

Guideline for Evaluating a Rash Illness as Possible Smallpox

Washington State Clinical Laboratory Advisory Council (CLAC)
 May 2004; Reviewed/ revised January 2008/ July 2017

Telephone Numbers For your Facility

Laboratory Director _____
 Laboratory Supervisor _____
 Lead Technologist _____
 Infection Control _____
 Local Health Jurisdiction _____

**Washington State DOH, Communicable Disease
 Epidemiology:** (206) 418-5500 or 1 (877) 539-4344

SMALLPOX RISK ASSESSMENT CATEGORIES

Low Risk of Smallpox - Manage as Clinically Indicated

1. No febrile prodrome
OR
1. Febrile prodrome (see Major Smallpox Criteria) AND
2. ≤3 Minor smallpox criteria (see Minor Smallpox Criteria)

Moderate Risk of Smallpox - Urgent Evaluation

1. Febrile prodrome (see Major Smallpox Criteria) AND
2. One other MAJOR smallpox criterion (see Major Smallpox Criteria)
OR
1. Febrile prodrome (see Major Smallpox Criteria) AND
2. ≥4 MINOR smallpox criteria (see Minor Smallpox Criteria)

High Risk of Smallpox - Report Immediately

1. Febrile prodrome (see Major Smallpox Criteria) AND
2. Classic smallpox lesion (see Major Smallpox Criteria) AND
3. Lesions in same stage of development (see Major Smallpox Criteria)

MAJOR SMALLPOX CRITERIA

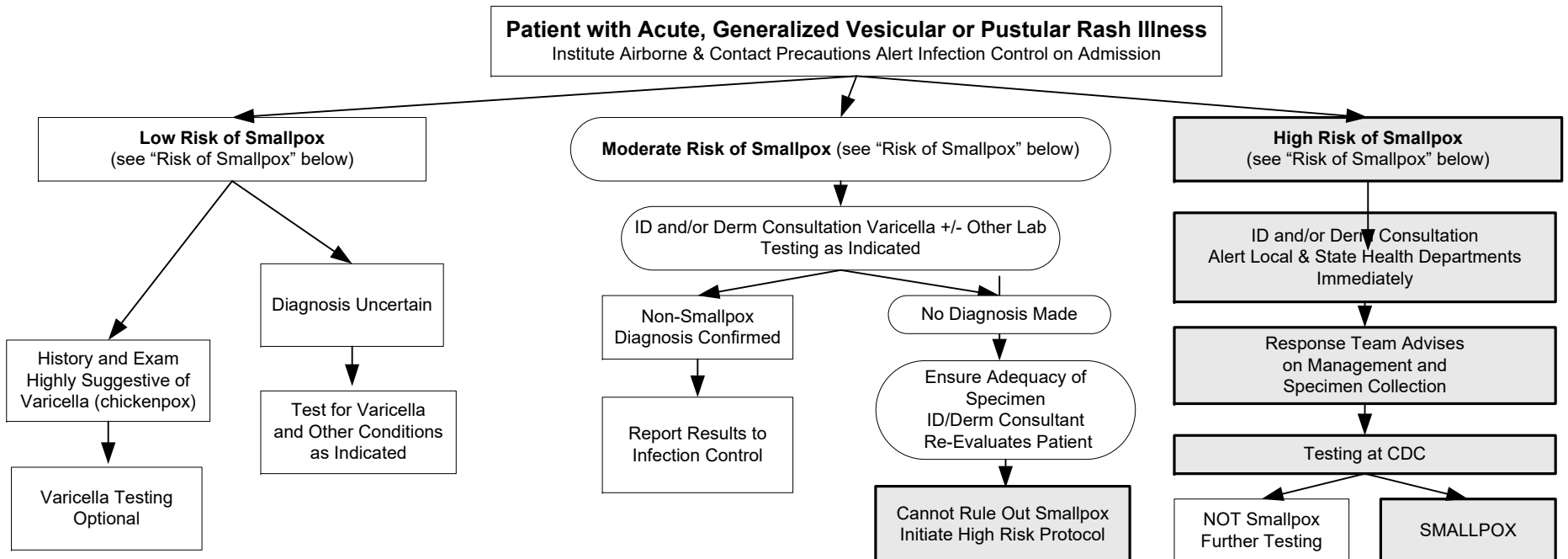
Febrile Prodrome: occurring 1-4 days before rash onset: fever greater than or equal to 101°F and at least one of the following: Prostration, headache, backache, chills, vomiting, or severe abdominal pain.

Classic Smallpox Lesions: deep-seated, firm/hard, round well-circumscribed vesicles or pustules; as they evolve, lesions may become umbilicated or confluent

Lesions in the same stage of development: on any one part of the body (e.g., the face, or arm) all lesions are in the same stage of development (i.e., all are vesicles, or all are pustules)

MINOR SMALLPOX CRITERIA

- Centrifugal distribution: greatest concentration of lesions on face and distal extremities
- First lesions on the oral mucosa/palate, face, or forearms
- Patient appears toxic or moribund
- Slow evolution: lesions evolve from macules to papules to pustules over days (each stage lasts 1-2 days)
- Lesions on the palms and soles



Differentiating Chickenpox From Smallpox

Chickenpox (varicella) is the most likely condition to be confused with Smallpox

In Chickenpox

- No or mild prodrome
- Lesions are superficial vesicles: "Dewdrop on a rose petal"
- Lesions appear in crops: on any one part of the body there are lesions in different stages (pustules, vesicles, crusts)
- Centripetal distribution: greatest concentration of lesions on the trunk, fewest lesions on distal extremities. May involve the face/scalp. Occasionally entire body equally affected.
- First lesions appear on the face or trunk
- Patients rarely toxic or moribund
- Rapid evolution: lesions evolve from macules; papules; vesicles; crusts quickly (<24 hours)
- Palms and soles rarely involved
- Patient may lack reliable history of varicella or varicella vaccination
- Assess for an exposure to chickenpox or shingles 10-21 days before rash onset

Common Conditions That Might Be Confused With Smallpox

Condition	Clinical Clues
Varicella (Primary infection with varicella-zoster virus)	Most common in children <10 years; children usually do not have a distinct viral prodrome
Disseminated herpes zoster	Immunocompromised or elderly persons; rash looks like varicella, usually follows a dermatomal distribution
Impetigo (<i>Streptococcus pyogenes</i> , <i>Staphylococcus aureus</i>)	Honey-colored crusted plaques with bullae are classic but may begin as vesicles; regional, not disseminated rash; patients generally not ill
Drug eruptions	Exposure to medications; rash often generalized
Contact dermatitis	Itching; contact with possible allergens; rash often localized in pattern suggesting external contact
Erythema multiforme minor	Target, "bulls eye", or iris lesions; often follows recurrent herpes simplex virus infections; can involve hands and feet (including palms and soles)
Erythema multiforme (incl. Stevens Johnson Syndrome)	Major form involves mucous membranes and conjunctivae; may be target lesions or vesicles
Enteroviral infection esp. Hand, Foot and Mouth disease	Most common in summer and fall; fever and mild pharyngitis 1-2 days before rash onset; lesions initially maculopapular but evolve into whitish-gray tender, flat often oval vesicles; peripheral distribution (hands, feet, mouth); can be disseminated.
Disseminated herpes simplex	Lesions indistinguishable from varicella; More common in immunocompromised host
Scabies; insect bites (incl. fleas)	Itching is a major symptom; patient is not febrile and is otherwise well
Molluscum contagiosum	Distinct umbilicated papules; May disseminate in immunocompromised persons;

Additional Smallpox Information

Laboratory Diagnostics: Clinical evaluation and a careful patient history that includes any information about recent smallpox vaccination or contact with a recent vaccinee are the mainstays of diagnosing smallpox vaccine-related adverse events. In many situations clinical diagnosis is not straightforward, and laboratory diagnostics for vaccinia are necessary to prevent inappropriate use of potentially toxic therapies. Diagnostics for conditions easily confused with vaccinia infection (i.e. varicella, herpes zoster, herpes simplex and enteroviruses) should be considered first, in particular for a nonvaccinee or a person with no history of contact with a vaccinee. Serologic testing for vaccinia is generally uninformative because it cannot distinguish between vaccinia immunity and vaccinia infection unless baseline antibody titers are available. Diagnostic testing for vaccinia at PHL is done via gene amplification (polymerase chain reaction [PCR]) using a method available through the Laboratory Response Network (LRN), an extensive system of public health and private laboratories that can be accessed through consultation with local and state health departments.

Laboratory Specimen Collection: A suspected adverse event after smallpox vaccination (or contact with a recent vaccinee) should be promptly reported to the appropriate local, state, or territorial health department. When appropriate, public health officials may recommend that clinical specimens be collected for further evaluation of a possible adverse event. The following specimen collection methods can be used (presented in descending order of preference): 1. Use a swab to collect a good amount of exudate from a lesion and place the swab in a dry sterile tube. 2. Collect a scab from a lesion into a dry sterile tube. 3. Use a slide to press down on one or more lesions to express exudates and make a 'slide impression'. Place the slide into a slide holder and then into a bag for transport.

Specimen Labeling and Handling: Label all tubes or slide holder with two unique identifiers on each. The requisition form should also include date of collection, source of specimen (vesicle, pustule, scab, or fluid), and the name of the submitter. Specimens should be maintained at a temperature of 2 to 8 degrees Centigrade.

Infection Control Procedures: Always wear appropriate personal protective equipment while collecting and packaging specimens. (Contact appropriate infection control personnel for your facility if you have infection control questions.)

Reference: Centers for Disease Control and Prevention Evaluating Patients for Smallpox, Version 1.0; January 31, 2002.