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.

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 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 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.

Preamble

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. About 25% 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 the 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%. Medicare spends more than $46 billion annually on costs associated with chronic wounds. Chronic diseases that develop from nonhealing wounds are commonly encountered by family physicians.

With their whole-person approach to medical care, family physicians 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). 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 physicians' skillset is required to help ill patients navigate the complex process quickly and simultaneously address multiple critical health problems. It is important for this care to be coordinated with multiple specialty providers, as appropriate to the clinical situation.

Given their holistic view of, and familiarity with, their patients, family physicians are uniquely positioned to help patients prioritize care and establish realistic care goals. Patients' relationship with their family physicians is vital to understanding their 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 the 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.

Patient Care

At the completion of residency, residents should be able to:

1. Apply the knowledge of anatomy, pathophysiology and comorbidities to the diagnosis and treatment of patients
2. Develop differential diagnoses and management plans through history and physical examination
3. Recognize factors that contributed to the wound of the individual patient, including social/economic barriers, nutrition/protein deficiency, comorbidities (infection, diabetes, hypertension, venous stasis, end-stage renal disease, chronic heart failure, vasculitis, radiation, etc.), lifestyle (occupation) and health literacy

Medical Knowledge

Family medicine residents should demonstrate the ability to apply knowledge of the following:

1. Basic understanding of wound care
    a. Phases of wound healing (coagulation, inflammatory, proliferation and remodeling) and what defines a chronic wound
    b. Chronic wound physiology (prolonged inflammatory phase, disordered cytokine and growth factor expression)

   c. Appropriate wound and peri-wound description and measurements
      i. Wound: size, depth, drainage (type, amount), color of bed, type of tissue (healthy granulation, hyper granulation, fibrin slough, biofilm, eschar), tunnel, undermining, pain, odor
      ii. Peri-wound: Redness, edema, temperature, pain, maceration, induration/desiccation and sensation
   d. Categories of dressings and most common examples
      i. Dressings to dry (alginate, gauze and other absorptive agents)
      ii. Dressings to wet (saline, emollients, water-based sustained-release gels, hydrocolloid dressings)
      iii. Antiseptic versus antimicrobial versus antibiotic
      iv. Dressings to debride
      v. Basic but broad understanding of how to use dressings to promote epithelialization
2. Basic understanding of venous stasis disease
   a. Understanding of compression therapy and available devices (Unna boots, compression stockings, etc.)
   b. Awareness of surgical interventions
   c. Awareness of sequelae (lip dermatosclerosis, chronic ulcers, frequent cellulitis, stasis dermatitis, etc.)
3. Basic understanding of diabetic and neuropathic lower extremity wounds
   a. Awareness of the morbidity and mortality associated with undiagnosed, untreated foot wounds in the physician's population of patients who have diabetes
   b. Ability to recognize Charcot arthropathy, appropriately refer for management and avoid unnecessary and dangerous procedures
   c. Understanding of, and ability to, educate patients on common changes associated with neuropathy, as well as routine foot care and screening
   d. Basic understanding of lower extremity offloading devices (total contact casting, offloading shoes, diabetic/neuropathic footwear, etc.)
4. Basic understanding of pressure wounds
   a. Risk factors and screening tools
   b. Staging and common locations of pressure wounds
   c. Knowledge of pressure-relief surfaces (beds, patient positioning, inappropriate devices/bedclothes, etc.)
5. Basic understanding and recognition of lymphedema
   a. Primary lymphedema (congenital)
   b. Secondary (mechanical insult to lymphatic drainage)
      i. Common risk factors: infections, trauma, cancer surgery, radiation to lymph nodes, obesity, etc.)
   c. Importance of compression
6. Basic understanding of radiation injury and long-term consequences
   a. Soft tissue radiation necrosis, osteoradionecrosis, impairment of lymphatic drainage, late effects of radiation, etc.

7. Basic understanding of major factors that impede the healing process
    a. Inflammatory conditions (infection, diabetes, trauma, autoimmune, malignancy, end-stage renal disease, etc.)
    b. Circulatory issues (atherosclerosis, venous reflux, lymphedema)
    c. Nutritional deficiencies (low-protein states, zinc deficiency)
    d. Social considerations (travel, social support, access to resources)
    e. Local wound environment
        i. Necrotic tissue
            1) Need to debride regularly, either sharply or with chemical dressings
        ii. Bioburden
            1) Antimicrobial, antiseptic and antibiotic topical products
            2) Removal of bioburden through cleansing and debridement
        iii. Moisture balance
            1) Dressing selection to maintain a moist healing environment to avoid desiccation or maceration
        iv. Age-related skin changes
        v. Obesity (lymphatic impairment, pressure on wounds)
    f. 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 by at least 20-30% in the first four weeks of treatment
        ii. 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
8. 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 the dermis)
9. 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
10. Hyperbaric oxygen therapy
    a. Recognize wound care indications for hyperbaric oxygen therapy approved by the Undersea and Hyperbaric Medical Society and the U.S. Food and Drug Administration
        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

11. Cost-effective care
    a. Identify the cost of dressing supplies and therapeutics regularly used in the office setting
    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)
12. In the appropriate setting, the resident should demonstrate the ability to independently perform or appropriately refer:
    a. History and physical examination appropriate for patients who have wounds
    b. Biopsy of skin lesions and wounds (punch biopsy and excisional biopsy)
    c. Application of topical anesthesia and injection of local anesthesia
    d. Incision and drainage of an abscess
    e. Sharp debridement with skin surgery instruments
    f. Proper choice of suturing materials and skin surgery instruments
    g. Skin closure techniques, including non-suturing (Steri-Strips, skin glues, etc.) and suturing techniques (simple interrupted, simple continuous, vertical and horizontal mattress and subcuticular suturing)
    h. Use of a handheld Doppler to evaluate peripheral vascular flow and recognize the difference in audible waveforms
    i. Methods of hemostasis
    j. Proper dressing application techniques
    k. Proper choice and application of compression garments

Interpersonal Communication

At the completion of residency, residents should be able to:

1. Listen to patients and their families and inquire about how the wound affects the patient's life (quality of life, social stigma, mobility, ability to work, etc.) and what are their care goals
2. Educate patients and their families about the patient's treatment plan(s) and expectations
3. Promote a safe environment where patients and others involved in their care can actively engage in their care decisions
4. Assist patients and others involved in their care in locating reputable medical information on the internet and other sources
5. Discuss internet safety and the protection of health information
6. Be adaptable and knowledgeable about different approaches to wound healing
7. Provide care with honesty and integrity, serial assessments and a willingness to try a different approach if a wound is not healing with initial treatment
8. Demonstrate a high level of professional competence to coordinate an

interdisciplinary care team to achieve a common outcome

Systems-Based Practice

At the completion of residency, residents should be able to:

1. Apply cost-effective care when ordering tests and select appropriate wound dressings, durable medical equipment supplies and chosen interventions
2. 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

Practice-Based Learning

At the completion of residency, residents should be able to:

1. Demonstrate a commitment to the continuity of patient care
2. Analyze, critique and review wound care literature to use an evidence-based approach to patient care
3. Teach and be a role model for medical students and other residents
4. Understand one's own clinical limitations, keeping in mind the need for frequent, intensive management of chronic wounds and the risk of limb loss

Professionalism

At the completion of residency, residents should be able to:

1. Provide wound care in a compassionate and culturally appropriate manner that takes into consideration the patient's care goals, health literacy and access to resources
2. Willingness and ability to counsel and educate patients and their caregivers and teach aspects of self-care to patients who have wounds
3. Maintain a positive approach to the psychosocial needs of patients who have wounds
4. Develop and maintain constructive interprofessional relationships with other specialists, where appropriate

Implementation

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

1. Longitudinal experience throughout the residency program via separate workshops,

lecture series, inpatient consults, outpatient clinic and nursing home visits
2. Focused two or four weeks of elective local or travel rotation
3. 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 and medical students.

Resources

Albanna MZ, Holmes JH IV, eds. *Skin Tissue Engineering and Regenerative Medicine*. New York, NY: Elsevier Inc.; 2016.

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

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. *Wound Care. 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. https://acwhtrlive.com/

Revisions

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