

MONKEYPOX SURVEILLANCE PROTOCOL

Draft

Note: This draft is dated August 28, 2003. Information about Monkeypox is changing rapidly. Make certain you have the most current guidance.

Public Health Action

1. Identify personnel to do field investigation of cases of monkeypox, and protect employee health. Personnel must:
 - a. Have *documented immunity to smallpox* (successful vaccination within three years). If unvaccinated personnel must be utilized in the response, they should have no contraindications to the smallpox vaccine and ideally be vaccinated prior to departure for fieldwork. If unvaccinated workers are exposed, they should be vaccinated as soon as possible, ideally within 4 days of exposure (vaccination should be considered up to 14 days after last exposure).
 - b. Use *airborne* (N-95 mask), *contact* (gloves, gown), and *standard precautions* during direct exposure to infected animals or humans, *even if fully vaccinated*.
2. Educate providers about diagnosis and urgent reporting of suspect patients with monkeypox.
3. Educate veterinarians about diagnosis and urgent reporting of suspect animals with monkeypox. IDEP should be consulted immediately about control measures if suspect animal cases are reported.
4. Educate providers to immediately isolate patients suspected of having monkeypox, to include:
 - a. Airborne precautions (negative pressure isolation of the patient and use of an N-95 mask by the healthcare worker);
 - b. Contact precautions (gloves, gown);
 - c. Standard precautions;
 - d. Notification of the Infection Control Practitioner; and
 - e. Isolation must continue until all scabs have fallen off
5. Report suspect cases to IDEP immediately (1-800-423-1271) and use "Form 1: Monkeypox case investigation Form" to gather information on all cases. Laboratory confirmation of suspect cases is critical. See 'laboratory diagnosis.' Consult IDEP regarding the investigation.
6. Advise cases not to donate blood, cells, tissue, organs, breast milk or semen while ill or under symptom surveillance.
7. Monkeypox patients who do not require hospitalization for medical indications may be isolated at home. Persons with extensive lesions that cannot be easily covered

(excluding facial lesions) or draining/weeping lesions or respiratory symptoms (e.g., cough, sore throat, or rhinorrhea) should be isolated in a room or area separate from other family members when possible. For movement outside the isolation area, a surgical mask should be worn if respiratory symptoms are present. Educate the family about the following guidelines:

- a. Skin lesions should be covered to the extent possible (e.g., long sleeves, long pants) to minimize risk of contact with others.
 - b. Family members who enter the room or area should wear a surgical mask that fits snugly; disposable gloves should be worn for direct contact with the patient.
 - c. Unexposed persons should not enter the home. Health-care personnel and others who must enter the home to provide patient-related services should wear an N95 respirator.
 - d. Hand hygiene (i.e., hand washing with soap and water or use of an alcohol-based hand rub) should be performed by infected persons and household contacts frequently, and particularly after touching body sites, clothing, linens, or environmental surfaces that may have had contact with infectious lesions.
 - e. Laundry (e.g., bedding, towels, clothing) may be washed in a standard washing machine with warm water and detergent; bleach may be added but is not necessary. Care should be used when handling soiled laundry to avoid direct contact with contaminated material. Soiled laundry should not be shaken or otherwise handled in a manner that may aerosolize infectious particles.
 - f. Dishes and other eating utensils should not be shared but segregation of specific utensils for use by the infected person is not necessary. Soiled dishes and eating utensils should be washed with warm water and soap.
 - g. Contaminated surfaces should be cleaned and disinfected. Standard household cleaning/disinfectants may be used in accordance with manufacturer's instructions. Dressing, bandages, and other materials contaminated with lesion drainage should be bagged and placed in another container for disposal with other household waste.
8. Identify and line list household contacts, close contacts and other contacts (i.e. those that have contact with case's clothing or bedding) of humans or animals with confirmed monkeypox using the CDC "Form 2: Monkeypox Contact/Site Worksheet". See form and instructions following the protocol.
- Close contact is defined as:
- a. > 3 hours direct exposure within 6 feet, or
 - b. Intimate contact resulting in exposure to body fluids or lesions of infected persons
- Record locating and demographic information for each contact in the spaces provided on Form 2. Use the priority codes according to the criteria on Form 2 to prioritize contacts.
9. For each contact:
- a. Prioritize contacts, using Form 2.
 - b. Call, or preferably visit those contacts in categories 1 and 2, and those contacts who have had intimate contact with body fluids or lesions of

infected persons or animals, and:

- i. Educate regarding monkeypox and smallpox vaccine, including contraindications to vaccination. Neither age nor pregnancy nor history of eczema are contraindications to vaccination in persons with close/intimate contact with a confirmed case of monkeypox. IDEP is willing to help with difficult decisions regarding risk-benefit of smallpox vaccination. Vaccination of persons with life-threatening allergies to latex or smallpox vaccine components and of persons with immunodeficiencies in T-cell function is contraindicated, including:
 - (1) HIV-infected adults with CD4 lymphocyte count less than 200 (or age-appropriate equivalent counts in children);
 - (2) Solid organ or bone marrow transplant recipients or others currently receiving high dose immunosuppressive therapy (i.e., 2 mg/kg body weight or a total of 20 mg/day of prednisone or equivalent for persons whose weight is > 10 Kg when administered for > 2 weeks)
 - (3) Persons with lymphosarcoma, hematological malignancies, or primary T-cell congenital immunodeficiencies.
- ii. Make arrangements through BPH for vaccination. Vaccine is available on emergency investigational new drug (EIND) protocol for control of monkeypox. Vaccination should be performed as soon as possible after a recognized exposure, preferably within 4 days of last exposure, but not later than 2 weeks after exposure is broken.
- iii. Place contacts under active surveillance and document using CDC "Form 3: Monkeypox Contact Surveillance Form". See form and instructions following the protocol. During the surveillance period (21 days following last exposure to the case):
 - (1) Call or visit the contact daily. Continue to offer education and information.
 - (2) Contacts should take their temperature twice daily.
 - (3) Contacts who develop a fever or rash or suspect vaccine adverse event should be referred for medical evaluation. The clinician, hospital or emergency room should be notified prior to the patient's arrival so that health care workers can take appropriate precautions. Newly diagnosed cases should be evaluated as above.
 - (4) Vaccination history and "take" should be recorded on Form 3.
 - (5) Health care workers with unprotected exposures should also be under active surveillance, with temperature recorded prior to reporting for duty each day. Hospital employees should be followed in collaboration with the infection control practitioner or employee health nurse at the hospital.
 - (6) Contacts should be advised not to donate blood, cells, tissue, organs, breast milk or semen during the 21 day surveillance period.

- c. Healthcare workers who care for patients with monkeypox while adhering to the recommended infection control precautions (airborne precautions with an N-95 mask and recent smallpox vaccination) should be vigilant for fever and other symptoms. They should take their temperature twice daily for the 21 days following last exposure and should be contacted regularly by infection control, employee health or other designated personnel to inquire about symptoms.

Disease Prevention Objectives

1. Prevent entry of monkeypox into West Virginia by preventing importation and sale of exotic species in the state.

Disease Control Objectives

1. Prevent transmission from a case of monkeypox by:
 - a. Immediate isolation using airborne and contact precautions for patients with monkeypox or undifferentiated febrile vesicular/pustular rash illness.
 - b. Appropriate vaccination of close and intimate contacts and active surveillance of contacts.
 - c. Investigation to identify the source and elimination of any ongoing source of exposure.

Disease Surveillance Objectives

1. To detect human monkeypox if it occurs in West Virginia.
2. To detect monkeypox in animals if it occurs in West Virginia.
3. To characterize the occurrence of disease in person, place and time.
4. To characterize the risk factors for disease in our state.
5. To estimate attack rates and secondary attack rates in our population.

Public Health Significance

Prior to May, 2003, human monkeypox had never been identified within the Western Hemisphere. Monkeypox normally occurs in central and west Africa. Usually, monkeypox cases are sporadic or may occur in small clusters. However, African villages have experienced outbreaks of monkeypox,. A well-documented African outbreak of monkeypox occurred in 1996 and 1997 in the Democratic Republic of Congo. During this outbreak, 88 cases were identified over a period of 12 months in 12 villages. The attack rate was approximately 2.2% and the mortality rate was 3.7%. Environmental factors influencing this outbreak were not identified. However, an increase in the susceptible population as a result of the end of smallpox vaccination is thought to have played a role.

The World Health Organization considered reinstatement of smallpox vaccination to prevent monkeypox in the region, but abandoned the idea because the risk of adverse events was thought to be too high in a region of the world where there is a high prevalence of undiagnosed HIV infection.

At the end of May of 2003, human cases of monkeypox were identified in the United States associated with direct or close contact with prairie dogs, a Gambian giant rat, and a rabbit. Investigations identified a common distributor where prairie dogs and Gambian giant rats were housed together in Illinois. The Gambian giant rats had been imported from Ghana in a shipment containing approximately 800 small mammals, and several of these mammals have tested positive for the monkeypox virus indicating that this shipment was the source of the 2003 United States monkeypox outbreak.

As of July 11, 2003, a total of 71 human cases of monkeypox have been reported from Wisconsin (39), Indiana (16), Illinois (12), Missouri (2), Kansas (1) and Ohio (1). Thirty-five of these cases are laboratory confirmed and the rest are suspect and probable cases. All patients were exposed prairie dogs or premises where prairie dogs were kept. There have been no deaths related to this outbreak.

Monkeypox in the United States is of particular importance because of its implications for the emergence of a new disease within the US. West Nile has illustrated how quickly a new disease might spread across the continent and become enzootic in our wildlife populations creating an ongoing risk of infection for humans. Swift public health action is needed to prevent further spread of monkeypox in both humans and animals within the United States.

Clinical Description

The most complete case series was published in Journal of Infectious Diseases, 1987; 156:293. The clinical features in 282 cases in Zaire were similar to those of the discrete or semiconfluent ordinary or modified type of smallpox.

Prodrome: During the preeruptive stage, patients reported fever, which lasted in 80% of patients for one to three days before rash onset. About 5% of patients developed fever the same day and the remaining 15% had a febrile prodrome lasting more than 3 days before rash onset. Other prodromal symptoms included severe headache, backache, general malaise and prostration. In many patients, enlargement of lymph nodes was observed prior to rash onset.

Eruptive phase: The skin eruption first appeared on the face, but 19% of patients first noted the rash on the forearms or some other part of the body. In general, the lesions developed more or less simultaneously and evolved in the same body region at the same rate through stages of macules, papules, vesicles, and pustules before umbilicating, draining, and desquamation. Most unvaccinated persons presented with a centrifugal rash with lesions all in the same stage, and facial, palmar and plantar pox. Duration of illness was 2-4 weeks, with scabs falling off by day 22-24. Complications occurred in 43% of unvaccinated and 9% of vaccinated persons, including secondary infection of skin lesions, pulmonary distress, bronchopneumonia, vomiting diarrhea, corneal ulceration, septicemia and encephalitis.

Previously vaccinated persons had less severe disease, including:

- a smaller number of lesions,
- less frequent finding of lesions of the mucous membranes or face
- less occurrence of upper respiratory symptoms, including sore throat and cough

In addition, there were no deaths among patients with a vaccination scar, but death rate was 11% with all deaths occurring in children between 3 months and 8 years of age. The age-specific case-fatality rate was highest in the youngest age group with a 15% case fatality rate in children aged 0-4.

The major clinical feature differentiating smallpox and monkeypox is lymphadenopathy, occurring in 84% of unvaccinated and 53% of vaccinated persons with monkeypox.

Etiologic Agent

Monkeypox virus (genus *Orthopoxvirus*)

Reservoir

Rodents, such as squirrels and rats are the most likely reservoirs for Monkeypox. However, Monkeypox infects a wide range of animal hosts including primates.

Mode of Transmission

Monkeypox is usually transmitted to humans through contact with respiratory droplets, skin, blood, other body fluids or bedding of infected animals. However, the disease can also spread from person to person via respiratory droplet or contact with body fluids, bedding or clothes of an infected human. Person-to-person transmission is relatively inefficient, and there is no evidence that person to person transmission alone can sustain Monkeypox within a population.

Incubation Period

7-17 days (CDC)

Infectious Period

Unknown. Likely from the onset of symptoms until scabs fall off.

Outbreak Recognition

As West Virginia has never had a case of Monkeypox, one case is defined as an outbreak.

Case Definition

(July 2, 2003)

Clinical Criteria:

Rash (macular, papular, vesicular, or pustular; generalized or localized; discrete or confluent)

Fever (subjective or measured temperature $\geq 99.3^{\circ}\text{F}$ ($\geq 37.4^{\circ}\text{C}$))

Other signs and symptoms

- Chills and/ or sweats
- Headache
- Backache
- Lymphadenopathy
- Sore Throat
- Cough
- Shortness of breath

Epidemiological Criteria:

- Exposure¹ to an exotic or wild mammalian pet² obtained on or after April 15, 2003, with clinical signs of illness (e.g., conjunctivitis, respiratory symptoms, and/or rash)
- Exposure¹ to an exotic or wild mammalian pet² with or without clinical signs of illness that has been in contact with a case of monkeypox either in a mammalian pet³ or a human
- Exposure⁴ to a suspect, probable or confirmed human case

¹Includes living in a household, petting or handling, or visiting a pet holding facility (e.g., pet store, veterinary clinic, pet distributor).

²Includes prairie dogs, Gambian giant rats, and rope squirrels. Exposure to other exotic or non-exotic mammalian pets will be considered on a case-by-case basis; assessment should include the likelihood of contact with a mammal with monkeypox and the compatibility of clinical illness with monkeypox.

³Includes living in a household, or originating from the same pet holding facility as another animal with monkeypox.

⁴Includes skin-to-skin or face to face contact

Laboratory Criteria:

- Isolation of monkeypox virus in culture
- Demonstration of monkeypox virus DNA by polymerase chain reaction testing in a clinical specimen
- Demonstration of virus morphologically consistent with an orthopoxvirus by

- electron microscopy in the absence of exposure to another orthopoxvirus
- Demonstration of the presence of orthopoxvirus in tissue using immunohistochemical testing methods in the absence of exposure to another orthopoxvirus

Case Classification:

Suspect Case

- Meets one of the epidemiologic criteria, AND
- Fever OR unexplained rash AND two or more other signs or symptoms with onset of first sign or symptom ≤ 21 days after last exposure meeting epidemiologic criteria

Probable Case

- Meets one of the epidemiologic criteria, AND
- Fever AND vesicular-pustular rash with onset of first sign or symptom ≤ 21 days after last exposure meeting epidemiologic criteria

Confirmed Case

- Meets one of the laboratory criteria

Exclusion Criteria

A case may be excluded as a suspect or probable monkeypox case if:

- An alternative diagnosis can fully explain the illness⁵ OR
- The case was reported on the basis of primary or secondary exposure to an exotic or wild mammalian pet or a human (see epidemiologic criteria) subsequently determined not to have monkeypox, provided other possible epidemiologic exposure criteria are not present OR
- The case was reported on the basis of contact with an exotic mammalian pet with or without signs of illness that had been in contact with an ill animal or human case that was subsequently excluded as a case of monkeypox (e.g., another etiology fully explains the illness) provided other possible epidemiologic exposure criteria are not present OR
- A case without a rash does not develop a rash within 10 days onset of clinical symptoms consistent with monkeypox⁶ OR
- The case is determined to be negative for non-variola generic orthopoxvirus by polymerase chain reaction testing of a well sampled rash lesion by the approved Laboratory Response Network (LRN) protocol.

⁵Factors that might be considered in assigning alternate diagnoses include the strength of the epidemiologic exposure criteria for monkeypox, the specificity of the diagnostic test, and the compatibility of the clinical presentation and course of illness for the alternative diagnosis.

⁶If possible, obtain convalescent-phase serum specimen from these patients. See specimen collection guidelines for details on collecting serum for convalescence evaluation.

Laboratory Diagnosis:

Laboratory diagnosis is essential to confirm a case of monkeypox. Any human or animal suspected of having monkeypox should have appropriate specimens collected for testing. The specimens will need to be shipped to the Centers for Disease Control in Atlanta. This **must** be done in coordination with the West Virginia Office of Laboratory Services and the Infectious Disease Epidemiology Program. Consult the CDC Guidelines for the collection and transport of suspect monkeypox case specimens (<http://www.cdc.gov/ncidod/monkeypox/diagspecimens.htm>) prior to collecting specimens. Clinicians and public health practitioners should collaborate to collect and store any of the following specimens on persons suspected of having monkeypox:

- Vesicular or pustular tissue and fluid
- Scabs
- Biopsy tissues
- Autopsy specimens from major organs
- Throat swabs for viral culture
- Whole blood for viral culture
- Serum for serological tests

Label **all** tubes, vials, microscope slide and EM grid holders with the following:

- Patient name,
- Date and time of collection
- Source of specimen (vesicle, pustule, or scab)
- Date of birth of patient (for cross referencing of specimens)
- Name or initials of person collecting specimen
- If patient is hospitalized, include hospital and identification numbers (e.g., medical record #, surgical path #).
- State ID or CDC Monkeypox ID number

Surveillance Indicators

1. Proportion of cases with complete demographic information
2. Proportion of suspect cases with laboratory testing performed.
3. Proportion of cases with complete clinical and risk factor information
4. Proportion of cases with identified contacts.
5. Number of contacts per case.
6. Proportion of contacts with complete follow-up information.
7. Proportion of cases with complete follow-up information.