Medical Toxicology and Public Health—Update on Research and Activities at the Centers for Disease Control and Prevention and the Agency For Toxic Substances and Disease Registry

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The following update includes the research and activities of medical toxicologists actively involved at the National Center for Environmental Health and the Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) at the Centers for Disease Control and Prevention (CDC). The Journal of Medical Toxicology will periodically highlight some of these activities to illustrate the growing relation between medical toxicology and public health.

Division of Environmental Hazards and Health Effects, Health Studies Branch (NCEH, CDC)

Toxicosurveillance and the Toxic Exposure Surveillance System¹

Through the use of the Toxic Exposure Surveillance System (TESS), the CDC's Division of Environmental Hazards and Health Effects, ATSDR, and the American Association of Poison Control Centers (AAPCC) are collaborating to identify public health hazards resulting from intentional or unintentional releases of chemicals or toxins. The CDC's primary role is to assist AAPCC in exploring the utility of TESS in early detection of illnesses associated with chemical releases. We anticipate that TESS, in its real-time mode, will potentially be able to:

- improve public health surveillance of chemical exposures and other potential health hazards;
- identify early markers for chemical poisonings of public health significance;
- identify emerging problems that may be associated with newly introduced household products, pharmaceuticals, and pesticides; and
- identify similar chemical or toxic exposures occurring at multiple sites throughout the United States.

Division of Laboratory Sciences (NCEH, CDC)

Biomonitoring: Public Health Application and Result Interpretation

The Biomonitoring Program of the CDC's Division of Laboratory Sciences at NCEH (<http://www.cdc.gov/biomonitoring>) measures chemicals in biological tissues and examines the association between these levels and adverse health effects. Several public health applications exist for biomonitoring, such as determining the prevalence of excess exposure, defining trends of exposure to a chemical over time, identifying vulnerable populations, and evaluating the effectiveness of interventions to limit human exposure to chemicals. In public health investigations of chemical exposure, biomonitoring can assist in defining exposure, aid with dose reconstruction, and determine the likelihood that health effects are related to exposure.

Medical toxicologists in the Division of Laboratory Sciences contribute to the interpretation and application of biomonitored data for many chemicals; some of the biomonitored chemicals include cotinine (from environmental tobacco smoke), metals (e.g., arsenic, lead, and mercury), pesticides, phthalates, polychlorinated biphenyls, polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans, and volatile organic compounds. The Biomonitoring Program supports multiple research

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collaborations with public partners and government agencies through consultation and participation in health studies. Medical toxicologists are evaluating research on chemicals that are emerging environmental toxicants, including cadmium, perchlorate, perfluorinated organic chemicals, and polybrominated diphenyl ethers.

Division of Toxicology, Emergency Response and Scientific Assessment Branch (ATSDR, CDC)

Emergency Response Following Hurricanes in 2005

The ATSDR Emergency Response and Scientific Assessment Branch provided medical personnel to establish the Clinical Medical Team (CMT) for the CDC Director's Emergency Operations Center. The CMT was charged with coordinating medically related issues for the CDC during the Hurricane Katrina response, and a medical toxicologist led the team. The CMT drafted information sheets on a variety of public health topics: from carbon monoxide poisoning to snake and reptile hazards and from first aid to injury prevention, the CMT played an integral part in public health. These information sheets were provided to personnel in the affected region and accessible for download from the CDC Web site. The CMT also drafted guidelines for

deploying personnel to address health and safety issues such as (a) required immunizations for responders, (b) handling of human and veterinary remains, (c) precautions for contact with blood and body fluids, and (d) requirements for personal protective equipment (PPE) for responders coming in contact with floodwater and sediment. The CMT was also responsible for determining when to release clinical medical supplies from the Strategic National Stockpile (SNS) to state and local authorities.

The role and responsibilities of the CMT adapted to the changing needs of personnel deployed to the region in the weeks following the initial hurricane response, and the team primarily focused on addressing the care and management of displaced persons and evacuees. The team drafted a working document to facilitate recognition, clinical diagnosis, and management of likely infectious disease entities among evacuees. The team also designed a portable medical record that could be used to track the medical problem list and management of an evacuee who may have received care at numerous sites within the affected region and outside the involved area after evacuation.

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