

A 2-year-old girl is brought to the office for a rash. She was in good health until 3 days ago when she developed fever, cough, rhinorrhea, and "pink eyes." Yesterday, the patient developed a rash on her face that has now spread over her entire body. The girl lives with her parents and several pets, including a dog, turtle, and new kitten. Approximately 6 weeks ago, the family returned from a trip to the Philippines to visit her grandparents. She takes no medications and has no allergies. Temperature is 39.6 C (103.3 F) and other vital signs are normal. Examination shows a blanching, erythematous maculopapular rash covering her face and entire body except for the palms and soles. Which of the following will most likely prevent the spread of this patient's infection to other patients in the office?

- ☐ A. Airborne precautions
- ☐ B. Antibiotic prophylaxis
- ☐ C. Contact precautions
- ☐ D. Droplet precautions
- ☐ E. Hand hygiene
- ☐ F. Passive immunization

**Submit**



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- ☒ A. Airborne precautions [21%]
- ☐ B. Antibiotic prophylaxis [2%]
- ☐ C. Contact precautions [11%]
- ☐ D. Droplet precautions [35%]
- ☐ E. Hand hygiene [17%]
- ☐ F. Passive immunization [14%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

Measles virus (rubeola)	
Transmission	<ul style="list-style-type: none"><li>Airborne</li></ul>
Clinical presentation	<ul style="list-style-type: none"><li>Prodrome (eg, cough, coryza, conjunctivitis, fever, Koplik spots)</li><li>Maculopapular exanthem<ul style="list-style-type: none"><li>Cephalocaudal &amp; centrifugal spread</li><li>Spares palms/soles</li></ul></li></ul>
Prevention	<ul style="list-style-type: none"><li>Live attenuated measles vaccine</li></ul>
	<ul style="list-style-type: none"><li>Supportive</li></ul>



Explanation:

User Id: [REDACTED]

Measles virus (rubeola)	
Transmission	<ul style="list-style-type: none"><li>• Airborne</li></ul>
Clinical presentation	<ul style="list-style-type: none"><li>• Prodrome (eg, cough, coryza, conjunctivitis, fever, Koplik spots)</li><li>• Maculopapular exanthem<ul style="list-style-type: none"><li>◦ Cephalocaudal &amp; centrifugal spread</li><li>◦ Spares palms/soles</li></ul></li></ul>
Prevention	<ul style="list-style-type: none"><li>• Live attenuated measles vaccine</li></ul>
Treatment	<ul style="list-style-type: none"><li>• Supportive</li><li>• Vitamin A for hospitalized patients</li></ul>

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This patient has the classic **cough, coryza, and conjunctivitis** prodrome with subsequent **exanthem of measles** (rubeola). Measles is a highly contagious virus that can cause outbreaks in unvaccinated persons. Symptoms manifest 1-3 weeks after inhalation of **infectious respiratory particles**, which are capable of remaining airborne for hours in a closed space (eg, airplane, clinic waiting room). Patients are most contagious during the prodrome but can spread disease for several days even after the resolution of the rash. Patients with known or suspected measles should be isolated and placed on **airborne precautions** (negative pressure room, **N95 facemask** for health care personnel).

The best way to prevent measles infection is by 2 doses of the live attenuated measles vaccine, which generates immunity in >95% of vaccinated persons. Measles occurs worldwide, particularly in areas with low vaccine rates. Because this patient returned from international travel 6 weeks ago and the incubation period is 1-3 weeks, she likely acquired measles domestically as it is becoming increasingly common due to hesitancy and refusal regarding vaccination.

**(Choice B)** Antibiotic prophylaxis can decrease transmission of *Neisseria meningitidis* or *Bordetella pertussis* but has no effect on measles transmission.

**(Choice C)** Contact precautions (ie, gown, gloves) can prevent transmission of organisms that spread by contact (eg, methicillin-resistant *Staphylococcus aureus*,



contagious during the prodrome but can spread disease for several days even after the resolution of the rash. Patients with known or suspected measles should be isolated and placed on **airborne precautions** (negative pressure room, **N95 facemask** for health care personnel).

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**(Choice B)** Antibiotic prophylaxis can decrease transmission of *Neisseria meningitidis* or *Bordetella pertussis* but has no effect on measles transmission.

**(Choice C)** Contact precautions (ie, gown, gloves) can prevent transmission of organisms that spread by contact (eg, methicillin-resistant *Staphylococcus aureus*, rotavirus) but do not prevent airborne transmission.

**(Choice D)** Droplet precautions (ie, surgical mask) can prevent transmission of organisms that spread via droplets (eg, influenza, respiratory syncytial virus), which are relatively large and have a short range. However, surgical masks do not block small airborne particles (eg, measles, varicella, tuberculosis).

**(Choice E)** Hand hygiene is an extremely effective method of preventing the spread of organisms by fecal-oral route (eg, enterovirus, *Clostridium difficile*), droplets, and secretions. However, hand hygiene cannot prevent the spread of airborne illnesses.

**(Choice F)** Passive immunization is achieved by administering high concentrations of specific antibody against a pathogen. It is an effective postexposure prophylaxis for varicella and rabies but not available for measles.

#### Educational objective:

Measles is characterized by a prodrome of cough, coryza, and conjunctivitis followed by a maculopapular rash that spreads in a cephalocaudal pattern. This highly contagious infection is transmitted by the airborne route.

#### References:

1. **Patterns of measles transmission among airplane travelers.**
2. **Measles.**



Media Exhibit

spirator safety mask

