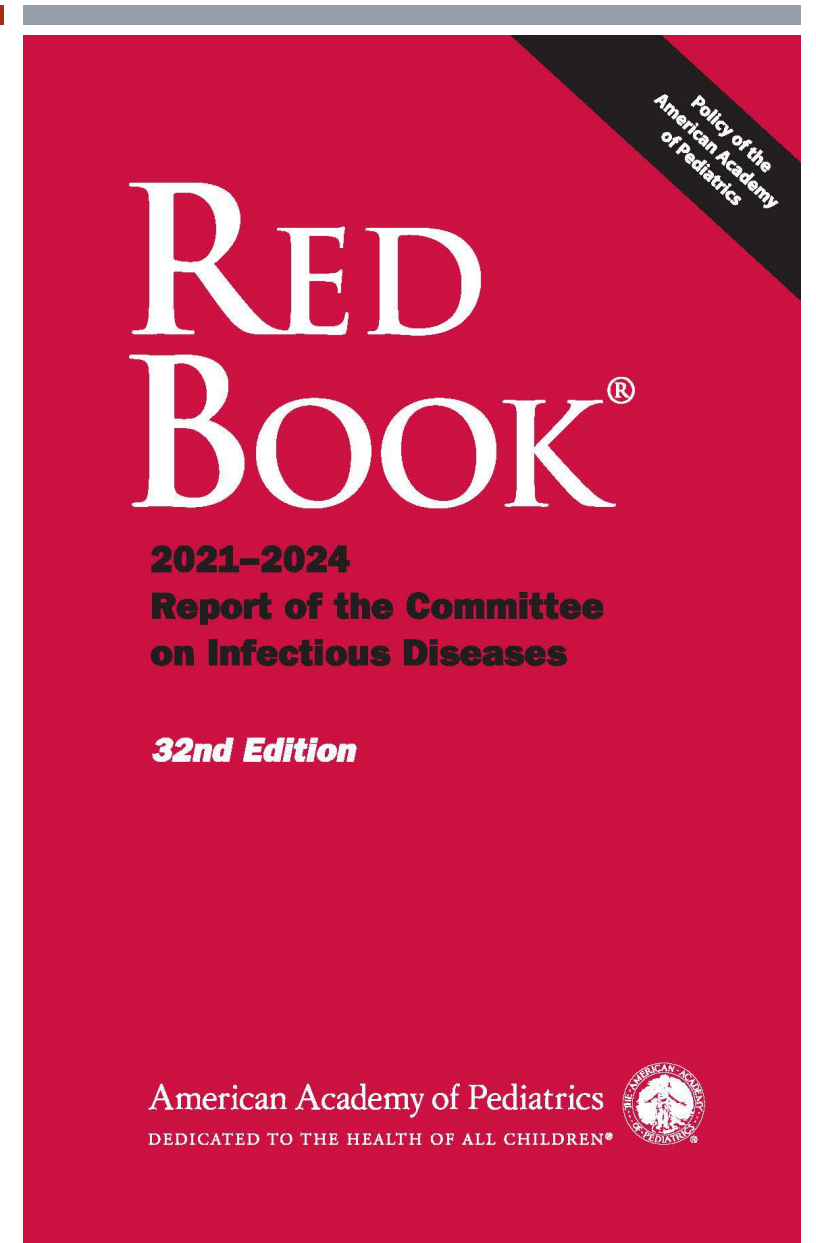


# DIAGNOSING MEASLES

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*Disclosure: no relevant financial relationships to disclose*

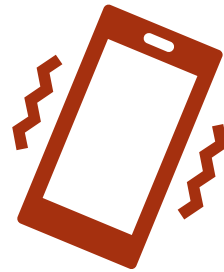


# OBJECTIVES OF PRESENTATION

By the end of the presentation, learners will be able to:



Describe infection prevention and control measures for a patient suspected of having measles



Understand the importance of immediately notifying public health



Explain the specimens to collect in a patient suspected of having measles



# PRE-VISIT CONTROL MEASURES

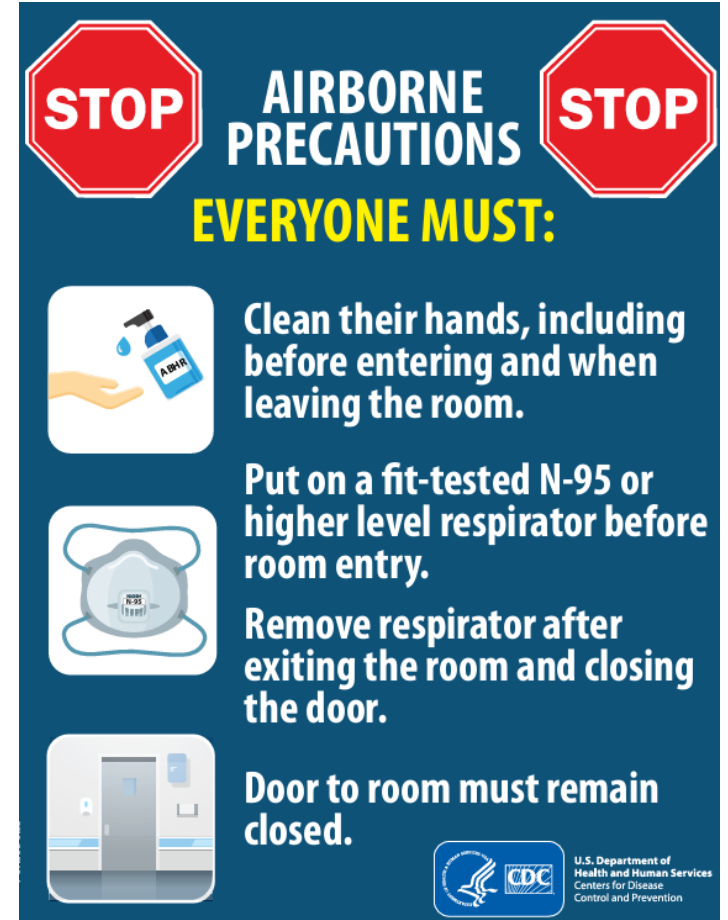
- Pre-visit telephone triage should only be completed by a clinically trained person
- Instruct to arrive at a side or back entrance instead of the main entrance
- Explain no other children should accompany a child with suspected measles
- Instruct that patients under 2 years of age or unable to wear a mask should be tented with a blanket or towel when entering the facility





Credit: CDC Public Health Image Library


# ON-SITE CONTROL MEASURES

- Provide face masks to patients 2 years of age and older and caregivers
- Immediately isolate the patient and caregiver to a private room with the door closed. Ideally, move them to an airborne infection isolation or negative pressure room if available.
- Only health care providers with 2 documented doses of MMR vaccine should provide care
- Standard and airborne precautions should be followed, including use of N95 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

# PUBLIC HEALTH NOTIFICATION

- To ensure rapid investigation and testing with contact tracing, **notification should occur immediately** upon suspicion of measles
  - Outpatient settings should immediately notify local or state health departments
  - Acute care facilities should immediately notify the hospital epidemiologist or infection prevention department
- Public health departments will be able to provide guidance on specimen collection and submission and will work with you to identify who may have been exposed
- Comprehensive serologic and virologic testing generally is not available locally and requires submitting specimens to state public health laboratories or the Centers for Disease Control and Prevention (CDC)



# DIAGNOSTIC TESTS

Measles virus infection can be confirmed by:

- Detection of measles viral RNA by reverse transcriptase-polymerase chain reaction (RT-PCR)
- Detection of measles virus-specific immunoglobulin
- Fourfold increase in measles IgG antibody concentration in paired acute and convalescent serum specimens (collected at least 10 days apart)
- Isolation of measles virus in cell culture



# SPECIMEN COLLECTION

## Nasopharyngeal or oropharyngeal swab

- Use commercial swab products and place in 2 mL of standard viral transport medium
- Ream the swab around the rim of the tube to retain cells and fluid in the tube
- Swab should be broken off and left in the tube

## Urine

- 50 mL in a sterile cup
- Store refrigerated at 2-8°C immediately after collection
- Should not be frozen

## Serum sample

- Blood should be collected by aseptic venipuncture
- Do not add anticoagulants or preservatives
- Collect blood in a red-top or serum-separator tube

# DETECTION OF VIRAL RNA BY RT-PCR

- Provides a rapid and sensitive method for case confirmation
- Many state public health laboratories and the Measles Laboratory at the CDC can perform RT-PCR assays to detect measles RNA
- It is important to collect samples as soon as possible after rash onset, because viral shedding declines with time after rash
- Specimen timing and quality greatly influence the results of RT-PCR testing, so a negative result should not be the only criterion used to rule out a case of measles
- These samples can also be used to genotype the virus, which is important to determine patterns of importation and transmission





# DETECTION OF VIRUS-SPECIFIC IgM

- The sensitivity of measles IgM assays varies by timing of specimen collection, immunization status of the patient, and the assay method
- Up to 20% of assays for IgM may have a false-negative result in the first 72 hours after rash onset
  - If the measles IgM result is negative and the patient has a generalized rash lasting more than 72 hours the measles IgM test should be repeated
- Measles IgM is detectable for at least 1 month after rash onset in unimmunized people but might be absent or transient in people immunized with 1 or 2 MMR doses.
  - Negative IgM test result should not be used to rule out the diagnosis in immunized people



# AAP RESOURCES

- Red Book Measles Chapter:  
<https://publications.aap.org/redbook>
- Immunization Tools & Resources:  
<https://www.aap.org/immunization>
- Project Firstline Infection Prevention & Control: <https://www.aap.org/projectfirstline>
- Healthy Children (for parents):  
<https://www.healthychildren.org/measles>



Credit: Heather Hazzan, *SELF Magazine*

# CONCLUSION



**Promptly isolate the patient**



**Report immediately upon suspicion of measles**



**Collect samples as soon as possible after rash onset**

