References

1. NICHD/NHLBI/ORD workshop summary: bronchopulmonary dysplasia. Jobe, AH, Bancalari, E. American Journal Respiratory Critical Care Medicine 2001; 163: 1723-1729.

2. American Thoracic Society Documents: Statement on the care of the child with chronic lung disease of infancy and childhood. American Journal Respiratory Critical Care Medicine 2003; 168: 356-396.

Preventing and Managing BPD Exacerbations

Prevention Measures

- Ensure a "reality-based discharge" from the hospital to home (based on family's and community's ability to care for the child).
- Emphasize to families the importance of oxygen.
- Practice proper hand hygiene.
- Eliminate exposure to environmental tobacco smoke.
- Limit exposure to contagious settings and individuals.
- Use preventative medical therapies according to the most current recommendations such as:
 - Respiratory syncytial virus (RSV) immunoprophylaxis
 - Influenza vaccine

Physical Examination

The physical examination should include an evaluation of the child for the presence of the following:

Wheezing

Nasal flaring

Changes in breathing pattern, especially increased work of breathing

CoughingCongestion

• Increased oxygen requirement

Cyanosis

• Changes in feeding

Edema

• Retractions

Management of Exacerbations

- The goals of treatment are to safely manage most BPD exacerbations at home and to minimize unnecessary emergency room visits and/or hospital readmissions.
- Families should be part of the care team for management at home.

Contact the BPD Service at (614) 722-4509

- If a child being followed by the BPD service presents in your office with respiratory difficulties
- With questions regarding BPD

Neurodevelopmental Follow-Up

Neurodevelopmental follow-up is continued with the BPD service until the child is 2 years of age. If indicated, subsequent referrals are initiated to monitor development through early childhood.



For an urgent consultation, to make a referral, or to arrange a transport, call the Physician Direct Connect Line 24 hours a day, seven days a week at (614) 355-0221 or (877) 355-0221. For more information, visit **NationwideChildrens.org/BPD.**

Neonatology



Care of the Bronchopulmonary Dysplasia (BPD) Patient Following Discharge



The Comprehensive Center for Bronchopulmonary Dysplasia

Bronchopulmonary dysplasia (BPD) is a multifaceted disease that affects both premature infants after the immediate neonatal period, and low birth-weight babies who spend longer periods of time on ventilation. BPD encompasses all of the medical problems associated with impaired lung function, as well as the growth, development and social functioning of the child and family.

The Comprehensive Center for Bronchopulmonary Dysplasia at Nationwide Children's Hospital is comprised of a multidisciplinary team that addresses the medical, nutritional, developmental and social needs of patients in a single location. The center, available on both an inpatient and outpatient basis, is designed to minimize emergency room visits and hospital admissions. Since its inception in 2004, it has helped to decrease babies with BPD readmission rates from over 30 percent to less than 10 percent.

As part of their development plans, patients are followed beyond the usual neonatal period, in order to gather data on long-term growth, nutrition and development. This information is used to guide future therapies and the direction of the overall program for prevention, treatment and follow-up of BPD.

A Team Approach to BPD

The center provides superlative, consistent care that is convenient for patients and their families. The entire team serves the baby and family by utilizing evidence-based practice and research to continuously improve care, all while creating a physical and therapeutic environment that empowers families to actively participate in the progress of their children.

In addition to board-certified neonatologists, the BPD team consists of:

• Case managers

- Social workers
- Advanced practice nurses
- Speech therapists

• Pharmacists

- Staff nurses
- Physical and occupational therapists
- Nutritionists

• Respiratory therapists

Treating the Whole Family

BPD places extreme demands on families who are often required to keep numerous and varied outpatient appointments. Education is a critical component for families, so that they are well informed, have realistic expectations and understand why certain therapies are used.

The center is designed to foster collaboration between pediatricians and families to address the nutritional, developmental, general medical and social services needs of each patient for long-term development.

Nationwide Children's unique approach to the management of BPD attracts families from across the country. Patients receive specialized treatment and families return home with specific treatment plans for their children. Additionally, there is a commitment to ongoing consultation between Nationwide Children's and the patient's primary care physician.

Welcome Center Services

Our Welcome Center Services supports families by coordinating all aspects of their visits with their clinical team, including:

• Housing and transportation: For families who require longer stays, Welcome Center Services can assist with accommodations at the Ronald McDonald House, located on the hospital's main campus. Accommodations are available for families on a first-come, first-served basis.

- Financial counseling to assist families with questions related to coverage for health care services, and specifically for out-of-network coverage
- Interpreters
- Sibling care
- Pastoral care

More information about the Welcome Center is available online at NationwideChildrens.org/WelcomeCenter.

To refer a patient to the Welcome Center, please call (800) 792-8401 ext. 9861 or email WelcomeCenter@NationwideChildrens.org.

Care of Patients with BPD Following Discharge

What is BPD?

- A primary disorder of the airways and lung parenchyma following interface of the lung with mechanical ventilation and oxygen
- Usually associated with prematurity
- Functional abnormalities are detectable by the third day of life and predisposing factors may be present at birth
- Classified by severity of the disease utilizing the following criteria¹:

Classification of BPD	Definition
Mild	Oxygen requirement at greater than or equal to 28 days of life, but not at 36 weeks post-conceptual age
Moderate	Less than 30% oxygen requirement at 36 weeks post-conceptual age
Severe	Greater than or equal to 30% oxygen requirement or intermittent mandatory ventilation at 36 weeks post-conceptual age

Typical Care at Home

This level of care is supportive, not therapeutic.

- Supplemental oxygen To maintain blood oxygen levels within a normal range
 - Avoid hypoxia.
 - Keep saturations $> 95\%^2$.
- Diuretics To reduce the amount of fluid present in the lungs
 - One of the last therapies to add
 - One of the first therapies to discontinue
 - May need supplemental electrolytes
 - Electrolytes need to be monitored.
- Inhaled bronchodilators To relax smooth muscle to ease breathing
- Inhaled and/or oral steroids To decrease swelling or inflammation that can cause wheezing and coughing
- Excellent nutrition To provide nutrients vital for growth and repair of lung tissue
 - Increased calories for weight gain
 - Increased calories often need to be supplied in conjunction with fluid restriction
- Home apnea or saturation monitor To continuously monitor and record heart rate, breathing and oxygen saturation

Other Problems Associated with BPD

- Congestive heart failure secondary to:
 - Inadequate oxygenation
 - Sodium imbalance
 - Pulmonary infection

- Pulmonary hypertension secondary to:
 - Inadequate oxygenation
- Increased blood pressure
- Feeding intolerance
- Developmental delays