

## 8.2 Small Pox, List A

<http://www.phac-aspc.gc.ca/tularemia/index-eng.php>

### ***Case Definition***

#### **Confirmed case**

Laboratory confirmation of infection:

- isolation of variola virus from an appropriate clinical specimen  
OR
- positive PCR for variola virus nucleic acid

\* Any testing related to suspected smallpox should be done at the NML with Level 4 containment facilities.

#### **Probable case**

- Clinical illness in a person who is epidemiologically linked to a laboratory-confirmed case or to a probable case

#### **Suspected case**

- Clinical illness in a person who is not epidemiologically linked to a laboratory-confirmed case or to a probable case of smallpox  
OR
- atypical lesion<sup>1\*\*</sup> known to be associated with the variola virus on a person who is epidemiologically linked to a laboratory-confirmed or probable case

### ***Clinical Presentation***

A smallpox infection starts with a sudden onset of fever (of > 38.33C), malaise, headache, backache and prostration 1-4 days before rash onset. Severe abdominal pain and delirium are sometimes present. After about three days, the fever drops and a maculopapular rash appears, involving vesicles or firm pustules in the same stage of development without other apparent cause. These lesions are deeply embedded and appear, characteristically, on the mouth and on the face, the hands, and the forearms. Scabs form after eight to fourteen day and these may become deep depigmented, pitted scars. Lesions may itch at scabbing stage. Illness lasts 14-21 days.

To differentiate, chickenpox or varicella from variola, the varicella rash is more superficial and more prominent on the trunk. The smallpox or variola is a centrifugal rash on face or forearm, and lesions on palms and soles (seen in >50% of cases) and the lesions are pitted and deep. The varicella lesions also appear at different stages of development where as variola does not. Variola major has a case fatality rate of 30% (can be as high as 50%). A picture of smallpox can be found at the following URL: [www.who.int/emc/diseases/smallpox/slideset/index.htm](http://www.who.int/emc/diseases/smallpox/slideset/index.htm)

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<sup>1</sup> Atypical presentation of smallpox include a) hemorrhagic lesions OR b) flat velvety lesions not appearing as typical vesicles or not progressing to pustules.

## ***Epidemiology***

### **Occurrence**

Smallpox has been officially declared eradicated by the WHO in 1980. The last naturally occurring case was 1977 in a Somali boy. The only source for smallpox exists in laboratories in Russia and the United States. It is believed some of these stores may have been obtained by terrorist countries and therefore it is felt to be a present threat through bioterrorism. There has not, however, been any evidence of disease.

### **Reservoir**

The reservoir for this virus is humans

### **Transmission**

Smallpox can be transmitted from person to person mainly through airborne droplets released from the lungs of an infected person through cough or sneezes. Contaminated clothing or bed linen can also spread the virus.

### **Incubation Period**

The incubation period is usually 12-14 days after exposure, could be 7-19 days.

### **Communicability**

During the incubation period transmission does not occur. Transmission can occur during the first week of illness but the period of infectiousness extends from the development of fever until all lesions have scabbed over. That is about 21 days from the onset of illness. Prior to eradication it was expected that each case infected at least five other individuals.

### ***Diagnosis***

Case confirmation is based on findings consistent with the above listed case definition.

### **Control Measures**

#### **Management of Case**

If a case of smallpox appeared it would be considered a global emergency. Treatment of the individual would consist of adequate hydration as well as strict isolation precautions that include airborne, contact, and standard precautions

#### **Management of Contacts**

Contacts should be vaccinated and, if develop fever, should be isolated. Vaccine, if given 2 -3 days after exposure, almost always prevents disease and given at 4-5 days almost always prevents death. The development of antibodies will occur more quickly than the disease will appear.

For those individuals who are considered to be at high risk of exposure to smallpox such as those who are immunocompromised, vaccinia immune globulin can be given with the vaccine. Vaccination and or vaccinia immune globulin would initially be performed by a team of experts from Health Canada's Center for Emergency Preparedness and Response Division.

Contraindications to use of smallpox vaccination under non-emergent circumstances would include: the presence of severe eczema, acute or chronic exfoliate skin conditions and for individuals who are immunosuppressed including household contacts.

### **Management of Outbreaks**

Notification of one case would result in a national response. The response to an outbreak would involve deployment of an expert team from Health Canada's Center for Emergency Preparedness and Response Division. They will assist with smallpox vaccine training and other key public health measures for Canada's search and containment strategy against smallpox. Direction for quarantine and vaccination would come from this team.

Consideration of implementing a vaccination program must include an assessment of the risk and threat from smallpox. Consideration must be given to the possibility of severe adverse reactions to vaccination. There must be an assessment done at a national level to determine the supply of vaccine and vaccinia immune globulin as well as the ability of local vaccination capacity.

The primary goal is to interrupt the transmission of smallpox. This would be done by rapid isolation of cases and by identification and vaccination of contacts. Identification of infected individuals will require intensive surveillance.

### **Preventive Measures**

The best preventive measure against smallpox is vaccination. Immunization of health care workers stopped in 1977 and the Canadian Forces stopped vaccinating in 1988; accordingly, very few of those born in Canada since 1972 would ever have had any vaccination against smallpox. Also those vaccinated prior to 1972 are not expected to have any remaining immunity.

If there was a reintroduction of smallpox at this time there is a very susceptible population. Prior to vaccinating individuals, a screening process must take place in order to rule out those who are at risk of complication from vaccination. The vaccination process currently would only take place under the direction of Health Canada as training of staff would be required.

Cases would need to be isolated to prevent further spread. This can be done at home to prevent further transmission. If the individual requires hospitalization, a room with negative air pressure should be used. Also contacts should be screened then placed under observation.

### **Reporting Requirements and Procedures**

The PH Lab will provide immediate report of any identified cases

#### **Regional MOH will notify**

- Local physicians, nurse practitioners, communicable disease control nurses (CDCNs) and infection control nurses (ICN) in the particular region.
- Provincial office of the CMOH as per list A

**Provincial Public Health is responsible for**

- Reporting the data related to the disease to PHAC and other regions.
- Analysis of cases and reporting in the Communicable Disease Report (CDR)