CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR and EXPLOSIVE (CBRNE) PLAN

Revised August 2013
CHEMICAL, BIOLOGICAL, RADIOLOGICAL, NUCLEAR, and EXPLOSIVE (CBRNE) RESPONSE PLAN for TRUMBULL COUNTY

PURPOSE: In the event of a threat involving Chemical, Biological, Radiological, Nuclear, and Explosives (CBRNE) agents, it may be necessary that the Trumbull County Health Departments be prepared to respond to such emergencies to minimize public health effects and manage the consequences by appropriate response plan.

ASSUMPTIONS:

- In the event of a CBRNE incident, Trumbull County response agencies may receive State and Federal agency assistance and guidance. The designated response agencies have sophisticated systems to detect and monitor CBRNE agent exposures and predict its spread. Trumbull County Health Departments will not duplicate these resources.

- Outside assistance would complement and not supplement Trumbull County Health Department’s own operating system.

- All four Health Departments in Trumbull County work cooperatively in situations within Trumbull County’s geo-political boundaries. In the event of a CBRNE incident, one single Health Department will provide command for all Health Department functions.

- All the agencies involved would operate under the Incident Command System.

OPERATIONS:

- Health Department activates the Public Health Emergency Response Plan and its coordinating Annexes and Appendices during any disaster, as needed.

- Heath Department will participate as a lead or supporting response agency depending on the type of CBRNE event. Public Health will follow local guidelines, ordinances, and laws as well as guidelines given from the Ohio Department of Health and the Centers for Disease Control during an event.

- Local government officials have first line of responsibility for emergency planning and response within their jurisdiction.

- Many elements of local, state and federal government will be integrated into a coherent biological response system including Facilities, Equipment, Trained Personnel, Communications and Plans and Procedures.

COMMUNICATION / NOTIFICATION:

- Notification of the event is made to the Trumbull County Public Health Departments through multiple avenues:
a. Concerned or threatened citizen
b. Emergency Management Agency
c. A first responder agency
d. The threatening person or organization

- The primary public health responder will notify Trumbull County EMA.
- The primary public health responder will notify ODH and other county health districts.
- The primary public health responder agency consults with other local, state, and federal agencies regarding Evacuation, Isolation and Quarantine, Sheltering in place, Risk of contagion, Decontamination of individuals, Specimen Collection, Prophylaxis/Vaccine, Surveillance, Public Health Advisories.
- See Trumbull County Communication Response Plan and Annex.

PUBLIC INFORMATION

- For most CBRNE events a Joint Information Center (JIC) will be established because many agencies will be responding to the incident. Each responding agency will have materials, instructions, and updates that will need to be released publicly. The JIC will coordinate this information before it is released as a way to keep the message to the public consistent. One spokesperson will be made available to address all of these issues to the media.

HEALTH DEPARTMENT RESPONSIBILITIES

A. BIOLOGICAL:
   Responsibilities:
   Public Health would be considered a lead response agency in a Biological Attack.

   - See Trumbull County Epidemiology Response Plan and Annex.

B. CHEMICAL, RADIOLOGICAL, NUCLEAR, EXPLOSIVES:
   Responsibilities:
   Public Health will play a supportive role in the response in Chemical, Radiological, Nuclear, and Explosive Incidents. First responder agencies such as Fire, Police, HazMat, EPA, etc will be the lead agencies in this type of incident.

   Public Health might provide assistance with:
   - Decontamination
   - Personnel protection equipment
   - Exposure assessment
   - Prophylaxis/vaccine use
   - Methods of collecting samples
Act as a liaison between Incident Commander and Ohio Department of Health and CDC
Provide up to date guidance on triage, infection control, and treatment to the hospitals, physicians, and EMS staff as provided by ODH/CDC.
Provide health and medical support at the any opened shelters.
Conduct surveillance and provide analysis.
Coordinate with contiguous county health departments and prepare public health information to be distributed to responders, medical professionals, and the public.
Coordinate with Red Cross for assistance with shelters

RESOURCES COORDINATION
1. Pharmaceuticals and Vaccines:
   • Public health will play a lead response role in distributing pharmaceuticals or vaccine to first responders and the public. Public Health will work in coordination with Trumbull County EMA for obtaining materials needed.
   • See the Trumbull County Public Health SNS Plan and Mass Dispensing Annex for procedures.

2. Decontamination:
   • The Trumbull County Hazmat Team will be the lead agency for decontamination. Public Health will play a supporting role, as needed.

3. Evacuation and Sheltering:
   • Red Cross and Trumbull County EMA will be the lead agencies in requesting and setting up shelters as needed during a disaster. Trumbull County Public Health will play a supporting role, as needed.
   • Health Department may dispatch sanitarians to inspect the safe habitation in the designated shelters in coordination with Red Cross.
   • Health Department may dispatch public health nurses to the shelters to provide assistance in providing the disease investigation and surveillance and administering the prophylaxis/vaccine if needed in coordination with Red Cross.
   • Medical Reserve Corps volunteers may be dispatched to assist at the Red Cross shelter.
TRUMBULL COUNTY HEALTH DEPARTMENT
BIOLOGICAL INCIDENT POLICY AND PROCEDURE

POLICY
The Trumbull County Health Department will follow CDC and ODH guidelines in handling all calls or contacts concerning the following biological agents: Anthrax, Botulism, Plague, Smallpox or potential exposures to these agents. The Trumbull County Health Commissioner or his designee will be the lead contact and PIO for the Health Department during any incidents of potential biological agent exposure.

PROCEDURE
Upon receipt of phone call, or notification of potential exposure to a biological agent, staff members receiving the call will:

1. Determine if threat is credible.

2. Instruct caller to keep substance isolated; if they have been exposed, have them wash their hands with hot soap and water. If visible product is on their clothing have them remove clothing and double bag clothing, followed by hand washing. Instruct caller to avoid further contact with the substance.

3. Complete Patient Data Collection Form for Suspected Biologic Exposure. If threat is deemed credible, local law enforcement will be notified.

4. If threat is deemed not credible, document and file complaint information.

If incident is determined a valid threat as a suspected biological agent:


2. Health Commissioner or his designee will be available to provide guidance on the need for decontamination and/or the need for chemoprophylaxis or vaccination.

3. Health Department personnel will make sure the FBI is contacted. Under PDD39, the FBI is the lead agency in the investigation of any terrorism incident.

4. If there is no actual scene, but a public health threat is believed to be imminent, the health department may be the incident commander.

5. Assure that any specimens are isolated and packaged following ODH criteria: at minimum, article(s) should be double bagged, and then placed in a rigid container labeled with the international biohazard symbol. For laboratory specimens (e.g. blood cultures), the epidemiologist or other designated personnel, will contact the hospital laboratory
involved and assure that the proper isolates are sent and that the lab is following ODH guidelines in collection and sending of isolates.

6. All unknown specimens (e.g. letter with powder, box, etc.) must be x-rayed before being sent to ODH lab.

7. Chain of custody must be maintained at all times; chain of custody forms must be completed and travel with all specimens. **See Chain of Custody Form.**

8. Health Department personnel will be responsible for tracking and follow up with any exposed individuals and/or the contacts of those exposed.

9. If individuals are hospitalized, the epidemiologist or designee will work with the hospital ICP to complete the epidemiologic investigation and follow up.

10. Trumbull County Health Department staff members will follow specific ODH and CDC guidelines for follow up and surveillance of disease specific biological exposures/diagnoses. The ODH Infectious Disease Control Manual will be used.

11. The epidemiologist or designee will follow up with contacts to assure that treatment and prophylaxis guidelines are being followed.

12. Health Department staff will notify potentially exposed individuals and advise where/when to seek treatment if not already obtained.

13. The Health Commissioner or his designee will be responsible for media contact/talking points that will be used and for all contact with the media including press releases.

14. The epidemiologist or designee will complete any Extended Investigation Forms required by the ODH or CDC.

15. A Communicable Disease Intake Form and subsequent record will be kept of all activities and maintained as a communicable disease record at the Health Department.
PATIENT DATA COLLECTION FORM
FOR SUSPECTED BIOLOGIC EXPOSURE

Name: __________________________________________________________

Birth Date _________ Age: _____

Sex: ____

Address:
__________________________________________________________________________
__________________________________________________________________________

Daytime Phone Number: (_____) __________

Evening Phone Number:(_____)_____________

Cell Phone: ___________ Pager: ___________ Fax: ___________

Contact Person: ____________________________________ Phone: (_____) ___________

Physician Name: ___________________________________ Phone: (_____) ___________

Suspected Biological Agent:

Where was your location at the time of exposure?

Approximate length of time you were in the exposed area?

Did the person seek medical attention? If so where?

Signature: ______________________________________________

Date: _______________
Maintaining chain of custody

- Chain of custody must be maintained in any specimen that is related to a potential legal or criminal investigation, such as a suspected act of terrorism.

- Custody of a sample is defined in the following ways:
  - It is in your actual possession, or
  - It is in your view, after being in your physical possession, or
  - It was in your possession and then you locked or sealed it up to prevent tampering, or
  - It is in a secure area.

- A chain-of-custody form is a document used to record the transfer, possession, and custody of samples and to ensure the integrity of samples from the time of collection through data reporting.

- Chain-of-custody procedures are used to establish the traceability of samples from the time of collection through the time of analysis. Sample identity is maintained by proper labeling. Each person involved in the chain of possession must sign a chain-of-custody form when sample custody is relinquished or received. The chain-of-custody form at a minimum will contain the following information:
  - Sample number
  - Signature of collector
  - Date and time of sample collection
  - Place and address of sample collection
  - Sample type (water, soil, air, etc.)
  - Signature of persons involved in the chain of possession
  - Inclusive dates and times of possession

- Chain-of-custody form must go to ODH with the specimen. The person relinquishing custody should make a copy of the form before releasing it to the transporting official.
Chain of Custody Form

Description of Item taken into custody: ____________________________________________
_____________________________________________________________________________

Reason for taking item into custody: ____________________________________________

<table>
<thead>
<tr>
<th></th>
<th>Person Handing over item (print &amp; sign name)</th>
<th>Telephone Number</th>
<th>Date</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Person Receiving Item (print &amp; sign name)</td>
<td>Telephone Number</td>
<td>Date</td>
<td>Time</td>
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<td>Disposition of Item</td>
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<th>Telephone Number</th>
<th>Date</th>
<th>Time</th>
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<td>Telephone Number</td>
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<td>Time</td>
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<td></td>
<td>Disposition of Item</td>
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<table>
<thead>
<tr>
<th></th>
<th>Person Handing over item (print &amp; sign name)</th>
<th>Telephone Number</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Person Receiving Item (print &amp; sign name)</td>
<td>Telephone Number</td>
<td>Date</td>
<td>Time</td>
</tr>
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<td></td>
<td>Disposition of Item</td>
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<td></td>
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<table>
<thead>
<tr>
<th></th>
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<th>Telephone Number</th>
<th>Date</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Person Receiving Item (print &amp; sign name)</td>
<td>Telephone Number</td>
<td>Date</td>
<td>Time</td>
</tr>
<tr>
<td></td>
<td>Disposition of Item</td>
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ENVIRONMENTAL HEALTH ASSESSMENT FORM FOR SHELTERS
For rapid assessment of shelter conditions during disasters

FACILITY INFORMATION

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<thead>
<tr>
<th>Location Name</th>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
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<tbody>
<tr>
<td></td>
<td>176 CHESTNUT NE</td>
<td>WARREN OH</td>
<td>44483</td>
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<table>
<thead>
<tr>
<th>Reason for Assessment</th>
<th>Type of Shelter</th>
<th>Shelter Manager</th>
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<tbody>
<tr>
<td>Preoperational</td>
<td>Evacuation</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Phone #</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>PH - 330-675-2489</td>
<td><a href="http://www.tcbh.org">www.tcbh.org</a></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Capacity</th>
<th>Number of Residents</th>
<th>Staff / Volunteers</th>
<th>Shelter Opened</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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INSPCTION INFORMATION

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<thead>
<tr>
<th>Inspector Name</th>
<th>Phone #</th>
<th>Inspection Date</th>
<th>Inspection Time</th>
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</table>

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Preparation on site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Served on site</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Safe food source</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Adequate supply</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Appropriate storage</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Appropriate temperatures (below 41; above 135)</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Hand washing facilities available &amp; stocked</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Sanitizer solution available &amp; correct concentration</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Safe food handling</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Dishwashing facilities available</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Clean kitchen area</td>
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<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Adequate/operational water supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Adequate ice supply</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Safe water source</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Safe ice source</td>
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<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Structural damage including cracks &amp; crevices</th>
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<tbody>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Security / Law Enforcement Available</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Water system operational</td>
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<tr>
<td>Yes</td>
<td>No</td>
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<td>NA</td>
<td>HVAC system operational</td>
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<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Hot water available</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Adequate ventilation</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Adequate space per person</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Free of injury / occupation hazards</td>
</tr>
<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Free of pest / vector issues</td>
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<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Electrical grid system operational</td>
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<tr>
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<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>Generator in Use? If so, type</td>
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<tr>
<td>Yes</td>
<td>No</td>
<td>Unk</td>
<td>NA</td>
<td>List indoor air temperature (°F)</td>
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NOTES

For rapid assessment of shelter conditions during disasters
## GENERAL SANITATION

<table>
<thead>
<tr>
<th>No.</th>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Adequate number of toilets</th>
<th>Toilet supplies available</th>
<th>Sewage system type</th>
<th>Adequate number of showers</th>
<th>Adequate laundry services</th>
<th>Adequate number of hand washing stations</th>
<th>Hand washing stations adequately supplied</th>
<th>Acceptable level of cleanliness</th>
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<td>On site</td>
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<td>31</td>
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<td>Unk/NA</td>
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## SOLID WASTE GENERATED

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<tr>
<th>No.</th>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Adequate number of collection receptacles</th>
<th>Appropriate separation</th>
<th>Appropriate disposal</th>
<th>Timely removal of waste</th>
<th>Appropriate storage including sharps containers</th>
<th>Types of waste generated:</th>
<th>Solid</th>
<th>Hazardous</th>
<th>Medical</th>
<th>Unk/NA</th>
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## SLEEPING AREAS

<table>
<thead>
<tr>
<th>No.</th>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Adequate number of cots / beds / mats</th>
<th>Adequate supply of bedding</th>
<th>Bedding changed regularly</th>
<th>Adequate spacing (2.5 - 3 ft between beds)</th>
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</thead>
<tbody>
<tr>
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## CHILDCARE AREA

<table>
<thead>
<tr>
<th>No.</th>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Clean diaper changing facilities</th>
<th>Hand washing facilities available</th>
<th>Safe &amp; clean toys</th>
<th>Clean food / bottle preparation area</th>
<th>Adequate child / caregiver ratio</th>
<th>Acceptable level of cleanliness</th>
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<tbody>
<tr>
<td>46</td>
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## OTHER CONSIDERATIONS

<table>
<thead>
<tr>
<th>No.</th>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Handicap accessibility</th>
<th>Designated smoking areas</th>
<th>Reported outbreaks, unusual illness / injuries</th>
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<tbody>
<tr>
<td>52</td>
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</table>

## COMPANION ANIMALS

<table>
<thead>
<tr>
<th>No.</th>
<th>Yes</th>
<th>No</th>
<th>Unk</th>
<th>NA</th>
<th>Companion animals present</th>
<th>Animal care available</th>
<th>Designated animal area</th>
<th>Animal feeding areas are separate from human feeding areas</th>
<th>Acceptable level of cleanliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
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## NOTES

Inspector: ___________________________ Signature: ___________________________ Date: ____________
Agency Rep: _________________________ Signature: ___________________________ Title: ___________________________

**ENVIRONMENTAL HEALTH ASSESSMENT FORM FOR SHELTERS**

For rapid assessment of shelter conditions during disasters

**INSTRUCTIONS AND GUIDELINES FOR COMPLETING FORM**

1. Preparation on site: self-explanatory

Revised: 8/8/2013

50 Westchester Drive
Phone: 510-444-3450
<table>
<thead>
<tr>
<th>2</th>
<th>Served on site: self-explanatory</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Safe food source: source of the food from a licensed contractor or caterer</td>
</tr>
<tr>
<td>4</td>
<td>Adequate supply: self-explanatory</td>
</tr>
<tr>
<td>5</td>
<td>Appropriate storage: food stored according to safe storage practices as required by Ohio Uniform Food Safety Code</td>
</tr>
<tr>
<td>6</td>
<td>Appropriate temperatures: below 41 or above 135</td>
</tr>
<tr>
<td>7</td>
<td>Hand washing facilities available &amp; stocked: fixed or portable are acceptable</td>
</tr>
<tr>
<td>8</td>
<td>Sanitizer solution available &amp; correct concentration: 50-100 ppm for Chlorine and 200+ ppm for Quat</td>
</tr>
<tr>
<td>9</td>
<td>Safe food handling: food handling is complaint with Ohio Uniform Food Safety Code</td>
</tr>
<tr>
<td>10</td>
<td>Dishwashing facilities available: place to wash, rinse and sanitize kitchen utensils and cooking equipment</td>
</tr>
<tr>
<td>11</td>
<td>Clean kitchen area: self-explanatory</td>
</tr>
<tr>
<td>12</td>
<td>Adequate operational water supply: drinking water: 1-2 gallons/per person/per day, for all uses 3-5 gallons/per person/per day</td>
</tr>
<tr>
<td>13</td>
<td>Adequate ice supply; ice supply sufficient to maintain cold food temperatures</td>
</tr>
<tr>
<td>14</td>
<td>Safe water source: from approved source</td>
</tr>
<tr>
<td>15</td>
<td>Structural damage including cracks &amp; crevices: note damage to physical structure (roof, windows, walls, etc)</td>
</tr>
<tr>
<td>16</td>
<td>Security/Law Enforcement Available: self explanatory</td>
</tr>
<tr>
<td>17</td>
<td>Hot water available: self-explanatory</td>
</tr>
<tr>
<td>18</td>
<td>Adequate ventilation: facility well-ventilated and free of air hazards such as smoke, fumes, etc</td>
</tr>
<tr>
<td>19</td>
<td>Adequate space person: sleeping: evac shelter 20ft² per person, post impact shelters 40ft² per person, special needs 60-100ft² per person</td>
</tr>
<tr>
<td>20</td>
<td>Free of injury / occupation hazards: general safety concerns (frayed electrical wires, carbon monoxide hazards, hazardous materials, etc)</td>
</tr>
<tr>
<td>21</td>
<td>Free of pest / vector issues: note presence of mosquitoes, fleas, flies, roaches, rodents, etc</td>
</tr>
<tr>
<td>22</td>
<td>Electrical grid system operational: self-explanatory</td>
</tr>
<tr>
<td>23</td>
<td>Generator in use: If yes, what type of generator is in use?</td>
</tr>
<tr>
<td>24</td>
<td>Adequate number of toilets: 1 operational toilet per 20 people</td>
</tr>
<tr>
<td>25</td>
<td>Adequate number of showers: 1 operational shower per 15 people</td>
</tr>
<tr>
<td>26</td>
<td>Adequate number of hand washing stations: 1 operational hand washing station per 15 people</td>
</tr>
<tr>
<td>27</td>
<td>Adequate number of collection receptacles: minimum of 1 30 gal container for every 10 people</td>
</tr>
<tr>
<td>28</td>
<td>Adequate number of cots / beds / mats: one per person</td>
</tr>
<tr>
<td>29</td>
<td>Adequate bedding for each cot, bed, or mat</td>
</tr>
<tr>
<td>30</td>
<td>Adequate spacing (2.5 - 3 ft between beds): self-explanatory</td>
</tr>
<tr>
<td>31</td>
<td>Adequate diaper-changing facilities: self-explanatory</td>
</tr>
<tr>
<td>32</td>
<td>Hand washing facilities available: self-explanatory</td>
</tr>
<tr>
<td>33</td>
<td>Safe &amp; clean toys: should adhere to applicable age group standards</td>
</tr>
<tr>
<td>34</td>
<td>Adequate frequency: self-explanatory</td>
</tr>
<tr>
<td>35</td>
<td>Adequate number of collection receptacles: minimum of 1 30 gal container for every 10 people</td>
</tr>
<tr>
<td>36</td>
<td>Adequate number of cots / beds / mats: one per person</td>
</tr>
<tr>
<td>37</td>
<td>Adequate bedding for each cot, bed, or mat</td>
</tr>
<tr>
<td>38</td>
<td>Adequate spacing (2.5 - 3 ft between beds): self-explanatory</td>
</tr>
<tr>
<td>39</td>
<td>Adequate diaper-changing facilities: self-explanatory</td>
</tr>
<tr>
<td>40</td>
<td>Hand washing facilities available: self-explanatory</td>
</tr>
<tr>
<td>41</td>
<td>Safe &amp; clean toys: should adhere to applicable age group standards</td>
</tr>
<tr>
<td>42</td>
<td>Clean food / bottle preparation area: self-explanatory</td>
</tr>
<tr>
<td>43</td>
<td>Adequate child / caregiver ratio: Infants (birth and under 12 months): 1 to 5 or 2 to 12 in same room; Infants (12 months and under 18 months): 1 to 6; Toddlers (18 months and under 2 1/2 years): 1 to 7; Toddlers (2 1/2 years and under 3 years): 1 to 8; Preschool - three years: 1 to 12; Preschool - four and five years of age: 1 to 14; School age - kindergarten to 11: 1 to 18; School age - 11 years through 14 years: 1 to 20</td>
</tr>
<tr>
<td>44</td>
<td>Handicap accessibility: self explanatory</td>
</tr>
<tr>
<td>45</td>
<td>Designated smoking areas: outside of the facility</td>
</tr>
<tr>
<td>46</td>
<td>Reported outbreaks, unusual illness / injuries: self explanatory</td>
</tr>
</tbody>
</table>

Revised: 8/8/2013
<table>
<thead>
<tr>
<th>Line</th>
<th>Text</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>Is there animal care available in the shelter for these animals? Animals have clean, fresh food and water.</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Is there a designated animal area; animals located away from people or separately housed</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Animal feeding area located away from the human feeding area: self explanatory</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Acceptable level of cleanliness: self-explanatory</td>
<td></td>
</tr>
</tbody>
</table>

Revised: 8/8/2013
State of Ohio Security Task Force
INVESTIGATION OF AN ANTHRAX INCIDENT

HANDLING SUBSTANCE

1. Do not open.
2. If opened already, do not smell, shake or taste.
3. Use one zip lock bag, and place the product in this bag. Place this bag into a second zip lock bag. If the product cannot be bagged, cover it with anything (paper, clothing, etc.) Wash your hands with plain soap and water. Anyone who has touched the suspect item must also wash his or her hands.

“Person perceives they have been threatened by ANTHRAX” (one or more of following)
1. Written note indicates anthrax?
2. Verbal threat prior to or with delivery of item?
3. Is there “product” or some visible substance present?

CALL LOCAL Law Enforcement or 9-1-1 and follow their instructions

Follow local procedures and notifications (e.g. Fire, FBI, EMS, EMA, Police, and local health department).

Criminal investigation begins.

Local authorities determine threat is NOT credible.

Local authorities determine threat IS credible.

Specimen could be tested in ODH lab on a case-by-case basis. Local officials will call ODH Infectious Disease Officer to notify. Transportation must be arranged by local law enforcement.

Contact the FBI and follow their current procedures. Initiate chain of custody and transport to the ODH Lab. Ohio State Highway Patrol may help in transport. LHD calls ODH Infectious Disease Officer.

YES, An exposure has occurred. A person may be required to follow-up with the local health department and his/her private physician. This includes all responders.

NO, exposure has not occurred. No threat to public health.

Dispose in regular trash in double bag.

Dispose in regular trash in double bag.

Local officials use the following to help determine if an exposure has occurred. Contact local health department if in doubt.

Exposure may include (any/all):
1. Dissemination device was activated that forced product into air.
2. Product was inhaled deeply (probably with severe coughing).
3. Product landed on an open wound or an opening in the skin.
ANTHRAX
(Malignant Edema, Malignant Pustule, Woolsorter's Disease, Charbon, Ragpicker's Disease)

REPORTING INFORMATION

- **Class A:** Report immediately via telephone the case or suspected case and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report immediately via telephone to the local public health department in which the reporting health care provider or laboratory is located. Local public health departments should report immediately via telephone the case or suspected case and/or a positive laboratory result to the Ohio Department of Health (ODH). For the local health department, cases should also be entered into the Ohio Disease Reporting System (ODRS) within 24 hours of the initial telephone report to ODH.
- **Reporting Form(s) and/or Mechanism:**
  - Immediate telephone reporting is required.
  - The local health department should enter the case into the Ohio Disease Reporting System (ODRS) within 24 hours after the telephone report.
- **Additional reporting information, with specifics regarding the key fields for ODRS Reporting can be located in Section 7.**

AGENT
*Bacillus anthracis*, a Gram-positive, encapsulated, spore-forming, non-motile rod. This organism is found in a vegetative state in humans and animals. When exposed to air, it forms spores which are highly resistant to physical and chemical agents. The spores live for years in contaminated soils.

CASE DEFINITION

**Clinical Description**

Cutaneous Anthrax: An acute illness or post-mortem examination revealing a painless skin lesion developing over 2 to 6 days from a papular through a vesicular stage into a depressed black eschar with surrounding edema. Fever, malaise and lymphadenopathy may accompany the lesion.

Inhalation Anthrax: An acute illness or post-mortem examination revealing a prodrome resembling a viral respiratory illness, followed by hypoxia, dyspnea or acute respiratory distress with resulting cyanosis and shock. Radiological evidence of mediastinal widening or pleural effusion is common.

Gastrointestinal Anthrax: An acute illness or post-mortem examination revealing severe abdominal pain and tenderness, nausea, vomiting, hematemesis, bloody diarrhea, anorexia, fever, abdominal swelling and septicemia.

Oropharyngeal Anthrax: An acute illness or post-mortem examination revealing a painless mucosal lesion in the oral cavity or oropharynx, with cervical adenopathy, edema, pharyngitis, fever, and possibly septicemia.

Meningeal Anthrax: An acute illness or post-mortem examination revealing fever, convulsions, coma, or meningeal signs. Signs of another form will likely be evident as this syndrome is usually secondary to the above syndromes.
Case Classification

**Suspect:** An illness suggestive of one of the known anthrax clinical forms. No definitive, presumptive, or suggestive laboratory evidence of *B. anthracis*, or epidemiologic evidence relating it to anthrax.

**Probable:** A clinically compatible illness that does not meet the confirmed case definition, but with one of the following:
- Epidemiological link to a documented anthrax environmental exposure;
- Evidence of *B. anthracis* DNA (for example, by LRN-validated polymerase chain reaction) in clinical specimens collected from a normally sterile site (such as blood or CSF) or lesion of other affected tissue (skin, pulmonary, reticuloendothelial, or gastrointestinal);
- Positive result on testing of clinical serum specimens using the Quick ELISA Anthrax-PA kit;
- Detection of Lethal Factor (LF) in clinical serum specimens by LF mass spectrometry;
- Positive result on testing of culture from clinical specimens with the RedLine Alert test.

**Confirmed:** A clinically compatible illness with one of the following:
- Culture and identification of *B. anthracis* from clinical specimens by the Laboratory Response Network (LRN);
- Demonstration of *B. anthracis* antigens in tissues by immunohistochemical staining using both *B. anthracis* cell wall and capsule monoclonal antibodies;
- Evidence of a four-fold rise in antibodies to protective antigen between acute and convalescent sera or a fourfold change in antibodies to protective antigen in paired convalescent sera using Centers for Disease Control and Prevention (CDC) quantitative anti-PA IgG ELISA testing;
- Documented anthrax environmental exposure AND evidence of *B. anthracis* DNA (for example, by LRN-validated polymerase chain reaction) in clinical specimens collected from a normally sterile site (such as blood or CSF) or lesion of other affected tissue (skin, pulmonary, reticuloendothelial, or gastrointestinal).

SIGNS AND SYMPTOMS

See case definition. Cutaneous anthrax is the most common form. The mortality rate is 5%-20% in untreated patients. Inhalation anthrax can present as respiratory distress with fever and shock. The mortality rate in inhalation anthrax is 80%-100%. Intestinal anthrax rarely occurs, but when it does, it usually manifests as explosive outbreaks of violent gastroenteritis with vomiting and bloody stools. The mortality rate is 25%-75%.

DIAGNOSIS

All specimens are sent to the ODH Laboratory, which will then forward them to CDC, as necessary.

Serology

EITB is available through the Centers for Disease Control and Prevention (CDC). This requires 2cc serum. Acute serum may be submitted singly or acute and convalescent sera (taken two weeks apart) may be submitted paired.

Culture and Isolation

Isolation of the organism from lesions, blood or discharges. Organism isolation can be done at ODHL. Immunofluorescence studies are done at CDC. For blood isolation, collect 10 cc of blood in a sterile red-topped tube. For cutaneous lesions use two dry sterile
swabs. Soak both swabs in the clear serous fluid of the lesion or ring of lesions. If the lesion has a black eschar, slightly moisten both swabs in sterile saline or broth and rotate carefully under the edge of the eschar to avoid its detachment from the skin.

Swab 1 - Immediately prepare a smear for gram stain and another for DFA. Air-dry both smears and gently heat-fix both.
Swab 2 - Place in a dry sterile tube or silica gel pack (as is used for strep).
Transport all specimens by messenger at ambient temperatures to ODHL.

EPIDEMIOLOGY
Source
Infected animals, contaminated animal products or environmental contamination by spores from these sources.

Occurrence
Worldwide, but primarily in enzootic areas in developing countries among those individuals who work with livestock, eat insufficiently cooked meat from infected animals, or work in establishments where wool, goatskins and pelts are processed. In the United States, human anthrax is rare, with only one to two human cases reported annually. The last case in Ohio was reported in 1964. In 2001, an intentional release of anthrax spores through the U.S. postal system resulted in 11 cutaneous and 11 inhalational cases.

Mode of Transmission
Cutaneous anthrax is contracted by direct contact with contaminated animal tissues, pelts, wool or fur. Inhalation anthrax results from inhalation of spores from contaminated wool or pelts and the intestinal form is acquired from eating contaminated meat or animal byproducts. Transmission between humans is unusual. Insects can act as mechanical vectors. *Bacillus anthracis* is a biologic warfare agent and potential terrorist weapon, as it can be aerosolized to expose large groups of people via inhalation.

Period of Communicability
Articles and soil contaminated with spores can remain infective for decades.

Incubation Period
From 1-7 days; incubation period of up to 60 days is possible.

PUBLIC HEALTH MANAGEMENT
Case
Investigation
Search for history of exposure to infected animals, contact or employment in industry working with hides, pelts, bone meal or other animal products. If there are multiple cases, consider terrorist activity.

Treatment
Ciprofloxacin is recommended. If the isolate is susceptible, doxycycline and amoxicillin are acceptable alternatives.

Isolation and Follow-up Specimens
There is no isolation requirement. Convalescent serum specimen 14 -35 days after acute specimen.
Public Health Significance
Person-to-person transmission is not common. Important to identify source, if possible, as others may have similar contact (work or home) and may also contract disease. Spores remain viable for decades in soil. If bioterrorism is suspected, post-exposure prophylaxis may be recommended for persons who may have been exposed to the spores. Post-exposure prophylaxis would include antimicrobials (such as ciprofloxacin or doxycycline) and possibly anthrax vaccine. Please note that there is an existing standing medical order issued by the Director of the Ohio Department of Health for Ohio local health departments in an emergency situation to dispense prophylactic antibiotics and to provide anthrax vaccine to persons with known or suspected exposure to \textit{Bacillus anthracis}. For further details, see http://www.odh.ohio.gov/pdf/idcm/btstandorders.pdf.

Contacts
Depending on the type of anthrax case (cutaneous, pulmonary, intestinal or oropharyngeal) and case history, look for others with similar exposure in family, co-workers, or community.

Prevention and Control
Educate workers handling potentially contaminated materials. Control dust in hazardous industries. Disinfect wool, bonemeal, and other animal products before processing. Consult state public health officials for advice on disposal of contaminated carcasses.

Source Investigation
In animal product manufacturing plants, follow-up cultures may be done. If an animal is involved, contact the Ohio Department of Agriculture, Division of Animal Industry, 8995 East Main Street, Reynoldsburg, Ohio 43068, 614-728-6220 or 800-300-9755.

Vaccination
For persons at high risk, such as veterinarians or workers handling potentially contaminated raw materials, a vaccine is available. This is obtained from CDC as needed or from Emergent BioSolutions, 2273 Research Boulevard, Suite 400; Rockville, MD 20850 Tel: 866-300-7602. In addition, Anthrax vaccine absorbed (AVA) may become available from CDC under an Emergency Use Authorization for post-exposure prophylaxis in a potential bioterrorism situation. For livestock vaccination recommendations, contact the Ohio Department of Agriculture.
What is anthrax?
Anthrax is an infection caused by a bacterial organism called *Bacillus anthracis*. The disease can be spread between animals and humans, but most people and animals become ill from exposure to soil containing spores where animals with anthrax have died. The recent use of anthrax by terrorists and the possibility of spreading anthrax for the purpose of warfare have increased the public's awareness of this disease.

Although anthrax can be found anywhere in the world, it is most common in the developing countries of South and Central America, Eastern Europe, Asia, Africa, the Caribbean and the Middle East. Anthrax is also present in the Western United States which is where human cases of anthrax typically occur. Ohio is not endemic for Anthrax.

Who can get anthrax?
Anthrax is typically a disease of sheep, cattle, horses, goats, and swine; but humans and other mammals can also become infected.

How is anthrax transmitted?
The bacterium exists in the soil in the form of spores. Spores are inactive forms of the bacteria that can survive for decades. Humans and other animals can become infected through contact with infectious spores from animals, animal hide, or contaminated environments. It cannot spread from person to person.

There are three types of anthrax in humans caused by different routes of infection.
- Inhalation anthrax is caused by breathing in airborne spores
- Cutaneous anthrax is caused by touching the spores (soil, animal fur, etc)
- Gastrointestinal anthrax is caused by eating undercooked animal meat or other animal byproducts containing anthrax spores

How long after exposure before symptoms appear?
The first symptoms usually occur within seven days, but typically within 48 hours.

What are the symptoms of anthrax?
Symptoms of disease vary depending on how the disease was contracted.

Cutaneous: Most anthrax infections occur when the bacterium enters a cut or abrasion. Skin infection begins as a raised itchy bump that resembles an insect bite but within 1-2 days develops into a small blister and then a painless ulcer, usually 1-3 cm in diameter, with a characteristic black area in the center. Lymph glands in the adjacent area may swell. About 20% of untreated cases of cutaneous anthrax will result in death. Deaths are rare with appropriate antimicrobial therapy.

Inhalation: Initial symptoms may resemble a common cold. After several days, the symptoms may progress to severe breathing problems and shock. Inhalation anthrax is usually fatal.
Intestinal: The intestinal disease form of anthrax may follow the consumption of contaminated meat and is characterized by inflammation of the intestinal tract. Initial signs of nausea, loss of appetite, vomiting, fever are followed by abdominal pain, vomiting of blood, and severe diarrhea. Intestinal anthrax results in death in 25% to 60% of cases.

How is anthrax diagnosed?
Anthrax is diagnosed by isolating *B. anthracis* from the blood, skin lesions, or respiratory secretions or by measuring specific antibodies in the blood of persons with suspected cases.

How is anthrax treated?
Anthrax can be treated with antibiotics. The earlier anthrax is treated, the higher the chances of recovery. If left untreated, anthrax can be fatal.

Is there a vaccine for anthrax?
There are effective vaccines for both animals and humans. In the United States these are recommended only for military personnel and those who have an increased occupational risk of exposure.

How can I prevent anthrax?
- When visiting countries where anthrax is common, humans should avoid contact with livestock and animal products.
- Avoid eating meat that has not been properly slaughtered and cooked.
- Do not open suspicious looking mail or packages

For more information visit these websites.

FACT SHEET

Anthrax: What You Need To Know

What Is Anthrax?
Anthrax is a serious disease caused by *Bacillus anthracis*, a bacterium that forms spores. A bacterium is a very small organism made up of one cell. Many bacteria can cause disease. A spore is a cell that is dormant (asleep) but may come to life with the right conditions.

There are three types of anthrax:
- skin (cutaneous)
- lungs (inhalation)
- digestive (gastrointestinal)

How Do You Get It?
Anthrax is not known to spread from one person to another.

**Anthrax from animals.** Humans can become infected with anthrax by handling products from infected animals or by breathing in anthrax spores from infected animal products (like wool, for example). People also can become infected with gastrointestinal anthrax by eating undercooked meat from infected animals.

**Anthrax as a weapon.** Anthrax also can be used as a weapon. This happened in the United States in 2001. Anthrax was deliberately spread through the postal system by sending letters with powder containing anthrax. This caused 22 cases of anthrax infection.

How Dangerous Is Anthrax?
The Centers for Disease Control and Prevention classifies agents with recognized bioterrorism potential into three priority areas (A, B and C). Anthrax is classified as a Category A agent. Category A agents are those that:
- pose the greatest possible threat for a bad effect on public health
- may spread across a large area or need public awareness
- need a great deal of planning to protect the public’s health

In most cases, early treatment with antibiotics can cure cutaneous anthrax. Even if untreated, 80 percent of people who become infected with cutaneous anthrax do not die. Gastrointestinal anthrax is more serious because between one-fourth and more than half of cases lead to death. Inhalation anthrax is much more severe. In 2001, about half of the cases of inhalation anthrax ended in death.

What Are the Symptoms?
The symptoms (warning signs) of anthrax are different depending on the type of the disease:

- **Cutaneous:** The first symptom is a small sore that develops into a blister. The blister then develops into a skin ulcer with a black area in the center. The sore, blister and ulcer do not hurt.
- **Gastrointestinal:** The first symptoms are nausea, loss of appetite, bloody diarrhea, and fever, followed by bad stomach pain.
Anthrax: What You Need To Know
(continued from previous page)

- Inhalation: The first symptoms of inhalation anthrax are like cold or flu symptoms and can include a sore throat, mild fever and muscle aches. Later symptoms include cough, chest discomfort, shortness of breath, tiredness and muscle aches. (Caution: Do not assume that just because a person has cold or flu symptoms that they have inhalation anthrax.)

How Soon Do Infected People Get Sick?
Symptoms can appear within 7 days of coming in contact with the bacterium for all three types of anthrax. For inhalation anthrax, symptoms can appear within a week or can take up to 42 days to appear.

How Is Anthrax Treated?
Antibiotics are used to treat all three types of anthrax. Early identification and treatment are important.

Prevention after exposure. Treatment is different for a person who is exposed to anthrax, but is not yet sick. Health-care providers will use antibiotics (such as ciprofloxacin, levofloxacin, doxycycline, or penicillin) combined with the anthrax vaccine to prevent anthrax infection.

Treatment after infection. Treatment is usually a 60-day course of antibiotics. Success depends on the type of anthrax and how soon treatment begins.

Can Anthrax Be Prevented?
Vaccination. There is a vaccine to prevent anthrax, but it is not yet available for the general public. Anyone who may be exposed to anthrax, including certain members of the U.S. armed forces, laboratory workers, and workers who may enter or re-enter contaminated areas, may get the vaccine. Also, in the event of an attack using anthrax as a weapon, people exposed would get the vaccine.

What Should I Do if I Think I Have Anthrax?
If you are showing symptoms of anthrax infection, call your health-care provider right away.

What Should I Do if I Think I Have Been Exposed to Anthrax?
Contact local law enforcement immediately if you think that you may have been exposed to anthrax. This includes being exposed to a suspicious package or envelope that contains powder.

What Is CDC Doing To Prepare For a Possible Anthrax Attack?
CDC is working with state and local health authorities to prepare for an anthrax attack. Activities include:
- Developing plans and procedures to respond to an attack using anthrax.
- Training and equipping emergency response teams to help state and local governments control infection, gather samples, and perform tests. Educating health-care providers, media, and the general public about what to do in the event of an attack.
- Working closely with health departments, veterinarians, and laboratories to watch for suspected cases of anthrax. Developing a national electronic database to track potential cases of anthrax.
- Ensuring that there are enough safe laboratories for quickly testing of suspected anthrax cases.
- Working with hospitals, laboratories, emergency response teams, and health-care providers to make sure they have the supplies they need in case of an attack.

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

- **Class A (foodborne):** Report immediately via telephone the case or suspected case and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report immediately via telephone to the local public health department in which the reporting health care provider or laboratory is located. Local health departments report to the Ohio Department of Health (ODH) at 614-722-7221.

- **Class B2 (infant and wound):** Report by the end of the business week in which the case or suspected case presents and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report to the local public health department in which the reporting health care provider or laboratory is located.

- Reporting Form(s) and/or Mechanism:
  - Foodborne cases: Immediately via telephone.
  - Infant and Wound cases: *Ohio Confidential Reportable Disease form* (HEA 3334, rev. 1/09), *Positive Laboratory Findings for Reportable Disease form* (HEA 3333, rev. 8/05), the local health department via the Ohio Disease Reporting System (ODRS), or the telephone.

- Additional reporting information, with specifics regarding the key fields for ODRS Reporting can be located in Section 7.

AGENT

A potent neurotoxin produced from *Clostridium botulinum*, and rare strains of *C. butyricum* and *C. baratii*, which are anaerobic, spore-forming bacteria.

CASE DEFINITION

Botulism, Foodborne

**Clinical Description**

Ingestion of botulinum toxin results in an illness of variable severity. Common symptoms are diplopia, blurred vision and bulbar weakness. Symmetric paralysis may progress rapidly.

**Laboratory Criteria for Diagnosis**

- Detection of botulinum toxin in serum, stool or patient’s food or
- Isolation of *Clostridium botulinum* from stool.

**Case Classification**

- **Suspect:** A clinically compatible case that is not yet laboratory confirmed with a plausible epidemiologic link that has not been confirmed.

- Probable: A clinically compatible illness with an epidemiologic link (e.g. ingestion of a home-canned food within the previous 48 hours).

- **Confirmed:** A clinically compatible illness that is laboratory confirmed or that occurs among persons who ate the same food as persons who have laboratory-confirmed botulism.

- **Not a Case:** This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.
* This case classification can be used for initial reporting purposes to ODH as CDC has not developed a classification.

**Botulism, Infant**

**Clinical Description**
An illness of infants, characterized by constipation, poor feeding and “failure to thrive” that may be followed by progressive weakness, impaired respiration and death.

**Laboratory Criteria for Diagnosis**
- Detection of botulinum toxin in stool or serum or
- Isolation of *Clostridium botulinum* from stool.

**Case Classification**
- **Suspect**: A clinically compatible illness reported by a health care provider without laboratory results.
- **Confirmed**: A clinically compatible illness that is laboratory-confirmed, occurring in a child aged <1 year.
- **Not a Case**: This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

* This case classification can be used for initial reporting purposes to ODH as CDC has not developed a classification.

**Botulism, Wound**

**Clinical Description**
An illness resulting from toxin produced by *Clostridium botulinum* that has infected a wound. Common symptoms are diplopia, blurred vision and bulbar weakness. Symmetric paralysis may progress rapidly.

**Laboratory Criteria for Diagnosis**
- Detection of botulinum toxin in serum or
- Isolation of *C. botulinum* from wound.

**Case Classification**
- **Probable**: A clinically compatible case in a patient who has no suspected exposure to contaminated food and who has either a history of a fresh, contaminated wound during the 2 weeks before onset of symptoms, or a history of injection drug use within the 2 weeks before onset of symptoms
- **Confirmed**: A clinically compatible illness that is laboratory confirmed in a patient who has no suspected exposure to contaminated food and who has a history of a fresh, contaminated wound during the two weeks before onset of symptoms.
- **Not a Case**: This status will not generally be used when reporting a case, but may be used to reclassify a report if investigation revealed that it was not a case.

**Botulism, Other Intestinal Colonization**

**Clinical Description**
See Botulism, Foodborne.
Laboratory Criteria for Diagnosis
- Detection of botulinum toxin in clinical specimen, or
- Isolation of Clostridium botulinum from clinical specimen

Case Classification

Suspect*: A clinically compatible illness reported by a health care provider without laboratory results.

Confirmed: A clinically compatible case that is laboratory-confirmed in a patient aged greater than or equal to 1 year who has no history of ingestion of suspect food and has no wounds.

* This case classification can be used for initial reporting purposes to ODH as CDC has not developed a classification.

SIGNS AND SYMPTOMS

Foodborne, Wound and Other Botulism
Initial complaints can include gastrointestinal symptoms (vomiting, diarrhea, abdominal pain), ptosis (droopy eyelids), visual difficulty (blurred or double vision), dry mouth, sore throat and dysphagia (difficulty swallowing). Paralysis can occur and continue for days or weeks. Fever is absent. Respiratory failure can also occur.

Infant Botulism
Infant botulism is a novel form of human botulism in which ingested spores of Clostridium botulinum colonize and grow in the infant's large intestine and produce botulinum neurotoxin in it. The action of the toxin in the body produces constipation, weakness (notably of gag, cry, suck and swallow), loss of muscle tone, and ultimately, flaccid ("limp") paralysis. Affected infants have difficulty feeding and often, breathing. However, in the absence of complications, patients recover completely from the disease.

DIAGNOSIS

Botulism is frequently misdiagnosed, most often as a polyradiculoneuropathy (Guillain-Barre or Miller-Fisher syndrome), myasthenia gravis, or other diseases of the central nervous system. In the United States, botulism is more likely than Guillain-Barre syndrome, chemical poisoning, or poliomyelitis to cause a cluster of cases of acute flaccid paralysis. Botulism differs from other flaccid paralyses in that it always manifests initially with prominent cranial paralysis and its invariable descending progression, in its symmetry, and in its absence of sensory nerve damage. The initial diagnosis is based on clinical symptoms. Treatment should not wait for laboratory confirmation.

Electromyography (EMG) may be helpful in diagnosis. A normal Tensilon test helps to differentiate botulism from myasthenia gravis; borderline positive tests can occur in botulism. Normal CTs and MRIs help to rule out CVA.

Laboratory confirmation is done by demonstrating the presence of toxin in serum, stool, or food, or by culturing C. botulinum from stool, a wound or food. Contact the ODH Outbreak Response and Bioterrorism Investigation Team (ORBIT) at 614-995-5599 (Monday – Friday; 8 AM – 5 PM) to arrange for specimen testing. The ODH Laboratory performs testing for botulinum. Contact the ODH Laboratory at 888-ODH-LABS (888-634-5227) (Monday – Friday; 8 AM – 5 PM) for specimen submission criteria. After-hours, weekends or holidays contact the infectious disease on-call duty officer (ID-on-Call) at 614-722-7221.
Specimen quantities needed:

- Serum: 10-15 ml (minimum of 2 ml, when necessary)
- Stool*: 25-50g or 20 ml for toxin testing; 1 g for culture
- Food: 25 g

* If an enema must be given because of constipation, a minimal amount of fluid (preferably sterile, nonbacteriostatic water) should be used to obtain the specimen so that the toxin will not be unnecessarily diluted.

*Campylobacter* is the most common identified infection preceding Guillain-Barre Syndrome (GBS). If a suspect botulism patient had diarrhea concurrent with or prior to onset of neurologic symptoms, consider culturing a stool sample for *Campylobacter*. Ideally, this should be done at the hospital, but stool in Cary Blair transport media can be submitted to ODH Lab; call ORBIT (614-995-5599) to make arrangements for testing at ODH Lab. For further information about Guillain-Barre Syndrome, see: [http://www.ninds.nih.gov/disorders/gbs/detail_gbs.htm](http://www.ninds.nih.gov/disorders/gbs/detail_gbs.htm)

**EPIDEMIOLOGY**

**Source**

*Clostridium botulinum* is ubiquitous and has been found in soil, sea sediment and the intestinal tracts of animals, including fish.

Foodborne botulism is an intoxication that results from the ingestion of preformed toxin in inadequately preserved, stored or prepared food. The most common food sources in the United States are low-acid home-canned fruits and vegetables. Meats and meat products are more commonly implicated in Europe, as are fish in Japan.

The sources of spores for infants include dust and honey. Light and dark corn syrups may also contain botulinum spores, but at much lower frequencies.

**Occurrence**

Worldwide. Sporadic cases, family and general foodborne outbreaks occur where food products are prepared or preserved by methods, which do not destroy botulinum spores and permit toxin formation. The actual incidence and distribution of infant botulism is unknown.

**Mode of Transmission**

*Foodborne:* ingestion of food containing pre-formed toxin.

*Wound:* contamination of a wound in which anaerobic conditions develop.

*Infant:* ingestion of spores which colonize the intestines and produce toxin (adults with special bowel problems are susceptible to “infant type” botulism). Honey may be implicated as the source of the spores.

Botulism is not transmitted person-to-person.

**Period of Communicability**

Botulinum toxin and organisms can be excreted in the feces for weeks to months after the onset of illness; however, secondary person-to-person transmission has not been documented.

**Incubation Period**

The incubation period for foodborne botulism ranges from 6 hours to 14 days, although it is usually 12-36 hours. For wound botulism, it is 4-14 days between the time of injury and the onset of symptoms. The incubation period for infant botulism is unknown (since...
it cannot be determined precisely when the infant ingested the causal botulinum spores).

PUBLIC HEALTH MANAGEMENT

Case
Botulism is a public health emergency. Prompt diagnosis and early treatment of botulism are essential to minimize the otherwise great risk of death. Prompt epidemiologic investigation is critical to prevent further cases from occurring if a hazardous food is still available for consumption. Contact the local health department and ODH ORBIT immediately by telephone 614-722-7221. ODH will notify CDC and facilitate consultation. If antitoxin is indicated, CDC will arrange for shipment directly to the attending physician. The local health department should investigate to determine the source of toxin and public health impact.

Treatment
Clinical diagnosis of botulism is confirmed by specialized laboratory testing that often requires days to complete. Routine laboratory test results are usually unremarkable. Therefore, clinical diagnosis is the foundation for early recognition of and response to a suspected cases of botulism. All treatment and management decisions should be made based on clinical diagnosis.

Foodborne, Wound, Other (Intestinal Colonization of Adults)
If diagnosed early, foodborne and wound botulism can be treated with an antitoxin which blocks the action of the botulinum toxin circulating in the blood. Intravenous botulinum antitoxin, available from the Centers for Disease Control and Prevention (CDC), is administered after testing for hypersensitivity to equine sera. Antitoxin can prevent the disease from worsening, but recovery still is gradual over many weeks. Botulinum antitoxin (an equine product) has rarely been used for treating infant botulism, because of the risk of sensitization or anaphylaxis. Purgation and high enemas are recommended if the patient’s gastrointestinal tract is not atonic. For wound botulism, debridement and drainage are performed and appropriate antibiotics administered.

Infant
Infant botulism may be treated with Botulism Immune Globulin Intravenous (Human) (BIG-IV), which was licensed by the United States Food and Drug Administration on October 23, 2003 under the proprietary name of BabyBIG®. The California Department of Health Services (CDHS) is the sponsor and national distributor of BabyBIG®, which may be obtained through the California Infant Botulism Treatment and Prevention Program (IBTPP) by contacting 510-231-7600. (Botulinum antitoxin [an equine product] has rarely been used for treating infant botulism, because of the risk of sensitization or anaphylaxis.)

The respiratory failure and paralysis that occur with severe botulism might require intensive medical and nursing care with the patient on a ventilator for weeks. After several weeks, the paralysis slowly improves.

Isolation
Botulism is not transmitted person-to-person. Medical personnel caring for patients with suspected botulism should use standard precautions (hand washing, eye protection, gown). Patients with suspected botulism do not need to be isolated, but those with flaccid paralysis from suspected meningitis require droplet precautions.

Contacts
ODH-IDCM   BOTULISM Page 5/Section 3   Revised 7/2011
Induced vomiting, gastric lavage, rapid purgation and high enemas facilitate elimination of toxin in persons known to have eaten incriminated food. With infant botulism, searching for other causes to rule out foodborne botulism is important. Exposed persons should be kept under close medical observation.

**Follow-up Specimens**
After investigation of the food histories of ill persons, suspected foods should be recovered for appropriate testing and subsequent disposal.

**Public Health Significance**
Suspicion of a single case of botulism should raise the question of a group outbreak involving a family or others who have shared a common food. Home-preserved foods or time-temperature abused commercial products should be the prime suspects until ruled out, although widely distributed commercially preserved foods are occasionally implicated and pose a far greater threat to the public health.

**Prevention and Control**
Education to improve home canning methods should be promoted. The exact time, temperature and pressure required to destroy spores varies with the food being processed. Bulging containers should not be opened and foods with strange odors should not be consumed or taste-tested. Commercial cans with bulging lids should be returned unopened to the vendor. Foods (e.g. soups) intended to be refrigerated, then heated should not be stored at room temperature before heating.

Since honey and possibly corn syrup appear to be risk factors for infant botulism, honey and corn syrup should not be fed to infants, especially those <6 months old. Handling diapers containing feces should be followed by careful hand washing at all times.
What is botulism?
Botulism is a rare but serious paralytic illness caused by a nerve toxin that is produced by the bacterium Clostridium botulinum and sometimes by strains of Clostridium butyricum and Clostridium baratii. There are five main kinds of botulism. Foodborne botulism is caused by eating foods that contain the botulinum toxin. Wound botulism is caused by toxin produced from a wound infected with Clostridium botulinum. Infant botulism is caused by consuming the spores of the botulinum bacteria, which then grow in the intestines and release toxin. Adult intestinal toxemia (adult intestinal colonization) botulism is a very rare kind of botulism that occurs among adults by the same route as infant botulism. Lastly, iatrogenic botulism can occur from accidental overdose of botulinum toxin. All forms of botulism can be fatal and are considered medical emergencies. Foodborne botulism is a public health emergency because many people can be poisoned by eating a contaminated food.

What kind of germ is Clostridium botulinum?
Clostridium botulinum is the name of a group of bacteria commonly found in soil. These rod-shaped organisms grow best in low oxygen conditions. The bacteria form spores, which allow them to survive in a dormant state until exposed to conditions that can support their growth. There are seven types of botulism toxin designated by the letters A through G; only types A, B, E and F cause illness in humans.

How common is botulism?
In the United States, an average of 145 cases are reported each year. Of these, approximately 15% are foodborne botulism, 65% are infant botulism, and 20% are wound botulism. Adult intestinal colonization and iatrogenic botulism also occur, but rarely. Outbreaks of foodborne botulism involving two or more persons occur most years and are usually caused by home-canned foods. Most wound botulism cases are associated with black-tar heroin injection, especially in California.

What are the symptoms of botulism?
The classic symptoms of botulism include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth and muscle weakness. Infants with botulism appear lethargic, feed poorly, are constipated, and have a weak cry and poor muscle tone. These are all symptoms of the muscle paralysis caused by the bacterial toxin. If untreated, these symptoms may progress to cause paralysis of the arms, legs, trunk and respiratory muscles. In foodborne botulism, symptoms generally begin 18 to 36 hours after eating a contaminated food, but they can occur as early as 6 hours or as late as 10 days.

How is botulism diagnosed?
Physicians may consider the diagnosis if the patient’s history and physical examination suggest botulism. However, these clues are usually not enough to allow a diagnosis of botulism. Other diseases such as Guillain-Barré syndrome, stroke and myasthenia gravis can appear similar to botulism, and special tests may be needed to exclude these other conditions. These tests may include a brain scan, spinal fluid examination, nerve conduction test (electromyography or EMG) and a tensilon test for myasthenia gravis. The most direct way to confirm the diagnosis is to demonstrate the botulinum toxin in the patient’s serum or stool by injecting serum or stool into mice and looking for signs of botulism. The bacteria can also be isolated from the stool of persons with foodborne and infant botulism. These tests can be performed at some state health department laboratories and at CDC.
How can botulism be treated?
The respiratory failure and paralysis that occur with severe botulism may require a patient to be on a breathing machine (ventilator) for weeks, plus intensive medical and nursing care. After several weeks, the paralysis slowly improves. If diagnosed early, foodborne and wound botulism can be treated with an antitoxin which blocks the action of toxin circulating in the blood. This can prevent patients from worsening, but recovery still takes many weeks. Physicians may try to remove contaminated food still in the gut by inducing vomiting or by using enemas. Wounds should be treated, usually surgically, to remove the source of the toxin-producing bacteria. Good supportive care in a hospital is the mainstay of therapy for all forms of botulism.

Currently, antitoxin is not routinely given for treatment of infant botulism. Infant botulism may be treated with Botulism Immune Globulin Intravenous (Human) (BIG-IV), also known as BabyBIG®.

Are there complications from botulism?
Botulism can result in death due to respiratory failure. However, in the past 50 years the proportion of patients with botulism who die has fallen from about 50% to 3-5%. A patient with severe botulism may require a breathing machine, as well as intensive medical and nursing care for several months. Patients who survive an episode of botulism poisoning may have fatigue and shortness of breath for years and long-term therapy may be needed to aid recovery.

How can botulism be prevented?
Botulism can be prevented. Foodborne botulism has often been from home-canned foods with low acid content, such as asparagus, green beans, beets and corn. However, outbreaks of botulism have been linked to more unusual sources such as chopped garlic in oil, chile peppers, tomatoes, improperly handled baked potatoes wrapped in aluminum foil, and home-canned or fermented fish. Persons who do home canning should follow strict hygienic procedures to reduce contamination of foods. Oils infused with garlic or herbs should be refrigerated. Potatoes which have been baked while wrapped in aluminum foil should be kept hot until served or refrigerated. Because the botulism toxin is destroyed by high temperatures, persons who eat home-canned foods should consider boiling the food for 10 minutes before eating it to ensure safety. Instructions on safe home canning can be obtained from county extension services or from the US Department of Agriculture. Because honey can contain spores of Clostridium botulinum and this has been a source of infection for infants, children less than 12 months old should not be fed honey. Honey is safe for persons 1 year of age and older. Wound botulism can be prevented by promptly seeking medical care for infected wounds and by not using injectable street drugs.

What are public health agencies doing to prevent or control botulism?
Public education about botulism prevention is an ongoing activity. Information about safe canning is widely available for consumers. State health departments and CDC have persons knowledgeable about botulism available to consult with physicians 24 hours a day. If antitoxin is needed to treat a patient, it can be quickly delivered to a physician anywhere in the country. Suspected outbreaks of botulism are quickly investigated, and if they involve a commercial product, the appropriate control measures are coordinated among public health and regulatory agencies. Physicians should report suspected cases of botulism to the local health department and local health departments should report suspected cases to the Ohio Department of Health.
PLAGUE
(Black Death)

REPORTING INFORMATION
• Class A: Report immediately via telephone the case or suspected case and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report immediately via telephone to the local public health department in which the reporting health care provider or laboratory is located. Local public health departments should report immediately via telephone the case or suspected case and/or a positive laboratory result to the Ohio Department of Health (ODH). Cases should also be entered into the Ohio Disease Reporting System (ODRS) within 24 hours of the initial telephone report to ODH.
• Reporting Form(s) and/or Mechanism:
  o Immediate telephone reporting is required.
  o For the local health department, the Ohio Disease Reporting System (ODRS) after the initial telephone report.
  o The Centers for Disease Control and Prevention (CDC) Plague Case Investigation Report (CDC 56.37, 02/2006) is required for completion by the local health department. Information collected from the form should be entered into ODRS and faxed to ODH, Outbreak Response & Bioterrorism Investigation team at 614-564-2456. The mailing address for this form is: ODH, Outbreak Response & Bioterrorism Investigation Team, ODH, 246 N. High St, Columbus, OH 43215.
• Additional reporting information, with specifics regarding the key fields for ODRS reporting can be located in Section 7.

AGENT
Yersinia pestis, the plague bacillus, gram-negative coccobacillus, enterobacteriaceae
Infectious Dose: a single bite of an infectious flea. Each bite releases several thousand plague bacilli from the gut of the flea. Inhalation of a droplet of infectious mucous from a pneumonic plague patient.

CASE DEFINITION
Clinical Description
Plague is transmitted to humans by fleas or by direct exposure to infected tissues or respiratory droplets; the disease is characterized by fever, chills, headache, malaise, prostration, and leukocytosis that manifests in one or more of the following principal clinical forms:
• Regional lymphadenitis (bubonic plague)
• Septicemia without an evident bubo (septicemic plague)
• Plague pneumonia, resulting from hematogenous spread in bubonic or septicemic cases (secondary pneumonic plague) or inhalation of infectious droplets (primary pneumonic plague)
• Pharyngitis and cervical lymphadenitis resulting from exposure to larger infectious droplets or ingestion of infected tissues (pharyngeal plague)

Laboratory criteria for diagnosis
Presumptive:
• Elevated serum antibody titer(s) to Yersinia pestis fraction 1 (F1) antigen (without documented fourfold or greater change) in a patient with no history of plague
vaccination or

• Detection of F1 antigen in a clinical specimen by fluorescent assay.

**Confirmatory:**

• Isolation of *Yersinia pestis* from a clinical specimen or
• A fourfold or greater change in serum antibody to *Y. pestis* F1 antigen.

**Case Classification**

**Suspect:** A clinically compatible case without presumptive or confirmatory laboratory results.

**Probable:** A clinically compatible case with presumptive laboratory results.

**Confirmed:** A clinically compatible case with confirmatory laboratory results.

**SIGNS AND SYMPTOMS**

Bubonic plague accounts for 90% - 95% of cases. Lymphadenopathy and fever with malaise, nausea, vomiting, and diarrhea characterize bubonic plague. Involvement of the lungs results in the very rare but highly contagious pneumonic form. Untreated bubonic plague has a case fatality rate of 50% - 60%; for untreated pneumonic plague, the rate is nearly 100%.

**DIAGNOSIS**

Appropriate specimens should be examined for evidence of plague if a person resides in, or has a recent travel history to, plague-infected areas; has been bitten by fleas; and presents with symptoms suggestive of plague (fever, lymphadenopathy). Specimens should be obtained from appropriate sites for isolating the bacteria. The preferred specimen for microscopic examination and isolation from a bubonic case is material from the affected bubo, which should contain numerous organisms. Blood cultures should be taken whenever possible. Specimens intended for culture should be taken **before** initiation of antibiotic treatment.

Evaluation of clinical specimens (e.g. CSF, bubo aspirates) by FA, and antibody testing (ELISA serology) is available at the CDC. Proper protocol is to send the serum or other sample(s) to CDC through the ODH Laboratory (ODHL). Call ODHL, 1-888-ODH-LABS (888-634-5227) select option #2- Microbiology, to arrange for shipment of serum or other specimens to CDC.

**EPIDEMIOLOGY**

**Source**

Plague is a worldwide zoonosis involving mammals and their fleas. Endemic foci persist in Africa, Asia, South America, and the western United States.

**Occurrence**

Endemic plague has not been reported from Ohio. Human plague in the United States has occurred as mostly scattered cases in rural areas (an average of 10 to 15 persons each year). Approximately 90% of these are reported from New Mexico, Arizona, California, and Colorado.

**Mode of Transmission**

The pneumonic form is spread through airborne droplets. The bubonic form is
transmitted through the bite of an infected flea and by handling infected tissues.

**Period of Communicability**
Bubonic plague is not transmitted person-to-person. The pneumonic form is highly contagious. There is no carrier state.

**Incubation Period**
Ranges from less than a day to 7 days.

**PUBLIC HEALTH MANAGEMENT**

**Case Investigation**
Plague should be considered in the febrile patient who has a history of travel to endemic areas, especially during the summer months (June to September). Travel history and contacts should be determined for the two weeks prior to the onset of illness. Complete the *Plague Case Investigation Report (CDC 56.37, 02/2006)* and fax to ODH- ORBIT 614-564-2456.

**Treatment**
Parenteral forms of the antimicrobials streptomycin or gentamicin are recommended, but a number of other antimicrobials are also effective.

**Isolation and Follow-up Specimens**
The Ohio Administrative Code (OAC 3701-3-13, (S)) states that “a person with plague shall be placed in droplet isolation until completion of forty-eight hours of effective antimicrobial therapy”. Cases of pneumonic plague should be held in strict respiratory isolation. Bubonic cases with no cough and a negative chest X-ray need only mask and gown isolation precautions. One serum specimen should be taken as early in the illness as possible to be followed by a second sample 1-4 months after antibiotic therapy has ceased.

**Public Health Significance**
High, especially for pneumonic plague, which is highly contagious. If bioterrorism is suspected, post-exposure prophylaxis may be recommended for persons who may have been exposed to the bacteria. Please note that there is an existing standing medical order issued by the Director of the Ohio Department of Health for Ohio local health departments in an emergency situation to dispense prophylactic antibiotics to persons with known or suspected exposure to *Yersinia pestis*. For further details, see [http://www.odh.ohio.gov/pdf/idcm/btstandorders.pdf](http://www.odh.ohio.gov/pdf/idcm/btstandorders.pdf).

**Contacts**
Persons exposed to plague patients who have pneumonia or to *Yersinia pestis* aerosols in the laboratory should be given 7 to 10 days course of antimicrobial therapy regardless of vaccination history.

**Prevention and Control**

**Travelers**
Travelers to western states (especially New Mexico and Arizona) should be warned to avoid handling living or dead wild animals and their fleas and to stay away from burrows. Gloves should be worn when skinning animals. Pets should be restrained and not allowed contact with wild rodents. Fleas should be controlled. Dogs and cats should
not be fed raw rodents or rabbit meat. Rodent infestation should be discouraged around houses and yards. Insect repellents should be used to prevent flea bites; follow label instructions and avoid overuse.

**Vaccination**
Plague vaccine is no longer commercially available. Vaccination against plague is not required by any country as a condition for entry. Vaccine has not been available since the mid 1990’s when the manufacturer stopped production due to the short period of effectiveness and many side effects.

**SPECIAL INFORMATION**
Plague is a candidate for acts of biological terrorism, especially due to the high contagious potential of the pneumonic form of the disease.


What is plague?
Plague is a bacterial disease that affects man and animals, especially rodents. Fleas pass the bacteria from animal to animal through their bites. Plague can exist in different forms and infected people may require strict isolation and disinfection procedures.

Millions of people in Europe died from plague in the Middle Ages, when human homes and places of work were inhabited by flea-infested rats. Today, the disease is relatively rare but can still be found in South America, Africa, Asia, and the southwestern United States. Globally, the World Health Organization receives reports of 1,000-3,000 cases of plague each year. The U.S. reports an average of 10-15 cases per year. There have been no reports of human plague acquired in Ohio.

How is plague spread?
The most common means of transmission is through the bite of infected fleas. Fleas become infected by feeding on rodents, such as the chipmunks, prairie dogs, ground squirrels, mice and rats. Cats have occasionally been diagnosed with plague.

Other important sources include the handling of tissues from infected animals (especially rabbits or rodents), airborne droplets from humans or household pets with plague pneumonia, and laboratory exposure.

Can anyone get plague?
Yes, but people living, working or visiting areas with infected rodents are at greater risk. Cats from endemic areas have also passed the disease to their owners and veterinarians.

What are the symptoms of plague?
The initial symptoms include inflamed and tender lymph glands in the body near where the infected flea bit the person, fever, chills, headache, and extreme exhaustion. The disease may progress to a generalized blood infection. Some cases also develop pneumonia. People with pneumonic plague may transmit the disease to other people when coughing. About 14% of all plague cases in the U.S. are fatal.

How soon do symptoms occur?
Symptoms usually begin within one to seven days after exposure to the plague bacteria.

How is plague diagnosed?
Laboratory tests can be performed on blood, sputum or fluid from a lymph node.

Does past infection with plague make a person immune?
Immunity after plague recovery is variable, and may not provide complete protection.

What is the treatment for plague?
Persons with plague should be hospitalized and medically isolated. Several antibiotics, including streptomycin, are effective in treating this disease.
Frequently Asked Questions About Plague

What is plague?
Plague is a disease caused by *Yersinia pestis* (*Y. pestis*), a bacterium found in rodents and their fleas in many areas around the world.

Why are we concerned about pneumonic plague as a bioweapon?
*Yersinia pestis* used in an aerosol attack could cause cases of the pneumonic form of plague. One to six days after becoming infected with the bacteria, people would develop pneumonic plague. Once people have the disease, the bacteria can spread to others who have close contact with them. Because of the delay between being exposed to the bacteria and becoming sick, people could travel over a large area before becoming contagious and possibly infecting others. Controlling the disease would then be more difficult. A bioweapon carrying *Y. pestis* is possible because the bacterium occurs in nature and could be isolated and grown in quantity in a laboratory. Even so, manufacturing an effective weapon using *Y. pestis* would require advanced knowledge and technology.

Is pneumonic plague different from bubonic plague?
Yes. Both are caused by *Yersinia pestis*, but they are transmitted differently and their symptoms differ. Pneumonic plague can be transmitted from person to person; bubonic plague cannot. Pneumonic plague affects the lungs and is transmitted when a person breathes in *Y. pestis* particles in the air. Bubonic plague is transmitted through the bite of an infected flea or exposure to infected material through a break in the skin. Symptoms include swollen, tender lymph glands called buboes. Buboes are not present in pneumonic plague. If bubonic plague is not treated, however, the bacteria can spread through the bloodstream and infect the lungs, causing a secondary case of pneumonic plague.

What are the signs and symptoms of pneumonic plague?
Patients usually have fever, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum. Nausea, vomiting, and abdominal pain may also occur. Without early treatment, pneumonic plague usually leads to respiratory failure, shock, and rapid death.

How do people become infected with pneumonic plague?
Pneumonic plague occurs when *Yersinia pestis* infects the lungs. Transmission can take place if someone breathes in *Y. pestis* particles, which could happen in an aerosol release during a bioterrorism attack. Pneumonic plague is also transmitted by breathing in *Y. pestis* suspended in respiratory droplets from a person (or animal) with pneumonic plague. Respiratory droplets are spread most readily by coughing or sneezing. Becoming infected in this way usually requires direct and close (within 6 feet) contact with the ill person or animal. Pneumonic plague may also occur if a person with bubonic or septicemic plague is untreated and the bacteria spread to the lungs.

Does plague occur naturally?
Yes. The World Health Organization reports 1,000 to 3,000 cases of plague worldwide every year. An average of 5 to 15 cases occur each year in the western United States. These cases are usually scattered and occur in rural to semi-rural areas. Most cases are of the bubonic form of the disease. Naturally occurring pneumonic plague is uncommon, although small outbreaks do occur. Both types of plague are readily controlled by standard public health response measures.

Can a person exposed to pneumonic plague avoid becoming sick?
Yes. People who have had close contact with an infected person can greatly reduce the chance of
Frequently Asked Questions About Plague
(continued from previous page)

becoming sick if they begin treatment within 7 days of their exposure. Treatment consists of taking antibiotics for at least 7 days.

How quickly would someone get sick if exposed to plague bacteria through the air?
Someone exposed to *Yersinia pestis* through the air—either from an intentional aerosol release or from close and direct exposure to someone with plague pneumonia—would become ill within 1 to 6 days.

Can pneumonic plague be treated?
Yes. To prevent a high risk of death, antibiotics should be given within 24 hours of the first symptoms. Several types of antibiotics are effective for curing the disease and for preventing it. Available oral medications are a tetracycline (such as doxycycline) or a fluoroquinolone (such as ciprofloxacin). For injection or intravenous use, streptomycin or gentamicin antibiotics are used. Early in the response to a bioterrorism attack, these drugs would be tested to determine which is most effective against the particular weapon that was used.

Would enough medication be available in the event of a bioterrorism attack involving pneumonic plague?
National and state public health officials have large supplies of drugs needed in the event of a bioterrorism attack. These supplies can be sent anywhere in the United States within 12 hours.

What should someone do if they suspect they or others have been exposed to plague?
Get immediate medical attention: To prevent illness, a person who has been exposed to pneumonic plague must receive antibiotic treatment without delay. If an exposed person becomes ill, antibiotics must be administered within 24 hours of their first symptoms to reduce the risk of death. Notify authorities: Immediately notify local or state health departments so they can begin to investigate and control the problem right away. If bioterrorism is suspected, the health departments will notify the CDC, FBI, and other appropriate authorities.

How can the general public reduce the risk of getting pneumonic plague from another person or giving it to someone else?
If possible, avoid close contact with other people. People having direct and close contact with someone with pneumonic plague should wear tightly fitting disposable surgical masks. If surgical masks are not available, even makeshift face coverings made of layers of cloth may be helpful in an emergency. People who have been exposed to a contagious person can be protected from developing plague by receiving prompt antibiotic treatment.

How is plague diagnosed?
The first step is evaluation by a health worker. If the health worker suspects pneumonic plague, samples of the patient’s blood, sputum, or lymph node aspirate are sent to a laboratory for testing. Once the laboratory receives the sample, preliminary results can be ready in less than two hours. Confirmation will take longer, usually 24 to 48 hours.

How long can plague bacteria exist in the environment?
*Yersinia pestis* is easily destroyed by sunlight and drying. Even so, when released into air, the bacterium will survive for up to one hour, depending on conditions.

Is a vaccine available to prevent pneumonic plague?
Currently, no plague vaccine is available in the United States. Research is in progress, but we are not likely to have vaccines for several years or more.

For more information, visit [www.bt.cdc.gov/agent/plague](http://www.bt.cdc.gov/agent/plague), or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).
SMALLPOX FACT SHEET

Smallpox Overview

The Disease
Smallpox is a serious, contagious, and sometimes fatal infectious disease. There is no specific treatment for smallpox disease, and the only prevention is vaccination. The name smallpox is derived from the Latin word for “spotted” and refers to the raised bumps that appear on the face and body of an infected person.

There are two clinical forms of smallpox. Variola major is the severe and most common form of smallpox, with a more extensive rash and higher fever. There are four types of variola major smallpox: ordinary (the most frequent type, accounting for 90% or more of cases); modified (mild and occurring in previously vaccinated persons); flat; and hemorrhagic (both rare and very severe). Historically, variola major has an overall fatality rate of about 30%; however, flat and hemorrhagic smallpox usually are fatal. Variola minor is a less common presentation of smallpox, and a much less severe disease, with death rates historically of 1% or less.

Smallpox outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally occurring case in the world was in Somalia in 1977. After the disease was eliminated from the world, routine vaccination against smallpox among the general public was stopped because it was no longer necessary for prevention.

Where Smallpox Comes From
Smallpox is caused by the variola virus that emerged in human populations thousands of years ago. Except for laboratory stockpiles, the variola virus has been eliminated. However, in the aftermath of the events of September and October, 2001, there is heightened concern that the variola virus might be used as an agent of bioterrorism. For this reason, the U.S. government is taking precautions for dealing with a smallpox outbreak.

Transmission
Generally, direct and fairly prolonged face-to-face contact is required to spread smallpox from one person to another. Smallpox also can be spread through direct contact with infected bodily fluids or contaminated objects such as bedding or clothing. Rarely, smallpox has been spread by virus carried in the air in enclosed settings such as buildings, buses, and trains. Humans are the only natural hosts of variola. Smallpox is not known to be transmitted by insects or animals.

A person with smallpox is sometimes contagious with onset of fever (prodrome phase), but the person becomes most contagious with the onset of rash. At this stage the infected person is usually very sick and not able to move around in the community. The infected person is contagious until the last smallpox scab falls off.
# Smallpox Disease

<table>
<thead>
<tr>
<th>Incubation Period (Duration: 7 to 17 days)</th>
<th>Exposure to the virus is followed by an incubation period during which people do not have any symptoms and may feel fine. This incubation period averages about 12 to 14 days but can range from 7 to 17 days. During this time, people are not contagious.</th>
</tr>
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<tbody>
<tr>
<td><strong>Not contagious</strong></td>
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<tr>
<th>Initial Symptoms <em>(Prodrome)</em> (Duration: 2 to 4 days)</th>
<th>The <em>first symptoms</em> of smallpox include fever, malaise, head and body aches, and sometimes vomiting. The fever is usually high, in the range of 101 to 104 degrees Fahrenheit. At this time, people are usually too sick to carry on their normal activities. This is called the <em>prodrome</em> phase and may last for 2 to 4 days.</th>
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<tbody>
<tr>
<td><strong>Sometimes contagious</strong></td>
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<tr>
<th>Early Rash (Duration: about 4 days)</th>
<th>A rash emerges first as small red spots on the tongue and in the mouth. These spots develop into sores that break open and spread large amounts of the virus into the mouth and throat. At this time, the person becomes most contagious.</th>
</tr>
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<tbody>
<tr>
<td><strong>Most contagious</strong></td>
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</table>

**Rash distribution:**

![Smallpox vs Chickenpox](image)

- **Smallpox**
- **Chickenpox**

<table>
<thead>
<tr>
<th>Pustular Rash (Duration: about 5 days)</th>
<th>The bumps become pustules—sharply raised, usually round and firm to the touch as if there’s a small round object under the skin. People often say the bumps feel like BB pellets embedded in the skin.</th>
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<td><strong>Contagious</strong></td>
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<tr>
<th>Pustules and Scabs (Duration: about 5 days)</th>
<th>The pustules begin to form a crust and then scab. By the end of the second week after the rash appears, most of the sores have scabbed over.</th>
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<td><strong>Contagious</strong></td>
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<tr>
<th>Resolving Scabs (Duration: about 6 days)</th>
<th>The scabs begin to fall off, leaving marks on the skin that eventually become pitted scars. Most scabs will have fallen off three weeks after the rash appears. The person is contagious to others until all of the scabs have fallen off.</th>
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<tbody>
<tr>
<td><strong>Contagious</strong></td>
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</table>

<table>
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<tr>
<th>Scabs resolved</th>
<th>Scabs have fallen off. Person is no longer contagious.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Not contagious</strong></td>
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</tbody>
</table>

*Smallpox may be contagious during the *prodrome* phase, but is most infectious during the first 7 to 10 days following rash onset.

For more information, visit [www.cdc.gov/smallpox](http://www.cdc.gov/smallpox), or call CDC at 800-CDC-INFO (English and Spanish) or 888-232-6348 (TTY).

August 9, 2004
SMALLPOX

REPORTING INFORMATION

- **Class A:** *Report immediately via telephone* the case or suspected case and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report immediately via telephone to the local public health department in which the reporting health care provider or laboratory is located.

  - Reporting Form(s) and/or Mechanism: *Immediately via telephone.*
  - Smallpox outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally occurring case in the world was in Somalia in 1977. Thus, if a suspected smallpox case is identified, it is an international epidemiologic emergency.
  - The Centers for Disease Control and Prevention (CDC) has several resources (e.g. algorithms for evaluating patients for smallpox, worksheet to collect clinical information to classify the risk of smallpox using CDC criteria) to assist public health and clinicians in the evaluation of a febrile, rash-illness patient for the likelihood of smallpox. These can be located at the following Web site: [http://www.bt.cdc.gov/agent/smallpox/diagnosis/](http://www.bt.cdc.gov/agent/smallpox/diagnosis/).
  - Additional reporting information, with specifics regarding the key fields for ODRS Reporting can be located in Section 7.

AGENT

Variola virus, a species of *Orthopoxvirus.*

CASE DEFINITION

This case definition came from the CDC ([http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/smallpoxcurrent.htm](http://www.cdc.gov/osels/ph_surveillance/nndss/casedef/smallpoxcurrent.htm))

Clinical Case Definition

An illness with acute onset of fever ≥101°F (≥38.3°C) followed by a rash characterized by firm, deep seated vesicles or pustules in the same stage of development without other apparent cause. Clinically consistent cases are those presentations of smallpox that do not meet this classical clinical case definition: a) hemorrhagic type, b) flat type, and c) *variola sine eruptione.* (Detailed clinical description is available on the CDC Web site: [http://www.bt.cdc.gov/agent/smallpox/index.asp](http://www.bt.cdc.gov/agent/smallpox/index.asp)).

Laboratory criteria for diagnosis

- Polymerase chain reaction (PCR) identification of variola DNA in a clinical specimen, or
- Isolation of smallpox (variola) virus from a clinical specimen (Level D laboratory only; confirmed by variola PCR).

Note: Indications for laboratory testing of patients with suspected smallpox should be followed as described in detail in Guide A of the CDC Smallpox Response Plan ([http://www.bt.cdc.gov/agent/smallpox/response-plan/](http://www.bt.cdc.gov/agent/smallpox/response-plan/)). Laboratory diagnostic testing for variola virus should be conducted in Level C or D laboratories only. Specimen collection, packaging and transport to CDC must be coordinated with the ODH Laboratory. A chain of custody form should accompany the specimen(s). Contact the
ODH Laboratory at 614-728-0544 (Monday – Friday; 8 AM – 5 PM) for CDC specimen submission criteria.

**Case Classification***

*Suspected:* A case with a generalized, acute vesicular or pustular rash illness with fever preceding development of rash by 1-4 days.

*Probable:* A case that meets the clinical case definition, or a clinically consistent case that does not meet the clinical case definition and has an epidemiological link to a confirmed case of smallpox.

*Confirmed:* case of smallpox that is laboratory confirmed, or a case that meets the clinical case definition that is epidemiologically linked to a laboratory confirmed case.

*Exclusion Criteria:* A case may be excluded as a suspect or probable smallpox case if an alternative diagnosis fully explains the illness or appropriate clinical specimens are negative for laboratory criteria for smallpox.

**SIGNS AND SYMPTOMS**

Onset is sudden, with fever, malaise, headache, severe backache, prostration and occasionally abdominal pain. After two to four days the temperature falls and a rash appears, passing through several stages (e.g. macular, papular, pustular, crusting), and finally forming scabs which fall off at the end of the third or fourth week; fever usually intensifies as the rash progresses to the pustular stage. The lesions form initially on the face and are most profuse there, followed closely by the arms and legs, with relatively fewer lesions on the trunk (centrifugal distribution).

**DIAGNOSIS**

The CDC has several resources to assist public health and clinicians in the evaluation of a febrile, rash-illness patient for the likelihood of smallpox. These can be located at the following web site: [http://www.bt.cdc.gov/agent/smallpox/diagnosis/](http://www.bt.cdc.gov/agent/smallpox/diagnosis/). The tools include algorithms for evaluating patients for smallpox and a worksheet to collect clinical information to classify the risk of smallpox using CDC criteria.

**EPIDEMIOLOGY**

**Source**

Humans were the only reservoir. Now, only laboratory specimens remain.

**Occurrence**

Formerly worldwide; currently eradicated. The last naturally acquired case in the world was in Somalia in 1977.

**Mode of Transmission**

Smallpox is transmitted person-to-person through contact with the respiratory discharges and the skin lesions of patients. Although droplet spread is the major mode of person-to-person smallpox transmission, airborne transmission through fine particle aerosol can occur. Smallpox may also be transmitted by contact with items (e.g. bed linens, clothing) that have been recently contaminated by respiratory secretions or smallpox skin lesions.
Period of Communicability
Communicable from a few days before the lesions appear until disappearance of all scabs, which usually occurs about three weeks after the onset of the rash. Permanent immunity usually follows recovery.

Incubation Period
After exposure, it takes between 7 and 19 days for symptoms of smallpox to appear (average incubation time is 12 to 14 days).

PUBLIC HEALTH MANAGEMENT
Case Investigation
Any suspected case constitutes a public health emergency. The patient should be kept in strict isolation in a private, negative airflow room with airborne and contact precautions.

Isolation
The Ohio Administrative Code (OAC 3701-3-13, (Y)) states that “a person with confirmed or suspected smallpox shall be placed in airborne isolation in a facility designated by the director. The patient’s release from the facility can occur when all scabs have fallen off.”

Contacts
All face-to-face contacts should be vaccinated and placed in quarantine for 19 days after their last contact with a smallpox case. In a large outbreak due to bioterrorism, exposed persons could be placed under surveillance in their home. These persons would take their temperature daily during this period and a fever greater than 101°F would suggest smallpox. These persons would then be isolated until a smallpox diagnosis has been confirmed or ruled-out.

Prevention and Control
Prompt investigation to determine the source of infection is of great importance. A ring of vaccination should be formed around the case.

Special Information
The vaccine has no other medical indication or use and is no longer commercially available.
Disease Fact Sheet

Smallpox

What are the symptoms of smallpox?
The symptoms of smallpox begin with high fever, head and body aches, and sometimes vomiting. A rash follows that spreads and progresses to raised bumps and pus-filled blisters that crust, scab, and fall off after about three weeks, leaving a pitted scar.

If someone comes in contact with smallpox, how long does it take to show symptoms?
After exposure, it takes between 7 and 19 days for symptoms of smallpox to appear (average incubation time is 12 to 14 days). During this time, the infected person feels fine and is not contagious.

Is smallpox fatal?
The majority of patients with smallpox recover, but death may occur in up to 30% of cases. Many smallpox survivors have permanent scars over large areas of their body, especially their face. Some are left blind.

How is smallpox spread?
Smallpox normally spreads from contact with infected persons. Generally, direct and fairly prolonged face-to-face contact is required to spread smallpox from one person to another. Smallpox also can be spread through direct contact with infected bodily fluids or contaminated objects such as bedding or clothing. Indirect spread is less common. Rarely, smallpox has been spread by virus carried in the air in enclosed settings such as buildings, buses, and trains. Smallpox is not known to be transmitted by insects or animals.

If smallpox is released in aerosol form, how long does the virus survive?
The smallpox virus is fragile. In laboratory experiments, 90% of aerosolized smallpox virus dies within 24 hours; in the presence of ultraviolet (UV) light, this percentage would be even greater. If an aerosol release of smallpox occurs, 90% of virus matter will be inactivated or dissipated in about 24 hours.

How many people would have to get smallpox before it is considered an outbreak?
One confirmed case of smallpox is considered a public health emergency, as the disease was eradicated in 1979. The virus only exists in a few labs worldwide.

Is smallpox contagious before the smallpox symptoms show?
A person with smallpox is sometimes contagious with onset of fever (prodrome phase), but the person becomes most contagious with the onset of rash. The infected person is contagious until the last smallpox scab falls off.

Is there any treatment for smallpox?
Smallpox can be prevented through use of the smallpox vaccine. There is no proven treatment for smallpox, but research to evaluate new antiviral agents is ongoing. Early results from laboratory studies suggest that the drug cidofovir may fight against the smallpox virus; currently, studies with animals are being done to better understand the drug's ability to treat smallpox disease (the use of cidofovir to treat smallpox or smallpox reactions should be evaluated and monitored by experts at NIH and CDC). Patients with smallpox can benefit from supportive therapy (e.g. intravenous fluids, medicine to control fever or pain) and antibiotics for any secondary bacterial infections that may occur.
FACT SHEET

Key Facts About Tularemia

This fact sheet provides important information that can help you recognize and get treated for tularemia. For more detailed information, please visit the Centers for Disease Control and Prevention (CDC) Tularemia Web site (www.bt.cdc.gov/agent/tularemia).

What is Tularemia?

Tularemia is a potentially serious illness that occurs naturally in the United States. It is caused by the bacterium *Francisella tularensis* found in animals (especially rodents, rabbits, and hares).

What are the Symptoms of Tularemia?

Symptoms of tularemia could include:
- sudden fever
- chills
- headaches
- diarrhea
- muscle aches
- joint pain
- dry cough
- progressive weakness

People can also catch pneumonia and develop chest pain, bloody sputum and can have trouble breathing and even sometimes stop breathing.

Other symptoms of tularemia depend on how a person was exposed to the tularemia bacteria. These symptoms can include ulcers on the skin or mouth, swollen and painful lymph glands, swollen and painful eyes, and a sore throat.

How Does Tularemia Spread?

People can get tularemia many different ways:
- being bitten by an infected tick, deerfly or other insect
- handling infected animal carcasses
- eating or drinking contaminated food or water
- breathing in the bacteria, *F. tularensis*

Tularemia is not known to be spread from person to person. People who have tularemia do not need to be isolated. People who have been exposed to the tularemia bacteria should be treated as soon as possible. The disease can be fatal if it is not treated with the right antibiotics.

How Soon Do Infected People Get Sick?

Symptoms usually appear 3 to 5 days after exposure to the bacteria, but can take as long as 14 days.
Key Facts About Tularemia  
(continued from previous page)

**What Should I Do if I Think I Have Tularemia?**

Consult your doctor at the first sign of illness. Be sure to let the doctor know if you are pregnant or have a weakened immune system.

**How Is Tularemia Treated?**

Your doctor will most likely prescribe antibiotics, which must be taken according to the directions supplied with your prescription to ensure the best possible result. Let your doctor know if you have any allergy to antibiotics.

A vaccine for tularemia is under review by the Food and Drug Administration and is not currently available in the United States.

**What Can I Do To Prevent Becoming Infected with Tularemia?**

Tularemia occurs naturally in many parts of the United States. Use insect repellent containing DEET on your skin, or treat clothing with repellent containing permethrin, to prevent insect bites. Wash your hands often, using soap and warm water, especially after handling animal carcasses. Be sure to cook your food thoroughly and that your water is from a safe source.

Note any change in the behavior of your pets (especially rodents, rabbits, and hares) or livestock, and consult a veterinarian if they develop unusual symptoms.

**Can Tularemia Be Used As a Weapon?**

*Francisella tularensis* is very infectious. A small number (10-50 or so organisms) can cause disease. If *F. tularensis* were used as a weapon, the bacteria would likely be made airborne for exposure by inhalation. People who inhale an infectious aerosol would generally experience severe respiratory illness, including life-threatening pneumonia and systemic infection, if they are not treated. The bacteria that cause tularemia occur widely in nature and could be isolated and grown in quantity in a laboratory, although manufacturing an effective aerosol weapon would require considerable sophistication.

**What is CDC Doing About Tularemia?**

The CDC operates a national program for bioterrorism preparedness and response that incorporates a broad range of public health partnerships. Other things CDC is doing include:

- Stockpiling antibiotics to treat infected people
- Coordinating a nation-wide program where states share information about tularemia
- Creating new education tools and programs for health professionals, the public, and the media.

For more information, visit [www.bt.cdc.gov/agent/tularemia](http://www.bt.cdc.gov/agent/tularemia), or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (Español), or (866) 874-2646 (TTY)
VIRAL HEMORRHAGIC FEVER
(VHF)

REPORTING INFORMATION

• **Class A:** *Report immediately via telephone* the case or suspected case and/or a positive laboratory result to the local public health department where the patient resides. If patient residence is unknown, report immediately via telephone to the local public health department in which the reporting health care provider or laboratory is located.

• **Reporting Form(s) and/or Mechanism:**
  - Immediately via telephone.
  - For local health departments, cases should also be entered into the Ohio Disease Reporting System (ODRS) within 24 hours of the initial telephone report to the Ohio Department of Health (ODH).

• Additional reporting information, with specifics regarding the key fields for ODRS Reporting can be located in Section 7.

AGENTS AND DISEASES

Viral hemorrhagic fevers (VHFs) refer to a group of illnesses that are caused by several distinct families of viruses. In general, the term "viral hemorrhagic fever" is used to describe a severe multi-organ system syndrome. The three most common VHFs are Ebola hemorrhagic fever, Lassa fever and Marburg hemorrhagic fever.

Ebola hemorrhagic fever is a severe, often-fatal disease inhumans and nonhuman primates (monkeys, gorillas, and chimpanzees) that has appeared sporadically since its initial recognition in 1976. The disease is caused by infection with Ebola virus, named after a river in the Democratic Republic of the Congo (formerly Zaire) in Africa, where it was first recognized. The virus is one of two members of a family of RNA viruses called the Filoviridae.

Lassa fever is an acute viral illness that occurs in West Africa. The illness was discovered in 1969 when two missionary nurses died in Nigeria. The cause of the illness was found to be Lassa virus, named after the town in Nigeria where the first cases originated. The virus, a member of the virus family Arenaviridae, is a single-stranded RNA virus and is zoonotic. In areas of Africa where the disease is endemic, Lassa fever is a significant cause of morbidity and mortality. It is mild or has no observable symptoms in about 80% of people infected with the virus; the remaining 20% have a severe multi-system disease. Lassa fever is also associated with occasional epidemics, during which the case-fatality rate can reach 50%.

Marburg hemorrhagic fever is a rare, severe type of hemorrhagic fever which affects both humans and non-human primates. Caused by a genetically unique zoonotic RNA virus of the family Filoviridae, its recognition led to the creation of this virus family. The four species of Ebola virus are the only other known members of the family Filoviridae. Marburg virus was first recognized in 1967, when outbreaks of hemorrhagic fever occurred simultaneously in laboratories in Marburg and Frankfurt, Germany and in Belgrade, Yugoslavia (now Serbia). A total of 37 people became ill, including laboratory workers as well as several medical personnel and family members who had cared for them. The first people infected had been exposed to African green monkeys or their tissues. In Marburg, the monkeys had been imported for research and to prepare polio vaccine.

CASE DEFINITION

**Clinical Description**

An illness with acute onset with ALL of the following clinical findings:
• A fever > 40°C
• One of more of the following clinical findings:
  o Severe headache
  o Muscle pain
  o Erythematous maculopapular rash on the trunk with fine desquamation 3-4 days after rash onset
  o Vomiting
  o Diarrhea
  o Pharyngitis (arenavirus only)
  o Abdominal pain
  o Bleeding not related to injury
  o Retrosternal chest pain (arenavirus only)
  o Proteinuria (arenavirus only)
  o Thrombocytopenia

Laboratory Criteria for Diagnosis
One or more of the following laboratory findings:
• Detection of VHF viral antigens in blood by enzyme-linked Immunosorbent Assay (ELISA) antigen detection
• VHR viral isolation in cell culture for blood or tissues
• Detection of VHF-specific genetic sequence by Reverse Transcription-Polymerase Chain Reaction (RT-PCR) from blood or tissues
• Detection of VHF viral antigens in tissues by immunohistochemistry

Criteria for Epidemiologic Linkage
One or more of the following exposures within the 3 weeks before onset of symptoms:
• Contact with blood or other body fluids of a patient with VHF
• Residence in or travel to a VHF endemic area
• Work in a laboratory that handles VHF specimens
• Work in a laboratory that handles bats, rodents, or primates from endemic areas
• Exposure to semen from a confirmed acute or convalescent case of VHF within 10 weeks of that person's onset of symptoms

Case Classification
Suspect: Case meets the clinical and epidemiologic linkage criteria.

Confirmed: Case meets the clinical and laboratory criteria.

Comment: VHF refers to viral hemorrhagic fever caused by either Ebola, Lassa, Lujo, or Marburg virus, a new world arenavirus, or Crimean-Congo hemorrhagic fever.

SIGNS AND SYMPTOMS
Ebola hemorrhagic fever symptoms include abrupt onset of fever, headache, joint and muscle aches, sore throat, and weakness, followed by diarrhea, vomiting, and stomach pain. A rash, red eyes, hiccups and internal and external bleeding may be seen in some patients.

Because the symptoms of Lassa fever are so varied and nonspecific, clinical diagnosis is often difficult. Symptoms include fever, retrosternal pain, sore throat, back pain, cough, abdominal pain, vomiting, diarrhea, conjunctivitis, facial swelling, proteinuria and mucosal bleeding. Neurologic problems have also been described, including hearing loss, tremors and encephalitis.
Marburg hemorrhagic fever onset is sudden and is marked by fever, chills, headache, and myalgia. Around the fifth day after the onset of symptoms, a maculopapular rash, most prominent on the trunk, may appear. Nausea, vomiting, chest pain, sore throat, abdominal pain and diarrhea then may appear. Symptoms become increasingly severe and may include jaundice, pancreatitis, severe weight loss, delirium, shock, liver failure, massive hemorrhage and multi-organ dysfunction. Because many of the signs and symptoms of Marburg hemorrhagic fever are similar to those of other infectious diseases, such as malaria or typhoid fever, diagnosis of the disease can be difficult, especially if only a single case is involved.

**DIAGNOSIS**
Ebola hemorrhagic fever is diagnosed through virus isolation, antigen-capture enzyme-linked immunosorbent assay (ELISA) testing, IgM ELISA and polymerase chain reaction (PCR). Virus isolation can be used to diagnose a case of Ebola HF within a few days of the onset of symptoms. Persons tested later in the course of the disease or after recovery can be tested for IgM and IgG antibodies. The disease can also be diagnosed retrospectively in deceased patients using immunohistochemistry testing, virus isolation, or PCR.

Lassa fever is most often diagnosed by using ELISA, which detects IgM and IgG antibodies as well as Lassa antigen. The virus itself may be cultured within 7 to 10 days. Immunohistochemistry performed on tissue specimens can be used to make a post-mortem diagnosis. The virus can also be detected by reverse transcription-polymerase chain reaction (RT-PCR); however, this method is primarily a research tool.

ELISA testing, IgM-capture ELISA, PCR, and virus isolation can be used to confirm a case of Marburg hemorrhagic fever within a few days of the onset of symptoms. The IgG-capture ELISA is appropriate for testing persons later in the course of disease or after recovery. The disease is readily diagnosed by immunohistochemistry, virus isolation, or PCR of blood or tissue specimens from deceased patients.

Do not attempt to culture any specimens. The Special Pathogens Branch at CDC works with Biosafety Level 4 (BSL-4) viruses. These viruses are highly pathogenic and require handling in special laboratory facilities designed to contain them. The hospital should be instructed to hold on to any blood, serum, CSF, respiratory secretions and other tissue collected. The local health department and ODH will coordinate the shipment of all laboratory specimens for testing. ODH Outbreak Response and Bioterrorism Investigation Team (614-995-5599) will follow up on the laboratory specimens.

**EPIDEMIOLOGY**

**Occurrence**
VHF viruses are distributed throughout the world. Each virus is associated with one or more nonhuman hosts, restricting natural occurrence of VHF to the areas inhabited by these species. Viruses causing hemorrhagic fevers are initially transmitted to humans when the habitats of the infected reservoir hosts and humans overlap. Risk of VHF is associated with human incursion into such areas. In general, humans are incidental (“dead-end”) hosts for these enzootic diseases.

**Mode of Transmission and Source**
People can be exposed to Ebola virus from direct contact with the blood and/or secretions, organs or semen of an infected person. Thus, the virus is often spread through families and friends because they come in close contact with such secretions when caring for infected persons. People can also be exposed to Ebola virus through
contact with objects, such as needles, that have been contaminated with infected secretions. Ebola can also be acquired while handling infected dead mammals in Africa, or through contact with the blood or organs of infected cynomolgus monkeys.

The reservoir, or host, of Lassa virus is a rodent known as the multimammate rat. These rodents breed very frequently, produce large numbers of offspring, and are numerous in the savannas and forests of West, Central, and East Africa. The virus is in urine and droppings, therefore, the virus can be transmitted through direct contact with these materials, through touching objects or eating food contaminated with these materials, or through cuts or sores. Contact with the virus also may occur when a person inhales tiny particles in the air contaminated with rodent excretions (aerosol or airborne transmission). Finally, because multimammate rats are sometimes consumed as a food source, infection may occur via direct contact when they are caught and prepared for food. Lassa fever may also spread through person-to-person contact. This type of transmission occurs when a person comes into contact with virus in the blood, tissue, secretions, or excretions of an individual infected with the Lassa virus.

Marburg virus is indigenous to Africa. While the geographic area to which it is native is unknown, this area appears to include at least parts of Uganda and Western Kenya, and perhaps Zimbabwe. As with Ebola virus, the actual animal host for Marburg virus also remains a mystery. Persons who have handled infected monkeys and have come in direct contact with their fluids or cell cultures, have become infected. Spread of the virus between humans has occurred in a setting of close contact, often in a hospital. Droplets of body fluids, or direct contact with persons, equipment, or other objects contaminated with infectious blood or tissues are all highly suspect as sources of disease.

**Incubation Period**

- **Ebola hemorrhagic fever:** 2-21 days
- **Lassa fever:** 6-21 days
- **Marburg hemorrhagic fever:** 2-21 days

**PUBLIC HEALTH MANAGEMENT**

*Case Investigation*

Obtain information about the patient’s occupation, history of travel outside the United States, contact with wild animals or lab animals, contact with a suspected or confirmed case of viral hemorrhagic fever, or close contact with an ill individual who traveled to a viral hemorrhagic fever-endemic area.

*Treatment*

There is no standard treatment for Ebola hemorrhagic fever. Patients receive supportive therapy. This consists of balancing the patient’s fluids and electrolytes, maintaining oxygen status and blood pressure, and treating for any complicating infections.

Ribavirin, an antiviral drug, has been used with success in Lassa fever patients. It has been shown to be most effective when given early in the course of the illness. Patients should also receive supportive care consisting of maintenance of appropriate fluid and electrolyte balance, oxygenation and blood pressure, as well as treatment of any other complicating infections.

A specific treatment for Marburg hemorrhagic fever is unknown; however, supportive therapy should be provided. This includes balancing the patient’s fluids and electrolytes,
maintaining their oxygen status and blood pressure, replacing lost blood and clotting factors and treating for any complicating infections. Treatment may also include transfusion of fresh-frozen plasma and other preparations to replace the blood proteins important in clotting. One controversial treatment is the use of heparin (which blocks clotting) to prevent the consumption of clotting factors. Some researchers believe the consumption of clotting factors is part of the disease process.

Isolation
Ohio Administrative Code (OAC) 3701-3-13 (DD) states:
“Viral hemorrhagic fever (VHF): a person with confirmed or suspected viral hemorrhagic fever shall be placed in airborne isolation until no longer considered infectious.”

Clinicians evaluating suspect cases should use standard (e.g. hand hygiene), airborne (e.g. N-95 respirator) and contact (e.g. gowns and gloves) precautions.

Contacts
Investigation
Currently there is no post exposure prophylaxis available for individuals exposed to these agents. Investigation of contacts and source of infection: Identify all close contacts in the three weeks after the onset of illness. Initiate quarantine and active surveillance of contacts by having contacts take and maintain record of body temperature twice a day for 3 weeks after last exposure. If temperature is greater than 101°F (38.3°C), hospitalize patient immediately and initiate appropriate isolation precautions. Specific treatment such as Ribavirin is most effective if given within 6 days of illness onset.

When a suspect case is reported, the local health department needs to start identifying close contacts. Often this starts with the family. The emergency room chart or the medical record may provide names of emergency contacts or family members.

The local health department needs to identify all persons who had “close contact” with the patient for the 21 days prior to the onset of the patient’s illness, and thereafter until the patient is released from isolation.

“Close contact” as described above means direct contact with the patient’s oral secretions. This generally means face-to-face contact, but can also include sharing food, drink, cigarette, eating utensil or toothbrush and intimate contact such as kissing. “Close contact” may also include traveling together in a car.

On identifying close contacts of a suspected case, quarantine should be initiated. The local health department can refer them to their own physician or possibly the emergency room to receive appropriate medical evaluation.

Contacts should also be advised to be alert for the early symptoms of VHFs (fever, headache, nausea, vomiting, stiff neck, joint and muscle aches, sore throat, and weakness, followed by diarrhea, vomiting and stomach pain, rash, red eyes, hiccups and internal and external bleeding), and to seek prompt medical attention if they start to get sick.
What are viral hemorrhagic fevers?
Viral hemorrhagic fevers (VHFs) refer to a group of illnesses that are caused by several distinct families of viruses. In general, the term "viral hemorrhagic fever" is used to describe a severe multisystem syndrome (multisystem in that multiple organ systems in the body are affected). Characteristically, the overall vascular system is damaged, and the body's ability to regulate itself is impaired. These symptoms are often accompanied by hemorrhage (bleeding); however, the bleeding is itself rarely life-threatening. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many of these viruses cause severe, life-threatening disease.

The Special Pathogens Branch (SPB) primarily works with hemorrhagic fever viruses that are classified as biosafety level four (BSL-4) pathogens. A list of these viruses appears in the SPB disease information index. The Division of Vector-Borne Infectious Diseases, also in the National Center for Infectious Diseases, works with the non-BSL-4 viruses that cause two other hemorrhagic fevers, dengue hemorrhagic fever and yellow fever.

How are hemorrhagic fever viruses grouped?
VHFs are caused by viruses of four distinct families: arenaviruses, filoviruses, bunyaviruses, and flaviviruses. Each of these families share a number of features:
- They are all RNA viruses, and all are covered, or enveloped, in a fatty (lipid) coating.
- Their survival is dependent on an animal or insect host, called the natural reservoir.
- The viruses are geographically restricted to the areas where their host species live.
- Humans are not the natural reservoir for any of these viruses. Humans are infected when they come into contact with infected hosts. However, with some viruses, after the accidental transmission from the host, humans can transmit the virus to one another.
- Human cases or outbreaks of hemorrhagic fevers caused by these viruses occur sporadically and irregularly. The occurrence of outbreaks cannot be easily predicted.
- With a few noteworthy exceptions, there is no cure or established drug treatment for VHFs.

In rare cases, other viral and bacterial infections can cause a hemorrhagic fever; scrub typhus is a good example.

What carries viruses that cause viral hemorrhagic fevers?
Viruses associated with most VHFs are zoonotic. This means that these viruses naturally reside in an animal reservoir host or arthropod vector. They are totally dependent on their hosts for replication and overall survival. For the most part, rodents and arthropods are the main reservoirs for viruses causing VHFs. The multimammate rat, cotton rat, deer mouse, house mouse, and other field rodents are examples of reservoir hosts. Arthropod ticks and mosquitoes serve as vectors for some of the illnesses. However, the hosts of some viruses remain unknown – Ebola and Marburg viruses are well-known examples.

Where are cases of viral hemorrhagic fever found?
Taken together, the viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live(s). Some hosts, such as the rodent species carrying several of the New World arenaviruses, live in geographically restricted areas. Therefore, the risk of getting VHFs caused by these viruses...
is restricted to those areas. Other hosts range over continents, such as the rodents that carry viruses which cause various forms of hantavirus pulmonary syndrome (HPS) in North and South America, or the different set of rodents that carry viruses which cause hemorrhagic fever with renal syndrome (HFRS) in Europe and Asia. A few hosts are distributed nearly worldwide, such as the common rat. It can carry Seoul virus, a cause of HFRS; therefore, humans can get HFRS anywhere where the common rat is found. While people usually become infected only in areas where the host lives, occasionally people become infected by a host that has been exported from its native habitat. For example, the first outbreaks of Marburg hemorrhagic fever, in Marburg and Frankfurt, Germany, and in Yugoslavia, occurred when laboratory workers handled imported monkeys infected with Marburg virus. Occasionally, a person becomes infected in an area where the virus occurs naturally and then travels elsewhere. If the virus is a type that can be transmitted further by person-to-person contact, the traveler could infect other people. For instance, in 1996, a medical professional treating patients with Ebola hemorrhagic fever (Ebola HF) in Gabon unknowingly became infected. When he later traveled to South Africa and was treated for Ebola HF in a hospital, the virus was transmitted to a nurse. She became ill and died. Because more and more people travel each year, outbreaks of these diseases are becoming an increasing threat in places where they rarely, if ever, have been seen before.

**How are hemorrhagic fever viruses transmitted?**
Viruses causing hemorrhagic fever are initially transmitted to humans when the activities of infected reservoir hosts or vectors and humans overlap. The viruses carried in rodent reservoirs are transmitted when humans have contact with urine, fecal matter, saliva, or other body excretions from infected rodents. The viruses associated with arthropod vectors are spread most often when the vector mosquito or tick bites a human, or when a human crushes a tick. However, some of these vectors may spread virus to animals, livestock, for example. Humans then become infected when they care for or slaughter the animals. Some viruses that cause hemorrhagic fever can spread from one person to another, once an initial person has become infected. Ebola, Marburg, Lassa and Crimean-Congo hemorrhagic fever viruses are examples. This type of secondary transmission of the virus can occur directly, through close contact with infected people or their body fluids. It can also occur indirectly, through contact with objects contaminated with infected body fluids. For example, contaminated syringes and needles have played an important role in spreading infection in outbreaks of Ebola hemorrhagic fever and Lassa fever.

**What are the symptoms of viral hemorrhagic fever illnesses?**
Specific signs and symptoms vary by the type of VHF, but initial signs and symptoms often include marked fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, or ears. However, although they may bleed from many sites around the body, patients rarely die because of blood loss. Severely ill patient cases may also show shock, nervous system malfunction, coma, delirium, and seizures. Some types of VHF are associated with renal (kidney) failure.

**How are patients with viral hemorrhagic fever treated?**
Patients receive supportive therapy, but generally speaking, there is no other treatment or established cure for VHFs. Ribavirin, an antiviral drug, has been effective in treating some individuals with Lassa fever or HFRS. Treatment with convalescent-phase plasma has been used with success in some patients with Argentine hemorrhagic fever.
**How can cases of viral hemorrhagic fever be prevented and controlled?**

With the exception of yellow fever and Argentine hemorrhagic fever, for which vaccines have been developed, no vaccines exist that can protect against these diseases. Therefore, prevention efforts must concentrate on avoiding contact with host species. If prevention methods fail and a case of VHF does occur, efforts should focus on preventing further transmission from person to person, if the virus can be transmitted in this way. Because many of the hosts that carry hemorrhagic fever viruses are rodents, disease prevention efforts include

- Controlling rodent populations;
- Discouraging rodents from entering or living in homes or workplaces;
- Encouraging safe cleanup of rodent nests and droppings.

For hemorrhagic fever viruses spread by arthropod vectors, prevention efforts often focus on community-wide insect and arthropod control. In addition, people are encouraged to use insect repellant, proper clothing, bednets, window screens, and other insect barriers to avoid being bitten.

For those hemorrhagic fever viruses that can be transmitted from one person to another, avoiding close physical contact with infected people and their body fluids is the most important way of controlling the spread of disease. Barrier nursing or infection control techniques include isolating infected individuals and wearing protective clothing. Other infection control recommendations include proper use, disinfection, and disposal of instruments and equipment used in treating or caring for patients with VHF, such as needles and thermometers.

In conjunction with the World Health Organization, the Centers for Disease Control and Prevention (CDC) has developed practical, hospital-based guidelines, titled Infection Control for Viral Haemorrhagic Fevers In the African Health Care Setting. The manual can help health-care facilities recognize cases and prevent further hospital-based disease transmission using locally available materials and few financial resources.

**What needs to be done to address the threat of viral hemorrhagic fevers?**

Scientists and researchers are challenged with developing containment, treatment, and vaccine strategies for these diseases. Another goal is to develop immunologic and molecular tools for more rapid disease diagnosis, and to study how the viruses are transmitted and exactly how the disease affects the body (pathogenesis). A third goal is to understand the ecology of these viruses and their hosts in order to offer preventive public health advice for avoiding infection.