

# Measles

<b>Signs and Symptoms</b>	Prodrome (fever AND cough <i>or</i> coryza <i>or</i> conjunctivitis) lasting 2-4 days followed by rash. Fever overlaps rash, and then drops 1-3 days or more after rash onset. Rash is maculopapular, typically begins on the head often along the hairline and spreads downward (cephalocaudal) usually becoming a full body rash. Complications can include diarrhea, otitis media, pneumonia, encephalitis, and rarely death. Assess likelihood of measles using the <a href="#">Measles Assessment Checklist</a> .	
<b>Incubation</b>	10-12 days (range 7-21 days). Rash starts 2-4 days after onset of prodrome.	
<b>Case classification</b>	<b>Clinical definition:</b> Illness characterized by a generalized rash lasting $\geq 3$ days, a fever $\geq 101.0^{\circ}\text{F}$ ( $38.3^{\circ}\text{C}$ ), AND cough <i>or</i> coryza <i>or</i> conjunctivitis.	
	<b>Confirmed case:</b> Acute febrile rash illness with at least one of the following: isolation of measles virus from a clinical specimen <u>OR</u> positive PCR test <u>OR</u> IgG seroconversion or significant rise in measles IgG antibody <u>OR</u> positive IgM test <u>OR</u> epi-linked to a lab confirmed case.	<b>Probable case (not used in WA):</b> In the absence of a more likely diagnosis, meets the clinical case definition, has noncontributory or no measles laboratory testing, and is not epi-linked to a lab confirmed case.
<b>Differential diagnosis</b>	fifth disease, roseola, rubella, scarlet fever (also called scarlatina), adenovirus infections, influenza, certain vector-borne illnesses such as Rocky Mountain spotted fever, Kawasaki disease and antibiotic reaction.	
<b>Treatment</b>	No specific treatment, supportive as needed.	
<b>Duration</b>	Typically lasts 7–10 days. Contagious at least from first symptom onset up to 4- 5 days prior to rash onset and remain contagious for at least 4 days after rash onset. See appendix A, Measles Worksheet	
<b>Exposure</b>	Person-to-person spread through airborne transmission (inhaling suspended droplet nuclei) or if infectious secretions come into contact with mucous membrane. Virus can remain infectious in aerosolized form in an air space for at least 2 hours after case departs.	
<b>Laboratory testing</b>	<p>If measles seems likely, collect specimens at the first health care visit for testing at WA PHL</p> <p><b>RT-PCR:</b> RT-PCR is the preferred confirmatory testing. NP/OP/ throat swab should be collected within 72 hours of rash onset; NP/OP Throat swab should be accompanied by urine if 72 hours since rash onset have passed. Urine PCR test is most sensitive between <math>\geq 72</math> hours and 10 days after rash onset and may not be positive until <math>&gt;4</math> days after symptom onset.</p> <p><b>Serum for IgM and IgG testing:</b> Serum measles IgM antibody positive is acceptable laboratory confirmation. Measles specific IgM antibody may not be present until <math>\geq 72</math> hours after rash onset and persist for about 30 days after rash onset. Note that false positive measles IgM results are common. Currently, <b>measles IgM testing is not available at the WA PHL</b>. For highly suspect or indeterminate cases, DOH CD Epi may request a serum sample to forward to CDC for testing. Serum sent to WAPHL for IgM testing will be appropriately stored for further instruction.</p> <p>A significant rise in serum measles IgG antibody between acute and convalescent titers is also acceptable laboratory confirmation.</p> <p>Please refer to the measles serology (<a href="#">IgG</a> and <a href="#">IgM</a>) and <a href="#">PCR</a> specimen collection instructions. For additional specimen shipping guidance, refer to the <a href="#">Measles Shipping Guide</a>.</p> <p>Submit according to PHL requirements: <a href="https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu">https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu</a></p> <p><b>Please note:</b> WA PHL does not perform measles culture testing.</p>	
<b>Public health actions</b>	All rash illnesses suspected to be measles must be immediately reported to DOH CD Epi	
<b>URGENT</b>	<ul style="list-style-type: none"> <li>• Facilitate transport of specimens to PHL to confirm diagnosis.</li> <li>• Isolate the case until 4 days after rash onset or until measles is ruled out.</li> <li>• Identify case contacts and sites where the case spent time while contagious.</li> <li>• Make appropriate recommendations to contacts (see Appendix G).</li> <li>• Provide consultation to facilities (e.g., businesses, schools, health care facilities) where case was present while contagious. Notify WA DOH for out of jurisdiction facilities.</li> <li>• Determine where case may have been exposed, if possible.</li> <li>• Conduct active surveillance for additional cases.</li> </ul>	

# Measles

## 1. DISEASE REPORTING

### A. Purpose of Reporting and Surveillance

- To rapidly identify measles cases.
- To prevent the spread of measles.
- To identify groups of unimmunized children and adults.

### B. Legal Reporting Requirements

- Health care providers and Health care facilities: **immediately notifiable to local health jurisdiction**
- Laboratories: **immediately notifiable to local health jurisdiction**; specimen submission required - isolate or clinical specimen associated with positive result (2 business days)
- Local health jurisdictions: **immediately notifiable to Washington State Department of Health (DOH) Communicable Disease Epidemiology (CDE)**

### C. Local Health Jurisdiction Investigation Responsibilities

- Begin investigation immediately.
- Report all *confirmed* and *probable* cases (see definitions below) as well as rash illness suspected to be measles to CDE by telephone immediately.
- Facilitate transport of specimens immediately to Public Health Laboratories to confirm the diagnosis.
- Isolate the case until 4 days after the rash onset (unless the diagnosis is ruled out).
- Identify contacts of the case and potential sites of transmission during the period of communicability.
- Provide consultation and assistance as needed to facilities, businesses, and schools within the jurisdiction where a case was present while contagious.
- Make appropriate recommendations to susceptible contacts (see Section 6).
- Enhance surveillance for additional cases.
- Complete the measles case report form for all *confirmed* cases (<https://www.doh.wa.gov/Portals/1/Documents/5100/210-073-ReportForm-Measles.pdf>) and enter the data into the Washington Disease Reporting System (WDRS). Only confirmed cases are reported to the CDC.

## 2. THE DISEASE AND ITS EPIDEMIOLOGY

### A. Etiologic Agent

The measles virus—a single-stranded, RNA-encoded paramyxovirus

## B. Description of Illness

Measles is characterized by a generalized maculopapular rash, fever for greater than 3 days, and one or more of the following: cough, coryza, or conjunctivitis.

Measles has a distinct prodrome that begins with fever and malaise. Additional symptoms can be conjunctivitis, coryza (sneezing, nasal congestion, and nasal discharge), cough, photophobia, and Koplik's spots (which are pathognomonic but uncommonly observed). These spots are seen as bluish-white specks on a rose-red background appearing on the buccal and labial (lip) mucosa usually opposite the molars.

Temperatures may exceed 40°C (104°F) and usually fall 2–3 days after rash onset. High fever persisting beyond the third day of the rash suggests that a secondary infection (e.g., otitis media) may have occurred.

The prodrome generally lasts 2–4 days before the rash occurs. The rash is maculopapular and begins on the head often along the hairline and spreads downward reaching the hands and feet. In severe cases, the lesions usually become confluent, especially on the face and upper body. Diarrhea occurs in 8% of cases.

Complications of measles include otitis media (7%), pneumonia (6%), and encephalitis (0.1%). Approximately 1 in 5 unvaccinated people in the U.S. who get measles is hospitalized. Death occurs in 1–3 per 1,000 cases in the United States. Measles can also cause long-term damage to the immune system, known as immune amnesia. The virus destroys memory cells within the immune system, leaving people vulnerable to infections for up to years after a measles infection.

More information on immune amnesia can be found here: <https://asm.org/articles/2019/may/measles-and-immune-amnesia>

## C. Measles in Washington

Two doses of a measles-containing vaccine, the measles-mumps-rubella vaccine (MMR) or measles-mumps-rubella-varicella vaccine (MMRV), which are included in the routine childhood immunization schedule, are 97% effective against measles. As a result, measles is rarely reported in the United States. In Washington State, most cases are internationally imported or directly associated with travelers from regions experiencing active outbreaks.

## D. Reservoirs

Acutely infected humans.

## E. Modes of Transmission

Measles is one of the most contagious infectious diseases, with an attack rate of over 90% among susceptible contacts. The virus is spread directly from person to person by inhalation of suspended droplet nuclei or when infectious nasopharyngeal secretions come into contact with the mucous membranes of a susceptible person. The measles virus is sensitive to environmental factors, including ultraviolet light and drying, but remains infectious in aerosol form in the air for approximately 2 hours.

## F. Incubation Period

The typical incubation period or the time from exposure to onset of fever ranges from 7–21 days (with an average 10 days), with the rash onset usually occurring within 2–4 days (range of 1–7 days) after the first symptoms appear and up to 21 days after the exposure. For investigation purposes, the “exposure period” is defined as 7–21 days prior to rash

onset.

### G. Period of Communicability

Measles is most communicable from the onset of prodrome through the first 3–4 days of rash. For investigation purposes, the “contagious period” is generally defined as the 4 – 5 days prior to the date of rash onset through at least the 4 days after the date of rash onset. Immuno-compromised people should be considered contagious for the duration of the illness.

### H. Treatment

No specific treatment. Supportive care according to clinical course.

The WHO currently recommends vitamin A for all children with measles and many US experts concur for all children regardless of hospitalization status with measles in the United States. The American Academy of Pediatrics currently recommends vitamin A for those with severe cases of measles requiring hospitalization, and those with suspected measles who are otherwise immunocompromised, or those with clinical evidence of vitamin A deficiency, or those who have recently immigrated from an area with high measles mortality

### I. Immunity

Immunity to measles after natural infection or vaccination is thought to provide lifelong immunity in most people. The 2-dose vaccine schedule is approximately 97% effective; in a small proportion of people (<5%), protection after vaccination may be incomplete due to no immune response after vaccination or waning immunity over time (rare for measles)

(See [Hickman, et al. J Infect Dis. \(2011\) 204 \(suppl 1\): S549-S558](#))

## 3. CASE DEFINITIONS

### A. Clinical Case Definition (2013)

An illness characterized by all the following:

- a generalized rash lasting  $\geq 3$  days
- a temperature  $\geq 101.0^{\circ}\text{F}$  ( $\geq 38.3^{\circ}\text{C}$ )
- cough or coryza or conjunctivitis

### B. Laboratory Criteria for Diagnosis

- Isolation of measles virus from a clinical specimen, or
- Detection of measles-virus-specific nucleic acid by polymerase chain reaction, or
- Significant rise in serum measles immunoglobulin G (IgG) antibody level between acute- and convalescent-phase specimens, by any standard serologic assay (see Comment), or
- Positive serologic test for measles immunoglobulin M (IgM) antibody. §

### C. Case Classification (2013)

*Probable (Not used in Washington State):* In the absence of a more likely diagnosis, a case that meets the clinical case definition, has noncontributory or no measles laboratory testing, **and** is not epidemiologically linked to a laboratory-confirmed case

*Confirmed:* An acute febrile rash illness<sup>†</sup> with:

- Isolation of measles virus<sup>‡</sup> from a clinical specimen; or
- Detection of measles-virus specific nucleic acid<sup>‡</sup> from a clinical specimen using polymerase chain reaction; or
- IgG seroconversion<sup>‡</sup> or a significant rise in measles immunoglobulin G antibody<sup>‡</sup> using any evaluated and validated method; or
- A positive serologic test for measles immunoglobulin M antibody<sup>‡§</sup>; or
- Direct epidemiologic linkage to a case confirmed by one of the methods above.

<sup>†</sup> Temperature does not need to reach  $\geq 101^{\circ}\text{F}/38.3^{\circ}\text{C}$  and rash does not need to last  $\geq 3$  days.

<sup>‡</sup> Not explained by MMR vaccination during the previous 6-45 days.

<sup>§</sup> Not otherwise ruled out by other confirmatory testing or more specific measles testing in a public health laboratory.

#### D. Comment

- A surveillance case definition is a set of uniform criteria used to define a disease for public health surveillance.
- All classifications are reported to CDE but only confirmed cases are reported to CDC.

#### E. Epidemiologic Classification of Internationally Imported and U.S.-Acquired

An **internationally imported** measles case means someone was exposed to measles while traveling outside the U.S. between 7 and 21 days before rash onset. The rash must appear within 21 days of entering the country, and there should be no known exposure in the U.S.

A measles case is considered **U.S.-acquired** if the patient has not traveled outside the country for 21 days before the rash appears or was exposed within the United States. These cases are then grouped by source: import-linked, imported-virus, endemic, or unknown source. Further information about these subclassifications can be found in the 2013 measles case definition at: <https://ndc.services.cdc.gov/case-definitions/measles-2013/>

## 4. DIAGNOSIS AND LABORATORY SERVICES

### A. Laboratory Diagnosis

It is recommended that any person with clinical features compatible with measles be tested; the preferred method for confirming measles is RT-PCR. Nasopharyngeal (NP), oropharyngeal (O/P), or throat swabs are the preferred samples. When possible, a urine sample should also be collected. The collection of both respiratory and urine specimens can increase the likelihood of detecting the virus, particularly 3-10 days after rash onset.

The preferred time for collection is within 72 hours of rash onset; up to 10 days post-rash may be successful. Negative PCR does not rule out measles because this method is affected by the timing of specimen collection and the quality and handling of the clinical specimens. False-negative results can occur with poor collection quality, particularly early or late in the illness, or if the person is otherwise immunocompromised. In such

cases, additional specimens may be requested for testing.

A measles diagnosis can be confirmed by demonstrating a significant rise in measles IgG antibody level (serology) in acute and convalescent sera; two serum specimens are required. The first specimen (acute) should be drawn as soon after rash onset as possible, ideally within the first 72 hours. The second specimen (convalescent) should be drawn 10–30 days after. The tests for IgG antibody should be conducted on both specimens using the same assay at the same time. The specific criteria for interpreting such a test depend on the test used.

Seroconversion from negative IgG to positive IgG using specimens as described above confirms the diagnosis of measles. Demonstrating a rise in measles IgG or seroconversion is not necessary when measles has been confirmed by another method.

Measles IgM can be done in addition to PCR. Approximately 80% of measles cases have detectable IgM antibody within 72 hours of rash onset, if the person is otherwise immunocompromised. However, serologic tests can result in false-negative results when serum specimens are collected too soon after rash onset (testing is most reliable when blood is drawn 4–11 days after rash onset). If a negative result is obtained from a specimen drawn less than 72 hours after rash onset, another specimen will be required typically collected 3–10 days after the rash begins.

False positive IgM results can occur, particularly when testing is being performed in a low-prevalence population (i.e., people who do not meet the clinical case definition or people with no obvious risk factors for measles). False-positive IgM results for measles may be due to the presence of rheumatoid factor in serum specimens. In such instances, when a positive IgM result is obtained, the result should be interpreted with caution. Further testing is recommended.

<https://www.cdc.gov/measles/php/laboratories/serology.html>

*Note: If viral testing results are noncontributory, additional testing can be performed for highly suspicious cases at CDC laboratories. Please call Communicable Disease Epidemiology (CDE) to discuss the timing of collection or the need for further testing. A small percentage of individuals who have previously been exposed to the measles antigen (i.e., vaccinated against or had measles disease) can subsequently become infected with wild-type measles virus. Such people may have a modified disease presentation, as well as a blunted or transient production of IgM. Therefore, a negative IgM test in vaccinated persons suspected of having measles should not be used to rule out the case. RT-PCR may be the best method to confirm such cases.*

## B. Services Available at the Washington State Public Health Laboratories (PHL)

PHL performs measles polymerase chain reaction (RT-PCR) testing. Please contact an epidemiologist at CDE before sending specimens to PHL. Testing can be performed after hours and weekends if necessary, but requires CDE consultation to be specifically discussed and requested.

Note: Serology testing IgG testing is available at PHL upon request, **IgM testing is not available at PHL at this time.**

Note: PHL requires all clinical specimens to have two patient identifiers, a name **and** a second identifier (e.g., date of birth) on the specimen. Due to laboratory accreditation standards, specimens will be rejected for testing if not properly identified. As well as specimen source and collection date.

## C. Specimen Collection and Submission

With LHJ approval, collect specimens for PCR as soon as possible after rash onset (may be sensitive up to 10 days after rash onset) NP and OP swabs in viral transport medium

(VTM) are preferred, universal transport medium (UTM) is also acceptable, this sample may be supplemented by urine. Send PCR specimens to the WA PHL. Day 0 is rash onset date:

- Within 72 hours of rash onset, may be sensitive up to 10 days after rash onset
  - Nasopharyngeal (NP)swab or oropharyngeal (OP) swab
- Between 4-10 days of rash onset,
  - NP/OP swab should be accompanied by a urine sample

**Please Note:** To rule out measles in a **vaccinated** person after a known exposure, consider collecting both a NP/OP swab and a urine sample for measles. In people who were previously vaccinated, the virus might only be detected in urine so testing both types of specimens is important.

Measles IgM can be done in addition to PCR but should not be the only method used as false positives are common.

- Serum should be collected as soon as possible after onset
- Send serum for measles IgM to your facility's usual reference lab, refer to their specific collecting, packaging and transporting instructions.

Measles-specific IgM antibody may not be present until 72 hours or more after rash onset.

- For additional information regarding collection, storage and shipping of specimens for testing, <https://doh.wa.gov/public-health-provider-resources/public-health-laboratories/lab-test-menu?combine=measles>  
For additional specimen shipping guidance, refer to the [Measles Shipping Guide](#).

## 5. ROUTINE CASE INVESTIGATION

Interview the case and others who may be able to provide pertinent clinical information.

### A. Evaluate the Diagnosis

- Review the clinical presentation, physical examination findings, travel history, and other risk factors during the likely exposure period (7–21 days before the onset of rash), and immunization status of the patient to determine the likelihood of the diagnosis. Sources of immunization data might include medical records, parent immunization cards, school/child care records, and the Child Profile.
- Determine whether to test for measles.
  - Testing should be performed on all unimmunized persons who meet the clinical case definition and have a known measles exposure or were in a high-risk setting during the likely exposure period (7–21 days prior to the rash onset).
  - Testing is discouraged if a patient's clinical presentation is not consistent with measles and the patient has no known increased risk for exposure to measles. This is true regardless of immunization status. Testing in these situations will increase the likelihood of obtaining a false positive result.
  - All other situations will require clinical judgment. Clinical decisions should be driven by the likelihood of disease based on symptoms and epidemiological links.

Although the clinical case definition only includes a generalized rash, fever  $\geq 101^{\circ}\text{F}$ , and cough, coryza or conjunctivitis, there are aspects of the clinical presentation which can increase the suspicion for measles. A

measles rash usually starts on the head or face and spreads downward (cephalocaudal) and the fever is generally still present at the time the rash begins.

- Up to 5% of individuals who receive the measles-containing vaccine may develop a mild, short-lived febrile rash typically 7-12 days post-vaccination. This reaction is more common after the first dose, usually does not require treatment and those who experience this reaction are not contagious to others around them. If a person received the measles-containing vaccine within 21 days prior to the onset of a rash and has risk factors for exposure to measles, specialized testing may be necessary. This should be discussed with local or state public health authorities.
  - A positive measles IgM test cannot confirm a diagnosis of measles in individuals who present with a measles-like illness and received the vaccine 6-45 days before the onset of rash. To distinguish between vaccine strains and wild-type viruses, real-time RT-PCR can be used. In the absence of strain typing to confirm a wild-type infection, cases of individuals with a measles-like illness who were recently vaccinated need to be evaluated carefully.
  - A case should be classified as confirmed if: they meet the clinical case definition, and they are epidemiologically linked to a laboratory-confirmed case.
- A small number of people that were previously exposed to measles (often appearing more than 45 days before the onset of rash) may still become infected by wild-type measles virus and are likely to have a modified disease presentation. These cases are usually detected during an outbreak or after a known exposure to a confirmed measles case. In rare instances, such cases can occur without a known exposure or other risk factors. If modified measles in a previously vaccinated person is suspected, call Communicable Disease epidemiology to discuss.
- Consider differential diagnosis: fifth disease, roseola, rubella, scarlet fever (also called scarlatina), adenovirus infections, influenza, certain vector-borne illnesses such as Rocky Mountain spotted fever, and antibiotic reactions.

Collect selected specimens at the first clinical encounter.
- A positive IgM result from a commercial laboratory and a person has symptoms consistent with measles, consult Communicable Disease epidemiology for further instructions.
- If measles is suspected, specimens should be sent to a public health laboratory for PCR testing. Negative PCR testing done during the recommended timeframe may “rule out” measles in the setting of a false positive IgM.

## B. Identify Potential Sources of Infection

Using a guide such as the “Measles Worksheet Part A” (see Appendix A), evaluate the activities of the case during the likely exposure period (7–21 days prior to the onset of rash).

Identify situations where the case might have been at increased risk of exposure to measles.

Collect the following information:

- contact information for any household member, playmate, or other contact who had a rash illness during the likely exposure period
- any travel outside of the United States or to an area of the United States where measles has recently occurred
- any contact with visitors from outside the United States or an area of the United States where measles has recently occurred
- any visit to a doctor’s office, clinic, or hospital (find out exact time[s], date[s], name of the clinic[s],

duration of visit[s], and areas of the facility visited)

- any indoor group activities attended (e.g., church, theaters, tourist locations, public or commercial travel, parties, athletic events, family gatherings) and contact information of the person who organized the group or event
- any work or volunteer activities in a health care setting, or attendance or work at a school, child care, college, prison, refugee center, etc.

### C. Identify Exposed, Susceptible Contacts and Potential Sites of Transmission

- Using the “Measles Worksheet Part B” (Appendix A), evaluate the activities of the case during the contagious period (4–5 days before through at least 4 days after the date the rash started). Because measles is so contagious, anyone with direct contact with the case is exposed along with anyone who was in the same room with a case for even a few minutes. Studies show the measles virus is highly contagious and can linger in the air or settle on surfaces for at least 2 hours after an infected person has left the room. Anyone who enters the enclosed space during that time could be considered *exposed*.
- Consider initiating a “Measles Contact Tracking Form” (Appendix B) for each contact identified.
- Determine measles immune status of the exposed contacts

People are considered to have **Presumptive Evidence of Immunity** to measles if they have:

- Written documentation of age-appropriate vaccination with a live measles-containing vaccine
  - **One dose** (at least) administered on or after the first birthday\*
  - **Two doses** of measles-containing vaccine are required for school-age children including students at post-high school secondary educational institutions with the first dose on or after their first birthday
  - Adults not at high risk: **one dose** administered after the first birthday
  - Adults at high risk such as postsecondary education institutions, health care personnel, international travelers: **two doses**, the first after their first birthday, the second dose at least 28 days after the first dose
- Written documentation of laboratory evidence of immunity
- Written documentation of laboratory confirmation of disease
- Birth before 1957
  - Birth before 1957 is not sufficient evidence of immunity for health care workers when local transmission is high or a measles outbreak

\* Persons who were vaccinated with an inactivated vaccine that was available from 1963-1967, and have not been re-vaccinated, may however be at risk for measles.

<https://www.cdc.gov/vaccines/vpd/mmr/hcp/recommendations.html>

<https://publications.aap.org/redbook/book/755/chapter/14079321/Measles?autologincheck=redirected>

- Alert health care facilities visited by the case during the contagious period and make recommendations regarding management of susceptible contacts (see Appendix G)
- If transmission may have occurred in a public place and potentially exposed individuals

cannot be identified, a press release may be the best way to inform the public. The press release should include information about the time and place of exposure, susceptibility, symptoms of measles and ways people can protect themselves.

#### D. Enhance Surveillance for Additional Cases

Alert health care providers, hospital emergency rooms, and student infirmaries of the potential for additional cases; encourage health care providers to consider measles in persons with a rash illness, take appropriate infection control precautions, and report suspected cases to public health. See Appendix D for a sample health alert.

## 6. CONTROLLING FURTHER SPREAD

Specific guidance from local and state health departments varies to address the unique needs, resources, and disease prevalence of individual communities.

### A. Case Management

Isolation: the separation of those with suspected or confirmed illness from those without illness

- People suspected of having measles should be advised to do the following during the contagious period, onset of rash considered to be Day 0 (until 4 days have passed since the onset of the rash) *or for the duration of illness if the patient is immunocompromised*:
  - Stay home and do not go to public places or social activities, child care, school or work.
  - prohibit contact with susceptible children (particularly infants), susceptible pregnant women, and immunosuppressed individuals\*.
  - Avoid contact with susceptible family members and visitors; and
  - Avoid exposing other people at health care facilities by calling ahead and making special arrangements to prevent contact with others.

<https://www.cdc.gov/infection-control/hcp/measles/index.html>

### B. Contact Management

Use the “Measles Contact Tracking Form” in Appendix B or a similar form to track all persons potentially exposed to the case. The algorithm in Appendix G outlines strategies that can be used for assessment and management of people with definite exposure to measles.

For any additional requirements for people attending preschool or school (K-12) or a health care worker, please see section 7A and 7B

#### Asymptomatic Contacts

1. For asymptomatic contacts with [Presumptive Evidence of Immunity](#) to measles:
  - Generally, do not need to be excluded from their normal activities and are not required to quarantine.
  - Provide education about measles symptoms
  - Instruct to monitor daily for prodromal signs and symptoms followed by a rash compatible with measles for at 21 *or 28 days if immunocompromised or immune globulin received* (see below under Passive Immunization) from the last possible exposure.
  - If measles-like symptoms develop within the daily monitoring period they should immediately isolate and contact their health care provider.

- People who have laboratory evidence of immunity, a positive measles IgG from a serum specimen, can be considered evidence of preexisting immunity either by prior vaccination or prior measles infection.

Serology (IgG) limitations for determining immunity status include:

- Detecting IgG antibodies from a serum specimen immediately after a suspected exposure (within 7 days) is consistent with pre-existing immunity and not a new infection
- IgG results obtained between 6–45 days after vaccination with a measles-containing vaccine cannot reliably distinguish between a vaccine response and a measles virus infection and are considered unreliable for confirming immunity.
  - A person who receives a measles-containing vaccine post-exposure and before IgG testing, a subsequent IgG result cannot be used as evidence of immunity, even if they remain symptom free

2. For asymptomatic contacts **without** presumptive evidence of immunity to measles:

- As determined by the local health jurisdiction, a person who receives a measles-containing vaccine within 72 hours of their **earliest** exposure may not be required to quarantine and can continue normal daily activities (school, work, childcare).
  - If a rash develops after vaccination, a clinical evaluation will be required to differentiate between a vaccine reaction, or a wild-type measles infection
  - Testing should be coordinated through the local health jurisdiction
- All other exposed asymptomatic people without presumptive evidence must stay home, away from others (quarantine), to prevent further spread. This involves avoiding all public places such as work or school, and separating from household members if possible.
- Exposed people in quarantine should monitor themselves daily for symptoms (fever, cough, rash, runny nose, red/watery eyes) for 21 days after their last exposure.
  - If any symptoms develop within 21 days, they should immediately isolate and contact their health care provider.

*In cases where immune globulin (IG) is given, or for specific high-risk scenarios, quarantine may extend to 28 days.*

### Symptomatic Contacts

- People with suspected measles should be isolated until their presumed infectious period is over, or measles has been ruled out.
- Susceptible contacts with respiratory symptoms and or fever should stay home and call their local health jurisdiction, as they may have an early case of measles.
- If a contact goes to a health care provider for evaluation of possible measles, the patient or public health should call ahead to ensure that facility personnel are aware of the specific reason for referral so that special arrangements can be made to keep them out of areas used by other patients.

- People with possible measles should avoid contact with others until the diagnosis is confirmed.

More measles information:

<https://www.ncbi.nlm.nih.gov/books/NBK448068/#:~:text=Persons%20with%20measles%20can%20transmit,Public%20Domain%2C%20via%20Wikimedia%20Commons>.

### Measles Post-Exposure Prophylaxis (PEP)

People exposed to measles who do not have presumptive evidence of immunity to measles should be offered post-exposure prophylaxis (PEP). There are two types of PEP, a measles-containing vaccine or immune globulin

More information on PEP can be found here: <https://doh.wa.gov/sites/default/files/2025-08/420-250-MeaslesHCFPEP.pdf>

#### 1. Active Immunization with a Measles-Containing Vaccine

For most unvaccinated people, a measles-containing vaccine given within 72 hours of earliest exposure to a confirmed measles case can prevent disease.

- Those who are NOT pregnant, are NOT immunocompromised, and are at least 6 months old the preferred Measles Post-Exposure Prophylaxis (PEP) is the MMR vaccine
  - Infants aged 6-12 months who receive a dose of a measles-containing vaccine after an exposure will still need to receive 2 doses of a measles-containing vaccine according to the recommended vaccine schedule. A discussion between the guardian and pediatrician is essential to determine the exact timing for vaccine administration
- Except with health care workers, unvaccinated, asymptomatic people exposed to measles who receive their first dose of measles-containing vaccine within 72 hours of their initial exposure may avoid quarantine.
  - This does not apply to health care settings
  - People who have otherwise never received the measles vaccination, and those who do not receive measles-containing vaccine within 72 hours of initial exposure, should be excluded at least 21 days after the most recent exposure to a measles case.

*Public health may consider special clinics to vaccinate susceptible contacts and others from the community.*

#### Passive Immunization with Immune Globulin (IG)

- IG can prevent or attenuate measles disease with measles if given within 6 days after first exposure. IG is recommended primarily for children under the age of 1 year old, pregnant women without evidence of measles immunity, and severely immunocompromised people but, can be considered for all susceptible household contacts and other close contacts who are at increased risk of severe infection, at the discretion of their primary care provider
- After IG is administered as PEP, the quarantine and monitoring period should be extended for an additional 7 days. **Because IG potentially prolongs the incubation period, extending quarantine to 28 days after the last exposure is necessary.**

To be effective, IG must be administered as soon as possible, within 6 days of exposure. The recommended methods of IG administration for the groups at increased risk are as follows:

- **Infants < 1 year old.** IG should be considered for infants aged under 12

months who have been exposed to measles.

- Infants who receive immune globulin after an exposure will still need to get 2 doses of a measles-containing vaccine, according to recommended vaccine schedule. The first dose should NOT be given at the same time as the immune globulin. After receiving immune globulin, the required time before receiving a measles-containing vaccine is 6 - 8 months, depending upon the route of administration. A discussion between the guardian and pediatrician is essential to determine the exact timing for vaccine administration
- For infants aged 6 through 11 months, measles containing vaccine can be administered in place of IG, if given within 72 hours of exposure
- **Pregnant people without evidence of measles immunity:** pregnant people without evidence of measles immunity who have been exposed to measles should receive a dose of intravenous IG within six days of exposure.

- **Immunocompromised people.**

*The degree of altered immunocompetence in a patient should be determined by the individual's primary licensed practitioner.*

- Severely immunocompromised patients\* who are exposed to measles should receive IG prophylaxis regardless of immunologic or vaccination status because they might not be protected by the vaccine

\*Severely immunocompromised patients include patients with severe primary immunodeficiency; patients who have received a hematopoietic cell transplant until at least 12 months after finishing all immunosuppressive treatment, or longer in patients who have developed graft-versus-host disease; patients on treatment for acute lymphoblastic leukemia (ALL) within and until at least 6 months after completion of immunosuppressive chemotherapy; and patients with HIV with severe immunosuppression, which for children  $\leq 5$  years is defined as CD4+ T-lymphocyte percentage  $<15\%$  and for children  $>5$  years and adolescents is defined as a CD4+ T-lymphocyte percentage  $<15\%$  or a CD4+ T-lymphocyte count  $<200$  lymphocytes/mm<sup>3</sup>, and those who have not received measles-containing vaccine since receiving effective antiretroviral therapy.

<https://www.cdc.gov/vaccines/hcp/imz-best-practices/altered-immunocompetence.html>

Lorry G. Rubin, Myron J. Levin, Per Ljungman, E. Graham Davies, Robin Avery, Marcie Tomblin, Athos Bousvaros, Shireesha Dhanireddy, Lillian Sung, Harry Keyserling, Insoo Kang, 2013 IDSA Clinical Practice Guideline for Vaccination of the Immunocompromised Host, Clinical Infectious Diseases, Volume 58, Issue 3, 1 February 2014, Pages e44–e100, <https://doi.org/10.1093/cid/cit684>

- Unless known to be susceptible to measles (i.e. unvaccinated and with no history of measles disease), people without documentation of immunity should have blood drawn (serology) **prior** to administration of IG, if possible, to test for the presence of measles IgG (prior immunity). However, administration of IG should not be delayed past 72 hours when results of immunity testing are pending
- Susceptible contacts who received IG for measles prophylaxis should be advised to be immunized against measles no earlier than 6 to 8 months administration, provided the person will be greater than and 12 months of age and the vaccine is not otherwise contraindicated

For additional PEP information for people exposed to measles, please see [Red Book Measles](#) chapter Table 3.32 and Table 3.33.

<https://publications.aap.org/redbook/book/755/chapter/14079321/Measles?autologincheck=redirected>

- **Education**

- All exposed people regardless of immune status should watch for symptoms of measles until 21 days after the last exposure to a confirmed case. If symptoms develop, they must self-quarantine and contact the local health department as soon as possible.
- If an exposure has occurred among members of a large group or in a public setting, consider educating and making recommendations to potentially exposed people via letters or press release.

### C. Other Exposed People or those who may be at high risk for severe complications

People potentially exposed to the same source as the case or who were present in the same setting during the likely exposure period should be told to watch for symptoms of measles particularly during the 7 to 21 (unless diagnoses at immunocompromised, see above) days following exposure regardless of immune status.

- **People at high risk of disease and measles complications include, but not limited to:**

- **Unvaccinated Individuals and Infants under the age of 12 months:**

Anyone without adequate doses of the measles-containing vaccine or prior infection

- **Unvaccinated Pregnant People:**

They are at higher risk for severe complications

- **Students at post-high school educational institutions**

Students at post-high school educational institutions who do not have presumptive evidence of immunity should receive two appropriately spaced doses of measles-containing vaccine. They are often in close quarters, facilitating rapid spread.

- **International travelers**

Persons aged 6 months and older who will be traveling internationally to any country outside the United States who do not have presumptive evidence of immunity should be vaccinated.

- After an early measles-containing vaccine given under 1 year, for travel, the routine two-dose measles-containing series, per APIC recommendations, is still needed to provide adequate protection. This dose is sometimes called "dose zero".
- The "dose zero" provides some short-term protection for travel, but the immune system needs the 2 standard doses (after 12 months) to build long-lasting immunity.

- **Health care workers**

Health care workers without presumptive evidence of immunity should get two doses of measles-containing vaccine, separated by at least 28 days. See specific recommendations in [7B](#).

- **Household and close contacts of immunocompromised people**

All family and other close contacts of people with compromised immune systems 12 months of age and older should receive two appropriately spaced doses of measles-containing vaccine unless they have other presumptive evidence of measles immunity.

- **People with immunocompromising conditions**  
See section [6B](#)\*
- **Adults who know they got the killed measles vaccine**  
A very small proportion of adults may have received killed measles vaccine from 1963 through 1967. One should consult their personal provider for further guidance.
- **Populations at increased risk for measles because of a measles outbreak**  
During measles outbreaks, health departments may provide additional recommendations to protect their communities. The at-risk population is defined by local and state health departments and depends on the epidemiology of the outbreak.

#### D. Environmental Measures

- If a person communicable with measles is in a health care facility, those in a shared airspace at the same time or in a shared airspace vacated by a person infectious with measles, the room should remain vacant for at least 2 hours. This approximate 2-hour window is recommended when the number of air changes per hour (ACH) is unknown.
- When evaluating the potential risk to people in healthcare facilities who may share an air supply, for example through HVAC systems or ventilation ducts, priority should be given to those who share the immediate air space. The close contacts of ill patients or healthcare workers should be addressed first.
- It is recommended that the facility's infection preventionists collaborate with the engineering staff to assess the risk of exposure that may have occurred in locations outside the immediate area such as connected by and HVAC system or ventilation.

## 7. MANAGING SPECIAL SITUATIONS

### A. Measles Cases Involving Employees, Volunteers or Attendees at a Child Care Facility and School (K-12) Schools (in the event of a school; or childcare)

As stated in Chapter 246-110 of the WAC (<https://app.leg.wa.gov/WAC/default.aspx?cite=246-110>), Section 246-110-020, states the County's health officer, in consultation with the chief administrator of the child care center or the superintendent of the school district, is responsible for taking appropriate actions to control or eliminate the spread of a contagious disease as defined in of contagious disease.

*These guidelines may vary by local health jurisdictions based on community outbreak levels and immunization rates, as determined by the local health officer.*

Exclusion refers to staff, volunteers and students without evidence of immunity are not allowed to attend activities including childcare center, schools or any extracurricular school activities such as clubs and sports. The local health officer makes the determination if excluding people susceptible to the disease during an outbreak is warranted.

Isolation is necessary for all symptomatic individuals with suspected or confirmed measles while they are contagious for four days after the rash begins, with rash onset counting as Day 0. Isolation means staying home avoiding contact with others, including all social activities, attending child care, school, work, social activities, sports, recreation events, any extracurricular activities. Students and staff in isolation should not be allowed in the school or childcare building until four full days have passed since rash onset.

## Measles

## Reporting and Surveillance Guidelines

Quarantine restricts the movement of asymptomatic, susceptible individuals who may have been exposed to a person contagious for measles. Any susceptible child, staff, volunteer in a childcare facility or K-12 school where a case of measles has been identified can be excluded from the facility or school and monitored for symptoms for up to 21 days from the last known measles exposure or up to 28 days if they have an immunocompromising condition or received immune globulin.

The local health officer will determine what documentation is acceptable.

Presumptive evidence of immunity as defined by the CDC and AAP includes the written documentation of at least one of the following:

*Proof of immunity should be prior to disease exposure. Those staff and students who receive vaccination after exposure may still need to be excluded*

- **One dose** (at least) administered on or after the first birthday\*
- **Two doses** of measles-containing vaccine are required for school-age children including students at post-high school secondary educational institutions with the first dose on or after their first birthday
- Adults not in a setting that poses a high risk for measles transmission: at least **one dose** administered after the first birthday
- Adults in a setting that poses a high risk for measles transmission such as postsecondary education institutions, health care personnel, international travelers: **two doses**, the first after their first birthday, the second dose at least 28 days after the first dose
- Written documentation of laboratory evidence of immunity
  - Please see limitations to laboratory confirmation in section [6B](#)
- Written documentation of laboratory confirmation of disease
  - Please see limitations to laboratory confirmation in section [6B](#)
- Birth before 1957
  - Birth before 1957 is not sufficient evidence of immunity for health care workers when local transmission is high or a measles outbreak
    - In Washington State, health care providers in schools (like nurses, therapists, social workers) are defined under RCW [18.130.040](#) (<https://app.leg.wa.gov/RCW/default.aspx?cite=18.130.040>)

### **Exclusions:**

Discuss any necessary exclusions from school or childcare with the local health department

- Children and staff with confirmed or suspected measles should be excluded for four full days after rash onset
- Students and staff who have had **one** documented dose of MMR vaccine may need to obtain a second dose. They may need to provide updated, verified records to ensure compliance to avoid exclusion from school
- All asymptomatic children, staff, and volunteers exposed to measles who have zero or unknown doses of measles-containing vaccine and do not have documented evidence of immunity before exposure should quarantine through 21 days after the last known contagious case was present in the school or through 21

days after their last personal exposure, whichever is later. If multiple cases of measles occur at a school or childcare center, the exclusion period may extend beyond 21 days.

- Staff and students who receive appropriate measles-containing vaccine within 72 hours of exposure days avoid or shorten the number of days or eliminate the need for quarantine requirements as determined by the local health officer. A second dose of MMR should be received 28 days later to complete the 2-dose series.
- Those staff and students who receive vaccination after exposure may still be excluded

*For more detailed information and associated WAC and RCW laws and rule references, please see <https://doh.wa.gov/community-and-environment/schools/immunization#37458>*

## B. Health Care Personnel

**Definition health care personnel:** include but are not limited to, nurses emergency medical service personnel, nursing assistants, physicians, technicians, therapists, phlebotomists, pharmacists, students and trainees, contractual staff not employed by the healthcare facility, and persons not directly involved in patient care, but who could be exposed to infectious agents that can be transmitted in the healthcare setting.

- To prevent measles outbreaks in health care settings, health care personnel should have documented immunity to measles *before* exposure, ideally as a condition of employment. Health care facilities should maintain readily available documentation of immunity. Acceptable evidence of immunity to measles in health care workers includes:
  - Documented administration of **2 doses** of live measles virus vaccine with the first dose given on or after the first birthday and the second dose given at least 28 days apart or
  - Laboratory evidence of immunity or
  - Laboratory confirmation of prior measles infection
  - Born before January 1, 1957,
    - Health care facilities should consider requiring measles-containing vaccination for unvaccinated workers born before 1957 without laboratory evidence of measles disease or laboratory evidence of immunity.

<https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm#Tab3>

\*During a measles outbreak, unvaccinated HCP (regardless of birth year) lacking laboratory evidence of immunity or disease must receive 2 doses of MMR vaccine, separated by at least 28 days.

### Exclusions:

If a person with measles is treated in a health care setting during their contagious period, immediately identify potentially all exposed personnel and assess the status of their immunity to measles.

- For asymptomatic health care personnel **with** presumptive evidence of immunity to measles who have an exposure to measles:
  - Postexposure prophylaxis is not necessary.
  - Work restrictions are not necessary.
  - Implement daily monitoring for signs and symptoms of measles from the 5th day after their first exposure through the 21st day after their last exposure.
- For asymptomatic healthcare personnel **without** presumptive evidence of immunity to measles who have an exposure to measles:
  - Administer postexposure prophylaxis in accordance with established

recommendations

- Exclude from work from the 5th day after their first exposure through the 21st day after their last exposure, regardless of receipt of postexposure prophylaxis. Consider extending exclusion from work through the 28th day after their last exposure if IG was administered.
- Work restrictions are not necessary for healthcare personnel who received the first dose of measles-containing vaccine **prior** to exposure:
  - They should receive their second dose of measles-containing vaccine as soon as possible, at least 28 days after their first dose.
  - Daily monitoring for signs and symptoms of measles from the 5th day after their first exposure through the 21st day after their last exposure.
- Health care personnel with known or suspected measles; exclude from work until 4 days have passed since the rash onset with rash onset being day 0

### **Infection Control:**

- Implement Standard and Airborne Precautions
- Patient placement is an Airborne Isolation Room (AIIR)
- Only health care personnel with documented presumptive evidence of immunity to measles and should enter the room of a suspected measles patient.

[Preventing Measles \(Rubeola\) in Healthcare Settings](https://doh.wa.gov/sites/default/files/2026-03/420-703.pdf)  
(<https://doh.wa.gov/sites/default/files/2026-03/420-703.pdf>)

Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings: <https://www.cdc.gov/infection-control/hcp/measles/>

## **8. ROUTINE PREVENTION**

### **A. Immunization Recommendations**

Routine immunization with measles-containing vaccine is recommended during childhood; the first dose of measles-containing vaccine is recommended at 12–15 months of age with a second dose recommended at 4–6 years. Two doses of measles-containing vaccine are also recommended for students attending college and other post-high school institutions, international travelers, and health care personnel. People born in 1957 or later should receive at least one dose of measles-containing vaccine if they do not have evidence of immunity to these three diseases. Approximately 95–98% of susceptible persons develop measles antibodies after a single dose of vaccine. After two doses of vaccine, 99% of persons develop serologic evidence of measles immunity.

Before any international travel, infants 6 months through 11 months of age should have 1 dose of measles vaccine. Infants who received 1 dose of measles vaccine before their first birthday should get 2 additional doses of the vaccine (one dose at 12 through 15 months of age and another dose at least 28 days later).

In certain outbreak settings, health officials may recommend the measles-containing vaccine be given to infants younger than 12 through 15 months of age, sometimes even to children as young as 6 months of age. However, since the decision to vaccinate children less than 12 months of age has vaccine supply implications for the state, the decision to implement this recommendation at the local level should include a prior

discussion between the local health jurisdiction, CDE, and the WA DOH Immunization Program.

Contraindications to vaccine include:

- a history of a severe allergic reaction (i.e., swelling of the mouth or throat, difficulty breathing, low blood pressure, shock) following a previous dose of measles vaccine or vaccine components (e.g., neomycin, gelatin) (Measles-containing vaccine can be given to egg-allergic persons)
- pregnancy
- significant immunosuppression
- recent receipt of antibody-containing blood products

Moderate or severe acute illness is a precaution, not a contraindication, and vaccination should be considered during an outbreak.

For more information about measles-containing vaccine schedules, adverse reactions and contraindications please see the current Pink Book.

<https://www.cdc.gov/pinkbook/hcp/table-of-contents/index.html>

## B. Prevention Recommendations

Vaccination is best way to prevent measles.

## ACKNOWLEDGEMENTS

This document is a revision of the Washington State Guidelines for Notifiable Condition Reporting and Surveillance published in 2002 which were originally based on the Control of Communicable Diseases Manual (CCDM), 17<sup>th</sup> Edition; James Chin, Ed. APHA 2000. We would like to acknowledge the Oregon Department of Human Services for developing the format and select content of this document.

## UPDATES

December 2008:

Section 3: The case definition was updated to include detection of measles specific nucleic acid by PCR as a laboratory criterion for diagnosis.

Section 4: Information was added regarding false positive IgM results. Section 5A: Guidance was added regarding when to test for measles.

January 2011:

The Legal Reporting Requirements section has been revised to reflect the 2011 Notifiable Conditions Rule revision.

January 2014:

Section 3: The case definition was updated to exclude the suspect case classification and edit the probable and confirmed definition and reflects the most recent January 2013 CSTE changes.

Section 4: Laboratory confirmed methods performed by WA PHL were updated to include newly validated polymerase chain reaction testing on nasopharyngeal swab specimens. Nasal wash removed from the list of acceptable respiratory specimens.

Section 5: Information on potential susceptibility of persons receiving inactivated measles vaccine only was added. Section 6: Guidance on when to vaccinate susceptible contacts to prevent future infection in circumstances when more than 72 hours have passed since exposure was included.

Guidance on vaccination and management of exposed contacts was clarified.

Guidance for use of immune globulin for post-exposure prophylaxis was updated to reflect CDC recommendations published in June 2013 (Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013: Summary Recommendations of the Advisory Committee on Immunization Practices (ACIP), MMWR, Vol. 62 / No. RR-4:

[https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm?s\\_cid=rr6204a1\\_e](https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm?s_cid=rr6204a1_e)

Section 7: Language was added to clarify when to exclude students or attendees from a school or childcare setting.

August 2014:

Addition of Appendix E: Assessment and management of persons with definite exposure to measles and public callers with possible exposure to measles at a public site.

Section 8A: Language was added regarding the need for a discussion between the local health jurisdiction, CDE, and WA DOH Immunization Program staff prior to implementation of a recommendation by a local jurisdiction to vaccinate 6-11 month old infants during an outbreak.

Section 4A: Note added about testing issues in previously vaccinated persons with a modified measles presentation.

Section

n 5A (2d & e): Added information about evaluating measles diagnosis in previously vaccinated persons.

November 2018:

Section 4: Clarified shipping temperature and time window for shipping for RT-PCR testing of nasopharyngeal swabs, urine, and

throat swabs.

May 2022:

Added coversheet/quick reference sheet.

Section 3: Clarified that the case classification “Probable” is not used in Washington State.

Section 4C: Updated the specimen collection and handling guidance to adhere to updates to the PHL lab test menu. Section 5: Included differential diagnosis.

Overall: Updated links and references throughout the document.

January 2024:

Updated lab submission process

Added WHO vitamin A recommendations

Added a link Interim to Infection prevention and Control Recommendations in Healthcare Settings (2019) June 2024:

Updated CDC links

December 2024:

Lab updates were made to preferential lab collection and submission; Facesheet in the Laboratory testing and section 4. A, B, & C

Added a preferred lab algorithm according to rash onset (Appendix D) Added

appendix E, Testing Quick Reference Sheet

Added Appendix F, Health Alert Template

January 2026. Exclusion requirements for those who receive MMR within 72 hours of exposure updated in the guideline as well as

Updated appendix G with this information.

To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email [doh.information@doh.wa.gov](mailto:doh.information@doh.wa.gov).

**APPENDIX A: MEASLES WORKSHEET**

Patient Name: \_\_\_\_\_

Patient DOB: \_\_\_\_/\_\_\_\_/\_\_\_\_

Immunization Status: \_\_\_\_\_

**PART A: Identifying Sources of Infection**

	DATE	DAY	LOCATIONS (with times)	CONTACTS
EARLIEST EXPOSURE DATE		-21		
		-20		
		-19		
		-18		
		-17		
		-16		
		-15		
Exposure period		-14		
		-13		
		-12		
		-11		
		-10		
		-9		
		-8		
		-7		
Rash Onset		<b>0</b>	See part B for contagious period	

**PART B: Identifying Exposed Contacts and Sites of Transmission**

	Day	Date	Locations with times	Contacts
Contagious Period		-5		
	Earliest contagious period			
	Definitely contagious from here		-4	
			-3	
			-2	
			-1	
	Rash onset		0	
			1	
			2	
			3	
		4		
Contagious for at least 4 days after rash onset				

**COLLECT THE FOLLOWING INFORMATION FOR EACH DATE:**

***Locations of potential exposure and transmission***

- Addresses and phone numbers of locations
- Dates and times visited (time of arrival and length of stay)
- Complete travel information (e.g., departure & arrival cities, method of transport, transport company, transport numbers)
- Remember to ask about stops at grocery stores, gas stations, churches, health care facilities, schools and child care centers

***Information about Contacts***

- Names and phone numbers of contacts
- Relation to case
- Are contacts symptomatic?
- Immunization status of contacts, if known

**APPENDIX B: MEASLES CONTACT TRACKING FORM**

Date	___ / ___ / ___	Time:	Investigator:
Case Name	Case rash onset date: ___ / ___ / ___		
Contact Name			
Date of first contact	___ / ___ / ___	Date of last	___ / ___ / ___
Symptom watch dates	___ / ___ / ___ (1st contact + 7 days) to ___ / ___ / ___ (Last contact +21 days)		
Relation to Case	<input type="checkbox"/> Household	<input type="checkbox"/> Family, non-household	<input type="checkbox"/> Co-Worker
	<input type="checkbox"/> Health care Worker	<input type="checkbox"/> Friend	<input type="checkbox"/> Other
DOB	___ / ___ / ___		
Age	<input type="checkbox"/> Years	<input type="checkbox"/> Months	
Address			
City, State, Zip			
County			
Home Phone	( ) _____ - _____		
Work Phone	( ) _____ - _____		
Other Phone	( ) _____ - _____		
Contact location			
Location details			
Is contact symptomatic?	<input type="checkbox"/> Yes <input type="checkbox"/> No		
Date of onset	___ / ___ / ___		
Briefly describe symptoms			
Last date contact followed	___ / ___ / ___		
Immune Status	<input type="checkbox"/> Had measles	<input type="checkbox"/> Born before 1957	
	<input type="checkbox"/> Unknown	<input type="checkbox"/> Pending serology Date collected ___ / ___ / ___ Results: _____	
	<input type="checkbox"/> Unvaccinated	<input type="checkbox"/> Vaccinated # MMR rec'd before exposure: ___ #1 ___ / ___ / ___ #2 ___ / ___ / ___	
Contacted by PH?	<input type="checkbox"/> Recommendations given	<input type="checkbox"/> Left message	<input type="checkbox"/> Not contacted
Notes or actions needed			

**APPENDIX C: MEASLES TESTING - QUICK REFERENCE SHEET****Deciding whether to test for measles:**

Routine childhood vaccination had previously made measles rare in the United States, because of a highly effective vaccination program and other control measures, measles was declared eliminated in 2000. However, due to recent outbreaks of measles there has been a rise in cases in the United States in early 2026.

To minimize false positive test results that can occur in low prevalence settings, it is important to limit testing to those patients who meet both the measles clinical case definition or epidemiological risk.

**Measles clinical case definition:**

An illness characterized by all the following:

- a generalized rash lasting greater than or equal to 3 days
- a temperature greater than or equal to 101.0°F (greater than or equal to 38.3°C)
- cough, coryza, or conjunctivitis

Sometimes the characteristic rash does not develop in immunocompromised patients

**Epidemiological risk factors in the past 21 days include:**

- Known contact with a measles case or an ill person with fever and a rash
- Contact with an international visitor who arrived in the U.S.
- Travel outside the U.S.
- Domestic travel through an international airport
- Visited a U.S. venue popular with international visitors such as a large theme park
- Lives in or visited a U.S. community where there are measles cases

**Specimens for RT-PCR testing (preferred)**

Detection of measles RNA in a clinical specimen can provide laboratory confirmation of infection. Throat, nasopharyngeal (NP) Urine and swab are the preferred specimen types. For detection of viral RNA by reverse transcription polymerase chain reaction (RT-PCR). RNA detection is more likely to be successful when samples are collected on the first day of rash through 3 days following onset of rash. With the greatest diagnostic sensitivity when specimens are collected at first contact with a suspected case.

**Specimen(s) for viral isolation: (rarely used for the diagnosis of measles)**

Contact the commercial laboratory for collection and submission instructions.

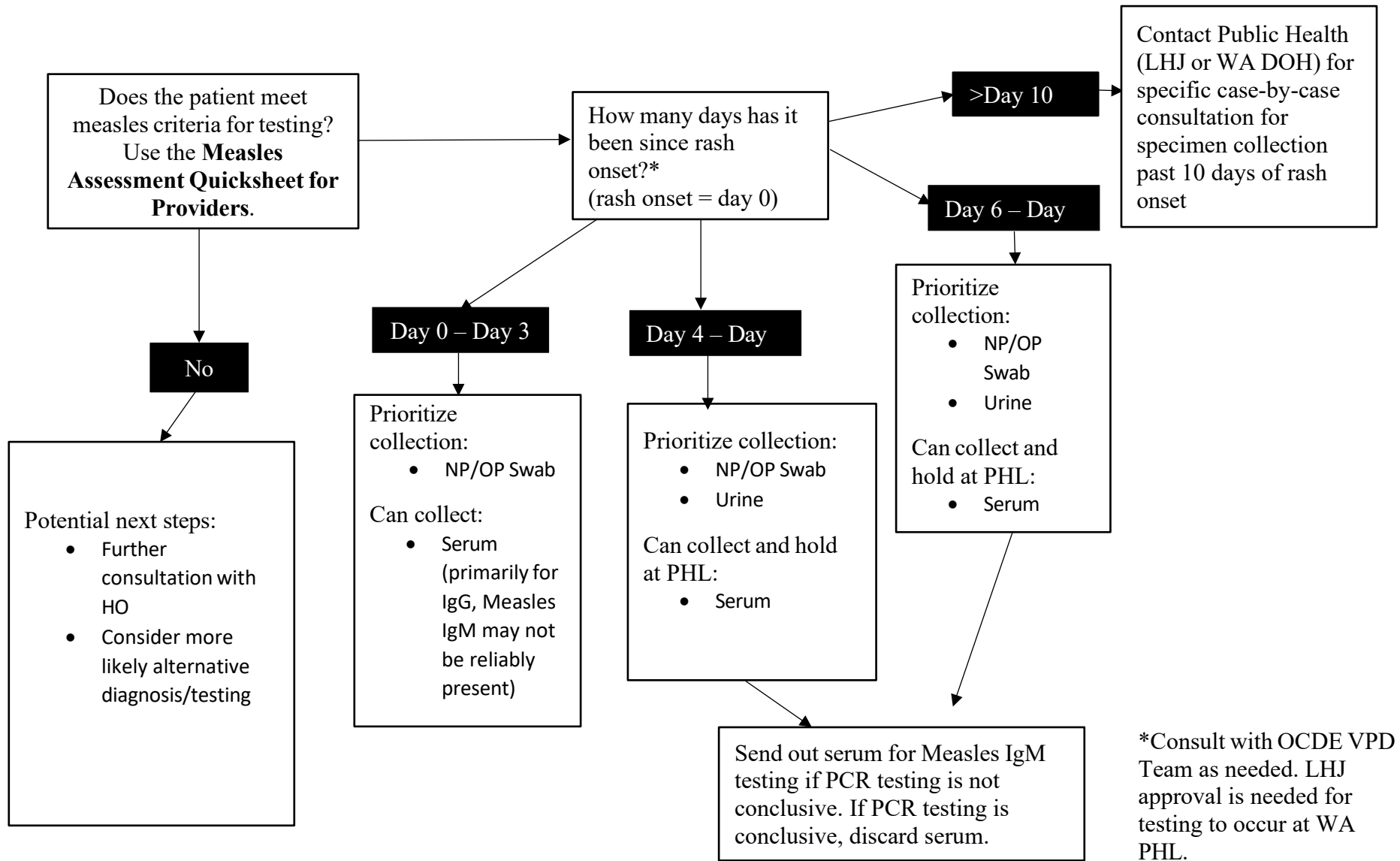
**Specimens for Serology**

**IgG:** IgG testing for acute measles requires demonstration of a rise in level of antibody against measles virus. Because tests for IgG require two specimens, and because a confirmed diagnosis cannot be made until the second specimen is obtained, IgM tests are generally preferred serology.

**IgM:** Detection of specific IgM antibodies in a serum specimens collected within the first few days of rash onset can provide presumptive evidence of a current or recent measles virus infection. No assay is 100% specific, serologic testing of non-measles cases using any assay will occasionally produce false positive IgM results. Serum specimens are collected too early with respect to rash onset may result in false negative results.

*Measles IgM is not available at the WA PHL. However, for highly suspect or indeterminate cases, WA PHL may request a serum sample to forward to CDC for testing.*

**APPENDIX D: MEASLES SPECIMEN COLLECTION AND TESTING DECISION TREE**



## APPENDIX E: INTERPRETATION OF SEROLOGY RESULTS

The person's immune status plays a role in deciding which serologic tests should be ordered and in the interpretation of the results. Here is a quick overview:

### On an unimmunized person

- Specimen collected less than 72 hours after the date of rash onset:

*Test for IgM.*

IgM positive = measles confirmed

IgM negative = cannot rule out measles

Collect another specimen 72 hours or more after rash onset

- Specimen collected 72 hours or more after the date of rash onset:

*Test for IgM and IgG*

IgM positive/IgG positive or negative = measles confirmed

IgM negative/IgG negative = measles ruled out

On a person with **unknown immunization** history or on a person with documented history of one or more doses of measles-containing vaccine

- Specimen collected less than 72 hours after the date of rash onset:

*Test for IgM and IgG*

IgM positive/IgG positive or negative = measles confirmed

IgM negative/IgG negative = cannot rule out measles

Collect another specimen 72 hours or more after rash onset

Did not respond to vaccination or was never vaccinated

IgM negative/IgG positive = measles ruled out

Demonstrates previous immunity to measles due to either prior vaccine or previous disease

- Specimen collected more than 72 hours or more after the date of rash onset:

*Test for IgM and IgG*

IgM positive/IgG positive or negative = measles confirmed

IgM negative/IgG negative = measles ruled out

Recommend immunization

IgM negative/IgG positive = measles ruled out

Demonstrates previous immunity to measles due to either prior vaccine or previous disease

*Please note: False positive IgM results for measles are not uncommon. False-positive IgM results may be due to the presence of rheumatoid factor in serum specimens. Serum specimens from patients with other rash illness, such as parvovirus B19, rubella, and roseola, have been observed to yield false-positive reactions in some IgM tests for measles. False-positive tests may be suspected when thorough surveillance reveals no source or spread of cases, when the case does not meet the clinical case definition, or when the IgG result is positive within 3 days of rash onset. When a laboratory IgM test result is suspected of being false-positive, additional tests may be performed following consultation with WA DOH Communicable Disease Epidemiology.*

**APPENDIX F: PROVIDER ALERT TEMPLATE**

Insert LHJ logo here

**Measles Alert for [LHJ] Health Care Providers and Clinic Directors**

Date: [Insert Message Date]

This is a Provider Alert from the [insert LHJ/Jurisdiction Name]:

Current Situation in Washington:

**EXAMPLE: ###** confirmed cases of measles (rubeola) have occurred in (number) residents of (county) *did these people have international travel, communal living? or exposed to someone who did, are they immunized is there a known exposure?* The cases were at the following locations during their infectious period before receiving the measles diagnosis.

- Rash onset (dates)
- Secondary cases could occur between (dates)

Public exposures: places, dates and times:

**Actions Requested:**

**Be aware:** Be aware of a confirmed measles case in a County resident, offices and clinics need to be prepared for managing potential measles cases

**Isolate:**

- Have a planned triage process for patients with fever and rash so these patients are not waiting in common areas with other people.
- Immediately isolate patients with suspected measles in airborne infection isolation room (AIIR) or a private room with a closed door.
- Follow standard and airborne precautions when evaluating suspected cases, regardless of vaccination status.
- Do not use or have staff enter the room for 2 hours after patient is discharged

**Notify:** Report suspected measles cases to Public Health at [phone number]

**Test:** Public Health will facilitate diagnostic testing with Washington State Public Health Laboratory

**Manage:** Public Health will assist in identifying close contacts and recommend post-exposure prophylaxis for eligible people.

**Vaccinate:** Assess immunization status of patients at every visit and recommend vaccination based on recommended schedule, health condition, occupation, and other risk factors such as travel.

**Recognizing a potential case of measles:**

Measles is a viral illness consisting of fever, cough, coryza, conjunctivitis, maculopapular rash, and, though less commonly, Koplik spots. Usually, cold symptoms precede the onset of the rash by two to four days, fever and the rash typically overlap, a measles case will often feel ill enough to seek medical care BEFORE rash onset. If a patient has presented with coryza, light sensitivity, or cough with high fever,

please consider measles a possibility and notify the health department immediately. The red rash usually begins on the face and spreads to the rest of the body. Koplik spots appear inside the mouth on the buccal mucosa and look like grains of sand. (Absence of Koplik spots does not rule out measles). Complications of measles can include otitis media, bronchopneumonia, laryngotracheobronchitis, diarrhea, and encephalitis.

**Diagnosing measles:**

Control measures are more effective when applied as early as possible. **If you suspect measles, contact [LHJ] immediately.** During regular business hours call [phone number]. After hours call our answering service after hours at [phone number] to have the physician on call paged. We will assist you with collection of specimens and rapid testing at a public health laboratory. **Do not wait for laboratory confirmation before reporting.** Control measures are most effective if public health can contact those exposed within 72 hours of exposure.

**APPENDIX G: Algorithm for assessment and management of persons with definite exposure to measles and public callers with possible exposure to measles at a public site.**

Immunization Status before exposure→	Birth before 1957	2 doses	1 dose <sup>&amp;</sup>	0 doses		Unknown	
<b>Risk assessment:</b>	Presumed immune	Presumed immune	~95% effective	<b>Susceptible</b>		Presumed susceptible	
<b>Prophylaxis:</b>	None	None	None HOWEVER 2 <sup>nd</sup> MMR within 72 hours of exposure is preferred	MMR within 72 hours of exposure; Consider IG (if indicated <sup>1</sup> ) within 6 days of exposure*		MMR within 72 hours of exposure; Consider IG (if indicated <sup>1</sup> ) within 6 days of exposure*	
<b>Recommendations:</b>	No recommendations or restrictions	No recommendations or restrictions	Second MMR recommended even if >72 hours after exposure (but MMR within 72 hours preferred)	<b>Close Contacts<sup>€</sup> (Asymptomatic)</b>	<b>Public Callers<sup>£</sup> (Asymptomatic)</b>	<b>Close Contacts<sup>€</sup> (Asymptomatic)</b>	<b>Public Callers<sup>£</sup> (Asymptomatic)</b>
				Get a dose of MMR. Do not vaccinate if too late for prophylactic MMR <sup>2</sup>	Discuss with provider. Get a dose of MMR or serum IgG titer.	May draw serum IgG titer, give a dose of MMR, if indicated	Discuss with provider. Get a dose of MMR or serum IgG titer.
<b>Symptom Watch:</b>	Yes Discuss date of exposure and symptom watch times.	Yes Discuss date of exposure and symptom watch times.	Yes Discuss date of exposure and symptom watch times. Adverse event a possibility 5-12 days after MMR received <sup>3</sup> <ul style="list-style-type: none"> <li>• 5% get rash</li> <li>• 15% get fever</li> </ul>	Yes Discuss date of exposure and symptom watch times. Explain what to do if symptoms develop: stay home, call your health care provider, call ahead before going to health care facility	Yes Discuss date of exposure and symptom watch times. Explain what to do if symptoms develop: stay home, call your health care provider, call ahead before going to health care facility	Yes Discuss date of exposure and symptom watch times. Explain what to do if symptoms develop: stay home, call your health care provider, call ahead before going to health care facility	Yes Discuss date of exposure and symptom watch times. Explain what to do if symptoms develop: stay home, call your health care provider, call ahead before going to health care facility
<b>Exclusion<sup>£</sup>:</b>	None unless symptoms develop.	None unless symptoms develop.	None unless symptoms develop.	None if MMR received within 72 hours of first exposure <sup>£</sup>	None	None if MMR received within 72 hours of exposure <sup>£</sup>	None
				If MMR not received within 72 hours of first exposure, quarantine either until immunity is confirmed or the maximum incubation period (21 days**) has passed since their most recent exposure <sup>£</sup>	None	If titers drawn, stay home from day 7 after exposure until titer results are available. If titer positive (IgG): no further restrictions and no MMR needed. If titer negative or not done: Quarantine at home for 21 days after exposure.	None
<b>Follow-up:</b>	None	None	None	Vaccinate after 21 days if measles did not develop.	None	Vaccinate after 21 days if measles did not develop.	None

Please note, in this appendix, “measles containing vaccine” and MMR are used interchangeably. This can apply to MMRV vaccine if that is the formulation being used.

<sup>€</sup> Named close contacts that can be monitored daily and who have had a specific measles exposure identified.

<sup>#</sup> Public callers are members of the public who may have been exposed to measles because of being in the same place/time as the infectious measles case but who are not named close contacts. This excludes other members of the general public (who should be recommended to follow CDC vaccination schedules and get up to date on vaccines).

<sup>&</sup> Health Care Workers (HCW) with one dose of MMR who have a definite or possible measles exposure (i.e. who are named close contacts or public callers) should be treated as a close contact with unknown MMR status. This additional caution is necessary due to the higher risk that an HCW contagious for measles might expose medically fragile individuals.

<sup>\*</sup> Vaccination and IG recommendations (such as recommended timing between MMR doses, vaccination of infants <1 year, and circumstances under which to give IG), may vary between local health jurisdictions depending on outbreak circumstances in each locale.

<sup>1</sup> Indications for IG include: Age <1 year, pregnancy, immunosuppression.

<sup>\*\*</sup> IG can prolong the incubation period, because of this, the recommended quarantine period is extended to 28 days after the last exposure.

<sup>£</sup> The Local Health Officer has the authority to determine and implement exclusion restrictions appropriate for the assessed risk within the community and situation

<sup>2</sup> MMR >72 hours after last exposure is not recommended for close contacts with 0 previous doses because of the possibility of adverse event (fever and/or rash) after first MMR. Vaccine-associated fever/rash, if they occur, typically develop ~2 weeks after vaccination, mimicking the incubation and symptoms of the measles virus. MMR given >72 hours after last exposure is not effective prophylaxis. To avoid investigating MMR-associated fever/rash as a measles case, MMR not indicated for unvaccinated close contacts >72 hours after last exposure. Vaccinate 21 or more days after exposure risk has ended.

<sup>ci</sup>

<sup>3</sup> Rash and fever rates after MMR refer to adverse events after the first dose; fever and rash are less common after the second dose.

<sup>4</sup> Quarantine and isolation are at the discretion of each LHJ and are typically voluntary, but under some circumstances quarantine/isolation may be legally mandated or enforced, as per LHJ discretion and determination.