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Imperative: Advanced Physician Training in Wound Care

Sandra K. Rosenberg*

Department Rehabilitation Medicine, University of Minnesota Medical School, USA

*Corresponding author: Sandra K. Rosenberg, Department Rehabilitation Medicine, University of Minnesota Medical School, USA.

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Abstract

Complex wound care is a rapidly advancing field of medicine. Scientific knowledge quickly expands as the number of patients effected increases and associated costs proliferate. This is occurring in an environment of deficient medical training and inadequate knowledge among physicians responsible for these patients' care. Heightened awareness of this burgeoning problem is needed. Advanced physician training and recognition of those physicians is imperative to address these complex patients.

Key words: Complex wounds; Education; Multidisciplinary team

Abbreviations: United States Dollar: USD; World Health Organization: WHO; American Board of Wound Medicine and Surgery: ABWMS.

Introduction

In the United States the incidence of non-healing cutaneous wounds affects over 8 million patients per year. This compares to 6 million estimated patients with heart failure and 3.5 million patients with breast cancer in 2019 [1,2]. It was originally estimated that wound care volume would result in cost to the healthcare system of over 20 billion dollars by 2015. Recent findings have shown that the 2015 cost to be closer to 50 billion dollars [3,4]. Fortune Business Insights, looking just at products related to wound care, recently reported in March 2021 that "The global chronic wound care market size is projected to reach USD 16.36 billion by the end of 2027" [5]. With an aging society combined with increasing comorbidities it is expected there will be an increase in the number of surgical wounds, pressure wounds, venous leg ulcerations, diabetic wounds, traumatic and other wounds, that will be at risk for poor and/or non-healing. Wound healing is a complex process that involves integration of numerous clinical and biochemical pathways with coordination of multiple medical specialties and disciplines. It is imperative that scientists and clinicians be aware of this burgeoning and needy population.

Discussion

The replacement of injured or damaged tissue can be compromised by multiple factors including, but not limited to obesity, diabetes, smoking, vascular disease, infection, renal failure, cancer, and malnutrition. A classic example of a non-healing wound is the diabetic foot ulcer. With decreased sensation and frequently concomitant peripheral vascular disease, chronic ulcers can easily form in this ever-growing population. The World Health Organization (WHO) has reported that the number of people with diabetes rose from 108 million in 1980 to 422 million in 2014 with prevalence rising more rapidly in low and middle-income countries [6]. These numbers are only a portion of the increasing number of patients worldwide with chronic non-healing wounds that will need care. Complicating the situation is the lack of formal advanced education for physicians on the science and treatment of non-healing wounds.

Comprehensive advanced chronic wound education is severely lacking. Though data on global education is scarce Patel and Grnick reported in 2008 that "The total hours of required wound ed-



ucation received in the United States was 9.2 hours in the 4 years of medical school. In the United Kingdom, the total time devoted to wound-related issues equaled 4.9 hours over 5 years. In Germany, a total of 9 hours of wound education was provided over 6 years" [7]. Yim and Sinha in 2014 found, by surveying medical schools in the United States, only 7 of 55 schools reported a formal wound healing elective [8]. Most patients with problem wounds are often being seen by family physicians and other primary care specialists. A survey reported in 1997 in the *Journal of Family Practice* found 99% of surveyed primary care physicians felt responsible for pressure ulcer care, but 70% reported lack of adequate training [9]. Clearly, further advanced education and training is needed.

Medical problems associated with and contributing to non-healing wounds present a challenge to the medical system since strategies designed to establish effective wound healing are dependent upon recognition of the precise cause(s) of the wound, identification of comorbidities, understanding prescribed therapeutic regimens, detecting concurrent infection and/or sepsis, peripheral vascular disease, vasculitis, malignancy, cardiac/renal/hepatic abnormalities, endocrine/rheumatological disorders, musculoskeletal/physical limitations, nutritional deficiencies, medication effects and contributing skin diseases. All are important parts of the evaluation. Not only are there systemic factors contributing to poor or stagnant wound healing, but there is a plethora of biochemical and regenerative properties of wound healing scientific knowledge based on rapid advancements in research that need to be regularly reviewed, understood, and integrated. In addition, social issues, fiscal constraints, dietary restrictions, cultural practices, and physical barriers effecting individual patients must be considered. Only then can a true comprehensive optimal treatment plan be developed.

The educated physician can institute a multidisciplinary treatment plan which may include labs, imaging, specialty referrals, nursing care, surgical care, pharmaceutical agents, biologic modalities, pain control, physical therapy, dietary modification, social services, and adjunctive medical devices (i.e., dressings, compression, specialized or modified footwear, prostheses, negative pressure therapy, hyperbaric oxygen, etc.). Multiple factors need to be considered to design appropriate interventions to maximize healing. The clinician must always keep in mind to not cause inadvertent harm. Patient safety and successful healing depend upon a physician who is knowledgeable not only about current wound care medical science, but also about the diagnosis and treatment of the different diseases that alter effective wound healing. The clinician must properly evaluate a patient's non-healing wound and guide the required different specialists and disciplines to work as a team, utilizing all the appropriate modalities to maximize the ability to heal and decrease the risk of recurrent injury. This physician is the advanced wound care specialist with sophisticated wound knowledge and training, understanding that the multidisciplinary coordinated team is the heart of clinical excellence in wound care.

It is essential that advanced wound care clinicians trying to provide the highest level of patient care coordinate a multidisciplinary wound care team. Studies support this approach. In Denmark, Holstein and Ellitsgaard published data in 2000 in *Diabetologia* show-

ing that wound management in a multidisciplinary set up resulted in a 75% decrease in the incidence of major amputations in diabetics. They concluded that "a multidisciplinary approach is required to decrease the risk of major amputation, wound infection and occurrence of the wounds themselves" [10]. Musarrat and Zahid in the *International Wound Journal* in February of 2019 reported a fall in diabetic lower extremity amputations from a high baseline of 27.5% down to 3.9% when a multidisciplinary diabetic foot care team was implemented [11]. Yet this comprehensive knowledge base of medicine, science, and expertise with coordination of a team does not fall within any now existing traditional medical or surgical specialty or subspecialty.

The expertise of the advanced wound care physician traverses many existing, traditional medical and surgical specialties without totally falling into the purview of any one group. Plastic surgery, general surgery, orthopedic surgery, vascular surgery, infectious disease, endocrinology, rheumatology, physical medicine and rehabilitation, dermatology, and primary care (general internal medicine, family practice, and emergency medicine) all contribute to the knowledge base and clinical experience involved when treating problematic, non-healing wounds. The advanced wound care physician draws from each, and more, of these areas of expertise, to properly assess a patient's problem(s) and formulate a comprehensive plan of treatment to reestablish and promote effective wound healing. Work is done to control pain, correct metabolic dysfunction, avoid adverse medication effect, minimize financial outlays, and avoid social disruption. The wound care specialist is the 'architect of wound healing' who assembles a team of expert practitioners working in a timely sequence to achieve a healed wound utilizing appropriate modalities. Without the trained wound care physician's expertise and leadership, the effort easily becomes splintered into a series of interventions that may be necessary, but unlikely to be successful alone. Healing is impaired and with it there is significantly increased risk of amputation, functional loss, pain, depression, social isolation, infection, sepsis, hospitalizations, and increased mortality. The care and safety of the patient is compromised. The costs to patient and the healthcare system accelerate.

Conclusion

The science of wound medicine is advancing and changing quickly. The aging population with its multiple concurrent comorbidities is increasing. The global incidence of diabetes and obesity are rising. The needs of a rapidly growing number of patients with complex wounds needs to be addressed. Costs are skyrocketing. It is only the educated, advanced wound care physician, knowledgeable about the causes, pathophysiology, natural history, associated comorbidities, prognosis, and treatment of problematic, non-healing wounds, who can safely and efficiently orchestrate an interdisciplinary and multispecialty team to meet the needs of these difficult patients. However, training is lacking. Organizations, such as the American Board of Wound Medicine and Surgery (ABWMS), have been developing wound fellowships to educate physicians [12]. Discussions are ongoing with the American Osteopathic Association and the American Board of Medical Specialties to address the need for subspecialty certification. As medicine advances so

does wound care. Advanced education for physicians and increased awareness of the impact of complex wounds is imperative.

Acknowledgement

None.

Conflict of Interest

Dr. Rosenberg serves on the Board of Directors of ABWMS.

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