

Measles in 2025: Updates for Clinicians

Nicholas Van Sickels, MD
Associate Professor of Medicine
Division of Infectious Diseases
Department of Internal Medicine
University of Kentucky College of Medicine

Disclosures

- I do not have any relevant financial or other disclosures for this presentation.

Educational Need/Practice Gap

- Gap: Most currently practicing United States clinicians have not seen or encountered a case of measles.
- Need: Updated education in/around measles in light of recent outbreaks in the United States and abroad

Objectives

1. Identify regions and populations potentially at risk for measles outbreaks in the United States
2. Describe correlates of immunity to measles, with a focus on vaccination
3. Demonstrate knowledge of infection prevention when encountering suspected or confirmed measles cases

Expected Outcome

- As a result of this educational session, clinicians should be better prepared when a suspected or confirmed measles case presents

Case 1: The Healthcare Worker

Case 1:

- A 34-year-old healthcare worker asks your advice regarding the recent measles outbreaks in the United States. He has no pertinent medical history, is not on any medications, and is otherwise healthy.
- He was able to track down his childhood vaccines – and found documentation of 2 doses of measles, mumps, and rubella (MMR) vaccine in his records. However, before he found them, he asked his PCP to run a titer which showed he was not immune to measles.
- He wants to know if he should get a booster dose of MMR.

What do you do?

- A. Vaccinate him again with 1 dose of MMR vaccine
- B. Re-start his vaccination series and give 2 doses of MMR vaccine, spaced 28 days apart
- C. Do nothing, he is immune to measles by vaccination history
- D. Call your friendly ID doctor who has recently acquainted themselves with measles in general

Case 1:

- Discussion:
 - 2 doses of measles-containing vaccine are extremely immunogenic
 - Commercial serologic assays have wide variability in sensitivity and specificity
 - Around 10% of HCW will have a false negative IgG to measles
 - Even with negative serology, vaccinated patients will form an amnestic response to measles exposure due to T & B cell memory
 - Some will get infected when large outbreaks occur – though secondary spread is rare

R_0 (Basic Reproduction Number)	Herd Immunity Threshold (HIT)	% of Population Needing Immunity
11	0.9091	90.9%
18	0.9444	94.4%

1. www.cdc.gov/mmwr/pdf/rr/rr6204.pdf, page 22
2. <https://pubmed.ncbi.nlm.nih.gov/26209410/>
3. <https://www.cdc.gov/pinkbook/hcp/table-of-contents/chapter-13-measles.html>
4. Rosen, Jennifer B et al. "Outbreak of measles among persons with prior evidence of immunity, New York City, 2011." *Clinical infectious diseases* : an official publication of the Infectious Diseases Society of America vol. 58,9 (2014): 1205-10. doi:10.1093/cid/ciu105

Measles History

- 910: Measles was first differentiated from Smallpox by a Persian Physician, Abū Bakr Muhammad Zakariyyā Rāzī (Rhazes)
- 1657: Cases of measles were first seen in Boston
- 1757: A Scottish Physician, Francis Home, demonstrated the infectious nature of measles in 1757
- 1954: Measles virus isolated by Dr. Thomas Peebles in Boston from a 13-year-old student, David Edmonston
- 1958: First measles vaccines are tested

1657

Measles Appears in Boston

In Boston, John Hull wrote in his diary that "the disease of measles went through the town," but fortunately there were very few deaths.



This illustration from a 19th century French medical text depicts the characteristic measles rash.

Year	Events	Results
1912	Pre-vaccination era	<ul style="list-style-type: none"> Measles becomes a nationally reportable disease in the United States
<1963	Pre-vaccination era	<ul style="list-style-type: none"> 500,000 cases of measles are reported/year 1/1000 die from measles annually 2/1000 have permanent brain damage 1/10 are hospitalized due to measles
1963-1967	Measles eradication program begins – 1 dose recommended for children	<p>Two vaccines available:</p> <ul style="list-style-type: none"> Inactivated vaccine (not as effective) Live (Edmonston B Strain) vaccine – higher rate of side-effects
1968	Improved and further weakened strain of Edmonston vaccine becomes available	<ul style="list-style-type: none"> Since 1968, this strain (Edmonston-Enders strain) has been the standard for measles vaccination in the USA
1971	MMR vaccine becomes available	<ul style="list-style-type: none"> MMR becomes a 1-dose series
1989-1991	Resurgence of measles cases in the United States	<ul style="list-style-type: none"> ACIP recommends 2 doses of MMR vaccine for all children
2000	Measles declared eliminated in the United States	<ul style="list-style-type: none"> Definition: absence of continuous transmission >12 months

Recommendations for vaccination

- Routine childhood series:
 - Dose 1: 12-15 months
 - Dose 2: 4-6 years
- Most adults:
 - If born in 1957 or later, 1 or 2 doses of measles-containing vaccine
- Healthcare workers, postsecondary education students, international travelers:
 - 2 doses of measles containing vaccine

<https://www.cdc.gov/vaccines/hcp/imz-schedules/child-adolescent-age.html>

Quick Cases: Adult Measles Vaccination Scenarios

Quick cases (audience Q&A)- Measles vaccination

- A 70-year-old comes to visit you for an annual check-up. She will be traveling across Europe this summer and wants to know if there are any vaccines recommended before her trip.
- What should you ask and/or do?

TABLE 3. Acceptable presumptive evidence of immunity to measles, rubella, and mumps*

	Routine	Students at post-high school educational institutions	Health-care personnel[†]	International travelers
Measles	(1) Documentation of age-appropriate vaccination with a live measles virus-containing vaccine [§] : –preschool-aged children: 1 dose –school-aged children (grades K-12): 2 doses –adults not at high risk ^{¶¶} : 1 dose, or (2) Laboratory evidence of immunity, [¶] or (3) Laboratory confirmation of disease, or (4) Born before 1957	(1) Documentation of vaccination with 2 doses of live measles virus-containing vaccine, [§] or (2) Laboratory evidence of immunity, [¶] or (3) Laboratory confirmation of disease, or (4) Born before 1957	(1) Documentation of vaccination with 2 doses of live measles virus-containing vaccine, [§] or (2) Laboratory evidence of immunity, [¶] or (3) Laboratory confirmation of disease, or (4) Born before 1957 ^{††}	(1) Documentation of age-appropriate vaccination with a live measles virus-containing vaccine: –infants aged 6–11 months ^{**} : 1 dose –persons aged ≥12 months [§] : 2 doses, or (2) Laboratory evidence of immunity, [¶] or (3) Laboratory confirmation of disease, or (4) Born before 1957

^{¶¶} Adults at high risk include students in post-high school educational institutions, health-care personnel, and international travelers.

Quick cases (audience Q&A)- Measles vaccination

- A 45-year-old otherwise healthy patient cannot find their measles vaccine records and ask you if they should be vaccinated.
- What should you ask and/or do?

TABLE 3. Acceptable presumptive evidence of immunity to measles, rubella, and mumps*

	Routine	Students at post-high school educational institutions	Health-care personnel^T	International travelers
Measles	(1) Documentation of age-appropriate vaccination with a live measles virus-containing vaccine ^S : –preschool-aged children: 1 dose –school-aged children (grades K-12): 2 doses –adults not at high risk ^{¶¶} : 1 dose, or (2) Laboratory evidence of immunity, [¶] or (3) Laboratory confirmation of disease, or (4) Born before 1957	(1) Documentation of vaccination with 2 doses of live measles virus-containing vaccine, ^S or (2) Laboratory evidence of immunity, [¶] or (3) Laboratory confirmation of disease, or (4) Born before 1957	(1) Documentation of vaccination with 2 doses of live measles virus-containing vaccine, ^S or (2) Laboratory evidence of immunity, [¶] or (3) Laboratory confirmation of disease, or (4) Born before 1957 ⁺⁺	(1) Documentation of age-appropriate vaccination with a live measles virus-containing vaccine: –infants aged 6–11 months ^{**} : 1 dose –persons aged ≥12 months ^S : 2 doses, or (2) Laboratory evidence of immunity, [¶] or (3) Laboratory confirmation of disease, or (4) Born before 1957

^{¶¶} Adults at high risk include students in post-high school educational institutions, health-care personnel, and international travelers.

Who should consider getting a booster?

The CDC says most people who receive two doses of a measles vaccine following the U.S. vaccination schedule are "protected for life."

You might need a booster if you received a measles vaccine before 1968, as that shot was not as effective as the current ones.

Talk to your health care provider about what is best for you.

1. <https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm>
2. https://www.pbs.org/newshour/health/do-adults-need-a-measles-booster-an-epidemiologist-explains-who-is-immune?utm_source=chatgpt.com

Is there a test to check your immunity to measles?

The CDC recommends locating your vaccination records to see if you have received either the MMR or MMRV vaccine.

You can also ask a health care provider to administer a blood test to determine if you are immune.

Quick cases (audience Q&A)- Measles vaccination

- A 36-year-old with inflammatory bowel disease on adalimumab (Humira®) comes for a follow-up and asks you if they should get a measles booster dose given all the cases in the United States. They received 2-doses of MMR vaccine as a child.
- What should you ask/do?

Post-exposure prophylaxis (PEP) for measles exposures who **ARE** pregnant or immunocompromised

Category	Age range	Measles immune status ^a	PEP type depending on time after initial exposure		
			≤3 days (≤72 hours)	4-6 days	>6 days
Severely Immunocompromised ^b	<12 months	Will need IG regardless of measles immune status	<ul style="list-style-type: none"> Give intramuscular immunoglobulin (IMIG)^{cd} Home quarantine^e for 28 days after last exposure 		<ul style="list-style-type: none"> PEP not indicated (too late)^f Home quarantine^e for 21 days after last exposure
	≥12 months		<ul style="list-style-type: none"> Give intravenous immunoglobulin (IVIG)^{cd} Home quarantine^e for 28 days after last exposure 		
Pregnant	n/a	Immune (IgG positive or 2 MMR doses)	<ul style="list-style-type: none"> PEP not indicated Exposed person has documented immunity. 		
		Non-immune (IgG negative)	<ul style="list-style-type: none"> Give intravenous immunoglobulin (IVIG)^{cd} Home quarantine^e for 28 days after last exposure 		<ul style="list-style-type: none"> PEP not indicated (too late)^f Home quarantine^e for 21 days after last exposure
		Unknown immunity	<ul style="list-style-type: none"> Draw titers (measles IgG) STAT to determine immunity; proceed as above based on titer results 		<ul style="list-style-type: none"> PEP not indicated (too late)^f Consider titers to determine risk of infection/risk to infant; proceed as above based on titer result

^a All persons exposed to measles must be notified of their exposure.

^b Management of immunocompromised persons can be challenging and may require individualized decisions with provider based on immunocompromising condition or medications.

Severely immunocompromising conditions (per ACIP and IDSA)* include:

- Severe primary immunodeficiency;
- Bone marrow transplant until ≥12 months after finishing all immunosuppressive treatment, and maybe longer in patients who have developed graft-versus-host disease;
- On treatment for acute lymphoblastic leukemia (ALL) within and until ≥6 months after completion of immunosuppressive chemotherapy;
- On cancer chemotherapy**
- Post solid organ transplantation**
- Receiving daily corticosteroid therapy with a dose >20mg (or >2 mg/kg/day for patients who weigh <10kg) of prednisone or equivalent for ≥14 days
- Receiving certain biologic immune modulators, such as tumor necrosis factor-alpha (TNF-α) blockers or rituximab**
- After hematopoietic stem cell transplant, duration of high-level immunosuppression is highly variable and depends on type of transplant (longer for allogenic than autologous), type of donor and stem cell source, and post-transplant complications such as graft vs. host disease and their treatments**
- AIDS or HIV with severe immunosuppression defined as CD4 <15% (all ages) or CD4 count <200 lymphocytes/mm³ (aged >5 years).

Low-level immunosuppression: In the absence of published guidance on exposed persons with low-level immunosuppression, consider assessing presumptive immunity to measles (measles IgG positive or 2 MMR vaccine doses) to determine if PEP is indicated. If not immune to measles, give PEP as MMR (if not contraindicated^c and within 72 hours of initial exposure). Consider intravenous IG^c if MMR is contraindicated^c or if it is too late for MMR (day 4-6 after initial exposure) with home quarantine for 28 days after last exposure. If no PEP is given because it is too late, home quarantine for 21 days after last exposure^e.

^c For patients who receive IG, provide these instructions: www1.nyc.gov/assets/doh/downloads/pdf/imm/stay-home-non-cases.pdf

^d Dosing of intramuscular IG for infants aged <12 months: 0.5 mL/kg of body weight (max dose 15mL). Dosing of intravenous IG for pregnant women not immune to measles and immunocompromised persons: 400 mg/kg. MMR or varicella vaccine administration must be delayed by 6 months and 8 months after intramuscular and intravenous IG, respectively. Reference: www.cdc.gov/mmwr/preview/mmwrhtml/rr6204a1.htm

^e When implementing home quarantine, ensure that all household members of the exposed individual are immune to measles. IG prolongs the incubation period to 28 days.

^f For patients who do not receive PEP, provide these instructions: www1.nyc.gov/assets/doh/downloads/pdf/imm/stay-home-cases.pdf

* References: CDC. Prevention of Measles, Rubella, Congenital Rubella Syndrome, and Mumps, 2013. MMWR. 2013;62(4);

Rubin et. al. 2013 IDSA Clinical Practice Guideline for Vaccination of the Immunocompromised Host. CID. 2014;58.

** Check guidance/discuss with treating provider as duration of immunosuppression during or following chemotherapy, transplants, or biologic immune modulators may vary.

- <https://www.nyc.gov/assets/doh/downloads/pdf/imm/pep-measles-providers.pdf>
- <https://www.cdc.gov/surv-manual/php/table-of-contents/chapter-7-measles.html>

Great reference for FAQ regarding MMR, measles, and PEP

The screenshot shows the Immunize.org website interface. At the top left is the Immunize.org logo. A search bar is located at the top center with the text "Search Immunize.org". To the right of the search bar are icons for "IZ Express", "Shop", "Donate", and "Guide". Below these are navigation tabs: "Vaccines & VISs", "Clinical Resources", "Ask the Experts" (which is underlined), "Official Guidance", "News & Updates", and "About".

The main content area is titled "Ask the Experts: MMR (Measles, Mumps, and Rubella)". It includes a breadcrumb trail: "Home / Ask the Experts / MMR (Measles, Mumps, and Rubella)". Below the title is a "Keyword Search" section with a search box containing "Search Ask the Experts" and a "Search" button. A "Show Filters" button is also present.

On the right side of the main content area, there is a "On this page" section with "Search & Filter" and "Back to Top" options.

The search results are displayed as a list of 77 items. The first three visible results are:

- MMR (MEASLES, MUMPS, AND RUBELLA) / DISEASE ISSUES
What is the current situation with measles, mumps, and rubella in the United States?
- MMR (MEASLES, MUMPS, AND RUBELLA) / DISEASE ISSUES
How serious are measles, mumps, and rubella?
- MMR (MEASLES, MUMPS, AND RUBELLA) / DISEASE ISSUES

A "Show All Answers" button is located to the right of the results list.

On the left side of the page, there is a navigation menu with the following items:

- Ask the Experts
 - Ask the Experts Overview
 - View All Questions
 - View All Video Questions
- Vaccine Topics
 - COVID-19
 - Dengue
 - Diphtheria
 - Hepatitis A
 - Hepatitis B
 - Hib (*Haemophilus Influenzae* type b)
 - HPV (Human Papillomavirus)
 - Influenza
- MMR (Measles, Mumps, and Rubella)
 - All MMR
 - Disease Issues
 - Vaccine Recommendations

Case 2: Recognizing and Testing for Measles

Case 2:

- A 48-year-old with high blood pressure, diabetes (A1c 8.2%), and metabolic-associated steatotic liver disease calls your office due to fevers, cough, and a slight rash (photo below) which is not bothering him – but he did notice it.
- He returned from a trip to Lubbock, Texas about 3 days ago where he was visiting family for 2 weeks. He does not remember anyone else being sick there.



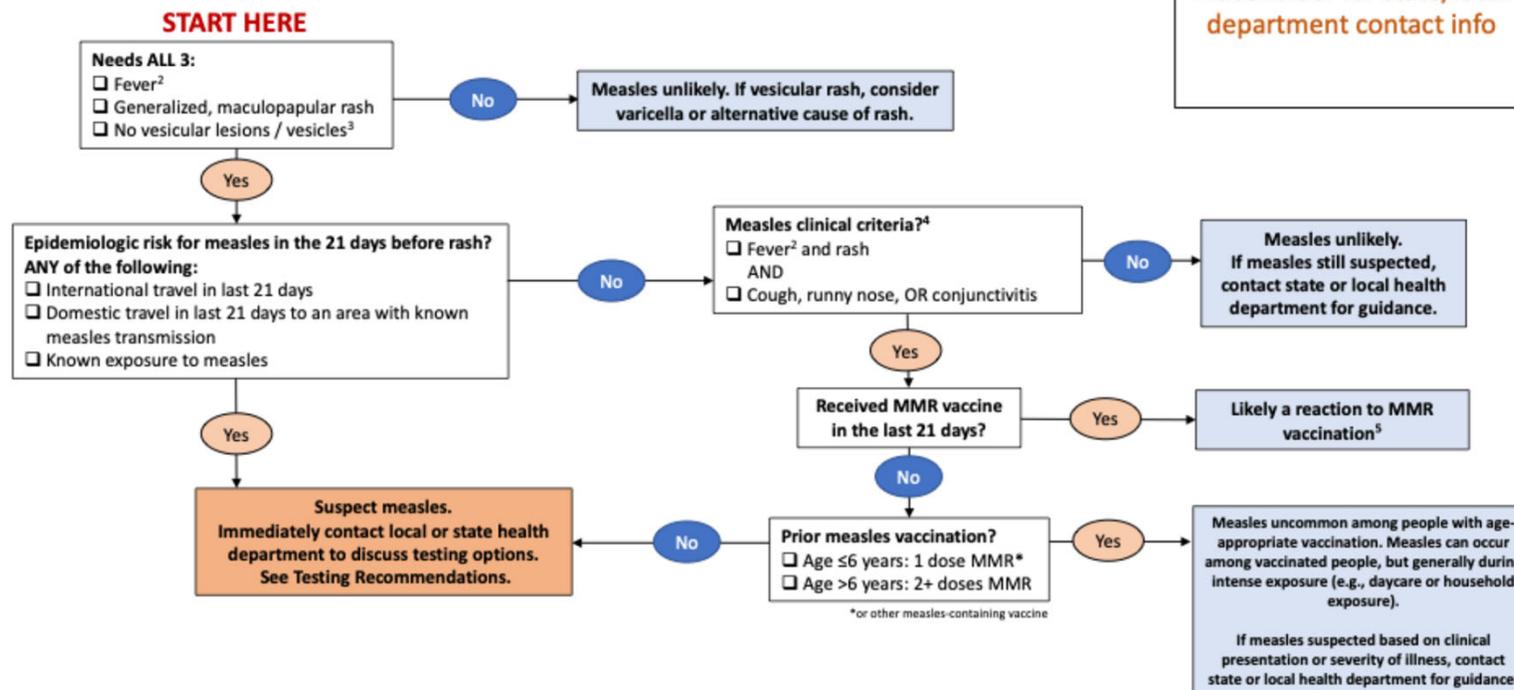
Case 2:

- What else do you need to know?
- What should you do?
 - Options:
 - Do a telehealth visit
 - Offer reassurance- likely it is a viral exanthem and will improve
 - Call for help
 - Bring him in for a visit

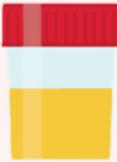
Measles evaluation algorithm

Evaluating a patient presenting with rash when there is no local measles transmission¹

Placeholder for state/local department contact info



Measles testing

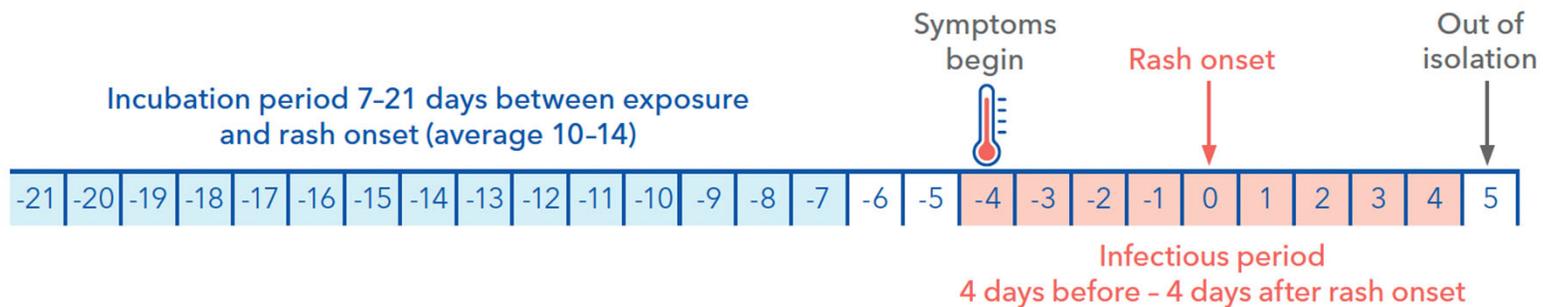
	Measles Tests	When to Collect?
Acute Disease	PCR Nasopharyngeal (NP) or Throat (OP) Swab 	As soon as possible upon suspicion of measles: ideally 0-3 days after rash onset, up to 10 days after rash onset.
	PCR Urine 	Within 10 days of rash onset <i>*Collecting a urine specimen along with an NP/OP swab may improve test sensitivity, especially if at the end of the PCR detection window.</i>
	IgM Serum 	Collect with specimen for PCR. Can be negative up to 3 days after rash onset. IgM can be detected for 6-8 weeks after acute measles.
Immunity	IgG Serum 	When assessing evidence of immunity, can be detected ~2 weeks after MMR vaccination

https://www.cdc.gov/mumps/media/pdfs/2025/02/MMRV-Testing-for-Clinicians_Jan2025.pdf

Infection control considerations

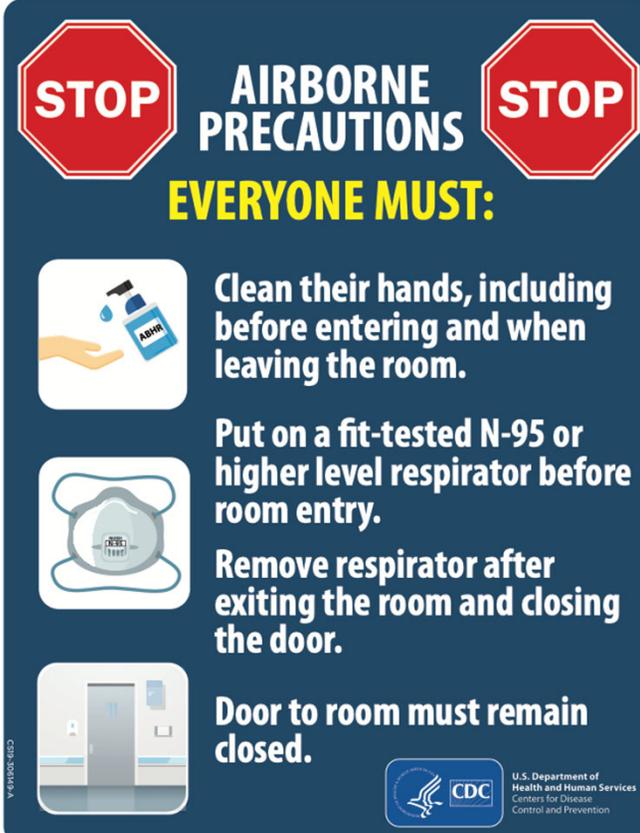
Large & Small Droplet Spread:

- Spending **any** amount of time in a room with a patient with measles is considered to be an exposure
- Measles is contagious to others for 2 hours after the room is vacated by a patient with measles



Infection prevention recommendations:

- Have patients call ahead if they are concerned about measles
- Ideally, telehealth visits (where feasible) should be performed with testing done in a negative pressure room or outdoors
- Inside a clinic, emergency department, or hospital:
 - Ensure all healthcare workers have presumptive evidence of measles immunity
 - Place an ear loop mask on the patient (if feasible)
 - The patient should be placed in an airborne isolation room (negative pressure)
 - If unavailable, a private room with the door closed, and wearing an earloop mask



STOP AIRBORNE PRECAUTIONS STOP

EVERYONE MUST:

-  Clean their hands, including before entering and when leaving the room.
-  Put on a fit-tested N-95 or higher level respirator before room entry.
-  Remove respirator after exiting the room and closing the door.
-  Door to room must remain closed.

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

Measles Safety Alert

What is measles?

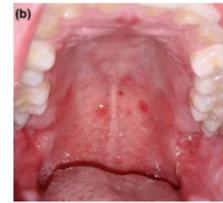
- **Symptoms:** fever, cough, conjunctivitis, coryza (severe runny nose, sneezing, and congestion), Koplik spots (small white spots over a red background inside the mouth), rash (starts 3-5 days after the other symptoms; tends to spread from the head down)
- **Complications:** diarrhea, ear infections, pneumonia, encephalitis, death
- **Immunization:** one dose of measles-containing MMR vaccine is 93% effective at preventing disease, two doses increases protection to 97%.



<https://www.cdc.gov/measles/signs-symptoms/photos.html>

Infection Prevention:

- **Contact IPAC:** 859.323.6337 (24/7) as soon as you become aware of a patient who might have measles. IPAC will help coordinate protocols, testing, and care coordination with the Kentucky Department of Public Health.
- **Have the following information ready when discussing your case with IPAC:**
 - Patient name, telephone number, address, and email address
 - MMR vaccination history (if available)
 - Rash onset date
- **Timing:** Patients with measles are most contagious from 4 days before to 4 days after appearance of the rash
- **Patient arrival:**
 - If possible, have the patient enter through a different entrance than the regular patient entrance
 - Have the patient wear a mask as soon as they enter the building
 - Room the patient immediately – do not have the patient wait in a waiting room or at triage.
- **Precautions:**
 - All patients with suspected or confirmed measles should be in airborne precautions
 - Healthcare workers caring for patients should have [presumptive evidence of immunity](#) to measles.
 - Any room occupied by the patient should be closed for at least 2 hours; contact IPAC for guidance about room re-opening.
 - Collect the names of all people who were in the same room as an unmasked patient
- **Immunize:** Patients born before 1957 or who have had two doses of the MMR vaccine are [considered immune](#).
- **Post-exposure prophylaxis (PEP):** A non-immune patient who was exposed to measles may require PEP with either MMR vaccine or immune globulin. Please consult KDPH ((888) 9-REPORT) or Infectious Diseases on call through UKMDs (859-257-5522).



Marc C. Patterson, Neurological Complications of Measles (Rubella), Current Neurology and Neuroscience Reports, 10.1007/s11910-020-1023-y, 20, (2020).

Testing:

- Order Rubella (Measles) serum antibody testing - both IgM and IgG.
- Perform either a throat swab or a nasopharyngeal swab, place it in viral transport media (VTM)
- Order Miscellaneous Test (Put "Measles (Rubella) Virus, Qualitative Real-time PCR, Nasopharyngeal/Throat" in the comments section)

More Information: [Measles quicksheet](#) – Kentucky Department for Public Health

https://www.chfs.ky.gov/agencies/dph/dehp/idb/Documents/MeaslesQuicksheet_March_2024.pdf

HOW TO CARE FOR YOURSELF AFTER MEASLES TESTING

CCO1002

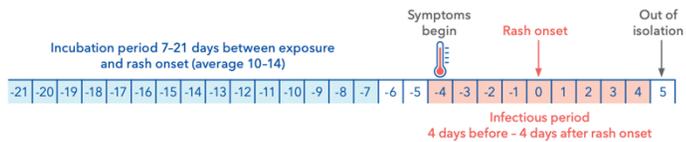
What is measles?

Measles is a very contagious respiratory infection. It often causes:

- Fever
- Rash
- Cough, runny nose, and/or red or irritated eyes

You can spread measles from 4 days before the rash starts to 4 days after it starts.

If you are exposed to measles but are not immune, symptoms often start about 6 to 21 days later (most often at around 2 weeks).



How does measles spread?

Measles spreads through the air when an infected person coughs or sneezes (respiratory droplets). It also spreads by touching fluids from an infected person's nose or mouth.

- The virus can stay in the air and on surfaces up to 2 hours.
- If you are not immune, you can get infected just by being in the same room as someone with measles.

What should I do while waiting for test results?

Since measles is very contagious, take the following precautions until you receive your test results:

- **Stay home:** Avoid public places, such as work, school, and crowds.
- **Limit contact:** Avoid close contact with others, especially infants, pregnant people, and those with weakened immune systems.
- **Practice good hygiene:** Wash your hands often and cover your mouth when coughing or sneezing.
- **Monitor your symptoms:** Seek medical help if you have trouble breathing or other serious symptoms.

What if I need medical help?

Most people recover from measles. But there are times when you should seek medical help right away.

Seek help if you have any of these:

- Trouble breathing
- Trouble with eating or drinking
- Fever that does not get better
- Confusion
- Extreme drowsiness or difficulty waking up

Call 911 for emergencies. Tell them you (or the person you are calling for) just had a measles test. This lets the emergency team take steps to stay safe.

Call your primary care provider if this is not an emergency. Call your provider's office and let them know you just had a measles test. They may be able to set up a telehealth visit to help guide you about the next best steps.

How Long Will It Take to Get My Test Results?

- It typically takes 1-2 business days. Measles testing is done at the Kentucky state lab (Monday through Friday).
- Until they are ready, follow the steps under "What should I do while waiting for test results?"

Where can I get more information on measles?

Visit the CDC's website: [cdc.gov/measles](https://www.cdc.gov/measles)

For local questions or concerns, contact:

- Lexington Fayette County Health Department: 859-252-2371
- If you are a University of Kentucky patient, please call the clinic site where you are seen (<https://ukhealthcare.uky.edu/hospitals-clinics>) or 859-257-1000 for assistance

Case 3: Measles exposure management

Case 3:

- The Lexington Fayette County Health Department calls about management for 4 close contacts of a known measles case, all exposed 2 days ago.
 1. Patient 1: 5-month-old (unvaccinated – not yet eligible)
 2. Patient 2: 21-year-old with confirmed receipt of 2-doses of MMR vaccine in Kentucky
 3. Patient 3: 34-year-old healthcare worker with confirmed receipt of 1-dose of MMR vaccine, no serologies done
 4. Patient 4: 37-year-old pregnant patient who cannot remember or find their measles vaccine history

Patient 1:

Patient 1: 5-month-old (unvaccinated – not eligible)

1. What form of PEP (if any) should they receive?
2. How long does the patient need to be isolated and monitored?
3. When should they be vaccinated?

Post-exposure prophylaxis (PEP) for measles exposures who are NOT pregnant or immunocompromised*

Age range	Measles immune status ^a	PEP type depending on time after initial exposure		
		≤3 days (≤72 hours)	4-6 days	>6 days
All ages	Immune (<i>IgG positive, 2 MMR doses, or born before 1957^b</i>)	<ul style="list-style-type: none"> • PEP not indicated. Exposed person has documented immunity 		
<6 months	Non-immune (<i>due to age</i>)	<ul style="list-style-type: none"> • Give intramuscular immunoglobulin (IMIG)^{cd} • Home quarantine^e for 28 days after last exposure 		<ul style="list-style-type: none"> • PEP not indicated (too late)^f • Home quarantine^e for 21 days after last exposure
6-11 months	Non-immune (<i>due to age</i>)	<ul style="list-style-type: none"> • Give MMR vaccine (<i>preferred over IG</i>) • No quarantine needed if MMR PEP given 	<ul style="list-style-type: none"> • Give intramuscular immunoglobulin (IMIG)^{cd} • Home quarantine^e for 28 days after last exposure 	<ul style="list-style-type: none"> • PEP not indicated (too late)^f • Home quarantine^e for 21 days last after exposure

Patient 2:

- Patient 2: 21-year-old with confirmed receipt of 2-doses of MMR vaccine in Kentucky
1. What form of PEP (if any) should they receive?
 2. How long does the patient need to be monitored for symptoms?
 3. Do they need to isolate from work or school?
 4. When should they be vaccinated?

Post-exposure prophylaxis (PEP) for measles exposures who are NOT pregnant or immunocompromised*

Age range	Measles immune status ^a	PEP type depending on time after initial exposure		
		≤3 days (≤72 hours)	4-6 days	>6 days
All ages	Immune (IgG positive, 2 MMR doses, or born before 1957 ^b)	<ul style="list-style-type: none"> • PEP not indicated. Exposed person has documented immunity 		
<6 months	Non-immune (due to age)	<ul style="list-style-type: none"> • Give intramuscular immunoglobulin (IMIG)^{cd} • Home quarantine^e for 28 days after last exposure 		<ul style="list-style-type: none"> • PEP not indicated (too late)^f • Home quarantine^e for 21 days after last exposure
6-11 months	Non-immune (due to age)	<ul style="list-style-type: none"> • Give MMR vaccine (preferred over IG) • No quarantine needed if MMR PEP given 	<ul style="list-style-type: none"> • Give intramuscular immunoglobulin (IMIG)^{cd} • Home quarantine^e for 28 days after last exposure 	<ul style="list-style-type: none"> • PEP not indicated (too late)^f • Home quarantine^e for 21 days last after exposure

Patient 3:

- Patient 3: 34-year-old healthcare worker with confirmed receipt of 1-dose of MMR vaccine, no serologies done
 1. What form of PEP (if any) should they receive?
 2. How long does the patient need to be monitored for symptoms?
 3. Can they go back to work?
 4. When should they be vaccinated?

Patient 3:

HCW Immunity Status	Post-Exposure Prophylaxis (PEP)	Work Exclusion	Symptom Monitoring	Vaccination Recommendations
Presumptive Evidence of Immunity	Not required	Not required	Daily monitoring from day 5 after first exposure through day 21 after last exposure	None needed
No Evidence of Immunity	Administer PEP per CDC/ACIP guidelines	Exclude from work from day 5 after first exposure through day 21 after last exposure, regardless of PEP receipt	Daily monitoring during exclusion period	Administer MMR 2 doses- if received IMIG or IVIG, wait 6 to 8 months (respectively) before vaccination
Received 1 Dose of MMR Vaccine Prior to Exposure	Not applicable	Not required	Daily monitoring from day 5 after first exposure through day 21 after last exposure	Administer second MMR dose ≥ 28 days after first dose
Develops Measles Symptoms	Not applicable	Exclude from work until 4 days after rash onset	Not applicable	Not applicable
Immunocompromised with Measles	Not applicable	Exclude from work for duration of illness	Not applicable	Not applicable

Patient 4:

- Patient 4: 37-year-old pregnant patient who cannot remember or find their measles vaccine history
1. What form of PEP (if any) should they receive?
 2. How long does the patient need to be monitored for symptoms?
 3. When can they be vaccinated?

Post-exposure prophylaxis (PEP) for measles exposures who ARE pregnant or immunocompromised

Category	Age range	Measles immune status ^a	PEP type depending on time after initial exposure		
			≤3 days (≤72 hours)	4-6 days	>6 days
Severely Immuno-compromised ^b	<12 months	Will need IG regardless of measles immune status	<ul style="list-style-type: none"> • Give intramuscular immunoglobulin (IMIG)^{cd} • Home quarantine^e for 28 days after last exposure 	<ul style="list-style-type: none"> • PEP not indicated (too late)^f • Home quarantine^e for 21 days after last exposure 	
	≥12 months				
Pregnant	n/a	Immune (IgG positive or 2 MMR doses)	<ul style="list-style-type: none"> • PEP not indicated Exposed person has documented immunity. 		
		Non-immune (IgG negative)	<ul style="list-style-type: none"> • Give intravenous immunoglobulin (IVIG)^{cd} • Home quarantine^e for 28 days after last exposure 	<ul style="list-style-type: none"> • PEP not indicated (too late)^f • Home quarantine^e for 21 days after last exposure 	
		Unknown immunity	<ul style="list-style-type: none"> • Draw titers (measles IgG) STAT to determine immunity; proceed as above based on titer results 	<ul style="list-style-type: none"> • PEP not indicated (too late)^f • Consider titers to determine risk of infection/risk to infant; proceed as above based on titer result 	



UKHC Measles PEP Protocol

Post-exposure Prophylaxis (PEP) for Non-Symptomatic Susceptible Contacts²

Immune globulin (IG) for PEP

The following patients are at high risk for severe illness and complications from measles and should be prioritized to receive immune globulin (IG):

- Infants <12 months old
- Susceptible pregnant people
- Severely immunocompromised people

Immune globulin dosing: Immune globulin should be administered <6 days since the last exposure to measles. See [KDPH protocol](#) for more details.

Risk Factor	<72 hours since last exposure	72 hours to 6 days
Infant <6 months old	IGIM (Gamastan) 0.5 mL/kg (max 15 mL)	
Infant 6 to 11 months old	IGIM (Gamastan) 0.5 mL/kg (Max 15 mL) or MMR vaccine	IGIM (Gamastan) 0.5 mL/kg (Max 15 mL)
Susceptible close contact over 1 year old	Give MMR vaccine if no contraindications	Contact KDPH
Pregnant person without evidence of immunity ⁴	IVIG 400 mg/kg (Gammagard)	
Severely immunocompromised ⁵	IVIG 400 mg/kg (Gammagard)	

Notes:

1. People exposed to measles who receive IG should receive MMR vaccine no earlier than 6 months after IGIM or 8 months after IVIG.
2. If IG is administered within 2 weeks following administration of MMR or varicella vaccine, they should be revaccinated.

3. Do not inject more than 3 mL of IGIM per injection site. Multiple injections are required for patients >6 kg. Patients >30 kg are unlikely to receive an effective dose. IVIG can be used if the patient qualifies.
5. Severely immunocompromised includes:
 - a. Severe primary immunodeficiency
 - b. Bone marrow or stem cell transplant recipients who are receiving immunosuppressive treatment, or completed treatment within the past 12 months (or longer if developed graft-versus-host disease)
 - c. Persons receiving treatment for Acute Lymphocytic Leukemia (ALL) or who completed chemotherapy for ALL within previous 6 months
 - d. Persons living with AIDS and HIV-infected persons with CD4 T-lymphocyte less than 15% or less than 200 lymphocytes/mm³
 - e. Persons who have not received MMR since starting to take anti-retroviral therapy
 - f. HIV infected persons without recent confirmation of immunologic status or measles immunity
 - g. Persons receiving daily corticosteroid therapy with a dose ≥20 mg (or >2 mg/kg/day for patients <10kg) of prednisone or equivalent for ≥14 days
 - h. Persons receiving immunomodulator medications (e.g. tumor necrosis factor alpha blockers)

Contraindications:

1. IG should not be given to people with immunoglobulin A (IgA) deficiency. Persons with IgA deficiencies have the potential for developing antibodies to IgA and therefore could experience an anaphylactic reaction when IG is administered.
2. IGIM should not be administered to persons with severe thrombocytopenia or any coagulating disorder that would contraindicate intramuscular injections.
3. History of anaphylactic reaction to a previous dose of IG.

Precautions:

1. Pregnancy: It is unknown whether IG can cause fetal harm when administered to a pregnant person or if it could affect reproduction.
2. Careful administration in persons reporting a history of systemic allergic reaction following the administration of IG.

Questions?