



## Recommended Curriculum Guidelines for Family Medicine Residents

# Allergy and Immunology

*This document was endorsed by the American Academy of Family Physicians (AAFP).*

## Introduction

This Curriculum Guideline defines a recommended training strategy for family medicine residents. Attitudes, behaviors, knowledge, and skills that are critical to family medicine should be attained through longitudinal experience that promotes educational competencies defined by the Accreditation Council for Graduate Medical Education (ACGME), [www.acgme.org](http://www.acgme.org). The family medicine curriculum must include structured experience in several specified areas. Much of the resident's knowledge will be gained by caring for ambulatory patients who visit the family medicine center, although additional experience gained in various other settings (e.g., an inpatient setting, a patient's home, a long-term care facility, the emergency department, the community) is critical for well-rounded residency training. The residents should be able to develop a skill set and apply their skills appropriately to all patient care settings.

Structured didactic lectures, conferences, journal clubs, and workshops must be included in the curriculum to supplement experiential learning, with an emphasis on outcomes-oriented, evidence-based studies that delineate common diseases affecting patients of all ages. Patient-centered care, and targeted techniques of health promotion and disease prevention are hallmarks of family medicine and should be integrated in all settings. Appropriate referral patterns, transitions of care, and the provision of cost-effective care should also be part of the curriculum.

Program requirements specific to family medicine residencies may be found on the ACGME website. Current AAFP Curriculum Guidelines may be found online at [www.aafp.org/cg](http://www.aafp.org/cg). These guidelines are periodically updated and endorsed by the AAFP and, in many instances, other specialty societies, as indicated on each guideline.

Each residency program is responsible for its own curriculum. **This guideline provides a useful strategy to help residency programs form their curricula for educating family physicians.**

## **Preamble**

The prevention, diagnosis, and treatment of allergic and immunologic conditions are everyday occurrences for the practicing family physician, whether it be the management of more benign conditions (e.g., allergic rhinitis) or severe and potentially life-threatening conditions (e.g., anaphylaxis, status asthmaticus). In addition to the immediate medical implications of these complex processes, significant social and economic facets may dramatically impact patients and their families and must be anticipated and addressed in a proactive and conscientious manner. The specialty of family medicine encompasses the care of adults and children who have allergic and immunologic diseases and promotes care that is comprehensive and continuous. Every family physician should be aware of the impact of allergic and immunologic problems on the patient and family members, and be able to perform diagnostic, therapeutic, and preventive services, including identification and management of environmental and occupational factors. Gaining thorough knowledge of allergic and immunologic conditions and being able to apply this knowledge to patients in practice are integral parts of family medicine education.

Family physicians are expected to become proficient in the diagnosis and treatment of patients who have allergic and immunologic conditions. The family physician may find it appropriate to seek consultation from an allergist or immunologist and must be actively engaged in the comanagement of their patients. In some cases, management by an allergist or immunologist may be indicated.

This Curriculum Guideline provides an outline of the competencies, attitudes, knowledge, and skills related to allergic and immunologic conditions that should be among the objectives of training programs in family medicine.

## **Competencies**

At the completion of residency training, a family medicine resident should be able to:

- Demonstrate knowledge of the diagnosis, treatment, and prevention of allergic and immunologic conditions (including, but not limited to: rhinitis, asthma, atopic dermatitis, seasonal and environmental allergies, food and drug allergies, urticaria, anaphylaxis, immunodeficiency, and hypersensitivity reactions) by taking care of such patients appropriately (Patient Care, Medical Knowledge)
- Be familiar with the performance and interpretation of spirometry and allergy testing results (skin and serum immunoglobulin E [IgE]) (Patient Care, Medical Knowledge)

- Discuss diagnostic, therapeutic, and preventive strategies for allergic and immunologic conditions with the patient and family members in a compassionate, effective manner (Interpersonal and Communication Skills)
- Demonstrate respect and sensitivity to patients and their families. Accept constructive feedback and provide constructive feedback to others (Professionalism)
- Be familiar with the appropriate application of evidence-based guidelines regarding allergic and immunologic conditions. Acknowledge gaps in personal knowledge and expertise, and appropriately ask for feedback (Practice-based Learning and Improvement)
- Appropriately utilize allergy and immunology consultation and be familiar with established reporting processes for allergies and allergic reactions. Demonstrate understanding of how individual disease burden, health care resources, and costs impact patients, families, populations, and the health care system (Systems-based Practice)
- Develop an awareness of how social determinants of health intersect with allergic and immunologic conditions and use this knowledge to actively seek out ways to improve patient and community health (Systems-based Practice)

## Attitudes

The resident should demonstrate attitudes that encompass:

- Understanding of the personal and societal impact of allergic and immunologic conditions
- Awareness of the importance of coordinating care between family physicians, allergy/immunology subspecialists, and other health care professionals to provide optimal patient care
- Recognition of the importance of family, community, and environmental factors in the prevention and treatment of allergic and immunologic conditions
- Lifelong learning and contribution to the body of knowledge about allergic and immunologic conditions
- Willingness to be accessible to, and accountable for, the residents' patients
- Awareness of the importance of cost-effective care in allergy and immunology

## Knowledge

In the appropriate setting, the resident should demonstrate the ability to apply knowledge of:

1. Biochemical and histological basis of the immune response, including the role and function of:
  - a. Innate Immunity
  - b. Adaptive Immunity—T and B lymphocytes, cytokines, IgE immunoglobulin (IgG, IgA,

IgM, IgE)

- c. Complement System
- d. Cells of Allergic Inflammation—mast cells, eosinophils

2. Classification scheme of immune-mediated damage
  - a. Type I (anaphylactic/immediate, late phase, and dual reactions)
  - b. Type II (cytotoxic reactions)
  - c. Type III (Arthus reaction)
  - d. Type IV (delayed reaction)
  - e. Type V (antireceptor)
3. Pathophysiology, identification, and treatment of primary and secondary immunodeficiency syndromes
4. Asthma, including the following:
  - a. Definition of asthma, and ability to understand and use the National Institutes of Health (NIH) asthma classification and severity index
  - b. Impact on quality of life and cost for both the individual and society
  - c. Defined strategies to reduce impairment and risk
  - d. Major pathologic factors in airway obstruction
    - i. Inflammatory mucosal edema
    - ii. Smooth muscle-mediated bronchoconstriction
    - iii. Sputum secretions
    - iv. Airway remodeling
  - e. Triggers of asthma symptoms
    - i. Infection
    - ii. Irritants, including tobacco smoke and environmental pollutants
    - iii. Exercise
    - iv. Allergens
    - v. Drugs
    - vi. Gastroesophageal reflux disease (GERD)
    - vii. Acute emotional stress
  - f. Diagnosis and differential diagnosis of asthma, including the following:
    - i. Appropriate history and physical examination
    - ii. Allergy evaluation
    - iii. Pulmonary function testing
    - iv. Bronchoprovocation challenge testing (e.g., methacholine, exercise)
  - g. Monitoring of symptoms using peak flow meters

- h. Appropriate use of preventive measures, such as avoidance of triggers and immunotherapy
- i. Ability to complete and implement an asthma action plan
- j. Medical treatment of asthma
  - i. Beta-2 agonists (both short and long acting)
  - ii. Steroids (both inhaled and systemic)
  - iii. Mast cell stabilizers
  - iv. Leukotriene receptor antagonists
  - v. Anticholinergics
  - vi. Methylxanthines
- k. Identification and management of status asthmaticus
- l. Management of asthma in patients who have concurrent medical conditions (pregnancy, diabetes, heart disease) and perioperatively
- m. Management of asthma in the athlete, including evaluation and management of exercise-induced bronchospasm
- n. Factors in compliance, such as:
  - i. Education
  - ii. Avoidance of environmental triggers and irritants such as tobacco
  - iii. Early intervention of social and behavioral components
  - iv. Cost
  - v. Proper use of medications and associated devices

5. Rhinitis, including the following:

- a. Symptoms, signs, and pathophysiology of the following:
  - i. Allergic rhinitis
  - ii. Local allergic rhinitis
  - iii. Nonallergic rhinitis
    - 1) Vasomotor rhinitis
    - 2) Rhinitis medicamentosa
    - 3) Hormonal rhinitis
    - 4) Aging rhinitis
    - 5) Atrophic rhinitis
- b. Triggers
  - i. Inhalant allergens (indoor, outdoor environmental)
  - ii. Irritants
  - iii. Physiologic factors
  - iv. Endocrinologic factors
  - v. Occupational agents
- c. Appropriate use of diagnostic testing, such as nasal smears, skin testing, and in vitro testing (serum IgE testing)
- d. Management
  - i. Trigger avoidance
  - ii. Pharmacotherapy
    - 1) Antihistamines

- 2) Decongestants
- 3) Mast cell stabilizers
- 4) Steroids (inhaled and systemic)
- 5) Anticholinergic
- 6) Leukotriene inhibitors

- iii. Immunotherapy

- e. Associated conditions
  - i. Rhinosinusitis
  - ii. Orthodontics
  - iii. Otitis media, serous otitis media, nasal polyps, anosmia, allergic conjunctivitis
  - iv. Sleep disorders, especially obstructive sleep apnea (OSA)

- 6. Adverse reactions to foods and drugs
  - a. Drugs
    - i. Classification: toxicity, intolerance, side effects, allergic reactions, interactions, genetic factors, idiosyncratic reactions
    - ii. Diagnosis: history, physical examination, skin and invitro testing
    - iii. Management: pharmacotherapy of acute reactions, avoidance, therapeutic desensitization
  - b. Foods
    - i. Classification: toxicity, intolerance, physiologic reactions, genetic factors, allergic reactions, additives, dermal allergy
    - ii. Diagnosis: history, physical examination, skin and in vitro testing, elimination diet, oral food challenge
    - iii. Prevention: Learning Early About Peanut (LEAP) allergy study, early allergenic food introduction in infancy

- 7. Dermatitis
  - a. Etiology and pathophysiology of allergic contact dermatitis and atopic dermatitis
  - b. Distribution and clinical characteristics used in diagnosis of various types of dermatitis
  - c. Patch testing
  - d. Management: avoidance, environmental control, soaks and baths, emollients, steroids, antipruritic drugs, including biologics and diet

- 8. Anaphylaxis
  - a. Precipitating factors: stinging insects, latex, pharmaceuticals, foods
  - b. Pathophysiology
  - c. Signs and symptoms: skin, respiratory, gastrointestinal tract, cardiovascular
    - i. Ability to compare and contrast symptoms in pediatric patients versus adults
  - d. Diagnosis
  - e. Treatment: epinephrine, fluids, antihistamines, steroids, vasopressors, endotracheal intubation

- f. Prevention
  - i. Patient education: anaphylactic kit, sting avoidance, sources of allergens
  - ii. Indications for venom immunotherapy
  - iii. Knowledge of epinephrine delivery systems
- 9. Urticaria and angioedema
  - a. Classification
    - i. Most common causes of acute urticaria versus angioedema
    - ii. Chronic urticaria
      - 1) Physical urticaria
      - 2) Chronic spontaneous urticaria
    - iii. Bradykinin-mediated angioedema
      - 1) Hereditary
      - 2) Acquired (e.g., angiotensin-converting enzyme (ACE) inhibitor)
  - b. Immunologic and nonimmunologic mechanisms
  - c. Diagnosis
  - d. Management: trigger avoidance, antihistamines (H1 and H2), steroids, leukotriene inhibitors, biologics (omalizumab)

## **Skills**

In the appropriate setting, the resident should demonstrate the ability to independently perform or appropriately refer the following:

- 1. Performing and interpreting pulmonary function tests
  - a. Peak expiratory flow rate (PEFR) versus symptomatic monitoring; PEFR is not considered superior to symptomatic monitoring, but it is still recommended for patients who have difficulty recognizing symptoms (e.g., patients on beta blockers, patients who have diabetes and neuropathy)
  - b. Spirometry, including measurements of forced expiratory volume (FEV), particularly forced expiratory volume in one second (FEV1), forced vital capacity (FVC), and FEV/FVC ratio, as well as response to bronchodilator administration
  - c. Flow volume loops
  - d. Exercise challenge testing
- 2. Appropriately ordering and interpretation of the following:
  - a. Skin testing
    - i. Puncture or prick testing
    - ii. Intradermal testing
    - iii. Conditions and medications that might interfere with testing
  - b. In vitro testing
    - i. IgE assay techniques
    - ii. Methods of reporting
    - iii. Interpretation, sensitivity, and specificity

3. Counseling patients and their families about the proper techniques to avoid triggers for allergic conditions
4. Conducting a comprehensive history and physical examination, with special emphasis on the diagnosis and management of allergic and immunologic conditions
5. Integrating factors—particularly environmental triggers—in the patient's family, home, and general lifestyle into the diagnostic and therapeutic process
6. Demonstrating an awareness of over-the-counter products and proper utilization of these products versus the need for prescription medications
7. Consulting and collaborating with allergy and immunology specialists and other health care professionals when appropriate, and integrating management in critical care situations
8. Using local and national reporting systems for allergic reactions to pharmaceutical agents

## **Implementation**

The development of core cognitive knowledge and appropriate skills for the care of the patient with an allergic or immunologic condition requires experience in a structured educational component of a family medicine residency program. Written competency-based goals and educational objectives are necessary. This does not need to be a "block rotation"—it could be a longitudinal experience—but the educational experience must be appropriately identified and structured. Most of this experience will be in an outpatient setting with appropriately qualified physician teachers and allergy/immunology consultants.

If a block rotation is developed, a typical week of activities might include hospital rounds; departmental conferences; informal discussion with the allergy/immunology consultant; evaluation of patients under the supervision of the allergy/immunology consultant; and participation in administration of immunotherapy, skin testing, and pulmonary function tests. Adequate time to perform detailed examinations of patients (both new and established patients) should be provided. Residents will obtain substantial additional clinical experience in allergy/immunology throughout the three years of their experience in a family medicine residency. Each resident's panel of patients in the family medicine center should contain an appropriate number of patients who have allergic and immunologic conditions.

## Resources

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## Website Resources

American Academy of Allergy, Asthma & Immunology (AAAAI). [www.aaaai.org](http://www.aaaai.org)

American College of Allergy, Asthma & Immunology (ACAAI). [www.acaai.org](http://www.acaai.org)

British Society for Allergy & Clinical Immunology (BSACI). [www.bsaci.org/](http://www.bsaci.org/)

National Heart, Lung, and Blood Institute.  
[www.nhlbi.nih.gov/health/indexpro.htm](http://www.nhlbi.nih.gov/health/indexpro.htm)

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Revised 9/2020 by Beaumont Health Wayne Family Medicine Residency Program, Wayne, MI