AMERICAN COLLEGE of NURSE-MIDWIVES

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 adults or newborns exposed to environmental toxins.
- 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 US 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 US residents across all demographics.[4] All people 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 adult.[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 endocrine 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. They are ideally positioned to prevent or limit toxic exposure in adults, 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 peoples' 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 adults and children are exposed to environmental toxins to some degree, midwives can identify 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 socioeconomic 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 families they serve. To promote change, midwives may include environmental history assessment as a routine part of primary care,[26] educate families 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 (CNM)/certified midwife (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 adults 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. ACNM also 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. TSCA chemical substance inventory. Updated February 16, 2023. United States Environmental Protection Agency website. Accessed January 25, 2023. https://www.epa.gov/tsca-inventory.
2. CCD/Existing Chemicals. Chemical hazard data availability study: what do we really know about the safety of high production volume chemics?. United States Environmental Protection Agency Office of Pollution Prevention and Toxics website. Updated August 2, 2010. Accessed January 25, 2023. https://noharm-uscanada.org/sites/default/files/documents-files/915/Chemical_Hazard_Data_Availability_Study_1998.pdf
3. The Toxic Substances Control Act. United States Environmental Protection Agency website. Amended June 22, 2016. Accessed January 25, 2023. https://www.epa.gov/laws-regulations/summary-toxic-substances-control-act.
4. National report on human exposure to environmental chemicals. Centers for Disease Control and Prevention website. Updated December 15, 2022. Accessed January 25, 2023. https://www.cdc.gov/exposurereport
5. Pesticides matter: reduce your exposure to toxic pesticides and protect your health and the health of your family. University of California, San Francisco website. Updated May 2016. Accessed January 25, 2023. https://prhe.ucsf.edu/sites/g/files/tkssra341/f/wysiwyg/PM_en2018.pdf
6. Buckley JP, Kuiper JR, Bennett DH, et al. Exposure to contemporary and emerging chemicals in commerce among pregnant women in the United States: the environmental influences on child health outcome (ECHO) program. *Environ Sci Technol*. 2022;56(10):6560-6573. doi: 10.1021/acs.est.1c08942.

7. Barr DB, Bishop A, Needham LL. Concentrations of xenobiotic chemicals in the maternal- fetal unit. *Reprod Toxicol.* 2007;23(3):260-266. doi:10.1016/j.reprotox.2007.03.003
8. Wang A, Abrahamsson DP, Jiang T, et al. Suspect screening, prioritization, and confirmation of environmental chemicals in maternal-newborn pairs from San Francisco. *Environ Sci Technol*. 2021;17;55(8):5037-49. doi:10.1021/acs.est.0c05984
9. Information sheet on children's environmental health for CHW: what every community health worker needs to know about children's environmental health. World Health Organization website. Published November 1, 2022. Accessed January 25, 2023. https://www.who.int/publications/i/item/WHO-HEP-ECH-CHE-22.03
10. Varshavsky, J, Smith A, Wang A, et al. Heightened susceptibility: a review of how pregnancy and chemical exposures influence maternal health. *Reprod Toxicol*, 2020;92: 14-56. doi:10.1016/j.reprotox.2019.04.004
11. La Merrill MA, Vandenberg LN, Smith MT, et al. Consensus on the key characteristics of endocrine-disrupting chemicals as a basis for hazard identification. *Nat Rev Endocrinol*. 2020;16(1):45-57. doi:10.1038/s41574-019-0273-8.
12. Lee DH, Jacobs DR Jr. New approaches to cope with possible harms of low-dose environmental chemicals. *J Epidemiol Community Health* 2019;73(3):193-197. doi:10.1136/jech-2018-210920
13. Committee opinion number 832: Reducing prenatal exposure to toxic environmental agents. The American College of Obstetricians and Gynecologists website. Published June 24, 2021. Accessed January 25, 2023. https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2021/07/reducing-prenatal-exposure-to-toxic-environmental-agents
14. Professional societies statements database. University of California, San Francisco Program on Reproductive Health and the Environment website. Updated October 2016. Accessed January 25, 2023. https://prhe.ucsf.edu/sites/g/files/tkssra341/f/Professional%20Statements%20Database.pdf.
15. Health professionals and environmental health education position statement. National Environmental Education Foundation website. Accessed January 25, 2023. https://www.neefusa.org/resource/health-professionals-and-environmental-health-education-position-statement
16. Report of Reference Committee D. American Medical Association House of Delegates website. Accessed January 25, 2023. https://www.ama-assn.org/system/files/a22-refcmte-d-report-annotated.pdf
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. 15th report on cancers. U.S. Department of Health and Human Services National Toxicology Program website. Updated November 10, 2022. Accessed January 25, 2023. https://ntp.niehs.nih.gov/whatwestudy/assessments/cancer/roc/index.html.
19. Vandali, V, Biradar RB. Impact of environment on health: Nurses role. *Journal of Clinical and Nursing* Research. 2018;2(3). doi:10.26689/jcnr.v2i3.373

20. AORN position statement on environmental responsibility. Association of periOperative Registered Nurses website. Updated March 2020. Accessed January 25, 2023. https://www.aorn.org/docs/default-source/guidelines-resources/position-statements/patient-workplace-safety/posstat-safety-environmental-responsibility.pdf?sfvrsn=ddbc8b13_1
21. ACNM core competencies for basic midwifery practice. American College of Nurse-Midwives website. Published March 2020. Accessed January 25, 2023. https://www.midwife.org/acnm/files/acnmlibrarydata/uploadfilename/000000000050/ACNMCoreCompetenciesMar2020_final.pdf
22. Giudice, LC, Llamas-Clark EF, DeNicola, N, et al. Climate change, women's health, and the role of obstetricians and gynecologists in leadership. *Int J Gynaecol Obstet*. 2021;155(3):345-356. doi:10.1002/ijgo.13958
23. What healthcare professionals should know –reproductive health. Centers for Disease Control and Prevention website. Updated October 28, 2019. Accessed January 23, 2023. https://www.cdc.gov/niosh/topics/repro/healthcare.html
24. Hauptman M, Woolf AD. Childhood ingestions of environmental toxins: what are the risks?. *Pediatr Ann*. 2017;46(12):e466-e471. doi:10.3928/19382359-20171116-01
25. Fourth National Climate Assessment. 2017;2(4):27-28. U.S. Global Change Research Program website. Updated 2018. Accessed January 25, 2023. https://nca2018.globalchange.gov/
26. Segal, TR, Giudice LC. Before the beginning: environmental exposures and reproductive and obstetrical outcomes. *Fertil Steril*. 2019;112(4), 613-621. doi:10.1016/j.fertnstert.2019.08.001
27. Pediatric environmental health toolkit. Physicians for Social Responsibility website. Revised June 28, 2017. Accessed January 25, 2023. http://www.psr.org/resources/pediatric-toolkit.html.
28. Kim HK, Jeong GH. Effect of pro-environmental prenatal education program on pregnant women's environmental health awareness and behaviors based on the protection motivation theory. *Inquiry*. 2022;59:469580211047045. doi: 10.1177/00469580211047045
29. Our Work. Collaborative for Health & Environment website. Accessed January 25, 2023. https://www.healthandenvironment.org/our-work/
30. Goldman RH, Zajac L, Geller RJ, Miller MD. Developing and implementing core competencies in children's environmental health for students, trainees and healthcare providers: a narrative review. *BMC Med Educ*. 2021;21(1):503. doi: 10.1186/s12909-021-02921-3
31. Protecting children's environmental health: a comprehensive framework. American Public Health Association website. Published November 7, 2017. Accessed January 25, 2023. https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2018/01/23/protecting-childrens-environmental-health

Note: Midwifery and midwives as used throughout this document refer to the education and practice of certified nurse-midwives (CNMs) and certified midwives (CMs) who have been certified by the American Midwifery Certification Board (AMCB).

Source: Division of Standards and Practice Clinical Standards and Practice Documents Section
Approved: ACNM Board of Directors, June 2015
Revised: 2023