

HEALTH CARE PROVIDER FACT SHEET

SMALLPOX

Information for Health Care Providers

Physicians • Nurses • Laboratory Personnel • Infection Control Practitioners

General

- Smallpox no longer occurs naturally.
 - Last naturally-occurring case in Somalia in 1977
 - Declared globally eradicated by WHO in 1980
 - Only 2 WHO-approved repositories of smallpox virus (CDC, Atlanta, GA and Institute for Viral Preparations, Moscow, Russia)
 - Routine childhood vaccination against smallpox discontinued in the U.S. in the early 1970's and worldwide in the early 1980's.
 - In general, people born after 1972 did not received smallpox vaccination
 - Vaccination does not confer lifelong immunity
 - Most adults vaccinated as children (born before 1972) susceptible to developing disease if exposed.
- **An intentional release of smallpox (variola) virus into the population could result in multiple primary exposures with a subsequently large number of secondarily exposed individuals if the illness is not recognized quickly.**

A suspected case of smallpox must be treated as a public health and medical emergency. Any suspected case of smallpox must be reported IMMEDIATELY to the Clark County Health District at 383-1378. The initial laboratory evaluation for confirmation of smallpox must be done at the Centers for Disease Control and Prevention (CDC) in Atlanta, GA.

Transmission

- Human-to-human transmission usually occurs by inhalation of virus-containing air-borne droplets of saliva during face-to-face contact (≤ 6 feet) with an infected person with subsequent infection of the oropharyngeal region of a susceptible person.
- Less commonly, transmission may also occur via:
 - Fine-particle aerosols
 - Seen more often from persons with severe symptoms (hemorrhagic signs or confluent lesions) or cough
 - Physical contact
 - Contact with material from the smallpox pustules or crusted scabs, (scabs much less infectious than respiratory secretions)
 - Contact with fomite contaminated by infectious secretions, pustule material, or scabs
- Attack rates for secondary non-immune household or close (face-to-face) contacts can be up to 80%.

Clinical Illness

- Incubation between 7-17 days (mean 12 days)
- At end of incubation period:
 - Fever ($\geq 100.5^\circ$ F)
 - Malaise and prostration
 - Headache and backache
 - Possible abdominal pain and delirium
- Maculopapular rash appears 1-3 days following onset of fever
 - Rash primarily on face, mucosa of mouth and pharynx, forearms, and legs (centrifugal distribution), some lesions on trunk (front more than back)
 - Most dense on face and extremities
 - Appear over 1-2 day period
 - Lesions generally evolve at same rate
 - Lesions seen on palms and soles
 - Maculopapular \rightarrow papular (1-2nd day of rash) \rightarrow vesicles (4-5th days of rash) \rightarrow pustular (7th day of rash) \rightarrow scabs (14-28th day of rash)

Clinical Presentations

Most common

- Ordinary-type (typical) smallpox
 - Discrete – most common, discrete lesions (lesions separated by normal skin), case fatality rate up to 9% in unvaccinated
 - Semi-confluent – rash confluent on face but discrete on body, case-fatality rate up to 37% in unvaccinated
 - Confluent – rash confluent on face and extremities, case-fatality rate up to 62% in unvaccinated

Less common

- Modified-type – similar to ordinary smallpox but with fewer, smaller lesions and more rapid recovery; usually seen in persons with some degree of immunity but not fully protected (previously but not recently vaccinated)
- Flat-type – lesions remain almost flush with skin (flatter pustules), severe toxemia, more common in children, seen in about 7% of unvaccinated individuals, most cases fatal
- Hemorrhagic-type – hemorrhages into the skin and mucous membranes, bleeding from multiple sites (epistaxis, hematemesis, hemoptysis, etc.), severe toxemia, more common in adults and pregnant women, most cases fatal

Differential Diagnosis

Ordinary-type

- Varicella (chicken pox) – (lesions more superficial, centripetal distribution, at different stages of development)
- Monkeypox - (recent travel to western or central Africa)
- Measles – (early stages of smallpox rash, Koplik's spots help differentiate)
- Erythema multiforme – (onset of symptoms and rash at same time, rash evolves quicker)
- Drug eruptions
- Generalized vaccinia - (in a recently vaccinated individual)
- Other rash illnesses with fever

Hemorrhagic-type

- Meningococcal septicemia
- Acute leukemia
- Viral hemorrhagic fevers

Diagnosis

- **Initial laboratory confirmation of smallpox must be coordinated with the Clark County Health District and NSPHL.**
- Once smallpox confirmed, other suspected cases may not require immediate laboratory confirmation
- Non-vaccinated personnel involved in specimen collection/handling should wear (at a minimum): properly fitted and filtered mask (e.g. N-95 respirators), gloves, gowns, face-shields, shoe covers.
- All samples should be collected and packaged in accordance with standard biological packaging and shipping guidelines (Public health officials will assist with specimen shipping to CDC)
- Specimens to be collected include:
 - Fluid from base of vesicle – collect with sterile cotton-tipped swab and place fluid on clean glass slide, let slide air-dry then place into seal-able slide holder for shipping to CDC.
 - Scraping from base of vesicle – use blunt edge of scalpel then place blade with material on it into screw-capped plastic container for shipping to CDC
 - Serum sample – use plastic serum separator tube, or allow whole blood to separate then draw off serum and place into screw-capped plastic vial for shipping to CDC
 - Unclotted whole blood – Draw 5cc into plastic purple-topped tube and seal with parafilm prior to shipping to CDC.

Therapy

- **Supportive therapy along with antibiotics as indicated for occasional secondary infections**
- **No antiviral substances have proven effectiveness for treating or preventing smallpox**

Vaccination

- **Should be administered to suspected smallpox patients if cohorted together to prevent exposure due to misclassification as a smallpox case**
- **Should be administered to all health care workers involved in smallpox patient care activities, transportation, or handling of potentially infectious materials from a smallpox patient**
- **Physicians may be asked to get an informed consent signed from persons receiving smallpox vaccination**

Infection Control

- Suspected smallpox patients should be isolated under strict airborne and contact precautions
 - Use negative pressure rooms with air filtration and anteroom
 - Limit number of personnel in contact with suspected case, limit their other patient care activities
 - Wear appropriate protective equipment when in contact with suspected case
 - Properly dispose of all protective equipment (biohazard bags) before leaving anteroom
 - Avoid transportation through hospital (e.g. portable x-rays in room), mask patient with N-95 respirator if transportation through hospital unavoidable

- Place contacts under fever surveillance for 18 days after last contact with case, if smallpox confirmed
 - Contacts or supervisor to monitor temperature twice a day
 - Report temperature $\geq 100.5^{\circ}$ F immediately to public health authorities
- Vaccination up to four days after exposure may prevent or reduce the seriousness of smallpox infection
 - Should be administered to all persons who had contact if smallpox confirmed
 - Should be administered to personnel, without contraindications, who will be involved in future evaluation/care of suspected cases (if not already a contact)
- Do not re-use equipment or room for other patients unless properly decontaminated

This information sheet has been adapted from material developed by the Washington State Department of Health in collaboration with the Centers for Disease Control and Prevention. Reuse or reproduction is authorized. Information updated May 11, 2001.

References

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5. Radetsky M. Smallpox: a history of its rise and fall. Pediatr Infect Dis J 1999; 18:85-93.
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**When You See Unusual,
Think Outbreak!**