# Post Exposure Plan for *Herpes simplex virus* (HSV)

## Background Information:

Herpes simplex virus (HSV), types 1 and 2, are found worldwide and are the main cause of cold sores. HSV can infect any part of the body but is mostly associated with infections of the mouth, pharynx, face, eye and central nervous system (CNS). HSV-1 can cause a number of infections including, painful lesions on the finger/nails, gingivostomatitis, eye diseases (e.g., blepharitis/dermatitis, conjunctivitis, dendritic epithelial keratitis, and corneal ulceration), etc. Corneal diseases due to HSV infections can cause blindness. HSV-2 is the leading cause of genital herpes, however, HSV-1 has become just as common in primary genital infections in developed countries. HSV can also cause a serious infection of the CNS, herpes simplex encephalitis, in children and adolescents. This can happen after a primary or latent infection with HSV-1. Primary infections with HSV-1 are usually acquired in childhood and may be asymptomatic or subclinical. Neonatal herpes is uncommon but is a serious complication of genital herpes with a very high mortality rate.

The primary reservoir host of HSV are humans. There is a high prevalence of HSV-1 in both developing and developed countries. Non-human primates, rabbits and rodents can be infected experimentally.

The most common mode of transmission is direct contact with infected secretions or mucous membranes/lesions from asymptomatic or symptomatic individuals shedding the virus. HSV-1 can also be transmitted through respiratory droplets, while both serotypes can be transmitted sexually. Neonatal herpes can be acquired at different times, in utero (5% of cases), peripartum (85% of cases) and postpartum (10% of cases).

Laboratory-acquired infections are presumed to occur via exposure to splashes or aerosolized materials contaminated with virus particles. Also, possibly via eating with virus-contaminated hands.

## Primary hazards in the laboratory :

Creation of splashes or aerosols, exposure to mucous membranes, ingestion, and exposure to contaminated sharps.

## Acceptable disinfectants:

HSV is inactivated by lipid solvents (e.g., 0.5% Lysol, 70% isopropanol, 4% (2000ppm) bleach).

## Exposure controls and personal protection:

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

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 waters 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.

If an infection is acquired, any lesions need to be completely covered to prevent spreading the infection.

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. The PI must also ensure that all personnel are aware of the signs and symptoms of a potential infection with HSV with an emphasis on the effects on the immunocompromised, persons with allergic dermatitis and pregnant individuals.

## At risk populations:

Neonates and infants are at risk for contracting neonatal herpes, which is an extremely severe disease with a high mortality rate. Children and adolescents are at risk of serious HSV infections, which can lead to encephalitis (70% mortality rate if left untreated).

## Immediate Action by Route of Exposure:

**Needlestick, Animal Bite, Laceration:** Wash area thoroughly with soap and running water. 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. Treating medical providers should also be informed of the possibility of HSV infection. The incubation period for this disease ranges from 1-26 days. Symptomatic individuals are recommended to be tested for HSV.**

## Post-exposure Prophylaxis:

Your health care provider can recommend appropriate treatment.

## Symptoms of infection in adults:

Symptomatic primary infections of HSV-1:

- Gingivostomatistis with
- Fever
- Sore throat
- Bad breath
- Anorexia
- Cervical adenopathy
- Mucosal edema
- Vesicular and ulcerative painful lesions of buccal mucosa, tongue, gums and pharynx
- Cold sores

Symptomatic primary infections of HSV-2:

- Genital herpes

If this is a primary infection of mucosal tissues with HSV-1, there often can be multiple profuse painful vesicular lesions on an inflamed mucosal base in approximately 20-25% of people. Reactivation usually results in fewer lesions and fewer, if any, systemic symptoms. Without treatment, the vesicular lesions can last for 10-14 days.

Recurrences generally will occur at or near the site of the primary infection. Immunocompromised individuals are likely to have more frequent recurrences or are more at risk for disseminated infection.

Cutaneous infections can cause initial itching and pain, followed by vesicular lesions. Vesicles can be accompanied by nerve pain and lymph swelling. Skin lesions of the digits, known as Herpetic Whitlow, take 2-3 weeks to heal and can also recur.

## 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 at Boulder (UCB) 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**

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 IACUC administrator, 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 UCB DMPs. If you are an UCB 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 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

**This list changes frequently. For a current listing of DMPs, please refer to the University of Colorado's Risk Management website at: https://www.cu.edu/risk/dmp**