# *Children's Health Protection Advisory Committee*

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December 30, 2013

Administrator McCarthy
United States Environmental Protection Agency
1200 Pennsylvania Ave, NW
Washington, DC 20460

RE: Prevention of Harmful Preconception and Prenatal Exposures

Dear Administrator McCarthy:

The Children's Health Protection Advisory Committee (CHPAC) applauds the EPA for its continuing efforts to provide individuals, communities, health professionals, industry, and government entities at all levels with the information and tools necessary to protect children and future generations from environmental health threats. CHPAC takes this opportunity to respond to the EPA Office of Children's Health Protection's request for messages, recommendations for communication, and research priorities related to prevention of harmful preconception and prenatal exposures.

CHPAC has developed several examples of science-based health messages for the Agency to use in informing individuals, healthcare providers, and communities about the importance of preventing harmful environmental exposures prior to conception and during the prenatal period (See Appendix A. Preparing for the Nine Months that Last a Lifetime). CHPAC encourages EPA to work with healthcare communications specialists, translators and experts in graphic design to enhance content, readability, effectiveness, and appeal of these messages prior to public dissemination. CHPAC considers this set of prenatal messages to represent a sample of messages that can be used in addition to EPA's existing prenatal messaging on air pollution[1] and mercury in fish.[2] CHPAC encourages EPA to leverage existing resources and invest sufficient resources to fully develop these and additional messages on other environmental exposures such as workplace exposures and exposures especially relevant to pregnant teenagers. CHPAC recognizes that these messages will be effective only if framed in the context of the social determinants of health[3] experienced by the

[1] Promoting Good Prenatal Health: Air Pollution and Pregnancy. Office of Children's Health Protection EPA-100-F-09-020 January 2010. Available at: http://yosemite.epa.gov/ochp/ochpweb.nsf/%20content/OCHP_Prenatal_FS_7_10.htm/$File/OCHP_Prenatal_FS_7_10.pdf?Open&preview.

[2] Consumption Advice: Joint Federal Advisory for Mercury in Fish. EPA Office of Water. March 2012. Available at: http://water.epa.gov/scitech/swguidance/fishshellfish/outreach/factsheet.cfm#consumers.

[3] See CHPAC Letter of November 14, 2013, available at: http://yosemite.epa.gov/ochp/ochpweb.nsf/content/chpac-sdh-letter-nov-2013.htm.

intended recipients. Examples of social and contextual factors that affect prenatal health and that should be considered in communicating these messages include: social support from family and friends, access to and selection of nutritious foods, exercise, sleep, access to healthy homes, communities, and workplaces, access to good medical care, employment and income, options for public transportation, neighborhood crime, and other sources of life stress.

As requested, CHPAC also provides EPA with recommendations on how best to i) effectively communicate these messages with communities, and in particular, those experiencing or at risk of experiencing health disparities in birth outcomes due to environmental exposures, ii) share these messages and underlying science with the healthcare community, iii) partner with other organizations to disseminate these messages, and iv) evaluate the effectiveness of its messaging efforts. These recommendations build on those provided by CHPAC to the EPA in November, 2011.[4] Finally, we offer recommendations on research priorities to be included in the EPA Office of Research and Development's (ORD) children's health research roadmap that will increase understanding of the scope of preconception and prenatal environmental exposures that can be harmful, the communities most at risk, and effective exposure prevention strategies.

CHPAC recommends that the EPA:

1. Disseminate to the public the environmental reproductive health messages prepared by CHPAC[5] using the communication strategies outlined in recommendations 2-4 below.
2. Communicate effectively with the public, especially communities experiencing or at risk of experiencing health disparities in environmental reproductive outcomes, through use of effective partnerships and existing networks.
3. Connect with the larger healthcare community to disseminate environmental reproductive health messages.
4. Partner with state and federal agencies, as well as community-based and other organizations to disseminate environmental reproductive health messages.
5. Evaluate the effectiveness of EPA messaging on environmental reproductive health.
6. Designate the following as priorities in the EPA ORD's children's health research roadmap:
    a. Research on the health effects of prenatal and preconception exposures.
    b. Research on the interactions of environmental exposures, socioeconomic factors, and characteristics of sensitive populations with poor birth outcomes, and incorporation of these types of data into mapping tools such as EJView.[6]
    c. Research the effectiveness of commonly recommended exposure reduction measures.
    d. Research on translation of scientific findings into actionable information for policy efforts as well as individual prevention and reduction of exposures to harmful environmental chemicals.
    e. Research the effectiveness of different methods employed to induce individuals to make behavioral changes in order to reduce their environmental exposures.

[4] See CHPAC Letter of November 17, 2011, available at: http://yosemite2.epa.gov/ochp/ochpweb.nsf/content/CHPAC_Prenatal_Letter.htm.
[5] Disseminate after working with healthcare communications specialists, translators and experts in graphic design to enhance content, readability, effectiveness, and appeal of these messages.
[6] EJView is a mapping tool developed by EPA, available at: http://www.epa.gov/environmentaljustice/mapping.html.

These recommendations are presented in more detail below.

1. **CHPAC recommends that EPA disseminate to the public, the environmental reproductive health messages prepared by CHPAC[5] in the document "*Preparing for the Nine Months that Last a Lifetime*," using the communication strategies outlined in recommendations 2-4 below.**

At EPA's request, CHPAC developed several science-based health messages to be shared with the public on the prevention and reduction of harmful environmental exposures prior to conception and during the prenatal period (See Appendix A. *Preparing for the Nine Months that Last a Lifetime*). It is important that factual and easy to understand messages related to environmental exposures are available to communities, especially for individuals of reproductive age, and CHPAC recommends that EPA disseminate these environmental reproductive health messages to the public in an effective and timely manner.

Information on the importance of environmental exposures during the preconception and prenatal stages for health is available.[4] For example, the Program on Reproductive Health and the Environment at the University of California San Francisco generated a report titled *Shaping our Legacy: Reproductive Health and the Environment*,[7] that summarized the scientific findings from the 2007 Summit on Environmental Challenges to Reproductive Health and Fertility. A description of reproductive health is provided in the report and specific language on early exposures and related child development is included. In this letter, we use the definition of environmental reproductive health provided in the report:[7]

> ***Reproductive health*** *refers to the health and healthy functioning of the female and male reproductive systems during all stages of life. Reproductive health means that women and men are capable of conceiving, that a woman is able to maintain a pregnancy to full term and to breastfeed, and that the baby is born healthy and properly developed. Reproductive health also means that children will not develop diseases or disabilities later in life that are caused by exposures they experienced in the womb or during infancy, early childhood or adolescence, and that they will be able to conceive and bear healthy and properly developed children.*
>
> ***Environmental reproductive health*** *is a collaborative, interdisciplinary effort to understand and reduce the harm that chemical exposures cause to fertility, pregnancy, development, growth and health throughout life. This field includes the work of scientists, researchers, clinicians, policymakers, health-affected groups, community and advocacy groups, and the media*.

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[4] See CHPAC Letter of November 17, 2011, available at: http://yosemite2.epa.gov/ochp/ochpweb.nsf/content/CHPAC_Prenatal_Letter.htm.

[5] Disseminate after working with healthcare communications specialists, translators and experts in graphic design to enhance content, readability, effectiveness, and appeal of these messages.

[7] Shaping our Legacy: Reproductive Health and the Environment. Program on Reproductive Health and the Environment. University of California, San Francisco, 2008. http://www.prhe.ucsf.edu/prhe/pubs/shapingourlegacy.pdf.

In creating these environmental reproductive health messages, we reviewed available messages from government websites, healthcare and environmental health organizations, and the scientific literature. We prioritized environmental reproductive health issues and chose four main topics based on considerations of the degree and extent of the exposures, the nature of the health hazards, the ease of exposure prevention, and the strength of scientific evidence that prevention of exposure can decrease harmful health effects. Each message is written in a simple and straightforward manner, avoiding scientific terms and complex concepts. We recognize that the messages will require further editing to tailor them for use with populations with different literacy levels, cultural settings, and informational needs.

We titled our messaging document "*Preparing for the Nine Months that Last a Lifetime*" to emphasize the importance that prenatal and preconception exposures can play in health during all life stages: fetal, infancy, early childhood, puberty, reproduction, and adulthood. The document opens with a short section that introduces the concept of environmental exposures in everyday life and their potential effects on health. The sections address the following topics: *Preparing Home for Baby*, which includes home safety and avoidance of chemical use, especially when preparing a nursery; *Lead in Pregnancy,* which discusses lead exposure and screening during pregnancy, and prevention of exposure in the home; *Healthy Fish Consumption,* which emphasizes eating a variety of fish and provides resources on how to choose fish to reduce exposure to harmful contaminants; and *Preventing Exposure to Pesticides*, which includes sources of exposure and health effects of pesticides, and emphasizes safer pest control practices and healthy food selection.

These messages provide basic information, practical tips, and tools to be shared with communities, and are ready for EPA review. CHPAC encourages EPA to invest in the resources necessary to fully develop these messages, working with healthcare communications specialists, translators and experts in graphic design to enhance readability, effectiveness, and appeal of the messages, prior to dissemination to communities. In order to be effective, health messages must be recognized as relevant by their intended audiences. Thus, these messages need to be tailored for different communities and appropriately framed in the context of the specific mix of individual, community, and society level factors influencing health. Since the form of the message may depend on the method of dissemination, the EPA should use focus groups to explore appropriate methods for message dissemination to specific communities, including a variety of social media modalities.

We encourage the Agency to develop and disseminate additional effective messages on other important preconception and prenatal environmental exposures. For example, messages should be developed and targeted towards workplace exposures and pregnant teens using tools appropriate to the relevant populations, such as health and safety training in the workplace, and social media and information graphics, respectively. Further, we encourage the Agency to continue to refine criteria for selection of additional message topics, taking into account relevant populations at risk and their other stressors during pregnancy, such as alcohol, tobacco, and other drugs, and social and contextual factors which comprise the social determinants of health.

2. **CHPAC recommends that EPA communicate effectively with the public, especially communities experiencing or at risk of experiencing health disparities in environmental reproductive outcomes, through use of effective partnerships and existing networks.**

Social determinants of health include a number of social and contextual factors that affect individuals, families, and communities.[3] These factors can have an impact on environmental reproductive health. For example, communities with decreased access to quality healthcare and increased hazardous environmental exposures can experience disparately higher rates of adverse birth outcomes (e.g., low birth weight, developmental delays) than the population at large.

One way that health disparities can be reduced is by using a framework that ensures that individuals have access to a full range of reproductive health services and are empowered to understand their healthcare needs. For example, the Reproductive Health Framework is a service delivery model for addressing the reproductive health needs of women. The focus is providing services for historically marginalized communities through the creation of reproductive health services.[8] Environmental reproductive health messages should be culturally relevant and made available to marginalized communities via existing frameworks.

CHPAC recommends EPA incorporate environmental reproductive health messages into reproductive justice efforts at the community level. Integration of these messages through existing networks such as those listed below can enhance outreach.

- American Indian/Alaska Native Committee of the March of Dimes Foundation West Region
- Indian Health Service, Division of Environmental Health Services, Children's Environmental Health Working Groups
- National Healthy Mothers Healthy Babies Coalition
- National Healthy Homes
- National Center for Healthy Housing
- Safer Chemicals, Healthy Families
- SisterSong Women of Color Reproductive Justice Collective
- Asian Communities for Environmental Justice
- National Women, Infants, and Children's Association

Partnering with electronic media outlets such as text4baby and the American Pregnancy Association, which provide targeted email and text messages throughout pregnancy, and with internet-based organizations like MomsRising.org, provides opportunities to insert targeted messages for at-risk populations. Local tribal/public health professionals and healthcare providers often stay connected with the populations they serve through Facebook and Twitter. These mechanisms provide an opportunity for dissemination of messages to diverse and underserved individuals in inner-city, rural, or tribal communities.

Tailoring health messages for specific diverse populations has also proven to be an effective means of communication. For instance, health messages communicated via community highway billboards in Indian Health Service unit areas and electronic signage in tribal health clinics and inner-city community health centers are more effective when they are personalized with images of local people or places. Other approaches include engaging youth in local service

[3] See CHPAC Letter of November 14, 2013, available at: http://yosemite.epa.gov/ochp/ochpweb.nsf/content/chpac-sdh-letter-nov-2013.htm.

[8] Asian Communities for Reproductive Justice. 2005. A New Vision for Advancing our Movement for Reproductive Health, Reproductive Rights, and Reproductive Justice. Available at: http://strongfamiliesmovement.org/assets/docs/ACRJ-A-New-Vision.pdf.

projects that adapt and personalize scripted messages developed by EPA through partnerships with Bureau of Indian Affairs, local schools, tribal colleges, and historically black colleges and universities. Local service projects such as these introduce an extra benefit to the community, empowering the participants, and improving the likelihood that the message will reach the target population and be relevant to the community.

3. **CHPAC recommends that EPA connect with the larger health care community to disseminate environmental reproductive health messages.**

**This can be accomplished by:**

a) Establishing relationships with professional medical, nursing, and public health organizations.

Professional organizations are an important part of a healthcare provider's acquisition and maintenance of knowledge throughout his/her career. Professional medical and nursing organizations publish journals and sponsor continuing education courses that keep providers updated on recent therapeutic findings and recommendations; they track individual provider progress towards re-certification; and they hold annual meetings where providers share clinical findings and network with each other.

The EPA should reach out to a broad range of professional healthcare provider organizations serving teens, young adults, and individuals of child-bearing age, to discuss the importance of environmental reproductive health for healthy pregnancies and to encourage information sharing and partnerships designed to effectively disseminate environmental reproductive health messages. The scope of professional organizations that the EPA should reach out to includes school health practitioners serving teens and young adults, occupational and other health practitioners serving men and women of childbearing age, prenatal health practitioners, and neonatal and pediatric health practitioners.

Therefore, outreach to organizations such as those listed below can play an important role in the dissemination of health messages.

American Academy of Pediatrics

American Academy of Family Physicians

American Congress of Obstetricians/Gynecologists

American Association of Nurse Practitioners

American College of Nurse-Midwives

American Nurses Association

Association of Schools and Programs of Public Health

National Association of Nurse Practitioner Faculties

Alliance of Nurses for Healthy Environments

National Association of Pediatric Nurse Practitioners

American Public Health Association

Pediatric Environmental Health Specialty Units

BirthWorks

Childbirth and Postpartum Professional Association

Doulas of North America International

American College of Occupational and Environmental Medicine

International Center for Traditional Childbearing

Midwives Alliance of North America

National Association of Neonatal Nurses

National Association of School Nurses, Inc.

Society of Pediatric Nurses

American Association of Clinical Toxicologists

American Association of Poison Control Centers

American College of Medical Toxicologists

American College Health Association

There are numerous subspecialty organizations within the broader groups, and organizations that target special interests of these professionals such as the environment and health disparities, that should also be included. Organizations can be approached about including environmental reproductive health information on their websites such as the messages themselves or links to the EPA website that contain the messages. The health messages should be distributed at informational booths at organizational annual meetings. The Pediatric Environmental Health Specialty Units (PEHSUs) should be supported to offer additional presentations at local, regional, and national meetings, which would introduce providers to the topic of environmental reproductive health and to the messages. In addition, organizations can be urged to publish opinions or guidelines relating to environmental reproductive health. The EPA should work with the organizations to craft the opinion or guideline, and point organization staff to the appropriate scientific literature and other background data relating to the issues.

PEHSUs are funded by the Agency for Toxic Substances and Disease Registry and the EPA to serve as regional go-to resources for clinical expertise in pediatric environmental health. PEHSUs respond to telephone inquiries from healthcare providers, concerned individuals, and public health agencies regarding health effects of environmental exposures. They provide numerous presentations to doctors and nurses, medical and nursing trainees, and public health and environmental organizations that include updates on the current science regarding health effects of environmental exposures, clinical guidelines for screening and treatment of environmental exposures, and health messages for patients. PEHSUs recognize the importance and relevance of prenatal exposures to pediatric health and beyond, and many are now incorporating information about prenatal exposures[9] into their outreach efforts. Adding clinical expertise on prenatal and preconception health would expand the outreach potential of the PEHSUs.

Consideration should be given to providing resources to include obstetricians in the PEHSU network of physicians in order to provide not only consultation on pregnant patients exposed to hazardous substances but education to their professional colleagues. Along with interdisciplinary collaboration with PEHSUs, influence and innovation from individuals within the specialty will be more likely to change the field of obstetrics and gynecology to include environmental reproductive health as one of the basic competencies. It is unlikely that current PEHSUs, consisting of pediatricians, occupational medicine physicians, and toxicologists will be able to gain a foothold in a field in which they have no experience or historical collaboration. Incorporating obstetricians into the PEHSU model would help build the capacity of prenatal healthcare providers to provide useful information on preconception and prenatal exposures at the community level and during the individual patient encounter in the exam room.

b) Establishing relationships with insurance carriers.

In the past decade, health insurance carriers have played a larger role in measuring health outcomes. For example, reimbursement may be tied to clinical outcomes such as blood glucose levels in diabetics or flu vaccination rates. Therefore, health insurance companies may be interested in becoming informed about potential adverse health outcomes related to preconception and prenatal environmental exposures, and the clinician's role in preventing or reducing exposures via health messaging. Insurance companies should be encouraged to add

[9] Sathyanarayana S, Focareta J, Dailey T, Buchanan S. 2012. *Environmental exposures: how to counsel preconception and prenatal patients in the clinical setting.* Am J Obstet Gynecol; 207(6): 463–470.

the delivery of environmental reproductive health messages to quality assessments of individual clinicians and their practice groups or larger healthcare organizations.

c) Establishing relationships with Federally Qualified Health Centers (FQHCs).

FQHCs provide low-cost healthcare to 20 million patients in the United States per year, and their infrastructure is organized by the National Association of Community Health Centers. The EPA should reach out to this group in a similar manner as to the medical professional organizations about posting messages on their website or links to the EPA website, present at their annual meetings and work with them to create clinical guidelines or recommendations that include environmental reproductive health messages. Similarly, the Indian Health Service has a separate infrastructure for healthcare providers that should be tapped for message dissemination.

d) Establishing relationships with professional organizations that represent minority healthcare and public health professionals.

There are numerous organizations representing minority healthcare providers that should be contacted about disseminating the environmental reproductive health messages. These include:

- National Medical Association
- Asian American Physicians Association
- National Alaska Native American Indian Nurses Association
- Asian American/Pacific Islander Nurses Association
- National Association of Hispanic Nurses
- National Black Nurses Association
- National Hispanic Medical Association

**4. CHPAC recommends that EPA partner with state and federal agencies, as well as community-based and other organizations to disseminate environmental reproductive health messages.**

EPA should identify other federal agencies that currently communicate health information (e.g., via a survey of website content) and leverage opportunities for inter-agency collaboration, resulting in improved health communication. This will also allow these messages to be provided in the context of other social determinants of health during pregnancy.

- For example, the Office of Women's Health (OWH) within the Department of Health and Human Services has an area on its website devoted to providing information on healthy pregnancies, with a section entitled "Before you get pregnant—Information for all women."[10] This is a prime example of an opportunity for fruitful inter-agency collaboration and synergy on prenatal health messaging efforts, where EPA can provide environmental reproductive health content for OWH's messaging efforts, and OWH can provide additional content on prenatal health for EPA to include in its messaging efforts (e.g., through links on the EPA website).

- Another example of an opportunity for fruitful inter-agency collaboration is illustrated by OWH's efforts to encourage mothers to breastfeed their babies, especially among the

[10] See http://www.womenshealth.gov/pregnancy/before-you-get-pregnant/index.html.

African-American community.[11] In this example, OWH can share information with EPA on the communication strategies that have or have not worked when providing health-based messages to specific communities.

- Additional federal agencies to partner with include the National Institute of Occupational Safety and Health, the Occupational Safety and Health Administration, the National Institutes of Health (National Institute of Environmental Health Sciences, National Institute on Minority Health and Health Disparities, National Institute of Child Health and Development), the Centers for Disease Control and Prevention, the Food and Drug Administration, the Health Resources and Services Administration, and the Centers for Medicare and Medicaid Services.

Similarly, EPA should reach out to state and local departments of health and other agencies charged with protecting environmental and public health, and to organizations such as the National Association of County and City Health Officials, the Association of State and Territorial Health Officials, and the Association of Maternal and Child Health Programs to identify opportunities for information sharing and dissemination of environmental reproductive health messages. For instance, the Association of Maternal and Child Health Programs offers a Life Course approach to women's health and has developed the Life Course Metrics Project, which is a collaborative effort to identify and promote a standardized set of indicators that can be used to measure progress in improving maternal and child health. CHPAC encourages the Agency to work with organizations such as this one to incorporate environmental messages and exposure metrics into the life course approach.

Additional organizations that may be interested in partnering with the Agency to disseminate environmental reproductive health messages include public interest groups, community-based organizations, and other organizations that target specific population segments, ethnicities, or health issues. Such organizations may include the following:

- March of Dimes
- Children's Environmental Health Network
- University of California, San Francisco Program on Reproductive Health and the Environment
- National Environmental Education Foundation
- Healthy Homes Collaborative
- The Collaborative on Health and the Environment
- Autism groups (e.g., The Autism Society)
- American Cancer Society
- Breast cancer groups (e.g., Breast Cancer Action, Breast Cancer Fund, Zero Breast Cancer)
- Environmental justice groups (e.g., WE ACT for Environmental Justice)
- Natural Resources Defense Council
- Environmental Working Group
- The Arc for People with Intellectual and Developmental Disabilities
- National Advocates for Pregnant Women

[11] See http://www.womenshealth.gov/itsonlynatural.

**5. CHPAC recommends that EPA evaluate the effectiveness of EPA's messaging on environmental reproductive health.**

*Metrics for Messaging Effectiveness*

It is important to assess the effectiveness of strategies for prenatal environmental health messaging with appropriate metrics. Metrics can lead to a better understanding of how messaging is being disseminated and who is receiving the messages. They also allow for an ability to assess knowledge gained from particular messages. Ideally, the end goal would be to assess behavioral changes that result from messaging efforts. We have listed some specific metrics for dissemination and knowledge transfer of messaging materials below.

We would like to emphasize the inherent complexity of having appropriate metrics. While we have listed examples below, we recommend using this as a guideline to create an evaluation program using EPA-specific metrics. The metrics listed below are modeled after those developed and described by the National Institute for Environmental Health Sciences (NIEHS) for evaluation of its internal and external communication efforts that are described in the NIEHS Partnerships for Environmental Public Health Evaluation Metrics Manual. The Centers for Disease Control Systematic Review on the Effectiveness of Health Communication Campaign is another resource for evaluation of health messaging.[12,13]

*Dissemination*

- Numbers of persons who received emails/newsletters/messaging
- Number of times messaging is referenced by parties or accessed on the internet
- Number of persons attending specific training sessions to learn about messaging
- For websites, traffic, number of elements accessed, trends in access over time
- Numbers of different types of groups/populations receiving messaging

*Knowledge Transfer*

- Quizzes, questionnaires, and surveys
- Tracking changes in behavior
- Assessment of retention of information over time
- Description of secondary transfer (relayed to trainees, used in other curricula/programs)

**6. CHPAC recommends that EPA designate the following as priorities in the EPA ORD children's health research roadmap:**

a. *Understanding the scope of preconception and prenatal environmental exposures that can be harmful*

[12] National Institute of Environmental Health Sciences. U.S. Department of Health and Human Services Partnerships for Environmental Public Health Evaluation Metrics Manual NIH Publication No. 12-7825.
[13] CDC. Community Preventive Services Task Force. Systematic review on the effectiveness of health communication campaigns. 2010.

- Conduct research on the health effects of prenatal and preconception exposures to chemicals and other stressors.[4]

*b. Characterizing communities most at risk*

- Conduct research on the interaction of environmental exposures, socioeconomic factors and characteristics of sensitive populations with poor birth outcomes, and explore ways to incorporate these types of data into mapping tools such as EJView.[6]

*c. Identifying effective exposure prevention strategies*

- Conduct research to evaluate the effectiveness of commonly recommended exposure reduction measures, such as vacuuming, dusting with damp cloth, hand washing, and product substitution to reduce exposures (e.g., reductions in the levels of environmental contaminants present in blood or urine) in real world environments (e.g., the home, workplace).
- Conduct research on effective ways to get information into the healthcare setting, specifically, research on how to translate the science on environmental reproductive health into actionable information people can use to prevent or reduce their exposures to harmful environmental chemicals.
- Conduct research on the effectiveness of different methods employed to induce individuals to make behavioral changes in order to reduce their environmental exposures.

The research recommendations provided here are specifically related to enhancing EPA's ability to reduce or eliminate harmful environmental exposures prior to conception and during the prenatal period. These recommendations do not supersede, but rather augment the advice CHPAC provided to the EPA on research related to preconception and prenatal exposures and health impacts in 2011.[4,14]

In summary, CHPAC recommends that EPA disseminate[5] the environmental reproductive health messages provided in Appendix A (*Preparing for the Nine Months that Last a Lifetime*) in an effective and timely manner, using the communication strategies, connections, and partnerships discussed above. Particular efforts should be made to effectively share these health messages with communities experiencing health disparities in birth outcomes. As an integral part of these and future environmental reproductive health messaging efforts, CHPAC recommends that EPA assess the efficacy of its messaging using appropriate metrics. Finally, CHPAC recommends that priorities for the EPA ORD children's health research roadmap include research directed

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[4] See CHPAC Letter of November 17, 2011, available at: http://yosemite2.epa.gov/ochp/ochpweb.nsf/content/CHPAC_Prenatal_Letter.htm.

[5] Disseminate after working with healthcare communications specialists, translators and experts in graphic design to enhance content, readability, effectiveness, and appeal of these messages.

[6] EJView is a mapping tool developed by EPA, available at: http://www.epa.gov/environmentaljustice/mapping.html.

[14] See CHPAC Letter of December 20, 2011, available at: http://yosemite.epa.gov/ochp/ochpweb.nsf/content/CHPAC-ORD-research-directions-letter.htm/$File/CHPAC-ORD-research-directions-letter.pdf.

towards understanding the scope of preconception and prenatal exposures that can be harmful, characterizing communities most at risk, and identifying effective exposure prevention strategies.

CHPAC urges the EPA to provide leadership and resources necessary to provide the public with clear, actionable information on how to protect and promote children's health across generations.

Thank you for your commitment to children's health.

Sincerely,

Pamela Shubat, Ph.D.
CHPAC Co-Chair

Sheela Sathyanarayana, M.D., M.P.H.
CHPAC Co-Chair

Attachment: Appendix A. Preparing for the Nine Months that Last a Lifetime

cc: Jim Jones, Assistant Administrator, Office of Chemical Safety and Pollution Prevention
Lek Kadeli, Acting Assistant Administrator, Office of Research and Development
Jackie Mosby, Acting Director, Office of Children's Health Protection
Janet McCabe, Acting Assistant Administrator, Office of Air and Radiation
Mathy Stanislaus, Assistant Administrator, Office of Solid Waste and Emergency Response
Nancy Stoner, Acting Assistant Administrator, Office of Water
Matthew Tejada, Director, Office of Environmental Justice
Lisa Garcia, Associate Assistant Administrator, Office of Environmental Justice

# Appendix A

# Preparing for the Nine Months that Last a Lifetime

*December 2013*

## Table of Contents



*The following content was developed by the CHPAC and represents samples of outreach messages for the public pertaining to environmental exposures prior to conception and during the prenatal period. CHPAC recognizes that these messages reflect the current state of the science and have not been vetted for cultural relevance for various populations at risk. Also, CHPAC recognizes that crafting these messages into a form appropriate for dissemination will require the input from professionals with expertise in marketing, translation, and graphic design. Messages will need to be updated as future research is published.*

## Introduction

Congratulations! You are pregnant, preparing for pregnancy, or just had a baby. You want to do everything possible to make sure you and your baby are as healthy as can be. You already know that you should not smoke or allow people to smoke around you and that you should only take medicines or dietary supplements that have been prescribed by a health care provider. You may also have heard about things in the environment that can cause problems for you and the baby or about air or water pollution that can cause health problems.

### What You Need to Know:

- You are your baby's first "environment." What you eat, drink, put on your skin or breathe in can affect your baby.
- There are many chemicals in food, cosmetics, clothing, furniture, cleaning supplies and work environments that can be passed on to your baby through your placenta and breast milk.
- Many of the chemicals you come into contact with on a daily basis have not been tested for their impacts on human health.
- Your exposure to substances such as lead, mercury, and pesticides can negatively affect your child's growth and development.
- Asthma triggers in the home such as cockroaches, mice, and mold can impact you and your baby's health.

Fortunately, there are a number of simple steps you can take to help provide a healthy start for your baby. The information in this pamphlet will help you think about these important issues and allow you to take action so you and your baby can be as healthy as possible.

## Preparing Home for Baby

### General Preparation

There are many chemicals in food, cosmetics, clothing, furniture, cleaning supplies and work environments. Some of these chemicals may be harmful to a developing baby. The chemicals are in several places within the home, like in the air, on surfaces and in dust. Examples are carbon monoxide, radon, lead, mercury, and chemicals that disrupt hormones such as some phthalates and flame retardants (http://www.healthychildren.org/English/safety-prevention/all-around/Pages/Environmental-Hazards.aspx). Fortunately, there are steps you can take to protect yourself and your baby.

- Wash hands frequently, especially before preparing or eating food, to remove dust and chemicals. This is a good habit that helps protect your family from the spread of infections like colds or the flu. It also reduces exposure to chemicals from surfaces and dust. http://www.hud.gov/offices/lead/library/hhi/HYHH_Booklet.pdf
- Keep window sills and other flat surfaces free from dust, using a damp cloth to clean.
- Remove shoes when entering your home to decrease dirt and chemicals being tracked into the home.

- Vacuum carpets often to decrease dust and dirt levels. Dust can hold many chemicals, including lead, pesticides, flame retardants, allergens, and asthma triggers.
- Have working smoke detectors and carbon monoxide monitors in your home. http://www.usfa.fema.gov/campaigns/smokealarms/alarms/index.shtm
- Replace mercury containing thermometers with mercury-free thermometers. Mercury-containing thermometers should be disposed of as hazardous waste. Additional information can be found at http://www.epa.gov/hg/thermometer-main.html or by calling the Stericycle Mailback Program at 800-355-8773.
- Wash fruits and vegetables prior to eating to remove pesticide residues.
- Try to reduce the use of products with fragrances (for example perfumes and air fresheners) as they may contain phthalates.

## Preparing the Nursery

Preparing a new nursery may release lead dust if old paint is scraped or sanded and may increase levels of chemicals in the room from paints, carpets and carpet pads. It is best to do this well before your baby arrives to allow the room to air out. Painting can lead to high volatile organic compound (VOC) levels in the air for a few days after the painting is complete. You can avoid these exposures by asking a friend or family member to do major projects, such as painting, removing carpets, refinishing floors, and removing mold, in the nursery. If that isn't possible, here are some tips to follow:

- Lead-based paint: If your home or apartment was built before 1978, it may contain lead-based paint (For more information call 1-800-424-LEAD). Damaged paint and any repairs that disturb lead paint can release lead dust into the home. This can be harmful to you and your baby. Removal of lead-based paint should be performed by a certified contractor when you are out of the work area. After work is completed, you have the right to ask the contractor to provide written proof that the area is safe for you to be in, preferably with a dust test. State level tenant's rights can be found at http://portal.hud.gov/hudportal/HUD?src=/topics/rental_assistance/tenantrights.
- Painting: Choose "no VOC" or "low VOC" paints. Limit use of oil-based paints. Increase ventilation by keeping the windows open to avoid inhaling paint fumes.
- You should wear gloves to protect your skin from paint and cleaning products. Always wash your hands after working with these products.
- Carpets: Dust collects in carpets and can contain many chemicals, allergens, and asthma triggers. Vacuum carpets often to remove dust. Because carpet removal releases dust, have someone else do this work and clean up dust before you enter the room. Non-carpeted surfaces are easiest to keep free of dust.

## Other Products Used in the Home

Cleaning products and other household items contain numerous chemicals and volatile organic compounds that may be harmful to you and your developing baby. Use the following tips and recommendations to reduce and prevent harmful exposures.

- When using cleaning products, consider using less toxic products such as those certified by Green Seal® or Eco-Logo®. http://www.epa.gov/epp/pubs/cleaning.htm

- When using cleaning products, wear gloves, read the label and follow manufacturer instructions. Only purchase and use the amount of product you need. http://www.aboutcleaningproducts.com/education/reading-a-label/
- When selecting baby feeding products or food preparation/storage items, avoid those that contain bisphenol A (BPA) or phthalates. Use glass or stainless steel instead. http://www.mayoclinic.com/health/bpa/AN01955
- Children's painted toys and vinyl products (rubber duckies, rain coats) may contain high levels of lead, phthalates, and other chemicals. When selecting toys, use online resources to make the best choices.
- When selecting personal care products, consider using online resources to make safer choices.
- Use integrated pest management techniques (http://www.epa.gov/pesticides/ipm/index.htm), including repairing cracks and holes, fixing water leaks, and other moisture sources, keeping food and garbage tightly covered, and using gels and baits in childproof containers to prevent and control pest infestations. Avoid use of pesticide sprays, foggers or bombs indoors.
- Ensure all medicine, cleaning products and home pesticides are out of reach of children or in a locked cabinet. Keep all products in their original containers. http://www.healthychildren.org/english/safety-prevention/at-home/medication-safety/Pages/default.aspx

# Lead in Pregnancy

## How dangerous is lead?

Exposure to lead while the brain is developing - in the womb and in the first six years of life - can permanently lower a child's intelligence and cause behavior problems. Lead is a metal that was added to paint and gasoline until the 1970s. Lead lasts for many years in the environment so it may be present in the house dust of old homes and in the soil. It is also present in some imported consumer items such as cosmetics, health remedies, pottery, and toys. Lead in the mother's blood stream can enter the baby's body. The mother can also transfer lead to her baby through her breast milk.

## How can I reduce exposure to lead dust in my home?

- Maintain your home by
  - Wiping up dust and paint chips with a damp cloth, especially on windowsills and floors.
  - Using a wet mop on smooth floors at least once a week.
  - Wiping flat surfaces with a damp cloth at least once a week.
- If your home was built before 1978:
  - Have your home tested for lead and if hazards are detected, have them fixed.
  - Do not participate in home renovation that generates dust such as scraping off old paint or tearing down walls.

## What can I do to prevent lead exposure?

- Never eat non-food items like dirt, broken pottery, or paint chips.
- Use only medicines and remedies recommended by your healthcare provider. Check with your provider before using any herbal supplements or ayurvedic medicine products because some of these may contain high levels of lead, mercury, arsenic or other harmful ingredients. Eat foods enriched with iron (lean red meats), calcium (dairy products and green leafy vegetables), and vitamin C (oranges, grapefruits, tomatoes, and green peppers).
- Avoid using imported clay dishes, food storage or cookware and never use dishes with chips or cracks.
- Do not allow anyone to scrape off old paint, especially if your home was built before 1978. All renovations in older homes should be done by a contractor certified in lead-safe work practices.
- Check with your local water company to find out if lead pipes were used in your region and if your water needs to be tested for lead (www.epa.gov/safewater). Solder and plumbing fixtures can also be a source of lead in drinking water.
- Use water from the cold-water tap and let it run for a few minutes for drinking, cooking, and making baby formula.

## Do I need a lead test?

**Based on guidance from the US Centers for Disease Control (CDC) you may need a blood test for lead if:**

- You recently moved to the United States.
- Your family uses imported pottery or ceramics for eating, cooking, or storing food.
- You have used home remedies such as azarcon, greta, or pay-loo-ah.
- You have ever eaten clay, dirt, pottery, or paint chips.
- Anyone in your home is exposed to lead dust at work or during other activities, such as construction, battery manufacturing, auto repair, shooting ranges, and making bullets.
- You have anemia.
- You use imported cosmetics or herbal remedies.
- You live with someone who has an elevated blood lead level.
- You live in a home built before 1978.

## Healthy Fish Consumption

Some fish contain contaminants that can impact healthy brain development in the fetus, infant, and child.

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| **Why is it important to eat a variety of fish?** | **Eat a Variety of Fish**<br>• Fish and shellfish are lean, low-calorie sources of vital nutrients good for heart health and brain development.<br>• Childbearing-age women should eat 6-12 ounces of safe fish per week to support the healthy development of your baby's brain.<br>• Some fish take in more toxic chemicals depending on their size, age, the food they eat, and the water where they live.<br>• Eating a variety of fish helps maximize the benefits of eating fish and minimize harmful exposure to chemicals. |
| **What are some of the harmful effects of fish contaminants on the developing baby?** | **Choose Wisely**<br>• Mercury<br>o Can harm the brain of the fetus, infant, and child;<br>o Can be eliminated from our bodies over time but damage to a developing brain is never reversed;<br>o No method of cleaning or cooking fish reduces the amount of mercury in a meal.<br>• PCBs (Polychlorinated Biphenyls) (a banned substance persistent in the environment)<br>o Can damage the infant brain and the system that fights infection;<br>o May cause cancer in humans;<br>o Cleaning and cooking a fish to remove skin and fat will lower the amount of PCBs in a fish meal.<br>• PBDEs (Polybrominated Diphenyl Ethers) (flame retardants)<br>o Can impact brain development<br>o Can cause behavioral problems in children. |

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| **How can you reduce your exposure to harmful contaminants in fish?** | **Know the Fish You Eat**<br>• Be aware of the type of fish you catch, purchase, or receive from a friend.<br>• There are state and national fish advisories with more information about which fish to eat—<br>o *Kid Safe Seafood*: http://www.kidsafeseafood.org/ (Search by Species then scroll down to Best Choices). This website provides species specific information on low-high contaminants, omega-3s, kid-safe best and worst choices, ocean-friendly sustainable harvest information, and meal-size guidelines for 0-6 and 6-12 year-olds.<br>o *U.S. EPA website* links to regional and local fish advisories http://water.epa.gov/scitech/swguidance/fishshellfish/fishadvisories/index.cfm<br>• Check out this information from the *Joint FDA/EPA Brochure* advising pregnant women to eat up to 12 ounces of a variety of fish/shellfish per week (a standard deck of cards is roughly 3 ounces).<br>http://water.epa.gov/scitech/swguidance/fishshellfish/outreach/advice_index.cfm |

[1] Daniels JL, Longnecker MP, Rowland AS, Goldin J, and the ALSPAC Study Team University of Bristol Institute of Child Health. (2004). Fish intake during pregnancy and early cognitive development of offspring. *Epidemiology, 15*(4), 394-402.
[2] Karagas MR, Choi AL, Oken E, Horvat M, Schoeny R, Kamai E, Cowell W, Grandjean P, Korrick S. (2012). Evidence on the human health effects of low-level methylmercury exposure. *Environmental Health Perspectives, 120*(6), 799-806.
[3] Kris-Etherton PM, Harris WS, Appel LJ. (2002). Fish consumption, fish oil, omega-3 fatty acids, and cardiovascular disease. *Circulation, 106*, 2747-2757.
[4] Williams C, Birch EE, Emmett PM, Northstone K, Avon Longitudinal Study of Pregnancy and Childhood Study Team. (2001). Stereoacuity at age 3.5 y in children born full-term is associated with prenatal and postnatal dietary factors: a report from a population-based cohort study. *American Journal of Clinical Nutrition, 73*(2), 316-22.

## Preventing Exposure to Pesticides

Pesticides are chemicals that are used to kill common pests such as insects, rodents, and weeds.

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| **Why is it important to reduce your exposure to pesticides before and during pregnancy?** | • Pesticide exposure can be dangerous to developing babies.<br>• Harmful effects can occur if the mother is exposed while pregnant.<br>• Pesticide exposure to women and men before the pregnancy starts can also contribute to harmful effects on the developing baby.<br>• Some pesticides can remain in the body for several months or more, so it is important to take preventative action now to reduce exposures. |
| **What are some of the harmful effects of pesticides for your developing baby?** | • Miscarriage or spontaneous abortion<br>• Increased risk of birth defects<br>• Damage to the developing brain that can change your baby's learning and behavior<br>• Premature birth<br>• Increased risk of childhood leukemia |
| **Where can you be exposed to pesticides?** | • In or around your home or garden, workplace, or school<br>• Around your community such as in parks and near roadways and agricultural fields<br>• In some fruits and vegetables<br>• In air, dust, and water<br>• In some treatments for lice, fleas, and scabies |

**How can you reduce your exposure to pesticides?**

**Prioritize Pest Prevention**

- Use pesticide-free methods for pest prevention in your home and garden.[1,2]
- Prevent pests from entering your home by sealing entry points with caulk, sealants, or screens which are available at your local hardware store.
- Eliminate hiding places and water sources that might attract pests.
- Store food and trash in closed containers.
- Clean up dishes and food spills as quickly as possible.
- Use non-chemical methods to control weeds, such as regular mowing and hand-weeding.

**Choose Safer Pest Control**

- Do not use pesticides in the home and garden, if possible.
- To help control fleas without pesticides, comb pets with a flea comb, regularly bathe pets with a pesticide-free shampoo, and wash pet bedding.
- Do not use the pesticide lindane to treat lice and scabies. Combing is the most important aspect of head lice control.[3]
- If a pesticide is needed:
    - Use baits and traps instead of sprays, foggers, or "bombs." Place baits and traps where kids can't get to them.
    - Follow directions for use, storage, and disposal to limit your exposure.
    - Do not use flea-and-tick collars, or flea "dips" or baths for your pets. Consider safer spot-on treatments or oral medications for your pets.

**Establish Healthy Habits**

- Consider choosing organic fruits and vegetables, especially apples, bell peppers, celery, spinach, peaches, nectarines, kale, grapes, potatoes, cherries, blueberries, and strawberries.
- Remember to always scrub fruits and vegetables under running water before eating them.
- Remove shoes when you enter the home, to avoid tracking in dirt and dust that may contain pesticides.
- If you work with pesticides, wash your hands after each use and change out of your work clothes before (or immediately after) you go home.
- Because pesticides can be in dust, vacuum and clean your floors regularly and use a damp cloth to dust, and wash your hands often, especially before eating or preparing food.
- If you have a home or community garden, contact your agricultural extension for information on soil testing. Use raised beds as a good gardening practice, especially if your garden soil may contain contaminants.

[1] Tips for pest prevention: www.cdpr.ca.gov/docs/dept/factshts/pull2.pdf
[2] Citizen's Guide to Pest Control and Pesticide Safety, at http://www.epa.gov/oppfead1/Publications/Cit_Guide/citguide.pdf
[3] See US EPA Integrated Pest Management for Schools, Chapter 11, at http://schoolipm.utk.edu/documents/epa_ipmmanual/EPA_IPMmanual_chap-11.pdf.