GREG GIANFORTE
GOVERNOR

DEPARTMENT OF PUBLIC HEALTH & HUMAN SERVICES

CHARLIE BRERETON
DIRECTOR

TO: Local Health Departments
FROM: Communicable Disease Epidemiology
RE: Care package for suspect measles cases

March 27, 2024

Given the increase in measles activity in multiple states in the U.S., we wanted to refresh a 'care package' of materials that you can use to assist with planning as well as questions from your surveillance partners and the general public. You may want to distribute some of these to your healthcare providers and laboratories. See suggested intent below.

The items included are:

If you have any questions or need any assistance, please contact Communicable Disease Epidemiology at 406-444-0273.

Thank you for your assistance as we prepare for potential suspect cases.

Measles (Rubeola) Suspicion Checklist for local public health

Any individual with a rash illness that the healthcare provider suspects might be measles should be handled as a suspect case until testing proves otherwise. However, the degree of suspicion may vary depending on the responses to the following criteria:

LAST NAME	**FIRST NAME**	**DOB**

	Yes	No	Unk	
Born Before 1957?				
Prior History of the Disease?				When:
Titer				Date:
Vaccination Status				
Unvaccinated				
Vaccinated				Dose 1 date:
				Dose 2 date:
Clinical Presentation				
Rash				Rash location: **Rash onset date:**
Fever				Temp: **Fever onset date:**
Cough				
Runny nose				
Koplik spots				
Conjunctivitis				
Travel History				Where:
(including out of state, out of country)				Date(s):
Visitors				Where:
(including out of state, out of country)				Date(s):
Contact with Known Measles Case?				Where:
				Date(s):
Pregnant				# weeks gestation:
Immunocompromised				Condition(s):
Case Definition Met?				If yes, consider the person a highly suspect case and recommend testing.
Specimen collection (Need both)				Date:
Nasopharyngeal or throat swab (PCR)				
Blood serum for serology (IgM)				
Laboratory Performing the Tests				
Provider Name and Phone Number				
DPHHS CDEpi Notified?				Date:
				Who:

NOTE: Please contact CDEpi immediately at 406-444-0273 (24/7) for consultation. Laboratories may contact the Montana Public Health Laboratory at 1-800-821-7284 for information on proper specimen collection, handling and shipping instructions.

Measles (Rubeola)

Current CSTE Case Definition (2013)

CSTE Position Statement(s): 12-ID-07

Clinical Description

An acute illness characterized by:

- Generalized, maculopapular rash lasting ≥3 days; **and**
- Temperature ≥101°F or 38.3°C; **and**
- Cough, coryza, or conjunctivitis.

Case Classification

Probable

In the absence of a more likely diagnosis, an illness that meets the clinical description with:

- No epidemiologic linkage to a laboratory-confirmed measles case; **and**
- Noncontributory or no measles laboratory testing.

Confirmed

An acute febrile rash illness† with:

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

† Temperature does not need to reach ≥101°F/38.3°C and rash does not need to last ≥3 days.
‡ Not explained by MMR vaccination during the previous 6-45 days.
§ Not otherwise ruled out by other confirmatory testing or more specific measles testing in a public health laboratory.

Case Classification Comment(s)

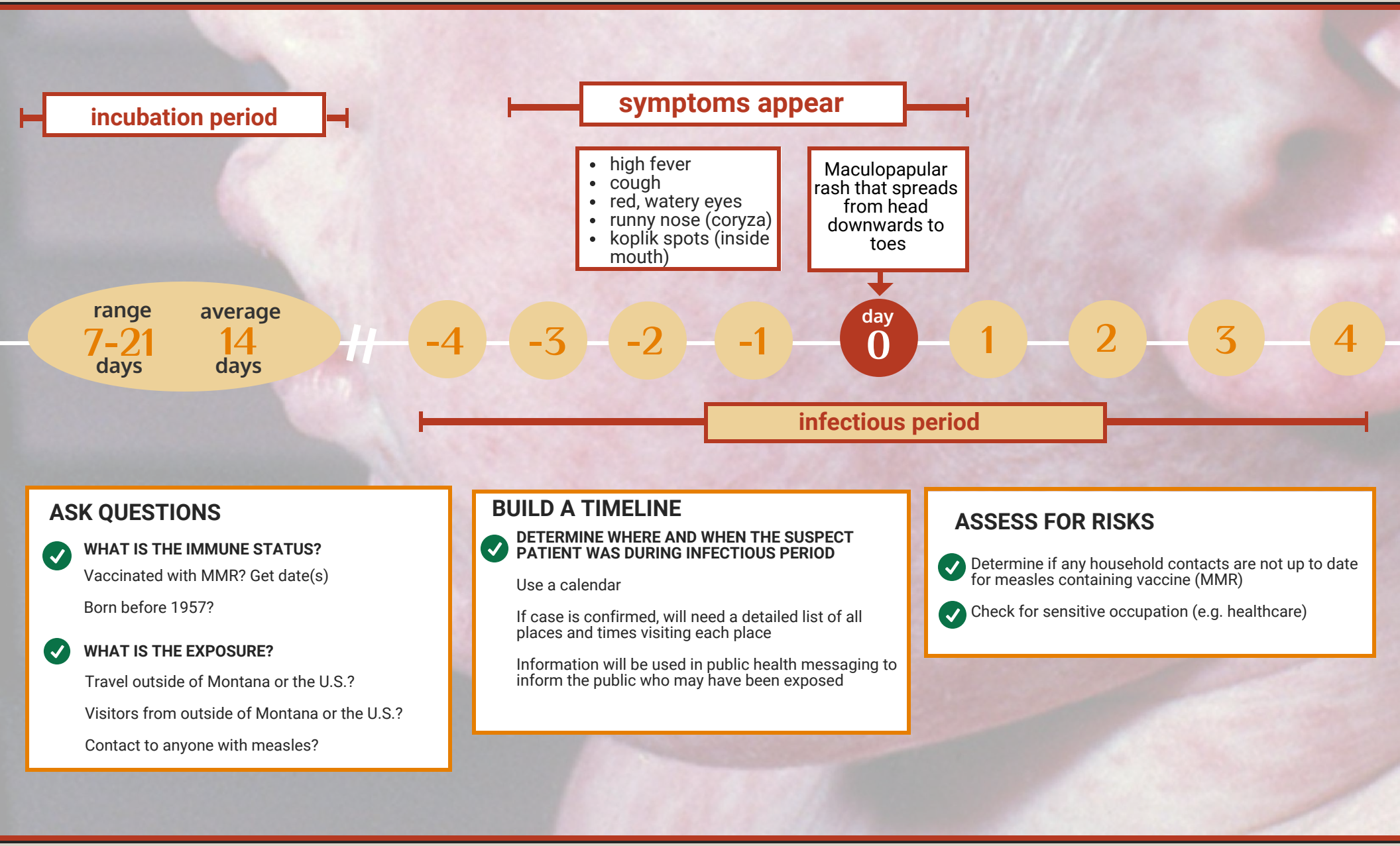
CDC does not request or accept reports of suspect cases so this category is no longer needed for national reporting purposes.

Measles Outbreak Case Definition

An outbreak of measles in Montana is defined as two or more laboratory-confirmed measles cases that are epidemiologically linked (related in time and space).

MEASLES TIMELINE

Guidance for local public health investigation



ASK QUESTIONS

WHAT IS THE IMMUNE STATUS?

Vaccinated with MMR? Get date(s)

Born before 1957?

WHAT IS THE EXPOSURE?

Travel outside of Montana or the U.S.?

Visitors from outside of Montana or the U.S.?

Contact to anyone with measles?

BUILD A TIMELINE

DETERMINE WHERE AND WHEN THE SUSPECT PATIENT WAS DURING INFECTIOUS PERIOD

Use a calendar

If case is confirmed, will need a detailed list of all places and times visiting each place

Information will be used in public health messaging to inform the public who may have been exposed

ASSESS FOR RISKS

Determine if any household contacts are not up to date for measles containing vaccine (MMR)

Check for sensitive occupation (e.g. healthcare)

MT DPHHS REV. 03/2024

Public Health IN THE 406 MONTANA COMMUNICABLE DISEASE EPIDEMIOLOGY

MEASLES

For use by medical providers

Thinking measles? Use the flowchart below for guidance.

MONTANA COMMUNICABLE DISEASE EPIDEMIOLOGY

Skin rash? Thinking measles?

What is the exposure?

If possible, consult prior to seeing patient at the clinic

Clinical case definition

Generalized maculopapular rash that spreads from head downward to toes AND fever (at least 100.4 F) present at rash onset AND cough or conjunctivitis or Koplik spots

Meets clinical case definition?

if not

Differential diagnoses

- Rubella
- Roseola infantum
- Human parvovirus
- Enteroviruses
- Arboviruses
- Kawasaki syndrome
- MIS-C
- Drug hypersensitivity rash
- Group A streptococcal disease (scarlet fever)

Infection control

Airborne precautions should be used immediately with all suspect cases.

Patients should be given a surgical mask to wear at all times and placed in a private negative air pressure room (or if unavailable, in a private room with the door closed)

Notify local public health to report and consult on laboratory testing for measles

Laboratory testing:

Respiratory Specimen → Throat, nasopharyngeal, or nasal swab for PCR

AND

Serum Specimen → Blood for serology (IgM/IgG)

QUESTIONS? CALL YOUR LOCAL HEALTH DEPARTMENT:

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PROJECT FIRSTLINE
CDC'S National Training Collaborative for Healthcare Infection Prevention & Control

American Academy of Pediatrics
DEDICATED TO THE HEALTH OF ALL CHILDREN®

Think Measles

Consider measles in any patient presenting with a febrile rash illness, especially if unvaccinated for measles or traveled internationally in the last 21 days.

1 Measles Symptoms

- High Fever
- Cough
- Coryza (runny nose)
- Conjunctivitis (red, watery eyes)
- Maculopapular Rash
  - Typically appears 2-4 days after symptoms begin.
  - Begins at hairline, spreads downward, to face, neck, and trunk.
  - Rash appears red on light complexions, but may be harder to see or appear as purple or darker than surrounding skin on dark complexions.

2 Pre-Visit Telephone Triage

- For those reporting measles symptoms, assess the risk of exposure:
  - Are measles cases present in your community?
  - Did the patient spend time out of the country in the 21 days before symptom onset?
  - Has the patient ever received the MMR vaccine?
- Triage should only be completed by a clinically trained person.
- If patient will be seen in the office, provide instructions on face masks for patient (2 years of age and older) and family.
- Instruct to arrive to a side or back entrance instead of the main entrance.

3 Patients Presenting with Suspected Measles

- Provide face masks to patients (2 years of age and older) and family before they enter the facility. Patients unable to wear a mask should be "tented" with a blanket or towel when entering the facility.
- Immediately move patient and family to an isolated location, ideally an airborne infection isolation room (AIIR) if available. If unavailable, use a private room with the door closed.
- No other children should accompany a child with suspected measles.
- Patients (2 years of age and older) and family should leave face masks on if feasible.

4 Infection Prevention Precautions

Only health care providers with immunity to measles should provide care to the patient and family. Standard and airborne precautions should be followed, including:

- Use of a fit tested NIOSH-approved N95 or higher-level respirator.
- Use of additional PPE if needed for task (e.g., gloves for blood draws).
- Cleaning hands before and after seeing the patient.
- Limiting transport or movement of patients outside of room unless medically necessary.

5 Public Health Notification

- To ensure rapid investigation and testing with contact tracing, notification should occur immediately upon suspicion of measles. Public health departments will be able to help confirm vaccination history for U.S. residents, provide guidance on specimen collection and submission, and manage contacts of confirmed cases.
- Acute care facilities should immediately notify the hospital epidemiologist or infection prevention department.
- Outpatient settings should immediately notify local or state health departments.

6 Clinical Care

- People with confirmed measles should isolate for four days after they develop a rash.
- If an AIIR was not used, the room should remain vacant for the appropriate time (up to 2 hours) after the patient leaves the room
- Standard cleaning and disinfection procedures are adequate for measles virus environmental control.

Maculopapular Rash

Source: CDC PHIL

Project Firstline is a national collaborative led by the U.S. Centers for Disease Control and Prevention (CDC) to provide infection control training and education to frontline healthcare workers and public health personnel. American Academy of Pediatrics is proud to partner with Project Firstline, as supported through Cooperative Agreement CDC-RFA-OT18-1802. CDC is an agency within the Department of Health and Human Services (HHS). The contents of this flyer do not necessarily represent the policies of CDC or HHS and should not be considered an endorsement by the Federal Government.

Resources:

Measles Red Book Online Outbreaks Page

CDC Interim Infection Prevention and Control Recommendations for Measles in Healthcare Settings

Montana Public Health Laboratory Guidance: Measles Testing

State communicable disease reporting rules require health care providers suspecting measles to report suspected cases to local public health authorities immediately. Public health authorities may implement immediate control measures to prevent transmission and/or arrange immediate transport of the specimen when warranted.

Specimen Criteria

Collect the following specimens to test for measles infection:

- Respiratory Specimen (Throat, NP, Nasal Swab)
- Serum

Specimen Collection for PCR Testing:

Collect specimens as soon as possible after appearance of rash, and ideally within 3 days of rash onset. Detection can be possible up to day 7 following onset of rash. *Respiratory Specimen*: Throat, Nasopharyngeal, or Nasal Dacron swabs in viral transport media.

Consult with Public Health authorities regarding PCR testing prior to rash development of individuals who may have had a recent exposure to measles.

Specimen Collection for IgM Testing:

For IgM testing, specimens must be collected >48 hours post rash onset.

- *Serum*: 1 – 2 ml of serum. Can be sent in a spun serum separator tube or can be poured off into a transport tube.

Transport Conditions:

- Keep *Respiratory specimens* cold, and transport with cold packs as soon as possible following specimen collection. Avoid repeat freeze-thaw cycles. If specimen transport is going to be delayed >24 hours, freeze the sample at -70°C and ship on dry ice.
- *Serum* specimens can be shipped cold (refrigerated) or frozen (preferable for IgM testing).

Submission Reminders:

*Please be sure to include the collection date and at least two patient identifiers (Name and DOB or medical record #) on the sample container.

*Use the online portal to order found at Montana Publich Health Laboratory. *For respiratory specimens, order Measles PCR. *For serology specimens, order Rubeola IgM Serology (ND). *Be sure to select the appropriate specimen source when ordering. *For the Onset Date, enter the date of rash onset.

*Print the Requisition form, verify patient identifiers match the sample, and place the paperwork in the side pouch of the specimen bag. *Place the two specimens in separate specimen bags with the correct paperwork in each pouch. *Finally, create a manifest for all samples being shipped and place the manifest separately in the shipping container.

Specimens can be transported by courier (if available), UPS or FedEx to:

Montana Public Health Laboratory
1400 Broadway, Room B126
Helena, MT 59601

Please contact the Montana Public Health Laboratory at 1-800-821-7284 for more information and remember to report any suspect measles to your local health department.

Measles Vaccination: information and FAQs for local health jurisdictions

The MMR vaccine is very safe and effective. Two doses of MMR vaccine are about 97% effective at preventing measles; one dose is about 93% effective.

Children

Routine vaccination

- 2-dose series at 12–15 months and 4–6 years
- ***Minimum age: 12 months***
- The 2nd dose may be given as early as 4 weeks after the 1st dose

Catch-up vaccination

- Unvaccinated children and adolescents: 2 doses at least 4 weeks apart

International travel

- **Infants 6–11 months:** 1 dose before departure. Revaccinate with 2 doses at 12–15 months (12 months for children in high-risk areas) and 2nd dose as early as 4 weeks later
- **Unvaccinated children 12 months and older:** 2 doses at least 4 weeks apart before departure

Adults

General information

- Administer 1 dose of measles, mumps, and rubella vaccine (MMR) to adults with no evidence of immunity to measles, mumps, or rubella

Presumptive Evidence of Immunity

Acceptable presumptive evidence of measles immunity includes at least one of the following:

- written documentation of adequate vaccination
    - receipt of one or more doses of a measles-containing vaccine administered on or after the first birthday for preschool-age children and adults not at high risk, and
    - two doses of measles-containing vaccine for school-age children and adults at high risk for exposure transmission (i.e., health care personnel, international travelers, and students at post-high school educational institutions); or
- laboratory evidence of immunity; or
- birth before 1957; or
- laboratory confirmation of disease.

Persons who do not meet the above criteria are considered susceptible and should be vaccinated unless contraindicated.

NOTE: documentation of a health care provider-diagnosed disease without laboratory confirmation is not considered evidence of immunity

Special populations and settings

MMR is contraindicated for pregnant women and adults with severe immunodeficiency. Please consult a medical provider for additional information or clinical consultation as warranted.

- **Pregnant women: A**dminister MMR after pregnancy and before discharge from health care facility.
- **Breastfeeding women**: May receive the MMR vaccination without restriction. It is safe for breastfeeding women to receive MMR vaccination. Breastfeeding does not interfere with the response to MMR vaccine, and the baby will not be affected by the vaccine through breast milk.
- **Women of childbearing age** with no evidence of immunity: Administer 1 dose of MMR.
- **Persons ≥ 12 months with HIV infection who do not have evidence of current severe immunosuppression** and no evidence of immunity to measles, mumps, or rubella: Administer 2 doses of MMR at least 28 days apart.
- **Students in postsecondary educational institutions, international travelers**, and **household contacts of immunocompromised persons** with no evidence of immunity: Administer 2 doses of MMR at least 28 days apart (or 1 dose of MMR if previously administered 1 dose of MMR)
- **Health care personnel** with no evidence of immunity: Administer 2 doses of MMR at least 28 days apart
- **Health care settings:** Persons who work in health care settings (including volunteers, trainees, nurses, physicians, technicians, receptionists, and other clerical and support staff) are at increased risk of exposure to measles and at increased risk of transmission to persons at high risk of severe measles. All persons who work in such settings should have presumptive evidence of immunity to measles to prevent any potential outbreak (see previous page 'Presumptive Evidence of Immunity').
- **Adults who received killed (inactivated) measles vaccine**: A very small proportion of adults (less than 5%) may have received killed measles vaccine from 1963 through 1967 during childhood. The ACIP recommends re-vaccinating anyone who received measles vaccine of unknown type, inactivated measles vaccine, or further attenuated measles vaccine accompanied by IG or high-titer measles immune globulin (no longer available in the United States) during these years.

Postexposure vaccination and use of immunoglobulin to prevent measles in exposed susceptible persons

Presumptive evidence of measles immunity should be assessed for all identified contacts.

The MMR vaccine, if administered within 72 hours of initial measles exposure, and immunoglobulin (IG), if administered within six days of exposure, may provide some protection or modify the clinical course of disease among susceptible persons. However, vaccination should be offered at any interval following exposure in order to offer protection from future exposures. An individual should not receive both MMR vaccine and IG following an exposure.

Except in health care settings, unvaccinated persons who receive their first dose of MMR vaccine within 72 hours postexposure may return to childcare, school, or work.

Individuals who are at risk for severe disease and complications from measles (e.g., infants <12 months of age, pregnant women without evidence of measles immunity, and severely immunocompromised persons regardless of vaccination status because they might not be protected by the vaccine) should receive IG within six days of exposure.

- All infants younger than 12 months who have been exposed to measles. The dose of IGIM is 0.5 mL/kg of body weight; the maximum dose is 15 mL. Alternatively, MMR vaccine can be given instead of IGIM to infants age 6 through 11 months, if it can be given within 72 hours of exposure.
- Pregnant women without evidence of measles immunity who are exposed to measles should receive an intravenous IG (IGIV) dose of 400 mg/kg of body weight.
- Severely immunocompromised people, irrespective of evidence of measles immunity or vaccination, who have been exposed to measles should receive an IGIV dose of 400 mg/kg of body weight.
- Other people who do not have evidence of measles immunity can receive an IGIM dose of 0.5 mL/kg of body weight. However, priority should be given to people who were exposed to measles in settings where they have intense, prolonged close contact (such as household, child care, classroom, etc.). The maximum dose of IGIM is 15 mL.

As with vaccine, after receipt of IG individuals cannot return to health care settings. In other settings such as childcare, school, or work, factors such as immune status, intense or prolonged contact, and presence of populations at risk, should be taken into consideration before allowing these individuals to return. These factors may decrease the effectiveness of IG or increase the risk of disease and complications depending on the setting to which they are returning.

Frequently Asked Questions

We have measles cases in our community. How can I best protect the young children in my practice?

First of all, make sure all your patients are fully vaccinated according to the ACIP immunization schedule.

In certain circumstances, MMR is recommended for infants age 6 through 11 months. Give infants this age a dose of MMR before international travel. In addition, consider measles vaccination for infants as young as age 6 months as a control measure during a U.S. measles outbreak. Consult your state health department to find out if this is recommended in your situation. Do not count any dose of MMR vaccine as part of the 2-dose series if it is administered before a child's first birthday. Instead, repeat the dose when the child is age 12 months.

In the case of a local outbreak, you also might consider vaccinating children age 12 months and older at the minimum age (12 months, instead of 12 through 15 months) and giving the second dose 4 weeks later (at the minimum interval) instead of waiting until age 4 through 6 years.

Finally, remember that infants too young for routine vaccination and people with medical conditions that contraindicate measles immunization depend on high MMR vaccination coverage among those around them. Be sure to encourage all your patients and their family members to get vaccinated if they are not immune.

Many people age 60 years and older do not have records indicating what type of measles vaccine they received as children in the early 1960s. What measles vaccine was most frequently given in that time period? That guidance would assist many older people who would prefer not to be revaccinated.

Both killed and live attenuated measles vaccines became available in 1963. Live attenuated vaccine was used more often than killed vaccine. The killed vaccine was found to be ineffective and people who received it should be revaccinated with live vaccine.

Without a written record, it is not possible to know what type of vaccine an individual may have received. So persons born during or after 1957 who received killed measles vaccine or measles vaccine of unknown type, or who cannot document having been vaccinated or having laboratory-confirmed measles disease should receive at least 1 dose of MMR. Some people at increased risk of exposure to measles (such as healthcare professionals and international travelers) should receive 2 doses of MMR separated by at least 4 weeks.

Do people who received MMR in the 1960s need to have their dose repeated?

Not necessarily. People who have documentation of receiving live measles vaccine in the 1960s do not need to be revaccinated. People who were vaccinated prior to 1968 with either inactivated (killed) measles vaccine or measles vaccine of unknown type should be revaccinated with at least one dose of live attenuated measles vaccine. This recommendation is intended to protect people who may have received killed measles vaccine which was available in the United States in 1963 through 1967 and was not effective. Persons vaccinated before 1979 with either killed mumps vaccine or mumps vaccine of unknown type who are at high risk for mumps infection (such as persons who work in a healthcare facility) should be considered for revaccination with 2 doses of MMR vaccine.

My child is 6-12 months old, can they get an MMR vaccine?

- If the child is younger than 6 months of age they cannot receive the MMR vaccine as it is not recommended.
- If the child is older than 6 months and younger than 12 months, they can get an MMR if they are going to an area that is considered endemic for measles transmission. Please consult public health for current list of geographic areas. This would be considered an invalid dose but would protect them during travel. Do not count any dose of MMR vaccine as part of the 2-dose series if it is administered before a child's first birthday. Instead, repeat the dose when the child is age 12 months.

My child is 3 years old and has received 1 dose of the MMR vaccine. Can they get their booster early?

Yes. The recommended spacing between first and second doses of MMR vaccine is at least 4 weeks (28 days). They would still be on schedule and would not need an additional dose between 4-6 years.

My child is 4-6 years old. If they get the booster early, does that change the vaccine schedule?

Children 4-6 years in age are eligible to get the second dose of MMR. The vaccine schedule would remain the same.

Why is a second dose of MMR necessary?

Between 2% and 5% of people do not develop measles immunity after the first dose of vaccine. This occurs for a variety of reasons. The second dose is to provide another chance to develop measles immunity for people who did not respond to the first dose.

What if the individual is not vaccinated at all?

Assess their age, if they are within the recommended age range they should receive one dose and depending on their age, return to the schedule or vaccinate with the second dose after 28 days, if needed.

How does being born before 1957 confer immunity to measles?

People born before 1957 lived through several years of epidemic measles before the first measles vaccine was licensed in 1963. As a result, these people are very likely to have had measles disease. Surveys suggest that 95% to 98% of those born before 1957 are immune to measles. Persons born before 1957 can be presumed to be immune. However, if serologic testing indicates that the person is not immune, at least 1 dose of MMR should be administered.

What are the contraindications and precautions for MMR vaccine?

Contraindications

- history of a severe (anaphylactic) reaction to neomycin (or other vaccine component) or following previous dose of MMR
- pregnancy
- severe immunosuppression from either disease or therapy

Precautions

- receipt of an antibody-containing blood product in the previous 3–11 months, depending on the type of blood product received. See www.cdc.gov/vaccines/hcp/acip-recs/general-recs/timing.html, Table 3 for more information on this issue
- moderate or severe acute illness with or without fever
- history of thrombocytopenia or thrombocytopenic purpura

Sources:

CDC Immunization Schedules

CDC Measles, mumps, and rubella vaccination

The Pink Book: Measles (Chapter 13)

VPD Surveillance Manual: Measles (Chapter 7)

Immunization Action Coalition

MEASLES FAQ: general information for the public

Q: Am I protected against measles?

A: CDC considers you protected from measles if you have written documentation (records) showing at least **one** of the following:

- You received **two** doses of measles-containing vaccine, and you are a(n)—
  - school-aged child (grades K-12)
  - adult who will be in a setting that poses a high risk for measles transmission, including students at post-high school education institutions, healthcare personnel, and international travelers
- You received **one** dose of measles-containing vaccine, and you are a(n)—
  - preschool-aged child
  - adult who will not be in a high-risk setting for measles transmission
- A laboratory confirmation that you had measles at some point in your life
- A laboratory confirmation that you are immune to measles
- You were born before 1957

Q: What should I do if I'm unsure whether I'm immune to measles?

A: If you're unsure whether you're immune to measles, you should first try to find your vaccination records or documentation of measles immunity. If you do not have written documentation of measles immunity, you should get vaccinated with measles-mumps-rubella (MMR) vaccine. Another option is to have a doctor test your blood to determine whether you're immune. But this option is likely to cost more and will take two doctor's visits. There is no harm in getting another dose of MMR vaccine if you may already be immune to measles (or mumps or rubella).

Q: I've been exposed to someone who has measles. What should I do?

A: Immediately call your doctor and let them know that you have been exposed to someone who has measles. Your doctor can:

- determine if you are immune to measles based on your vaccination record, age, or laboratory evidence, and
- make special arrangements to evaluate you, if needed, without putting other patients and medical office staff at risk.

If you are not immune to measles, MMR vaccine or a medicine called immune globulin may help reduce your risk developing measles. Your doctor can help to advise you and monitor for signs and symptoms of measles.

If you do not get MMR or immune globulin, you should stay away from settings where there are susceptible people (such as school, hospital, or childcare) until your doctor and health department says it's okay to return. This will help ensure that you do not spread it to others.

Q: I think I have measles. What should I do?

A: Immediately call your doctor and let them know about your symptoms you are having. Your doctor can:

- determine if you are immune to measles based on your vaccination record or if you had measles in the past, and
- make special arrangements to evaluate you, if needed, without putting other patients and medical office staff at risk.

Q: My doctor or someone from the health department told me that I have measles. What should I do?

A: If you have measles, you should stay home for four days after you develop the rash. Staying home is an important way to not spread measles to other people. Talk to your doctor to discuss when it is safe to return.

You should also:

- Cover your mouth and nose with a tissue when you cough or sneeze and put your used tissue in the trash can. If you don't have a tissue, cough or sneeze into your upper sleeve or elbow, not your hands.
- Wash your hands often with soap and water.
- Avoid sharing drinks or eating utensils.
- Disinfect frequently touched surfaces, such as toys, doorknobs, tables, counters.

Call your doctor if you are concerned about your symptoms.

Q: How effective is the measles vaccine?

A: The measles vaccine is very effective. One dose of measles vaccine is about 93% effective at preventing measles if exposed to the virus. Two doses are about 97% effective.

Q: Could I still get measles if I am fully vaccinated?

A: Very few people—about three out of 100—who get two doses of measles vaccine will still get measles if exposed to the virus. Experts aren't sure why. It could be that their immune systems didn't respond as well as they should have to the vaccine. But the good news is, fully vaccinated people who get measles are much more likely to have a milder illness. And fully vaccinated people are also less likely to spread the disease to other people, including people who can't get vaccinated because they are too young or have weakened immune systems.

Q: Do I ever need a booster vaccine for measles?

A: No. CDC considers people who received two doses of measles vaccine as children according to the U.S. vaccination schedule protected for life, and they do not ever need a booster dose.

Adults need at least one dose of measles vaccine, unless they have evidence of immunity. Adults who are going to be in a setting that poses a high risk for measles transmission should make sure they have had two doses separated by at least 28 days. These adults include students at post-high school education institutions, healthcare personnel, and international travelers.

If you're not sure whether you were vaccinated, talk with your doctor.

Q: How common was measles in the United States before the vaccine?

A: Before the measles vaccination program started in 1963, about 3 to 4 million people got measles each year in the United States. Of those people, 400 to 500 died, 48,000 were hospitalized, and 4,000 developed encephalitis (brain swelling) from measles.

Q: What are the vaccine coverage levels like in the United States?

A: Nationally, the rates of people vaccinated against measles have been very stable since the Vaccines for Children (VFC) program began in 1994. For 2022-2023 school year, nationwide vaccination coverage of kindergarten children with MMR is 93.1%. However, MMR vaccination coverage levels continue to vary by state, with MMR coverage levels of <90% observed in 12 states and local areas during the same time period. At the county or lower levels, vaccine coverage rates may vary considerably. Pockets of unvaccinated people can exist in states with high vaccination coverage, underscoring considerable measles susceptibility at some local levels.

Q: Where do cases of measles that are brought into the United States come from?

A: Unvaccinated travelers can bring measles into the United States from any country where the disease still occurs or where outbreaks are occurring including Europe, Africa, Asia, and the Pacific. In 2022, there were an estimated 9 million measles cases worldwide and 136,000 deaths, mostly children. In recent years, many measles cases came into the United States from common U.S. travel destinations, such as the United Kingdom, Austria, the Philippines, and Romania, that are experiencing outbreaks of measles. CDC has a travel alert related to the global measles situation that can be read on CDC's Global Measles page.

Q: Why have there been more measles cases in the United States in recent years?

A: In 2011, 2014, 2018, and 2019, states reported higher numbers of measles cases compares to other years post-elimination. Since December 2023, the US has seen a large increase in cases, with more cases already reported in 2024 than all of 2023. CDC experts attribute this to:

- More measles cases than usual in countries to which Americans often travel (such as the United Kingdom, Austria, and the Philippines), and therefore more measles cases coming into the U.S., and/or
- More spread of measles in U.S. communities with pockets of unvaccinated people.

Q: Has measles been eliminated from the United States?

A: Yes. In 2000, the United States declared that measles was eliminated from this country. The United States eliminated measles because it has a highly effective measles vaccine, a strong vaccination program that achieves high vaccine coverage in children, and a strong public health system for detecting and responding to measles cases and outbreaks.

Q: What does "measles elimination" mean?

A: CDC defines measles elimination as the absence of continuous disease transmission for 12 months or more in a specific geographic area. Measles is no longer endemic (constantly present) in the United States.

Q: If measles is eliminated, why do people still get it in the United States?

A: Every year, unvaccinated travelers (Americans or foreign visitors) get measles while they are in other countries and bring measles into the United States. They can spread measles to other people who are not protected against measles, which sometimes leads to outbreaks. This can occur in communities with unvaccinated people.

Most people in the United States are protected against measles through vaccination, so measles cases in the U.S. are uncommon compared to the number of cases before a vaccine was available. Since 2000, when public health officials declared measles eliminated from the U.S., the annual number of people reported to have measles ranged from a low of 13 people in 2020 to a high of 1274 people in 2019.

Q: Is measles a concern for the United States?

A: Yes. Since measles is still common in many countries, travelers will continue to bring this disease into the United States. Measles is highly contagious, so anyone who is not protected against measles is at risk of getting the disease. People who are unvaccinated for any reason, including those who refuse vaccination, risk getting infected with measles and spreading it to others. And they may spread measles to people who cannot get vaccinated because they are too young or have specific health conditions.

Q: Could measles ever re-establish itself in the United States?

A: Yes, measles could become endemic (constant presence of a disease in an area) in the United States again, especially if vaccine coverage levels drop. This can happen when people

- forget to get vaccinated on time,
- don’t know that they need a vaccine dose (this is most common among adults), or
- refuse vaccines for religious, philosophical or personal reasons.

Research shows that people who refuse vaccines tend to group together in communities. When measles gets into communities with pockets of unvaccinated people, outbreaks are more likely to occur. It can be difficult to control the spread of the disease in these communities, which could lead to the virus re-establishing itself in the United States.

High sustained measles vaccine coverage and rapid public health response are critical for preventing and controlling measles cases and outbreaks.

Q: Will the United States ever get rid of measles completely?

A: Yes, it's possible. The first step is to eliminate measles from each country and region of the world. Once this happens, there will be no place from which measles can spread.

All member states in the six World Health Organizations regions have committed to eliminating measles, however progress slowed during the COVID-19 pandemic. The current goal is complete elimination by 2030. Once every country eliminates a disease, health officials consider the disease "eradicated" from the world.

Measles and the Vaccine (Shot) to Prevent It

Last updated April 2017

The best way to protect against measles is to get the measles-mumps-rubella shot (called the MMR shot). Doctors recommend that all children get the MMR shot.

Why should my child get the MMR shot?

The MMR shot:

- Protects your child from measles, a potentially serious disease, as well as mumps and rubella.
- Prevents your child from getting an uncomfortable rash and high fever from measles.
- Keeps your child from missing school or childcare (and keeps you from missing work to care for your sick child).

Is the MMR shot safe?

Yes. The MMR shot is very safe, and it is effective at preventing measles (as well as mumps and rubella). Vaccines, like any medicine, can have side effects. But most children who get the MMR shot have no side effects.

What are the side effects?

Most children do not have any side effects from the shot. The side effects that do occur are usually very mild, such as a fever, rash, soreness or swelling where the shot was given, or temporary pain and stiffness in the joints (mostly in teens and adults). More serious side effects are rare. These may include high fever that could cause a seizure.

Is there a link between the MMR shot and autism?

No. Scientists in the United States and other countries have carefully studied the MMR shot. None has found a link between autism and the MMR shot.

What is measles?

Measles is a serious respiratory disease (in the lungs and breathing tubes) that causes a rash and fever. It is very contagious. In rare cases, it can be deadly.

What are the symptoms of measles?

Measles starts with a fever that can get very high. Some of the other symptoms that may occur are:

- Cough, runny nose, and red eyes
- Rash of tiny, red spots that start at the head and spread to the rest of the body
- Diarrhea
- Ear infection

Doctors recommend that your child get 2 doses of the MMR shot for best protection. Your child will need one dose at each of the following ages:

- 12 through 15 months
- 4 through 6 years

Infants 6 months to 11 months old should have 1 dose of MMR shot before traveling to another country.

CS HCVG15-CHD-122 05/30/2017

Is it serious?

Measles can be dangerous, especially for babies and young children. From 2001-2013, 28% of children younger than 5 years old who had measles had to be treated in the hospital.

For some children, measles can lead to:

- Pneumonia (a serious lung infection)
- Lifelong brain damage
- Deafness
- Death

How does measles spread?

Measles spreads when a person infected with the measles virus breathes, coughs, or sneezes. It is very contagious. You can catch measles just by being in a room where a person with measles has been, up to 2 hours after that person is gone. And you can catch measles from an infected person even before they have a measles rash. Almost everyone who has not had the MMR shot will get measles if they are exposed to the measles virus.

Where do measles cases in the United States come from?

Every year, unvaccinated U.S. residents get measles while they are abroad and bring the disease into the United States and spread it to others. Measles is common in other parts of the world, including countries in Europe, Asia, the Pacific Islands, and Africa. Worldwide, about 20 million people get measles each year. When people with measles travel into the United States, they can spread the disease to unvaccinated people including children too young to be vaccinated.

How many measles cases are there in the United States each year?

From year to year, measles cases can range from roughly less than 100 to a couple hundred. However, in some years like 2014, there were more measles cases than usual. In 2014, 667 people from 27 states were reported as having measles. Most of these people got measles in the United States after being exposed to someone who got measles while in another country.

Where can I learn more about the MMR shot and my child?

To learn more about the MMR shot, talk to your child's doctor, call 1-800-CDC-INFO, or visit www.cdc.gov/vaccines/parents.

The Centers for Disease Control and Prevention, American Academy of Family Physicians, and the American Academy of Pediatrics strongly recommend children receive all vaccines according to the recommended schedule.

MEASLES:
Important considerations

suspect | report | confirm | prevent

- As of March 2024, cases of measles are occurring in 17 states in the U.S.
- Europe is also experiencing multiple measles outbreaks, with 7 deaths reported in the first 5 weeks of 2024.
- The last case of measles reported in Montana was in 1990.

WHO'S AT RISK

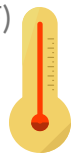
- Babies who are too young for vaccine (<12 months)
- Immunocompromised people
- Pregnant women
- Unvaccinated people

INCUBATION

Average: **14 days**
(range 7-21 days)

SYMPTOMS

- High fever (up to 104 F)
- Runny nose
- Cough
- Red, watery eyes
- Rash (spreads from head to toe)
- Koplik spots (sometimes)



Measles complications can include: pneumonia, encephalitis, and/or death

How infectious is measles? **One person can infect 12-18 susceptible people**

RISK FACTORS

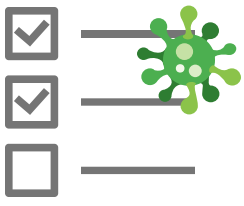
Travel to a place where measles is endemic or an outbreak is occurring

Contact with someone who has measles

Not receiving a measles vaccine (MMR)

Visitors from areas where measles is occurring

SUSPECT



Evaluate signs and symptoms and risk factors to determine **if measles is high on the suspicion list.**

REPORT

Measles is **immediately reportable** to local public health. Reporting should not wait until lab results are available. If you suspect measles, report it ASAP.

CONFIRM

A diagnosis of measles is confirmed by prompt laboratory testing. **The gold standard** is PCR and can be performed as soon as possible following rash onset. This should be paired with a blood test that detects IgM antibody production.

PREVENT

The measles vaccine (MMR) is extremely effective against preventing the disease in those who are >12 months of age. **Two doses of MMR are 97% effective.**

For more information, contact your local health department

PublicHealth IN THE 406 MONTANA COMMUNICABLE DISEASE EPIDEMIOLOGY

GREG GIANFORTE
GOVERNOR

DEPARTMENT OF PUBLIC HEALTH & HUMAN SERVICES

CHARLIE BRERETON
DIRECTOR

March 27, 2024

School administrators and staff:

As of March 21, 2024, 64 cases of measles have been reported to CDC from 17 states. There are no cases in Montana. The majority of cases in 2024 are related to unvaccinated travelers who are exposed while traveling to areas where measles is endemic or are experiencing measles outbreaks. Although the risk of measles is low when traveling, preparation is key to preventing an outbreak of measles in Montana.

Measles is an extremely contagious virus that can be dangerous, especially for young children. The measles virus can survive in a room for up to two hours after an infected person leaves the space. If exposed to the virus, anyone who is not immune is likely to get measles.

At this time, school administrators should review teacher and staff records for evidence of immunity. People are considered immune to measles if any of the following are true:

- You are a pre-school age child with one measles vaccine (MMR – measles, mumps, rubella)
- You are a school-age child (K-12) or adult who has had two measles vaccines (MMR - measles, mumps, rubella).
- You were born before 1957.
- You have had measles disease (diagnosed by a health care provider and confirmed with a lab test).
- You have had a blood test that shows you are immune to measles.

If a case of measles occurs in a school setting, the local health department will work closely with the school to assess evidence of immunity for students and staff and determine potential risks of exposure to measles. Recommendations may include post-exposure prophylaxis, and unvaccinated staff or students may be excluded from school until the risk of measles has passed **or** the individual receives a dose of MMR vaccine.

It is vital to report suspected measles cases to your local public health agency immediately. Public health officials will help determine key response activities necessary to confirm the illness and/or guide the response to potential exposures. In addition, measles communications to the public should be coordinated with your local public health department to avoid any potential issues with incorrect information. Please be sure to have your local public health agency contact information readily available.

Information on measles activity can be found at the DPHHS website's Measles page. In the event of a confirmed case in Montana, we will immediately update the website and a Health Alert Network (HAN) Advisory will be issued. The CDC updates U.S. cases weekly on their Measles Cases and Outbreaks Page.

Thank you for your help to ensure that our students stay healthy and safe!

State Case ID: Lab ID: NNDSS ID:

Measles Investigation Form

Patient name (last, first): Date reported to Health Department:

Date investigation began: Database entry date:

Interviewer name: Interviewer phone/email:

Interview/Call Log:

Date: **Response:** ☐ Left message ☐ Busy ☐ Wrong# ☐ Completed ☐ Other: **Interviewer initials:**

Date: **Response:** ☐ Left message ☐ Busy ☐ Wrong# ☐ Completed ☐ Other: **Interviewer initials:**

Date: **Response:** ☐ Left message ☐ Busy ☐ Wrong# ☐ Completed ☐ Other: **Interviewer initials:**

Working Status:

a) Date: **Status:** ☐ Suspected ☐ Probable ☐ Confirmed (Epi) ☐ Confirmed (Lab) ☐ Ruled out

Notes:

b) Date: **Status:** ☐ Suspected ☐ Probable ☐ Confirmed (Epi) ☐ Confirmed (Lab) ☐ Ruled out

Notes:

c) Date: **Status:** ☐ Suspected ☐ Probable ☐ Confirmed (Epi) ☐ Confirmed (Lab) ☐ Ruled out

Notes:

General Notes:

Note to Interviewer:

- Prior to beginning the interview, fill in the introductory script at the top of page #2 and the questions/sections in **bold/shaded** throughout the form.
- Say the scripted text that is in italics throughout the form to introduce the different sections.
- Use Mr., Mrs., or Ms. Last Name; preferable not to use their first name
- If they are still a suspect case pending results, do not say they have measles when leaving a message or on the phone
- If the patient is not the interviewee, replace 'your' with the patient's name throughout the interview

Final Investigative Findings

Final patient status: ☐ Ruled out ☐ Confirmed (Epi) ☐ Confirmed (Lab) ☐ Unknown

Case outbreak related? ☐ Yes ☐ No ☐ Unknown **If yes, outbreak name:**

Import status: ☐ International importation ☐ U.S. acquired

Import status – U.S. acquired: ☐ Import-linked case ☐ Imported-virus case ☐ Endemic case ☐ Unknown source case

Introductory Script: Measles Investigation

*Hello, my name is **[insert name]**, I am calling from the **[Insert Health Department]**. May I please speak to **[Insert name of patient or parent]**?*

*I am calling because **[PICK ONE: 1. you were identified as someone who may have had contact with measles at [location]; 2. you are suspected of having measles; or 3. you have tested positive for measles]**. We would like to ask you a few questions about your recent whereabouts and contacts, recent symptoms, and medical history. We would also like to ask about people you have had contact with to better understand the possible spread of the virus to others in your family and community.*

*We hope that your answers will help identify those with measles and stop the spread of the virus to keep everyone in the community safe. We estimate that these questions will take 20 minutes to answer. Your participation is voluntary. You do not have to answer any questions that make you uncomfortable, and you can stop at any time. The personal identifiable information you share with me today will be kept confidential and will not be shared outside of **[Insert Health Department]**.*

Would you like to continue with the questions?

INVESTIGATION BEGINS

We will now begin the interview with some general questions.

Demographic Information

1. May I ask your name: 2.(If not patient) What is your relationship to the patient?

2. What is your: Address: City: County:

State: Zip: Telephone: Country of usual residence:

3. What was your sex at birth? ☐ Male ☐ Female ☐ No answer

4. What is your age?

5. What is your date of birth?

6. Would you describe yourself as Hispanic/Latino? ☐ Yes ☐ No ☐ Unknown

7. How would you describe your race? ☐ Black/African American ☐ Asian/Pacific Islander ☐ American Indian/Alaska Native ☐ White ☐ Other ☐ Unknown

Next, I will ask you about any symptoms or recent illness you might have had.

Clinical Information

8. Did you have (a):

a. Rash? ☐ Yes ☐ No ☐ Unknown

a.1. When did you first notice the rash?

a.2. Was the rash generalized (all over)? ☐ Yes ☐ No ☐ Unknown

a.3. How would you describe the rash? (e.g., where did it start? Was it itchy? What did the rash look like?)

a.4. Do you still have a rash? ☐ Yes ☐ No ☐ Unknown

a.4.i. If no, how long did the rash last? (days)

b. Fever? ☐ Yes ☐ No ☐ Unknown

b.1. When did the fever start?

b.2. What was the highest temperature measured (circle reporting scale)? ˚F or ˚C

c. Cough? ☐ Yes ☐ No ☐ Unknown

d. Stuffy or runny nose (coryza)? ☐ Yes ☐ No ☐ Unknown

e. Swollen, red, itchy eyes (conjunctivitis)? ☐ Yes ☐ No ☐ Unknown

f. Ear infection (otitis)? ☐ Yes ☐ No ☐ Unknown

g. Pneumonia? ☐ Yes ☐ No ☐ Unknown

h. Diarrhea? ☐ Yes ☐ No ☐ Unknown

i. Vomiting? ☐ Yes ☐ No ☐ Unknown

j. Dehydration? ☐ Yes ☐ No ☐ Unknown

k. Low platelets (Thrombocytopenia)? ☐ Yes ☐ No ☐ Unknown

l. Brain inflammation or swelling (Encephalitis)? ☐ Yes ☐ No ☐ Unknown

m. Did you have any other symptoms or complications? ☐ Yes ☐ No ☐ Unknown

m.1. If yes, describe other symptoms or complications:

9. Did you visit a healthcare provider because of your illness? ☐ Yes ☐ No ☐ Unknown

a. If yes, where were you consulted? (Check all that apply) ☐ Clinic ☐ Emergency ☐ Department

b. If yes, when did you visit this health care provider?

c. If yes, what is the name of the facility?

10. Were you hospitalized because of your illness? ☐ Yes ☐ No ☐ Unknown

a. If yes, what was the name of the hospital?

b. If yes, what was the admission date?

c. If yes, what was the discharge date?

11. Did the patient die? ☐ **Yes** ☐ **No** ☐ **Unknown**

a. If yes, what was the date of death?

Next, I have a couple questions about your health.

Past Medical History

12. (If female) Are you pregnant? ☐ Yes ☐ No ☐ Unknown

13. Do you have a weakened immune system? ☐ Yes ☐ No ☐ Unknown

a. If yes, can you describe or name the condition(s) or medication(s) that make you have a weakened immune system?

Next, I would like to continue with questions about your potential contact with measles.

Epidemiologic Investigation

Note to Interviewer: Annotate the travel details and exposure details from questions 14 and 15 in the tables on page 5 and 6 on the corresponding day, and then proceed chronologically starting with day -21.

14. Have you traveled outside of the U.S. in the past 21-days? ☐ Yes ☐ No ☐ Unknown

a. If yes:

a.1. When did you depart from the U.S.?

a.2. What countries did you visit?

a.3. When did you return to the U.S.?

15. Before your rash appeared, were you in contact with someone known to have measles or with similar symptoms to you (e.g., rash and fever)? ☐ Yes ☐ No ☐ Unknown

a. If yes:

a.1. Where did the contact with this person occur? ☐ Day Care ☐ School ☐ Doctor's Office ☐ Hospital Ward ☐ Hospital ER ☐ Hospital Outpatient ☐ Home ☐ Work ☐ College ☐ Military ☐ Correctional Facility ☐ Place of Worship ☐ International Travel ☐ Unknown ☐ Other? If other, can you describe?

a.2. What is the name of the location?

a.3. When did the contact occur (list date(s): one time=first date only; multiple=first and last date)? -

a.4. Are there any other details that you want to share about this contact?

a.5. If source case of this patient is known (i.e., if there is a known direct epidemiological link), please add the specific source Case ID:

Note to Interviewer: If the patient was exposed to measles outside of the U.S. (international importation) OR if the direct source case of this person's measles infection is known (see Q15 a.5), you can skip the Exposure Period Table below and ONLY need to fill out the table for the Infectious Period Table (4 days before and 4 days after rash onset).

Note to Interviewer: For businesses with multiple sites, please specify which location.

Next, to try to identify where you might have been infected with measles, I would like to ask about locations you have visited and people you have interacted with each day starting 21 days before your rash appeared to 5 days before the rash appeared.

Exposure Period Table

Day	Date	Locations Visited/Times at Each Location	Number of People or Approximate (large pub. loc. = unk)	Public Transportation Used and Details (e.g., ride share, plane, bus)
-21				
-20				
-19				
-18				
-17				
-16				
-15				
-14				
-13				
-12				
-11				
-10				
-9				
-8				
-7				
-6				
-5				

Next, to help prevent further spread of the virus, I would like to ask about locations you have visited and people you have interacted with during the time you may have been contagious (4 days before and 4 days after the rash appeared).

Infectious Period table

-4				
-3				
-2				
-1				
0 Rash Onset				
1				
2				
3				
4				

Next, to help identify the potential spread of the virus in your home, I would like to ask you about those who live in your household.

Name	Relation to Patient	DOB	Age	Symptoms	MMR Vaccination Status	Number of Vaccine Doses (0 if none)	Date of Dose 1	Date of Dose 2
					☐ Yes ☐ No ☐ Unknown			
					☐ Yes ☐ No ☐ Unknown			
					☐ Yes ☐ No ☐ Unknown			
					☐ Yes ☐ No ☐ Unknown			

Note to Interviewer: If the vaccine information and laboratory information is known before the interview (e.g., from prior review of the immunization registry and laboratory results), this is the end of the interview. Skip to the end to thank the interviewee for participation.

Vaccination Status

Note to Interviewer: If vaccination information is unavailable, proceed with asking the vaccine questions to the patient. The patient will need to send proof of measles vaccination.

16. Have you received a measles-containing vaccine? ☐ Yes ☐ No ☐ Unknown

a. How many doses (If never received measles-containing vaccine, put 0)?

b. What date(s) was/were the measles-containing vaccine given?

b.1. Dose 1 Date

b.2. Dose 2 Date

b.3. Dose 3 Date

17. Did the patient receive postexposure prophylaxis (PEP)? ☐ Yes ☐ No ☐ Unknown

a. If yes, what type of PEP did they receive? ☐ Vaccine ☐ Immunoglobulin (IG) ☐ Unknown

a.1. If vaccine or IG received:

Date when PEP was received?

Was PEP given within 3 days (for vaccine) or 6 days (for IG) of the first measles exposure (reference Question 15 a.3)? ☐ Yes ☐ No ☐ Unknown

a.2. If IG given, how was it administered? ☐ Intramuscular (IM) ☐ Intravenous (IV) ☐ Unknown

Laboratory Information

18. Was measles testing performed? ☐ **Yes** ☐ **No** ☐ **Unknown**

Note to Interviewer: For newly identified patients, please ask if patient will give permission to have specimen collected to verify measles disease. The patient will be informed about the results of the test and all information will be strictly confidential.

Permission Granted: ☐ Yes ☐ No

19. Fill in testing information:

Test Type	Test Result	Date Specimen Collected	Performing Laboratory (e.g., commercial, state, APHL ref lab, CDC)
PCR	☐ Pos ☐ Neg ☐ Indet ☐ Pend		
IgM	☐ Pos ☐ Neg ☐ Indet ☐ Pend		
IgG acute	☐ Pos ☐ Neg ☐ Indet ☐ Pend		
IgG conval	☐ Pos ☐ Neg ☐ Indet ☐ Pend		
Genotype	☐ Pos ☐ Neg ☐ Indet ☐ Pend		
MeVA	☐ Pos ☐ Neg ☐ Indet ☐ Pend		
	☐ Pos ☐ Neg ☐ Indet ☐ Pend		
–			

END OF INVESTIGATION

*That concludes the questions we have for today, thank you for your participation. Do you have any questions? If you have any questions in the future, please contact **[State Health Department]** at **[Phone Number]**. Any pending updates on lab results or measles status will be communicated by [State Health Department] when they become available. Thank you again and have a nice day.*