

Track 1 – Outbreak/Public Health

Medical Preparedness for Acts of Water Terrorism

February 4, 2005 1:00pm ~ 2:00pm

MEDICAL PREPAREDNESS FOR ACTS OF WATER TERRORISM



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Recognizing Waterborne Disease and the Health Effects of Water Pollution: Physician On-Line Reference Guide

Physician Preparedness for Acts of Water Terrorism

accessible at: www.WaterHealthConnection.org

Medical Preparedness for Acts of Water Terrorism

Recent terrorist activity in the US has forced the ...

- public health and medical communities
- federal security and regulatory agencies
- federal, state, and local water authorities

to consider **intentional contamination of US water supplies** as part of an organized effort to disrupt and damage important elements of our nation's infrastructure.



Medical Preparedness for Acts of Water Terrorism

Water supplies and water distribution systems represent potential targets for terrorist activity in the US based upon the **critical need for water** in every sector of our industrialized society.



Medical Preparedness for Acts of Water Terrorism

Deliberate contamination of wells, reservoirs, and other water sources for civilian populations has been employed as a **method of attack** by opposing military forces throughout the history of war.

Modern dispersal mechanisms of biological, chemical, and radiologic warfare agents have expanded considerably and include **water as a delivery mechanism**.



Courtesy of the US EPA

Medical Preparedness for Acts of Water Terrorism

Even short-term disruption of potable water supplies can significantly impact a community.

Intentional contamination of municipal water systems as part of a terrorist attack could lead to **serious** medical, public health, and economic consequences for a community.



Serious Health Consequences of Water Contamination and Waterborne Disease

Waterborne Cryptosporidiosis Outbreak in Milwaukee, Wisconsin (1993)

- 403,000 Milwaukee residents developed diarrhea reflecting an **attack rate of 52%** of the population.
- Over 4,000 residents hospitalized with cryptosporidiosis listed as the underlying or contributory **cause of death in 100 patients**.
- 725,000 productive days lost costing **\$54 million** in lost time and associated expenses for the Milwaukee community.

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Serious Health Consequences of Water Contamination and Waterborne Disease

Waterborne *E. coli* O157:H7 Outbreak in Walkerton, Ontario (2000)

- 2,300 residents severely ill with **seven deaths**, mainly children
- \$70 million attributed to class action settlement
- \$11 million spent on reconstruction of municipal water system
- Total cost of outbreak **\$155 million** to date




(CP Photo Kevin Frayer)

Medical Preparedness for Acts of Water Terrorism

How real is the terrorist threat to US water supplies?

In his 2002 State of the Union Address, President Bush noted that captured Al Qaeda documents included detailed maps of several US **municipal public drinking water systems**.



Courtesy of the US EPA

How real is the terrorist threat to US water supplies?

This is an official
CDC Health Advisory

Distributed via Health Alert Network
February 07, 2003, 20:56 EDT (8:56 PM EDT)
CDCHAN-000113-03-02-07-ADV-N

CDC and EPA Water Advisory in Response to High Threat Level
Today, the Department of Homeland Security upgraded the Homeland Security Advisory System from yellow level (elevated risk of terrorist attack) to orange level (high risk of terrorist attack).

While there are no data to indicate that water has been specifically targeted, our **nation's water infrastructure remains at risk to terrorist attacks, or acts intended to substantially disrupt the ability of a water system to provide a reliable supply of water.** Therefore, public health agencies and water utilities are encouraged to continue to work together, keep each other informed of any unusual activities, and confirm the proper operation of notification channels in emergency response plans.

How real is the terrorist threat to US water supplies?

Congressional Research Service Reports

RS21026 - Terrorism and Security Issues Facing the Water Infrastructure Sector

1-Apr-2003; Claudia Copeland and Betsy Cody

Abstract: Damage to or **destruction of the nation's water supply and water quality infrastructure by terrorist attack could disrupt the delivery of vital human services in this country, threatening public health and the environment, or possibly causing loss of life.** Interest in such problems has increased since the September 11, 2001, terrorist attacks. Across the country, water infrastructure systems extend over vast areas, and ownership and operation responsibility are both public and private but are overwhelmingly nonfederal. Since the attacks, federal dam operators and water and wastewater utilities have been under heightened security conditions and are evaluating security plans and measures.

How real is the terrorist threat to US water supplies?

SECURITY ADVISORY

TO: AWWA Leadership All Utilities
FROM: Jack W. Hoffbuhr
DATE: August 4, 2004

Who: FBI and Department of Homeland Security
What: Suspicious activity reporting criteria

The Federal Bureau of Investigation (FBI) and the Department of Homeland Security (DHS) has issued the attached Aug. 3 memo requesting that owners and operators of the nation's critical infrastructure/key resource facilities — **including water utilities** — report suspicious activities that may indicate pre-operational terrorism planning.

How real is the terrorist threat to US water supplies?

DRINKING SUPPLY: **Terrorists had eyes on water**

reviewjournal.com

Security bulletin reveals treatment facility plot details

By J.M. KALIL and DAVE BERNIS
© Copyright 2004, REVIEW-JOURNAL
Thursday, August 12, 2004

Recent government intelligence suggests **terrorists have discussed recruiting employees of water treatment facilities to poison drinking supplies** in hopes of causing mass casualties, according to a federal bulletin obtained by the Review-Journal.

Distributed Wednesday to law enforcement agencies and water facility operators nationwide, the document states that newly uncovered information indicates terrorists discussed **striking water facilities in major urban areas** before the Sept. 11, 2001, attacks.

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How real is the terrorist threat to US water supplies?

Terrorists sought to recruit water employees

Industry Outlook – 8/13/2004 11:50:00 AM

"Terrorists thought it would be **futile to attempt to directly poison a large water reservoir** because of the dilution factor," the bulletin stated, according to the paper. "Rather, they focused on the possibility of **poisoning the water during the water treatment process.**"

Terrorists spoke about inserting an unnamed poison into water during the chlorination process. "To accomplish this objective, they discussed **recruiting insiders to work with them,**" the paper cited.



How real is the terrorist threat to US water supplies?

abcNEWS.com Original Report

Third Watch

For Third Time in Three Months, FBI Warns of Biological and Chemical Attacks

abcNEWS

May 28 – For at least the third time in three months, the FBI is warning law enforcement officials nationwide to be on alert for chemical and biological attacks, ABCNEWS has learned.

No Specific Threat But Great Concern


This latest FBI bulletin comes as the nation remains on a state of high alert for terror attacks. Last week, the Bush administration raised the domestic threat level warning to orange, or "high," a decision made in part because of a series of threatening messages found on the Internet. A previous FBI bulletin obtained by ABCNEWS pointed to two recent e-mails intercepted by U.S. intelligence.

A perhaps coincidental Arabic magazine article also may be concerning officials. Sources provided ABCNEWS today with a government analysis of a published e-mail interview with a purported al Qaeda leader, identified as Abu Mohammad al-Ablaj, in which he hints about poison attacks in the United States. In the interview, al-Ablaj did not rule out **al Qaeda using new combat techniques, such as using sarin gas or poisoning drinking water in U.S. cities or in other Western nations.**

How real is the terrorist threat to US water supplies?

Feds Arrest Al Qaeda Suspects With Plans to Poison Water Supplies

RESPOND TO EDITOR EMAIL THIS ARTICLE PRINTER FRIENDLY BECOME A FOX FAN



Tuesday, July 30, 2002
By Carl Cameron

FOX NEWS

WASHINGTON ---- Federal officials have arrested two Al Qaeda terror suspects in the U.S. with documents in their possession about how to poison the country's water supplies, Fox News has learned.


FNC

How real is the terrorist threat to US water supplies?


Man killed in alleged poison water case

Wednesday, February 5, 2003 Posted: 4:44 PM EST (2144 GMT)

ACCOMAC, Virginia (AP) – A Virginia state trooper was shot and wounded and the suspected shooter was shot to death after officers went into a house to arrest a man accused of plotting to poison water supplies, according to police and court records.




How are public health and water authorities preparing?



Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents

Interim Final - August 2004
Response Guidelines




How are public health and water authorities preparing?

Sandia to build water-safety device

Sensor would be able to sniff out chemical, biological toxins

By Ian Hoffman, STAFF WRITER
Article Last Updated: Tuesday, December 7, 2004



LIVERMORE -- Scientists are rushing to devise a chemical and biological sensor for drinking-water systems, portrayed by experts Monday as highly vulnerable to covert attack.

In a research contract signed Monday, Sandia National Laboratories-California agreed to deliver within six months a prototype of an unattended water sensor to Englewood, Colo.-based engineering firm CH2M Hill and Tenix, the largest defense and engineering firm in Australia.

To succeed, Sandia scientists must turn a handheld chemical sensor developed for the military and emergency first responders into a machine that cheaply and reliably can sniff out **dangerous toxins and germs twice and hour in water mains, tanks and pump houses.**

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How are public health and water authorities preparing?

WaterISAC Information Sharing & Analysis Center

Wednesday, December 29, 2004




Online Water Security

Be informed. Be prepared.

The Water Information Sharing and Analysis Center (WaterISAC) is the most comprehensive and up-to-the-minute online resource of security information for America's drinking and wastewater utilities. It provides a unique link between the water sector and federal environmental, homeland security, law enforcement, intelligence and public health agencies.

How are local and state authorities preparing?

LOS ANGELES COUNTY OPERATIONAL AREA EXERCISE PROGRAM



WATER TERRORISM EXERCISE SCENARIO

At 0900 hours, plant workers at the City Water Treatment Plant found 3 pencil-like rods approximately 1" in diameter and 6" long lying near a ladder used to access to the facility's 1-million gallon water tank.


The Los Angeles Sheriff's Department and the Los Angeles County Fire Department responded to the call to investigate at 0945. Upon their arrival at the scene, Radiation Pagers worn by the firemen began to sound. The area was cordoned off and the facility has been locked down pending further investigation.

How are local and state authorities preparing?

Division of Environmental Health
Office of Drinking Water

Washington State Conducts Drinking Water Counter-Terrorism Exercises

The Washington State Department of Health teamed up with engineering firm CH2MHill to conduct tabletop counter-terrorism exercises in several locations throughout our state during July 2004. The exercises were designed to demonstrate and test emergency response protocols during a simulated event in which drinking water is intentionally contaminated or contamination is threatened.



How are local and state authorities preparing?

State of Maine Department of Human Services
Division of Health Engineering Drinking Water Program

GUARDING AGAINST TERRORIST AND SECURITY THREATS


Suggested Measures for Drinking Water

The Office of Homeland Security established a five-tiered Homeland Security Advisory System to provide a national framework for notification about the nature and degree of terrorist threats. The system establishes a set of graduated a threat conditions or a threat levels that change in response to increases or decreases in or terrorist threats.

The threat levels are colored coded, beginning with green, and increasing in severity through blue, yellow, orange, and red. **While the threat may not be specific to water utilities, the water sector may consider themselves potential targets.**

Medical Preparedness for Acts of Water Terrorism

Early detection and rapid response to biological, chemical or radiological terrorist assaults on **drinking water supplies** are critical elements to any anti-terrorism response strategy that strives to protect the public's health.



Courtesy of the US EPA

Medical Preparedness for Acts of Water Terrorism

Although water quality detection methods for recognizing intentional contamination of a watershed or water treatment facility are improving ...

- The most likely initial indication that a water contamination event has occurred in a community will be a **change in disease trends and illness patterns.**
- This contamination could also present as a community-wide **waterborne disease outbreak** or a **cluster of water-related cases** of chemical or radiologic toxicity in the general population.

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Medical Preparedness for Acts of Water Terrorism

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Medical Preparedness for Acts of Water Terrorism

The medical and public health community are positioned to play **a critical role in minimizing the impact of an act of water terrorism** by practicing medicine with an increased index of suspicion that such an attack may occur in their community.



Medical Preparedness for Acts of Water Terrorism

Key Pre-incident Response Strategy:

Prepared medical and public health practitioners may make the difference between a **controlled response to a water terrorism event** versus a **public health crisis**.



(CP Photo Kevin Frayer)

Medical Preparedness for Acts of Water Terrorism

Medical preparedness for acts of water terrorism will be critical in order to reduce:

- the public health impact of a water terrorism event
- the secondary disruption to potable water availability and distribution
- the psychological impact of the public's lack of confidence in water safety and quality following an incident of intentional contamination of water

Water Terrorism Preparedness Challenges

Medical and public health practitioners must understand their critical role as "front-line responders" in detecting water-related disease resulting from intentional contamination.

- Local community healthcare providers are likely to provide the **first warning** to health authorities of waterborne acts of terrorism.
- Early recognition, timely outbreak investigations, accurate diagnosis, and conscientious reporting of suspected waterborne terrorism disease will be **essential to maintaining water security and safety**.

Water Terrorism Preparedness Challenges

Prompt identification of waterborne disease resulting from water terrorism may be confounded by difficulties in early diagnosis.

- Diagnosis of water-related disease is a **diagnostic challenge** for most healthcare providers.
- Many WMD-related diseases may present with **vague, non-specific symptoms** and may be difficult to differentiate from naturally occurring disease in a community.



Water Terrorism Preparedness Challenges

Contamination of water with WMD agents may produce a broad spectrum of disease involving virtually every organ system and enter the body through several portals including:

- Ingestion and aspiration of water
- Dermal absorption during bathing activities
- Inoculation of skin lesions from direct contact with contaminated water
- Consumption of food directly contaminated by water during food preparation
- Consumption of food indirectly contaminated by water via the food chain or agricultural practices

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Water Terrorism Preparedness Challenges

Many WMD agents display a significantly different clinical picture when the route of exposure is ingestion.

- Using food and water as a mode of dispersion for weaponized agents **may confound diagnosis**, delay treatment, and impede protective public health measures.
- Epidemiologic investigations and clinical assessments must not be restricted to evaluation of inhalation and cutaneous routes of exposure alone.



Water Terrorism Preparedness Challenges

Obtaining accurate exposure histories from symptomatic patients may be difficult since exposure to WMD agents may occur through multiple exposure pathways including water.

- The majority of WMD agents that may be used during intentional contamination of water supplies are **not unique to water**.
- Public drinking water may represent **only one source** of waterborne exposure with deliberate contamination of recreational waters, swimming pools or even bottled water acting as possible targets of terrorist activity.

Water Terrorism Preparedness Challenges

Water-related disease may present as benign symptoms or self-limited illness in healthy patients while the same exposure in vulnerable patients may result in serious morbidity and mortality.

- The impact of a terrorist attack depends upon the type of population exposed and their level of immunity or vulnerability.
- Susceptible populations will experience the **most severe health outcomes** from any water terrorist event.



Water Terrorism Preparedness Challenges

Future terrorist activity may not follow an expected pattern of attack with respect to water requiring vigilance by public health and medical professionals in both populated AND rural areas.

- A small outbreak of terrorism related waterborne disease may act as a warning of a **more large scale attack**.
- Water systems in small rural communities may represent **“testing grounds”** for larger scale attacks in metropolitan municipal water systems.

Water Terrorism Preparedness Challenges

A coordinated and effective response to acts of water terrorism will depend upon cooperation among a multidisciplinary team of professionals.

- Any response to water terrorism will require cooperation from a **multidisciplinary team** of healthcare providers, public health and water utility practitioners, law enforcement professionals, and community leaders.
- The medical and public health community will need to foster **new partnerships** with water utility practitioners in order to protect the public's health and ensure water safety.

Water Terrorism Preparedness Challenges

Medical and public health practitioners will be faced with providing credible and timely risk communication and public notification of a suspected water contamination event.

- Healthcare providers are among the **most trusted sources** of information for the general public regarding drinking water quality and safety.
- Community residents will immediately turn to their healthcare providers and public health leaders for advice regarding the safety of their drinking water **during and after** a water terrorism event.

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Recognizing Waterborne Disease and the Health Effects of Water Pollution

Physician On-Line Reference Guide (WaterHealthConnection.org)

Created to assist the medical and public health community recognize and manage waterborne disease and the health effects of water contamination from either **natural OR intentional** contamination of water.



Recognizing Waterborne Disease and the Health Effects of Water Pollution

Physician Preparedness for Acts of Water Terrorism: An On-Line Readiness Guide

- “24/7” availability
- Free access to more than 450 webpages of relevant clinical information
- Peer-review by leading terrorism experts from public health, medical academia, and military medicine
- CME offering for both physician and non-physician participation



Recognizing Waterborne Disease and the Health Effects of Water Pollution

Recognizing Waterborne Disease and the Health Effects of Water Pollution: A Physician On-Line Reference Guide (WaterHealthConnection.org)

Usability Data – 24 month reporting period

- Successful hits to website – 7,020,888
- Average page or document views per day – 21,634
- Median length of visit to website - 1 hour and 20 minutes
- Number of professional organizations posting WaterHealthConnection.org website – 428 organizations

Physician Preparedness for Acts of Water Terrorism

Section 1: Purpose of Physician Readiness Guide for Acts of Water Terrorism

- The threat to U.S. water supplies and public health
- Clinical and diagnostic challenges resulting from the threat of water terrorism
- Physicians and healthcare providers as “frontline responders” to acts of water terrorism



Physician Preparedness for Acts of Water Terrorism

Section 2: Understanding the Threat of Water Terrorism

- Understanding the threat of water terrorism in the US
- Water as a potential terrorist target for dispersal of biological, chemical, and radiologic (BCR) agents
- Collaboration with public health authorities and water utility practitioners



Physician Preparedness for Acts of Water Terrorism

Section 3: BCR Agent Dispersal and Multiple Exposure Pathways

- Dissemination of biological, chemical and radiologic agents using multiple exposure pathways
- Distinguishing features between biological, chemical and radiologic exposure events
- Host susceptibility factors and vulnerable population considerations for BCR agent exposure



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Section 4: Detection and Diagnosis of Waterborne Terrorism

- Environmental detection and monitoring of potential waterborne BCR agents
- Use of diagnostic indicators and epidemiologic patterns to detect BCR agent disease and waterborne exposure
- Completion of an effective exposure history to accurately diagnose intentional waterborne disease



Physician Preparedness for Acts of Water Terrorism

Section 5: Evaluation and Management of Disease Resulting from BCR Agents

- Overview of clinical challenge of waterborne disease resulting from BCR warfare agents
- On-line quick reference guides and rapid response cards for BCR agents
- Collaboration with public health authorities and notifiable disease and case reporting requirements in the event of terrorist activity



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Section 5.1: Clinical Approach and Medical Management of BIOLOGICAL AGENTS

- Clinical challenge of evaluation and management of waterborne biological warfare agents
- Clinical approach to diagnosing waterborne biological warfare agents
- Overview of biological warfare agents of public health concern



Physician Preparedness for Acts of Water Terrorism

Section 5.2: Clinical approach and medical management of BIOLOGICAL TOXINS

- Clinical challenge of evaluation and management of waterborne biological toxins
- Clinical approach to diagnosing waterborne biological toxins
- Overview of biological toxin agents of public health concern



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Section 5.3: Clinical approach and medical management of CHEMICAL AGENTS

- Clinical challenge of evaluation and management of waterborne chemical warfare agents
- Overview of chemical warfare agents of public health concern
- Industrial and agricultural compounds as potential chemical terrorism agents



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Section 5.4: Clinical approach and medical management of RADIOLOGIC AGENTS

- Clinical challenge of evaluation and management of waterborne radiologic agents resulting from radiological terrorism events
- Clinical approach to diagnosing waterborne radiologic agents resulting from terrorism
- Overview of public health threat of waterborne radiologic agents resulting from radiological terrorism



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Section 6: Clinician Role in Community and Readiness Risk Communication


- Physician role in local preparedness and community readiness for acts of water terrorism
- Practicing physicians as risk communicators following a waterborne terrorism event
- Physician readiness training opportunities and on-line educational training options



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Section 7: Clinician On-Line Resources Guide and Targeted Search Engine Tools

- Clinical on-line resources guide and targeted search engines
- 100 most useful terrorism preparedness websites for healthcare providers
- Targeted search of 100 most useful physician terrorism preparedness websites by category




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Section 8: Glossary of Disaster Preparedness Term

AGENT BZ

The chemical 2,4,6-trinitrophenyl ester, chemical abstracts service (CAS) registry No. 65851-89-2 BZ is a code designation for a potent psychoactive compound that has a pharmacological action similar to that of other anticholinergic drugs (atropine, scopolamine for example) except that the effects are more severe and longer lasting. It has an incapacitating agent classified as a Class B poison for transportation purposes. It is an odorless, white crystalline solid that in granular form may be compounded with a fuel oxidizer mix for thermal dissemination.


Source: Medical NBC Online Information Server, Glossary



Physician Preparedness for Acts of Water Terrorism

Physician Preparedness for Acts of Water Terrorism: An On line Readiness Guide

A "ready made" disaster tool for the public health, medical, and disaster preparedness community who may be faced with managing water-related disease resulting from biological, chemical or radiologic terrorism in their communities.



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