



Post Exposure Plan for *Pseudomonas aeruginosa*

Background Information:

Pseudomonas aeruginosa is a gram-negative rod-shaped bacterium that is a widespread opportunistic pathogen. They are free-living bacteria that are commonly found in soil and water. They can produce toxins such as exotoxin A and enterotoxins and multiple natural mechanisms have been identified for antibiotic resistance.

Pseudomonas species infect humans, animals (wild, domestic, livestock), and plants (flora and fungi).

The most common routes of exposure in humans are aerosol/inhalation, direct contact, ingestion, and percutaneous.

Laboratory-acquired infections have not been reported but *P. aeruginosa* is one of the most common bacterial causes of health care acquired infections.

Illness from carbapenem-resistant *P. aeruginosa* is reportable. The State of Colorado requires reporting from both physicians and laboratories in all instances of infection with carbapenem-resistant *Pseudomonas aeruginosa*.

Primary hazards in the laboratory :

Ingestion, exposure to contaminated sharps, creation of splashes or aerosols, contact with naturally or experimentally infected animals, their feces or used bedding.

Acceptable disinfectants:

P. aeruginosa is susceptible to 70% ethanol, 0.5% hydrogen peroxide, or 10% fresh made bleach (sodium hypochlorite). If *P. aeruginosa* forms a biofilm, resistance to disinfectant is similar to that of bacterial spores. Hydrogen peroxide and sodium hypochlorite disinfectants are more bactericidal against *P. aeruginosa* biofilms compared to quaternary ammonium compounds.

Exposure controls and personal protection:

P. aeruginosa is a Risk Group 2 organism. Biosafety Level (BSL)-2 practices, containment equipment, and facilities are required when working with materials known or suspected of containing this agent.



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Personal protective equipment such as lab coats and gloves must be worn when handling infected or potentially infected materials. Eye protection must be used when there is a known or potential risk of generating splashed or aerosols.

Procedures that may generate aerosols or splashes should be conducted in a certified biosafety cabinet.

Personnel should wash their hands frequently while working in and before leaving the laboratory. Personal items including water bottles, cell phones, car keys, etc., should be stored in such a way as to avoid contamination and should be accessed only when the laboratory exercise is completed, lab coats and gloves are removed, and hands are washed.

The Principal Investigator (PI), or their designee, must ensure that all personnel are adequately trained in safe laboratory practices, universal precautions, and proper surface and equipment disinfection before initiating any work with this agent. *Pseudomonas* can survive for months on dry surfaces and inanimate objects. The PI must also ensure that all personnel are aware of the signs and symptoms of a potential infection with *P. aeruginosa*.

At risk populations:

Pseudomonas aeruginosa infections are most common in immunocompromised individuals. Diseases and conditions such as cystic fibrosis, bronchiectasis, neutropenia, burns, cancer, AIDS, organ transplant, uncontrolled diabetes mellitus increase risk.

Immediate Action by Route of Exposure:

Needlestick, Animal Bite, Laceration: Wash area thoroughly with soap and running water. Rinse the area under cool water for several minutes. Do not apply disinfectant to the skin.

Mucous membranes (Eyes, nose, mouth): Flush the eyes for 10-15 minutes if eyes have been exposed to splash or spray containing bacteria. Rinse out mouth without swallowing after any exposure.

Inhalation: If contaminated materials are aerosolized and potentially inhaled, rinse mouth twice and spit. Do not swallow.

After First Aid:

Suspected infections related to research exposures must be reported to the University of Colorado, Boulder's Biosafety Officer at 303-492-2817. Please see below for complete instructions related to suspected research exposure. The incubation period varies based on infection type but generally 24 – 72 hours. Symptomatic individuals are recommended to be tested and if rapid test results are positive, are advised to have their samples cultured and further analyzed to compare with the laboratory strain used.



Post-exposure prophylaxis:

The health care provider can recommend appropriate treatment. *P. aeruginosa* infections are sometimes successfully treated with common antibiotics but can frequently be resistant.

Symptoms of infection in adults:

- Flu-like symptoms (fever/chills, headache, dehydration, lethargy)
- Cutaneous symptoms (rash, itchiness, blisters)
- Ocular symptoms (pain, redness, swelling, blurred vision)
- Gastrointestinal symptoms (nausea, vomiting, diarrhea)
- Respiratory symptoms (coughing, sneezing, pneumonia)
- Musculoskeletal symptoms (joint and muscle pain)

After First Aid – Treatment and Reporting:

University of Colorado Boulder: Procedures for Work-Related Injuries or Illness, Including Animal Bites, Severe Allergic Symptoms, and Sharps Exposures.

It is the policy of the University of Colorado Boulder that all incidents that result in an injury or severe illness to faculty, staff or students be appropriately documented and reported. If a work-related incident, accident, injury or illness occurs:

a) Medical Treatment

- a. **In case of life or limb-threatening emergency call 911** or go immediately to the nearest emergent or urgent care facility. Immediately administer appropriate first aid, including thoroughly washing any wounds or exposed areas with soap and water, if at all possible.
- b. **If you are an employee of the University and you need non-emergency care** for a work-related illness or injury that has occurred during regular weekday working hours, you must be treated at one of the UCB Designated Medical Providers (DMPs: shown below). **Boulder Community Hospital Emergency Department has the ability to rapidly test for work-related infectious disease or potential biological exposures; all other DMPs may not have this rapid capability.** Testing can be done on the exposed personnel; it may be difficult to test any source patient or sample at the DMP.
- c. **After hours or while traveling**, go to the nearest urgent or emergent care facility.
- d. **Sharps injuries** that include exposure to human blood, body fluids, tissues, tissue culture cells are considered to be injuries with a potential for transmitting bloodborne pathogens. Prompt evaluation and treatment is necessary for these injuries (go to Boulder Community Hospital Emergency Department).

b) Reporting



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- a. Report the work-related injury or illness to your supervisor immediately. You or your supervisor should notify the Biosafety Officer at 303-492-2817 or at Cher.Masini@colorado.edu . (The BSO may confer with IBC Chair, Veterinarian, or Occupational Health RN.)
 - b. You must file a worker's compensation injury report form **within 4 days of the work-related injury** / exposure or illness onset. Report the incident on the URM website and use the on-line reporting form.
 - c. Sharps injuries must be reported on the URM's needle stick exposure report form.
 - d. All injury reporting forms can be found at the URM's website at <https://www.cu.edu/risk/file-claim>
- c) Eligibility (who is eligible to be seen by UCB Designated Medical Providers?)**
- a. All UCB employees, paid UCB staff, graduate students receiving a traineeship or stipend administered by UCB, undergraduate work-study students and paid undergraduate student assistants are eligible to be seen by CU DMPs. If you are an employee and you visit your regular primary care provider for a work-related injury and your visit is coded as a work-related injury, your primary insurance may not cover the cost of your visit or treatment with your primary care provider.
- Some individuals are not covered by UCB Worker's Compensation:*** All visiting or resident scholars who do not receive payment via UCB (e.g., Howard Hughes Medical Institute Fellows) must follow the work-related exposure / illness or injury protocol outlined by their parent institution or outside funding source. Contract or consulting employees are also not covered by UCB Worker's Compensation; they need to follow the work-related exposure / illness or injury protocols established by their parent institution or consult with their personal health care provider. Volunteers, contract employees and students not paid by UCB are **not** covered by UCB Worker's Compensation and should be seen by their personal health care provider. If you are a student with a Wardenburg Health care plan, post-exposure lab tests are available and covered.
- d) Payment and questions:**
- a. All employee bills from medical providers must be sent to University Risk Management:
University Risk Management (<https://www.cu.edu/risk/file-claim>)
1800 Grant Street, Ste 700
Denver, CO 80203
Fax: 303-860-5680
 - b. For further questions, contact URM at: 303-860-5682 or 888-812-9601

UCB Designated Medical Providers

<https://www.cu.edu/risk/dmp>

October 2022: Boulder & North Metro Denver:



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Concentra Medical Centers

3300 28th Street

Boulder, CO 80301

303-541-9090

290 Nickel Street, Ste 200

Broomfield, CO 80020

303-460-9339

500 E. 84th Avenue, Ste B14

Thornton, CO 80229

303-287-7070

550 E Thornton Pkwy, Ste 110

Thornton, CO 80229

720-872-0399

1860 Industrial Circle, Ste D

Longmont, CO 80501

303-682-2473

COMP Colorado Occupational Medical Partners

9025 Grant Street, Ste 200

Thornton, CO 80229

303-292-0034

Injury Care Associates



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9351 Grant Street, Ste 600

Thornton, CO 80229

720-531-8377

Peak Form Medical Clinic

695 S Broadway

Boulder, CO 80305

303-402-9283

1093 E Bridge Street

Brighton, CO 80601

303-655-9005

Workwell Occupational Medicine

Currently not accepting walk-ins, please schedule an appointment.

205 S Main Street, Suite C

Longmont, CO 80501

303-702-1612

1600 Specht Point Rd, Suite 115

Fort Collins, CO 80525

970-672-5100

2528 West 16th Street

Greeley, CO 80634

970-356-9800



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