Erdreich LS, Alexander DD, Wagner ME, Reinemann D. Meta-analysis of stray voltage on dairy cattle. J Dairy Sci 2009; 92:5951–5963.

Erdreich LS, Van Kerkhove MD, Scrafford CG, Barraj L, McNeely M, Shum M, Sheppard AR, Kelsh M. Factors that influence the radiofrequency power output of GSM mobile phones. Radiation Res 2007; 168(2):253–261.

Bailey WH, Erdreich LS. Accounting for human variability and sensitivity in setting standards for electromagnetic fields. Health Phys 2007; 92:649–657.

Yarborough CM, Erdreich LS. Child neurocognitive and behavioral outcomes and maternal solvent exposure during pregnancy. Arch Pediatr Adolesc Med 2005; 159:690.

Moulder JE, Foster KR, Erdreich LS, McNamee JP. Mobile phone, mobile phone base stations and cancer: A review. Int J Radiat Biol 2005; 81:189–203.

Erdreich LS, Friedman MA. Epidemiologic evidence for assessing the carcinogenicity of acrylamide. Regul Toxicol Pharmacol 2004; 39:150–157.

Erdreich LS, Klauenberg BJ. Radio frequency radiation exposure standards: Considerations for harmonization. Health Physics 2001; 80:430–439.

Dourson ML, Anderson M, Erdreich LS, MacGregor J. Using human data to protect the public's health. Regul Toxicol Pharmacol 2001; 33(22):234–256.

Haber LT, Diamond GL, Zhao Q, Erdreich LS, Dourson ML. Hazard identification and dose-response of ingested nickel soluble salts. Regul Toxicol Pharmacol 2000; 31:231–241.

Haber LT, Erdreich LS, Diamond DL, Maier AM, Ratney R, Zhao Q, Dourson ML. Hazard identification and dose-response of inhaled nickel soluble salts. Regul Toxicol Pharmacol 2000; 31:210–230.

Foster KF, Erdreich LS. Thermal models for microwave hazards and their role in standards development. Bioelectromagnetics 1999; 20:52–63.

Moulder JE, Erdreich LS, Malyapa RS, Merritt J, Pickard WF, Vijayalaxmi. Cell phones and cancer: what is the evidence for a connection? Radiation Res 1999; 151:513–531.

Foster KR, Erdreich LS, Moulder J. Weak electromagnetic fields and cancer in the context of risk assessment. Proc IEEE 1997; 85:733–746.

Erdreich LS. Scientific evidence—Issues in EMF epidemiology. Shepard's Expert and Scientific Evidence Quarterly 1993; 1:213–226.

Brown KG, Erdreich LS. Statistical uncertainty in the no-observed-adverse-effect level. Fund Appl Toxicol 1989; 13:235–244.

Hill RN, Erdreich LS, Paynter OE, Roberts PA, Rosenthal SL, Wilkinson CF. Thyroid follicular cell carcinogenesis: a review. Fund Appl Toxicol 1989; 12:629–697.

Hattis D, Erdreich LS, Ballew M. Human variability in susceptibility to toxic chemicals—A preliminary analysis of pharmacokinetic data from normal volunteers. Risk Anal 1987; 7:415–426.

Erdreich LS, Burnett C. Improving the use of epidemiologic data in health risk assessment. Toxicol Environ Health 1985; 1:65–81.

Stara JF, Erdreich LS (eds). Approaches to risk assessment for multiple chemical exposures. Conference Proceedings, EPA-600/9-84-008, U.S. Environmental Protection Agency, 1984.

Erdreich LS. Comparing epidemiologic studies of ingested asbestos for use in risk assessment. Environ Health Prospect 1983; 43:99–104.

Erdreich LS, Lee, ET. Use of relative operating characteristic analysis in epidemiology—A method for dealing with subjective judgment. Am J Epidemiol 1981; 144:649–662.

Erdreich LS, Asal NR, Hoge AF. Morphological types of breast cancer: Age, bilaterality and family history. Southern Med J 1980; 73:28–32.

West KM, Erdreich LS, Stober, JA. A detailed study of risk factors for retinopathy nephropathy in diabetes. Diabetes 1980; 29:501–508.

West KM, Erdreich LS, Stober JA. Absence of a relationship between smoking and diabetic microangiopathy: A detailed study. Diabetes Care 1980; 3:250–252.

West K, Erdreich LS, Stober J, et al. Risk factors for diabetes related angiopathy. Exerpta Medica 1979; 148:251–252.

Erdreich J, Erdreich LS. Intermodulation products fh+f1 and 2fh+f1: Masking and growth and low frequency primary. J Acoustical Soc Amer 1978; 64.

Book Chapters

Erdreich LS. Using epidemiology to explain disease causation to judges and juries. pp. 173–183. In: Expert Witnessing: Explaining and Understanding Science. Meyer C (ed), CRC Press, Boca Raton, FL, 1999.

Erdreich LS. Combining animal and human studies, resolving conflicts, summarizing the evidence. In: Epidemiology and Risk Assessment. L. Gordis (ed), Oxford University Press, New York, NY. June 18–22, 1995.

Stara JF, Hertzberg RC, Bruins RJF, Dourson ML, Durkin PR, Erdreich LS, Pepelko WE. Approaches to risk assessment of chemical mixtures. In: Chemical Safety Regulation and Compliance. Hamburger F, Marquis JK (eds), 1985.

Erdreich J, Erdreich, LS. Epidemiologic strategies to understanding noise induced hearing loss. In: New Perspectives on Noise-Induced Hearing Loss. Hamernic RP, Henderson NP, Salvi R (eds), Raven Press, New York, NY, 1982.

Books Edited

Stara JF, Erdreich LS (eds). Advances in Health Risk Assessment for Systematic Toxicants and Chemical Mixtures: An International Symposium. Princeton Scientific Publishing Co., Inc., Princeton, NJ, 1985.

Reports

Erdreich LS, Mullin, CS. Hypersusceptible subgroups of the population in multiple chemical risk assessment. In: Approaches to Risk Assessment for Multiple Chemical Exposures. EPA-600/9-84-008. Stara JF, Erdreich LS (eds.), U.S. Environmental Protection Agency, 1984.

Stara JF, Erdreich LS (eds). Selected approaches to risk assessment for multiple chemical exposures. Progress Report on Guideline Development, EPA-600/9-84-014a, 1984.

Non Peer-Reviewed Publications

Erdreich LS, Roberts W. Identifying flawed reasoning in biomedical science: A more cogent argument than "Junk Science." Toxic Torts and Environmental Law Committee Newsletter. American Bar Association, Summer 2006.

Committee on Man and Radiation of the IEEE (COMAR) Technical Reports

Expert reviews on potential health effects of radiofrequency electromagnetic fields and comments on the bioinitiative report. Health Physics 2009; 97:348–356.

The IEEE exposure limits for radiofrequency and microwave energy. IEEE Eng Med Biol 2005; 24 (2):114–117+121.

Electromagnetic hypersensitivity: COMAR Technical Information Statement. IEEE Eng Med Biol 2002; Sept/Oct 173–175.

Human exposure to radio frequency and microwave radiation from portable and mobile telephones and other wireless communication devices. IEEE Eng Med Biol 2001; 20(1):128–131.

Safety issues associated with base stations used for personal wireless communications. COMAR Technical Information Statement September 2000. www.ewh.ieee.org/soc/embs/comar/

Possible hazards from exposure to power frequency electric and magnetic fields. IEEE Eng Med Biol 2000; 19(1):131–137.

Human exposure to electric and magnetic fields from RF sealers and dielectric heaters. IEEE Eng Med Biol 1999; 18(1):88–90.

Biological effects of electric and magnetic fields from video display terminals. IEEE Eng Med Biol 1997; 16(3):87–92.

Invited Presentations

Erdreich L. Epidemiologic methods in analysis of scientific issues in the courtroom. Acoustical Society of American 146th Meeting, Austin, TX, November 2003.

Erdreich, LS. Epidemiology of radio frequency energy exposure and health. Armed Forces Epidemiology Board, San Diego, CA, February 2002.

Erdreich, L. Epidemiology: What it can tell you and what it can't? Short Course on Electromagnetic Energy. RF Safety: Science, Compliance and Communications. Co-sponsored by the Electromagnetic Energy Association and the Center for Environmental Radiation Toxicology of the University of Texas Health Sciences Center at San Antonio, San Antonio, TX, January 2000.

Erdreich L. What are the policy issues? Short Course on Electromagnetic Energy. RF Safety: Science, Compliance and Communications. Co-sponsored by the Electromagnetic Energy Association and the Center for Environmental Radiation Toxicology of the University of Texas Health Sciences Center at San Antonio, San Antonio, TX, January 2000.

Erdreich LS, Moulder JE. Cell phones and cancer: An update on the evidence for a connection. 1st International Medical Scientific Congress "Non-Ionizing High-Frequency EM Radiations: Researching the Epidemiological and Clinical Evidences" Sponsored by the University of L'Aquila and the Italian Society of Medical Statistics, Rome, Italy, November 1999.

Erdreich J, Erdreich LS. Human vibration standards: do we ask the right questions? 133rd Meeting of the Acoustical Society of America, Pennsylvania State University, State College, PA, June 1997.

Erdreich L. Epidemiologic studies of EMF. The EMF Regulation and Litigation Institute: Anticipating, Avoiding and Managing EMF Claims, Business Development Associates, Inc., Washington, DC, April 1996.

Erdreich L. Health issues and radiofrequency devices. Defining the role of local government: antennas, towers, and satellite dishes. Pace University School of Law, White Plains, NY, March 1996.

Erdreich L, Klauenberg BJ. Recent developments in non-cancer risk assessment and optimal use of radiofrequency data. Michaelson Research Conference, Colorado Springs, CO, August 1996.

Erdreich L. Overview of EMF epidemiological research; update. Electric and Magnetic Fields: Science and Policy Update, Sponsored by Northwestern University, University of Illinois, IIT Research Institute and Commonwealth Edison. Chicago, IL, October 1995.

Erdreich L. EMF and residential and occupational health risks. Conference on Electromagnetic Fields—Legal and Technical Update of the Bar of the City of New York and Society for Risk Analysis, September 1995.

Erdreich LS. The two newest studies: what questions should we ask? EMF Seminar: Focus on Research, Electric Power Research Institute, March 1994.

Erdreich LS. Epidemiology in developing exposure standards: science and policy roles. Electromagnetic Energy Association Annual Meeting and Symposium, May 1994.

Erdreich LS. Research: answers or more questions? 9th Annual Meeting and Symposium of the Electromagnetic Energy Policy Alliance, Alexandria, VA, May 1993.

Erdreich LS. EMF research: Summarizing the evidence. Symposium on Possible Health Effects of EMFs Associated with Electric Power Generation and Distribution. Iowa Academy of Science, Des Moines, IA, February 1992.

Erdreich LS. EMF health issues briefing. Residential and Small Commercial Services Seminar, Electric Council of New England, Manchester, NH, May 1991.

Erdreich LS. State policy options for managing extremely low frequency electromagnetic fields. Conference on Health Effects of High Voltage Power Lines, Center for Environmental Health, University of Connecticut, West Hartford, CT, June 1990.

Erdreich LS. Current public health issues in EMF. University of Oklahoma College of Public Health Alumni Day, Oklahoma City, OK, October 1989.

Thorslund T, Erdreich LS, Hegner R. Testing hypotheses of mechanism using epidemiologic data. Presented at the International Symposium on Chemical Mixtures: Risk Assessment and Management, Cincinnati, OH, June 1988.

Erdreich LS, Sonich C. Hypersusceptible subgroups of the population: determining numbers at risk. Presented at Satellite Meeting of the Environmental Mutagen Society, March 1983.

Prior Experience

Bailey Research Associates, Principal Scientist, 1991–1999
Environmental Research Information (ERI), Senior Research Associate, 1989–1991
Clement Associates, Senior Associate, 1987–1989
U.S. Environmental Protection Agency, Office of Research and Development, Methods Evaluation and Development Staff, Group Leader, 1984–1987
U.S. Environmental Protection Agency, Office of Research and Development, Environmental Criteria and Assessment Office, Senior Epidemiologist, 1980–1984

Current Academic Appointments

- Adjunct Associate Professor, Department of Environmental and Community Medicine, Robert Wood Johnson Medical School, University of Medicine & Dentistry of New Jersey, 1993–present

Teaching Appointments

- Lecturer, Short Course on Electromagnetic Energy: University of Texas Health Science Center, Center for Environmental Radiation Toxicology, San Antonio, Texas (1998, 2000
- Adjunct Assistant Professor, Institute of Environmental Health, University of Cincinnati Medical Center, 1982–1987
- Teaching Assistant, Department of Biostatistics and Epidemiology, University of Oklahoma School of Public Health, 1975–1979
- Teacher of Biology and Chemistry, Ann Arbor, MI; Philadelphia, PA; Montgomery County, MD, 1964–1972

Advisory Positions

- Institute of Electrical and Electronics Engineers (IEEE), 1992–present
  - Chair, Epidemiology Workgroup of Subcommittee 4 Safety Level with Respect to Human Exposure to Radiofrequency Fields (3 kHz–33 GHz), for the Standards Coordinating Committee 28 Non-Ionizing Radiation, 1992–2000
  - Member, Standards Coordinating Committee 28 Non-Ionizing Radiation, and Subcommittee 3 Safety Levels with Respect to Human Exposure (0-3 kHz), Institute of Electrical and Electronics Engineers (IEEE)
- Member of the Committee on Man and Radiation (COMAR) of the Engineering in Medicine and Biology Society, 1995–2000; 2002–2007
- Chair of the Expert Panel to advise the Massachusetts Department of Public Health, Bureau of Environmental Health Assessment regarding radio-frequency

exposure from the Air Force Space Command's PAVE PAWS radar system on Cape Cod, 1998–1999

- Member of a panel convened by Health Canada to review a toxicity assessment of a priority substance under the Canadian Environmental Protection Act (1,3-butadiene), 1998
- Served on peer review panels for risk assessments for chromium, cadmium, acrylamide, and for methylmercury, convened by Toxicology Excellence for Risk Assessment, a non-profit, 501(c)(3) corporation, 1997–1998
- Contributor to NATO Standardization Agreement: Evaluation and Control of Personnel Exposure to Radio-Frequency Fields - 3 kHz to 300 GHz, 1995
- At EPA, managed and co-authored the agency's first draft Interim Methods for Development of Inhalation Reference Doses, 1987–1988
- Member of U.S. EPA's work group to develop Oral Reference Doses for non-carcinogens, available on Integrated Risk Information System (IRIS), 1986–1987
- Member of EPA's Risk Assessment Forum's Technical Panel: Developing a Scientific Policy for Thyroid Neoplasia, 1986–1987
- Panel member for an EPA workshop in weight of evidence/hazard identification for non-cancer health endpoints, 1986–1987
- Co-Chair of EPA's agency-wide committee to write Risk Assessment Guidelines for Chemical Mixtures, 1985–1986
- Program Committee to plan a national symposium Epidemiology and Health Risk Assessment, sponsored by private, governmental and academic institutions, 1984–1985
- Member, Environmental Advisory Council to the City of Cincinnati. Appointed to the Executive Committee, 1986, 1984–1987
- Planned and managed an international symposium on "Advances in Risk Assessment of Systematic Toxicants and Chemical Mixtures," held October 1984; co-edited the proceedings, 1983–1984
- Chairperson for two international symposia: "Risk Assessment for Multiple Chemical Exposures," sponsored by EPA, 1981–1983