ADL BSL-3 Emergency Response Packet

TAKE THIS PACKET WITH YOU!

- Emergency Contact Information
- Workers’ Compensation Information
- Directions to Authorized Treating Physicians
- Directions to Fort Collins Emergency Room
- Biosafety Incident Report Form
- Infectious Agent Fact Sheets:

<table>
<thead>
<tr>
<th>Arenaviruses (Junin, Tacaribe, and Pirital)</th>
<th>Middle East Respiratory Virus Syndrome Virus (MERS)</th>
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</thead>
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<tr>
<td>Blue tongue Virus (exotic)</td>
<td>Low Path Avian Influenza virus</td>
</tr>
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<td>Brucella Species (abortus, suis, melitensis)</td>
<td>Rabies</td>
</tr>
<tr>
<td>Burkholderia mallei</td>
<td>Severe Fever and Thrombocytopenia Syndrome Virus</td>
</tr>
<tr>
<td>Burkholderia pseudomallei</td>
<td>St Louis Encephalitis Virus</td>
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<td>Chikungunya Virus</td>
<td>Venezuelan Equine Encephalitis Virus</td>
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<td>Coxiella Burnetii</td>
<td>West Nile Virus</td>
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<tr>
<td>Eastern Equine Encephalitis Virus</td>
<td>Yersinia pestis</td>
</tr>
<tr>
<td>Japanese Encephalitis Virus</td>
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</tbody>
</table>

Updated 7/16/13
The most up to date version of this document can be found in the Biosafety or Occupational Health Websites under the “Illness Procedure and “Emergency Response Packet” Bar: http://www.ehs.colostate.edu/WOHSP/Bsl3Packets.aspx
# Emergency Phone Numbers

<table>
<thead>
<tr>
<th>BIOSAFETY EMERGENCY NUMBER</th>
<th>491-0270</th>
</tr>
</thead>
<tbody>
<tr>
<td>IDRC On-Call</td>
<td>491-IDRC (491-4372)</td>
</tr>
<tr>
<td>Fort Collins Emergency Room</td>
<td>495-7000</td>
</tr>
<tr>
<td>Occupational Health Coordinator</td>
<td>491-3102, 420-8172</td>
</tr>
</tbody>
</table>
Workers’ Compensation Procedure

Updated 12/2014

NOTE: Workers Compensation Statutes change frequently, and every effort has been made to update this document accordingly. However, Risk Management is the source for the most current Workers’ Compensation procedures: http://www.ehs.colostate.edu/WWorkComp/Home.aspx

• First Report of Injury must be INITIATED as soon as possible
  – Online link: required forms: https://wsnet.colostate.edu/cwis86/EHslogin/default.aspx?From=WorkComp

• Medical attention must be sought by a CSU Authorized Treating Physician
  – For a complete list of CSU Authorized Treating Physicians: http://www.ehs.colostate.edu/WWorkComp/HealthContPrint.aspx

• All claims are subject to review and may not be covered under Workers Compensation unless found compensable under current Worker’s Compensation Statutes.
  – **GO TO A CSU AUTHORIZED TREATING PHYSICIAN WHENEVER POSSIBLE** as initial visit costs will be covered through Workers Compensation even if it is determined that your illness is not work related. If you must go to the ER or an Urgent Care provider for the specific reasons listed above, you and/or your insurance carrier will be responsible for all health care costs for illnesses/injuries that are NOT related to your employment.
  – However, in order to assure that medical attention is sought appropriately for potentially work related illnesses, CSU may cover certain out of pocket costs for ER or Urgent Care services that are NOT covered under Colorado Workers’ Compensation Statutes (provided that the requirements of this procedure have been properly followed). In general, such coverage will not exceed $2,000.

• CSU Workers’ Compensation Website: http://www.ehs.colostate.edu/WWorkComp/Home.aspx
When to go to a CSU Authorized Treating Physician

- During regular business hours
  - When you **have a fever**, and you have been in the **BSL-3 barrier in the last 5 days**
  - When you have a **KNOWN exposure** to or an injury **IN VOLVING TUBERCULOSIS**
  - When you have a minor injury

- When told by the ER, Urgent Care, or Workers’ Compensation to follow up after an Emergency Room or Urgent Care visit

- Due to limitations in Workers’ Compensation coverage for ER or Urgent Care visits, see a CSU Designated Care Provider whenever possible.
  - For details see Workers’ Compensation Procedure in this packet, or “**BSL3 Illness Procedures**” online at [http://www.ehs.colostate.edu/WBiosafety/Home.aspx](http://www.ehs.colostate.edu/WBiosafety/Home.aspx) under the bar labeled “**BSL3 Illness Procedures, Info, and Emergency Response Packets**”.
CSU AUTHORIZED TREATING PHYSICIANS

For NON-EMERGENCY incidents

If you go to the Emergency Room, follow-up with one of these providers

A complete list of designated providers can be found at:
http://www.ehs.colostate.edu/WWorkComp/HealthContPrint.aspx
University of Colorado Health Occupational Health Services
4674 Snow Mesa Drive, Suite 200
Fort Collins, CO
(970) 495-8450
Mon-Fri, 7:00am - 6:00pm
**Workwell Fort Collins**
1600 Specht Point Road, Suite 115
Fort Collins, CO
(970) 672-5100
Mon- Fri, 8:00am - 5:00pm

**Workwell Loveland**
1608 Topaz Drive
Loveland, CO
(970) 593-0125
Mon-Fri, 8:00am - 5:00pm

**FROM FOOTHILLS CAMPUS to Workwell, Fort Collins**
• Turn Right on Overland Trail.
• Turn Left on W. Prospect Road.
• Turn Right at Specht Point Drive.
• Workwell is located on the first floor.

Approximate drive time is 15 minutes.

**FROM MAIN AND SOUTH CAMPUSSES to Workwell, Fort Collins**
• Head East on Prospect Road.
• Turn Right at Specht Point Drive.
• Workwell is located on the first floor.

Approximate drive time is 15 minutes.
When to go to the Emergency Room

- When you have a KNOWN EXPOSURE to a BSL-3 infectious agent (other than Tuberculosis)
- When you have a major injury
- **WHEN A CSU AUTHORIZED TREATING PROVIDER IS CLOSED** and you have a fever within 5 days of being in the BSL-3 barrier and/or have symptoms associated with disease due to pathogens worked with.
  - IF YOU GO TO THE EMERGENCY ROOM OR URGENT CARE AND ARE DIRECTED TO DO SO, YOU MUST FOLLOW UP WITH ONE OF THE CSU AUTHORIZED TREATING PHYSICIAN THE NEXT BUSINESS DAY.
- Complete list: [http://www.ehs.colostate.edu/WWorkComp/Home.aspx](http://www.ehs.colostate.edu/WWorkComp/Home.aspx)
- If you go to the Emergency Room or Urgent Care, it is your responsibility to follow up by providing them with your Workers’ Compensation claim number and billing information:
  
  P.O. Box 4998
  Greenwood Village, CO 80155
  Phone: (303) 804-2000
  Fax: (303) 804-2005
  Toll-Free: (888) 428-4671
Emergency Room Directions

Please do not drive yourself. Have someone take you. Contact Biosafety if you need a ride. 491-0270
EMERGENCY ROOM NEAREST TO CSU

Go to Emergency Room closest to you

Poudre Valley Hospital
Emergency Dept (Colorado Health Medical Group)
1024 South Lemay Ave
Fort Collins, CO
(970) 495-7000
24 hours, 7 days per week

FROM FOOTHILLS CAMPUS
• Turn Left on Overland Trail
• Turn Right on W. Mulberry Street
• Turn Right on Riverside Avenue
• Turn Right at S. Lemay Avenue
• Hospital is on the East side of the road.

Approximate drive time is 15 minutes.

FROM MAIN AND SOUTH CAMPUSES
• Head East on Prospect or Drake
• Turn Left at Lemay Avenue
• Hospital is on the East side of the road.

Approximate drive time is 10 minutes.
Poudre Valley Hospital Harmony

URGENT CARE

Go to an Urgent Care closest to you

FROM FOOTHILLS CAMPUS
- Turn Left on Overland Trail
- Turn Right on Mulberry Ave
- Turn Right on Riverside Ave
- Turn Left on E. Prospect Rd
- Turn Right on Timberline Rd
- Turn Left on E. Harmony Rd
- Facility is on the South side of Harmony Road
- Follow signs to Urgent Care

Approximate drive time is 21 minutes

FROM MAIN AND SOUTH CAMPUSES
- Head East on Prospect Rd
- Turn Right on Timberline Rd
- Turn Left on E. Harmony Rd
- Facility is on the South side of Harmony Road
- Follow signs to Urgent Care

Approximate drive time is 20 minutes

PVHs Harmony Urgent Care
2127 E. Harmony Road
Daily, 8 a.m. to 8 p.m.
(970) 297-6250
# Biosafety Incident Report Form

**THIS IS NOT A WORKERS’ COMPENSATION INCIDENT REPORT FORM**

If this is an injury, have you filled out a workers’ compensation form?  □ Yes  □ No

<table>
<thead>
<tr>
<th>Personal Information</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>CSU ID:</td>
</tr>
<tr>
<td>First Name:</td>
<td>Last Name:</td>
</tr>
<tr>
<td>Email:</td>
<td>Phone Number:</td>
</tr>
<tr>
<td>Alt. Phone Number:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Emergency Contact Information</th>
<th>Phone #:</th>
<th>Alt. Phone #:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone #:</td>
<td>Alt. Phone #:</td>
<td></td>
</tr>
<tr>
<td>Name:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phone #:</td>
<td>Alt. Phone #:</td>
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<table>
<thead>
<tr>
<th>Incident Information</th>
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<tbody>
<tr>
<td>Pathogen working with:</td>
<td></td>
</tr>
<tr>
<td>Does the pathogen contain recombinant DNA or synthetic nucleic acid molecules?  □ Yes  □ No</td>
<td></td>
</tr>
<tr>
<td>Location (building, room):</td>
<td>Time of Incident:</td>
</tr>
<tr>
<td>Incident Type (exposure, physical injury, etc.):</td>
<td></td>
</tr>
<tr>
<td>Incident Description (Provide as much detail as possible and list external events that may have contributed to the incident):</td>
<td></td>
</tr>
</tbody>
</table>

...
<table>
<thead>
<tr>
<th>Method</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Needlestick</td>
<td></td>
</tr>
<tr>
<td>☐ Blood or body fluids</td>
<td></td>
</tr>
<tr>
<td>☐ Spill</td>
<td></td>
</tr>
<tr>
<td>☐ Aerosol</td>
<td></td>
</tr>
<tr>
<td>☐ Animal Bite/Scratch</td>
<td></td>
</tr>
<tr>
<td>☐ Necropsy</td>
<td></td>
</tr>
<tr>
<td>☐ Broken glass</td>
<td></td>
</tr>
<tr>
<td>☐ Sharps Container</td>
<td></td>
</tr>
<tr>
<td>☐ Other (describe)</td>
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</tbody>
</table>

**Action(s) taken to control incident** *(e.g. hand washing, spill clean-up, etc.):*

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<tbody>
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</table>

**Personal Protective Equipment (PPE) Worn at time of Injury**

<table>
<thead>
<tr>
<th>PPE Item</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Scrubs</td>
<td>☐ Tyvek</td>
</tr>
<tr>
<td>☐ Surgical gown</td>
<td>☐ PAPR</td>
</tr>
<tr>
<td>☐ N-95 respirator mask</td>
<td>☐ Face Shield</td>
</tr>
<tr>
<td>☐ Gloves</td>
<td>☐ Goggles</td>
</tr>
<tr>
<td>☐ Hair Cover</td>
<td>☐ Shoes</td>
</tr>
</tbody>
</table>

**Was there a PPE failure?**

If yes, explain:

<p>| |</p>
<table>
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Print or scan and send to the Biosafety Office: 6021 Campus Delivery, 141 General Services Building, Fort Collins, CO 80523; E-mail scanned copies to Heather.Blair@colostate.edu, or Joni.Triantis@colostate.edu
Arenaviruses -Junin, Tacaribe, Pirital

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

CONTAINMENT AND SPECIAL PRECAUTIONS

Containment

- Junin virus Candid #1 Vaccine strain:
  - BSL-3 practices, containment equipment and facilities are recommended for infectious or potentially infected materials, animals, or cultures. PAPR is required while working with infectious or potentially infections materials and animals.

- Pirital virus:
  - BSL-3 practices, containment equipment and facilities are recommended for infectious or potentially infected materials, animals, or cultures. PAPR is required while working with infectious or potentially infections materials and animals.

- Tacaribe virus:
  - BSL-3 practices, containment equipment and facilities are recommended for infectious or potentially animals. PAPR is required while working with infectious or potentially infections materials and animals.
  - BSL-2 practices, containment equipment and facilities are recommended for infectious or potentially infected materials or cultures.

Containment

- The authorized Junin virus strain for work at CSU is the attenuated Junin virus Candid #1 vaccine strain.

HAZARD IDENTIFICATION

Disease:

- Junin virus: Argentine hemorrhagic fever
- Pirital and Tacaribe viruses have not been associated with human disease; however, precautionary measures are warranted.

Transmission: Human infection is incidental but occurs by aerosol inhalation (e.g. culture; or blood, tissues, feces, or urine of infected animals) or through percutaneous inoculation (needlesticks, contact of skin wounds with contaminated materials).

Communicability: Person-to-person spread is rare; however, Junin virus has been associated with nosocomial outbreaks.

Incubation: 5-21 days

Infectious dose: Unknown

VIABILITY/INACTIVATION

Inactivation:

- Autoclave sensitive
- 1% bleach (500 ppm available sodium hypochlorite), 70% Ethanol, 2% glutaraldehyde
MEDICAL

Signs and symptoms:

- There are three phases of illness associated with Argentine hemorrhagic fever
  - **Prodromal phase- Lasting for 1 week after symptom onset**
    - Flu-like symptoms (fever, chills, malaise, headache)
    - Muscle pain, particularly in lower back
    - Nausea and vomiting
    - Dizziness
  - **Neurological-hemorrhagic Phase- Occurring between 8-12 days after symptom onset**
    - Vomiting blood
    - Tar colored stools
    - Nose bleeds
    - Blood in urine and uterine bleeding
    - Blood in lungs
    - Mental confusion
    - Tremors
    - Delirium
    - Convulsions
    - Complications of superimposed bacterial infections such as septicemia and pneumonia
  - **Convalescence Phase – Lasting 1-3 months**
    - Weakness
    - Memory loss
    - Irritability

Pre-exposure prophylaxis:

None

Diagnosis:

- WBC count of less than 2,500/mm³ and a platelet count of less than 100,000/mm³
- Virus isolation (from blood and mucosal secretions)
- RT-PCR
- Immunoassays

Post-exposure prophylaxis:

- Administration of convalescent serum or antiviral therapy (ribavirin)

Treatment of clinical cases:

- While administration of convalescent serum is highly effective, ribavarin is effective if delivered early in onset of symptoms
- Supportive care including pain management
WHAT TO DO IF AN EXPOSURE OCCURS

Employees, Graduate Students, Work Study

1. Employee notifies Biosafety (970-491-0270) and/or Occupational Health Program Coordinator (970-420-8172) to inform where medical attention will be sought and if transportation is needed
   • The Principal Investigator/Supervisor must also be notified
2. Employee goes to Emergency Room
3. After the Emergency Room visit, individual fills out the following forms:
   • Biosafety Incident report form: http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf
   • Workers’ Compensation (within 4 days or as soon as possible): http://www.ehs.colostate.edu/WWorkComp/Home.aspx
4. Employee follows up with CSU Authorized Treating Physician

Student Not Paid by CSU

1. Contact supervisor/PI
2. Student or supervisor contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Student goes to CSU Health Network (formerly Hartshorn Health Services)

Volunteers and Visitors

1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Individual goes to their personal physician, or as otherwise directed by their physician

REFERENCES

• CDC Transmission Information: http://wwwnc.cdc.gov/eid/article/17/12/11-0393_article.htm#r3
• CDC Web Page: http://www.cdc.gov/ncidod/dvrd/spb/mnpages/dispages/arena.htm
• Iowa State University Technical Sheet: http://www.cfsph.iastate.edu/Factsheets/pdfs/viral_hemorrhagic_fever_arenavirus.pdf

CONTENT REVIEW

This document has been reviewed by:

• CSU subject matter expert: Dr. Tony Schountz
Avian Influenza Virus (Highly Pathogenic, H5N1)

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CONTAINMENT AND SPECIAL PRECAUTIONS

Containment
- BSL-3 and ABSL-3 Level practices, containment equipment and facilities are required for work involving virus isolation and laboratory manipulation of virus.
- BSL2 practices and containment equipment are recommended for activities with clinical or diagnostic specimens

Special considerations:
- Select Agent
- Health care personnel PPE should include eye protection, laboratory coat or gown, gloves, and particulate N95 masks or equivalent.

VIABILITY/INACTIVATION

Inactivation:
- Autoclave sensitive
- 1% bleach (500 ppm available sodium hypochlorite), 70% ethanol, and a number of commercially available disinfectants.

Stability:
- Infectious for 4-30 days in water, depending on temperature. Variable survival in feces.

HAZARD IDENTIFICATION

Disease: Influenza

Transmission: shed in feces, nasal secretions and saliva, fomites and flies are mechanical vectors.

Communicability: person to person spread is rare, and most likely due to close contact with severely ill patient.

Incubation: 1 to 4 days, virus shed for 3-5 days after initial signs

Infectious dose: unknown

MEDICAL

Signs and symptoms:
- Fever
- Chills
- Loss of appetite, weight loss
- Headache
- Myalgia (muscle pain)
- Weakness
- Sneezing
- Rhinitis
- Sore throat
- Non productive cough
- Diarrhea
- Abdominal pain
- Photophobia (light sensitivity)
- Nausea
- Vomiting
- Ear infection
- Pneumonia

Pre-exposure prophylaxis:
None (seasonal flu vaccination not protective)

Diagnosis:
- Viral isolation, detection of antigens or nucleic acids, virus isolated in cell lines or chicken embryos then identified by hemagglutination inhibition tests and nucleic acid sequencing. Antigens can be detected in respiratory secretions by immunofluorescence or ELISA. Commercial rapid diagnostic tests are available as well as RT-PCR tests.
  - Serum taken:
    - Day of exposure and upon recovery
- Guidance for laboratory testing of persons with suspected infections can be found at: http://www.cdc.gov/flu/avianflu/guidance-labtesting.htm

Treatment:
Post-exposure prophylaxis:
- Oseltamivir once daily for 7 days post potential exposure

Treatment of clinical cases:
- Amatadine
- Rimantadine
- Zanamivir
- Oseltamivir
- Guidance for Follow-up

WHAT TO DO IF AN EXPOSURE OCCURS

Employees, Graduate Students, Work Study
1. Employee notifies Biosafety (970-491-0270) and/or Occupational Health Program Coordinator (970-420-8172) to inform where medical attention will be sought and if transportation is needed
   - The Principal Investigator/Supervisor must also be notified
2. Employee goes to Emergency Room
3. After the Emergency Room visit, individual fills out the following forms:
- Workers’ Compensation (within 4 days or as soon as possible):
  http://www.ehs.colostate.edu/WWorkComp/Home.aspx

4. Employee follows up with CSU Authorized Treating Physician

**Student Not Paid by CSU**

1. Contact supervisor/PI
2. Student or supervisor contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Student goes to CSU Health Network (formerly Hartshorn Health Services)

**Volunteers and Visitors**

1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Individual goes to their personal physician, or as otherwise directed by their physician

**REFERENCES**

- CDC Infection Control: http://www.cdc.gov/flu/professionals/infectioncontrol/index.htm
- CDC Web Page: http://www.cdc.gov/flu/avianflu/
- Iowa State University Technical Data Sheet, Influenza: http://www.cfsph.iastate.edu/Factsheets/pdfs/influenza.pdf
- Iowa State University Technical Data Sheet, Highly Pathogenic Avian Influenza: http://www.cfsph.iastate.edu/Factsheets/pdfs/highly_pathogenic_avian_influenza.pdf

**CONTENT REVIEW**

This document has been reviewed by:

- CSU subject matter expert: Dr. Richard Bowen
Brucella spp. (B. abortus, B. melitensis, B. suis, B. canis)

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

CONTAINMENT AND SPECIAL PRECAUTIONS

Containment:
- BSL-3 level practices, containment equipment, and facilities for manipulations of cultures and experimental studies using animals.
- BSL-2 level practices, containment equipment and facilities for manipulations of clinical specimens.

Special Considerations:
- Select Agent

HAZARD IDENTIFICATION

Disease: Brucellosis, Undulant fever

Transmission: ingestion, direct contact of mucous membranes and broken skin with infected material, inhalation, contact with vaccine strain for cattle RB51 (accidental injection)

Communicability: Person to person spread is extremely rare, occurring through sexual contact or ingestion of infected breastmilk.

Incubation: variable, 5-60 days, stable in the environment

Infectious Dose: 10 to 100 by inhalation

VIABILITY/INACTIVATION

Stability: Survives for up to 28 days at room temperature on glass and aluminum and without UV light and 7 days on concrete. Survives in carcasses and organs for up to 135 days, and blood stored at 4 C for 180 days

Inactivation:
- Autoclave sensitive
- 1%-2.5% bleach (500 -1,250 ppm available sodium hypochlorite), 70% ethanol, susceptible to most commonly available disinfectants

MEDICAL

Signs and Symptoms:
Note that there have been very few documented human cases of infection with B. canis

Systemic disease:
- Intermittent fever
- Headache
- Weakness
- Profuse sweating
- Chills
- Arthralgia (joint pain)
- Localized suppurative (discharge or pus) infections
**Diagnosis:**
Serological testing microagglutination testing at day 0 and at week 2, 4, 6 and 24

**Pre-exposure Prophylaxis:**
None

**Treatment:**
- **Post-exposure Prophylaxis and Treatment of Symptomatic Cases:**
  - Antibiotic therapy, doxycycline (100mg) and rifampin (600mg) in combination for 21 days
  - Exposure to the RB51 (vaccine) strain does not require rifampin
  - For individuals with problems with doxycycline, trimethoprim-sulfamethoxazole can be used

**WHAT TO DO IF AN EXPOSURE OCCURS**

**Employees, Graduate Students, Work Study**
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3. Individual goes to their personal physician, or as otherwise directed by their physician

**REFERENCES**
- CDC Clinician Guide: [http://www.cdc.gov/brucellosis/clinicians/index.html](http://www.cdc.gov/brucellosis/clinicians/index.html)
- CDC Information on Transmission: [http://www.cdc.gov/brucellosis/transmission/index.html](http://www.cdc.gov/brucellosis/transmission/index.html)
- Iowa State University Technical Data Sheet: [http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis.pdf)
- Iowa State University Technical Data Sheet, Brucella abortus: [http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_abortus.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_abortus.pdf)
- Iowa State University Technical Data Sheet, Brucella canis: [http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_canis.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_canis.pdf)
- Iowa State University Technical Data Sheet, Brucella melitensis: [http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_melitensis.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_melitensis.pdf)
- Iowa State University Technical Data Sheet, Brucella ovis: [http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_ovis.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_ovis.pdf)
- Iowa State University Technical Data Sheet, Brucella suis: [http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_suis.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/brucellosis_suis.pdf)

**CONTENT REVIEW**

This document has been reviewed by:

- CSU subject matter expert: Dr. Richard Bowen
**Burkholderia mallei**

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

**CONTAINMENT AND SPECIAL PRECAUTIONS**

Containment: BSL-3 level practices, containment equipment, and facilities are required for work involving infectious body fluids, tissues, animals and cultures.

Special considerations:
- Select Agent, Tier 1
- Health Risk Factors: People with diabetes or renal disease are at greater risk for infection.

**HAZARD IDENTIFICATION**

Disease: Glanders

Transmission: inhalation, contact with mucous membranes, through broken skin, ingestion.

Communicability: Person-to-person transmission could occur

Incubation: 10-14 days following aerosol exposure; 1 – 5 days following percutaneous exposure.

Infectious dose: unknown

**VIABILITY/INACTIVATION**

Stability: Inactivated by heat and sunlight, but can survive in wet or humid places for at least two weeks and can survive in water at room temperature for a month.

Inactivation methods:
- Autoclave sensitive
- 1% bleach (500 ppm available sodium hypochlorite), 70% Ethanol, 2% glutaraldehyde, Iodines, Phenolics and Formaldehyde

**MEDICAL**

Signs and symptoms:

Vary pending route of infection:
- Acute localized infection (Infection by inoculation of abraded or lacerated skin, percutaneous, mucosal)
  - Nodules, abscesses and ulcers at site of inoculation
  - Fever, sweats, malaise, swelling of regional lymph nodes
- Acute Septicemia (Infection by inhalation or localized infection)
  - Fever
  - Chills
  - Malaise (discomfort)
  - Myalgia (muscle pain)
  - Severe headache
- Disorientation
- Chest pain
- Rash
- Lymphadenopathy (swollen lymph nodes)
- Cellulitis (skin infection)
- Cyanosis (blue or purple skin color)
- Jaundice (yellowing of the skin)
- Photophobia (light sensitivity)
- Diarrhea
- Necrotizing (dead or black) lesions
- Tachycardia (fast heart beat)
- Hepatomegaly or splenomegaly (enlarged liver or spleen)
- Multi-organ failure
- Death within 24 to 48 hours of onset of symptoms

- **Acute pulmonary infection (infection by inhalation)**
  - Pulmonary abscesses
  - Pleural effusion (build-up of fluid between layers of tissue)
  - Pneumonia
  - Fever
  - Sweats
  - Coughing
  - Chest pain
  - Dyspnea (shortness of breath)

- **Chronic suppurative (pus) disease (Infection by inoculation of abraded or lacerated skin, percutaneous, mucosal)**
  - Multiple abscesses, nodules and ulcers
  - Organ involvement
  - Weight loss
  - Lymphadenopathy (swollen lymph nodes)
  - Chronic form of the disease can last up to 25 years

**Pre-exposure prophylaxis:**
NONE

**Medical Surveillance:**
- Before working with or around this agent, individuals must enroll in CSU’s medical surveillance program through the CSU Occupational Health Program.

**Diagnosis:**
- Self-report febrile illness with or without cough for 21 days post exposure
- Culture of sputum or cutaneous lesions. Isolation from blood, sputum, urine, or skin lesions.
- Serum taken day of exposure, 1, 2, 4, and 6 weeks post exposure.
  - 4 fold increase in titer is indicative of infection
  - Detection of antibodies in blood does not distinguish between *B. mallei* and *B. pseudomallei*,
Treatment

- Note, for any prolonged use of TMP-SMX, of coadministration of folinic acid may be considered to prevent or reduce the antifolate activity of TMP-SMX without affecting its antimicrobial action.

- Post exposure prophylaxis (duration 3 weeks):
  - Despite slight differences in antimicrobial drug susceptibilities, drug regimens that are effective in human melioidosis (which have been better evaluated than those for glanders) would also be expected to be effective in glanders. Recommendations for the management of exposure to *B. mallei* are the same as those for *B. pseudomallei* with one important exception. Although serum should be taken and stored, no validated serologic test for human glanders currently exists.
  - Antimicrobial susceptibility of the strain of involved in the exposure event should be known, and if not tested as soon as possible. PEP should be cross referenced with this information to ensure efficacy. Resistance may be developed to tetracyclines.
  - Trimethoprim-sulfamethoxazole (TMP-SMX) orally: 160 mg/800mg tablets: 2 tablets every 12 h for adult ≥60kg
    OR
    80 mg/400 mg tablets: 3 tablets every 12 h for adult 40-60 kg
    OR
    160 mg/800 mg tablets: 1 tablet every 12 h or 80 mg/400 mg tablets: 2 tablets every 12 h for adult <40 kg,
    OR
  - Amoxicillin-clavulanic acid (co-amoxiclav) orally: 500 mg/125 mg tablets: 3 tablets every 8 h for adult ≥ 60 kg*
    OR
    500 mg/125 mg tablets: 2 tablets every 8 h for adult <60 kg*
  
  *Weight-based dosage based on 20 mg/5 mg/kg/dose.

- Treatment of Glanders:
  - Initial parenteral therapy
    - Ceftazidime 50 mg/kg/dose (up to 2 g) intravenous every 8 h or 6 g per day by continuous infusion after a 2 g bolus,
    OR
    - Meropenem 25 mg/kg/dose (up to 1 g) intravenous every 8 h (for intensive care unit, neuro-melioidosis or persistent bacteremia)
    - Duration of therapy a minimum of 10–14 d, however, four or more weeks of parenteral therapy may be necessary in cases of more severe disease such as septic shock, deep seated or organ abscesses, extensive lung disease, osteomyelitis or septic arthritis or neurological melioidosis.
    - Consider the addition of trimethoprim-sulfamethoxazole (TMP-SMX) for patients with severe infection involving the brain, prostate, or other privileged site (same dosing as described in Eradication Therapy, below). Can be administered by IV infusion over 30-60 min every 12 h, or nasogastric, or oral, as appropriate. If TMP-SMX is included, it should be used for the entire duration of the intensive phase.
    - A switch to meropenem is indicated if patient condition worsens on ceftazidime, e.g., organ failure, development of a new focus of infection during treatment, or if repeat blood cultures remain positive. Depending on the severity of infection, the dose for patients ≥3 months and older can be ≤40 mg/kg/dose; not to exceed 2 g/dose.
**Oral eradication therapy**

- Trimethoprim-sulfamethoxazole (TMP-SMX) orally: 160 mg/800 mg tablets: 2 tablets every 12 h for adult ≥60 kg
  
  OR
  80 mg/400 mg tablets: 3 tablets every 12 h for adult 40–60 kg
  
  OR
  160 mg/800 mg tablets: 1 tablet every 12 h or 80 mg/400 mg tablets: 2 tablets every 12 h for adult <40 kg
  
  OR
- Amoxicillin-clavulanic acid (co-amoxiclav) orally: 500 mg/125 mg tablets: 3 tablets every 8 h for adult ≥60 kg*
  
  OR
  500 mg/125 mg tablets: 2 tablets every 8 h for adult <60 kg*

*Weight-based dosage based on 20 mg/5 mg/kg/dose

- Duration at is a minimum of 3 months
- If the organism is susceptible and the patient does not have a documented allergy to it, oral TMP-SMX is the agent of first choice. If the organism is resistant to TMP-SMX or the patient is intolerant, the second-line choice is co-amoxiclav.

**WHAT TO DO IF AN EXPOSURE OCCURS**

**Employees, Graduate Students, Work Study**

1. Employee notifies Biosafety (970-491-0270) and/or Occupational Health Program Coordinator (970-420-8172) to inform where medical attention will be sought and if transportation is needed.
   - The Principal Investigator/Supervisor must also be notified
2. Employee goes to Emergency Room
3. After the Emergency Room visit, individual fills out the following forms:
   - Biosafety Incident report form:
     [http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf](http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf)
   - Workers’ Compensation (within 4 days or as soon as possible):
     [http://www.ehs.colostate.edu/WWorkComp/Home.aspx](http://www.ehs.colostate.edu/WWorkComp/Home.aspx)
4. Employee follows up with CSU Authorized Treating Physician

**Student Not Paid by CSU**

1. Contact supervisor/PI
2. Student or supervisor contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed.
3. Student goes to CSU Health Network (Formerly Hartshorn Health Services)
4. After the visit to CSU Health Network, student fills out Biosafety Incident Report form
   [http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf](http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf)
Volunteers and Visitors

1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed.
3. Individual goes to their personal physician, or as otherwise directed by their physician
4. Individual fills out Biosafety Incident Report form

http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf

REFERENCES

- CDC, Actions Required before working with B. pseudomallei: http://wwwnc.cdc.gov/eid/article/14/7/07-1501_article.htm#actionrequiredbeforeworkingwithb.pseudomallei
- Iowa State University Fact Sheet, B. mallei: http://www.csph.iastate.edu/Factsheets/pdfs/glanders.pdf
- Iowa State University Fact Sheet, B. pseudomallei: http://www.csph.iastate.edu/Factsheets/pdfs/melioidosis.pdf

CONTENT REVIEW

This document has been reviewed by:

- CSU subject matter expert: Dr. Herbert Schweizer
- Licensed Physicians: Colorado Health Medical Group, Occupational Health (principal: Dr. Tracy Stefanon)
**Disclaimer**

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

**CONTAINMENT AND SPECIAL PRECAUTIONS**

**Containment:** BSL-3 level practices, containment equipment, and facilities are required for work involving infectious body fluids, tissues, animals and cultures.

**Special considerations:**
- Select Agent, Tier 1
- Health Risk Factors: Persons with diabetes, chronic kidney failure, cystic fibrosis, chronic lung disease, immunosuppression, or alcoholics are at increased risk for infection with this organism.

**HAZARD IDENTIFICATION**

**Disease:** Melioidosis

**Transmission:** Inhalation, ingestion, percutaneous inoculation (wounds or abrasions), not spread by casual contact.

**Communicability:** Extremely rare person-to-person spread

**Incubation:** Varies from 1 day to years; generally 1-21 days, and acute localized infection could be 1-5 days post inoculation.

**Infectious dose:** Unknown

**VIABILITY/INACTIVATION**

**Stability:** Can survive for years in soil and water and is very resistant to drying.

**Inactivation methods:**
- Autoclave sensitive
- 1% Sodium hypochlorite, 70% Ethanol, 2% glutaraldehyde, Iodines, Phenolics and Formaldehyde

**MEDICAL**

**Signs and symptoms:**
Most individuals exposed to *B. pseudomallei* do not develop symptoms. Those who do develop symptoms usually have predisposing medical conditions (See Special Considerations). Symptoms of melioidosis may be exhibited many years after exposure, commonly in association with an alteration in immune status or other compromising conditions such as diabetes. Manifestations of disease are extremely broad ranging and form a spectrum from rapidly life-threatening sepsis to chronic low-grade infection. A common clinical picture of acute melioidosis is that of sepsis associated with bacterial dissemination to distant sites, frequently causing concomitant pneumonia and liver and splenic abscesses. Infection may also occur in bone, joints, skin, soft tissue, or the prostate. Specific disease manifestations include:
- **Early:**
  - Enlarged lymph nodes in jaws/neck (looks like mumps)
  - Skin infections
- **Acute Pulmonary disease** (most common form, from inhalation or secondary from septicemia)
  - Fever above 102 F
  - Pneumonia

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**Burkholderia pseudomallei**
- Coughing
- Chest pain
- Headache
- May present similar to tuberculosis with fever, weight loss, and lung lesions.

- **Acute Localized (infection through skin and mucous membrane exposures)**
  - Ulcers, abscessus, or cellulitis at site of inoculation
  - Fever and malaise
  - Could progress to acute septicemic form

- **Acute Septicemia (infection through inhalation or as consequence of localized infection)**
  - Fever
  - Severe muscle tenderness
  - Severe headache
  - Diarrhea
  - Disorientation

- **Chronic Suppurative Infection (Infection through skin and mucous membrane exposures)**
  - Pneumonia
  - Abcessus located primarily on extremities
  - Patients may not have a fever
  - May present similar to tuberculosis with fever, weight loss, and lung lesions

**Pre-exposure prophylaxis:**

**NONE**

**Medical Surveillance:**

- Before working with or around this agent, individuals must enroll in CSU’s medical surveillance program through the Occupational Health Program.

**Diagnosis:**

- Self-report febrile illness with or without cough for 21 days post exposure – if symptoms occur, culture sputum samples on Ashdown medium or *Burkholderia cepacia* agar if Ashdown is unavailable. Gram negative, motile, bipolar staining, wrinkled colonies.
- Detection of antibodies in blood, 4 fold increase in titer is indicative of infection
  - Serum taken:
    - Day of exposure, 1, 2, 4, and 6 weeks post exposure

**Treatment**

- Note, for any prolonged use of TMP-SMX, of coadministration of folinic acid may be considered to prevent or reduce the antifolate activity of TMP-SMX without affecting its antimicrobial action.

- **Post exposure prophylaxis (duration 3 weeks):**
  Antimicrobial susceptibility of the strain of involved in the exposure event should be known, and if not tested as soon as possible. PEP should be cross referenced with this information to ensure efficacy. If patient seroconverts, but is asymptomatic, continue PEP for 12 weeks, with periodic checks.
  - Trimethoprim-sulfamethoxazole (TMP-SMX) orally: 160 mg/800 mg tablets: 2 tablets every 12 h for adult ≥60kg
    - OR
    - 80 mg/400 mg tablets: 3 tablets very 12 h for adult 40-60 kg
OR
160 mg/800 mg tablets: 1 tablet every 12 h or 80 mg/400 mg tablets: 2 tablets every 12 h for adult <40 kg,
  OR
  Amoxicillin-clavulanic acid (co-amoxiclav) orally: 500 mg/125 mg tablets: 3 tablets every 8 h for adult ≥ 60 kg*
  OR
  500 mg/125 mg tablets: 2 tablets every 8 h for adult <60 kg*

*Weight-based dosage based on 20 mg/5 mg/kg/dose.

Treatment of melioidosis:
  o Initial parenteral therapy
    Ceftazidime 50 mg/kg/dose (up to 2 g) intravenous every 8 h or 6 g per day by continuous infusion after a 2 g bolus
    OR
    ▪ Meropenem 25 mg/kg/dose (up to 1 g) intravenous every 8 h (for intensive care unit, neuromelioidosis or persistent bacteremia)
    ▪ Duration of therapy a minimum of 10–14 d, however, four or more weeks of parenteral therapy may be necessary in cases of more severe disease such as septic shock, deep seated or organ abscesses, extensive lung disease, osteomyelitis or septic arthritis or neurological melioidosis.
    ▪ Consider the addition of trimethoprim-sulfamethoxazole (TMP-SMX) for patients with severe infection involving the brain, prostate, or other privileged site (same dosing as described in Eradication Therapy, below). Can be administered by IV infusion over 30-60 min every 12 h, or nasogastric, or oral, as appropriate. If TMP-SMX is included, it should be used for the entire duration of the intensive phase.
    ▪ A switch to meropenem is indicated if patient condition worsens on ceftazidime, e.g., organ failure, development of a new focus of infection during treatment, or if repeat blood cultures remain positive. Depending on the severity of infection, the dose for patients ≥3 months and older can be ≤40 mg/kg/dose; not to exceed 2 g/dose.
  o Oral eradication therapy
    ▪ Trimethoprim-sulfamethoxazole (TMP-SMX) orally: 160 mg/800 mg tablets: 2 tablets every 12 h for adult ≥60 kg
      OR
      80/400 tablets: 3 tablets every 12 h for adult 40–60 kg
      OR
      160 mg/800 mg tablets: 1 tablet every 12 h or 80 mg/400 mg tablets: 2 tablets every 12 h for adult <40 kg
      OR
    Amoxicillin-clavulanic acid (co-amoxiclav) orally: 500 mg/125 mg tablets: 3 tablets every 8 h for adult ≥60 kg*
      OR
      500 mg/125 mg tablets: 2 tablets every 8 h for adult <60 kg*

*Weight-based dosage based on 20 mg/5 mg/kg/dose.
- Duration at is a minimum of 3 months
- If the organism is susceptible and the patient does not have a documented allergy to it, oral TMP-SMX is the agent of first choice. If the organism is resistant to TMP-SMX or the patient is intolerant, the second-line choice is co-amoxiclav.

**WHAT TO DO IF AN EXPOSURE OCCURS**

**Employees, Graduate Students, Work Study**

1. Employee notifies Biosafety (970-491-0270) and/or Occupational Health Program Coordinator (970-420-8172) to inform where medical attention will be sought and if transportation is needed.
   - The Principal Investigator/Supervisor must also be notified
2. Employee goes to Emergency Room
3. After the Emergency Room visit, individual fills out the following forms:
   - Workers' Compensation (within 4 days or as soon as possible): [http://www.ehs.colostate.edu/WWorkComp/Home.aspx](http://www.ehs.colostate.edu/WWorkComp/Home.aspx)
4. Employee follows up with CSU Authorized Treating Physician

**Student Not Paid by CSU**

1. Contact supervisor/PI
2. Student or supervisor contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed.
3. Student goes to CSU Health Network (Formerly Hartshorn Health Services)

**Volunteers and Visitors**

1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed.
3. Individual goes to their personal physician, or as otherwise directed by their physician

**REFERENCES**


• Peacock SJ, Schweizer HP, Dance DAB, Smith TL, Gee JE, Wuthiekanun V, et al. Management of Accidental Laboratory Exposure to *Burkholderia pseudomallei* and *B. mallei*. Emerging Infectious Disease. 2008:14 (7) ([http://cmr.asm.org/content/18/2/383.long](http://cmr.asm.org/content/18/2/383.long)).


**CONTENT REVIEW**

This document has been reviewed by:

• CSU subject matter expert: Dr. Herbert Schweizer

• Licensed Physicians: Colorado Health Medical Group, Occupational Health (principal: Dr. Tracy Stefanon)
Chikungunya Virus

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

CONTAINMENT AND SPECIAL PRECAUTIONS

Containment
- BSL-3 level practices, containment equipment and facilities are required for infectious or potentially infected materials, animals, cultures, or insects

Special considerations:
- Mosquito-borne virus
- Transmission to fetus rare, may cause abortion in first trimester

HAZARD IDENTIFICATION

Disease: Chikungunya fever

Transmission: Mosquito bite, aerosol transmission in laboratory

Communicability: Limited evidence for vertical transmission (mother to infant in womb)

Incubation: 2-12 days

Infectious dose: unknown

VIABILITY/INACTIVATION

Inactivation:
- Autoclave sensitive
- 1% bleach (500 ppm available sodium hypochlorite), 70% ethanol, 2% glutaraldehyde, organic solvents, detergents

MEDICAL

Signs and symptoms:
- Self-limiting fever
- Arthralgia (joint pain)
- Arthritis in knee, joints and ankle
- Rash
- Nausea and vomiting
- Eruption of mucous surfaces

Pre-exposure prophylaxis:

None
Diagnosis:
- Serology – testing serum to detect virus-specific IgM and IgG
- Serum taken:
  Day of exposure and 10-14 days later to detect 4-fold rise in titer

Treatment
Post-exposure prophylaxis:
- Supportive care

Treatment of clinical cases:
- Treatment is supportive and symptomatic

WHAT TO DO IF AN EXPOSURE OCCURS

Employees, Graduate Students, Work Study
1. Employee notifies Biosafety (970-491-0270) and/or Occupational Health Program Coordinator (970-420-8172) to inform where medical attention will be sought and if transportation is needed
   - The Principal Investigator/Supervisor must also be notified
2. Employee goes to Emergency Room
3. After the Emergency Room visit, individual fills out the following forms:
   - Workers’ Compensation (within 4 days or as soon as possible): [http://www.ehs.colostate.edu/WWorkComp/Home.aspx](http://www.ehs.colostate.edu/WWorkComp/Home.aspx)
4. Employee follows up with CSU Authorized Treating Physician

Student Not Paid by CSU
1. Contact supervisor/PI
2. Student or supervisor contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Student goes to CSU Health Network (formerly Hartshorn Health Services)

Volunteers and Visitors
1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Individual goes to their personal physician, or as otherwise directed by their physician

REFERENCES
CONTENT REVIEW
This document has been reviewed by:

- CSU subject matter expert: Dr. Carol Blair

WHO Guidelines on Clinical Management:
http://www.wpro.who.int/mvp/topics/ntd/Clinical_Mgmt_Chikungunya_WHO_SEARO.pdf
Coxiella burnetii

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CONTAINMENT AND SPECIAL PRECAUTIONS

Containment
- BSL-3 level practices, containment equipment, and facilities are required for work involving infectious body fluids, tissues, animals and cultures.

Special considerations:
- Select Agent
- Health care personnel PPE should include masks and eye protection when generation of aerosols or splatters of body fluids are anticipated.
- Health Risk factors: Persons with valvular heart disease, prosthetic heart valves, liver disease, altered immune systems and pregnant individuals are at increased risk for developing Q fever or complications.

HAZARD IDENTIFICATION

Disease: Q fever

Transmission: inhalation of infective animal body fluids (urine, milk, blood, and birthing fluids); arthropods (ticks). Person to person transmission is rare. While there is not a risk of secondary contamination or reaerosolization of the organisms from patients exposed to aerosolized C. burnetti, contaminated clothing may be a source of infection.

Communicability: While rare, person to person transmission has been reported in hospital workers as well as contact families.

Incubation: 10-40 days; varies

Infectious dose: 10-50 cfu by inhalation and percutaneous

VIABILITY/INACTIVATION

Stability: Spore-like form is resistant to heat, drying and sunlight and fomites contaminated by blood, urine, feces, and birth fluids can remain infectious for long periods.

Inactivation:
- Autoclave sensitive
- 1% Sodium hypochlorite, 5% Peroxide, , 70% Ethanol (30 minutes), 2% glutaraldehyde, formaldehyde
- Zoonotic
- Can cause abortion and premature labor
- People with recent heart surgery should avoid contact with agent
**MEDICAL**

**Signs and symptoms:**
Commonly presents as self-limited febrile illness of 2-14 days of duration. Can also cause chronic infections such as endocarditis or granulomatous hepatitis.

- High Fever
- Flu-like symptoms
- Abdominal pain
- Severe sweats
- Weakness
- Severe headache
- Pneumonitis (no cough or chest pain)
- Hepatitis
- Osteomyelitis
- Arthritis
- Endocarditis
- Neurological signs- confusion

**Pre-exposure prophylaxis:**
Vaccine (Q-Vax) may be available but requires sensitivity testing and travel to Australia.

**Diagnosis:**
- Serological tests include: immunofluorescence, microagglutination, complement fixation and ELISA
- PCR can detect organism in blood, cerebrospinal fluid, tissues and milk.
- Serum taken: Day of exposure, and 14 - 21 days post infection to detect 4-fold rise in titer

**Treatment**
- **Post exposure prophylaxis:**
  - Doxycycline, 100 mg, orally, every 12 hours, or tetracycline, 500 mg, orally every 6 hours following moderate to high risk exposure.
- **Symptomatic Treatment: Should be started within first 3 days:**
  - 100 mg Doxycycline, orally, twice daily for 15-21 days
  - Chronic stage – Doxycycline and quinolones for 4 years, or Doxycycline and hydroxychloroquine for 1 ½ to 3 years

**WHAT TO DO IF AN EXPOSURE OCCURS**

**Employees, Graduate Students, Work Study**
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4. Employee follows up with CSU Authorized Treating Physician

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2. Student or supervisor contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Student goes to CSU Health Network (formerly Hartshorn Health Services)
4. After the visit to CSU Health Network, student fills out Biosafety Incident Report form
   http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf

Volunteers and Visitors
1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to
   arrange transportation if needed
3. Individual goes to their personal physician, or as otherwise directed by their physician
4. Individual fills out Biosafety Incident Report form
   http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf

REFERENCES
- CDC Prophylaxis after Exposure: http://wwwnc.cdc.gov/eid/article/14/10/08-0576_article.htm
- Iowa State University Technical Data Sheet: http://www.cfsph.iastate.edu/Factsheets/pdfs/q_fever.pdf
- Moodie CE, Thompson HA, Meltzer MI, Swerdlow DL. Prophylaxis after exposure to Coxiella burnetii. Emerg Infect Dis [serial
  on the Internet]. 2008 Oct [date cited]. (http://www.cdc.gov/EID/content/14/10/1558.htm)
  Biosafety, 11(1), 32-41.

CONTENT REVIEW
This document has been reviewed by:
- CSU subject matter expert: Dr. Richard Bowen
**Disclaimer**

This document is for informational purposes ONLY. This document should not be used in lieu of professional medical attention, and medical professionals should seek appropriate resources for diagnosis and treatment.

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**Encephalitis Viruses**

*Japanese Encephalitis Virus (JE)*

*Western Equine Encephalitis (WEE)*

*Venezuelan Equine Encephalitis (VEE)*

*Eastern Equine Encephalitis (EEE)*

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**CONTAINMENT AND SPECIAL PRECAUTIONS**

**Containment**

- BSL-3 Level practices, containment equipment and facilities are required for work involving potentially infected materials, animals, cultures, or mosquitos.

**Special considerations:**

- North American strains of EEE virus and some epizootic subtypes (IAB and IC) of VEE virus are Select Agents
- Arthropod-borne disease
- Can cross placenta

**HAZARD IDENTIFICATION**

**Disease:** Encephalomyelitis

**Transmission:** infected mosquitoes, aerosol transmission of VEE and WEE viruses, natural person to person spread not reported, no human to mosquito transmission for WEE and EEE virus, but can happen in VEE virus up to 72 hours post-infection, VEE virus known to cross the placenta and this may also occur with the other viruses.

**Incubation:** 1-6 days (VEE) 5-15 days (JE, WEE and EEE)

**Infectious dose:** VEE – 1 pfu, JE, WEE and EEE – unknown

**VIABILITY/INACTIVATION**

**Stability:** Stable in blood, exudates, and freeze dried materials (VEE), can survive over winter in mosquito eggs (JEE)

**Chemical Inactivation:** Like most enveloped viruses, susceptible to 1% bleach (500 ppm available sodium hypochlorite), 2% glutaraldehyde, 3-8% Formaldehyde, quaternary compounds and phenolics. JEE and VEE are susceptible to 70% ethanol. EEE is inactivated after 60 minutes exposure to 50% ethanol.

**Physical Inactivation:** Sensitive to autoclave and drying
MEDICAL

Signs and symptoms:

**EASTERN EQUINE ENCEPHALITIS**

- Fever
- Chills
- Myalgia (muscle pain)
- Arthralgia (joint pain)
- Headache
- Irritability
- Neck stiffness
- Confusion
- Stupor
- Disorientation
- Tremors
- Seizures
- Paralysis
- Coma
- Abdominal pain
- Vomiting and diarrhea
- Symptoms subside in 1-2 weeks

**JAPANESE ENCEPHALITIS**

- Fever
- Headache
- Stupor
- Disorientation
- Coma
- Tremors/Seizures
- Paralysis
- Diarrhea
- Myalgia (muscle pain)

**WESTERN EQUINE ENCEPHALITIS (similar signs as EASTERN EQUINE ENCEPHALITIS)**

- Fever
- Chills
- Myalgia (muscle pain); back pain
- Malaise (discomfort)
- head ache
- Nausea, vomiting
- Diarrhea, abdominal pain
- Respiratory symptoms
- Symptoms subside in 1-2 weeks

**VENEZUELAN EQUINE ENCEPHALITIS**

- Fever
- Chills
- Malaise (discomfort)
- Myalgia (muscle pain)
- Severe headache
- Encephalitis
- Coughing
- Sore throat
- Nausea, vomiting
- Diarrhea
- Symptoms subside in 4-6 days

Pre-exposure prophylaxis:

- **JE:** Vaccine readily available, although there are no data demonstrating vaccine efficacy post needle stick or aerosol exposure.
- **EEV, VEE, and WEE:** May be available under certain circumstances through USAMRIID

Diagnosis:

- In all cases, Serum is taken on day of exposure, and 10-14 days post infection to detect 4-fold rise in titer.
- **EEE:** Isolated in A549 and MRC-5 cell cultures. Antigens detected by immunofluorescence and ELISA. Nucleic acid detected by RT-PCR.
- **WEE:** Throat swabs can be cultured. Viral isolation in embryonated eggs (Vero cell plaque assay). Also, detection methods similar to EEE.
• VEE: Viral isolation from blood, CSF and throat swabs. During febrile stage, antigen capture ELISA can detect VEE in the blood. Also, detection methods similar to EEE and WEE.
• JE: Similar to EEE, WEE and VEE

Treatment (Post-Exposure Prophylaxis/Treatment):
• Treatment is supportive and symptomatic

WHAT TO DO IF AN EXPOSURE OCCURS

Employees, Graduate Students, Work Study
1. Employee notifies Biosafety (970-491-0270) and/or Occupational Health Program Coordinator (970-420-8172) to inform where medical attention will be sought and if transportation is needed
   • The Principal Investigator/Supervisor must also be notified
2. Employee goes to Emergency Room
3. After the Emergency Room visit, individual fills out the following forms:
   • Biosafety Incident report form: [http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf](http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf)
   • Workers’ Compensation (within 4 days or as soon as possible): [http://www.ehs.colostate.edu/WWorkComp/Home.aspx](http://www.ehs.colostate.edu/WWorkComp/Home.aspx)
4. Employee follows up with CSU Authorized Treating Physician

Student Not Paid by CSU
1. Contact supervisor/PI
2. Student or supervisor contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Student goes to CSU Health Network (formerly Hartshorn Health Services)

Volunteers and Visitors
1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Individual goes to their personal physician, or as otherwise directed by their physician

REFERENCES
• CDC General Information: [http://www.cdc.gov/ncidod/dvbid/jencephalitis/qa.htm](http://www.cdc.gov/ncidod/dvbid/jencephalitis/qa.htm)
• Iowa State University Technical Fact Sheet, Eastern, Western, Venezuelan: [http://www.cfsph.iastate.edu/Factsheets/pdfs/ builds/easter_wester_venezuelan_equine_encephalomyelitis.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/ builds/easter_wester_venezuelan_equine_encephalomyelitis.pdf)
• Iowa State University Technical Fact Sheet, Japanese: [http://www.cfsph.iastate.edu/Factsheets/pdfs/japanese_encephalitis.pdf](http://www.cfsph.iastate.edu/Factsheets/pdfs/japanese_encephalitis.pdf)

**Disclaimer**
This document is for informational purposes ONLY. This document should not be used in lieu of professional medical attention, and medical professionals should seek appropriate resources for diagnosis and treatment.

CONTENT REVIEW
This document has been reviewed by:
• CSU subject matter experts: Dr. Richard Bowen
Middle East Respiratory Syndrome Virus (MERS-CoV, Formerly Human Coronavirus Erasmus)

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

CONTAINMENT AND SPECIAL PRECAUTIONS

Containment

- BSL-3 and ABSL-3 Level practices, containment equipment and facilities are required for work involving virus culture and isolation, laboratory manipulation of virus stocks, and all work involving animals. All work with exposed animals or manipulation of virus in vitro will require use of a PAPR for respiratory protection.

Special considerations:

- Healthcare: There is very limited information on transmission, severity and clinical impact of this newly emerged coronavirus. Until transmission is better understood, it is recommended that patients under investigation and probable and confirmed cases should be managed according to CDC’s infection control recommendations for the coronavirus that caused SARS per Appendix A of the 2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings (http://www.cdc.gov/hicpac/2007ip/2007isolationprecautions.html) and CDC’s Appendix 1, Supplement I of Public Health Guidance for Community-Level Preparedness and Response to SARS (http://www.cdc.gov/sars/guidance/I-infection/app1.html) which include:
  - Prioritized placement into a single patient room, with preference for Airborne Infection Isolation Room
  - Droplet Precautions are recommended in addition to Standard Precautions, and Airborne Precautions should be used for aerosol generating procedures.
  - Appropriate use of PPE:
    - Laboratory coat or gown and gloves are recommended during procedures and patient-care that might result in contact of clothing/exposed skin with blood /body fluids, secretions.
    - In addition, eye protection, particulate N95 masks or equivalent during procedures and patient-care likely to generate splashes or sprays of blood, body fluids, or secretions.
  - Vigilant environmental disinfection is recommended per http://www.cdc.gov/hicpac/Disinfection_Sterilization/3_2contaminatedDevices.html

VIABILITY/INACTIVATION

Inactivation:

- Autoclave sensitive
- Studies with SARS indicates effective disinfection after 1-minute contact time with 10% household bleach (5,000 ppm available sodium hypochlorite), 70% ethyl alcohol, and povidone-iodine (1% iodine)

Stability:

- Not specifically known, however, the closely related SARS-CoV is infectious in solution for up to 9 days, and 24 hours to 6 days in the dried state, and is heat labile.

HAZARD IDENTIFICATION

Transmission: At least one strain has the potential for a broad host range, indicating potential for zoonotic and human-to-human transmission.
Communicability: Unclear. May have originated from bats, and zoonotic infection and human-to-human transmission is a possibility.

Incubation: Unknown. The incubation period for SARS is usually 2-7 days with approximately 95% of patients developing symptoms within 10 days.

Infectious dose: Unknown

**MEDICAL**

Signs and symptoms:
- Symptoms have not yet been comprehensively defined, and may be similar to SARS, including prodromal symptoms of fever, myalgias and headache for the first 3–7 days followed by respiratory symptoms including non-productive cough. Dsypnea may follow and may progress to respiratory failure.
- CDC requests that state and local health departments report patients under investigation for infection to CDC. Severity of symptoms may vary, ranging from flu-like to symptoms to those for severe acute respiratory syndrome (SARS):
  - Criteria for investigation of infection can be found at [http://www.cdc.gov/coronavirus/ncv/case-def.html](http://www.cdc.gov/coronavirus/ncv/case-def.html) and include:
    - Acute respiratory infection, which may include fever and cough, AND
    - Suspicion of pulmonary parenchymal disease (e.g. pneumonia or acute respiratory distress), AND
    - Symptoms not already explained by any other infection or etiology, including all clinically indicated tests for community acquired pneumonia

Pre-exposure prophylaxis:
None

Medical Surveillance and Occupational Health:
- Before the initiation of work involving HuCov EMC, personnel shall be enrolled in the CSU Occupational Health Medical Surveillance Program; and be appropriately trained and proficient in specific laboratory and safety practices for the work being performed.
- Personnel working with HuCov EMC should immediately contact their supervisor in the event of exposure or development of respiratory symptoms
  - Exposures: The procedure outlined below should be followed for exposures
  - Symptoms: If symptoms consistent with the above description occur, then personnel should seek medical attention from a CSU Authorized Treating Physician, per the CSU Illness Procedure:

Diagnosis:
- To increase likelihood of detection, it is recommended that multiple specimens are collected from different sites.
- Lower respiratory tract and stool specimens should be considered as priority for collection and testing.
Treatment:

Post-exposure prophylaxis:
- Evaluation and active monitoring for respiratory symptoms as discussed above (in addition to sore throat, rhinorrhea, chills, myalgia, headache) within 10 days of exposure
- Activity restrictions should be discussed with the health department

Treatment of clinical cases:
- No specific treatment is recommended except for meticulous supportive care.

WHAT TO DO IF AN EXPOSURE OCCURS

Employees, Graduate Students, Work Study
1. Employee notifies Biosafety (970-491-0270) and/or Occupational Health Program Coordinator (970-420-8172) to inform where medical attention will be sought and if transportation is needed
   - The Principal Investigator/Supervisor must also be notified
2. Employee goes to Emergency Room
3. After the Emergency Room visit, individual fills out the following forms:
   - Workers’ Compensation (within 4 days or as soon as possible): [http://www.ehs.colostate.edu/WWorkComp/Home.aspx](http://www.ehs.colostate.edu/WWorkComp/Home.aspx)
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3. Student goes to CSU Health Network (formerly Hartshorn Health Services)

Volunteers and Visitors
1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Individual goes to their personal physician, or as otherwise directed by their physician

REFERENCES
- CDC disinfection guide (SARS): [http://www.cdc.gov/hicpac/Disinfection_Sterilization/3_2contaminatedDevices.html](http://www.cdc.gov/hicpac/Disinfection_Sterilization/3_2contaminatedDevices.html)

**CONTENT REVIEW**

This document has been reviewed by:

- CSU subject matter expert: Dr. Richard Bowen
- CSU Institutional Biosafety Committee Physician: Dr. Joseph Lopez
- Colorado Health Medical Group, Occupational Health (Dr. Tracey Stefanon)
**Rabies Virus**

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

**CONTAINMENT AND SPECIAL PRECAUTIONS**

**Containment:**
- BSL-2 level practices, containment equipment and facilities are recommended for infectious or potentially infected materials, animals, or cultures
- BSL-3 and ABSL-3 level practices, containment equipment and facilities are required when aerosols are likely

**Special considerations:**
- High fatality rate!
- All personnel working with the virus or infected animals should be immunized and have demonstrable anti-viral titers.

**HAZARD IDENTIFICATION**

**Disease:** Rabies, Hydophobia

**Transmission:** Saliva containing virus introduced by bite or scratch, aerosol.

**Communicability:** Person to person possible but rare and only documented in transplant recipients

**Incubation:** 10 days to many months

**Infectious dose:** Unknown

**VIABILITY/INACTIVATION**

**Inactivation:**
- Autoclave sensitive
- UV radiation and lipid solvent sensitive
- Susceptible to 1% sodium hypochlorite, 2% glutaraldehyde, 70% ethanol, formaldehyde

**MEDICAL**

**Signs and symptoms:**

***Once symptoms occur Rabies is ~100% Fatal – DO NOT WAIT FOR SYMPTOMS***

- Malaise
- Fever
- Headache
- Discomfort, pain
- Anxiety
- Confusion
- Agitation
- Insomnia
- Abnormal behavior
- Sensitivity to light and sound
- Delirium
- Hallucinations
- Slight or partial paralysis
- Hypersalivation
- Difficulty swallowing
- Pharyngeal spasms upon exposure to liquids
- Convulsions
- Furious hyperexcitability
- Hydrophobia
- Death within 2 to 10 days from onset of symptoms
Diagnosis:
Serology – ELISA or EIA to check for IgM
Saliva – Virus isolation or RT-PCR

Treatment:
- **Pre-exposure prophylaxis:**
  - VACCINATION AVAILABLE
  - From the 2008 ACIP Recommendations for human rabies prevention: Table 5 below describes the pre-exposure prophylaxis schedule, and Table 6 determines who might get vaccinated
- **Post-exposure prophylaxis:**
  - From the 2008 ACIP Recommendations for human rabies prevention: Table 3 below displays the prophylaxis guide based on animal exposure
  - From the 2010 ACIP Recommendations for use of a reduced (4-dose) vaccine schedule for post-exposure prophylaxis to prevent human rabies: Table 3 displays the post-exposure prophylaxis schedule

**TABLES FROM 2008 RECOMMENDATIONS OF THE ADVISORY COMMITTEE ON IMMUNIZATION PRACTICES**

http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5703a1.htm
**TABLE 6. Rabies pre-exposure prophylaxis guide — United States, 2008**

<table>
<thead>
<tr>
<th>Risk category</th>
<th>Nature of risk</th>
<th>Typical populations</th>
<th>Pre-exposure recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous</td>
<td>Virus present continuously, often in high concentrations. Specific exposures likely to go unrecognized. Bite, nonbite, or aerosol exposure.</td>
<td>Rabies research laboratory workers; rabies biology production workers.</td>
<td>Primary course. Serologic testing every 6 months; booster vaccination if antibody titer is below acceptable level.*</td>
</tr>
<tr>
<td>Frequent</td>
<td>Exposure usually episodic, with source recognized, but exposure also might be unrecognized. Bite, nonbite, or aerosol exposure.</td>
<td>Rabies diagnostic laboratory workers, cavers, veterinarians and staff, and animal-control and wildlife workers in areas where rabies is enzootic. All persons who frequently handle bats.</td>
<td>Primary course. Serologic testing every 2 years; booster vaccination if antibody titer is below acceptable level.*</td>
</tr>
<tr>
<td>Infrequent (greater than population at large)</td>
<td>Exposure nearly always episodic with source recognized. Bite or nonbite exposure.</td>
<td>Veterinarians and animal-control staff working with terrestrial animals in areas where rabies is uncommon to rare. Veterinary students. Travelers visiting areas where rabies is enzootic and immediate access to appropriate medical care including biologics is limited.</td>
<td>Primary course. No serologic testing or booster vaccination.</td>
</tr>
<tr>
<td>Rare (population at large)</td>
<td>Exposure always episodic with source recognized. Bite or nonbite exposure.</td>
<td>U.S. population at large, including persons in areas where rabies is epizootic.</td>
<td>No vaccination necessary.</td>
</tr>
</tbody>
</table>

* Minimum acceptable antibody level is complete virus neutralization at a 1:5 serum dilution by the rapid fluorescent focus inhibition test. A booster dose should be administered if the titer falls below this level.

**TABLE 3. Rabies postexposure prophylaxis guide — United States, 2008**

<table>
<thead>
<tr>
<th>Animal type</th>
<th>Evaluation and disposition of animal</th>
<th>Postexposure prophylaxis recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dogs, cats, and ferrets</td>
<td>Healthy and available for 10 days observation</td>
<td>Persons should not begin prophylaxis unless animal develops clinical signs of rabies.*</td>
</tr>
<tr>
<td></td>
<td>Rabid or suspected rabid</td>
<td>Immediately begin prophylaxis.</td>
</tr>
<tr>
<td></td>
<td>Unknown (e.g., escaped)</td>
<td>Consult public health officials.</td>
</tr>
<tr>
<td>Skunks, raccoons, foxes, and most other carnivores; bats†</td>
<td>Regarded as rabid unless animal proven negative by laboratory tests§</td>
<td>Consider immediate prophylaxis.</td>
</tr>
<tr>
<td>Livestock (small rodents (rabbits and hares), large rodents (woodchucks and beavers), and other mammals)</td>
<td>Consider individually</td>
<td>Consult public health officials. Bites from squirrels, hamsters, guinea pigs, gerbils, chipmunks, rats, mice, other small rodents, rabbits, and hares almost never require antirabies postexposure prophylaxis.</td>
</tr>
</tbody>
</table>

* During the 10-day observation period, begin postexposure prophylaxis at the first sign of rabies in a dog, cat, or ferret that has bitten someone. If the animal exhibits clinical signs of rabies, it should be euthanized immediately and tested.  
† Postexposure prophylaxis should be initiated as soon as possible following exposure to such wildlife unless the animal is available for testing and public health authorities are facilitating expeditious laboratory testing or it is already known that brain material from the animal has tested negative. Other factors that might influence the urgency of decision-making regarding initiation of postexposure prophylaxis before diagnostic results are known include the species of the animal, the general appearance and behavior of the animal, whether the encounter was provoked by the presence of a human, and the severity and location of bites. Discontinue vaccine if appropriate laboratory diagnostic test (i.e., the direct fluorescent antibody test) is negative.  
§ The animal should be euthanized and tested as soon as possible. Holding for observation is not recommended.
**TABLE FROM 2010 RECOMMENDATIONS OF THE ADVISORY COMMITTEE ON USE OF REDUCED (4-DOSE) VACCINE SCHEDULE FOR POSTEXPOSURE PROPHYLAXIS TO PREVENT HUMAN RABIES**

**TABLE 3. Rabies postexposure prophylaxis (PEP) schedule --- United States, 2010**

<table>
<thead>
<tr>
<th>Vaccination status</th>
<th>Intervention</th>
<th>Regimen*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not previously vaccinated</td>
<td>Wound cleansing</td>
<td>All PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent (e.g., povidone-iodine solution) should be used to irrigate the wounds.</td>
</tr>
<tr>
<td></td>
<td>Human rabies immune globulin</td>
<td>Administer 20 IU/kg body weight. If anatomically feasible, the full dose should be infiltrated around and into the wound (s), and any remaining volume should be administered at an anatomical site (intramuscular [IM]) distant from vaccine administration. Also, HRIG should not be administered in the same syringe as vaccine. Because HRIG might partially suppress active production of rabies virus antibody, no more than the recommended dose should be administered.</td>
</tr>
<tr>
<td></td>
<td>(HRIG)</td>
<td></td>
</tr>
<tr>
<td>Previously vaccinated**</td>
<td>Wound cleansing</td>
<td>All PEP should begin with immediate thorough cleansing of all wounds with soap and water. If available, a virucidal agent such as povidone-iodine solution should be used to irrigate the wounds.</td>
</tr>
<tr>
<td></td>
<td>HRIG</td>
<td>HRIG should not be administered.</td>
</tr>
<tr>
<td></td>
<td>Vaccine</td>
<td>Human diploid cell vaccine (HDCV) or purified chick embryo cell vaccine (PCECV) 1.0 mL, IM (deltoid area†), 1 each on days 0, 3, 7 and 14.†</td>
</tr>
</tbody>
</table>

* These regimens are applicable for persons in all age groups, including children.
† The deltoid area is the only acceptable site of vaccination for adults and older children. For younger children, the outer aspect of the thigh may be used. Vaccine should never be administered in the gluteal area.
§ Day 0 is the day dose 1 of vaccine is administered.
† For persons with immunosuppression, rabies PEP should be administered using all 5 doses of vaccine on days 0, 3, 7, 14, and 28.
** Any person with a history of pre-exposure vaccination with HDCV, PCECV, or rabies vaccine adsorbed (RVA); prior PEP with HDCV, PCECV or RVA; or previous vaccination with any other type of rabies vaccine and a documented history of antibody response to the prior vaccination.

**WHAT TO DO IF AN EXPOSURE OCCURS**

**Employees, Graduate Students, Work Study**

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Student Not Paid by CSU
1. Contact supervisor/PI
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3. Student goes to CSU Health Network (formerly Hartshorn Health Services)
4. After the visit to CSU Health Network, student fills out Biosafety Incident Report form
   [Link to report form]

Volunteers and Visitors
1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Individual goes to their personal physician, or as otherwise directed by their physician
4. Individual fills out Biosafety Incident Report form
   [Link to report form]

REFERENCES
- ACIP Post Exposure Vaccination Recommendations: [Link]
- CDC Web Information: [Link]
- Iowa State University Technical Sheet: [Link]
- Public Health Agency of Canada Data Sheet: [Link]

CONTENT REVIEW
This document has been reviewed by:
- CSU subject matter expert: Dr. Richard Bowen
Severe fever with thrombocytopenia syndrome virus expands its borders

Ying Wu¹ and George F Gao¹,²

Emerging Microbes and Infections (2013) 2, e36; doi:10.1038/emi.2013.36; published online 19 June 2013

The war on emerging pathogens is intensifying in 2013.

The outbreak of avian-origin influenza A (H7N9) virus in eastern China¹,² has reminded the world of the imminent threat of unexpected pathogens, including an “old” virus, influenza. Recent conversation has centered on H5N1, H9N2, H7N3, and H7N7, but never before had we considered H7N9 to be the cause of outbreaks of human infection or the next possible pandemic. Maybe we have to take a closer look at the possibility of reassortment among any of the 16 hemagglutinins and 9 neuraminidases subtypes, and even within the newly identified bat-derived, influenza-like virus H17N10.³,⁴

A new coronavirus, called human coronavirus Erasmus Medical Center (hCoV-EMC) (with a recent proposed new name as Middle East respiratory syndrome coronavirus, or MERS-CoV in abbreviation), has caused alarm in the Middle East, as human infection was first reported in March 2012.⁵ In one year, as of May 12, 2013, there have been 34 cases, with 18 fatalities in total (www.who.org). More importantly, human-to-human transmission has been reported, with second-generation infections in France and the UK in those individuals who have had close contact with patients with a history of travel to the Middle East.

Less publicized but equally significant, the recently emerged severe fever with thrombocytopenia syndrome virus (SFTSV) expanded its geographic spectrum in 2012–2013, from China to the USA, and now to Japan.

SFTSV-induced disease was first suspected in China in 2009, and the virus was isolated and confirmed in 2011.⁶ SFTSV is a new member of the genus Phlebovirus, with over 70 known members in the genus, which is in the family Bunyaviridae. Although the phlebovirus has been found in Africa and Europe for many years, SFTSV is the first-ever virus of this type isolated in China.⁶–¹⁰ The virus is known as the Heartland virus after the name of the place (Heartland, Missouri) where the virus was first isolated in the USA. The Heartland virus is phylogenetically distinct from SFTSV isolated in China, although similar clinical manifestations have been observed.⁹

Early this year, SFTSV was confirmed in western regions of Japan. Officials referred to the etiological agent of this outbreak as the same that caused disease in China, or SFTSV. However, these two agents are similar but not identical. As Dr. William L. Nicholson from the USA Centers for Disease Control and Prevention (CDC) suggested, these viruses could be considered as “cousins.”

The viruses from three countries are too different to be linked in their transmission. The viruses are most likely of the same type but with local origins. In fact, both USA Heartland virus- and Japanese SFTSV-infected patients were retrospectively confirmed, and travel by certain patients can be traced back to 2009 for the USA and the summer of 2012 for Japan. Scientists from both countries are now working on several earlier suspected cases. There is no evidence that the patients in the USA or Japan had travelled to China. Therefore, it seems the virus has been in the USA and Japan for some time. The three viruses may not have a common origin but certainly cause similar or even the same symptoms and clinical outcomes.

In China, SFTSV has caused an approximately 12% case fatality rate (CFR), which is an alarming number for this country.⁶,¹¹ Retrospective cases in Japan have an even higher CFR, with four deaths out of eight confirmed cases (additional suspected cases still need to be confirmed). The infected areas in China are concentrated in central China, covering six provinces. The major clinical symptoms and signs in the patients from the three countries are the same: high fever, thrombocytopenia, leucopenia, and elevated levels of serum hepatic enzymes. Although this group of viruses is transmitted by ticks, there is evidence in China that person-to-person transmission was highly probable through direct blood contact when the index patients had high viremia.¹²–¹⁴ Therefore, SFTSV is indeed a dangerous pathogen, and precautionary measures should be implemented in epidemic areas. Although no virus has yet been isolated from ticks, reverse transcription polymerase chain reaction (RT-PCR) tests on tick samples revealed evidence of virus.

To prevent infection and a possible epidemic, a call for vaccine development has been made in China. Scientists from the China CDC are working on this task in collaboration with large pharmaceutical companies. As high-level viremia is observed in acutely infected patients, therapeutic human-origin monoclonal antibodies or even antisera will serve as lifesaving agents that should be developed in the near future. Studies on pathogenesis, tick transmission, and useful animal models should also be pursued. A comparative study of the viruses from China, the USA, and Japan will be important to understand their etiology and to develop effective vaccines and therapies.

¹CAS Key Laboratory of Pathogenic Microbiology and Immunology, Institute of Microbiology, Chinese Academy of Sciences, Beijing 100101, China and ²Chinese Center for Disease Control and Prevention, Beijing 102206, China
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Emerging Microbes and Infections (2013) 2, e36; doi:10.1038/emi.2013.36; published online 19 June 2013
answer many questions about the origins and diversity of these viruses.

Indeed, our war on emerging pathogens may never end.


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Emerging Microbes and Infections
St. Louis Encephalitis Virus

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

CONTAINMENT AND SPECIAL PRECAUTIONS

Containment:
- BSL-3 Level practices, containment equipment and facilities are required for work involving potentially infected materials, animals, cultures, or mosquitos.

Special considerations:
- Mosquito-borne virus

HAZARD IDENTIFICATION

Disease: St. Louis encephalitis
Transcription: Mosquito bite
Incubation: 4-21 days
Infectious dose: unknown

VIABILITY/INACTIVATION

Inactivation:
- Autoclave sensitive
- 1% - 10% bleach (500- 5000 ppm available sodium hypochlorite), 70% ethanol, 2% glutaraldehyde, organic solvents, detergents

MEDICAL

Signs and symptoms:
- Most infections are asymptomatic
- Acute inflammatory disease of short duration, potentially involving the brain, spinal cord and meninges
- Severe infections have acute onset:
  - High fever
  - Headache
  - Nausea
  - Myalgia (joint pain)
  - Malaise (discomfort)
  - Meningeal signs – stupor, coma, convulsions, paralysis
  - Individuals over 60 have high rate of acute encephalitis

Pre-exposure prophylaxis:
None

Diagnosis:
Testing Serum taken at day of exposure and day 14 to check for 4-fold rise in antibody titer
Treatment:
Post-exposure prophylaxis:
• Supportive care
Treatment of clinical cases:
• Treatment is supportive and symptomatic

WHAT TO DO IF AN EXPOSURE OCCURS
Employees, Graduate Students, Work Study
1. Employee notifies Biosafety (970-491-0270) and/or Occupational Health Program Coordinator (970-420-8172) to inform where medical attention will be sought and if transportation is needed
   • The Principal Investigator/Supervisor must also be notified
2. Employee goes to Emergency Room
3. After the Emergency Room visit, individual fills out the following forms:
   • Biosafety Incident report form:
     http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf
   • Workers’ Compensation (within 4 days or as soon as possible):
     http://www.ehs.colostate.edu/WWorkComp/Home.aspx
4. Employee follows up with CSU Authorized Treating Physician

Student Not Paid by CSU
1. Contact supervisor/PI
2. Student or supervisor contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Student goes to CSU Health Network (formerly Hartshorn Health Services)
4. After the visit to CSU Health Network, student fills out Biosafety Incident Report form
   http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf

Volunteers and Visitors
1. Contact supervisor/PI
2. Contact Biosafety (491-0270) or Occupational Health (420-8172) to inform where attention is being sought, and to arrange transportation if needed
3. Individual goes to their personal physician, or as otherwise directed by their physician
4. Individual fills out Biosafety Incident Report form
   http://www.ehs.colostate.edu/WBiosafety/PDF/IncidentReportForm.pdf

REFERENCES
• BMBL: http://www.cdc.gov/biosafety/publications/bmbl5/BMBL.pdf
• CDC Information on Symptoms and Treatment: http://www.cdc.gov/sle/

CONTENT REVIEW
This document has been reviewed by:
• CSU subject matter expert: Dr. Carol Blair
West Nile Virus

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

CONTAINMENT AND SPECIAL PRECAUTIONS

Containing: BSL-3 Level practices, containment equipment and facilities are recommended for infectious or potentially infected materials, animals, cultures, or mosquitoes.

Special considerations:
- Can cross placenta and present in breast milk

HAZARD IDENTIFICATION

Disease: West Nile Fever, Neuroinvasive West Nile

Transmission: mosquitoes, exposure to broken skin or mucous membranes, needlesticks, transplacental and breast milk. Potential hazard in handling, including necropsy of infected birds.

Incubation: 3-12 days

Infectious dose: unknown

VIABILITY/INACTIVATION

Inactivation:
- Autoclave sensitive
- 1% sodium hypochlorite, 3% hydrogen peroxide, 70% ethanol, 2% glutaraldehyde, 1% iodine, phenolics and 3-8% formaldehyde

MEDICAL

Signs and symptoms:

West Nile Fever
- Flu-like symptoms
- Anorexia
- Nausea
- Swollen lymph nodes
- Vomiting
- Sore throat
- Conjunctivitis
- Skin rash on chest, stomach or back
- Fever
- Headache
- Resolve in 2 to 6 days
Neuroinvasive West Nile

- Encephalitis – changes in consciousness, disorientation, ataxia, incoordination, tremors, involuntary movements
- Meningitis – fever, headache, stiff neck, photophobia
- Flaccid paralysis – resembles polio, weakened limbs, muscle aches, abnormal bowel and bladder control, dizziness, vertigo

Pre-exposure prophylaxis:

NONE – no vaccine currently approved for use in US

Diagnosis:

Serology – presence of IgM in serum or cerebrospinal fluid, ELISA, plaque reduction neutralization tests, indirect immunofluorescence, (Cross reactivity with yellow fever, Japanese encephalitis, St. Louis encephalitis, or dengue)

Serum taken:
Day of exposure, and 10-14 days post infection to detect 4-fold rise in titer

Treatment (Post-Exposure Prophylaxis/Treatment):

Treatment is supportive and symptomatic

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3. Individual goes to their personal physician, or as otherwise directed by their physician
REFERENCES

- CDC Website: http://www.cdc.gov/ncidod/dvbid/westnile/index.htm
- Iowa State University Fact Sheet: http://www.cfsph.iastate.edu/Factsheets/pdfs/west_nile_fever.pdf

CONTENT REVIEW

This document has been reviewed by:

- CSU subject matter expert: Dr. Richard Bowen
Yersinia pestis

Principal investigators are responsible for communicating this information to staff working with or around this agent, and for mitigation of associated risks. This document is not intended to be used as a sole source for diagnosis, medical treatment, or medical advice. Consult a CSU Authorized Treating Physician for concerns about work related medical conditions.

CONTAINMENT AND SPECIAL PRECAUTIONS

Containment
- BSL-3 level practices, containment equipment, and facilities are required for work involving infectious body fluids, tissues, animals and cultures.

Special considerations:
- Select Agent, Tier 1
- Zoonotic

HAZARD IDENTIFICATION

Disease: Bubonic, pneumonic and septicemic plague

Transmission: Bite of infected flea, inhalation, animal-to-human or person-to-person transmission by human fleas or directly in pneumonic plague, handling infected tissues, touching or skinning infected animals

Communicability: Person to person spread possible through aerosol transmission

Incubation: Generally 1-8, depending on form: Percutaneous: 2-8 days; pneumonic 1-6 days; Septicemic 1-4 days

Infectious dose: Unknown

VIABILITY/INACTIVATION

Stability: Viable in soil, water, carcasses, hides, and grains for several weeks, and longer at near freezing temperatures. Killed within several hours of exposure to sunlight and disinfectants, or within 15 minutes of exposure to 55°C. Aerosolized bacteria will survive up to one hour, depending on conditions.

Inactivation:
- Autoclave sensitive
- 1% Sodium hypochlorite, 70% Ethanol, 2% glutaraldehyde, Iodines, phenolics and formaldehyde

MEDICAL

Signs and symptoms:
- Bubonic (Flu-like, with enlarged lymph nodes)
  - Sudden onset:
    - Headache
    - Fever
    - Malaise (discomfort)
    - Swollen and painful lymphnodes
  - Myalgia (joint pain)
  - Vomiting, nausea
  - Abdominal pain
- **Pneumonic (Lung infection)**
  - Sudden onset:
    - High fever
    - Headache
    - Malaise (discomfort)
    - Myalgia (joint pain)
    - Cough (could have bloody sputum)
  - Chills
  - Nausea, vomiting
  - Diarrhea, abdominal pain
  - Respiratory failure

- **Septicemic (Blood infection)**
  - Sudden onset:
    - Fever
    - Headache
    - Chills
    - Malaise (discomfort)
    - Myalgia (joint pain)
  - Nausea, vomiting
  - Abdominal pain
  - Hypotension
  - Meningitis -- rare

**Pre-exposure prophylaxis:**

NONE – Vaccine currently unavailable in the United States

**Medical Surveillance:**

- Before working with or around this agent, individuals must enroll in CSU’s medical surveillance program through the CSU Occupational Health Program.

**Diagnosis:**

- CDC Resource for diagnosis: [http://www.cdc.gov/plague/healthcare/clinicians.html](http://www.cdc.gov/plague/healthcare/clinicians.html)
- Organism cultured from sputum, blood or aspirates of lymph node on blood agar, MacConkey or infusion broth.
- PCR and immunoassays done at CDC-Fort Collins.
- Latex agglutination tests, passive hemagglutination and complement fixation tests available.
- Serum taken:
  - Day of exposure (or as early as possible) and 4-6 weeks after disease onset and >14 days post infection to detect 4-fold rise in titer

**Treatment:**

- CDC Resource for clinicians: [http://www.cdc.gov/plague/healthcare/clinicians.html](http://www.cdc.gov/plague/healthcare/clinicians.html)
- **Post Exposure Prophylaxis:**
  - Doxycycline (100 mg, orally every 12 hours); Ciprofloxacin (500 mg, orally every 12 hours).
  
  **Chemoprophylaxis should be started within 24 hours and continue for 7 days after last known or suspected exposure**
  - **Treatment of clinical cases:**
    - Streptomycin (streptomycin 30 mg/kg/day administered IM in 2 divided doses) for 10 days
- Gentamicin can be used due to toxicity or immediate nonavailability of streptomycin (5 mg/kg IV once daily or 2 mg/kg loading dose followed by 1.7 mg/kg IV every 8 hours)
- Tetracycline: loading dose 2g then 2g daily in 4 divided doses for 7 to 10 days
- Chloramphenicol 25 mg/kg every 6 hours IV

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REFERENCES

- CDC Website: http://www.cdc.gov/plague/
- CDC Plague Fact Sheet: http://www.cdc.gov/plague/resources/235098_Plaguefactsheet_508.pdf
- CDC Information for Clinicians: http://www.cdc.gov/plague/healthcare/clinicians.html
- Iowa State University Fact Sheet: http://www.cfsph.iastate.edu/Factsheets/pdfs/plague.pdf
CONTENT REVIEW

This document has been reviewed by:

- CSU subject matter expert: Dr. Richard Bowen
- Licensed Physicians: Occupational Health Services (principal: Dr. Tracy Stefanon)