

The University of Arizona Pediatric Residency Program

Primary Goals for Rotation

Allergy - Immunology

1. **GOAL:** Understand the role of the pediatrician in preventing allergy and immunologic diseases, and in counseling and screening individuals at risk for these diseases.
2. **GOAL:** Develop a working knowledge of normal development of the immune system, and recognize pathophysiologic and other clinical findings that indicate deviations from the norm.
3. **GOAL:** Evaluate, treat, and/or refer patients with presenting signs and symptoms that suggest an allergic or immunologic disease process.
4. **GOAL:** Diagnose and manage patients with common allergic/immunologic conditions that generally do not require referral.
5. **GOAL:** Recognize, initiate management of, and refer patients with allergic/immunologic conditions that generally require referral.
6. **GOAL:** Understand the role of the general pediatrician in the assessment and management of anaphylaxis, angioedema and urticaria.
7. **GOAL:** Diagnose and manage patients with allergic rhinitis and conjunctivitis.
8. **GOAL:** Diagnose and manage patients with asthma.
9. **GOAL:** Understand the role of the general pediatrician in the assessment and management of atopic dermatitis.
10. **GOAL:** Understand the principles, diagnosis and management of drug allergy.
11. **GOAL:** Understand the role of the general pediatrician in the assessment and management of patients with food allergy.
12. **GOAL:** Understand the role of the general pediatrician in the assessment and management of patients with immunodeficiency.
13. **GOAL:** Recognize, screen for, refer and co-manage patients with HIV.
14. **GOAL:** Demonstrate high standards of professional competence while working with patients under the care of a subspecialist.

1. GOAL: Understand the role of the pediatrician in preventing allergy and immunologic diseases, and in counseling and screening individuals at risk for these diseases.

A. Identify individuals at risk for developing allergic or immunologic disease by providing routine allergy/immunology screening of all patients and parents and offering prevention counseling that addresses:

1. Breast-feeding and diet in the prevention of allergic disease
2. Introduction of solid foods in the prevention of allergic disease
3. Smoking and household chemicals/irritants that may exacerbate allergic diseases
4. "Myths" related to allergic disease, e.g., its role in behavioral disorders such as ADHD and autism
5. Risk factors for development of asthma and allergic diseases including family history

B. Provide allergy/immunology prevention counseling to parents and patients with identified allergic diseases, including:

1. Allergen avoidance and environmental control, e.g., pets and indoor allergens
2. Access to lay organizations and support groups
3. Proper use of epinephrine self-injectors

2. GOAL: Develop a working knowledge of normal development of the immune system, and recognize pathophysiologic and other clinical findings that indicate deviations from the norm.

A. Describe the normal development and pathophysiology of the immune system, including the cellular, humoral, phagocytic and complement-based systems.

B. Discuss the classification of hypersensitivity reactions, e.g. Gell and Coombs classification.

C. Explain the clinical history and findings on physical examination that suggest the presence of allergic-based disease or immunologic dysfunction that requires further evaluation and treatment. Include discussion of family history and genetic factors.

D. Develop a strategy for the work-up of suspected allergic disease or immunodeficiency, based on presenting symptoms and signs.

E. Interpret clinical and laboratory tests to identify allergic disease or immunologic dysfunction, including: screening tests for immune deficiency (e.g., CBC with absolute lymphocyte and neutrophil counts, Immunoglobulin levels, DTH skin tests); delayed hypersensitivity; allergy skin testing; serology (e.g., screening with RAST); and pulmonary function tests.

F. Describe the relationship of allergic disease and immunodeficiency to otitis media, sinusitis, pharyngitis, meningitis and pneumonia.

3. GOAL: Evaluate, treat, and/or refer patients with presenting signs and symptoms that suggest an allergic or immunologic disease process.

A. Create a strategy to investigate whether the following presenting signs and symptoms are caused by an allergic process or immunologic dysfunction, and determine if the patient should be treated or referred:

1. Cough
2. Wheezing
3. Skin rash
4. Recurrent pneumonia
5. Recurrent skin infections
6. Recurrent otitis, sinusitis, pharyngitis
7. Rhinorrhea
8. Red eyes
9. Gastrointestinal symptoms (vomiting, diarrhea, abdominal pain, etc.)
10. Failure to thrive
11. Vomiting, diarrhea (including bloody or mucoid stools)
12. Syncope with exercise
13. Snoring

4. GOAL: Diagnose and manage patients with common allergic/immunologic conditions that generally do not require referral.

A. Diagnose, explain and manage the following allergic/immunologic conditions when they are mild to moderate in severity and without complications:

1. Allergic rhinitis
2. Allergic conjunctivitis
3. Atopic dermatitis
4. Asthma, mild intermittent and mild persistent
5. Urticaria/angioedema
6. Food allergies
7. Common drug allergies
8. Insect sting allergy-local reactions
9. IgA deficiency
10. Transient hypogammaglobulinemia of infancy
11. Sinusitis and recurrent otitis media

5. GOAL: Recognize, initiate management of, and refer patients with allergic/immunologic conditions that generally require referral.

A. Identify, explain, initially manage and refer the following allergic/immunologic conditions:

1. Allergic/immunologic conditions that are severe or refractory to therapy
2. Asthma, moderate or severe persistent
3. Patients who require diagnostic testing and/or immunotherapy
4. Chronic urticaria
5. Hereditary or severe angioedema
6. Anaphylaxis
7. Latex allergy
8. Immunodeficiency (congenital, acquired, or metabolic) with compatible symptoms

9. Serum sickness

- B. Identify the role and general scope of practice of pediatric allergists and immunologists; recognize situations where children will benefit from the skills of specialists trained in the care of children; and work effectively with these professionals to care for children with allergies, asthma, and immunologic disorders.

6. GOAL: Understand the role of the general pediatrician in the assessment and management of anaphylaxis, angioedema and urticaria.

- A. Recognize the signs and symptoms of urticaria, angioedema and anaphylaxis.
- B. Distinguish anaphylaxis from anaphylactoid reactions.
- C. Discuss the pathophysiology of urticaria, angioedema, and anaphylaxis.
- D. Identify triggers for urticaria, angioedema, and anaphylaxis and provide counseling about avoidance.
- E. Develop a treatment plan for initial management of urticaria, angioedema and anaphylaxis, including indications for use of epinephrine, antihistamines and steroids.
- F. Establish an educational plan for a child with urticaria, angioedema, or anaphylaxis, including medical alert systems, trigger avoidance, and proper use of epi-pens and antihistamines.
- G. Identify the indicators for an allergy referral of a child with urticaria, angioedema and anaphylaxis.

7. GOAL: Diagnose and manage patients with allergic rhinitis and conjunctivitis.

- A. Identify the signs and symptoms of allergic rhinitis and conjunctivitis, including differentiation of allergic from other causes of rhinorrhea and red eyes.
- B. Describe causes of rhinitis and conjunctivitis other than allergic disease.
- C. Identify co-morbidities associated with allergic rhinitis and conjunctivitis, including asthma, eczema, sleep-disordered breathing, sinusitis, etc.
- D. Discuss the indications, clinical significance and limitations of diagnostic tests for allergic rhinitis and conjunctivitis. Interpret the results of these tests: total peripheral eosinophil count, prick and intradermal skin tests, RAST tests, IgE levels.
- E. Educate families and child care facilities about environmental and allergen controls that can alleviate allergic and nonallergic rhinitis and conjunctivitis, and discuss the non-infectious nature of allergic conjunctivitis.
- F. Compare pharmacologic options for treatment of allergic and non-allergic rhinitis and conjunctivitis, considering potential side effects and drug interactions. These therapies include: oral and topical antihistamines and anticholinergics, topical steroids and vasoconstrictive agents, mast cell stabilizers (cromolones), decongestants, anticholinergic agents, leukotriene modifiers, combination medications and emerging therapies (e.g. monoclonal IgE).
- G. Identify the indicators for an allergy referral of a child with allergic rhinitis and conjunctivitis.

H. Discuss the guidelines for safe administration of immunotherapy. Administer immunotherapy prescribed by an allergist to a patient and establish a plan to monitor for untoward reactions.

8. 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, inspirase, 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.

9. GOAL: Understand the role of the general pediatrician in the assessment and management of atopic dermatitis.

A. Recognize the signs and symptoms of atopic dermatitis, differentiating atopic dermatitis from other causes of chronic skin disease.

B. Understand associations of atopic dermatitis with other allergic disorders, such as food allergy, rhinitis and asthma.

C. Identify triggers, both allergic and irritant, that worsen the atopic dermatitis condition and provide counseling for avoidance.
D. Design a treatment plan to manage atopic dermatitis that may include skin hydration and moisturization, options for topical anti-inflammatory medication, and use of antihistamines.
E. Develop a working knowledge of the side effects of topical ointments, in particular corticosteroids.
F. Identify the indicators for referral to allergy or dermatology specialists for the child with atopic dermatitis.
10. GOAL: Understand the principles, diagnosis and management of drug allergy.
A. Discuss the pathophysiology of drug allergy.
B. Recognize the signs and symptoms of drug allergies, including differentiating drug allergy from other causes of skin rash, joint swelling and anaphylaxis.
C. Discuss the genetic basis, mechanisms and manifestations of drug allergy including urticaria, serum sickness, Stevens Johnson Syndrome, and anaphylaxis.
D. List the medications most commonly used to treat drug allergy and anaphylactic reactions.
E. Establish an education and treatment plan for a child with a drug allergy that includes drug avoidance and the use of antihistamines, epinephrine, steroids and supportive treatment.
F. Identify the indicators that would lead to subspecialist referral for a child with drug allergy.
11. GOAL. Understand the role of the general pediatrician in the assessment and management of patients with food allergy.
A. Identify the signs and symptoms of food allergy and differentiate food allergy from other causes of skin rash, and GI or pulmonary symptoms.
B. Differentiate IgE-mediated food allergy from non-IgE mediated food allergy.
C. List the foods and formulas most commonly associated with food allergy.
D. Discuss the indications, clinical significance, and limitations of diagnostic tests and procedures to diagnose food allergies and interpret the results of skin testing, RAST testing, elimination diets, food challenges.
E. Explain the natural history of food allergies, including when suspected allergens may be introduced into the diet.
F. Create a treatment plan for a child with food allergies that includes food avoidance, food challenges, management of allergic symptoms, and emergencies.
G. Identify the indicators that would lead to subspecialist referral for a child with food allergy.
12. GOAL: Understand the role of the general pediatrician in the assessment and management of patients with immunodeficiency.
A. Identify the signs and symptoms of immunodeficiency diseases, and differentiate immunodeficiency from other causes of acute and chronic disease, as well as primary from secondary immunodeficiency disorders.

- B. Organize immunodeficiency diseases into five pathophysiologic categories (antibody, cellular-mediated, combined, complement, phagocytic) and distinguish etiologic types (e.g., genetic, post-infectious, post-chemotherapy).
- C. Discuss the indications, clinical significance and limitations of diagnostic tests and procedures to assess immune function. Interpret the results of tests of: CBC (especially evaluation for age-appropriate ALC and ANC), lymphocyte (T, B, NK cell) number and function, immunoglobulin levels, antibody function, mitogen and antigen assay for lymphocyte function, DTH skin testing, complement levels, and neutrophil assays, as well as laboratory evaluations for secondary immune disorders, such as HIV and CF.
- D. Demonstrate the initial approach to evaluation, treatment and referral for a child with suspected immunodeficiency.
- E. Discuss treatment options available for patients with primary immunodeficiency disorders and the potential harm of blood transfusions and vaccines in these patients.
- F. Under supervision of an immunologist, develop a treatment plan for a child with immunodeficiency, including pharmacologic management, precautions, and immunizations.

13. GOAL: Recognize, screen for, refer and co-manage patients with HIV.

- A. Describe the pathophysiology, natural history, presenting signs and symptoms, and associated opportunistic infections in patients with HIV.
- B. Identify the risk factors for perinatal transmission of HIV, tests for screening and confirmatory diagnosis, and indications for referral, including asymptomatic HIV infected patients.
- C. Describe risk factors and symptoms that should prompt testing for HIV infection in neonates, children and adolescents.
- D. Review HIV infection, the related risks of opportunistic infections, the use of laboratory parameters (e.g., CD4 counts and viral load measures) to monitor clinical course, general treatment modalities (including chemoprophylaxis), and the common complications and toxicities of anti-HIV medications.
- E. Identify the indicators for referral of the patient to an infectious disease specialist.
- F. Demonstrate the ability to obtain proper informed consent for HIV testing, including legal requirements in one's locale.

14. 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. Allergy: shot administration
2. Allergy: skin testing
3. Medication delivery: IM/SC/ID
4. Medication delivery: inhaled
5. Pulmonary function tests: peak flow meter
6. Pulmonary function tests: spirometry
7. Pulmonary function tests: perform
8. Pulse oximeter: placement

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. Pulmonary function tests: interpretation
2. Radiologic interpretation: chest X-ray
3. Radiologic interpretation: sinus films

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.