



# Society for Risk Analysis New England Chapter

[www.sra-ne.org](http://www.sra-ne.org)

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## 2007-2008 Event Series

**January 23, 2007**

**Refreshments: 3:30 pm - 3:45 pm**

**Presentations: 3:45 pm – 6:30 pm**

# INNOVATIVE ENVIRONMENTAL EPIDEMIOLOGY RESEARCH AND APPLICATIONS TO RISK ASSESSMENT

## Presentations

## ASSAYS OF BRAIN STRUCTURE AND FUNCTION: INTEGRATING METHODS FOR NEUROTOXICOLOGY

Roberta F. White, Ph.D., Boston University School of Public Health

and

## DETERMINING RISKS TO BACKGROUND ARSENIC USING A MARGIN OF EXPOSURE APPROACH

Barbara D. Beck, Ph.D., DABT, Gradient Corporation

## Location

Harvard School of Public Health  
Landmark Center  
401 Park Drive  
Room 414a West

Please RSVP by **Wednesday, January 16<sup>th</sup>** to Donna Vorhees  
([djvorhees@comcast.net](mailto:djvorhees@comcast.net)). Space is limited, so reserve your seat today!



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## ABSTRACTS OF PRESENTATIONS

**Roberta White.** *Assays of Brain Structure and Function: Integrating Methods for Neurotoxicology.* Behavioral endpoints - especially scores on tests of cognition, motor skills, and mood - have been used to detect the neurotoxicity of chemicals for over 40 years. Recently, highly sensitive neuroimaging techniques have been added to the toolbox of behavioral toxicologists. However, application of these methods has often been haphazard, and the capacity of these tools to test hypotheses about the specific disruptions of brain structures and functions caused by chemical exposures has rarely been invoked in epidemiologic research. This presentation reviews the field of behavioral neurotoxicology, considers the tools available for assessing exposure effects on the central nervous system, compares the power and pitfalls of four types of outcomes through validation research, and describes the integration of behavioral and imaging methodology as an approach in epidemiologic research. Research on the CNS effects of prenatal methylmercury exposure will be used to illustrate one attempt at integrating methods.

**Barbara Beck.** *Determining Risks to Background Arsenic Using a Margin of Exposure Approach.* Inorganic arsenic ( $As_i$ ) is a known human carcinogen. In certain areas of the world, where natural levels of  $As_i$  in the drinking water are extremely high (e.g., hundreds of ppbs), an association has been established between ingestion of  $As_i$  and cancer prevalence (skin, bladder, and lung). Regulatory agencies use linear extrapolation to estimate  $As_i$  cancer risks; this results in risks from background exposure to  $As_i$  in food, water, and soil greater than  $10^{-6}$ , and, in some cases,  $10^{-4}$ , thus exceeding regulatory targets. However, epidemiological and mechanistic evidence strongly supports a non-linear dose response of inorganic  $As_i$ . We therefore propose a Margin of Exposure (MOE) analysis to characterize risks to background  $As_i$  exposures. For a point of departure, we use the no-effect level identified by Lamm *et al.* (2006). This value is based on a re-analysis of the Taiwanese data, demonstrating that the dose-response for  $As_i$ -related bladder and lung cancer has an apparent threshold, with bladder and lung cancer risk significantly increased ( $SMR \geq 100$ ) only at drinking water concentrations above 151  $\mu g/L$  (CI: 42 to 229  $\mu g/L$ ). Using estimates of Taiwanese specific weight and intake factors, we converted this drinking water level to a no effect level dose of 0.013 mg/kg-day. We calculated MOEs for the US population by comparing the no effect level dose to estimates of background exposures to  $As_i$  in food, water and soil, considering distributions of intake as well as  $As_i$  concentration in the various media. We conducted sensitivity analyses to explore the impacts of alternative assumptions regarding dietary intake, water intake, and concentrations in groundwater and surface water. Our analysis demonstrated that typical and high end (95%ile) background exposures to  $As_i$  in food, water, and soil for children and adults do not present a toxicological concern in the US. Varying key assumptions by 50% in magnitude in both directions did not change the conclusions.



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## BIOGRAPHICAL SKETCHES OF PRESENTERS

**Dr. White** studies the effects of exposures to industrial chemicals and chemical pollutants on brain function, using both behavioral measures and neuroimaging techniques. She has studied occupational lead exposures in adults, environmental lead exposure in children, prenatal exposure to methylmercury and polychlorinated biphenyls from maternal diet, and solvent exposures in children and adults. A current project examines the effects of prenatal pesticide exposure among farm workers in South Africa. Recent brain neuroimaging studies include functional magnetic resonance imaging (fMRI) in adolescents with prenatal exposure to methylmercury and biphenyls, magnetic resonance spectroscopy (MRS) of lead-exposed workers, and structural MRI in Gulf War veterans. She has also studied the neurocognitive sequelae of neurodegenerative disorders such as Parkinson's disease, multiple sclerosis and Alzheimer's disease and is interested in gene-environment interactions underlying these disorders. Dr. White holds appointments in the Neurology and Psychology departments at BU and has trained over 100 students in environmental health, behavioral neuroscience, behavioral neurology, and neuropsychology. (email address: [rwhite@bu.edu](mailto:rwhite@bu.edu))

**Dr. Beck** is an expert in toxicology and in health risk assessment for environmental chemicals, especially metals and air pollutants and the author of over 30 book chapters and journal articles on these topics. Dr. Beck directs Gradient's toxicology and risk assessment practice. She has performed site-specific risk assessments, developed risk assessment methodologies, e.g., for cumulative risk assessment, and has presented the results to different audiences including regulatory agencies, the U.S. Congress and the public. Before joining Gradient, she was Chief of Air Toxics Staff in Region I EPA. Prior to that, she was a Fellow in the Interdisciplinary Programs in Health at the Harvard School of Public Health. Dr. Beck is at present a Lecturer in Toxicology at Harvard. (email address: [bbeck@gradientcorp.com](mailto:bbeck@gradientcorp.com))

## GETTING TO THE EVENT

Directions to Landmark: <http://www.hsph.harvard.edu/landmark/location.html>

- **From the [MBTA](#) Subway (on foot)** - Take the Green Line "D" train to the Fenway Stop.
- **Driving directions**
  - From North or South of Boston:* Take I-93 North/South to Exit 26 (Storrow Drive). Follow Storrow Drive approximately 2.5 miles to Kenmore Square/Fenway exit (on left). The exit ramp forks, stay to your right. Take right at first light into Kenmore Square. Take leftmost fork at second light onto Brookline Avenue. Once on Brookline Avenue, pass Fenway Park on your left and the movie theater, part of Landmark Center, on your right. Turn right onto Park Drive at first big intersection. Turn right again into the parking area.
  - From West of Boston:* Take I-90 to exit 18. Follow Storrow Drive eastbound to Kenmore Square/Fenway exit. Follow directions above.



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- **Once you arrive at Landmark**

*Parking:* available at the Landmark Center. For questions, please call [Laz Parking](http://LazParking.com) at 617-927-0398. Maximum daily rate is \$15.

*Room location:* Enter on the ground floor between Best Buy and REI; take the escalator or stairs to the upper lobby. The East Wing will be to your right, the West Wing to your left. Proceed to the 4<sup>th</sup> floor of the West Wing.

## UPCOMING SRA-NE MEETINGS

### Upcoming SRA-New England Events

*January 23, 2008. Participate in Planning the Future of SRA-New England.* Join our planning committee now. The committee will develop chapter bylaws, including election procedures, and define our chapter's goals and new initiatives. Thanks to Dr. Igor Linkov's efforts, we have funding that provides us with the opportunity to explore new initiatives beyond our regular schedule of events. Our first meeting will take place at 2:30pm on January 23<sup>rd</sup> at the Landmark Center, Room 414a immediately before our regularly scheduled event. Please email Amy Rosenstein ([ARosenstein@icfi.com](mailto:ARosenstein@icfi.com)) if you are interested in participating.

*April 8, 2008: Joint Licensed Site Professional Association and SRA-New England Meeting.* Topic: **Subsurface Vapor Intrusion**. Speakers: Henry Schuver and Harlee Strauss. Mr. Schuver will discuss the technical challenges to evaluating this pathway and the status of EPA's efforts to produce final guidance. Dr. Harlee Strauss will discuss her experience evaluating this exposure pathway at Massachusetts sites over the last 20 years and information needs for sound risk evaluation of this exposure pathway.

## OTHER ANNOUNCEMENTS

### Join or Renew Membership in SRA-New England Now

It's time to renew your membership in the New England Chapter, and we've attached a membership form to this announcement for your convenience. You can also download the form to join or renew your membership at [www.sra-ne.org](http://www.sra-ne.org). Dues are just \$7 for students and \$15 for others.

### 2008 Annual Meeting of the Society for Risk Analysis

The 2008 Annual Meeting of the Society for Risk Analysis will be held in Boston. We invite you to participate by joining a workgroup that will plan and host events associated with the national meeting. Please email Donna Vorhees ([djvorhees@comcast.net](mailto:djvorhees@comcast.net)) if you are interested in participating.



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### Other Events of Interest

*February 14-18, 2008: AAAS Annual Meeting, Boston, MA.* (AAAS meeting website: [http://www.aaas.org/meetings/Annual\\_Meeting/2008\\_boston/](http://www.aaas.org/meetings/Annual_Meeting/2008_boston/)). The meeting includes **FREE EVENTS** that might interest SRA-NE members:

1. **2008 FAMILY SCIENCE DAYS** on Saturday & Sunday, 16-17 February 2008, 11:00am-5:00pm with lab demonstrations that show the fun of science.
2. AAAS invites parents of children with disabilities, faculty members, special education teachers, counselors, and neighbors to attend two events, for middle school and high school students with disabilities. The first event is the **AAAS LUNCHEON FOR SCIENTISTS AND STUDENTS WITH DISABILITIES** on Friday, Feb 15, 2008 from 10:00am to 2:00pm. AAAS holds this luncheon every year, at the Annual Meeting, for middle school and high school students and scientists with disabilities. It is an opportunity for working scientists to sit with the students and share their education experiences and coping strategies. Throughout the years, many students with disabilities have been encouraged to pursue science as a result of meeting a real scientist with a disability. The second event is a career seminar, **INTERNSHIPS IN STEM: OPEN OPPORTUNITIES TO GRADUATE STUDIES AND EMPLOYMENT**, and will immediately follow the Luncheon on Friday, Feb 15 from 2:15pm to 3:45pm. Both events are in the Sheraton Boston Hotel. A highlight, of both events, will be a panel of **ENTRY POINT!** alumni with disabilities who have participated in 10-week summer internships at NASA, IBM, MERCK, Lockheed Martin, and NOAA, and have continued their education or are working in science fields. Please email me at [lsummers@aaas.org](mailto:lsummers@aaas.org), or call me at 202-326-6649 **before February 8, 2008** if you and your students are interested in attending one or both of these events.

### Employment Opportunities

If you have an employment opportunity you would like listed here, please contact Karen Vetrano at [kvetrano@trcsolutions.com](mailto:kvetrano@trcsolutions.com) or 860-298-6351. Please note that the job-posting fee for this newsletter is \$100 for recruiters/commercial and \$50 for government and nonprofit organizations. Please make your payment to Arlene Levin, NE-SRA Treasurer at Eastern Research Group, 110 Hartwell Street, Lexington, MA 02173



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## MEMBERSHIP FORM: 2007-2008

PLEASE Print Clearly, ESPECIALLY THE E-MAIL ADDRESSES

Date:

Name:

Mailing Address:

City/State/Zip:

Telephone:

Email address:

Employer:

Position:

Areas of Interest:

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Membership dues for SRA-NE are independent from the dues charges by the National Society for Risk Analysis. Your SRA-NE dues support the activities of this chapter and pay for expenses relating to guest speakers.

Annual dues for SRA-NE are as follows:

|         |                |
|---------|----------------|
| \$15.00 | Regular Member |
| \$ 7.00 | Student Member |

Thank you for your interest and continuing support of the New England Chapter of SRA. Mail your membership application and payment to SRA-NE Treasurer at the address below. Please make checks payable to: Society for Risk Analysis - New England Chapter.

Arlene Levin  
Eastern Research Group  
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Phone: 617-674-7369      Fax: 617-674-2851

Please RENEW for the 2007-2008 academic year! Thank you!