Boston Children’s Hospital/Harvard Medical School Fellowship Training in Pediatric & Reproductive Environmental Health
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This material was supported by the American Academy of Pediatrics (AAP) and funded (in part) by the cooperative agreement FAIN: 5 NU61TS000237-05 from the Agency for Toxic Substances and Disease Registry (ATSDR).

Funding for this seminar was made possible (in part) by the cooperative agreement award number 1U61TS000237-05 from the Agency for Toxic Substances and Disease Registry (ATSDR). The views expressed in written materials and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services.

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• We do not intend to discuss an unapproved/investigative use of a commercial product/device in our presentation.
### Children’s Vulnerability

<table>
<thead>
<tr>
<th>Vulnerability</th>
<th>Details</th>
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<tbody>
<tr>
<td>Porous blood-brain barrier; Sensitive forming brain tissue</td>
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<tr>
<td>Immature immune system</td>
<td></td>
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<tr>
<td>Immature, thin skin</td>
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<tr>
<td>Immature lungs until 8 years old</td>
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<tr>
<td>Breathing zone closer to ground</td>
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<tr>
<td>Rely on others for safety, protection or escape</td>
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<tr>
<td>Immature detox: liver, kidneys, lungs</td>
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<tr>
<td>Breast feeding</td>
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<td>Nutritional differences</td>
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<td>Smaller size and wt; Longer life spans</td>
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<td>Poor cognitive discrimination</td>
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<tr>
<td>Oral exploratory habits</td>
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<tr>
<td>Pica</td>
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<tr>
<td>Mimicry</td>
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<tr>
<td>Curiosity</td>
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<tr>
<td>Mobility: crawling, cruising, toddler gait</td>
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Children’s & Women’s Reproductive Health Cumulative Risks & Disparities

- Poverty
- Stressed Mother
- Lead
- Allergens
- Poor Nutrition
- Squalid Neighborhood
- Noise
- No Parks
<table>
<thead>
<tr>
<th>Support need for specific clinical information on environmental toxins</th>
<th>Facilitate early response to public health issues</th>
<th>Engage in public educational outreach activities</th>
<th>Participate in clinical assessments and referrals as needed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Partner</strong> with local and state health departments and regional poison control centers</td>
<td>Give advice to residents and community leaders</td>
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<td></td>
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<td>Provide health care provider education and training opportunities</td>
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</tbody>
</table>
Boston Children’s Hospital/Harvard Medical School PREH Fellowship Training

- Certified fellowship training site by Academic Pediatric Association
- 2 years (optional: 3rd research year)
- Requirements: physician-level pediatrics or family medicine residency & state licensure eligibility
Fellowship Training Goals

- Clinical Service
- Teaching
- Research
- Community Advocacy
Fellowship Venues

PEHC & PCC clinics at BCH

MA/RI Regional PCC

BCH Inpatient & Consult Service

Region 1 N.E. PEHSU

Region 1 EPA

HSPH HMS

Region 1 ATSDR
Speaker

Bryan Stierman, MD, MPH, FAAP
Clinical Fellow in Pediatric Environmental Health, Boston Children's Hospital
Staff Physician, General Pediatrics, Boston Children's Hospital
Instructor in Pediatrics, Harvard Medical School
What does an Environmental Health Fellow do?

- Manganese Exposure
- Day at MA Statehouse
- Interface with DPH

**Research**
- Resident/Med Student Education
- Conferences
- General Public
- Community Physicians

**Teaching Others**
- Inpatient
- Outpatient Clinic
- Telephone Consult

**Fellowship**
- Mentored
- Experiential
- Self-directed
- Formal Coursework

**Advocacy**

**Learning**

**Clinical Practice**
Clinical Practice

- Fellowship
- Clinical Practice
  - Inpatient
  - Outpatient Clinic
  - Telephone Consult
Cases

- LEAD!!!!
  - Lead paint
  - Water
  - Marksmanship
  - Imported Products

- Radon
- Arsenic
- Uranium
- Pesticides (paraquat)
- PFAS

- Mold
- VOCs
- Carbon Monoxide
- Manganese
- TCE
- HAA5
- Possible Cancer Cluster
- “Sewer Gas”
- Coal Tars
- Non-ionizing radiation
- Cannabis
- Unexplained symptoms

Image Source: By Alchemist-hp (talk) (www.pse-mendelejew.de) - Own work, FAL, https://commons.wikimedia.org/w/index.php?curid=12381318
Learning Fellowship

Learning

Mentored
Experiential
Self-directed
Formal Coursework
Learning

Formal Coursework
• Certificate in Applied Biostatistics through Harvard Catalyst
• Introduction to Environmental Health through Harvard School of Public Health
• Toxicology for Urgent, Emergency, and Critical Care through Harvard Medical School
• Introduction to Clinical Research through Boston Children’s Hospital
• Numerous lectures and grand rounds throughout the medical center

Self-Directed
• Books
• Articles
• Tox Profiles

Experiential Learning
• Clinical work
• Academic papers, presentations

Mentorship
Teaching Others

- Resident/Med Student Education
- Conferences
- General Public
- Community Physicians

Teaching Others
Fellowship
Teaching Others

Screening, Diagnosis and Multi-pronged Management and Prevention of Elevated Blood Lead Levels in Children

Marissa Hauptman, MD, MPH, FAAP
Attending Physician
New England Pediatric Environmental Health Specialty Unit

Bryan Stierman, MD, MPH
Clinical Fellow
New England Pediatric Environmental Health Specialty Unit

Commentary

Children With Autism Spectrum Disorder and Lead Poisoning: Diagnostic Challenges and Management Complexities

Marissa Hauptman, MD, MPH\textsuperscript{1,2,3},\textsuperscript{d} Bryan Stierman, MD, MPH\textsuperscript{1,2,3},
and Alan D. Woolf, MD, MPH\textsuperscript{1,3}

Radon: Information for Clinicians

Presented during the May 10, 2018 AAP Environmental Health ECHO

Bryan Stierman, MD, MPH
Clinical Fellow in Environmental Health
Region 1 Pediatric Environmental Health Specialty Unit
Boston Children’s Hospital

Carbon Monoxide

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https://commons.wikimedia.org/w/index.php?curid=19457589
Research

Manganese Exposure

Research

Fellowship

Advocacy

Day at MA Statehouse

Interface with DPH

Advocacy

Fellowship

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Benefits of the Fellowship

• Gain expertise in clinical assessment and management of a wide-range of environmental exposures, especially lead poisoning
• Develop and understanding of the concepts of risk assessment and risk communication
• Work at the interface of clinical medicine and public health
• Opportunity for formal coursework and informal learning in public health and environmental health
• Ability to expand research and academic horizons in environmental health
• Meeting and collaborating with leaders in the field
Prior Fellows Employment After Fellowship

- Assistant Director Pediatric Environmental Health Center
- Academic Medicine
- Private Practice
- CDC Epidemic Intelligence Service
Questions???