

A 3-day-old-girl is in the neonatal intensive care unit due to low birth weight. She was born at 36 weeks gestation to a 25-year-old mother by induced vaginal delivery due to severe intrauterine growth restriction. The mother is from India and initiated prenatal care during the second trimester after immigrating to the United States. She did not take prenatal vitamins due to nausea. Prenatal laboratory studies obtained at 20 weeks gestation showed a nonreactive rapid plasma reagin, negative hepatitis B surface antigen and HIV antibody testing, and positive rubella and varicella IgG. The newborn's weight, length, and head circumference are below the 3rd percentile. Both lenses are cloudy, and a continuous "machine-like" murmur is best heard over the left upper sternal border. Which of the following maternal interventions could have prevented this neonate's condition?

- ☐ A. Avoidance of kitty litter
- ☐ B. Cesarean delivery
- ☐ C. Folate supplementation
- ☐ D. Intrapartum antibiotic prophylaxis
- ☐ E. Prenatal antiviral therapy
- ☐ F. Vaccination prior to conception



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- ☐ A. Avoidance of kitty litter [4%]
- ☐ B. Cesarean delivery [1%]
- ☐ C. Folate supplementation [1%]
- ☐ D. Intrapartum antibiotic prophylaxis [3%]
- ☐ E. Prenatal antiviral therapy [6%]
- ☒ F. **Vaccination prior to conception** [86%]

Proceed to Next Item

Explanation:

User Id: [REDACTED]

Congenital rubella syndrome	
Clinical triad	<ul style="list-style-type: none"><li>• Cataracts or glaucoma</li><li>• Sensorineural hearing loss</li><li>• Congenital heart disease (eg, patent ductus arteriosus)</li></ul>
Diagnosis	<ul style="list-style-type: none"><li>• Rubella IgM</li><li>• Polymerase chain reaction testing</li></ul>
Prevention	<ul style="list-style-type: none"><li>• Maternal immunization with live attenuated rubella vaccine prior to conception</li></ul>

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This small-for-gestational-age infant's presentation of **cataracts** (cloudy lens) and **patent ductus arteriosus** (continuous, "machine-like" murmur) is concerning for **congenital rubella syndrome (CRS)**. **Sensorineural hearing loss** is also a classic neonatal sequelae. Prenatal maternal infection may be asymptomatic or present with a self-limited illness of a prodrome (eg, fever, cough, conjunctivitis) followed by a diffuse maculopapular rash. Rubella can be transmitted through the placenta and into fetal circulation; the risk of developing significant fetal defects is highest during the **first trimester**.

Routine first-trimester prenatal screening includes testing for maternal IgG to rubella. However, positive rubella serology obtained later in pregnancy cannot differentiate between infection in early pregnancy and immunization as IgG will appear a few weeks after infection. Due to universal vaccination, rubella is uncommon in the United States. Rubella and cases of CRS are more common in families from countries that lack widespread vaccination.

The best way to prevent CRS is by herd immunity through **live attenuated rubella vaccination**. Immunization should occur prior to conception; rubella immunization is contraindicated during pregnancy due to a theoretical risk for the live vaccine to cause fetal infection.

**(Choice A)** Avoiding cat litter can prevent congenital toxoplasmosis, which commonly presents with macrocephaly, chorioretinitis, and diffuse intracranial calcifications, none of which are present in this infant.

**(Choices B and E)** Cesarean delivery is indicated for maternal HIV infection with high viral load or active genital herpes lesions. Prenatal antiviral therapy decreases vertical transmission of HIV and can reduce the risk of active herpes lesions at the time of delivery. CRS is acquired well before delivery, unaffected by mode of delivery, and not preventable by antiviral therapy.

**(Choice C)** Folic acid supplementation prior to conception and during the first trimester is important for preventing neural tube defects such as spina bifida and anencephaly.

**(Choice D)** Neonatal group B streptococcal disease can cause sepsis, pneumonia, and meningitis. Transmission can be reduced by intrapartum antibiotic prophylaxis. However, this perinatal infection does not cause cataracts or congenital heart disease.

#### Educational objective:

First-trimester maternal-fetal transmission of rubella is teratogenic. Congenital rubella syndrome presents with cataracts, patent ductus arteriosus, and sensorineural hearing loss, and is best prevented by vaccination prior to conception.



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#### References:

1. [Rubella and pregnancy: diagnosis, management and outcomes.](#)
2. [Three cases of congenital rubella syndrome in the postelimination era--Maryland, Alabama, and Illinois, 2012.](#)