Medical Care of Ill Disaster Evacuees: Additional Diagnoses to Consider

Common medical problems will continue to be the most prevalent conditions among evacuees. However, evacuees have been exposed to potentially contaminated flood waters and crowded living conditions, and have had many opportunities for traumatic injury therefore; clinicians also should consider some less common diagnoses when evaluating patients. This document outlines, by presenting symptoms and alphabetically, some conditions to consider when providing healthcare to evacuees.

Diagnostic Testing

Assistance with most diagnostic testing can be obtained through your state health department, or assistance through the CDC Directors Emergency Operations Center at **770-488-7100**.

General Natural Disaster Information

Additional public health information about responding to natural disasters is available at http://www.bt.cdc.gov/disasters/index.asp .

Presenting Symptoms

Altered mental status/central nervous system syndromes: Alteration of mental status may occur as a result of multiple infectious and non-infectious causes. Other features of infection (e.g., fever, elevated white blood cell count) should prompt suspicion of infectious encephalitis; in the absence of signs of infection, toxic or metabolic encephalopathies and traumatic injury should be considered. It is important to quickly exclude common etiologies of acute alteration of mental status (alcohol/drug intoxication, hypoglycemia, electrolyte imbalance, subdural hematoma). Persons with severe altered mental status should be monitored closely for ability to protect the airway. Some infectious and non-infectious etiologies of encephalopathy described in this document are listed below.

Arboviral disease or mosquito-borne disease (West Nile virus disease, St. Louis encephalitis virus disease)
Aseptic/viral meningitis (enterovirus)
Carbon monoxide poisoning
Cholinesterase-inhibiting pesticide (e.g., organophosphates, carbamates) Poisoning
Heat stress
Insect repellent and insecticide poisoning
Leptospirosis
Meningococcal disease
Primary amebic meningoencephalitis ([PAM], *Naegleria fowleri*)
Rabies
Scedosporium apiospermum (*Pseudallesheria boydii*)
Tetanus

Conjunctivitis: Excessive lacrimation, irritation, and hyperemia of the palpebral and bulbar conjunctivae of one or both of the eyes can be caused by chemical or physical irritation as well as by a wide variety of bacterial and viral agents, including *Haemophilus influenzae*, *Streptococcus pneumoniae*, *Moraxella*, adenovirus, and enterovirus. Conjunctivitis may also be a manifestation of a larger systemic infection, such as leptospirosis. Usually, tests for viral conjunctivitis may be considered; however, patients' needs

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should be evaluated on a case-by-case basis. Because some of the causes of conjunctivitis may lead to outbreaks given the crowded living conditions, or specific diagnostic tests need to be considered, the following etiologies should be considered when evaluating evacuees.

Adenoviruses
Enteroviruses
Leptospirosis

Fever with poorly localized signs: Fever is one of the most common presenting complaints of patients and may indicate mild or life-threatening conditions. There are many clinical conditions, both infectious and non-infectious, that may present with fever. Most febrile conditions will present with other localizing diagnostic clues, such as rash or diarrhea. The entries listed below (not meant to be all-inclusive) may present with fever alone, or as a first symptom well before others develop.

Adenoviruses
Arboviral disease or mosquito-borne disease (West Nile virus disease, St. Louis encephalitis virus disease)
Enteroviruses (including coxsackie and echoviruses)
Leptospirosis
Mumps

Diarrheal illness: Diarrheal disease is caused by a wide variety of viral, bacterial, parasitic, and non-infectious agents. The primary goal in the treatment of any form of diarrhea is prevention of or appropriate correction of dehydration. No routine tests or medications are recommended for uncomplicated diarrheal illness; however, patients' needs should be evaluated on a case-by-case basis. Patients should be encouraged to wash their hands thoroughly with soap after toileting or changing diapers and before eating or handling food for another person. Alcohol-based hand gels may be used when soap and water are not available, and when hands are not grossly soiled. Additional information is available at: http://www.bt.cdc.gov/disasters/hurricanes/dguidelines.asp.

Possible causes of diarrheal disease among evacuees include the following:

Cryptosporidiosis
Giardiasis
Leptospirosis
Norovirus-associated Gastroenteritis
Shigellosis

Rashes: A wide range of pathogens, toxins, allergens, and autoimmune conditions could cause rash illness in disaster evacuees. Some of the infectious causes of rash illnesses could lead to outbreaks given the crowded living conditions evacuees have encountered and include: adenoviruses, enteroviruses, chicken pox, measles, rubella, and human parvovirus B19. Some of these and other etiologies that should be considered when evaluating an ill evacuee include the following.

Arboviral disease or mosquito- borne disease (West Nile virus disease, St. Louis encephalitis virus disease)
Enteroviruses (e.g., hand-foot-and-mouth disease)
Group A streptococcus
Meningococcal disease
Measles
Rubella
Scabies
Ringworm (tinea pedis, tinea cruris, tinea corporis)

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Skin and soft tissue lesions and infections: A variety of bacterial and fungal pathogens can infect skin and soft tissues when their integrity has been compromised by trauma, heat, water, and other factors. Below are several conditions which may present with skin findings and may be more likely to be encountered in disaster evacuees.

Aeromonas hydrophila
Group A streptococcus
Lice
Methicillin-Resistant *Staphylococcus Aureus* (MRSA)
Mumps
Non-tuberculous mycobacteria
Pinworms
Scabies
Ringworm (tinea pedis, tinea cruris, tinea corporis)
Vibrio spp. wound infections

Respiratory illness:
A wide range of pathogens cause respiratory illnesses. Many are more likely to occur in evacuees because of the crowded living conditions they encountered. Some, such at tuberculosis, require a prompt public health and/or clinical response to treat and prevent additional cases. For others, treatment and control efforts are not well defined. Pathogens that may be encountered as individual cases or in outbreaks include *Mycobacterium tuberculosis*, *Streptococcus pneumoniae*, *Mycoplasma*, *Chlamydia*, adenovirus, coronaviruses, human parainfluenza viruses (HPIVs), human metapneumovirus (HMPV), influenza viruses, enteroviruses, rhinovirus, and respiratory syncytial virus. For most of these infectious agents, droplet and/or contact precautions are likely to decrease spread. Aerosol transmission is important in transmission of TB and may also occur for adenoviruses and influenza viruses. Other possible causes of respiratory illnesses include the following:

Adenoviruses
Cholinesterase-inhibiting pesticide (e.g., organophosphates, carbamates)
Common bacterial pneumonias (*Mycoplasma pneumoniae* and *Streptococcus pneumoniae* [pneumococcus])
Group A streptococcus pharyngitis
Influenza viruses
Legionellosis (*Legionella*)
Measles
Respiratory viruses (other)
Pertussis (whooping cough)
Scedosporium apiospermum (*Pseudallesheria boydii*)
Tuberculosis

Alphabetical Listing of Clinical Summaries

Adenoviruses

Symptoms
Keratoconjunctivitis: insidious onset of eye pain and erythema, frequently bilateral. Symptoms may last 1-4 weeks.
Pharyngoconjunctival fever: acute onset of pharyngitis, cough, fever headache, myalgia, malaise, and conjunctivitis. Symptoms may last 3-5 days.
Acute respiratory disease: cough, fever, sore throat, rhinnorhea. Symptoms can last for 3-5 days.
Infection control considerations: Droplet precautions; add contact precautions if conjunctivitis. Strict attention should be paid to hand hygiene and instrument re-processing procedures. Effective

disinfection can be accomplished by immersion of contaminated equipment in a 1% solution of sodium hypochlorite for 10 minutes or by steam autoclaving.
Diagnostic considerations: Adenovirus is most commonly detected by direct immunofluorescent staining, or by cell culture of sputum, nasopharyngeal swabs, throat swabs or conjunctival swabs. Virus can also be detected by PCR. Evaluating possible outbreaks to determine etiology is suggested, although routine evaluation of sporadic cases is often not performed.
Treatment considerations: For acute illness no specific therapy is available
Special considerations: Adenovirus infections are endemic, particularly among children, but also have caused epidemics of pharyngoconjunctival fever, keratoconjunctivitis, gastroenteritis, and acute respiratory disease among military trainees, long -term care residents, and persons living in crowded living conditions.
Links:
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm;
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5116a1.htm.

Aeromonas hydrophila

Symptoms: Typically presents as cellulitis. Can also present as pain, erythema or swelling around a leech bite. Consider if history of brackish water or leech exposure.
Infection control considerations: Standard precautions. Wash hands with soap or alcohol-based gel after contact with wound.
Diagnostic considerations: Wound culture
Treatment considerations: Treat with antibiotics that cover gram-negative bacteria e.g. quinolone or trimethoprim/sulfamethoxazole (TMP/SMX).

Arboviral Disease or Mosquito-borne Disease (West Nile virus [WNV] disease, St. Louis encephalitis [SLE] virus disease)Symptoms: Mild fever in most; few with neuroinvasive disease have meningitis (fever, headache, nuchal rigidity), encephalitis (altered mental status, focal neurologic signs), flaccid paralysis (asymmetric weakness). Occasionally transient maculopapular rash will develop. Severe tremors may be suggestive.

Infection control considerations: Standard precautions. Prevention of mosquito bites through personal protection and community-based vector control programs.
Diagnostic considerations: CSF will generally demonstrate pleocytosis, elevated protein, and normal glucose. Diagnosis is made by demonstration of WNV- or SLE-specific IgM antibodies in CSF or a 4-fold rise in antibody titers in acute and convalescent-phase serum. Testing available through state health departments.
Treatment: Supportive only.
Link: http://www.cdc.gov/ncidod/dvbid/westnile/

Carbon Monoxide Poisoning

Symptoms: Nausea, headache, shortness of breath, confusion, chest pain, dizziness, coma (severe), cherry red skin (severe), metabolic acidosis (severe), arrythmias, tachycardia and palpitations, cardiovascular collapse (severe). Consider if more than one person presents from same location with the same complaints.
Risk Factors: Use of a power generator, a gas grill, space heater, gas-powered pressure washer, or other source of open flame in an enclosed area.
Control considerations: Never use generators, grills, camp stoves, or other gasoline, propane, natural gas, or charcoal-burning devices inside your home, basement, garage, or camper—or even outside near an open window.
Diagnostic considerations: Clinical suspicion is critical to protect against the possibility of sending a patient back to a life-threatening environment. Mild cases mimic viral syndromes. Diagnosis may be confirmed by measuring the carboxyhemoglobin level in blood. However, the CO level may return to normal in mild cases of poisoning by the time the patient is evaluated. Most

importantly, suspicion of CO exposure in a patient with a normal CO level (eg. symptoms improve when the patient is outdoors or otherwise away from the exposure) should prompt an evaluation of possible risks (eg. generator) in the patient's environment.
Treatment: Remove the victim from the exposure. Treat with high flow normobaric oxygen (NBO). Contact the local Poison Control center (1-800-222-1222). Clinical evaluation may indicate the need for hyperbaric oxygen therapy (HBO).
Link: http://www.cdc.gov/co/

Cholinesterase-inhibiting Pesticide (e.g., organophosphates, carbamates) poisoning
Symptoms: Diaphoresis, salivation, emesis, diarrhea, lacrimation, urinary incontinence, headaches, dizziness, restlessness, tremors, muscle fasciculations, bronchospasm/bronchorrhea, miosis, seizure (severe).
Risk factors: Environmental and structural pest control workers (e.g., mosquito control, exterminators) applying pesticides; workers in areas where pesticide has been applied.
Control considerations: Advise users to follow manufacturer's recommendations regarding application and dilution. Advise on use of proper personal protective clothing and equipment.
Diagnostic considerations: Initial diagnosis and the decision to treat is made on clinical grounds such as an exposure history and signs and symptoms. Confirmation of the diagnosis is made by measuring cholinesterase levels, the most reliable of which is RBC cholinesterase (without a baseline, RBC cholinesterase is useful only if severely depressed). RBC cholinesterase levels may not be useful for diagnosing the easily reversible effects of some cholinesterase-inhibiting pesticides, such as carbamates). Differential diagnoses include nonpesticide anticholinesterase agents such asneostigmine, nicotinic alkaloids, green tobacco syndrome, and overexposure to medications for Alzheimer disease.
Treatment: Remove victim from exposure and remove contaminated clothing. Airway maintenance, atropine, pralidoxime**.**
Link: http://www.cdc.gov/niosh/topics/pesticides/

Common Bacterial Pneumonias (*Mycoplasma pneumoniae* and *Streptococcus pneumoniae* [pneumococcus])
Symptoms: Adults: fever, cough, chest pain, shortness of breath. Infants and young children: fever, malaise, cough, headache, tachypnea or chest indrawing.
Infection control considerations: Standard Precautions. Transmission via respiratory droplets and, for some agents, by fomites contaminated by respiratory droplets. Good hand and respiratory hygiene are recommended.
Diagnostic considerations: Gram stain and/or culture of sputum; blood culture should also be obtained on febrile patients. For severe cases treatment should not be delayed and empiric antimicrobial therapy begun. Diagnosis of *M. pneumoniae* depends upon isolation of *M. pneumoniae* or fourfold rise in antibody titers between acute- and convalescent-phase serum specimens collected 4 weeks apart. Single elevated CF antibody titers are of limited use for clinical diagnosis. Urinary antigen testing for pneumococcus is useful for adults.
Treatment considerations:
Infectious Diseases Society of America pneumonia treatment guidelines: Clin Infect Dis 2003;37:1405-1432.
(http://www.journals.uchicago.edu/CID/journal/issues/v37n11/32441/32441.html)
Special considerations: Report clusters of unexplained pneumonia or outbreaks of respiratory disease to state or local health departments. Pneumonia and meningitis caused by *Mycoplasma* and pneumococcus have been implicated in outbreaks in communities, schools, nursing homes, and other settings with crowded living conditions.
Link:

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Guidelines for preventing healthcare associated pneumonias:
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm

Cryptosporidiosis

Symptoms: Nonbloody, watery diarrhea. Can have dehydration, weight loss, abdominal pain, fever, nausea, and vomiting. May be asymptomatic infection. Symptoms may come and go in cycles and usually last 1-2 weeks in immunocompetent persons. Symptoms can be chronic or more severe in immunocompromised patients, especially those with CD4 counts <200/mL.
Infection control considerations: Standard Precautions, with additional Contact Precautions for diapered or incontinent children/adults for duration of illness and for 2 weeks after resolution of symptoms. Transmitted via fecal - oral route. Spreads easily among toddlers. Median 7 day incubation period (range 2 to 14 days). Shedding usually up to 2 weeks after symptom resolution but can be up to 2 months. Unflagging attention to handwashing is required. Organism is chlorine resistant so avoid swimming for 2 weeks after symptoms resolve. Cohorting ill individuals, when feasible, may reduce transmission.
Diagnostic considerations: Specific request for crypto testing. Acid-fast staining methods most frequently used but for greatest sensitivity and specificity, immunoflourescence microbiology is method of choice, followed by enzyme immunoassays.
Treatment considerations: Generally supportive. Nitazoxanide has been approved for treatment in immunocompetent patients 1 year of age and older. The effectiveness of nitazoxanide in immunosuppressed persons is unclear. For persons with AIDS, anti-retroviral therapy, which improves immune status, will also reduce Cryptosporidium oocyst excretion and decrease diarrhea associated with cryptosporidiosis.
Link: http://www.dpd.cdc.gov/dpdx/HTML/Cryptosporidiosis.htm

Enteroviruses (Aseptic/Viral Meningitis, Conjunctivitis, Hand-Foot-and-Mouth Disease, Febrile Illness)

Symptoms: *Meningitis*: Abrupt onset of fever, headache, meningeal signs (nuchal rigidity, phono-photophobia). Illness may be associated with vesicular or petechial rash, gastrointestinal symptoms. Generally self-limited, but encephalitis may occasionally occur. *Acute hemorrhagic conjunctivitis*: acute onset of pain, edema, erythema and often subconjunctival hemorrhage in both eyes. Symptoms may last 4-6 days. *Hand-foot-and-mouth disease*: sore throat or mouth, fever, vesicles on buccal mucosa and tongue, and on hands and feet.
Infection control considerations: Standard Precautions for adults; Contact Precautions for children for the duration of illness. Strict attention should be paid to hand hygiene, especially after diaper changing. Fecal shedding can persist for several weeks after onset of illness and extends beyond the symptomatic period. Respiratory shedding is usually limited to 1 week.
Diagnostic considerations: Evaluating possible outbreaks of conjunctivitis and hand-foot-and-mouth disease to determine etiology is suggested, although routine evaluation of sporadic cases is often not performed. A causative agent in aseptic meningitis is not identified in over half of cases, and a wide variety of viral agents may lead to illness. CSF will generally display a modest pleocytosis, elevated protein, and normal glucose. Laboratory diagnosis of enteroviruses is performed by virus isolation in cell culture. Virus can also be detected with PCR of CSF specimens from cases of aseptic meningitis. The critical diagnostic consideration is excluding treatable etiologies of aseptic meningitis, including herpes simplex encephalitis, tuberculosis meningitis, and leptospirosis.
Treatment considerations: Management is supportive, with no specific therapy for acute infection. Immune globulin intravenously has been used for life threatening neonatal infections.
Link: http://www.cdc.gov/ncidod/dvrd/revb/enterovirus/viral_meningitis.htm

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Special considerations: Enteroviruses can cause a range of clinical illnesses, including aseptic meningitis, encephalitis and exanthems, and have caused epidemics of acute hemorrhagic conjunctivitis and hand-foot and mouth disease.

Giardiasis

Symptoms: Spectrum varies from asymptomatic carriage to severe diarrhea and malabsorption. Acute symptoms may include nonbloody watery diarrhea, abdominal pain, bloating, nausea, and vomiting and, in immunocompetent persons, may last 2-6 weeks, occasionally longer. Chronic giardiasis may result in protracted, intermittent, often debilitating disease with passage of foul-smelling stools, flatulence, abdominal distention, and anorexia, which can lead to weight loss, failure to thrive, and anemia.
Infection control considerations: Communicable for as long as infected person excretes cysts, which is variable and may be months without drug therapy. Standard Precautions, with additional Contact Precautions for diapered or incontinent children/adults for duration of illness and for 3-4 days after initiation of drug therapy. Transmitted via fecal - oral route. Spreads easily among toddlers. Median 7 day incubation period (range 1 to 2 weeks). Unflagging attention to handwashing is required. Cohorting ill individuals, when feasible, may reduce transmission.
Diagnostic considerations: Stool for ova and parasites (O&P). Repeated samplings may be necessary. Alternate methods include fecal antigen detection tests by enzyme immunoassays, and detection of parasites in stool by immunofluorescence. In addition, samples of duodenal fluid or duodenal biopsy may demonstrate trophozoites.
Treatment considerations: Generally supportive. Several drugs are available to treat giardiasis including metronidazole and tinidazole. Drug resistance is known but is rare. Nitazoxanide has provided some encouraging results in the management of giardiasis in children, aged 1-11 years.
Link: http://www.dpd.cdc.gov/dpdx/HTML/Giardiasis.htm

Group A streptococcal (*Streptococcus pyrogenes*) pharyngitis

Symptoms: Sudden onset of fever, exudative tonsillitis or sore throat, with tender, enlarged cervical lymph nodes. Some patients may also have the skin rash of concurrent scarlet fever.
Infection control considerations: Droplet precautions for hospitalized infants and young children. Standard precautions for others. For outbreaks in special close contact groups (e.g. shelters, the military, day care centers, schools, nursing homes), it may be necessary to administer penicillin to the entire group to terminate spread.
Diagnostic considerations: The current recommendation is to first do a rapid antigen detection tests (RADT) (high specificity but an 85% sensitivity). If positive assume the patient has a group A streptococcal infection. For children and adolescents, a negative RADT should be confirmed with a throat culture.
Treatment considerations: A penicillin such as penicillin V or amoxicillin. Erythromycin is recommended for penicillin-allergic patients, but alternatives include 1st generation cephalosporins. Treating an infected person with an antibiotic for 24 hours generally eliminates their ability to spread the bacteria. However, it is important to complete the entire course of antibiotics as prescribed in order to eradicate the organism and to avoid development of rheumatic heart disease.
Link: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/groupastreptococcal_t.htm
Special considerations: Culture of asymptomatic individuals is not recommended unless there is an outbreak of rheumatic fever or acute glomerulonephritis in the community.

Heat Stroke

Symptoms: *Change in mental status.* This is the most severe form of heat stress and is a life-threatening emergency. The victim may be confused or unconscious. The core body temperature taken rectally is greater than 105F. This equates to an oral temperature above 103F. The skin is hot and dry and the mucus membranes are tacky.

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Risk factors: Heavy exertion, high ambient temperatures and humidity, lack of potable water, concomitant use of diuretic and anti-psychotic medications and beverages (e.g., caffeine, alcohol), recent febrile illness.
Diagnostic considerations: Rectal core temperature is the most accurate method.
Treatment considerations: Immediate immersion in an ice bath with ice packs on groin and armpits. Cooling mister fan. Cooled intravenous fluids and lavage by nasogastric tube. ICU admission to monitor body temperature, mental status and cardiac arrythmias. Evaluate for need to control the airway. Intravenous fluids are critical in reversing the severe dehydration and electrolyte derangements that usually accompany this condition.
Special considerations: Consider coexisting injuries or conditions which contributed to the patient being in a hot environment for an extended period (e.g., head injury, intoxication, diabetic emergency)
Link: http://www.cdc.gov/niosh/hotenvt.html and Emergency Medicine - A Comprehensive Study Guide Edited by Judith Tintinalli.

Influenza

Symptoms and signs: *Adults*: abrupt onset of fever, non productive cough, sore throat, rhinorrhea or nasal congestion, headache, shortness of breath, myalgias, and exacerbation of underlying chronic conditions (e.g., COPD, CHF, diabetes). Elderly persons may not always manifest fever. *Children*: fever, non productive cough, rhinorrhea or nasal congestion, respiratory distress, lethargy, irritability, and sometimes diarrhea; sepsis-like syndrome in infants.
Infection control considerations: Contact and droplet precautions. Good hand and respiratory hygiene may help prevent transmission. .
(http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm). Annual influenza vaccination of all health-care workers and persons at high risk for complications of influenza is recommended.
Diagnostic considerations: Respiratory specimens (nasal, nasopharyngeal, nasal wash) should be collected within 4 days of illness onset for all tests. Testing should begin at the onset of influenza season, which differs by region. Influenza A and B viruses can be detected with immunofluorescent antibody staining (DFA and IFA), rapid diagnostic tests, RT-PCR, and viral cell culture. Rapid influenza diagnostic tests (enzyme immunoassays) are commercially available, and have high specificity, but moderate sensitivity compared to viral culture.
Treatment considerations: Prescription antiviral medications for early treatment of uncomplicated influenza and for chemoprophylaxis are available; approved age groups, dosage, route of administration, adverse effects, and cost differ among the different agents.
Secondary invasive bacterial infections are common with influenza virus infections, including MRSA; IDSA pneumonia treatment guidelines are available at
(http://www.journals.uchicago.edu/CID/journal/issues/v37n11/32441/32441.html)
Links:
Guidelines for preventing healthcare associated pneumonias:
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm;

Insect Repellant and Insecticide Poisoning

Symptoms: Tremor, nausea and vomiting, paresthesia, hyperesthesia of the mouth and face, headaches, dizziness, weakness, confusion, seizures (severe).
Risk Factors: Personal use of insect repellants on non-intact skin, use under clothing, use of occlusive dressings after application. Inadvertent ingestion of pesticides. Working in area where insecticide is been sprayed.
Control considerations: Warn residents before aerial application of insecticides. Personal use should be as recommended by manufacturer. Do not use insecticides on broken or abraded skin, on open wounds, or under occlusive dressings.

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Diagnostic considerations: Since there are no readily available tests for insecticides poisoning, diagnosis is made from history of exposure and clinical features.
Treatment: Remove victim from exposure and remove contaminated clothing. Water decontamination of grossly contaminated skin may be necessary to avoid further absorption. Treatment of the signs and symptoms of toxicity is usually supportive (eg. seizure control).
Link: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5227a1.htm

Legionellosis

Symptoms: Most commonly affects adults with underlying medical conditions, smokers, or persons ≥65 years of age and presents with symptoms typical of pneumonia, including fever, cough, and chest pain.
Infection control issues: Standard precautions. The environmental source should be identified to prevent new cases.
Diagnostic considerations: Testing for Legionellosis should be done on all pneumonia patients requiring intensive care as well as those with exposures listed below in Special Considerations. The urine antigen test can detect infection with *Legionella pneumophila* serogroup 1, which causes approximately 80% of cases in the United States. However, the urine test does not detect infections with other serogroups of *L. pneumophila* or other species of *Legioniella*. Culture of *Legionella* from respiratory secretions, lung tissue, or pleural fluid is recommended for diagnosis. Special culture techniques are required to isolate *Legionella*.
Treatment considerations: Macrolides and fluoroquinolones recommended.
Special Considerations: *Legionella* grows in warm-water environments but it requires amplification and aerosolization; in floods outbreaks have been traced to aerosilization associated with aeration from pumping water out of buildings. Disease rates may increase following heavy rainfall. The incubation period of Legionnaires' disease is 2-10 days; patient's activities in the 10 days prior to symptom onset should lead clinicians to consider *Legionella.*

Links:
http://www.journals.uchicago.edu/CID/journal/issues/v37n11/32441/32441.html
http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5210a1.htm

Leptospirosis

Symptoms: Classically present with fever, headache, subconjuctival suffusion, and muscle aches, occasional vomiting and diarrhea, or jaundice, abdominal pain, or a rash, presenting 2 days to 4 weeks after exposure. A second phase of illness may present with liver or renal failure, meningoencephalitis, or pulmonary hemorrhage with respiratory failure. Exposure to floodwaters has been implicated in outbreaks.
Infection control considerations: Standard precautions.
Diagnostic considerations: Serologic testing (suspect leptospirosis if extensive exposure to flood waters). Rapid serological testing (e.g., Leptospira Dip-Stick IgM dot-ELISA test kits) available; confirmatory testing by serology is conducted by CDC (404-639-3158 or 404-639-4876) through state health departments.
Treatment considerations: Treatment should be initiated as soon as the diagnosis of leptospirosis is suspected (preferably before 5th day following onset). Intravenous penicillin G or ceftriaxone is the treatment of choice for severe cases or hospitalized patients. Oral doxycycline for treatment of patients with mild disease.
Links:
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/leptospirosis_g.htm
http://www.cdc.gov/ncidod/dbmd/diseaseinfo/files/Leptospirosis_FAQ.pdf

Lice

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Symptoms: Severe itching and excoriation of scalp (head lice), skin (body lice), or axillae and groin (pubic lice or "crabs"). Heavier infestations can involve eyelashes and eyebrows. Secondary infection may lead to regional lymphadenitis.
Infection control considerations: Contact precautions. Launder all clothing, towels and bedding in hot water (55°C or 130°F) and dry laundry using hot cycle for 20 minutes. Dry clean clothing that is not washable. Store all clothing, stuffed animals, comforters, etc. that cannot be washed or dry cleaned in a plastic bag and seal for 2 weeks. Soak combs and brushes for 1 hour in rubbing alcohol, Lysol®, or wash with soap and hot water (130°F). Vacuum floors and furniture but do not use fumigant sprays; they can be toxic if inhaled. All close contacts should be checked for lice and nits every 2-3 days. Treat if lice and nits are found. Prophylactic treatment not recommended. Nits (eggs) remain viable on clothing. Head and pubic lice survive for 1-2 days if they fall off the host; body lice survive up to 10 days off the host.
Diagnostic considerations: Head lice: inspect hair and scalp. Nits on the hair shaft within ¼ inch of the scalp or crawling lice confirms infestation and need for treatment. Body lice: inspect seams of clothing and body for nits and crawling lice. Pubic lice (crabs): inspect pubic hair for nits or crawling lice.
Treatment considerations: Head lice: Treat with pediculicide (e.g., 1% permethrin cream rinse applied for 10 minutes then washed off, or malathion [others available – see link below]). May require re-treatment after 7-10 days. See clothes and environmental cleaning advice above. Pubic lice: same as for head lice. See clothes cleaning advice above. Inform sexual partners and avoid sexual contact until partners have been treated and infestation has been cured. Body lice: Launder clothes, towels, and bedding as above. A 1% permethrin or pyrethrin lice shampoo may be applied to the body.
Link: http://www.cdc.gov/ncidod/dpd/parasites/lice/default.htm

Measles

Symptoms: Prodromal fever, conjunctivitis, coryza, cough and small spots with white or bluish white centers on an erythematous base on the buccal mucosa (Koplik spots). A characteristic red, blotchy maculopapular rash appears on the 3rd to 7th day, beginning on the face (hairline) and then becomes generalized. Rash typically lasts 4-7 days.
Infection control considerations: Airborne infection isolation recommended for the duration of illness. Incubation period 7-18 days, usually 10 days. Infected patients are contagious from 4 days prior to rash up to four days after rash onset. Susceptible exposed persons should be vaccinated unless contraindicated. Unvaccinated contacts can be given measles vaccine up to 72 hours after exposure. Immune globulin can be given more than 72 hours after exposure or to individuals in whom vaccine is contraindicated.
Diagnostic considerations: Confirmation of clinical suspicion of measles can be made by serologic testing for measles-specific IgM antibodies. In addition, viral culture or RT-PCR of respiratory secretions or urine; however, culture may take 7 – 10 days. Presumptive cases should be reported to local health authorities before results of diagnostic tests are known
Treatment considerations: Supportive
Link: http://www.cdc.gov/nip/diseases/measles/default.htm

Meningococcal Disease (*Neisseria meningitidis*)

Symptoms: Generally begin with fever, headache, and nuchal rigidity; encephalopathy and coma may ensue over a period of hours. A petechial rash with macules or vesicles may be indicative. Fulminant cases may rapidly progress to septic shock and death.
Infection control considerations: Suspected cases should be placed in droplet precautions immediately.

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Diagnostic considerations: Confirmation is through culture isolation of meningococci from CSF or blood, preferably obtained prior to initiation of antimicrobial therapy. Rapid diagnostic assays, including latex agglutination testing of CSF for group-specific meningococcal capsule proteins and PCR for evidence of *N. meningitides* DNA in a normally sterile site, are available for identification of probable cases. .
Treatment considerations: Parenteral penicillin or third-generation cephalosporin; for patients who are penicillin-allergic, consult a infectious disease specialist. Patients treated with penicillin should receive rifampin, ciprofloxacin, or ceftriaxone prior to discharge from the hospital to eliminate nasopharyngeal carriage.
Link: ftp://ftp.cdc.gov/pub/Publications/mmwr/rr/rr4605.pdf
Special considerations: Mandatory reporting to public health authorities. Close/intimate contacts will require chemoprophylaxis (rifampin, ceftriaxone, or ciprofloxacin).

Methicillin-Resistant *Staphylococcus aureus* (MRSA)

Symptoms: Typically presents as ulcer, abscess, or lesion with a "spider bite" appearance. Can present as cellulitis and/or fever.
Infection control considerations: Contact precautions. Keep wounds covered with a clean, dry bandage.
Diagnostic considerations: Culture abscess drainage or wound
Treatment considerations: Best treatment for abscess is drainage. Beta-lactam antibiotics are ineffective. Oral antibiotic treatment with trimethoprim-sulfamethoxazole (TMP/SMX) or clindamycin. Serious cases can be treated with intravenous vancomycin.
Link: http://www.cdc.gov/ncidod/dhqp/ar_mrsa_ca_clinician.html

Mumps

Symptoms: Fever, headache, muscle aches and swelling of one or more salivary glands, usually the parotid. Respiratory symptoms are common in children under age 5. Post-pubertal males can present with orchitis.
Infection control considerations: Droplet precautions until 9 days after the onset of parotid swelling. Incubation period 14-25 days, usually 16-18 days. Infected patients are most contagious from 2 days prior to illness onset to 4 days after. Vaccination of exposed persons is not always effective. Immune globulin is not recommended.
Diagnostic considerations: Confirmation of clinical suspicion of mumps can be made by viral culture of respiratory secretions or urine, however, culture may take 7 – 10 days. Presumptive cases should be reported to local health authorities before results of diagnostic tests are known
Treatment considerations: supportive
Link: http://www.cdc.gov/nip/diseases/mumps/default.htm

Non-tuberculous Mycobacteria

Symptoms: Most common species that present with skin ulcers or erythematous lesions are *Mycobacterium ulcerans* , *M. marinum and M. absessus*. *M. fortuitum*, *M. chelonae*, and *M. avium* complex can also present as post-traumatic wound infections. Suspect if skin lesions to do not respond to typical antibiotic regimens. *M. marinum* is associated with salt water exposure, including fish tanks.
Infection control considerations: Standard precautions. Keep wounds covered.
Diagnostic considerations: Gram stain of aspirate showing beaded Gram positive rods, acid fast stain of aspirate and culture for acid fast bacilli.
Treatment considerations: Varies by organism

Link: http://www.cdc.gov/ncidod/hip/myco/M_Abscessus_faq.htm

Norovirus-associated Gastroenteritis

Symptoms: Most commonly, people present with acute onset of vomiting as the initial symptom closely followed by watery, non-bloody diarrhea. Many patients may have fever, myalgia, headache, and abdominal cramps. Symptoms generally last for 1-3 days, and while usually self-limited, fluid losses due to vomiting may lead to dehydration. Norovirus-gastroenteritis occurs in all age groups

Infection control considerations: Standard Precautions for continent adults with careful attention to good hand hygiene practices. Contact precautions for diapered or incontinent persons or during outbreaks. During outbreaks, it may help to cohort such patients in a separate room or area and to dedicate restrooms for use only by ill persons. For more information about infection control measures in community evacuation centers, see http://www.bt.cdc.gov/disasters/commshelters.asp.

Diagnostic considerations: Routine testing of ill individuals is not warranted, except in the event of outbreaks of vomiting and diarrhea. Diagnosis relies on the detection of viral RNA in stools, testing is done at most state public health laboratories or at CDC. Identification of the virus can be best made from stool specimens taken within 48 to 72 hours after onset of symptoms

Treatment considerations: Supportive

Link:http://www.cdc.gov/ncidod/diseases/submenus/sub_norwalk.htm

Pertussis (whooping cough)

Symptoms: First symptoms, the catarrhal phase, lasts 1-2 weeks with coryza and intermittent cough; low-grade fever. The next symptoms, the paroxysmal phase lasts several weeks with spasmodic cough, post-tussive vomiting, and inspiratory whoop. Very young infants often present with apnea, and may not exhibit paroxysmal cough. Adult symptoms range from mild upper respiratory (URI) to the symptoms of classic pertussis. Adults who cough forcefully enough to vomit are likely to have pertussis.

Infection control considerations: Droplet precautions. Guidance on pertussis outbreak control is available from the National Immunization Program (404-639-8257), or the CDC Director's Emergency Operations Center (770-488-7100).

Diagnostic considerations: Deep nasopharyngeal swab or aspirate for culture or DNA PCR test (most sensitive). The most specific test ("gold standard") for pertussis is bacterial culture but it is not always sensitive and can require 7+ days to obtain a result. Presumptive cases should be reported to local health authorities before results of diagnostic tests are known.

Treatment considerations: Macrolides (e.g., azithromycin, erythromycin, clarithromycin) are the preferred antibiotics for treatment and chemoprophylaxis of pertussis. Macrolides do not modify the course of pertussis unless given in the catarrhal phase. Treatment with a macrolide is recommended for all infants with pertussis, and for children and adults coughing for <21 days to eliminate Bordetella pertussis from the nasopharynx and to prevent continuing transmission.

Special Considerations: Pertussis outbreaks occur in settings where groups of people are in close quarters; the usual incubation period of pertussis is 7-10 days (range 4-21 days). Chemoprophylaxis is most important for exposed children and adults who have contact with infants <6 months of age.

Link: http://www.cdc.gov/nip/publications/pertussis/guide.htm

Pinworms

Symptoms: Perianal itching, disturbed sleep, irritability and possible secondary infection of scratched skin. Vulvovaginitis is a possible manifestation.

Infection control considerations: Standard precautions. Transmission by ingestion of infective eggs from contaminated hands, food, or surfaces. Autoinfection occurs. Prevent transmission by hand washing after going to the toilet, before eating, and after changing diapers; daily changing of

underwear and frequent changing of night clothes; bathing after waking up to reduce egg contamination; and avoiding scratching of anal area. Simple laundering of clothes and linen is adequate for disinfection. Cleaning and vacuuming entire household or washing sheets every day are probably not necessary or effective. Contagious as long as gravid females lay eggs on perianal skin. Eggs remain viable indoors for about 2 weeks.
Diagnostic considerations: Apply transparent adhesive tape or pinworm paddle over the perianal region first thing in the morning before defecation and washing, and examine microscopically for eggs.
Treatment considerations: Pyrantel pamoate is the drug of choice; mebendazole, or albendazole are alternatives; repeat after 2 weeks. Close family contacts should also be treated if infection occurs again or if infection is present in multiple family members.
Link: http://www.cdc.gov/ncidod/dpd/parasites/pinworm/default.htm

Primary Amebic Meningoencephalitis ([PAM], *Naegleria fowleri*)

Symptoms: Fulminant meningoencephalitis characterized by severe headache, other meningeal signs, high fever, vomiting, focal neurologic deficits, and encephalopathy. Onset of coma can be very rapid. Frequently fatal despite aggressive treatment.
Risk factors: Swimming and diving in freshwater ponds.
Infection control considerations: Standard precautions.
Diagnostic considerations: CSF will appear similar to that in bacterial meningitis, with high pleocytosis and elevated protein and decreased glucose. Diagnosis is made by demonstration of motile amoebae on wet mount preparations of fresh CSF, or on stained smears of CSF
Treatment considerations: Fatal outcome is common. *N. fowleri* has been treated successfully with intravenous and intrathecal amphotericin B and miconazole plus rifampin, and also with amphotericin B, rifampin, and ornidazle. Other successful therapies are less well documented.

Links:
http://www.cdc.gov/ncidod/dpd/parasites/naegleria/default.htm
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5240a4.htm

Rabies

Symptoms: Initially nonspecific (e.g., malaise, fever, headaches) for several days to weeks, followed by neurologic symptoms (including confusion, paresthesias, insomnia, and agitation) followed by paresis, spasm of swallowing muscles, coma, and death.
Infection control considerations: Standard precautions. Rabies is not spread person-to-person.
Diagnostic considerations: Diagnosis is made by testing (e.g., fluorescent antibody staining) of brain tissue or by laboratory evaluation of frozen tissue from nuchal biopsy, saliva, serum, or cerebral spinal fluid.
Treatment considerations: Postexposure prophylaxis (PEP) following an animal bite, scratch, or contact with saliva from an animal suspected of having rabies consists of thorough wound care, and immediate administration of human rabies immune globulin to provide passive immunity. Vaccination with 5 doses of vaccine, beginning immediately after the exposure, then at 3, 7, 14, and 28 days following first dose. Virtually all rabies cases result in death. For questions about rabies PEP or treatment, call your local health department or the CDC rabies team at 770-488-7100.
Link: http://www.cdc.gov/ncidod/dvrd/rabies/
Special considerations: If at all possible, implicated domestic animal (dog, cat, ferret) should be detained and observed for 10 days. Wild or ill animals should be euthanized and heads submitted for definitive rabies testing.

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Respiratory Viruses, Other (e.g., respiratory syncytial virus [RSV], adenovirus, rhinoviruses, human metapneumoviruses)

Symptoms: *Infants* and children: rhinorrhea, fever, cough, wheezing, difficulty breathing, lethargy, irritability. *Adults*: fever, cough, shortness of breath, and exacerbation of underlying chronic lung and heart disease.

Infection control considerations: Contact precautions. Good hand and respiratory hygiene. (http://www.cdc.gov/flu/professionals/infectioncontrol/resphygiene.htm).

Diagnostic considerations: Respiratory syncytial virus, RSV, is the most common cause of severe acute respiratory illness in children aged <2years and can cause especially severe disease among those born prematurely or with underlying cardiac, pulmonary or immune diseases. RSV immunoflourescent assays and rapid RSV antigen tests are readily available but have limited sensitivity in adults. The most sensitive PCR assays applied to appropriately timed and collected specimens detect most infections in all age groups. Respiratory specimens (nasal wash, nasopharyngeal swab) should be collected within 4 days of illness onset. Differential diagnosis of respiratory illness includes parainfluenza viruses, human metapneumoviruses, human coronaviruses, influenza viruses, and bacterial pathogens, among others. Expanded testing for other pathogens should be considered during an outbreak or cluster investigation. Contact state health departments or CDC for additional assistance.

Treatment considerations: RSV, as well as parainfluenza virus, human metapneumovirus and human coronavirus, infections are treated with primarily supportive care.

Link:

Guidelines for preventing healthcare associated pneumonias: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5303a1.htm;

Special considerations- Infants and young children at risk for serious RSV infection should be considered for prophylaxis with monthly doses of humanized murine anti-RSV monoclonal antibody during the RSV season. (AAP guidelines: http://aappolicy.aappublications.org/cgi/content/abstract/pediatrics;112/6/1442)

Ringworm (tinea pedis, tinea cruris, tinea corporis)

Symptoms: Dermatophyte infections of the trunk, legs, or arms (tinea corporis), feet (tinea pedis) or groin (tinea cruris) are common after prolonged exposure to wet, warm, climates, especially if suboptimal hygiene is present. Tenia pedis presents with scaling or cracking of the skin especially between the toes. Infection presents with a flat, spreading ring-shaped or circular lesion with a characteristic raised edge around all or part of the lesion on the body or in the groin area.

Infection control considerations: Standard precautions. Persons should be excluded from swimming pools while infected or until treatment initiated. Person-to-person spread can occur if close body contact is frequent.

Diagnostic considerations: Scrapings from the advancing lesion margins can be viewed under a microscope with 10% potassium hydroxide, looking for segmented, branched, fungal filaments.

Treatment considerations: Any topical fungicide including miconazole or clotrimazole is effective along with thorough bathing with soap and water. If extensive disease is present, consider oral itraconazole or terbinafine.

Special considerations: To prevent reinfection, other body sites such as scalp, feet, hands, and nails should be examined and treated if also infected.

Links:

http://www.nlm.nih.gov/medlineplus/ency/article/001439.htm
http://www.cdc.gov/healthypets/diseases/ringworm.htm

Rubella

Symptoms: Usually a mild disease characterized by a generalized erythematous maculopapular rash, generalized lymphadenopathy, and slight fever. Approximately 25-50% of rubella infections

are asymptomatic. Maternal rubella infection during pregnancy can result in miscarriage, fetal death, or a constellation of congenital anomalies (congenital rubella syndrome).
Infection control considerations: Droplet precautions until 7 days after onset of rash. Spread by contact with nasopharyngeal secretions of infected people. Incubation period 14-21 days, usually 14-17 days. Infected patients are contagious from 1 week before rash onset to 4 days after rash onset. Vaccination of exposed persons is not always effective. Immune globulin is not recommended. Contraindications to vaccination with MMR vaccine include pregnancy, age <6 months, and severe immunocompromising conditions.
Diagnostic considerations: Diagnosis of acute infection can be made through serologic testing for rubella specific IgM. Urine, blood, or nasopharyngeal secretions should be collected for viral isolation. Presumptive cases should be reported to local health authorities before results of diagnostic tests are known.
Treatment considerations: supportive
Link: http://www.cdc.gov/ncidod/diseases/submenus/sub_rubella.htm
Special Considerations: The percentage of susceptible people in certain immigrant population groups, especially adolescent and adult males from Latin America, may be higher.

Scabies

Symptoms: Presents as papules, vesicles or tiny linear, often red, burrows on skin, especially on webs between fingers, anterior surfaces of wrists and elbows, axillary folds and beltline. Intense itching, especially at night. Secondary infection from scratching can occur.
Infection control considerations: Contact precautions. Transmission occurs through prolonged direct contact with infested skin and also during sexual contact. Clothing, towels, and bedsheets worn or used within 48 hours of treatment should be laundered in hot water (55°C or 130°F) and heat dried using the hot cycle for 20 minutes**.** Away from the body, mites do not survive more than 48-72 hours.
Diagnostic considerations: Diagnosis is most commonly made by looking at the burrows or rash. Mites can be recovered from a burrow by scraping the lesion with a scalpel and examining the material microscopically. If skin scraping or biopsy is negative, patient might still be infested.
Treatment considerations: Multiple options exist, including topical 5% permethrin or 1% gamma benzene hexachloride. Household members and close contacts should be treated simultaneously. Retreatment is sometimes required after 7-10 days.
Link: http://www.cdc.gov/ncidod/dpd/parasites/scabies/default.htm

***Scedosporium apiospermum* (*Pseudallescheria boydii*)**

Symptoms: In immunocompent persons this mould, present in sewage, water, and soil, can cause invasive disease after massive inoculation into the lungs (i.e., near drowning or aspiration) or traumatic inoculation into the skin (i.e., madura foot), keratitis, endohphthalmitis, or arthritis. Although invasive disease through aspiration in this setting should be very rare, presenting symptoms include pneumonia or often just focal neurologic deficits from a brain abscess; symptoms may not present until 30-130 days after the aspiration event. Skin manifestations may appear as a small, painless, subcutaneous nodule several months after the inoculation event; nodules soon open to form sinus tracts discharging “white grains.”
Infection control considerations: Standard Precautions.
Diagnostic considerations: Isolation of fungus from clinical specimen in appropriate clinical setting. Histopathology cannot distinguish *S. apiospermum* from *Aspergillus* spp. Blood cultures are seldom positive.
Treatment considerations: *S. apiospermum* is often resistant to amphotericin B, but susceptible to extended-spectrum triazoles (e.g., voriconazole, posaconazole). Surgical drainage is usually necessary.
Link: http://www.doctorfungus.org/thefungi/Pseudallescheria.htm

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Tetanus (*Clostridium tetani* toxin)

Symptoms: Acute onset of painful strong muscular contractions, particularly of the masseter, neck, and trunk muscles. Early abdominal rigidity is also frequently seen. Subsequently, generalized spasms, particularly stimulus-induced, develop; ophisthotonos and "risus sardonicus" (a facial expression characterized by clenched teeth and contracted facial muscles) are frequently seen.
Infection control considerations: Standard precautions.
Diagnostic considerations: Tetanus is diagnosed on the basis of clinical features and exposure history. Laboratory diagnosis is of little value.
Treatment considerations: Thorough wound cleansing. Intramuscular tetanus immune globulin (TIG) 3,000 – 6,000 IU in a single dose should be given as soon as possible, along with antimicrobial treatment for C. tetani (intravenous metronidazole for 7-14 days). Active immunization with tetanus toxoid should be given concomitantly with treatment.
Link: http://www.cdc.gov/nip/publications/pink/tetanus.pdf

Tuberculosis

Symptoms: Symptoms of tuberculosis (TB) disease include coughing for ≥3 weeks, loss of appetite, weight loss, night sweats, hemoptysis (bloody sputum), hoarseness, fever, fatigue, or chest pain.
Infection control considerations: Airborne infection isolation (negative pressure room).
Diagnostic considerations: The index of suspicion should be higher for individuals who are recent close contacts to persons with infectious TB or those who have a medical condition (e.g., HIV infection, immunosuppressive therapy) associated with an increased risk of TB disease. The necessary diagnostic tests are chest radiography and laboratory tests of sputum (microscopic examination for acid-fast bacilli and culture and PCR). Any evacuee with a productive cough should be evaluated for TB.
Treatment considerations: Typically, TB treatment is provided by public health departments, often working in collaboration with other providers, to ensure that the patient completes therapy
Links:
Treatment of Tuberculosis, CDC/American Thoracic Society, 2003
Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection,CDC, 2001

Special Considerations: If you suspect that a person might have TB disease, promptly call the local or state TB program* for collaboration on the possible need for isolation and further diagnostic measures. For disaster evacuees, the public health points of contact for TB concerns can be found at http://www.cdc.gov/nchstp/tb/pubs/tboffices.htm.
If you are unable to reach these points of contact, please call Gail Burns-Grant at CDC, 404-639-8336.

***Vibrio spp.* wound infections**

Symptoms: Increasing redness, swelling, and pain in a wound with history of exposure to brackish water; often rapidly progressive. Severe infections, including hemorrhagic bullae, peripheral edema, sepsis, and death may occur with *V. vulnificus* infections, or with *V. parahemolyticus* infections among persons with hepatic disease or other immunocompromising conditions.
Infection control considerations: Standard precautions. There is no evidence for person-to-person transmission of *V. vulnificus*. Wash wounds with soap and water as soon as possible after brackish water exposure. Incubation period is 1 – 3 days, and possibly as long as 7 days.
Diagnostic considerations: Culture wound or hemorrhagic bullae. Forward isolates to public health laboratory.
Treatment considerations: Adults: doxycycline and a third-generation cephalosporin, or single-agent treatment with a fluoroquinolone. Children: trimethoprim-sulfamethoxazole and an aminoglycoside. Debride necrotic tissue. Amputation is required occasionally.

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Link: http://www.bt.cdc.gov/disasters/vibriovulnificus.asp

For more information, visit www.bt.cdc.gov/disasters,
or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

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