



PREVENTIVE MEDICINE UPDATE



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SARS: SHOULD WE BE CONCERNED?

by Sheryl A. Bedno

Severe acute respiratory syndrome (SARS) has continued to cause worldwide concern, although its return is uncertain. Some may feel that it is not worth the time and money to prepare for a disease that did not cause many deaths and mainly affected some Asian countries and Canada. However, SARS tapped the resources of many hospitals and healthcare settings and had serious economic implications for many countries. The importance of planning for SARS cannot be underestimated. The valuable lessons in epidemiology and infection control of SARS can apply to many other infectious diseases, known or unknown, that may be encountered. Here, we will review the basics of SARS and see the importance of adequate preparedness.

What is SARS?

It is a severe, febrile respiratory illness caused by a previously unknown coronavirus, SARS-associated coronavirus (SARS-CoV), that is spread primarily by close person-to-person contact (by respiratory droplets, from coughing or sneezing). The signs and symptoms are fairly nonspecific. The illness

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THE THREAT OF HEPATITIS A

by Will Cann

"Another hepatitis patient died Friday, bringing to three the number of deaths from a hepatitis A outbreak linked to a Mexican restaurant in western Pennsylvania. Meanwhile, the restaurant chain said it was removing green onions from the menu in all of its outlets.¹" So went Associated Press Writer Joe Mandak's November 14th article describing the recent outbreak of hepatitis A which, despite the licensure of hepatitis A vaccine in 1995, continues to be one of the most frequently reported vaccine preventable diseases in the United States.

The hepatitis A virus (HAV) is a 27-nm RNA agent that can produce symptomatic or asymptomatic infection in humans after an average incubation period of 28 days. The illness, caused by HAV infection, typically has an abrupt onset of symptoms that can include fever, malaise, anorexia, nausea, abdominal pain, dark urine, and jaundice. Younger individuals with HAV infection are less likely than older ones to be symptomatic. While deaths are rare, they may occur in the very young, old and infirmed.

HAV replicates in the liver, is excreted in bile, and is ultimately shed in the stool. Infectivity reaches its peak during the 2-week period before onset of jaundice or elevation of liver enzymes when the concentration of virus in stool is highest. The concentration of the virus in the stool declines after jaundice appears. Viremia occurs soon after infection and persists through the period of liver enzyme elevation. Children and infants can shed HAV up to several months after the onset of

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Contact Preventive Medicine:

Page 596-9367 or call 968-4479

Send consults by CHCS

Website: [http://www.mamc.amedd.](http://www.mamc.amedd.army.mil/preventive_med/main_pm.htm)

[army.mil/preventive_med/main_pm.htm](http://www.mamc.amedd.army.mil/preventive_med/main_pm.htm)

generally begins with a fever (greater than 100.4°), sometimes accompanied by chills, headache, body aches, and malaise. Some may experience mild respiratory symptoms at this point and even diarrhea. After about 2 to 7 days, SARS patients may develop a dry, nonproductive cough that may progress to hypoxia. In approximately 10-20%, mechanical ventilation is required. Most develop pneumonia.

How many people became ill from SARS?

Almost 8,500 people, over 800 of whom died, in 29 countries around the world.

What is the difference between a "probable case" and a "suspect case" of SARS?

The CDC (Centers for Disease Control) has defined a suspect case as having fever, respiratory illness, and recent travel to an affected area with community transmission of SARS and/or contact with a SARS patient. A probable case meets the criteria for a suspect case and also has evidence of pneumonia or respiratory distress syndrome.

What were the successful measures that brought the epidemic to an end?

The World Health Organization, on 12 March 2003, issued a historic global alert for SARS and then coordinated a rapid, international response, which led to the identification of the etiologic agent, SARS-CoV, in less than 2 weeks. Implementation of control measures by WHO and CDC contained the outbreak within 4 months. The measures included surveillance, detection and isolation of cases, identification and monitoring of cases, adherence to infection control precautions, and sometimes quarantine. **It is important to emphasize that these are the traditional public health measures used to prevent the spread of any infectious disease, and indeed, they worked for SARS.**

What about medications or even a vaccine?

Several medications were used during the epidemic, such as ribavirin (an antiviral drug) and steroids, but studies thus far have not found any benefit. Development of a SARS vaccine is already underway; however, clinical trials have not yet commenced. As such, a vaccine would not be ready should SARS return this winter.

If I suspect SARS in a patient, what do I do?

According to the CDC, initial diagnostic testing for suspected SARS patients should include chest radiograph, pulse oximetry, blood cultures, sputum

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Gram's stain and culture, and testing for viral respiratory pathogens, notably influenza A and B and respiratory syncytial virus. Suspected patients should be isolated in a negative pressure room. Health care providers should don a N-95 HEPA-Filter mask before entering the isolation room. **You should also call or page Preventive Medicine and Infectious Disease.**

Finally, what can we do to prepare ourselves?

1. Education about SARS to permit rapid identification of infected persons.
2. Familiarization with proper infection control to prevent spread of SARS and any other infectious disease.

References:

Centers for Disease Control: <http://www.cdc.gov/ncidod/sars/>
World Health Organization: <http://www.who.int/csr/sars/en/>

MANAGEMENT OF PATIENTS WITH DEPLETED URANIUM EXPOSURE

by Alden L. Weg

As soldiers return to our facility from recent deployments, many will have questions regarding potential health effects from exposures on the battlefield. One issue that will likely arise is how to manage soldiers who have been exposed to Depleted Uranium (DU). Most soldiers exposed to DU will be identified during the Post-Deployment Survey conducted at the demobilization sites. There may be individuals not identified at these sites who present to your clinic for health issues that they feel may be related to DU exposure. This article will outline guidelines for chronic management of patients with DU exposure.

Depleted Uranium is a dense, radioactive heavy metal used in ammunition and armor and armor piercing projectiles.¹ Depleted uranium is what remains after the more radioactive isotopes are removed from uranium ore. Naturally occurring uranium ore is a slightly radioactive substance. The resulting depleted uranium is only 60% as radioactive as natural uranium due to the removal of the more radioactive isotopes. The major health effects of depleted uranium are primarily due to its heavy metal properties rather than its radioactive properties.

Soldiers may be exposed to DU if their vehicle is impacted and penetrated by a DU projectile. Flames cause DU ammunition to oxidize resulting in the inhalation of DU fumes, particles and other combustion products. DU fragments may penetrate

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COLD WEATHER INJURY PREVENTION

by Kent Bennett

Fort Lewis is not one of the places that one initially thinks of when discussing cold weather injuries (CWI's); however, there were 8 CWI's reported among active duty soldiers at Ft Lewis from 01 October 2002 through 15 September 2003. Therefore, the potential for further cold injuries this year exists and must be minimized.

Generally, CWI's can be categorized as either central or peripheral injuries. Hypothermia, a type of central injury, results from prolonged cold exposure and body heat loss. This type of injury can occur at temperatures above freezing, especially when a person is wet. This is because heat loss occurs 5-25 times faster when a person is wet. Drowsiness, mental slowness, and lack of coordination are among the symptoms. Shivering is not always present. Peripheral injuries include chilblains, frostbite, and immersion foot and result from decreased blood flow in the extremities. Chilblains occurs as a result of recurrent, prolonged exposure of bare skin to 20-60° F temperatures with high humidity. Skin appears red (or darkened) and swollen. Also, the skin is usually tender and may be pruritic. Frostbite is the freezing of tissue and commonly results from exposure of skin to metal or extremely cool fuels and lubricants. Wind chill and tight clothing are known to worsen this problem. Numbness and tingling of affected areas are common. The area might also be blistered, swollen, and appear pale or waxy. Immersion (or trench) foot occurs as a result of prolonged exposure of feet to wet conditions at 32-60° F. Inactivity, damp socks and tightly laced boots speed the onset and increases the severity of this injury. Symptoms begin with cold, numb feet that may progress to shooting pain. The feet appear swollen, red, and may bleed.

Dehydration is another injury type often seen in cold weather training. Other injuries related to cold weather include snow blindness (burning of the cornea by UV radiation) and carbon monoxide poisoning. Carbon monoxide poisoning injuries can result from burning fuels without proper ventilation and are commonly seen as a consequence of using stoves in tents or sleeping in running vehicles.

Certain conditions place one at an increased risk of having a CWI. Temperatures below 40° F, precipitation (rain, snow, ice, and humidity) or wet clothes, wind of 5 mph or higher, inadequate shelter or clothing, and lack of water and provisions are all risk factors of cold weather injuries. Other risk factors can include: previous cold/significant injury,

clinical illness. Chronic shedding of HAV in feces does NOT occur; however, shedding can occur in persons who have relapsing illness. For most people infected with HAV, IgM anti-HAV becomes detectable 5-10 days before the onset of symptoms and can persist for up to 6 months after infection. IgG anti-HAV appears early in the course of infection and remains detectable for the person's lifetime. The presence of IgG anti-HAV confers lifelong protection against the disease. No chronic infection is known to occur.

HAV infection is acquired primarily through the fecal-oral route by either person-to-person contact or ingestion of contaminated food or water. HAV infection has rarely been transmitted by transfusion of blood or blood products collected from donors during the viremic phase of their infection. HAV can be stable in the environment for months. Heating foods at temperatures >185°F for 1 minute or disinfecting surfaces with household bleach is necessary to inactivate HAV. Children play a major role in the transmission of HAV because most children have asymptomatic or unrecognized infections.

In the United States, cyclic increases in the incidence of hepatitis A have occurred approximately every decade. The incidence of hepatitis A in Washington has been decreasing since the late 1990s; DOH receives approximately 300 to 500 reports of acute hepatitis A virus (HAV) infections per year. The incidence has fallen from 18/100,000 in 1996 to 5/100,000 in 2000. Reported mortality due to hepatitis A ranges from 0.1%-0.3%; however, mortality is elevated to 1.8% for adults over 50. Persons with chronic liver disease have an elevated risk of death from fulminant hepatitis A. There is typically one fatality/year associated with fulminant hepatitis A in Washington State.

Common source outbreaks have been related to contaminated water; food contaminated by infected food handlers, including foods that are not cooked or are handled after cooking, raw or undercooked mollusks harvested from contaminated waters; and contaminated produce such as lettuce and strawberries.

The hepatitis A vaccine can provide long-term protection against the disease. Immune globulin can also be useful in preventing hepatitis A. When given within 14 days of exposure, it can provide short-term protection for persons with hepatitis A exposure who have not been vaccinated. Clinicians should be aware of who should be vaccinated against Hepatitis A. The following individuals should be vaccinated:

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nicotine/alcohol/caffeine use, inadequate nutrition, low activity, fatigue, and unfamiliarity with cold weather.

There are some general steps that you can take to lower your risk of becoming a cold injury. First, minimize exposed skin, as it is more likely to develop frostbite. Frequently inspect extremities, face and ears for signs of frostbite. Change into dry clothing whenever clothing becomes wet. Wash and dry your feet and put on dry socks at least twice each day. Eat about 4500 calories each day that you are training in a cold weather environment. Drink between 3-6 liters of fluid per day. Warm, sweet drinks are useful to re-warm. Wearing camouflage paint is not recommended below 10° F. Consider not wearing camouflage when the temperature is between 32° F and 10° F as it can obscure cold weather injuries. Remember the C-O-L-D acronym to help prevent cold weather injuries and when wearing cold weather clothing. Keep cold weather clothing **C**lean. Avoid **O**verheating. Wear many **L**oose layers. Keep clothes **D**ry.

Leaders should take additional steps to prevent cold injuries. First, ensure that the unit is properly trained and equipped for the expected weather in the training area. Encourage hydration and utilize work/rest cycles. Also increase the rotation frequency of troops in sedentary jobs. Utilize the buddy system to check for CWI's. Finally, use a Wind Chill Temperature Table (see below) to determine the risk of frostbite at a given wind speed for the ambient temperature. Note that any air movement (running, riding in open vehicles) has the same effect as wind. Next determine the work intensity level based on the current training. Then use the Wind Chill Category Table (see last table) to determine the appropriate CWI prevention guidelines to follow.

Any patient emergently in the medical system with a history consistent with a CWI should have the injury evaluated by Vascular Surgery to rule out cold injury. All soldiers found to have a first degree cold injury (hyperemia and edema) should be given a permanent P-2 profile code U. This allows the service member to wear extra cold weather protection including non-regulation clothing under their authorized outer garments to supplement Army cold weather gear. All soldiers with a second degree (hyperemia and vesicle formation) or greater cold injury should be given a temporary P-3 profile for three months restricting any physical activity limited by the injury. This profile should be renewed as necessary for the duration of that cold season. Further, the soldier should be restricted from activities requiring exposure to cold below 32°F. The patient should be re-evaluated after the cold season for the continued need of a P-3 profile. If the P-3 profile is discontinued, the P-2 profile should be issued. All documented cold injuries should be

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referred to Preventive Medicine for counseling on cold weather injury prevention and case reporting. (See MAMC regulation 40-94, TB Med 81, and AR40-400)

See tables on page 6

See CHPPM website for further cold weather guidance. <http://chppm-www.apgea.army.mil/coldinjury>

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into muscle and other soft tissues, and DU contaminated dust may get into the mouth resulting in ingestion. Some soldiers may be exposed to DU if they perform salvage operations on tanks disabled by DU rounds. Exposure by breathing fumes of burning DU metal occurs only if the vehicle is hit or if the soldier is near a target hit by DU munitions. Simply riding in a vehicle with intact DU munitions or DU shielding will not result in intake of DU.

The major chronic effects of DU exposure involve the kidney. Like other heavy metals, the chemical form, amount, and solubility of the DU particles will determine the potential toxicity to an individual. Potential problems with high levels of DU exposure include renal tubular changes and glomerular lesions. Based on information from soldiers exposed during the 1991 Gulf War, even soldiers with embedded DU fragments have maintained normal kidney function.

A system is currently established to monitor individuals who have DU exposure. A Depleted Uranium Bioassay 24-hour urine is performed following specific guidelines. The results of this bioassay determine who requires long-term surveillance.

Occupational Medicine should be consulted regarding soldiers with established DU exposure to ensure the bioassay is performed properly and the appropriate long-term surveillance is arranged. Remember, only certain deployed soldiers will require a urine bioassay - not every deployed soldier requires Occupational Medicine consultation.

The DU guideline has established 3 categories of personnel regarding DU exposure (Table 1). Urine bioassays are required for Categories I and II. Urine bioassays should be performed no later than 180 days post incident.

Additional information regarding DU exposure can be obtained from U.S. Army Center for Health Promotion and Preventive Medicine – Occupational and Environmental Medicine (DOEM), 5158 Blackhawk Road, Aberdeen Proving Ground, MD 21010-5403.

<http://chppmwww.apgea.army.mil/doem/>

Reference:

U.S. Army Center for Health Promotion and Preventive Medicine Post Deployment Exposure Fact Sheet 65-050-0503. May 2003

WHO REQUIRES A DEPLETED URANIUM URINE BIOASSAY

Category I: Personnel who were in, on, or near (less than 50 m) an armored vehicle at the time the vehicle was struck. These personnel may exceed peacetime occupational exposure standards. Based upon field environmental measurements, research results and dose assessments during combat or deployment operations, depleted uranium may be internalized in sufficient amounts to exceed current peacetime depleted uranium occupational standards in three exposure scenarios:

(1) Personnel who are in, on, or near (within 50 meters) an armored vehicle at the time the vehicle is struck by depleted uranium munitions. These personnel can internalize depleted uranium through inhalation, wound contamination, ingestion and embedded depleted uranium fragments.

(2) Personnel who are in, on, or near (within 50 m) a vehicle with depleted uranium armor at the time the armor was breached by DU or non-DU munitions. These personnel can internalize depleted uranium through inhalation, wound contamination, ingestion and embedded depleted uranium fragments.

(3) First responders who entered struck vehicles to perform evacuation, first-aid/buddy-aid for the personnel in the struck vehicle. These personnel may internalize depleted uranium through inhalation and ingestion.

Category II: Personnel who may exceed peacetime exposure "action" levels that require biomonitoring.

During combat (or deployment) operations, depleted uranium may be internalized in amounts that are below occupational exposure standards, but at levels that the Nuclear Regulatory Commission (NRC), the Occupational Safety and Health Administration (OSHA), or Army policy requires a **bioassay for peacetime operations in the following scenarios:**

(1) Personnel who are in, on, or near (within 50 m) a fire involving depleted uranium munitions. These personnel can be exposed through inhalation and ingestion.

(2) Personnel who routinely enter vehicles with DU dust to perform maintenance, recovery operations, battle damage assessment and intelligence gathering operations. These are personnel who, as a result of their military occupation, are required to routinely enter vehicles with DU dust and spend more than 800 hours inside a vehicle.

Category III: Personnel in the vicinity of an event involving DU munitions or armor and receive "incidental exposure" (e.g. downwind from a tank fire involving DU, but greater than 50 m distance).

Personnel in this category should only have the DU bioassay performed if, in the physician's opinion, the patient or patient's family would benefit from the process. The VA/DOD Post-Deployment Clinical Practice Guidelines will be used for this assessment.

- Persons 2 years of age and older traveling or working in countries with high or intermediate rates of hepatitis A (Central and South Americas, the Middle East, the Caribbean, Mexico, Asia excluding Japan, Africa, and southern or eastern Europe).
- Men who have sex with men.
- Persons who use street drugs.
- Persons with chronic liver disease.
- Persons who have occupational risk for infection such as food handlers.
- Persons who have clotting-factor disorders.
- Children who live in states, counties, or communities where the average annual hepatitis A rate during 1987 - 1999 was 20 or more cases per 100,000 people. In Washington State, children living in 13 high rate counties should be immunized routinely: Asotin, Chelan, Clark, Cowlitz, Douglas, Grays Harbor, King, Klickitat, Mason, Skamania, Spokane, Thurston and Yakima

Hepatitis A is a reportable disease in all states. The goals of hepatitis A surveillance are to identify contacts of case-patients who might require post exposure prophylaxis, detect outbreaks, determine the effectiveness of hepatitis vaccination, monitor disease incidence, determine epidemiologic characteristics of infected persons, and determine missed opportunities for vaccination. Cases of hepatitis A that are diagnosed at Madigan Army Medical Center should be reported to the Department of Preventive Medicine. Preventive Medicine will initiate contact tracing and ensure that case reports are communicated to the appropriate local and state public health agencies. Moreover, Preventive Medicine will make recommendations regarding whether or not case contacts should receive hepatitis A immunoglobulin or vaccination. Together, we can take appropriate steps to limit the possibility of another devastating outbreak.

References:

Prevention of Hepatitis A Through Active or Passive Immunization: Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR 1999; 48(RR-12).

Mandak, Joe. Pa. Hepatitis Outbreak Kills Third Victim. StatesmanJournal.com 14 November 2003.

Hepatitis A Fact Sheet. Washington Department of Health. www.doh.wa.gov/Topics/hepafact.htm.

Chin, James. Control of Communicable Diseases Manual, 17th edition. United Book Press, Inc. Baltimore, Maryland. 2000.

Wind Chill Temperature Table

Wind Speed (mph) ↓	Air Temperature (°F)																	
	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
0	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95

RISK OF FROSTBITE (see times on chart below)

- GREEN LITTLE DANGER (frostbite occurs in >2 hours in dry, exposed skin)
- YELLOW INCREASED DANGER (frostbite could occur in 45 minutes or less in dry, exposed skin)
- RED GREAT DANGER (frostbite could occur in 5 minutes or less in dry, exposed skin)

Time to occurrence of frostbite in minutes or hours (In the most susceptible 5% of personnel.)

Wind Speed (mph) ↓	Air Temperature (°F)											
	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
0	>2h	>2h	>2h	>2h	>2h	>2h	40	22	20	13	11	9
5	>2h	>2h	>2h	>2h	31	22	17	14	12	11	9	8
10	>2h	>2h	>2h	28	19	15	12	10	9	7	7	6
15	>2h	>2h	33	20	15	12	9	8	7	6	5	4
20	>2h	>2h	23	16	12	9	8	6	5	4	4	4
25	>2h	42	19	13	10	8	7	6	5	4	4	3
30	>2h	28	16	12	9	7	6	5	4	4	3	3
35	>2h	23	14	10	8	6	5	4	4	3	3	2
40	>2h	20	13	9	7	6	5	4	3	3	2	2
45	>2h	18	12	8	7	5	4	4	3	3	2	2
50	>2h	16	11	8	6	5	4	3	3	2	2	2

WET SKIN COULD SIGNIFICANTLY DECREASE THE TIME FOR FROSTBITE TO OCCUR.

*Source: USARIEM Technical Note "SUSTAINING HEALTH & PERFORMANCE IN COLD WEATHER OPERATIONS," October 2001

Wind Chill Category (see Wind Chill Temperature Table above)

Work Intensity	Little Danger	Increased Danger	Great Danger
High Digging foxhole, running, marching with rucksack, making or breaking bivouac	Increased surveillance by small unit leaders; Black gloves optional - mandatory below 0°F (-18°C);	ECWCS* or equivalent; Mittens with liners; No facial camouflage; Exposed skin covered and kept dry; Rest in warm, sheltered area; Vapor barrier boots below 0°F (-18°C) Provide warming facilities	Postpone non-essential training; Essential tasks only with <15 minute exposure; Work groups of no less than 2; Cover all exposed skin, Provide warming facilities
Low Walking, marching without rucksack, drill and ceremony	Increased surveillance; Cover exposed flesh when possible; Mittens with liner and no facial camouflage below 10°F (-12°C); Full head cover below 0°F (-18°C). Keep skin dry - especially around nose and mouth.	Restrict Non-essential training; 30-40 minute work cycles with frequent supervisory surveillance for essential tasks. See above.	Cancel Outdoor Training
Sedentary Sentry duty, eating, resting, sleeping, clerical work	See above; Full head cover and no facial camouflage below 10°F (-12°C); Cold-weather boots (VB) below 0°F (-18°C); Shorten duty cycles; Provide warming facilities	Postpone non-essential training; 15-20 minute work cycles for essential tasks; Work groups of no less than 2 personnel; No exposed skin	Cancel Outdoor Training

*ECWCS - Extended Cold Weather Clothing System

These guidelines are generalized for worldwide use. Commanders of units with extensive extreme cold-weather training and specialized equipment may opt to use less conservative guidelines.