



Central California Pediatrics

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Specialty information for physicians who treat children and expectant mothers.



What is Bronchopulmonary Dysplasia?

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Bronchopulmonary dysplasia (BPD), also known as chronic lung disease of infancy, is a multifactorial lung development disorder that most commonly affects newborns born prematurely with a low birth weight, who have received oxygen or mechanical ventilation. It is a result of arrested lung development in addition to inflammation and remodeling that occurs while a neonate is receiving mechanical ventilation and oxygen. Diagnosis is based on an assessment at 36 weeks gestation, depending on the amount of respiratory support needed and oxygen supplementation for 28 days. Those who are most severely affected are those needing supplemental oxygen and mechanical ventilation early in their neonatal course.

Fetal lungs go through the following developmental stages: embryonic, pseudoglandular, canalicular, saccular, alveolar. Therefore, babies born at 24 weeks gestation have growth arrest in the saccular stage, characterized by larger-sized alveoli, with thick alveolar septum and decreased number of alveoli. This, in addition to reduction in surfactant production and the number of capillaries overall, leads to a decrease in the surface area for gas exchange.

What are the long-term effects of BPD?

Long-term respiratory outcomes of BPD become more apparent over time, including the need for home oxygen therapy and chronic inhaled medications and/or diuretics. Airway disease is a common comorbidity, therefore some may undergo airway evaluation through bronchoscopies to assess degree of impairment. Other modalities used for

assessment include the use of polysomnography and pulmonary function testing to assess the degree of impairment. Identifying patients with the highest morbidity and mortality is important in order to optimize their long-term outcomes.

The importance of collaborative care

Lung growth continues for several years after birth, during which it is imperative to support BPD infants and monitor them closely. *BPD Collaborative* published guidelines for the care of BPD infants, encouraging an interdisciplinary approach involving multiple subspecialty expertise early in the disease course. Given that infants with BPD are at risk of impaired gas exchange, failure to thrive, aspiration, pulmonary hypertension and altered pulmonary function, special consideration in routine clinical assessments should include:

- Pulmonary assessment for signs of increased workload and airway obstruction (retractions, low oxygen saturation, tachypnea, wheezing)
- Signs of pulmonary edema (tachypnea, crackles)
- Cardiac assessment for persistent pulmonary hypertension
- Poor weight gain despite optimized intake
- Neurodevelopmental assessment
- Feeding skills and aspiration assessment

Any concerns with respect to the above assessments warrant subspecialty referral and further evaluation.

Preparing for Respiratory Syncytial Virus (RSV)

The Centers for Disease Control and Prevention has warned clinicians across the country of a spike in RSV cases, especially in the Southern United States. While Valley Children's is not currently experiencing this spike, we do anticipate that an increase of RSV cases and respiratory illnesses are on the horizon. Since June 2021, Valley Children's has had 51 total cases of RSV, 18 of which were in the last week of August alone. Compared to last season between the months of November and March, Valley Children's had two cases of RSV in 2020-21 (which was significantly reduced due to the masking mandate and State lockdown), and 528 in 2019-20 (a more typical year with school in session and masks not in use).

RSV in children can lead to bronchiolitis or pneumonia, and babies 6 months and younger may require hospitalization if they are experiencing difficulty breathing or are dehydrated. Remain watchful for RSV symptoms, which include runny nose, decreased appetite, coughing, sneezing, fever, wheezing and trouble breathing. Small infants may have non-specific symptoms such as irritability or decreased activity. The symptoms of RSV may closely resemble the symptoms for COVID-19, so even if a COVID-19 test is negative, we recommend that children stay home if they have any symptoms of respiratory viral infection. To reduce the chance of illness of COVID-19 and all respiratory illness, please wash hands frequently, cover a cough or sneeze with tissues or sleeve and stay home if you or your child are ill.

Sources (Front)

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3. Pasha AB, Chen XQ, Zhou GP. Bronchopulmonary dysplasia: Pathogenesis and treatment. *Exp Ther Med.* 2018;16(6):4315-4321. doi:10.3892/etm.2018.6780
4. Davidson LM, Berkelhamer SK. Bronchopulmonary Dysplasia: Chronic Lung Disease of Infancy and Long-Term Pulmonary Outcomes. *J Clin Med.* 2017;6(1):4. Published 2017 Jan 6. doi:10.3390/jcm6010004

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1. Jenco, Melissa. American Academy of Pediatrics News. AAP: Don't use COVID-19 vaccine o -label for children. (August 23, 2021) <https://www.aappublications.org/news/2021/08/23/fda-covid-vaccine-licensure-082321>
2. Centers for Disease Control and Prevention. Increased Interseasonal Respiratory Syncytial Virus (RSV) Activity in Parts of the Southern United States. (June 10, 2021). <https://emergency.cdc.gov/han/2021/han00443.asp>

Medical Staff News

The following pediatric specialists recently joined Valley Children's:

Cardiology

Bianca Castellanos, MD
Sunny Chang, MD
(Eagle Oaks, Bakersfield)

Diagnostic Radiology

Shannon Tocchio, MD

Emergency Medicine

Kayla Barnes, MD
Michael Hazboun, MD

Endocrinology

Betty Shum, MD

Gastroenterology

Archana Lingannan, MD

OB/GYN

Agnes Bosch, MD (Warner Women's)

Neonatology

Prashant Agarwal, MD
Naisha Chokshi, MD

Pulmonology

Deena Yousif, MD

Primary Care

Layla Makahleh, MD (Adventist Health)
Finnian Steele, DO (Dakota)
Cristina Vargas, MD (Olivewood)



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