Clinical Pathway: Anthrax Inhalational Exposure

High probability of anthrax exposure (see page 2)

--Ill with compatible symptoms (see bottom, right)
--Call Infectious Disease Service immediately
--Obtain blood cultures and LP
--Obtain Gram stain of CSF and any skin lesions suggestive of cutaneous anthrax
--Obtain Thoracentesis (for Gram stain and culture) if pleural effusion is present
--Obtain Gram stain of unspun peripheral blood
--Notify laboratory that anthrax is suspected
--Hospitalize using Standard Precautions; consider Contact Precautions for any draining cutaneous lesions

Begin prophylactic antibiotics (see page 4)

--Evaluate further as indicated by signs and symptoms
--Obtain CXR/chest CT
--Obtain blood cultures
--Obtain LP if symptoms suggestive of meningitis are present
--Obtain other clinical specimens as indicated per DDx

If hospital lab identifies Bacillus species, specimen should be sent to a level B/C laboratory for full identification

If anthrax is highly suspected or B anthracis is isolated, contact local public health department immediately to initiate an epidemiologic investigation

If B anthracis is isolated, send to level B/C laboratory for confirmation and assessment of in vitro sensitivities; adjust therapy as needed

Inhalational Anthrax

Early-phase symptoms:
- Fever or chills
- Fatigue
- Malaise
- Minimal or nonproductive cough
- Dyspnea
- Profound sweating
- Nausea, vomiting
- Rhinorrhea usually not present

Late-phase symptoms:
- Fever
- Severe respiratory distress
- Symptoms of meningitis
- Shock

Laboratory findings:
- CXR shows widened mediastinum, pleural effusion, or infiltrates (effusions are hemorrhagic)
- WBC high or normal with left shift
- SGOT or SGPT may be elevated
- Hypoxemia (alveolar-arterial O2 gradient >30 Hg on room air; O2 sat <94%)

CT findings:
- Hilar and mediastinal lymph node enlargement and pleural effusions

Noninfectious causes

Differential diagnosis (DDx):
- Influenza
- Mycoplasmal pneumonia
- Legionnaires’ disease
- Tularemia
- Psittacosis
- Other viral pneumonias
- Q fever
- Acute bacterial mediastinitis
- Fibrous mediastinitis caused by Histoplasma capsulatum
- Coccidioidomycosis
- Tuberculosis

Report suspected and confirmed cases to local public health department immediately

--Continue antibiotics for at least 60 days
--Consider anthrax vaccine or more prolonged use of prophylactic antibiotics if high-dose exposure occurred
--Educate patient regarding side effects of prophylactic therapy and symptoms of anthrax
--Instruct patient to follow up if side effects or symptoms occur
--Routine follow-up to assess symptoms, side effects, and psychological support

Not ill or no compatible illness

Begin prophylactic antibiotics (see page 4)

Not ill or compatible illness

Hospitalize using Standard Precautions; consider Contact Precautions for any draining cutaneous lesions

Begin 3-drug antibiotic therapy (IV) (see page 3)

Low probability of anthrax exposure or no known exposure (see page 2)

--Ill with compatible symptoms (see bottom, right)
--Obtain blood cultures and LP
--Obtain Gram stain of CSF and any skin lesions suggestive of cutaneous anthrax
--Obtain Thoracentesis (for Gram stain and culture) if pleural effusion is present
--Obtain Gram stain of unspun peripheral blood
--Notify laboratory that anthrax is suspected
--Hospitalize using Standard Precautions; consider Contact Precautions for any draining cutaneous lesions

Begin prophylactic antibiotics (see page 4)

--Evaluate further as indicated by signs and symptoms
--Obtain CXR/chest CT
--Obtain blood cultures
--Obtain LP if symptoms suggestive of meningitis are present
--Obtain other clinical specimens as indicated per DDx

If hospital lab identifies Bacillus species, specimen should be sent to a level B/C laboratory for full identification

If anthrax is highly suspected or B anthracis is isolated, contact local public health department immediately to initiate an epidemiologic investigation

Not ill or no compatible illness

Begin prophylactic antibiotics (see page 4)

--Report suspected and confirmed cases to local public health department immediately
--Continue antibiotics for at least 60 days
--Consider anthrax vaccine or more prolonged use of antibiotics if high-dose exposure occurred

Copyright 2002 Center for Infectious Disease Research & Policy (www.cidrap.umn.edu) and Infectious Diseases Society of America (IDSA) (www.idsociety.org).
Assessing the Probability of Anthrax Exposure

<table>
<thead>
<tr>
<th>High Probability</th>
<th>During a known anthrax event:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Persons exposed to an air space where a suspicious material may have been aerosolized (eg, near a suspicious powder-containing letter during opening)</td>
</tr>
<tr>
<td></td>
<td>Persons who shared an air space likely to be the source of an inhalational anthrax case (eg, being exposed to a shared ventilation system)</td>
</tr>
<tr>
<td></td>
<td>Persons who may have been exposed to an item contaminated with <em>Bacillus anthracis</em> (eg, an envelope or other vehicle) along the transit path of the item (eg, a postal sorting facility in which an envelope containing <em>B anthracis</em> was processed)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In situations where anthrax has not previously been identified*:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons who opened a suspicious letter or package that was found to contain a white powder suspected to be a source of <em>B anthracis</em></td>
</tr>
<tr>
<td>Persons exposed to an air space where suspicious material may have been aerosolized (eg, near a suspicious powder-containing letter during opening)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Low Probability</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No history of exposure to an item (eg, an envelope or other vehicle) or powder confirmed or suspected to harbor <em>B anthracis</em> spores</td>
</tr>
<tr>
<td></td>
<td>No history of exposure to an air space where a suspicious material could have been aerosolized (eg, being present at the time a powder-containing letter was opened)</td>
</tr>
<tr>
<td></td>
<td>No history of exposure to an air space likely to have been the source for a confirmed case of inhalational anthrax</td>
</tr>
</tbody>
</table>

*In situations where anthrax exposure is suspected but no prior cases of anthrax have been confirmed, a risk assessment should be conducted by local public health and law enforcement officials. If the probability of anthrax exposure is considered high on the basis of the risk assessment, prophylactic antimicrobial therapy should be initiated for asymptomatic exposed persons while the suspect material is being tested for *B anthracis*. Any persons who have symptoms compatible with anthrax should be treated with appropriate antibiotics, according to the clinical pathway (see page 1), until anthrax can be confirmed or ruled out.