

# **Chemical Agents of Opportunity for Terrorism: The Medical and Psychological Consequences of TICs (Toxic Industrial Chemicals) and TIMs (Toxic Industrial Materials)**

**May 6, 2006**

**Durham Research Center Building  
Suzanne and Walter Scott Jr Education Center  
DurHam Research Plaza & Emile Street  
University of Nebraska Medical Center  
Omaha, Nebraska, 68198  
7:45 AM- 5:00 PM**

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## **COURSE OBJECTIVES**

The American College of Medical Toxicology (ACMT) in conjunction with the Agency for Toxic Substances and Disease Registry (ATSDR) are pleased to offer a 1-day course on: *Chemical Agents of Opportunity for Terrorism: The Medical and Psychological Consequences of TICs (Toxic Industrial Chemicals) and TIMs (Toxic Industrial Materials)*. This course will provide awareness-level training on a variety of toxic syndromes likely to be encountered following exposures to TICs and TIMs and other chemical agents of opportunity. The course will focus on the medical and psychological issues pertaining to TICs, TIMs as well as other important non-volatile chemical exposures.

In recent years, there has been growing concern that many of the most likely threats of chemical terrorism involve so-called "agents of opportunity." Both common and unusual industrial agents may pose a considerable threat as potential terrorist weapons. While an understanding of the traditional military chemical weapons (e.g. nerve agents) remains essential, an appreciation of the myriad of other potential toxic chemicals readily available in our society is crucial if we are to optimally prepare, identify and defend against chemical threats. This course will utilize a symptom-based clinical approach to describe the medical impact of various chemical poisons. We will provide a framework to enhance recognition of the common health effects of apparently disparate chemical toxins, describe the risk to various healthcare workers, and introduce clinical and public health management strategies. The traditional military warfare chemical agents will not be covered in these lectures because information on these agents is readily accessible through a number of other forums such as the Internet.

### **By attending this one-day course, the participant will be able to:**

- **Understand the concept of chemical agents of opportunity, TICs and TIMs and appreciate the basis for increased public health preparedness**
- **Identify chemical agents of opportunity that could be used by terrorists**
- **Discuss the past use of these chemicals in mass exposure situations**
- **Describe the major health effects of TICs, TIMs and other important non-volatile chemical agents that could be used by terrorists**
- **Identify the primary modalities available to treat victims of such chemical exposures**
- **Understand the psychological impact of mass chemical exposures**

## **TARGET AUDIENCE**

The information presented will be of interest to law enforcement officials, public health officials, emergency response coordinators, FOSCs, environmental health scientists, toxicologists, occupational/environmental and emergency physicians, veterinarians, laboratorians, engineers, industrial hygienists and others involved with chemical terrorism preparedness and response.

## **COURSE FACULTY**

The faculty members are all board certified and fellowship trained physician medical toxicologists who are members of the American College of Medical Toxicology (ACMT) and currently serve as consultants to

ATSDR. They have extensive experience directly caring for patients suffering from the ill-effects of chemical agents and poisons. ACMT is the major professional organization of physicians specializing in medical toxicology in the United States. In 1999 ACMT entered into a 5-year cooperative agreement with ATSDR under the auspices of Program Announcement 99081: Program to Build Capacity to Conduct Environmental Health Promotion Activities. This agreement was designed, in part, to enhance educational outreach to health care professionals on issues pertaining to environmental toxicology. Recognizing the urgent need to improve the capacity of health professionals and public health officials to respond knowledgeably and effectively to chemical terrorism and related mass chemical exposure, the ACMT – ATSDR partnership has considerably expanded during the past year. A national network now links medical toxicologists across the country with the 10 ATSDR regional offices. As part of this growing partnership, ACMT has organized this intensive one-day training course on the medical response to chemical terrorism and mass chemical exposure incidents.

## **PROGRAM AGENDA**

### **Chemical Agents of Opportunity for Terrorism: The Medical and Psychological Consequences of TICs (Toxic Industrial Chemicals) and TIMs (Toxic Industrial Materials)**

#### **8:00- 8:15: Welcome, opening remarks**

#### **8:15 - 9:15: Toxic Warfare: Looking Beyond Conventional Chemical Weapons**

While the threat of conventional chemical warfare has received much attention, and is the subject of tight control measures and a program of planned chemical destruction, less interest has been paid to other chemical agents that have great potential to wreak havoc on the civilian sector and produce mass casualties. This talk will provide an overview of toxic warfare, TICs and TIMs, and key lessons from history.

#### **9:15 – 10:30: Toxic Gases, Fumigants and Cyanide**

Chemical compounds are produced in massive quantities as part of America's industrial complex. Many of these compounds are amenable to use as large-scale terrorist weapons. Phosgene, chlorine and anhydrous ammonia will be discussed as potential inhalational threats. Pathophysiology, treatment and potential sources in the community and in the transportation system will be discussed. Cyanide and fumigants such as methyl bromide, sulfuryl fluoride, chloropicrin and the phosphides are among the most toxic TICs. An overview of availability, mechanism of action, metabolism, clinical presentation and medical management, including antidote utilization will be covered.

#### **10:30-10:45: Break**

#### **10:45-11:45: The Clinical Neurotoxicology of Chemical Terrorism**

The awesome complexity of the central nervous system makes it particularly vulnerable to poisons. This lecture will provide insight into the expected clinical effects of potential terroristic poisons by highlighting three distinct brain syndromes: psychedelia (hallucinations), sedation (coma) and seizures (convulsions).

#### **11:45-12:45: Radiation**

A brief review of radiation health physics will be followed by a discussion of acute radiation syndrome. Various radiologic devices will be discussed with their potential for use as terrorist weapons.

#### **12:45-13:30: lunch break**

#### **13:30 – 14:30: Terrorism by Fear and Uncertainty: Delayed Toxic Syndromes**

Previous experience in medical toxicology provides notable examples in which malice or mishap has resulted in widely publicized episodes of group or mass poisoning whose presentation was delayed. The toxicity of metals such as thallium and the organomercurials, and of halogenated hydrocarbons such as dioxins and PCBs, will be discussed with particular reference to how poisoning with these agents presents and why delay in symptom onset complicates response to potential incidents of toxic terrorism.

#### **14:30 – 15:30: Recognizing Current Vulnerabilities: Threats to the Water, Food, and Drug Supply**

This presentation will discuss the vulnerability of the food, water and drug supply of our nation and the potential use as a vehicle for chemical terrorism. Recent mass poisonings involving nicotine in food, and contamination of illicit drug supply will be discussed. The potential problems relating to counterfeit pharmaceuticals and contamination of drinking

water will also be discussed.

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**15:30 – 15:45: Break**

**15:45 – 16:45: The Psychological Impact of Mass Chemical Exposures**

It is often difficult to differentiate psychological harm caused by chemical or biological terrorism from other illnesses. Previous events demonstrate that large numbers of patients with psychological distress will impact the emergency response and potentially overwhelm the health care system. Strategies must be developed to diminish fear and hopefully decrease subsequent mass psychogenic illness that is likely to occur following a mass chemical exposure.

**16:45-1700: closing remarks, questions, etc**