Pediatric Environmental Health
(26-BE/PH-7063)
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Division of Epidemiology and Biostatistics
University of Cincinnati College of Medicine
Department of Environmental Health

Spring Semester, January 11 – April 28, 2016
Fridays, 2:00 – 4:00 PM
Kettering Laboratory - Room 121


The text is available in the College of Medicine Bookstore under this course number.

Definition:

- There is no single definition of ‘Pediatric Environmental Health’. As commonly used, it refers to the impact of exposure to chemical contaminants on health and development from conception through adolescence.
- The scope of this field has expanded to include the influence of our human-made or ‘built’ and social environments, alone or in interaction with chemical exposures.
- As a medical specialty, ‘Pediatric Environmental Health’ is now recognized as an important adjunct to regular well child care.
- More than ever before, pediatric and public health practitioners recognize the special vulnerabilities of the developing fetus and child to environmental influences and are focused on the means of preventing and treating disease related to a wide variety of exposures.
- ‘Pediatric Environmental Health’ as a clinical and public health discipline refers to the Diagnosis, Treatment, and Prevention of disease due to exposure to
environmental hazards and the promotion of healthy environments for pregnant women and children.

**Course Objectives:**

- Understand how the fetus, infant and child are behaviorally and physiologically different from adults where environmental hazards and their impact on health and development are concerned.
- Understand the role of biomarkers of exposure, dose, individual sensitivity, and effect in pediatric environmental health research and clinical practice.
- Understand the origins and evolution of pediatric environmental health as a scientific and clinical discipline.
- Understand the public health aspects of pediatric environmental health as it relates to risk assessment, patient management, communication and advocacy.
- Understand the basic principles of human development as they relate to environmental chemical exposures and how early exposures may lead to higher risks for adult disease, including metabolic disorders, cancer, neurologic diseases, and other outcomes.
- Understand the scope of pediatric environmental health research and clinical practice on a global level.
- Understand the principles and methods of neuropsychological, psychometric, and neuroimaging assessment in pediatric environmental health studies.
- Understand the associations between environmental chemical exposures on neurodevelopment and diseases of the central nervous system, including cancer.
- Understand the relationship between air pollution and children’s pulmonary and related health outcomes.
- Understand the potential roles of the genome and epigenome in modifying risks associated with exposure to environmental toxicants.
- Understand how pediatric environmental health research findings can be translated into clinical and public health practice.
- Understand the ethical and logistical challenges of conducting pediatric environmental health research and clinical practice.
- Develop the knowledge and understanding to present your own views on a focused topic in pediatric environmental health to a student and faculty audience through a well organized platform presentation.

**Course Requirements:**

Class attendance (essential), participation, and assigned readings, including online instruction will be required. Active participation in class discussions is highly encouraged. The final grade will be based upon participation (5%) student presentation (25%), and take-home mid-term examination (35%) and final examination (35%).
The student presentation (25% of grade) should take the form of a platform power point presentation of 20 minutes in length, and at least 5 minutes for class discussion. The student must also prepare a PowerPoint slide outline and a bibliography of their primary literature and internet sources for distribution to the class prior to their presentation. The presentation should be on a focused organ, physiological system, or exposure specific topic in pediatric environmental health. Please advise the course director of your topic by the 7th week of the spring semester.

The take-home mid-term and final examinations will be essay. The mid-term examination will be distributed by e-mail on February 22 and due February 26, 12 PM EST. The final examination will be distributed on April 15 in class and will be due April 28, 12:00 PM EST.

Course Format:

Classes on most days will begin with a 15-30 minute discussion of the previous week’s readings. Supplemental readings and lecture slides will be e-mailed to you about one week prior to lecture. Most articles are also readily available in the UCCM e-journals Donald C. Harrison Library online system. The discussion period of the class is not optional. All students are expected to attend and participate. Questions and comments are welcome and expected. This will be followed by a lecture covering the week’s topic(s).

Winter Weather in Cincinnati:

This is called the ‘Spring Semester’. However, we are all aware that the winter season can present challenges in this community with respect to commuting to class and work. If I cannot get in, I do not expect my students to. I will use our Bearcat e-mail chain to keep you advised if a class needs to be cancelled or rescheduled. A mild winter is predicted so we pray this will not be necessary.
January 15

1.) Introduction to Pediatric Environmental Health: Fetal, Infant and Child Sensitivities to Environmental Influences

Dr. Kim N. Dietrich

Readings:


Text: *Pediatric Environmental Health, 3rd Edition*, Preface, Chapters 1, 3, 4, Appendix A

January 22

1.) Group Discussion of Previous Week’s Readings.

2.) Use and Interpretation of Biomarkers in Pediatric Environmental Health Research and Clinical Practice

Dr. Kim N. Dietrich

Readings:


Text: *Pediatric Environmental Health, 3rd Edition*, Chapters 5, 6, 7, 8, 15, 16, 53
January 29

1.) Group Discussion of Previous Weeks’s Readings

2.) Origins and Evolution of Children's Environmental Health

Video Guest Lecture

Dr. Bruce P. Lanphear

Readings:


Text: Pediatric Environmental Health, 3rd Edition, Chapters 2, 57, 58, 59

Suggested Web Presentations by Dr. Lanphear:

impact of toxins on the developing brain: https://www.youtube.com/watch?v=E6KoMABz1Bw

impact of tobacco and lead on ADHD: https://www.youtube.com/watch?v=Tjoh-9QN414
February 5

1.) Group Discussion of Previous Week’s Readings

2.) Developmental Toxicology in Pediatric Environmental Health

Dr. Kim N. Dietrich

Readings:


Text: *Pediatric Environmental Health, 3rd Edition, Chapter 44*

3.) Perinatal and Pediatric Origins of Adult Disease

Dr. Kim N. Dietrich

Readings:


Text: *Pediatric Environmental Health 3rd Edition, Chapter 45*

February 12

1.) Discussion of Previous Week’s Readings

2.) International Pediatric Environmental Health:

A.) Contemporary Pediatric Environmental Health Disasters in Developing Countries

Dr. Kim N. Dietrich
B.) Challenges of Conducting Pediatric Environmental Health Studies Abroad

Guest Lecturer: Dr. Aimin Chen

Readings:


Text: *Pediatric Environmental Health, 3rd Edition*, Chapters 12, 14, 17, 18, 31, 51, 52

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February 19

1.) Discussion of Previous Week’s Readings

2.) Air Pollution and Children’s Health

Guest Lecturer: Dr. Patrick Ryan

Readings:


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February 26

Mid-Term Examination week.

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March 4

1.) **Assessment of the Central and Peripheral Nervous Systems in Pediatric Environmental Health**

Lecturers: Drs. Kimberly Yolton and Kim Cecil

**Readings:**


March 11

1.) Discussion of Previous Week’s Readings

2.) Neurobehavioral and Other Health Effects of Prenatal/Postnatal Exposure to Environmental Chemicals on the Central Nervous System – I

Dr. Kim N. Dietrich

Readings:


March 18

1.) Discussion of Previous Week’s Readings

2.) Neurobehavioral and other Health Effects of Prenatal/Postnatal Exposure to Environmental Chemicals on the Central Nervous System – II

Guest Lecturer: Dr. Tania Carreon-Valencia

Readings:


March 21 -27
Spring Break

April 1 – April 8

1.) Translating Pediatric Environmental Health Research into Clinical Practice.

Guest Lecturer: Dr. Nicholas Newman

Readings:


This interactive, animated/audio, web-based module introduces the basics of pediatric environmental health practice. It offers health-care providers detailed examples about how to best deliver anticipatory guidance on a range of environmental health issues related to children’s health and development. Case examples explore the unique biological factors and exposure patterns that make children especially vulnerable to toxic chemicals. These should help pediatric health care specialists recognize possible environmental causes of some of the illnesses they might treat in their daily practice, as well as potential environmental exposures to be avoided. The module also discusses current pediatric medical practices related to environmental health and provides resources for delivering anticipatory guidance during well-child visits. The training module takes approximately 90 minutes to complete. CME credits are available.
April 15

1.) Student Presentations

2.) Distribution of Final Examinations

April 23-28

Final Examination Week

Your final examinations are due Thursday, April 28 at 12:00 PM EST. You may deposit your examinations in my mailbox located in the Kettering Laboratory mailroom (Rm. 125) or e-mail to kim.dietrich@uc.edu.

Revised January 19, 2016