Recommended curriculum guidelines for family medicine residents

Allergy and immunology

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

INTRODUCTION

Each family medicine residency program is responsible for its own curriculum. The AAFP Commission on Education's Subcommittee on Graduate Curriculum has created this guide as an outline for curriculum development, and it should be tailored to the needs of the program.

Through a series of structured and/or longitudinal experiences, the curricula below will support the overall achievement of the core educational competencies defined by the Accreditation Council for Graduate Medical Education (ACGME) and provide guideposts to program requirements specific to family medicine. For updates and details, please refer to the ACGME website at www.acgme.org. Current AAFP curriculum guidelines may be found online at 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.

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, potentially life-threatening conditions (e.g., anaphylaxis, status asthmaticus). In addition to the immediate medical implications of these complex processes, significant social and economic factors may dramatically affect patients and their families and must be anticipated and addressed

proactively and conscientiously. The specialty of family medicine encompasses the care of adults and children who have allergic and immunologic diseases and promotes comprehensive, continuous care. Every family physician should be aware of the impact of allergic and immunologic problems on patients and family members and be able to provide diagnostic, therapeutic and preventive services, including the identification and management of environmental and occupational factors. Gaining thorough knowledge of allergic and immunologic conditions and applying this knowledge to patients in practice are integral parts of family medicine education.

Family physicians are expected to become proficient in diagnosing and treating patients who have allergic and immunologic conditions. They may find it appropriate to consult an allergist or immunologist and must be actively engaged in the co-management 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 family medicine training programs.

PATIENT CARE

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

Be familiar with the performance and interpretation of spirometry and allergy testing results (i.e., skin and serum immunoglobulin E [IgE]).

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
    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 interpreting 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. Counseling patients and their families about different symptomatic manifestations of asthma
5. Conducting a comprehensive history and physical examination, with special emphasis on the diagnosis and management of allergic and immunologic conditions
6. Integrating factors, particularly environmental triggers in the patient's family, home and general lifestyle, into the diagnostic and therapeutic process
7. Demonstrating an awareness of over-the-counter products and proper utilization of these products versus the need for prescription medications
8. Consulting and collaborating with allergy and immunology specialists and other health care professionals when appropriate, and integrating management in critical care situations
9. Using local and national reporting systems for allergic reactions to pharmaceutical agents
10. Understanding different social determinants of health that can affect risk, such as housing factors (mold, ventilation, etc.), affordability of medications, among others, as well as coordinating with a social worker when appropriate

MEDICAL KNOWLEDGE

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.

Residents should demonstrate the ability to apply knowledge of the following:

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
    e. Serum markers of anaphylactic reaction (e.g., tryptase levels)

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 (anti-receptor)
3. Pathophysiology, identification and treatment of primary and secondary immunodeficiency syndromes
4. Asthma, including the following:
    a. Definition of asthma and the ability to understand and use the National Institutes of Health 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, environmental pollutants and occupational exposures
        iii. Exercise
        iv. Allergens
        v. Drugs
        vi. Gastroesophageal reflux disease
        vii. Acute emotional stress
    f. Diagnosis and differential diagnosis of asthma, including the following:
        i. Appropriate history and physical examination to determine the severity of asthma as either mild, moderate or severe (intermittent and persistent)
        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. In addition, immunization against respiratory infections
    i. Ability to complete and implement an asthma action plan
    j. Medical treatment of asthma (maintenance and rescue) and the evidence-based and guideline-based use of asthma medications

i. MART: long-acting beta agonist and inhaled corticosteroid combination
ii. Beta-2 agonists (both short and long acting)
iii. Steroids (both inhaled and systemic)
iv. Mast cell stabilizers
v. Leukotriene receptor antagonists
vi. Anticholinergics
vii. Methylxanthines
viii. Monoclonal antibodies

k. Allergen immunotherapy (both subcutaneous and sublingual) 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. Assess asthma control: patient's asthma symptoms and their risk for future exacerbations
o. Compliance factors, 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, like proper inhaler use techniques

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 and its evidence-based use
        1) Antihistamines (both oral and intranasal)
        2) Decongestants
        3) Mast cell stabilizers
        4) Steroids (inhaled and systemic)
        5) Anticholinergic
        6) Leukotriene inhibitors
    iii. Immunotherapy
        1) Biologics (anti-IgE and anti-IL4/13)

e. Associated conditions
    i. Rhinosinusitis
    ii. Orthodontics and other anatomical variations
    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 in vitro 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
        iv. Management: avoidance, oral immunotherapy (OIT), anti-IgE antibody (omalizumab)
7. Dermatitis
    a. Etiology and pathophysiology of allergic contact dermatitis and atopic dermatitis
    b. Distribution and clinical characteristics used in the 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 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
        i. Trigger avoidance
        ii. Pharmacotherapy
            1) Antihistamines (H1, H2
            2) Steroids
            3) Leukotriene inhibitors
            4) Biologics (omalizumab)
            5) C1-INH concentrate
            6) Bradykinin receptor antagonist (Icatibant) for hereditary angioedema)

INTERPERSONAL COMMUNICATION

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

Discuss diagnostic, therapeutic and preventive strategies for allergic and immunologic conditions with the patient and family members in a compassionate, effective manner.

The resident should demonstrate attitudes that encompass:

1. Awareness of the importance of coordinating care between family physicians, allergy/immunology subspecialists and other health care professionals to provide optimal patient care
2. Promoting a safe environment where patients and others involved in their care can actively engage in their care decisions
3. Assisting patients and others involved in their care in locating reputable medical information on the internet and other sources
4. Discussing internet safety and protecting health information

SYSTEMS-BASED PRACTICE

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

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.

The resident should demonstrate attitudes that encompass:

1. Developing an awareness of how social determinants of health intersect with allergic and immunologic conditions and using this knowledge to actively seek out ways to improve patient and community health
2. Recognizing the importance of family, community and environmental factors in the prevention and treatment of allergic and immunologic conditions
3. Awareness of the importance of cost-effective care in allergy and immunology

PRACTICE-BASED LEARNING

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

1. Be familiar with the appropriate application of evidence-based guidelines regarding allergic and immunologic conditions.
2. Acknowledge gaps in personal knowledge and expertise, and appropriately ask for feedback

The resident should demonstrate attitudes that encompass:

Lifelong learning and contributing to the body of knowledge about allergic and immunologic conditions.

PROFESSIONALISM

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

1. Demonstrate respect and sensitivity to patients and their families
2. Accept constructive feedback and provide constructive feedback to others

The resident should demonstrate attitudes that encompass:

1. Understanding of the personal and societal impact of allergic and immunologic conditions
2. Willingness to be accessible to, and accountable for, the residents' patients
3. Demonstrating awareness of implicit bias, particularly in relation to race and ethnicity

IMPLEMENTATION

The development of core cognitive knowledge and appropriate skills for the care of patients 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 discussions with the allergy/immunology consultant; evaluation of patients under the supervision of the allergy/immunology consultant; and participation in the 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 family medicine residency. Each resident's panel of patients in the family medicine center should include an appropriate number of patients who have allergic and immunologic conditions.

RESOURCES

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long-term prophylaxis. In: Saini S, Feldweg AM (Eds). UpToDate. Waltham, MA: UpToDate; 2025.

WEBSITE RESOURCES

American Academy of Allergy, Asthma & Immunology (AAAAI). www.aaaai.org

American College of Allergy, Asthma & Immunology (ACAAI). www.acaai.org

British Society for Allergy & Clinical Immunology (BSACI). www.bsaci.org/

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REVISIONS

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