



POSITION STATEMENT

The Effect of Environmental Toxins on Reproductive and Developmental Health

The American College of Nurse-Midwives (ACNM) affirms that midwives and other reproductive health care professionals have ethical and professional responsibilities to address risks of environmental contamination through the following actions:

- Increase individual awareness of the presence and effects of various environmental contaminants,
- Provide appropriate education and interventions for women or newborns exposed to environmental toxins, and
- Encourage policy and program development and continuing research to promote a cleaner, safer environment.

Background on Environmental Toxins in the United States

Researchers increasingly demonstrate links between environmental contaminants and human diseases. Toxic chemicals are encountered daily through water, air, food, personal care products and home, work, and community environments. Currently, the majority of the more than 84,000 chemicals produced or used in the U.S. have not undergone comprehensive testing for human toxicity.¹⁻³ The Centers for Disease Control and Prevention tracks the bioaccumulation of chemicals in humans and has identified hundreds of chemicals of concern in blood and urine samples of U.S. residents across all demographics.⁴ All pregnant women are exposed to fetotoxic chemicals.^{5,6} Many toxic chemicals cross the placenta, and some accumulate at greater concentrations in the fetus than in the mother.⁷ Hundreds of exogenous chemicals have been identified in samples of newborn cord blood.⁸

Foreign chemicals compromise the delicate processes of reproduction and fetal development. Exposures have been linked with irreversible, life-long, and even multigenerational effects such as birth defects, developmental delays, and adult-onset illnesses.^{4,9} For example, industrial chemicals known as endocrine-disruptors disrupt hormone function and are found in industrial air pollution, food contaminated by pesticides and heavy metals, and some plastics, cosmetics, and paper products. Endocrine disruptors are linked to adverse health outcomes such as altered puberty onset, infertility, aneuploidy, miscarriage, preeclampsia, fetal growth restriction, preterm delivery, menstrual irregularities, polycystic ovary syndrome, uterine fibroids, endometriosis, shortened lactation, breast cancer, early menopause, thyroid dysfunction, obesity, diabetes, and cardiovascular diseases.^{10,11} Contrary to prior belief, safe, low levels do not exist for many chemicals. Just as natural hormones are active at extremely low concentrations and initiate various physiologic functions based on level of exposure, some hormone disruptors have been found to be more active and dangerous at low levels than at high levels.¹²

ACNM joins numerous, prominent organizations that have spoken out on this issue and recognizes the need for increased efforts from ACNM members and other responsible parties to address the mounting problem of environmental pollution.¹³⁻²⁰

Patient Education and Interventions

Exposure to many chemicals is preventable. Midwives are required to possess knowledge about environmental hazards encountered during preconception, pregnancy, and the postpartum period and are ideally positioned to prevent or limit toxic exposure in women, fetuses, and infants.^{21,22} Prior efforts to reduce exposures to alcohol, tobacco, mercury, and lead have been successful. Midwives can now play a pivotal role in limiting women's contact with other well-documented hazards, including air pollution, bisphenol A, disinfection byproducts, pesticides, petroleum products, phthalates, solvents, chlorinated hydrocarbons, and metals.²³

While all women and children are exposed to environmental toxins to some degree, midwives can identify particularly vulnerable populations that are exposed to contamination at greater-than-average rates as well as those that are most susceptible to exposure. Risk factors include low socio-economic status, poor housing quality, occupational exposures such as agricultural pesticides and products used by nail salon workers, poor health, poor nutrition, and psychosocial stressors.^{24,25}

Many local and national resources exist to assist midwives in addressing this issue with the women and families they serve. To promote change, midwives may include environmental history assessment as a routine part of primary care,²⁶ educate women to increase their awareness and encourage healthy behavioral changes,^{27,28} and enhance their own professional knowledge on this issue.^{29,30}

Recommendations for Policy and Research to Promote a Cleaner, Safer Environment

Many environmental exposures are beyond the control of the individual. Institutional and political changes are critical to prevent harmful chemical exposures. ACNM recognizes the certified nurse-midwife/certified midwife (CNM/CM) as a member of a larger community working toward a cleaner environment. Midwives can act as change agents for environmental protection and can be instrumental in influencing regulations where they live. They can also influence policies in the hospitals, birth centers, and homes where they work.²⁴ The fact that environmental toxins are harmful to women and children presents a challenge and an opportunity for change.³¹

ACNM acknowledges the need for legislative and regulatory bodies to identify and uphold restrictions and bans on known and suspected toxic chemicals and supports increasingly robust research and investigation regarding causal relationships between toxic chemicals and disease. Further, ACNM supports industry and regulatory efforts for more socially responsible chemical use and increasing efforts to assist populations already harmed by exposure to toxic chemicals. In cases where research has not fully clarified the causal relationships between chemicals and disease, ACNM supports leading scientists in advocating for precautionary principles to be employed.¹⁷

REFERENCES

1. United States Environmental Protection Agency. TSCA chemical substance inventory. <http://www.epa.gov/oppt/existingchemicals/pubs/tscainventory/basic.html>. Updated March 13, 2014. Accessed May 12, 2015.
2. United States Environmental Protection Agency. HPV chemical hazard data availability study. www.epa.gov/HPV/pubs/general/hazchem.htm. Updated August 2, 2010. Accessed May 12, 2015.
3. Vogel SA, Roberts JA. Why the toxic substances control act needs an overhaul, and how to strengthen oversight of chemicals in the interim. *Health Aff.* 2011;30(5):898-905. doi: 10.1377/hlthaff.2011.0211.
4. Centers for Disease Control and Prevention. National report on human exposure to environmental chemicals. <http://www.cdc.gov/exposurereport/>. Updated June 4, 2014. Accessed May 12, 2015.
5. Sutton P, Perron J, Giudice L, Woodruff T. Pesticides matter: a primer for reproductive health physicians. http://prhe.ucsf.edu/prhe/pdfs/pesticidesmatter_whitepaper.pdf. Published 2011. Accessed May 12, 2015.
6. Woodruff TJ, Zota AR, Schwartz JM. Environmental chemicals in pregnant women in the United States: NHANES 2003-2004. *Environ Health Perspect.* 2011;119(6):878-885. doi: 10.1289/ehp.1002727.
7. Barr DB, Bishop A, Needham LL. Concentrations of xenobiotic chemicals in the maternal-fetal unit. *Reprod Toxicol.* 2007;23(3):260-266.
8. Environmental Working Group. Body burden: the pollution in newborns. <http://www.ewg.org/research/body-burden-pollution-newborns>. Published July 14, 2005. Accessed May 12, 2015.
9. Landrigan PJ, Miodovnik A. Children's health and the environment: an overview. *Mt Sinai J Med.* 2011;78(1):1-10. doi: 10.1002/msj.20236.
10. Barrett J, Gonzalez S, Sarantis H, Varshavsky J. Girl, disrupted: hormone disruptors and women's reproductive health. <http://prhe.ucsf.edu/prhe/publications.html>. Published January, 2009. Accessed May 12, 2015.
11. Diamanti-Kandarakis E, Bourguignon JP, Giudice LC, et al. Endocrine-disrupting chemicals: an Endocrine Society scientific statement. *Endocr Rev.* 2009;30(4):293-342. doi: 10.1210/er.2009-0002.
12. Vandenberg LN, Colborn T, Hayes TB, et al. Hormones and endocrine-disrupting chemicals: low-dose effects and nonmonotonic dose responses. *Endocr Rev.* 2012;33(3):378-455. doi: 10.1210/er.2011-1050.
13. The American College of Obstetricians and Gynecologists. Committee opinion number 575: exposure to toxic environmental agents. <http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Health-Care-for-Underserved-Women/Exposure-to-Toxic-Environmental-Agents>. Published October 2013. Accessed May 12, 2015.
14. University of California, San Francisco Program on Reproductive Health and the Environment. Professional societies statements database. <http://prhe.ucsf.edu/prhe/pdfs/ProfessionalStatementsDatabase.pdf>. Updated January, 2015. Accessed May 12, 2015.

15. Health & Environment. Position statement: health professionals and environmental health education. <http://www.neefusa.org/pdf/PositionStatement.pdf>. Published April 3, 2009. Accessed May 12, 2015.
16. American Medical Association House of Delegates. Resolution 404 (A-08): a modern chemicals policy. http://www.edf.org/sites/default/files/2008_ama_resolutions-3-4.pdf. Published April 30, 2008. Accessed May 12, 2015.
17. Council on Environmental Health. Chemical-management policy: prioritizing children's health. *Pediatrics*. 2011;127(5):983-990. doi: 10.1542/peds.2011-0523.
18. Reuben SH, President's Cancer Panel. Reducing environmental cancer risk: what we can do now. http://deainfo.nci.nih.gov/advisory/pcp/annualReports/pcp08-09rpt/PCP_Report_08-09_508.pdf. Published April, 2010. Accessed May 12, 2015.
19. American Nurses Association. ANA's principles of environmental health for nursing practice with implementation strategies. <http://www.nursingworld.org/MainMenuCategories/WorkplaceSafety/Healthy-Nurse/ANAsPrinciplesofEnvironmentalHealthforNursingPractice.pdf>. Published 2007. Accessed May 12, 2015.
20. Association of periOperative Registered Nurses. AORN position statement on environmental responsibility. *AORN J*. 99(1):18-21. doi: <http://dx.doi.org/10.1016/j.aorn.2013.10.011>.
21. American College of Nurse-Midwives. Core competencies for basic midwifery practice. <http://www.midwife.org/ACNM/files/ACNMLibraryData/UPLOADFILENAME/000000000050/Core%20Competencies%20Dec%202012.pdf>. Published December, 2012. Accessed May 12, 2015.
22. Sutton P, Woodruff TJ, Perron J, et al. Toxic environmental chemicals: the role of reproductive health professionals in preventing harmful exposures. *Am J Obstet Gynecol*. 2012;207(3):164-173. doi: 10.1016/j.ajog.2012.01.034.
23. Woodruff TJ, Carlson A, Schwartz JM, Giudice LC. Proceedings of the Summit on Environmental Challenges to Reproductive Health and Fertility: executive summary. *Fertil Steril*. 2008;89(2 Suppl):e1-e20. doi: 10.1016/j.fertnstert.2008.01.065.
24. Morello-Frosch R, Zuk M, Jerrett M, Shamasunder B, Kyle AD. Understanding the cumulative impacts of inequalities in environmental health: implications for policy. *Health Aff*. 2011;30(5):879-887. doi: 10.1377/hlthaff.2011.0153.
25. Luber G, Knowlton K, Balbus J, et al. Climate change impacts in the United States. Chapter 9 human health. <http://nca2014.globalchange.gov/report/sectors/human-health>. Accessed May 12, 2015.
26. University of California, San Francisco Program on Reproductive Health and the Environment. Clinical practice: resources for health care professionals to promote environmental health. http://prhe.ucsf.edu/prhe/clinical_resources.html. Updated February 10, 2015. Accessed May 12, 2015.
27. Physicians for Social Responsibility. Pediatric environmental health toolkit. <http://www.psr.org/resources/pediatric-toolkit.html>. Accessed May 12, 2015.
28. American College of Nurse Midwives. Environmental hazards during pregnancy. *J Midwifery Womens Health*. 2006;51(1):57-58. doi:10.1016/j.jmwh.2005.09.008.
29. Collaborative on Health and the Environment. Partner resources. Retrieved from <http://www.healthandenvironment.org/resources>.

30. Trasande L, Newman N, Long L, et al. Translating knowledge about environmental health to practitioners: are we doing enough? *Mt Sinai J Med.* 2010;77(1):114-123. doi: 10.1002/msj.20158.
31. Landrigan PJ, Goldman LR. Children's vulnerability to toxic chemicals: a challenge and opportunity to strengthen health and environmental policy. *Health Aff.* 2011;30(5):842-850. doi: 10.1377/hlthaff.2011.0151.

Source: Division of Standards and Practice Clinical Standards and Practice Documents Section
Approved: ACNM Board of Directors, June 2015