

# Infection Prevention Implications of Managing Haitian 2010 Earthquake Patients in U.S. Hospitals

## **Prepared by:**

### **2010 APIC Emergency Preparedness Committee**

Chair: Barbara Russell, RN, MPH, CIC; Co-Chair: Jacie Volkman, MPH, CIC, CHEP

## Lead Authors:

Terri Rebmann, PhD, RN, CIC and Jacie Volkman, MPH, CIC, CHEP

## Committee Members:

Sharon Alexander, MPH, BSN, MT(ASCP), CIC

Barbara Citarella, RN, BSN, MS, CHCE

Bill Coll, M. Pub.Aff, LP

Steve Hilley, RN

Lisa McKinney, RN

Debra A. Novak, DSN, RN

William Wagner, ScD, CHCM, CHSP, CHEP

February 2010

# Table of Contents

<b>Section</b>	<b>Page</b>
Introduction.....	2
Infectious Disease Concerns Specific to Haiti.....	2
Screening, Medical Examination, and Patient History .....	3
Isolation and Personal Protective Equipment Use.....	3
Visitors.....	4
Animal Management .....	4
References.....	5
Appendices .....	
Appendix A: Common Infectious & Communicable Diseases in Haiti .....	6
Appendix B: Syndrome-Based Isolation Precautions for Haitian Earthquake Victims .....	7
Appendix C: Transmission Route, Isolation, and Control Measures for Common Infectious Diseases in Haiti .....	8

# Infection Prevention Implications of Managing Haitian Earthquake Patients in U.S. Hospitals

## Introduction

On January 12, 2010, Haiti suffered an earthquake measuring 7.0 on the Richter scale, the strongest earthquake in Haiti's history. Even prior to the 2010 earthquake, Haiti was a very poor country with a weak public health care system. Almost half of Haiti's population did not have access to safe drinking water or medical care, 40% lacked adequate food leading to malnutrition and a high rate of low birth weight babies, and over three-quarters had inadequate sanitation.<sup>1</sup> In addition, infectious diseases contributed to a large portion of mortality in Haiti. According to a 2006 report from the World Health Organization<sup>2</sup>, approximately 43% of all deaths in Haiti were related to infectious diseases, including HIV/AIDS, lower respiratory illnesses, meningitis, diarrheal illnesses, and tuberculosis (TB). Diarrheal illnesses alone were associated with 16% of mortality in children under the age of five in Haiti in 2007.<sup>3</sup> The 2010 earthquake exacerbated these issues and is expected to have long-term negative effects on Haitian citizens' health.

As of January 31, 2010, hundreds of Haitian earthquake victims had been flown to the U.S. to receive medical care, and many more are expected.<sup>4</sup> The epidemiology of Haiti differs from the U.S. and U.S. healthcare workers should consider this when screening and treating Haitian earthquake victims. **This document was developed to aid healthcare workers in preventing the spread of communicable diseases when providing care to Haitian earthquake victims. It is designed to be used as a planning and reference document for U.S. hospitals receiving Haitian earthquake victims.** Hospitals receiving patients from Haiti should continue to implement routine infection prevention practices. Standard infection prevention recommendations are outlined in other documents and will not be outlined here.<sup>5,6</sup> Only infection prevention challenges/issues uniquely related to Haiti and the Haitian earthquake will be addressed in this document.

*This document does not provide infection prevention guidelines for healthcare workers or other volunteers working in Haiti.* Volunteers going to Haiti to provide earthquake response assistance should refer to the Centers for Disease Control and Prevention's (CDC) recommendations for those traveling to Haiti.<sup>7,8</sup>

## Infectious Disease Concerns Specific to Haiti

Prior to the 2010 earthquake, infectious diseases were associated with a high mortality rate in Haiti. The most common infectious diseases contributing to mortality in Haiti include HIV/AIDS, pneumonia, meningitis, water and foodborne illnesses, and TB.<sup>2</sup> In addition, other infectious diseases occur regularly in Haiti, including malaria, leprosy, dengue, tetanus, typhoid, hepatitis, parasitic illnesses, diphtheria, and anthrax. The 2010 earthquake will likely increase the development of vector-spread illnesses (such as malaria and dengue) and the spread of communicable diseases due to poor access to safe water, food, and sanitation, as well as overcrowded conditions in shelters. Surveillance and immunization will be difficult to implement in Haiti given the current resources available, and this will likely contribute to further communicable disease transmission. Healthcare workers who screen and provide care for Haitian earthquake victims need to understand the epidemiology of Haiti so that appropriate infection prevention strategies can be implemented to control the spread of disease in U.S. hospitals and provide appropriate anti-infective therapies to patients.

The most common infectious and communicable diseases in Haiti are outlined in Appendix A. Disease-specific information on these and other agents is available through the CDC: <http://emergency.cdc.gov/disasters/earthquakes/haiti/illnesses.asp>

## **Screening, Medical Examination, & Patient History**

Prior to admission, patients from Haiti should be screened for infectious diseases/communicable conditions. Healthcare workers should consider Haiti's epidemiology (as described above) when performing a medical history and examination of Haitian earthquake victims. In addition to endemic infectious diseases, Haitian earthquake victims are likely to develop infections due to the lack of medical care available in Haiti, resulting in infected wounds and other infectious complications. Living in crowded conditions in Haiti can also contribute to communicable disease spread. Information on preventing infection transmission in shelters and alternate care sites has been published.<sup>9,10</sup>

The medical history of Haitian earthquake victims should include the following:<sup>11</sup>

- Traumatic injuries and surgical history
- History and symptoms of infectious diseases and communicable conditions
- Risk factors for infection, such as chronic diseases, immunosuppression, etc
- Recent exposure to communicable disease, such as TB
- Animal/insect exposures (e.g. mosquitoes, bats, rabid animals, etc)
- Current medications, including herbal remedies, over-the-counter medications, etc
- Immunization status

During the medical examination performed on any patient arriving from Haiti, clinicians should maintain a high level of suspicion for infectious diseases and communicable conditions. Typical signs and symptoms of infectious diseases/communicable conditions include: fever, cough, rash, upper respiratory symptoms, diarrhea, vomiting, stiff or sore neck or jaw, and draining lesions or wounds. Symptomatic individuals should be placed on isolation. Isolation precautions based on patients' symptoms are outlined in Appendix B.

## **Isolation & Personal Protective Equipment (PPE) Use**

As with all patients, healthcare workers should use Standard Precautions with patients from Haiti to prevent the transmission of infectious agents during healthcare personnel interactions, regardless of the patient's diagnosis. Standard Precautions include the use of personal protective equipment (PPE), such as gloves, gowns, goggles, face shields, masks, and respirators as appropriate. Healthcare workers should choose PPE based on the procedure being performed and the suspected mode of transmission of potential agents. Expanded isolation precautions must be implemented if a patient has or is suspected of having a disease or condition that is communicable and transmission may not be prevented using Standard Precautions alone. This is known as using *transmission-based precautions*. A full description of Standard Precautions and transmission-based precautions are outlined in the literature.<sup>5</sup>

Transmission-based precautions will be essential when caring for patients from Haiti. In addition, Haiti has a different epidemiological pattern of infectious diseases than what is seen in the U.S. and this should be taken into account when deciding which precautions to use with patients from this country. For example, transmission-based precautions indicate that a mask should be used if a patient has respiratory symptoms, such as a cough and fever. However, tuberculosis (TB), especially multi-drug

resistant TB, is prevalent in Haiti. Therefore, healthcare workers in the U.S. should maintain a high level of suspicion for TB when assessing patients from Haiti and consider using Airborne Precautions with appropriate PPE (i.e., an N-95 respirator or higher level respirator) if the person is coughing and has a fever. Wounds and infected lesions are common after earthquakes and other natural disasters, and can be anticipated among Haitian patients. Draining wounds/lesions should be handled using Contact Precautions. Patients should be asked to acknowledge understanding of infection prevention practices by having them repeat back the protocols or demonstrate appropriate behavior such as hand hygiene.

Isolation should not be discontinued until communicable diseases/conditions are ruled out and/or the patient is no longer believed to be contagious. Isolation precautions for diseases with a high prevalence in Haiti are outlined in Appendix C. Appendix B outlines syndrome-based isolation precautions for Haitian earthquake victims when their diagnosis is unknown.

## **Visitors**

In Haitian culture, family is the most important responsibility. Family members are morally and legally required to visit an ailing member. Consequently, Haitian patients may have a large number of visitors, especially if death is anticipated.<sup>12</sup>

Visitors should follow hospital infection prevention guidelines/policies. As with any other visitor, healthcare workers should observe individuals visiting patients from Haiti for signs of communicable diseases. Symptomatic visitors should be referred for medical evaluation. Visitor restriction should be based on existing hospital infection prevention policies. Visitors should be informed of hospital infection prevention policies. Language-appropriate fact sheets should be developed and/or interpreters should be on-hand to communicate hospital infection prevention practices. Visitors should be asked to acknowledge understanding of infection prevention practices by having them repeat back the protocols or demonstrate appropriate behavior such as hand hygiene.

## **Animal Management**

Haitian earthquake victims may arrive at U.S. hospitals with their animals/pets. In most hospitals, only service animals are allowed to visit or stay. Some facilities do allow animal visitation through Pet Therapy programs, but protocols must be in place to prevent the spread of disease from animals to humans. Existing hospital policies regarding animal management and visitation should be followed.

In accordance with the Americans with Disabilities Act (ADA), all service animals should be allowed into areas of the hospital as outlined in existing hospital policies. The animal does not have to be licensed or certified by a state or local government as a service animal, but they must meet the definition of a “service animal” according to the 1990 ADA. The ADA defines a service animal as *“any animal individually trained to do work or perform tasks for the benefit of an individual with a disability, including, but not limited to, guiding individuals with impaired vision, alerting individuals who are hearing impaired to intruders or sounds, providing minimal protection or rescue work, pulling a wheelchair or fetching dropped items”* (pg. 1).<sup>13</sup>

## References

1. World Health Organization. (2010). Public health risk assessment and interventions: Earthquake: Haiti. Retrieved February 4, 2010 from: [http://www.who.int/diseasecontrol\\_emergencies/publications/haiti\\_earthquake\\_20100118.pdf](http://www.who.int/diseasecontrol_emergencies/publications/haiti_earthquake_20100118.pdf)
2. World Health Organization. (2006). Morality country fact sheet 2006. Retrieved February 7, 2010 from: [http://www.who.int/whosis/mort/profiles/mort\\_amro\\_hti\\_haiti.pdf](http://www.who.int/whosis/mort/profiles/mort_amro_hti_haiti.pdf)
3. World Health Organization. (2010). Haiti earthquake health response. Retrieved February 4, 2010 from: [http://www.who.int/hac/crises/hti/haiti\\_alert\\_16jan10.pdf](http://www.who.int/hac/crises/hti/haiti_alert_16jan10.pdf)
4. Kay, J. (2010). U.S. military resuming Haiti medical flights. The Associated Press. Retrieved February 7, 2010 from: <http://abcnews.go.com/US/wireStory?id=9709440>
5. Siegel, J. D., Rhinehart, E., Jackson, M., Chiarello, L., and the Healthcare Infection Control Practices Advisory Committee. (2007). Guideline for isolation precautions: Preventing transmission of infectious agents in healthcare settings 2007. Retrieved July 3, 2007 from: <http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/Isolation2007.pdf>
6. Carrico, R. (Ed.). (2009). *APIC Text of Infection Control and Epidemiology* Washington DC: Association for Professionals in Infection Control and Epidemiology, Inc.
7. Centers for Disease Control and Prevention. (2010). Haiti earthquake and travel. Retrieved February 7, 2010 from: <http://wwwnc.cdc.gov/travel/content/haiti-earthquake-travel.aspx>
8. Centers for Disease Control and Prevention. (2010). Health information for travelers to Haiti. Retrieved February 7, 2010 from: <http://wwwnc.cdc.gov/travel/destinations/haiti.aspx>
9. Rebmann, T., Wilson, R., Alexander, S., Cloughessy, M., Moroz, D., Citarella, B., et al. (2008). Infection prevention and control for shelters during disasters. Washington, DC: Association for Professionals in Infection Control and Epidemiology. Available at: <https://www.apic.org/>
10. Rebmann, T., Russell, J., Alexander, S., Cloughessy, M., Coll, B., Hilley, S., et al. (2009). Infection Prevention for Alternate Care Sites. Retrieved November 20, 2009 from: <https://www.apic.org/>
11. Centers for Disease Control and Prevention (2010) Interim recommendations for initial domestic medical screening of Haitian orphan parolees. Retrieved February 9, 2010 from: <http://www.cdc.gov/immigrantrefugeehealth/exams/recommendations-domestic-medical-screening-haitian-orphan.html>
12. Cook Ross Inc. (2010). Background on Haiti and Haitian health culture. A cultural competence primer. Retrieved February 11, 2010 from: <http://www.cookross.com/docs/haiti.pdf>
13. American Veterinary Medical Association. (2008) AVMA policy service animals. Retrieved September 16, 2009 from: [http://www.avma.org/issues/policy/service\\_animals.asp](http://www.avma.org/issues/policy/service_animals.asp)

## **Appendix A**

### **List of Common Infectious & Communicable Diseases in Haiti\***

- Anthrax
- Dengue
- Diphtheria
- Hepatitis
- HIV/AIDS
- Leprosy
- Malaria
- Parasites
- Tetanus
- Tuberculosis (TB)
- Typhoid

\* See CDC website for detailed disease specific information:  
<http://emergency.cdc.gov/disasters/earthquakes/haiti/illnesses.asp>

## Appendix B

### Syndrome-Based Isolation Precautions for Haitian Earthquake Victims

This table is intended as a guideline and is not all inclusive. Standard Precautions should be used for all patient encounters. Individuals with a known communicable disease should be isolated using published guidelines by Healthcare Infection Control Practices Advisory Committee (HICPAC).<sup>5</sup> This table outlines appropriate isolation precautions for situations in which the causative agent is not known. Isolation precautions in this table are transmission-based and were developed with consideration given to the epidemiology of Haiti.

Symptoms/Syndrome	Isolation Precautions	Individual Placement/ Separation
<b>Respiratory</b>		
Cough, runny nose, watery eyes in adults	Standard	None
Cough, runny nose, watery eyes in children (until communicable disease is ruled out)	Droplet; Contact	Cohorting; Spatial distancing <sup>1</sup>
Fever (Temp > 100.4 <sup>0</sup> F) & cough in adults (until communicable disease is ruled out)	Droplet	Cohorting; Spatial distancing <sup>1</sup>
Fever (Temp > 100.4 <sup>0</sup> F) & cough in children (until communicable disease is ruled out)	Droplet; Contact	Cohorting; Spatial distancing <sup>1</sup>
Persistent cough (≥ 3 weeks) in adults with at least one other symptom suspicious of TB (i.e., night sweats, lung infiltrate, bloody sputum) or risk factor (i.e., exposure)	Airborne <sup>2</sup>	AIRR or negative pressure area/room; Cohorting
Fever (Temp > 100.4 <sup>0</sup> F) & productive cough in children with at least one other symptom suspicious of TB (i.e., lung infiltrate, failure to thrive) or risk factor (i.e., exposure)	Airborne <sup>2</sup>	AIRR or negative pressure area/room; Cohorting
<b>Gastrointestinal</b>		
Vomiting	Standard	Social distancing <sup>1</sup>
Loose, unformed, watery, or explosive stools, with or without blood	Contact <sup>3</sup>	Cohorting; Spatial distancing <sup>1</sup>
<b>Rash</b>		
Fever (Temp > 100.4 <sup>0</sup> F) & vesicular rash	Airborne; Contact	AIRR or negative pressure area/room; Cohorting
Fever (Temp > 100.4 <sup>0</sup> F), petechial rash, and stiff/sore neck	Droplet	Cohorting; Spatial distancing <sup>1</sup>
Maculopapular with cough, coryza, and fever	Airborne	AIRR or negative pressure area/room; Cohorting
<b>Other</b>		
Eye infections (drainage from eye)	Contact	Social distancing <sup>1</sup>
Draining wound/lesion that cannot be covered	Contact	Cohorting; Spatial distancing <sup>1</sup>

<sup>1</sup>Spatial Distancing involves separating the potentially contagious person from others by a distance of at least 3 – 6 feet which should include placement in a private room when available.

<sup>2</sup>Haiti has a high prevalence of tuberculosis; therefore, it is prudent to consider using airborne precautions in patients with a cough, fever, and at least one other symptom until TB can be ruled out

<sup>3</sup>Once an infectious agent is ruled out, consider switching the patient to Standard Precautions

## Appendix C

### Transmission Route, Isolation, and Control Measures for Common Infectious Diseases in Haiti<sup>§</sup>

Disease	Agent	Transmission Route	Isolation & Other Control Measures	Special Considerations
Anthrax	<i>Bacillus anthracis</i>	<u>Cutaneous anthrax</u> : direct contact with spores or contact with contaminated materials/surfaces, such as handling sick or dead animals or animal excreta. <u>Inhalation anthrax</u> : inhalation of spores. <u>Gastrointestinal anthrax</u> : consuming improperly cooked contaminated meat.	Standard	Cutaneous anthrax is not uncommon in Haiti; it should be considered if a patient presents with an itchy papular lesion or a necrotic black eschar. Tourists have acquired the infection from contact with untreated animal hides used to make souvenir drums.
Dengue	flaviviruses	Vector-borne (mosquitoes)	Standard	Dengue is endemic in Haiti and should be considered in patients who present with febrile illness
Diphtheria	<i>Corynebacterium diphtheriae</i>	Cutaneous diphtheria: respiratory droplets Pharyngeal diphtheria: contact with lesion drainage	Cutaneous diphtheria: Contact* Pharyngeal diphtheria: Droplet* *Continue until 2 cultures taken 24 hrs apart are neg.	Diphtheria is endemic in Haiti because vaccination coverage is low.
Hepatitis	<i>Hepatitis A, B, C, E</i>	<u>Hepatitis A</u> : Fecal/oral, sexual <u>Hepatitis B</u> : Bloodborne, sexual, vertical <u>Hepatitis C</u> : Bloodborne, possibly sexual or vertical <u>Hepatitis E</u> : Fecal/oral	Standard	Hepatitis A & E occur frequently in Haiti due to lack of clean water for drinking and hand hygiene
HIV/AIDS	<i>Human immunodeficiency virus (HIV)</i>	Bloodborne, sexual, vertical	Standard	Approximately 4.5% of the population of Haiti is HIV+. About 30% of pregnant women infected with HIV in Haiti transmit it to their infant.
Leprosy	<i>Mycobacterium leprae</i>	Believed to be spread via respiratory droplets	Droplet	Leprosy is endemic in Haiti
Malaria	Protozoan parasite <i>Plasmodium falciparum</i>	Vector-borne (mosquitoes)	Standard	There are four types of protozoan parasites that cause malaria, but 99% of cases contracted within Haiti are by <i>Plasmodium falciparum</i>

<sup>§</sup>Clinical information for these diseases, such as signs and symptoms, are available from the CDC: <http://emergency.cdc.gov/disasters/earthquakes/haiti/illnesses.asp>

## Transmission Route, Isolation, and Control Measures for Common Infectious Diseases in Haiti (continued)<sup>§</sup>

Disease	Agent	Transmission Route	Isolation & Other Control Measures	Special Considerations
Parasites	<i>Ascaris lumbricoides</i> , <i>Cryptococcus neoformans</i> , <i>Giardia lamblia</i> , <i>Giardia intestinalis</i> , <i>Hymenolepiasis nana</i> , <i>Nicrophorus americanus</i> , <i>Strongeloides stercoralis</i> , <i>Taenia sp.</i> , <i>Trichuris trichiura</i>	Contaminated water for most; incompletely cooked beef or pork for <i>Taenia</i> species	Standard, except for Giardiasis. Giardiasis: Contact precautions recommended for diapered and incontinent patients for duration of illness.	There are many types of parasites in Haiti; this table lists the most common.
Tetanus	<i>Clostridium tetani</i>	Direct contact with <i>Clostridium tetani</i> spores, usually from the soil, or human or animal feces into an open wound	Standard	Vaccine coverage for tetanus is poor in Haiti. Risk of tetanus will be high due to open wounds from trauma & untreated injuries
Tuberculosis (TB)	<i>Mycobacterium tuberculosis</i>	Pulmonary TB: inhalation of airborne droplet nuclei Extrapulmonary TB:	Pulmonary TB: Airborne* Extrapulmonary TB: *Isolation continues until they have 3 successive negative smears collected in 8 – 12 hr intervals, at least 2 weeks of therapy, and improving symptoms	Haiti has a high prevalence of TB, including multi-drug resistant TB; maintain a high level of suspicion for TB among these patients as part of your facility's TB Control Program
Typhoid	<i>Salmonella typhi</i>	Fecal/oral, consuming contaminated food or water	Standard	Typhoid occurs frequently in Haiti due to lack of clean water for drinking and hand hygiene

<sup>§</sup>Clinical information for these diseases, such as signs and symptoms, are available from the CDC: <http://emergency.cdc.gov/disasters/earthquakes/haiti/illnesses.asp>