CRITICAL REVIEW

Education in Wound Management in Europe with a Special Focus on the Danish Model

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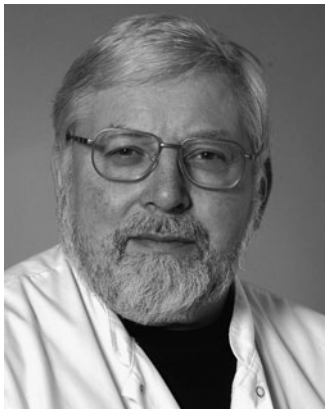
Background: Standardized education and training programs are fundamental for the establishment of a healthcare structure within wound management.
The Problem: Presently, however, wound healing education is only included to a minor degree in the education of nurses and medical doctors, and there is no consensus in Europe on the minimum education program needed to be an educated expert in handling wound patients.
Clinical Care Relevance: In this article, educational initiatives and models for education of medical doctors and nurses in Europe and especially in Denmark are described.
Conclusion: The goal for the future should be to achieve a general consensus on the minimal education program, and in Europe this could be achieved as a collaboration between the Educational program of European Wound Management Association (EWMA and national programs).



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Abbreviations and Acronyms

CWHC = Copenhagen Wound Healing Center
EWMA = European Wound Management Association
UWHC = University Center of Wound Healing

INTRODUCTION

STANDARDIZED EDUCATION and training programs are one of the most important factors in the establishment of a healthcare structure within wound management.[1,2] If the creation of an advanced structure is not followed by a significant level of education for all staff working in the area of problem wounds, the structure probably will collapse, because a certain degree of education and training is needed to improve and optimize wound treatment. Presently, wound healing education is only included to a minor degree, in the pregraduate education of nurses and medical doctors. Despite an effort to correct this, there is a need for other initiatives.

In multidisciplinary educational programs, it is important that admission is open to qualified applicants from all relevant medical specialties. The program may be modular, addressing the deficiencies in the educational background of the individual applicant. Candidates with a medical background would require additional training in surgical disciplines to develop an understanding of indications and contraindications for procedures and anticipated outcomes and to attain skill in wound-related surgical procedures. Surgical candidates would require additional exposure to principles of internal medicine, dermatology, rheumatology, geriatrics, and other specialities to broaden the scope of differential diagnoses and nonsurgical treatment options. Several obstacles must be addressed,[3] including definition and objectives, the selection of a qualified program director, defined candidate qualifications for being included, fellow responsibilities during the program,

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environment requirements, equipment and clinical facilities, scholarly activities, research opportunities, clinical rotations and condition of work, accreditation, and funding.

Educational challenges include determining program content and at what academic level. Internationally, countries have differences related to culture, services, stage of development, and access to product and reimbursement. A variety of problems and possibilities arise, but developing effective educational programs must include the political, social, and healthcare delivery system of the host country. The recognition of educational and training problems has resulted in the establishment of educational development projects and groups in different international societies and the establishment of training programs for medical doctors as well as nurses.[3,4]

Most patients with problem wounds also have a comorbid medical problem and, for this reason, are most often addressed by the family physicians and to a lesser extend by specialists.[3] In fact, 99% of surveyed primary care physicians feel that they are responsible for pressure ulcer care, but 70% feel they have inadequate training to produce such care.[5] In Sweden, 74% of nurse students said that they had < 10 h of tuition on leg ulcer care, and 78% had never seen a Doppler as a part of leg ulcer patient assessment. Eighty percent said that they need more education especially related to wound etiology, documentation, and monitoring of treatment.[6]

Distance learning and other educational formats are also possibilities, which could be used in wound education. However, no other specialty residency program in medicine would accept less than a formal face-to-face patient care-driven educational experience. Similar conditions can be argued for other type of staff; for this reason, these educational possibilities will not be further discussed in this chapter.

EDUCATIONAL MODELS

European models

European Wound Management Association (EWMA) is an umbrella organization for national European wound societies. The EWMA Educational Program is focusing on the production of a flexible framework for the delivery of wound management education and thus has raised the profile of wound care in a variety of healthcare settings. This shall be achieved without taking away professional autonomy in different countries for determining standards. The objectives are to foster collaboration and develop a management curriculum framework and quality assurance process in the form of benchmarking standards. Ten modules on specific subjects (such as patient and wound assessment, wound infection, and pressure, leg, and diabetic foot ulcers) have been completed. These modules are standards for education in wound healing and outline a minimum content for education on each topic. With these modules as background, EWMA is developing an evaluation instrument, which can evaluate education programs in wound healing and care. Using these criteria for education programs in Europe, the goal is to make a European standard for what is needed in an accepted educational program (a "Minimal Education Set"). Certification will be given by EWMA after each education initiative has been evaluated and accepted. Currently, 42 European and International courses on wound management are endorsed by EWMA (evaluation of course content, provisioning, etc., made on the basis of the above curriculum).

Additionally, EWMA offers the EWMA University Conference Model, which allows students of wound care to complete part of their training through participation in the EWMA Conference. A new educational imitative starting in the fall of 2011 is the EWMA-supported network on wound management training and education. The objective of this initiative is collaboration and coordination between European teaching institutions, education planners, teaching professionals, and clinical working wound healers.

Different types of educational initiatives have been initiated in national societies and single institutions all over Europe. In France, a three-level education model was established in 1997, and after finishing all levels, the candidates have to pass a written examination and produce a thesis before they are accepted. The course is called "University Diplomas in Wound Healing." In England and Wales, certificate programs for different groups of healthcare providers have been developed and these programs have also increased the level of wound healing and care education.

The Danish model

The Danish model for treating problem wounds consists of two major centers and several minor wound care teams specialized for wound treatment.[1,2,4,7,8] A "wound healing center" is defined as a multidisciplinary department with both an outpatient clinic and an inpatient ward, where staff is dedicated full time to wound healing problems. A "wound care team" is defined as a minor multidisciplinary group of wound healers in the local area, which collaborates with the wound healing

Table 1. *Important factors for the establishment of optimal expert concept*

1. Multidisciplinary concept
2. Implemented in the national healthcare
3. Involving both primary and secondary healthcare sectors
4. Standard wound classification
5. Standard registration of data
6. Standard treatment plans and programs
7. Standard educational and training programs
8. Standard team organization and "gate-keeper"
9. Research plans
10. Cost-effectiveness plans
11. Quality assurance plans

Source: Gottrup *et al.,* 2007.[2]

center.[9–12] Clinically, the organizational model consists of two major wound healing centers, which are built as hospitals units with their own staff and inpatient beds (Copenhagen Wound Healing Center [CWHC], The University Center of Wound Healing [UWHC] in Odense). In the CWHC there are more than 50 full-time employees dedicated to wound care, and in UWHC more than 40 persons are working full time on wound treatment. Important factors for the establishment of an optimal expert concept are shown in Table 1.

The educational activity described in the following section is based on the function of these centers and in collaboration with the Danish Wound Healing society.

The Danish education for nurses

In Denmark the "postgraduate education for nurses working with wounds" started in 1997 and in 2008 it was changed to a diploma course. Presently, about 400 nurses have passed these educational programs. The program for the original course lasted 6 months and consisted of four modules and essay work. The aims of the educational courses are to develop and improve nursing care, treatment, and prophylaxis to patients with wounds. The diploma type of education also consists of modules, but these can be combined with other types of nurse specialities.

Documentation and evaluation of the nurse during observation, assessment, and treatment of wounds is the critical parameter. In practice, 25 participants of each course were selected by their documented knowledge of wound care and the distribution is equal from the primary and secondary healthcare sectors as well as geographically. The education consisted of modules and the participants produced a project paper related to a wound problem that they had experienced in their own practice. A questionnaire has been distributed to examine the importance of the courses for each participant. A 2-day follow-up meeting is performed at 1 year after the end of the course. The results from the earlier courses was that the participants in most cases were able to stimulate the healthcare administrators at their local hospitals to organize new wound care services and to achieve increased salary as expert-level clinicians in healthcare. The results of the questionnaire show that each participant had increased their knowledge and competence to treat patients with problem wounds. The participants obtained a certificate and the title of "Nurse Specialist in Wound Healing." This allows negotiations for specific employments and extra salary.

After the diploma course is completed, it is still the hope that this education can be the basis for the establishment of a formalized national specialist education program for nurses working in wound care.

The Danish medical doctor education

An organizing group of the Danish Wound Healing Society, chaired by the author, has been working on the establishment of an expert area in "Clinical Wound Healing" related to the speciality of surgery. All specialities interested or relevant are invited to participate. The suggestion was based on the existing structure of the healthcare system, but with new elements focusing on wound problems especially.[3,9]

An important part of an expert concept is a plan for a standardized education of the staff. Both pregraduate and postgraduate educations are needed.

A three-level competence model has been proposed as follows:

Level I: The basic education of all specialist doctors. The education is primarily theoretical and should be included in all specialist programs.

Level II: The education for doctors in wound healing teams and on specialized hospital departments treating problem wounds. The education is both theoretical and practical, should last 12 months, and takes place in a specialized wound healing center.

Level III: The education for specialized doctors employed at wound healing centers. The education has a theoretical and practical part of which the latter should last 24 months. Of this, at least 12 months should take place at a specialized wound healing center and the remaining months on a relevant specialized department. This education has to be achieved after the physician has completed his specialty degree in a relevant specialty (plastic, vascular, orthopedic, and general surgeries, dermatology, internal medicine, geriatrics, and others). The level III physician should document knowledge

Table 2. *Educational training topics for physicians in clinical wound healing in Denmark*

Theoretical Aspects

General knowledge:

1. The wound healing process and influencing factors
2. Physiology of tissue perfusion and oxygenation
3. Pathophysiology of all type of problem wounds
4. Principles in the use of tissue perfusion assessment
5. Principles in the use of imaging, vascular imaging, and anatomy
6. Principles in the use of dressings (moist wound healing, etc.)
7. Principles in the use of antibiotics, antiseptics, etc.
8. Principles in the treatment of pain

Specialized knowledge related to involved medical specialities:

1. Dermatology (immunological, dermatological, allergy, and malignant wounds)
2. Internal medicine (endocrinological factors, diabetes)
3. Vascular surgery (treatment possibilities, revascularization methods)
4. Orthopedic surgery (surgical procedures especially in the diabetic neuropatic foot ulcers)
5. Plastic surgery (surgical procedures like flaps and skin tranplantation)

Clinical and Technical Competences

Type of wounds (neuropathic foot ulcers [specially diabetic foot ulcers], venous leg ulcers, aterial leg/foot ulcers, pressure ulcers, immunological wounds, acute problem wounds):

1. Differential diagnostic considerations
2. Create a diagnostic plan
3. Create a treatment plan with considerations to conservative and surgical procedures
4. Create a follow-up plan including prophylactic considerations

General technical skill:

1. Have provided or assisted to at least 20 surgical procedures of the diabetic foot
2. Have provided or assisted to at least 10 split skin transplantations
3. Have provided or assisted to at least 10 surgical procedures for varicose veins
4. Have provided anesthesia of a toe and made a revision of the toe
5. Have provided biopsies of different wounds

Other Competences

A specific level of competence in:

1. Communication
2. Multidisciplinary collaboration
3. Administrative/chief experience
4. Academic/research experience

Source: Gottrup, 2011.[8]

both in the theoretical background of the wound healing process in general and in relation to the involved specialty, with practical and technical skills in relation to the treatment of different types of problem wounds (Table 2). These skills will be achieved both by performing different types of courses and through actual clinical practice. The goal is that the physician who completes this education should be able to function as the team leader for a wound healing group in a major nonacademic hospital and apply for a specialist wound healing consultant position at a university hospital.

Related to the establishment of an expert area in "Clinical Wound Healing," a 2-year additional educational experience, after finishing basic specialty training, has been developed for medical doctors. Educational training topics are listed in Table 2. All specialties interested or relevant are invited to participate. The suggestion is based on the existing structure of the healthcare system, but with new elements specially focusing on the wound problems.[3,9] Both pregraduate and postgraduate educations are needed. This education is presently implemented in the Danish Medical Associations educational system and is expected to be started up in the coming year.

CONCLUSION

The wound healing and care area is heterogeneous with respect to education of people working with problem wounds and there is presently no consensus in Europe on the minimum education program needed to be an educated expert in wound healing and care. Different models have been developed and the Danish educational experience for nurses as well as medical doctors is described. The goal for the future should be to achieve a general consensus on the minimal education program, and to achieve this collaboration between EWMA Educational program and national programs is severely needed.

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