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Committee on Obstetric Practice

The American College of Nurse-Midwives endorses this document. This Committee Opinion was developed by the Committee on Obstetric Practice in collaboration with liaison member Nathaniel DeNicola, MD, MSc and committee member Ann E. Borders, MD, MSc, MPH, and with the assistance of Veena Singla, PhD and Tracey J. Woodruff, PhD, MPH.

Reducing Prenatal Exposure to Toxic Environmental Agents

ABSTRACT: There is emerging evidence that links exposure to toxic environmental agents and adverse reproductive and developmental health outcomes. Toxic exposures related to reproductive and developmental health primarily have been associated with infertility and miscarriage, obstetric outcomes such as preterm birth and low birth weight, neurodevelopmental delay such as autism and attention deficit hyperactivity disorder, and adult and childhood cancer. Although there is substantial overlap in the type of exposure and the associated health outcomes, for the purposes of this document, exposures generally can be grouped into the following categories: toxic chemicals, air pollution, and climate change-related exposures. Obstetric care clinicians do not need to be experts in environmental health science to provide useful information to patients and refer patients to appropriate specialists, if needed, when a hazardous exposure is identified. It is important for obstetrician–gynecologists and other obstetric care clinicians to become knowledgeable about toxic environmental exposures that are endemic to their specific geographic areas, such as local water safety advisories (eg, lead-contaminated water), local air quality levels, and patients' proximity to power plants and fracking sites. Although exposure to toxic environmental agents is widespread across populations, many environmental factors that are harmful to reproductive health disproportionately affect underserved populations and are subsumed in issues of environmental justice. Clinical encounters offer an opportunity to screen and counsel patients during the prepregnancy and prenatal periods—particularly individuals most disproportionately affected—about opportunities to reduce toxic environmental health exposures. This Committee Opinion is revised to integrate more recent literature regarding reducing prepregnancy and prenatal toxic environmental exposures.

Recommendations and Conclusions

The American College of Obstetricians and Gynecologists makes the following recommendations and conclusions:

- It is important for obstetric care clinicians to be knowledgeable about toxic environmental agents in relation to environmental health risk assessment, exposure reduction, and clinical counseling.
- Obstetrician–gynecologists and other obstetric care clinicians should consider including questions about environmental exposures in the patient history during prepregnancy visits and prenatal care.

- Typical elements of an environmental health history include assessment for exposures from the workplace, home, or recreational activities.
- It may be beneficial to integrate environmental health into obstetrics and gynecology training and practice. Advocating for policies that will reduce harmful exposures and protect the health of pregnant individuals and their children is encouraged.

Introduction

This Committee Opinion is revised to integrate recent literature regarding reducing prepregnancy and prenatal

toxic environmental exposures. Scientific evidence has emerged over the past 20 years that demonstrates that prepregnancy and prenatal exposure to toxic environmental agents can have lasting effects on reproductive health across the life span (1–5). Although there is evidence that connects some exposures to effects on pregnancy and fetal health, more research is needed to explore other environmental exposures and guide recommendations for effective clinical interventions. Still, clinical counseling toward reduction, when possible, of exposures that are known or considered to be potentially toxic can be included in care while more evidence is gathered regarding the clinical efficacy of specific interventions and questions of causation.

Toxic environmental agents can range from population-based exposures such as air pollution and water contamination to specific individual exposures such as personal care products and food packaging (6). Exposures may be the result of an acute environmental crisis, such as the 2014 lead-contaminated water in Flint, Michigan. They also may result from chronic, often undetected, periods of continued pollution, such as the widespread mercury poisoning from methylmercury bioaccumulation in local fish and shellfish after decades of industrial wastewater being dumped in Minamata Bay, Japan (7). Notably, this environmental crisis laid the groundwork for global regulation on mercury pollution and identified seafood as a potential source of heavy metal exposure (7).

Background

Unlike pharmaceuticals, most environmental chemicals have entered the marketplace without comprehensive and standardized information regarding their reproductive or other long-term toxic effects (8). Given that intrauterine gestation is a critical and particularly susceptible window of human development, obstetrician-gynecologists and other obstetric health care clinicians can be effective in reducing prenatal exposure to environmental health threats because they are uniquely positioned to educate patients about the effects of environmental exposure before and during pregnancy. Therefore, it is important for obstetric care clinicians to be knowledgeable about toxic environmental agents in relation to environmental health risk assessment, exposure reduction, and clinical counseling. Clinical encounters offer an opportunity to screen and counsel patients during the prepregnancy and prenatal periods—particularly individuals most disproportionately affected—about opportunities to reduce toxic environmental health exposures. The guidance in this document comes with the understanding that some individuals and communities may have limited control over such exposures and may need to balance competing risks; therefore, recommendations are intended to guide counseling on reducing exposure where possible and to advocate for policies that will protect all populations.

Environmental Disparities

Although exposure to toxic environmental agents is widespread across populations, many environmental factors that are harmful to reproductive health disproportionately affect underserved populations and are subsumed in issues of environmental justice (9). In the United States, individuals in communities of color are more likely to live in counties with the highest levels of outdoor air pollution (10, 11) and to be exposed to a variety of indoor pollutants, including lead, allergens, and pesticides, than white populations (12). In addition, the effects of exposure to environmental chemicals can be exacerbated by injustice, racism, poverty, neighborhood quality, housing quality, psychosocial stress, and nutritional status (12–14).

Individuals with occupational exposure to toxic chemicals are additionally vulnerable to adverse reproductive health outcomes because of the risk of higher exposures in the workplace (15). For example, levels of organophosphate pesticides and phthalates (often used in plastics) measured in occupationally exposed populations are far greater than levels measured in the general population (16, 17). Immigrant populations working low-wage labor disproportionately work in occupations associated with a hazardous workplace environment in relation to toxic chemical exposures (18, 19).

A 2009 report by the National Academy of Sciences underscores that the effects of low-dose exposure to an environmental contaminant may be quite different based on characteristics such as the underlying health status of the population and the presence of additional or background environmental exposure (20).

Environmental Exposures and Outcomes

There is emerging evidence that links exposure to toxic environmental agents and adverse reproductive and developmental health outcomes (4, 21–24). However, more research is needed to understand whether these associations are linked to causality and, if so, to determine the levels of exposure to guide recommendations for clinical interventions. Toxic exposures related to reproductive and developmental health primarily have been associated with infertility and miscarriage, obstetric outcomes such as preterm birth and low birth weight, neurodevelopmental delay such as autism and attention deficit hyperactivity disorder, and adult and childhood cancer (25) (Table 1). Although there is substantial overlap in the type of exposure and the associated health outcomes, for the purposes of this document, exposures generally can be grouped into the following categories: toxic chemicals, air pollution, and climate change-related exposures (6).

Toxic Chemicals

Chemicals can be found in a wide range of consumer products, personal care products, food packaging, and household materials, as well as in air and water (26).

Table 1. Toxic Chemicals or Pollutants and Reported Associations With Adverse Reproductive Health Outcomes*

Chemical or pollutant with reported adverse association	Potential health effect
Antineoplastic drugs (1) , bisphenol A (BPA) (2) , cigarette smoke (3) , ethylene oxide (4), formaldehyde (5) , polybrominated diphenyl ether (PBDE) flame retardants (6), solvents (7–10)	Infertility and miscarriage
Air pollutants from fracking (11), ambient air pollutants (12–14) , antineoplastic drugs (15), cigarette smoke (16) , ethylene oxide (17), formaldehyde (18) , perfluorochemicals (PFAS)* (19, 20) , pesticides (21), phthalates (22), polybrominated diphenyl ethers (PBDEs) (23), toluene (24)	Preterm birth and low birth weight
Ambient air pollutants (25) , bisphenol A (BPA) (26), lead (27, 28) , mercury (29, 30) , pesticides (31, 32) , phthalates (33–35) , polybrominated diphenyl ether (PBDE) flame retardants (36–38) , polychlorinated biphenyls (PCBs) (39)	Neurodevelopmental impairment

Studies designated in bold are supported by the U.S. Agency for Healthcare Research and Quality (U.S. AHRQ) Level 1 evidence systematic review, meta-analysis, or scientific consensus statement. All other studies are U.S. AHRQ Level II or III experimental studies or well-designed quasi-experimental studies. The level of evidence refers to the environmental exposure and reported health outcomes; however, the magnitude of the associated risk is not specified. The counseling provided is intended to assist obstetric care clinicians in reducing toxic exposures for pregnant individuals where possible and is not based on established evidence of limiting the adverse health outcome.

*Associations noted are from reports of animal and limited human studies. Although there are reported associations between exposures and adverse obstetric outcomes, an association does not necessarily mean that the exposure is a cause of the outcome. More research is needed to understand if there is causality and, if so, at what level of exposure or use of a specific product.

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Chemicals can cross the placenta and, in some cases, such as with methylmercury, can accumulate in the fetus, which results in higher fetal concentrations than maternal levels (27–29). Prenatal exposure to specific toxic environmental chemicals is associated with various adverse neonatal and childhood health consequences, and exposure at any point in gestation may lead to harmful reproductive and developmental health outcomes. For example, scientific consensus among a group of expert scientists, health professionals, and patient advocates called Project TENDR (Targeting Environmental Neuro-Developmental Risk) identified toxic chemical exposures that may contribute to neurodevelopmental disorders, including learning disabilities, attention deficit hyperactivity disorder, autism, and behavioral or intellectual delay (4, 30) (Table 1, Table 2).

Many of these exposures, particularly among the toxic chemicals, share a common biological pathway that results in endocrine disruption (31, 32). These endocrine disrupting chemicals represent a heterogeneous group of agents used in pesticides, plastics, industrial chemicals, and fuels.

Air Pollution

Emerging evidence finds that that air pollution, especially fine particulate matter (PM_{2.5}, or fine inhalable particles with diameters that are generally 2.5 micrometers and smaller), may be associated with adverse fetal outcomes, including preterm birth (33–39) and low birth weight (33, 39–42). Supporting intervention studies show that reducing air pollution exposure may reduce the risk of preterm birth, as has been reported in populations

Table 2. Suggested Key Elements of Environmental History and Reported Associated Reproductive Health Outcomes*

Suggested key elements of environmental history	Toxic environmental agent	Reported associations	Counseling to minimize exposure to toxic environmental agent
Lead Recent emigration Working with lead Living with someone identified with elevated blood lead level	Lead [†]	Neurodevelopmental delay and lowered intelligence (1, 2) Attention deficits and behavioral problems (3, 4)	Use a wet cloth or mop to clean floors and surfaces. Toxic substances like lead are present in dust. Sweeping and dusting with a dry cloth can spread dust into the air instead of removing it. There may be lead in house paint, dust, and garden soil. Any home built before 1978 may have lead paint. Call the National Lead Information Center for information about how to prevent exposure to lead at 1(800) 424-LEAD. If you have lead paint in your home, cover it with a fresh coat of paint, wallpaper, or tiles. Never sand or remove lead paint yourself. Hire a contractor who is certified in lead abatement. Look for lead-free products. Additional guidance at: https://www.acog.org/Clinical-Guidance-and-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Lead-Screening-During-Pregnancy-and-Lactation
Home environment and lifestyle Living with somebody who smokes	Cigarette smoke	Increased risk of low birth weight infant (5)	Avoid secondhand smoke exposure, tobacco cessation, and relapse prevention. Additional guidance at: https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2020/05/tobacco-and-nicotine-cessation-during-pregnancy
Flame retardants in foam furniture	Polybrominated diphenyl ether (PBDE) flame retardants [†]	Decrease in cognitive and motor function including lower IQ (2, 6–8)	Choose foam products labeled “flame retardant free.” Use a wet cloth or mop to clean floors and surfaces. Wash your hands frequently, and always before eating, as hand gel only kills bacteria and does not remove toxins.
Location/region	Polycyclic aromatic hydrocarbons (PAH's) air pollutant [†]	Preterm birth (9–11) Low birth weight (12–15) Neurodevelopment: autism spectrum (16, 17)	Follow the recommendations of local air quality alerts or water safety advisories; consider avoiding outdoor exercise during peak times for air pollution.

(continued)

Table 2. Suggested Key Elements of Environmental History and Reported Associated Reproductive Health Outcomes* (continued)

Suggested key elements of environmental history	Toxic environmental agent	Reported associations	Counseling to minimize exposure to toxic environmental agent
Home environment and lifestyle			
Cleaning products	Solvents	Miscarriage (18, 19) Low birth weight (20, 21)	Clean your home with nontoxic products. Some cleaning products contain solvents. It is easy and inexpensive to make effective, nontoxic cleaners. You can use common items like vinegar and baking soda. Avoid dry cleaning your clothes. Many dry cleaning systems use toxic chemicals, such as solvents. Use water instead. Most clothes labeled “dry clean only” can be washed with water.
Pesticides	Pesticides [†]	Childhood cancer (22, 23) Autism spectrum disorders (24, 25) Decreased intelligence quotient (25) Decreased working memory (25–27)	Avoid using pesticides at home, including sprays, bug bombs, chemical tick-and-flea collars, flea baths, or flea dips. To help keep insects and rodents out of your home: <ul style="list-style-type: none"> • Clean up crumbs and spills. • Store food in tightly closed containers. • Seal cracks around doors, windowsills, and baseboards. • Repair drips and holes. • Get rid of standing water. • Use baits and traps.
Personal care products	Phthalates	Neurodevelopmental disorders (2, 28, 29) Male reproductive outcomes (30, 31)	Decrease use of scented personal care products. “Fragrance-free” labels are preferable to “scented” or “unscented” products; look for phthalate-free products.
Diet and nutrition			
Seafood consumption	Mercury [†]	Decreased cognitive function and decrements in memory (2, 32–34)	Eat fish with lower levels of mercury; avoid some large fish such as shark, swordfish, king mackerel, and tilefish. Use trusted sites to find local fish advisories. Don’t eat the fish you or others catch before checking these warnings to make sure the fish is safe to eat.

(continued)

Table 2. Suggested Key Elements of Environmental History and Reported Associated Reproductive Health Outcomes* (continued)

Suggested key elements of environmental history	Toxic environmental agent	Reported associations	Counseling to minimize exposure to toxic environmental agent
Diet and nutrition Produce	Listeria monocytogenes	Severe fetal and neonatal infections that may lead to fetal loss, preterm labor, neonatal sepsis, meningitis, and death	Thoroughly wash raw produce, even if it will be peeled or cut to reduce bacterial contamination; it is unclear if this will reduce other toxic chemical exposures (eg, perchlorate or PFAS)
			Avoid certain foods with a high risk of contamination with listeria. Additional guidance at: https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2014/12/management-of-pregnant-women-with-presumptive-exposure-to-listeria-monocytogenes
	Pesticides [†]	Childhood cancers (22, 23) Autism spectrum disorders (24, 25) Decreased intelligence quotient (25) Decreased working memory (25–27)	Eat foods with limited pesticides, such as USDA organic, whenever possible.
Food preparation	Per- and poly- fluorinated alkyl substances (PFAS), also known as perfluorochemicals (PFCs)	Low birth weight (35)	Avoid nonstick cookware, if possible.
Food storage containers	Bisphenol A (BPA)	Miscarriage (36–38) Neurodevelopment disorders (39)	Choose glass, ceramic, or stainless-steel containers for food and drink instead of plastic, if possible.
Fast food	Phthalates	Neurodevelopmental disorders (2, 28, 29) Male reproductive outcomes (30, 31) Low birth weight (35)	Avoid fast food and other processed foods whenever possible. Increase the number of meals you make at home and try to use fresh, local, and seasonal foods.
	Per- and poly- fluorinated alkyl substances (PFAS), also known as perfluorochemicals (PFCs)		

(continued)

Table 2. Suggested Key Elements of Environmental History and Reported Associated Reproductive Health Outcomes* (continued)

Suggested key elements of environmental history	Toxic environmental agent	Reported associations	Counseling to minimize exposure to toxic environmental agent
Workplace or occupational exposure			In some cases, cleaning supplies containing chemicals can be replaced with less toxic options.
Agriculture	Pesticides		
Manufacturing	Organic solvents, heavy metals		By Occupational Safety and Health Administration (OSHA) standards, employers are required to ensure that exposures to workplace hazards do not harm workers' health.
Custodial and cleaning services	Organic solvents		
Beauty salon	Solvents, phthalates		Pregnant individuals have rights to a safe and healthy workplace.
Health care	Biologics and radiation		Additional guidance at: https://www.acog.org/clinical/clinical-guidance/committee-opinion/articles/2018/04/employment-considerations-during-pregnancy-and-the-postpartum-period

Adapted from McCue K, DeNicola N. Environmental exposures in reproductive health. *Obstet Gynecol Clin North Am* 2019;46:455–68.

Studies designated in bold are supported by U.S. Agency for Healthcare Research and Quality (U.S. AHRQ) Level 1 evidence systematic review, meta-analysis, or scientific consensus statement. All other studies are U.S. AHRQ Level II or III experimental studies or well-designed quasi-experimental studies. The level of evidence refers to the environmental exposure and reported health outcomes, however magnitude of the associated risk is not specified. The counseling provided is intended to assist obstetric care clinicians in reducing toxic exposures for pregnant individuals where possible and is not based on established evidence of limiting the adverse health outcome.

*Associations noted are from reports of animal and limited human studies. Although there are reported associations between exposures and adverse obstetric outcomes, an association does not necessarily mean that the exposure is a cause of the outcome. More research is needed to understand if there is causality and, if so, at what level of exposure or use of a specific product.

[†]Listed in Project TENDR: Targeting Environmental Neuro-Developmental Risks

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surrounding retired coal power plants (43). Proximity to fracking sites also has been associated with low birth weight (44).

Climate Change and Regional Exposures

The American College of Obstetricians and Gynecologists recognizes that climate change is an urgent women’s health concern as well as a major public health challenge (45). Along with air pollution, extreme heat and extreme cold may be associated with adverse fetal outcomes, including preterm birth (33–38) and low birth weight (33, 40–42, 46).

Clinical Assessment and Counseling

Environmental Health History

Obstetrician–gynecologists and other obstetric care clinicians should consider including questions about environmental exposures in the patient history during prepregnancy visits and prenatal care (Table 2). An environmental health history is the key first step in identifying specific types of potentially harmful exposures to the pregnant individual and fetus to tailor appropriate exposure reduction strategies. Typical elements of an environmental health history include assessment for exposures from the workplace, home, or

recreational activities (Table 2). For example, prepregnancy and prenatal counseling can include an assessment of lead exposure in these domains. Screening questions for lead exposure are further reviewed in ACOG Committee Opinion No. 533, “Lead Screening During Pregnancy and Lactation” (47).

After an environmental health history and assessment is completed, obstetrician–gynecologists and other obstetric care clinicians are encouraged to provide information regarding reducing exposure to toxic agents at home, in the community, and at work, being mindful of economic and other costs that reduction may entail. If an exposure is identified, patients can be educated regarding avoiding or reducing exposure to toxic agents where possible and, when necessary, referred to occupational medicine programs or to the United States Pediatric Environmental Health Specialty Units (48).

Counseling About Environmental Exposures

Obstetric care clinicians do not need to be experts in environmental health science to provide useful information to patients and to refer patients to appropriate specialists, if needed, when a hazardous exposure is identified. Existing clinical experience and expertise in communicating risks of treatment are largely transferable

Box 1. Fish Choices			
Best choices Eat 2–3 servings a week			
Anchovy	Flounder	Pickering	Smelt
Atlantic croaker	Haddock	Plaice	Sole
Atlantic mackerel	Hake	Pollock	Squid
Black sea bass	Herring	Salmon	Tilapia
Butterfish	Lobster, American and spiny	Sardine	Trout, freshwater
Catfish	Mullet	Scallop	Tuna, canned light (includes skipjack)
Clam	Oyster	Shad	Whitefish
Cod	Pacific chub mackerel	Shrimp	Whiting
Crab	Perch, freshwater and ocean	Skate	
Crawfish			
Good choices Eat 1 serving a week			
Bluefish	Halibut	Spanish mackerel	Tuna, yellowfin
Buffalofish	Mahi mahi/dolphinfish	Striped bass (ocean)	Weakfish/seatrout
Carp	Monkfish	Tilefish (Atlantic Ocean)	White croaker/Pacific croaker
Chilean sea bass/	Rockfish	Tuna, albacore/white, canned	
Patagonian toothfish	Sablefish	and fresh/frozen	
Grouper	Sheepshead		
	Snapper		
Choices to Avoid Highest mercury levels			
King mackerel	Shark	Tilefish (Gulf of Mexico)	Tuna, bigeye
Marlin	Swordfish		
Orange roughy			
U.S. Food and Drug Administration. Advice about eating fish: for women who are or might become pregnant, breastfeeding mothers, and young children. Silver Spring, MD: FDA; 2019. Available at: https://www.fda.gov/food/consumers/advice-about-eating-fish . Retrieved March 25, 2021.			

to environmental health. Many of the opportunities for counseling on environmental exposures occur during routine elements of prenatal and prepregnancy care when discussing topics such as food and water-related exposures, personal care products, and lifestyle modification (Table 2).

The Precautionary Principle states that in cases of serious or irreversible threats to the health of humans or ecosystems, acknowledged scientific uncertainty should not be used to postpone preventive measures (22). This principle can help guide clinical counseling about reduction of exposures that are known or considered to be potentially toxic until more evidence is gathered regarding the clinical efficacy of specific interventions. Clinician contact time with a patient does not need to be the primary point of intervention. Information and resources about environmental hazards can be successfully incorporated into a childbirth class curriculum or provided to patients in the form of written materials to help parents identify opportunities to reduce exposure for themselves and their children (49).

Workplace and Occupational Exposures

Employment sectors at particular risk of potentially hazardous exposures during pregnancy include agriculture (pesticides), manufacturing (organic solvents and heavy metals), dry cleaning (solvents), custodial and cleaning services (organic solvents), beauty salons (solvents and phthalates), and health care (biologics and radiation) (48). In some cases, cleaning supplies containing chemicals can be replaced with less toxic options. By Occupational Safety and Health Administration (OSHA) standards, employers are required to ensure that exposures to workplace hazards do not harm workers' health (51). Additionally, there are rights that employees have to a safe and healthy workplace, and obstetrician-gynecologists and other obstetric care clinicians can provide information and resources to their patients and partners that might help them better understand these rights. (51, 52).

Food-Related Exposures

Patients should be advised that some large fish, such as shark, swordfish, king mackerel, and tilefish, are known to contain high levels of methylmercury, which is teratogenic (53). Individuals in the prepregnancy period and those who are pregnant or lactating should avoid these fish and be encouraged to eat a variety of other types of fish (Box 1). Pregnant and lactating individuals also should check local advisories regarding the safety of fish caught in local lakes, rivers, and coastal areas (53).

Food preparation and storage can play a role in toxic exposure reduction. Patients can be advised to thoroughly wash raw produce to reduce bacterial contamination, even if it will be peeled or cut; however, it is unclear whether this will reduce all toxic chemical exposures (eg, perchlorate or pre- and polyfluoroalkyl substances [PFAS]) (54, 55). Although there is limited

evidence available, heating foods in plastic containers, including polystyrene, may increase exposure to plastic resins that may have endocrine-disrupting effects. Patients can be counseled that preparing and storing foods in glass or nonplastic containers may reduce their risk of exposure to these plastic resins. In addition, because consuming fast food has been associated with exposure to endocrine disruptors such as phthalates, recommendations to prepare meals at home or avoid fast food have the potential to reduce these exposures (56, 57).

Individuals can take actions to reduce their exposures to toxic chemicals (58–60). For example, research has shown that when children's diets change from conventional to organic, the levels of pesticides in their bodies decrease (59, 60). Likewise, avoiding dietary sources of bisphenol A (BPA) (eg, some canned food) can reduce measured levels of the chemical in children and adult family members, and short-term changes in dietary behavior may substantially decrease exposure to phthalates (58, 59). Although these data underscore the importance of selecting foods without pesticides, BPA, and phthalates whenever possible, it should be acknowledged that not all individuals will have ready physical or financial access to these food options. In addition, future research on the efficacy of implementing modifiable interventions to reduce these environmental exposures and effects is needed.

Personal Care Products

Personal care and cosmetic products may contain unrecognized toxins. Products marketed to individuals of color (particularly skin lighteners and hair straighteners) have been found to contain mixtures of endocrine-disrupting chemicals (eg, parabens and phthalates), but these chemicals often are not listed on the labels (62, 63). Although there are reported associations between exposure to endocrine-disrupting chemicals and adverse obstetric outcomes, more research is needed to understand if there is causality and, if so, at what levels of exposure or use of a specific product. Of note, although studies are limited, there is no evidence suggesting that the use of hair dye in pregnancy is associated with adverse obstetric outcomes.

Selecting products labeled "fragrance-free" rather than "unscented" may help reduce exposure to endocrine-disrupting chemicals because unscented products may contain multiple scents, still bound by phthalates, that are mixed to cancel each other out. Patients can be counseled that selecting cosmetic and personal care products without phthalates, parabens, oxybenzone, and triclosan may lower their exposure (64).

Regional Environmental Exposures

It is important for obstetrician-gynecologists and other obstetric care clinicians to become knowledgeable about toxic environmental exposures that are endemic to their

specific geographic areas, such as local water safety advisories (eg, lead-contaminated water), local air quality levels, and patients' proximity to power plants and fracking sites. Clinical counseling can include recommending avoidance of outdoor exercise during peak times for air pollution and relaying key messages from local safety advisories. Obstetrician-gynecologists and other obstetric care providers in communities near coal power plants or fracking sites can stay apprised of potential adverse obstetric outcomes associated with proximity to these sites (43, 44).

The Role of Obstetric Care Clinicians in Environmental Health Beyond the Clinical Setting

Reporting identified hazards is critical to prevention of further exposures and poor obstetric outcomes. Local and state health agencies and the Association of Occupational and Environmental Clinics serve as resources for reporting occupational and environmental illnesses.

More research is needed to confirm and better understand the mechanisms between specific environmental health exposures and adverse obstetric outcomes and to guide clinical recommendations. The American College of Obstetricians and Gynecologists fully supports rigorous scientific investigation into links between environmental hazards and adverse reproductive and developmental health outcomes. Systematic review methods based on best practices in clinical medicine (eg, Cochrane and GRADE) have been developed and used for evaluating environmental health science, and their application should be expanded to improve the evidentiary basis for decision making (65). Environmental health surveillance, including measuring and tracking chemicals in individuals and the environment, is critical to this effort (32).

Obstetrician-gynecologists and other obstetric care clinicians can be effective in reducing prenatal exposure by recognizing and responding to environmental exposures and counseling patients appropriately (66, 67). Action at the individual level can reduce exposure to some toxic chemicals (58–60), but individuals alone cannot reduce many exposures. Evidence-based recommendations for preventing harmful environmental exposure ultimately must also include policy change (68–69). Policies to limit the manufacturing and use of harmful chemicals are effective in reducing exposures (71–73). Accordingly, many medical associations have taken steps in that direction. The American College of Obstetricians and Gynecologists and the American Society for Reproductive Medicine have joined the American Academy of Pediatrics and numerous other health professional organizations in calling for timely action to identify and reduce exposure to toxic environmental agents while addressing the consequences of such exposure (2, 74, 75).

Conclusion

Environmental health is an important consideration for healthy individuals, pregnancies, fetuses, and infants. Obstetrician-gynecologists can help to optimize the long-term and short-term health of the pregnant individual and the fetus by assessing for risks of toxic exposure and counseling about exposure reduction. Obstetrician-gynecologists and other obstetric care clinicians do not need to be experts in environmental health science to provide useful information to patients and to refer patients to appropriate specialists, if needed, when a hazardous exposure is identified. It may be beneficial to integrate environmental health into obstetrics and gynecology training and practice. Advocating for policies that will reduce harmful exposures and protect the health of pregnant individuals and their children is encouraged.

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