

# The University of Arizona Pediatric Residency Program

## Primary Goals for Rotation

### Pulmonary

1. **GOAL:** Diagnose and manage patients with asthma.
2. **GOAL:** Understand the role of the pediatrician in preventing pulmonary disease, and in counseling and screening individuals at risk for these diseases.
3. **GOAL:** Distinguish normal from pathological pulmonary conditions.
4. **GOAL:** Evaluate, treat and/or refer patients presenting with signs and symptoms that suggest an abnormality of the respiratory system.
5. **GOAL:** Diagnose and manage pulmonary problems that generally do not require referral.
6. **GOAL:** Recognize and initially manage patients with pulmonary problems that generally require referral.
7. **GOAL:** Understand the general pediatrician's role in the management of bronchopulmonary dysplasia in children.
8. **GOAL:** Understand the general pediatrician's role in the management of cystic fibrosis.
9. **GOAL:** Recognize and manage upper airway obstruction and desaturation.
10. **GOAL:** Demonstrate high standards of professional competence while working with patients under the care of a subspecialist.

**1. GOAL: Diagnose and manage patients with asthma.**

- A. Identify the signs, symptoms, and pathophysiology of asthma, and differentiate asthma from other causes of cough, wheezing, shortness of breath and exercise intolerance.
- B. Discuss the indications, clinical significance, and limitations of diagnostic tests and procedures for asthma. Interpret the results of these tests and procedures: arterial blood gas, pulse oximetry, chest X-ray, pulmonary function testing, peak flow monitoring, spirometry, inhaler use (MDI, DPI), spacing devices (e.g. aero-chambers, inspirease, etc.), nebulizers, and asthma action plans.
- C. Classify the baseline disease severity of a patient with asthma according to current national guidelines, e.g., mild-intermittent, mild-persistent, moderate-persistent or severe-persistent.
- D. Identify associated diseases or co-morbid conditions related to asthma (e.g., GER, allergic rhinitis, etc.).
- E. Identify triggers that exacerbate a patient's asthma (environmental, seasonal, infectious) and provide counseling about avoidance where feasible.
- F. Compare the indications, effectiveness, side effects and costs of the different pharmacologic agents used in the treatment of asthma, and discuss "reliever" and "controller" therapy.
- G. Establish a treatment plan for the child with asthma that includes routine follow-up for reassessment, and the initial treatment and referral of the patient with impending respiratory failure due to asthma.
- H. Based on a patient's symptoms and disease severity classification, develop a written asthma action plan for home and school. Include assessment and recognition of asthma symptoms (e.g., symptom-driven vs. peak flow assessments), a step-wise pharmacological approach to the management of acute symptoms ("reliever" therapy) and chronic symptoms ("controller" therapy), and instructions about when to seek professional medical care.
- I. Educate a patient and family about all aspects of asthma, including course of disease, quality of life, risk factors for sudden death, strategies to improve adherence to treatment, trigger avoidance, symptom recognition and monitoring, asthma action plans, medications and delivery systems, and seeking professional medical care.
- J. Discuss the factors that affect patient/family and school adherence to treatment protocols and the key role of support services in reducing barriers to care.
- K. Identify the indicators for an allergy or pulmonary referral of a child with asthma.

**2. Understand the role of the pediatrician in preventing pulmonary disease, and in counseling and screening individuals at risk for these diseases.**

A. Provide routine pulmonary counseling to all parents and patients about:

1. The hazards of cigarette smoke, including passive smoke, and available resources for smoking cessation
2. The hazards of inhalational agents in home, school or work environments and in recreational exposure and abuse
3. Significance of noisy breathing (e.g., stridor and snoring)
4. The impact of obesity on risk for sleep-disordered breathing
5. Risks of aspiration of foreign bodies (e.g., peanuts, candies)

B. Provide counseling to parents and patients with specific pulmonary diseases, addressing:

1. Treatment and expected course of a patient with chronic lung disease, and access to support groups
2. Annual influenza immunization for patients with chronic lung disease
3. Prevention of exposure of high-risk patient to respiratory syncytial virus (RSV)

**3. GOAL: Distinguish normal from pathological pulmonary conditions.**

A. Describe normal rates and patterns of breathing, including normal variations with sleep (e.g., brief apnea, periodic breathing), anxiety and fever.

B. Differentiate normal variations in chest wall anatomy (e.g., pectus excavatum) from those that impair ventilation (e.g., scoliosis).

C. Explain the findings on clinical history and examination that suggest pulmonary disease requiring further evaluation and treatment.

D. Identify system conditions that may present with respiratory symptoms or lead to pulmonary disease, including swallowing dysfunction, immunodeficiency and restrictive orthopedic conditions.

E. Identify indications and limitations of clinical and laboratory tests used to identify pulmonary-based disease and respiratory failure. Interpret the following tests: chest X-ray, pulmonary function test reports (e.g., spirometry and lung volume determinations), polysomnography reports, pulse oximetry, blood gas determination, sweat chloride testing, exercise challenge and bronchial provocation studies.

**4. GOAL: Evaluate, treat and/or refer patients presenting with signs and symptoms that suggest an abnormality of the respiratory system.**

A. Create a strategy to determine if the following signs and symptoms are caused by an abnormality of the respiratory system and determine if the patient needs treatment or referral:

1. Cough, both acute and chronic

2. Wheezing
3. Tachypnea
4. Shortness of breath/dyspnea
5. Exercise intolerance
6. Recurrent pneumonia
7. Failure to thrive
8. Chest pain
9. Apnea
10. Noisy breathing (e.g., stridor or snoring)
11. Digital clubbing
12. Hemoptysis
13. Cyanosis
14. Sleep disturbances

**5. GOAL: Diagnose and manage pulmonary problems that generally do not require referral.**

A. Diagnose, explain and manage the following pulmonary conditions:

1. Apparent life threatening event (initial work-up and management)
2. Asthma (mild intermittent and mild persistent)
3. Bronchiolitis
4. Bronchitis
5. Chest pain
6. Croup
7. Follow up of apnea of prematurity
8. Uncomplicated pneumonia (bacterial, viral)

**6. GOAL: Recognize and initially manage patients with pulmonary problems that generally require referral.**

A. Identify, explain, initially manage and refer the following pulmonary conditions:

1. Airway obstruction
2. Apnea (central and obstructive sleep apnea syndrome)
3. Apparent life-threatening event requiring further investigation or monitoring
4. Asthma (moderate and severe persistent and mild persistent without adequate control)
5. Bronchopulmonary dysplasia
6. Cystic fibrosis
7. Foreign body at or below the epiglottis or in the esophagus
8. Pneumonia with empyema
9. Pulmonary presentations and complications of HIV infection  
(Pneumocystis carinii infection and lymphoid interstitial pneumonitis)
10. Moderate and severe persistent asthma
11. Respiratory failure
12. Pneumothorax
13. Tuberculosis
14. Volatile substance abuse or ingestion

- 15. Hemoptysis
- 16. Congenital lung malformations
- 17. Ventilatory muscle weakness
- 18. Psychogenic cough
- 19. Interstitial lung disease
- 20. Pleural effusion

B. Identify the role and general scope of practice of pulmonology; recognize situations where children benefit from the skills of specialists trained in caring for children; and work effectively with these professionals to care for children with pulmonary disorders.

**7. GOAL: Understand the general pediatrician's role in the management of bronchopulmonary dysplasia in children.**

A. Collaborate with a pulmonologist to execute a respiratory management plan as part of the coordination of care for a child with chronic lung disease.

B. Identify indicators that signify a worsening pulmonary condition in a child with CLD and may require a pulmonary referral and re-evaluation.

C. Develop a written plan for preventive care of children with CLD, including influenza vaccination and RSV prevention and prophylaxis.

D. Discuss the medications used in the treatment of CLD, including indications, side effects, monitoring, and age- and weight-adjusted dosing.

**8. GOAL: Understand the general pediatrician's role in the management of cystic fibrosis.**

A. Discuss the presenting signs and symptoms of cystic fibrosis and refer the patient for appropriate confirmatory testing, education, and treatment. Discussion should include high-risk populations, associated symptoms, treatment options and expected course of the disease.

B. Participate in development and implementation of a coordinated pulmonary and nutritional treatment plan for a patient with cystic fibrosis, including recognition and treatment of acute episodic illnesses, nutritional deficiencies, intestinal obstruction and psychosocial issues. Discuss the multidisciplinary approach to cystic fibrosis care and the role of the general pediatrician.

C. Identify indicators that signify an exacerbation of pulmonary symptoms. Provide appropriate initial treatment and referral to a specialty center for further evaluation and treatment.

**9. GOAL: Recognize and manage upper airway obstruction and desaturation.**

A. Recognize and manage upper airway obstruction.

1. Identify conditions that result in upper airway obstruction.
2. Know indication for and demonstrate use of oropharyngeal airway vs. nasal trumpet.
3. Discuss routine care of a tracheostomy and know how to recognize tracheostomy obstruction; demonstrate proficiency in replacement of a tracheostomy tube.

B. Recognize desaturation that requires intervention and know the indications for use of appropriate oxygen delivery devices (e.g., simple nasal cannula, simple O<sub>2</sub> mask, Venturi mask, partial rebreather and non-rebreather masks).

**10. GOAL: Demonstrate high standards of professional competence while working with patients under the care of a subspecialist.**

A. **Competency 1: Patient Care.** Provide family-centered patient care that is development- and age-appropriate, compassionate, and effective for the treatment of health problems and the promotion of health.

1. Use a logical and appropriate clinical approach to the care of patients presenting for specialty care, applying principles of evidence-based decision-making and problem-solving.
2. Describe general indications for subspecialty procedures and interpret results for families.

B. **Competency 2: Medical Knowledge.** Understand the scope of established and evolving biomedical, clinical, epidemiological and social-behavioral knowledge needed by a pediatrician; demonstrate the ability to acquire, critically interpret and apply this knowledge in patient care.

1. Acquire, interpret and apply the knowledge appropriate for the generalist regarding the core content of this subspecialty area.
2. Critically evaluate current medical information and scientific evidence related to this subspecialty area and modify your knowledge base accordingly.

C. **Competency 3: Interpersonal Skills and Communication.** Demonstrate interpersonal and communication skills that result in information exchange and partnering with patients, their families and professional associates.

1. Provide effective patient education, including reassurance, for a condition(s) common to this subspecialty area.
2. Communicate effectively with primary care and other physicians, other health professionals, and health-related agencies to create and sustain information exchange and teamwork for patient care.

3. Maintain accurate, legible, timely and legally appropriate medical records, including referral forms and letters, for subspecialty patients in the outpatient and inpatient setting.

**D. Competency 4: Practice-based Learning and Improvement.** Demonstrate knowledge, skills and attitudes needed for continuous self-assessment, using scientific methods and evidence to investigate, evaluate, and improve one's patient care practice.

1. Identify standardized guidelines for diagnosis and treatment of conditions common to this subspecialty area and adapt them to the individual needs of specific patients.

2. Identify personal learning needs related to this subspecialty; systematically organize relevant information resources for future reference; and plan for continuing acquisition of knowledge and skills.

**E. Competency 5: Professionalism.** Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diversity.

1. Demonstrate personal accountability to the well-being of patients (e.g., following up on lab results, writing comprehensive notes, and seeking answers to patient care questions).

2. Demonstrate a commitment to carrying out professional responsibilities.

3. Adhere to ethical and legal principles, and be sensitive to diversity.

**F. Competency 6: Systems-based Practice.** Understand how to practice high-quality health care and advocate for patients within the context of the health care system.

1. Identify key aspects of health care systems as they apply to specialty care, including the referral process, and differentiate between consultation and referral.

2. Demonstrate sensitivity to the costs of clinical care in this subspecialty setting, and take steps to minimize costs without compromising quality

3. Recognize and advocate for families who need assistance to deal with systems complexities, such as the referral process, lack of insurance, multiple medication refills, multiple appointments with long transport times, or inconvenient hours of service.

4. Recognize one's limits and those of the system; take steps to avoid medical errors.

## Procedures

**A. GOAL: Technical and therapeutic procedures.** Describe the following procedures, including how they work and when they should be used; competently perform those commonly used by the pediatrician in practice.

1. Chest physiotherapy
2. Medication delivery: inhaled
3. Pulmonary function tests: peak flow meter
4. Pulmonary function tests: spirometry
5. Pulmonary function tests: perform
6. Pulse oximeter: placement
7. Suctioning: tracheostomy
8. Thoracentesis
9. Tracheostomy tube: replacement
10. Ventilation: bag-valve-mask
11. Ventilation support: initiation

**B. GOAL: Diagnostic and screening procedures.** Describe the following tests or procedures, including how they work and when they should be used; competently perform those commonly used by the pediatrician in practice.

1. Broncho-alveolar lavage
2. Monitoring interpretation: pulse oximetry
3. Monitoring interpretation: respiratory
4. Pulmonary function tests: interpretation
5. Radiologic interpretation: chest X-ray

## Adapted From

Kittredge, D., Baldwin, C. D., Bar-on, M. E., Beach, P. S., Trimm, R. F. (Eds.). (2004). APA Educational Guidelines for Pediatric Residency. Ambulatory Pediatric Association Website. Available online: [www.ambpeds.org/egweb](http://www.ambpeds.org/egweb).