

## ID Snapshot

# What's the Dx? Intercostal retractions, wheezing in child with congenital heart disease

by **H. Cody Meissner, M.D., FAAP**

A 9-month-old female is seen in the emergency department in February following four days of poor feeding and increased work of breathing. Physical examination reveals a temperature of 37.9 degrees Celsius (100.2 degrees Fahrenheit), pulse 167 beats per minute, respiratory rate 48 breaths per minute, marked intercostal retractions and wheezing in both lungs. Oxygen saturation is 68% while breathing 100% oxygen by mask.

The patient has a history of ventricular septal defect for which she receives daily diuretic therapy. Two influenza immunizations were administered in the past three months. A third monthly dose of palivizumab was administered two weeks prior to her current illness. A chest radiograph obtained soon after intubation is shown at right.

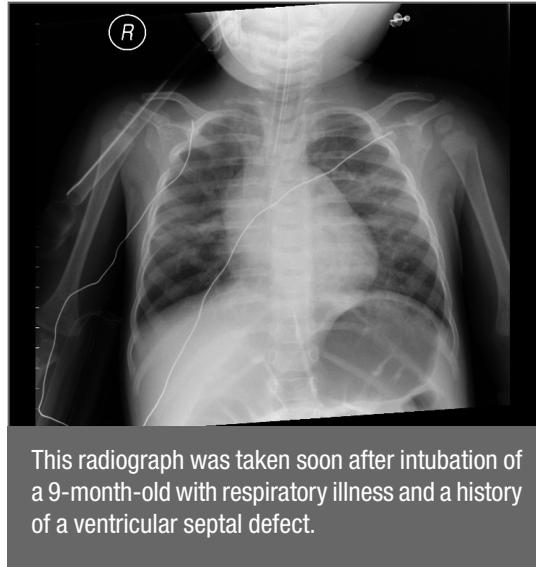
The most likely cause of this child's respiratory illness is:

- Chlamydia trachomatis*
- respiratory syncytial virus (RSV)
- influenza virus
- rhinovirus
- Staphylococcus aureus*

Answer: b. RSV was isolated from nasal washing in a shell vial assay.

Congenital heart disease occurs in four to eight children per 1,000 live births. Children with congenital heart disease who are most vulnerable to severe RSV infection include those younger than 2 years of age with surgically uncorrected lesions. This includes children with large left-to-right shunts, children with pulmonary hypertension that is greater than one-half the systemic pressure, infants with cyanotic heart disease and those with complex heart disease such as single ventricle anatomy.

A placebo-controlled trial demonstrated that palivizumab prophylaxis reduced the rate of RSV hospitalization by 45% among children with



hemodynamically significant heart disease. Relative to the placebo arm, the reduction in RSV hospitalization was 29% for children with cyanotic disease and 58% for children with acyanotic heart disease. No placebo-controlled trial of any high-risk group of patients with palivizumab prophylaxis has demonstrated a statistically significant reduction in mortality rate.

AAP recommendations note that children with hemodynamically significant congenital heart disease most likely to benefit from immunoprophylaxis include infants younger than 24 months of age who are receiving medication to control congestive heart failure, infants with moderate to severe pulmonary hypertension and infants with cyanotic heart disease.

Influenza virus was a possible cause of infection in this case, although the risk was

reduced because of influenza vaccine administration. All people 6 months of age and older should receive annual influenza immunization, especially those at increased risk of complications such as children with congenital heart disease.

Lower respiratory tract infection due to rhinovirus may cause symptoms similar to those caused by RSV, but rhinovirus infection is less likely to cause these symptoms in children younger than 1 year of age.

The clinical presentation and chest radiograph are not typical of infection due to *Staphylococcus aureus*. *C. trachomatis* may cause a subacute, afebrile pneumonia, but onset usually is before 4 months of age.



*Dr. Meissner is professor of pediatrics at Floating Hospital for Children, Tufts Medical Center. He also is an ex-officio member of the AAP Committee on Infectious Diseases and associate editor of the AAP Visual Red Book.*