



AMERICAN ACADEMY OF FAMILY PHYSICIANS

Recommended Curriculum Guidelines for Family Medicine Residents

Wound Care

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

Introduction

This AAFP 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. 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 skillset 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. These guidelines are periodically updated and endorsed by the AAFP and, in many instances, other specialty societies, as indicated on each guideline.

Please note that the term “manage” occurs frequently in AAFP Curriculum Guidelines. “Manage” is used in a broad sense indicating that the family physician takes responsibility that optimal and complete care is provided to the patient. To manage does not necessarily mean that all aspects of care need to be directly delivered personally by the family physician and may include appropriate referral to other health care providers, including other specialists, for evaluation and treatment.

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

Older adults make up a large percentage of the population in the United States, and the number of older adults continues to increase. With this growing population comes an increase in chronic diseases and their consequences. Family physicians frequently encounter patients who have chronic wounds that are the sequelae of advanced chronic health conditions and poorly controlled chronic diseases. These represent a significant, underappreciated source of morbidity and mortality, as well as a significant cost to the health care system. Twenty-five percent of all admissions of patients who have diabetes to an acute care hospital are for the management of chronic wounds. Many of these admissions end in limb amputation because of progression of a chronic wound. The five-year mortality rate of patients who undergo amputation due to a chronic lower extremity wound is almost 50 percent. More than \$46 billion is spent by Medicare annually on costs associated with chronic wounds. The chronic diseases from which nonhealing wounds develop are commonly encountered by the family physician.

Family physicians promote a whole-person approach to medical care and either assume management of chronic conditions (e.g., diabetes, hypertension, hyperlipidemia) or coordinate the patient’s care within the multidisciplinary team (e.g., for vascular disease, end-stage renal disease, malignancy). Chronic wounds are often the direct result of these chronic diseases or, at least, are comorbid with them. The healing of chronic wounds requires identification and proper management of underlying health problems. Chronic wound management and healing is necessarily a multidisciplinary and multispecialty team endeavor. The family physician’s skillset is required to help ill patients navigate the complex process of quickly and simultaneously addressing multiple critical health problems. It is important for this care to be coordinated with multiple specialty providers through multiple venues of care, as appropriate to the clinical situation.

Given their holistic view of and familiarity with their patients, family physicians are in a unique position to help patients prioritize care and establish realistic care goals. The relationship that patients have with their family physician is vital to understanding patients’ values, priorities, and life goals. A patient’s involvement in shared decision making depends on an understanding of factors including what a chronic wound

represents to a patient's overall level of health, the risk of morbidity and mortality associated with chronic wounds, and the cost and commitment required to heal a chronic wound. The family physician is best equipped to make sure the patient's values and best interests are served in a holistic approach to healing chronic wounds.

Competencies

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

- Demonstrate an understanding of the physiology of wound healing (Medical Knowledge)
- Apply knowledge of anatomy to the diagnosis and treatment of patients (Medical Knowledge)
- Formulate diagnostic treatment plans employing a thorough understanding of the underlying basic science principles of wound healing (Medical Knowledge)
- Provide compassionate and culturally appropriate patient care that recognizes the effect of skin problems on the patient and emphasizes the importance of comprehensive preventive care (Patient Care)
- Provide compassionate, coordinated wound management that emphasizes that wound management is as much about morbidity, mortality, and quality of life as it is about achieving wound healing (Patient Care)
- Acquire the ability to develop differential diagnoses and management plans through history and physical examination (Patient Care)
- Be proficient at treating wounds and performing procedures with a thorough understanding of pathophysiology (Patient Care)
- Demonstrate independence in the evaluation and management of all aspects of patient care, including pain management (Patient Care)
- Identify the social and economic needs of patients and their barriers to accessing and participating in a wound healing care plan (Patient Care)
- Demonstrate proficiency at triage of different wound types and associated comorbidities, such as vascular disease, infectious disease, radiation-induced tissue necrosis, and vasculitis/vasculopathy (Patient Care)
- Listen to patients and their families, with particular interest in the impact of the wound on their life and their care goals (Interpersonal and Communication Skills)
- Demonstrate compassionate, culturally competent communication strategies for interacting with patients, their families, and other individuals from diverse socioeconomic and cultural backgrounds (Interpersonal and Communication Skills)

- Demonstrate a high level of professional competence in order to coordinate an interdisciplinary care team to achieve a common outcome (Interpersonal and Communication Skills)
- Educate patients and their families about the patient's treatment plans and expectations (Interpersonal and Communication Skills)
- Demonstrate ethical principles, and maintain confidentiality of patient information, informed consent, and other business practices (Professionalism)
- Apply time management principles as necessary to be accountable to patients and other health care professionals (Professionalism)
- Demonstrate commitment to continuity of patient care (Professionalism)
- Analyze, critique, and review wound care literature to use an evidence-based approach to patient care (Practice-based Learning and Improvement)
- Teach and be a role model for medical students and other residents (Practice-based Learning and Improvement)
- Understand one's own clinical limitations, keeping in mind the need for frequent, intensive management of chronic wounds and the high risk of loss of limb (Practice-based Learning and Improvement)
- Consult with other members of the health care team to provide cost-efficient health care for patients (Systems-based Practice)
- Apply cost-effective care when ordering tests, selecting appropriate wound dressings, and applying chosen interventions (Systems-based Practice)
- Coordinate patient care within the health care system and understand the role of different venues of care and health care professionals as part of the interdisciplinary team in overall patient management, including wound care (Systems-based Practice)

Attitudes and Behaviors

The resident should develop attitudes and behaviors that encompass:

- Confidence in diagnosing and managing skin conditions related to wounds
- A positive approach to the psychosocial needs of patients who have wounds
- Familiarity with the broad spectrum of wound treatment modalities
- Willingness and ability to counsel and educate patients and to teach aspects of self-care to patients who have wounds and their caregivers
- Desire to learn and perform common dermatologic procedures
- Constructive relationships with other specialists, when appropriate

Knowledge

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

1. Basic understanding of wound care
 - a. Phases of wound healing (coagulation, inflammatory, proliferation, and remodeling)
 - b. Chronic wound physiology (prolonged inflammatory phase, disordered cytokine, and growth factor expression)
 - c. Appropriate wound description and its measurements (e.g., maceration, gangrene, lipodermatosclerosis, hemosiderin deposition, fibrin slough, necrosis of tissue)
 - d. Categories of dressings and most common examples
 - i. Dressings to dry (alginate and other absorptive agents)
 - ii. Dressings to wet (saline, emollients, water-based sustained-release gels)
 - iii. Antiseptic versus antimicrobial versus antibiotic
 - e. Basic understanding of venous stasis disease (lymphedema, chronic venous hypertension, etc.)
 - i. Understanding of compression therapy and available devices (Unna boots, compression stockings, etc.)
 - ii. Awareness of surgical interventions
 - iii. Awareness of sequelae (lipodermatosclerosis, chronic ulcers, frequent cellulitis, stasis dermatitis, etc.)
 - f. Basic understanding of diabetic and neuropathic lower extremity wounds
 - i. Awareness of the morbidity and mortality associated with undiagnosed, untreated foot wounds in the physician's population of patients who have diabetes
 - ii. Ability to recognize Charcot arthropathy, appropriately refer for management, and avoid unnecessary and dangerous procedures
 - iii. Understanding of, and ability to educate patients on, common changes associated with neuropathy, as well as routine foot care and screening
 - iv. Basic understanding of lower extremity offloading devices (total contact casting, offloading shoes, diabetic/neuropathic footwear)
 - g. Basic understanding of pressure wounds
 - i. Risk factors and screening tools
 - ii. Staging and common locations of pressure wounds
 - iii. Knowledge of the standards of care of treatment and their regulatory implications
 - iv. Knowledge of pressure-relief surfaces (beds, patient positioning, inappropriate devices/bedclothes)
 - h. Basic understanding of radiation injury and long-term consequences
 - i. Soft tissue radionecrosis, osteoradionecrosis, late effects of radiation, etc.
 - i. Routine and necessary components of a patient's wound history and physical examination

- i. Accurately describe dermatologic conditions
 - ii. Accurately describe wound size, depth, and etiology
 - j. Basic understanding of major factors that impede the healing process
 - i. Inflammatory conditions (infection, diabetes, trauma, autoimmune, malignancy, etc.)
 - ii. Circulatory issues (atherosclerosis, venous reflux, lymphedema)
 - iii. Nutritional deficiencies
 - iv. Social considerations (travel, social support, access to resources)
 - v. Local wound environment
 - 1. Necrotic tissue
 - a. Sharply debrided regularly, up to once weekly
 - 2. Bioburden
 - a. Antimicrobial, antiseptic, and antibiotic topical products
 - b. Removal of bioburden through cleansing and debridement
 - 3. Moisture balance
 - a. Dressing selection to maintain a moist healing environment to avoid desiccation and maceration
 - vi. Age-related skin changes
 - k. Acceptable rate of healing and when a wound should be considered chronic or nonhealing
 - i. The wound management plan should be reconsidered if there is not closure of the wound of at least 20 percent to 30 percent in the first four weeks of treatment.
 - 1. There is a significant impact on healing outcomes and rates of amputation if at least minimum healing goals are not achieved in the first four weeks.
2. Differential diagnosis in a patient who has a chronic wound
 - a. Comorbid conditions that lead to chronic wounds (e.g., obesity, diabetes)
 - b. Most commonly encountered wound types
 - c. Underlying pathophysiology of the most commonly encountered chronic wounds (pressure, arterial, venous, lymphedema, traumatic, inflammatory and atypical, malignant, etc.)
 3. Wound debridement options and techniques
 - a. Understand the need for wound debridement
 - b. Recognize when sharp debridement can be safely done in the clinic setting by the primary physician and which cases need referral to a surgeon
 - c. Define selective and excisional debridement (removing biofilm versus excision of necrotic tissue below the level of dermis)
 4. Bioburden management
 - a. Describe clinical signs that can be used to differentiate between infected and colonized wounds
 - b. Identify clinical scenarios in which antibiotics are indicated
 - c. Name available topical dressing options for bioburden management

5. Hyperbaric oxygen therapy
 - a. Recognize wound care indications for hyperbaric oxygen therapy approved by the Undersea and Hyperbaric Medical Society (UHMS) and the U.S. Food and Drug Administration (FDA)
 - i) Lower extremity diabetic ulcers
 - ii) Gas gangrene
 - iii) Crush injuries
 - iv) Necrotizing fasciitis
 - v) Refractory osteomyelitis
 - vi) Delayed radiation injury
 - vii) Compromised skin flaps and grafts
 - viii) Thermal burns
6. Cost-effective care
 - a. Identify the cost of dressing supplies and therapeutics regularly used in the wound clinic versus the primary care office
 - b. Outline appropriate ordering of tests and when to escalate to further testing (advanced vascular testing, evaluation for osteomyelitis)
 - c. Recognize the cost of treatment options and differentiate between long-term and short-term costs (e.g., cost of healing wounds versus cost of amputation)

Skills

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

1. History and physical examination appropriate for patients who have wounds
2. Biopsy of skin lesions and wounds (punch biopsy and excisional biopsy)
3. Application of topical anesthesia and injection of local anesthesia
4. Incision and drainage of an abscess
5. Sharp debridement with a curette and/or a scalpel
6. Proper choice of suturing materials and skin surgery instruments
7. Skin closure techniques, including nonsuturing (Steri-Strips, skin glues) and suturing techniques (simple interrupted, simple continuous, vertical and horizontal mattress, and subcuticular suturing)
8. Use of a handheld Doppler to evaluate peripheral vascular flow and recognize the difference in audible waveforms
9. Methods of hemostasis
10. Proper dressing application techniques
11. Proper choice and application of compression garments

Implementation

Depending on the individual's interest and the available recourse, implementation of this curriculum can be accomplished through one of the following:

- a. A longitudinal experience throughout the residency program via separate workshops, lecture series, inpatient consults, outpatient clinic, and nursing home visits
- b. A focused two or four weeks of elective local or travel rotation
- c. A focused two or four weeks of core rotation as part of the surgical requirement

Attending physicians should demonstrate proper technique and allow residents to actively participate in consults and procedures to achieve competence. Resident physicians who have demonstrated proper skills in caring for patients who have wounds should act as teachers and role models to other residents.

Resources

Bryant RA, Nix DP, eds. *Acute and Chronic Wounds: Current Management Concepts*. 5th ed. St. Louis, Mo.: Elsevier, Inc.; 2016.

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Jayesh BS, Sheffield PJ, Fife CE. *Textbook of Chronic Wound Care: An Evidence-Based Approach to Diagnosis and Treatment*. 1st ed. Flagstaff, Az.: Best Publishing Company; 2018.

Little SH, Menawat SS, Worzniak M, Fetters MD. Teaching wound care to family medicine residents on a wound care service. *Adv Med Educ Pract*. 2013;4:137-144.

Sheffield PJ, Fife CE. *Wound Care Practice*. 2nd ed. Flagstaff, Az.: Best Publishing Company; 2007.

Sussman C, Bates-Jensen BM. *A Collaborative Practice Manual for Health Professionals*. 4th ed. Philadelphia, Pa.: Lippincott Williams and Wilkins; 2012.

Website Resources

American College of Wound Healing and Tissue Repair. <http://ACWound.org/college>

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