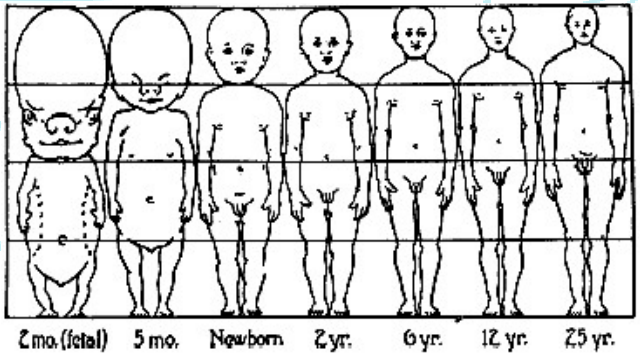
ENVIRONMENTAL HEALTH HISTORY FOR PEDIATRICS



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A National Environmental Education Foundation Program

GOALS FOR THIS TALK

- To define environmental health (EH)
- To discuss the importance of EH history-taking
- To review NEEF history-taking tools
  - Screening Environmental History
  - Supplemental Environmental History
  - Pediatric Environmental Health (PEH) Primer
- Resources
- Next steps in the evolution of EH history

WHAT IS ENVIRONMENTAL HEALTH ?

- **Environmental health is the field of science that studies how the environment influences human health and disease**

www.niehs.nih.gov/oc/factsheets/pdf/e-health.pdf

"ENVIRONMENTAL HEALTH"

- **"Environmental health includes both the direct pathological effects of chemicals, radiation and some biological agents, and the effects (often indirect) on health and wellbeing of the broad physical, psychological, social and aesthetic environment which includes housing, urban development, land use and transport."**

  - ***World Health Organization***

www.euro.who.int/eprise/main/WHO/Progs/HEP/20030612_1

"ENVIRONMENT" INCLUDES

- **Natural environment**
  - **Physical, chemical and biological things in our surroundings (air, water, food, soil)**
- **Man-made or "built" environment**
  - **Physical structures where people live, work and play**
  - **Consequences of human alteration to the natural environment (e.g. air pollution)**
- **Social environment**
  - **Lifestyle factors such as diet and exercise, SES and other societal influences that may affect health**

www.niehs.nih.gov/oc/factsheets/pdf/e-health.pdf

PRACTICAL DEFINITION

- **Although we recognize that there is a broader definition of “environment”, most experts in PEH currently focus their teaching on naturally occurring and man-made chemical and physical hazards to children’s health**

GENE - ENVIRONMENT INTERACTIONS

- **Gene-environment interactions can shift the balance between health and disease**
- ***"Genetics loads the gun…but environment pulls the trigger"*[1]**
- **Gene-environment interactions are influenced by gender and age**

1 - http://dels.nas.edu/emergingissues/docs/Olden.pdf

ENVIRONMENTAL HEALTH HAZARDS

- **Children often more susceptible**
- **Among parents' top health worries**
- **Concerns about environment and**
  - **Asthma**
  - **Developmental disabilities**
  - **Obesity**
  - **Birth defects**
  - **Pediatric cancer**

MEDICAL/NURSING TRAINING

- **Little time spent on EH issues in US medical and nursing schools, training programs**
- **There is a need to**
  - **Increase clinicians' awareness**
  - **Integrate environmental history-taking into practice**

Kilpatrick et al, EHP 2002;
AAP Handbook of Pediatric Environmental Health, p. 1, 2003.

ENVIRONMENTAL HEALTH HAZARDS

- **Questions about the environment are basic to a complete pediatric history**
- **During much of the last century, doctors made house calls and could observe the child's environment - this is no longer common practice**
- **Now, *asking* about physical surroundings is needed to identify some exposures, prevent others**

PEDIATRIC ENVIRONMENTAL HEALTH INITIATIVE

- **NEEF campaign to facilitate integrating EH history-taking into practice**
- **Developed to fill current gaps in education and training**
- **Obtaining a history is often *THE FIRST STEP* in eliciting exposures**
  - **History can also help prevent exposures**

CLINICIANS' ROLES

- **With families: clinicians can help identify and/or prevent hazardous exposures**
  - **Clinicians often need resources to alleviate identified problems**
- **In the community: advocacy work**
- **Other settings: working with parents and professionals in schools, child care, occupational settings**

WHEN TO TAKE AN ENVIRONMENTAL HISTORY

- **Health supervision ("well child") visits**
  - **Use screening environmental history**
- **Routine urgent visits**
  - **Asthma, otitis media**
- **Other visits for illness**
  - **Unusual presentations**
  - **Persistent or puzzling/non-specific symptoms**
  - **Multiple persons with same symptoms**

WELL CHILD VISITS

- **History, PE, monitoring growth and development, giving immunizations, performing screening tests**
- **Anticipatory guidance**
- **25-40% of US pediatricians' time spent in well child care**[1]

1 - 2000 Nelson's Textbook of Pediatrics

INTEGRATING QUESTIONS ABOUT ENVIRONMENT INTO THE HISTORY

- **Many areas of questioning are already part of the history**
- **Using Screening History Form can ensure completeness**
- **Supplemental Form provides additional information**
- **PEH Primer gives background information**

Pediatric Environmental History (0-18 Years of Age)

The Screening Environmental History

For all of the questions below, most are often asked about the child's primary residence. Although some questions may specify certain locations, one should always consider all places where the child spends time, such as daycare centers, schools, and relative's houses.

Where does your child live and spend most of his/her time?	_____
What are the age, condition, and location of your home?	_____
Does anyone in the family smoke?	❑ Yes ❑ No ❑ Not sure
Do you have a carbon monoxide detector?	❑ Yes ❑ No ❑ Not sure
Do you have any indoor furry pets?	❑ Yes ❑ No ❑ Not sure
What type of heating/air system does your home have? ❑ Radiator ❑ Forced air ❑ Gas stove ❑ Wood stove ❑ Other_____	
What is the source of your drinking water? ❑ Well water ❑ City water ❑ Bottled water	
Is your child protected from excessive sun exposure?	❑ Yes ❑ No ❑ Not sure
Is your child exposed to any toxic chemicals of which you are aware?	❑ Yes ❑ No ❑ Not sure
What are the occupations of all adults in the household?	_____
Have you tested your home for radon?	❑ Yes ❑ No ❑ Not sure
Does your child watch TV, or use a computer or video game system more than two hours a day?	❑ Yes ❑ No ❑ Not sure
How many times a week does your child have unstructured, free play outside for at least 30 minutes?	_____
Do you have any other questions or concerns about your child's home environment or symptoms that may be a result of his or her environment?	_____

Follow up/ Notes

This screening environmental history is designed to capture most of the common environmental exposures to children. The screening history can be administered regularly during well-child exams as well as to assess whether an environmental exposure plays a role in a child's symptoms. If a positive response is given to one or more of the screening questions, the primary care provider can consider asking further questions on the topic provided in the Additional Categories and Questions to Supplement the Screening Environmental History.

The Screening Environmental History is taken in part from the following sources:

- American Academy of Pediatrics Committee on Environmental Health. Pediatric Environmental Health 2nd ed. Etzel RA, Balk SJ, Eds. Elk Grove Village, IL: American Academy of Pediatrics; 2003. Chapter 4: How to Take an Environmental History.
- Balk SJ. The environmental history: asking the right questions. *Contemp Pediatr.* 1996;13:19-36.
- Frank A, Balk S, Carter W, et al. Case Studies in Environmental Medicine. Agency for Toxic Substances and Disease Registry, Atlanta GA. 1992, rev. 2000. Taking an Exposure History.

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SCREENING HISTORY

- **Where child lives or spends time**
- **Exposure to secondhand smoke (SHS)**
- **Water source; food exposures**
- **Sun exposure**
- **Exposure related to parents' occupations**
- **Other concerns elicited from parent**

AAP Handbook of Pediatric Environmental Health 2003

1 - WHERE THE CHILD LIVES OR SPENDS TIME

- **Community**
- **Housing**
  - **Home**
  - **Child care**
  - **School**
- **Outdoors**
- **Work (for employed teens)**

COMMUNITY

- **Toxic hazards may exist in the community**
  - **Industrial/hazardous waste sites, landfills**
  - **Toxic hazards are often more prevalent in poorer communities**
- **More broadly, community factors impacting health include housing, land use and transportation**

HOUSING

- **Home/child care/relatives' homes**
  - **Infants/young children are mostly indoors**
  - **Lead paint**
  - **Air pollutants: carbon monoxide, heating sources, radon, allergens**
  - **Toxic chemicals (including indoor/outdoor pesticides)**
- **School exposures**

HOUSING – SCREENING QUESTIONS

- **Where does your child live/spend time?**
- **What are the age, condition and location of your home?**
- **Do you have a CO detector?**
- **Do you have any indoor furry pets?**
- **What type of heating/air system does your home have?**
- **Is your child exposed to toxic chemicals?**
- **Have you tested your home for radon?**

HOUSING - INTERVENTIONS & RECOMMENDATIONS

- **Test child for lead depending on age**
- **Fix water leaks; remove visible mold; discard very moldy items**
- **Urge use of CO detectors in sleeping areas**
- **Place toxic chemicals out of reach; discourage use unless no alternatives**
- **EPA recommends having home tested for radon[1]**

http://www.nsc.org/EHC/indoor/rad_faqs.htm#is%20it%20a%20problem

BEYOND HISTORY AND ADVICE..

- **Eliciting a positive history is the first step in detecting an environmental hazard**
- **Abatement advice may help**
- **It may be necessary to enlist lawyers and other advocates to solve environmental problems resulting from poor housing**
- **Pediatric Environmental Health Specialty Units are useful resources**

SCHOOL/CHILD CARE

- **Clinicians can advise parents to visit/walk through their child's school/child care setting at the beginning of the year**
- **They can look for**
  - **Mold or water damage**
  - **Pets in the classroom**
  - **If newly renovated areas are cleaned up or aired out for safe occupancy**
  - **The smell of harsh/hazardous cleaning products**

2 - SECONDHAND SMOKE (SHS)

- **SHS: smoke exhaled by a smoker, and smoke released from a smoldering cigarette**
- **SHS = Environmental Tobacco Smoke (ETS)**

SHS - CLINICAL EFFECTS

- **Asthma: 202,300 episodes/year[1]**
- **Bronchitis/pneumonia (<18mo)[2]**
  - **150,000 - 300,000 cases**
  - **7,500 – 15,000 hospitalizations**
  - **136 – 212 deaths**
- **OM: 790,000 visits/year[1]**
- **SIDS: 430 deaths/year[1]**

1-California Air Resources Board. June 2005. ftp://ftp.arb.ca.gov/carbis/regact/ets2006/app3exe.pdf
2-Health Effects of Exposure to Environmental Tobacco Smoke. The Report of the California Environmental Protection Agency, 1997.

SHS - CLINICAL EFFECTS

- **Exposed children more likely to have respiratory complications with general anesthesia[1]**
- **Children living with smokers are at greater risk for injury and death from house fires[2]**
- **Children living with smokers are more likely to become smokers themselves[3]**

1 - Koop CE, Anesthesiology 1998; 88: 1141-2.
2 – Difranza JR, Lew RA. Pediatrics 1996; 97:560-8.
3 – Farkas et al. Prev Med 1999.

SHS – SCREENING QUESTIONS

- **Do you smoke?**
- **Do other family members or child's caregivers smoke?**

SHS - INTERVENTIONS & RECOMMENDATIONS

- **Strongly advise parents to quit**
  - **"As your child's pediatrician, I think the best thing you can do for your health and your child's health is to quit smoking. My staff and I can help you."**
- **If parents want to quit soon, provide assistance and/or refer to Quitline: 1-800-QUIT NOW**
- **If parents can't quit now, urge smoke free homes, child care settings and cars**

3 - WATER/FOOD EXPOSURES

- **Well water may contain high levels of nitrates**
  - **Infants may develop methemoglobinemia**
- **Tap water may contain lead**
- **Fish may contain mercury, PCB's**

WATER/FOOD – SCREENING QUESTIONS

- **What is the source of your drinking water?**
  - **Well water, city water, bottled water**
- **Do you eat fish? Does your child eat fish? If so, what kinds and how often?**

WATER/FOOD – INTERVENTIONS & RECOMMENDATIONS

- **Test water from private wells quarterly for 1 year for coliforms and nitrates**
  - **If levels acceptable, then test yearly**
- **Test tap water for lead if water is consumed by infants**
  - **Straight from tap, in reconstituted infant formula and juice**
- **Advise about fish low in contaminants[1]**

1- http://oceansalive.org/eat.cfm

4 - EXPOSURE TO UV LIGHT

- **Exposure to ultraviolet (UV) light through natural and artificial sources is linked to the development of skin cancer later in life**
  - **Non-melanoma skin cancer**
  - **Melanoma**

MELANOMA

- **Most common fatal skin cancer**
- **2006: 62,190 new cases with 7,910 deaths[1]**
- **Occurs in teens, young adults**
- **Metastatic melanoma has a grave prognosis**
- **Prevention, early detection are key**

1 – American Cancer Society 2006 (www.cancer.org).

CHILDHOOD EXPOSURE

- **~25% of lifetime sun exposure occurs during childhood and adolescence[1]**
- **Episodic high exposures sufficient to cause sunburn, particularly in childhood and adolescence, increase the risk of melanoma[2]**

1- Godar et al. *Photochem Photobiol 2003*
2 -Elwood, Jopson. *Int J Cancer* 1997;73

UV LIGHT – SCREENING QUESTIONS

- **Are you (your child) protected from excess sun exposure?**
- **Do you visit tanning parlors?**

UV LIGHT – INTERVENTIONS & RECOMMENDATIONS

- **Do not burn; avoid sun tanning and tanning beds**
- **Generously apply sunscreen**
- **Wear protective clothing**
- **Seek shade**
- **Use extra caution near water, snow and sand**

http://www.skincancerprevention.org/Tips/tabid/54/%20Default.aspx

5 - WORK

- **“Brought-home” or “para-occupational” exposures**

WORK – SCREENING QUESTIONS

- **What are the occupations of all adults in the household? What are hobbies?**
- **If teens work, what are their occupations/hobbies?**

PREVENTING WORK-RELATED EXPOSURES

- **Counsel parents in hazardous occupations to shower at work, change clothes and shoes before getting into cars and driving home**
- **If parents work in the home with toxic substances, make sure that children have no access to the work area**

Environmental Health Anticipatory Guidance

TOPIC	AGE/PERIOD
Home, ETS, mold, occupational exposures, breast/bottle issues	Prenatal or first visit
ETS, Sun exposure, mold	2 months
Poisons, household pesticides, lead	6 months
Arts and Crafts	Preschool
Occupational/Hobby exposures	Teens
Lawn/garden products/services	Spring/Summer
Wood stoves/heating	Fall/Winter

AAP Handbook, 2003

SICK VISITS

- **Incorporating environmental etiologies into differential diagnoses**

ENVIRONMENT AND DISEASE

- **Making the connection between a child's disease and the environment requires a high index of suspicion**
- **A clinician must think like a medical detective**
- **Illness caused by an environmental agent may present as a common medical problem**
- **It is important to ask the right questions; physical exam and lab tests follow**

CONSIDER ENVIRONMENTAL CAUSES WITH…

- **Coma, seizures, developmental delay, irritability, constipation…**
  - ***LEAD***
- **Asthma, pneumonia, OM…**
  - ***SHS***
- **Fatigue, headache, dizziness, weakness, nausea, vomiting…**
  - ***CO POISONING***

ENVIRONMENTAL HISTORY- SOLVING A MYSTERY

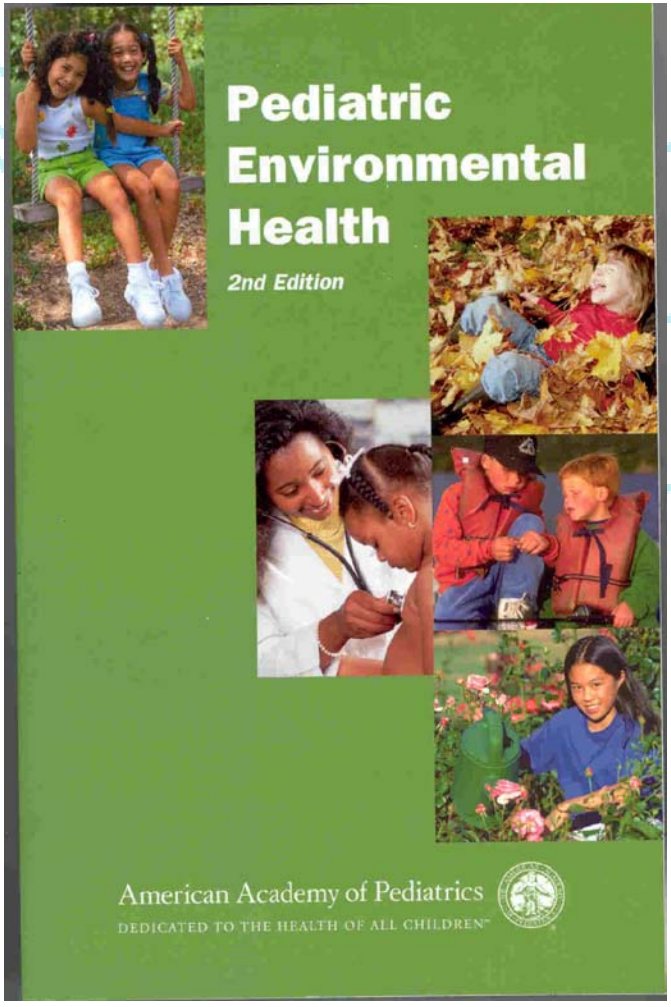
- **Others similarly affected? *WHO***
- **What are symptoms? *WHAT***
- **Symptoms better/worse on weekdays or weekends? What time of day? *WHEN***
- **Do symptoms subside or worsen in a particular location? During specific activities? *WHERE***
- **Parents' theories *WHY***

RESPONDING TO PARENTS' CONCERNS

- **Parents may have questions and concerns about environmental hazards**
- **Resources are available**

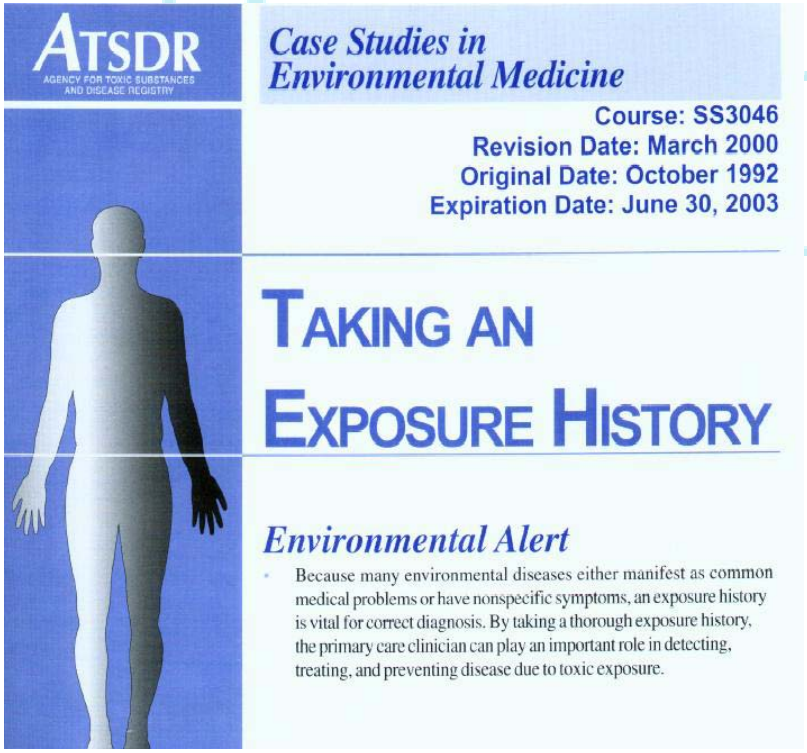
PEHSU's


Locations of Pediatric Environmental Health Specialty Units
10 • SEATTLE
Pediatric Environmental Health Specialty Unit
8 • DENVER
Rocky Mountain Regional Pediatric Environmental Health Specialty Unit
5 • CHICAGO
Center for Children's Environmental Health
1 • BOSTON
Pediatric Environmental Health Center
2 • NEW YORK CITY
Mt. Sinai Pediatric Environmental Health Specialty Unit
3 • WASHINGTON, D.C.
Mid-Atlantic Center for Children's Health and Environment
4 • ATLANTA
Southeast Pediatric Environmental Health Specialty Unit
9 • SAN FRANCISCO
UCSF Pediatric Environmental Health Specialty Unit
9 • IRVINE
UCI Pediatric Environmental Health Specialty Unit
6 • TYLER
Southwest Center for Pediatric Environmental Health Specialty Unit
7 • IOWA CITY
Midwest Pediatric Environmental Health Specialty Unit
Puerto Rico
U.S. Virgin Islands
Hawaii
Guam
American Samoa
Canadian and Mexican locations not shown



Pediatric Environmental Health, November 2003

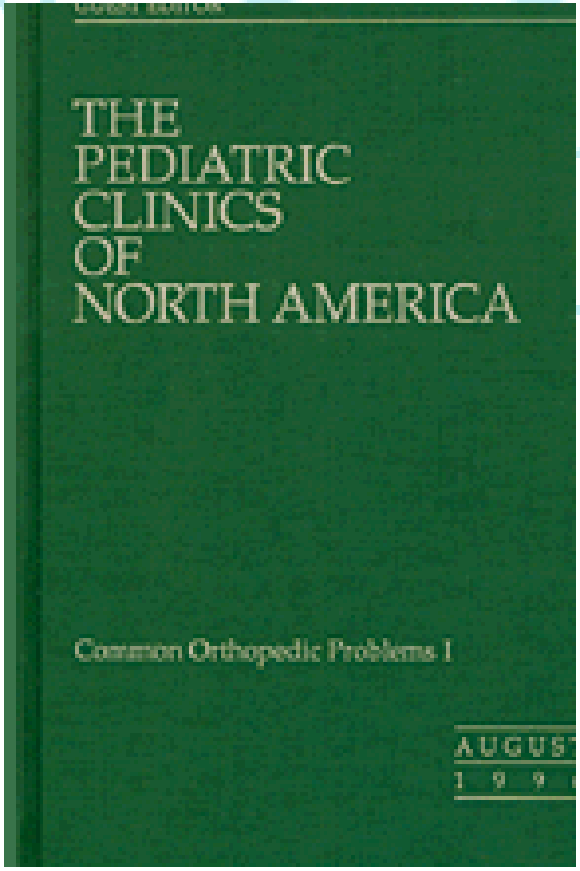
ATSDR CASE STUDIES



- ***Taking an Exposure History, March 2000***

http://www.atsdr.cdc.gov/HEC/CSEM/exphistory/goals_objectives.html

PEDIATRIC CLINICS OF NORTH AMERICA



- ***Environmental Health, October 2001***
- ***Jerome Paulson, MD, Editor***

POWERPOINT CASE PRESENTATION

- **Pediatric Environmental Health History by R Goldman, M Shannon, A Woolf**
- **Gives a detailed approach to gathering information when the child has a symptom**
- **Developed by the PEHSU of Cambridge Hospital and Children's Hospital, Boston, supported by AOEC and ATSDR**
- ***www.aoec.org/content/resources_1_3_8.htm***

ORGANIZATIONS

- American Academy of Pediatrics
  - Committees on Environmental Health
  - www.aap.org
- National Environmental Education Foundation
  - Pediatric Environmental Health Initiative
  - http://www.neefusa.org/health/PEHI/index.htm
- Physicians for Social Responsibility
  - Pediatric Environmental Health Toolkit
  - www.igc.org/psr
- Healthy Schools Network
  - www.healthyschools.org

IN SUMMARY…

- **Considering environmental conditions is basic to assuring health and well-being**
- **Environmental history is basic to a comprehensive pediatric history**
- **NEEF tools can help clinicians gather information in key areas: housing, smoke exposure, water & food, UV light, work**

A BROADER VIEW OF PEDIATRIC ENVIRONMENTAL HEALTH

- **Paradigm shift: expands thinking from individual toxicants to also considering "the social environment"**
- **"A healthy community environment encompasses aspects of human health, disease, and injury that are determined or influenced by factors in the overall environment"**
- ***THE CHALLENGE*: *How can we broaden our histories to also incorporate this larger view into our care of children?***

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