

WOUND CURRICULUM FOR STUDENT NURSES

EUROPEAN
QUALIFICATION
FRAMEWORK
LEVEL 4



Wound curriculum for student nurses: – European Qualification Framework Level 4

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1. Introduction and background

In recent years, the care of people with chronic wounds has made enormous progress throughout Europe. However, aging populations, more complex wounds and advanced diagnostics are big challenges, especially because more people with chronic wounds are treated in their own homes. Bringing existing evidence-based and best practice knowledge to all nurses is a key objective of the European Wound Management Association (EWMA).

The EWMA has previously published curricula for professional* nurse education intended for use in post-registration qualification in wound management on Levels 5–7 of the European Qualifications Framework (EQF). The aim of these curricula is to support a common approach to pre- and post-registration qualification in wound management for nurses across Europe. The curricula were developed by working groups representing different European countries and providers of education.

However, as vocational qualifications throughout Europe are not uniform and pre-registration curricula may differ, there has been an unmet need to develop a curriculum covering pre-registration nurse education, to provide a starting point for increased and standardised education in wound care. This curriculum presents a framework and key content on skin integrity and wound care that is recommended for inclusion in student nurse curricula (general nurse education). In most European countries, this curriculum corresponds with the European Qualification Framework (EQF) Level 4. In combination, the full series of EWMA curricula can thus be adapted to meet the

competencies expected at Level 4, progressing into Levels 5, 6 or 7.

1.1 Method and development

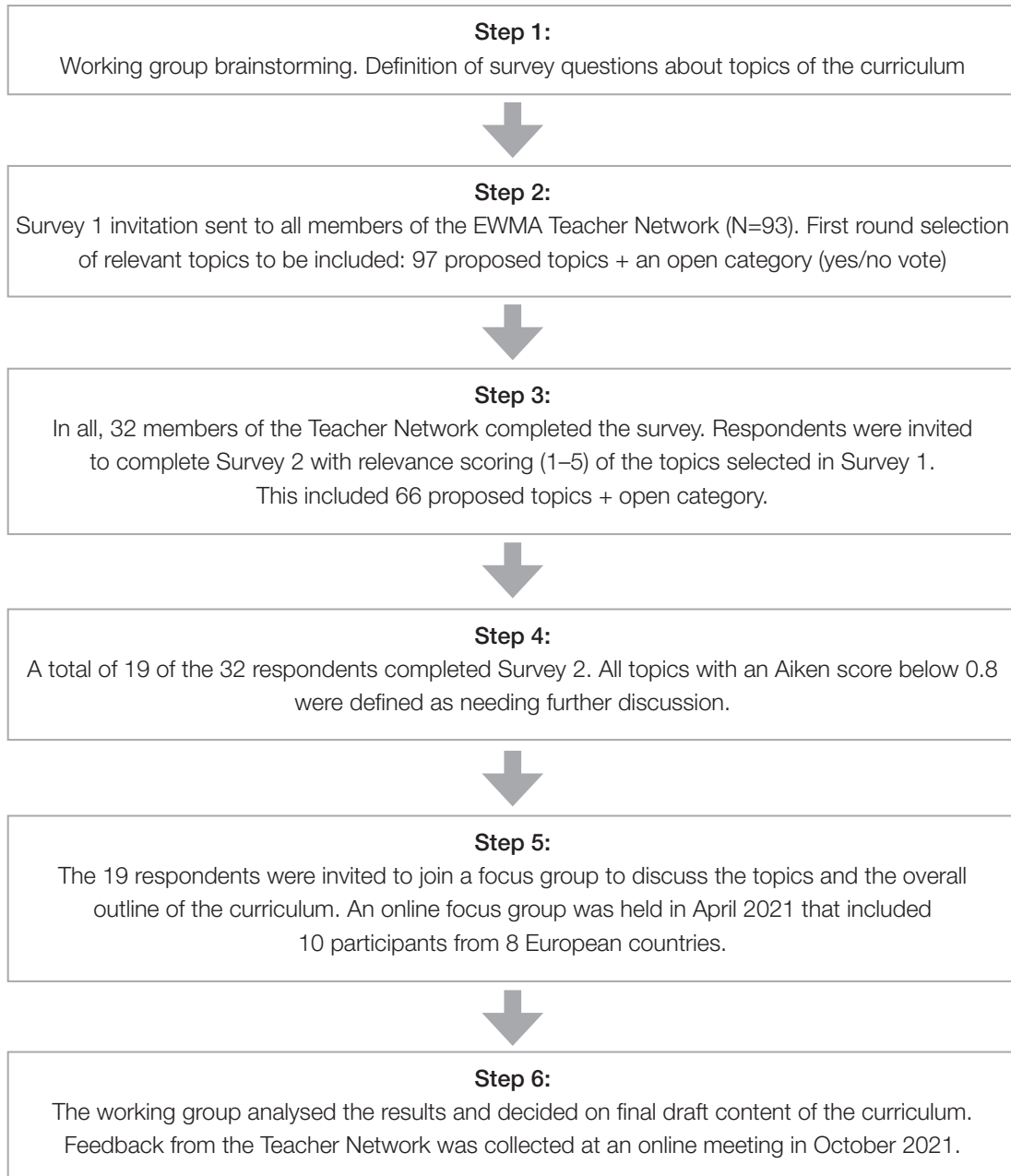
The curriculum was initiated by the EWMA and developed in collaboration with the EWMA Teacher Network, which aims to gather and ensure knowledge-sharing among wound management educators from across Europe. A working group, representing different European countries, was established for this purpose (see the colophon for information about the members of the working group).

The curriculum was developed using a Delphi process with engagement from members of the EWMA Teacher Network. The Delphi process included a two-phase survey and was concluded with a focus group that met in April 2021 (see Figure 1).

As the rationale for developing this curriculum is based on an awareness of the high degree of variation in the provision and level of teaching related to wound management in pre-registration nurse education across Europe, the curriculum working group acknowledges that different professional requirements and curricular structures exist across Europe. The curriculum is therefore designed to be flexible and adaptable to local or national requirements and structures.

This will be further explained in the sections below (1.2–1.4), and in the section on implementation (section 4).

Figure 1: Curriculum development process, including the Delphi process



1.2 Scope, aims and objectives of the curriculum

This curriculum considers that individuals with complex skin care needs or acute and chronic wounds require specific interventions related to their clinical presentation. The challenges related to multiple co-morbidities also need to be taken into consideration. To be able to apply a holistic

approach to and provide effective management of individuals with complex skin care needs or wounds, nurses require specific knowledge, practical skills and an awareness of patient safety, wound care, the patient's overall status and interdisciplinary teamwork.

The nursing process provides the overarching

framework for the curriculum and considers the outcomes of the interventions during care delivery (prevention, diagnostics and treatment). The curriculum presents the most important nursing interventions required for assessment, planning and evaluation related to individuals with acute and chronic wounds. The curriculum aims to provide students with the theoretical and practical skills to support appropriate decision making (evidence-based nursing and practice, problem-based learning and practical-based learning).

A professional scope of practice and code of conduct are considered fundamental and essential components for guiding nursing practice. Clear guidance should be provided and defined with regards to professional boundaries. These boundaries are, however, typically defined according to national or local recommendations or legislation and have therefore not been provided within the curriculum, though they can be added as appropriate.

1.3 Curriculum framework/delivery

The curriculum is designed in a modular structure and includes 15 units of study. The described learning outcomes correspond with EQF Level 4. The units of study are presented as either being principles of 'skin and wound care' or as 'applied skin and wound care'. They are numbered according to the recommended order, but do not need to be taught in this order. The order may

be adjusted by the educator, considering national curriculum and local circumstances; however, all units must be covered in the full undergraduate curriculum.

The learning outcomes, describing what students should be able to achieve by the end of the course, are related to the competencies, skills and knowledge required for fulfilling the skin and wound care-related obligations of a general nurse. This is further described in Section 2.

Workload

(example/recommended number of hours):

Due to the variations in structures, classifications and levels of education in the undergraduate/pre-registration nurse education programmes across Europe, a specific number of hours or credits is not defined for this curriculum.

Despite the above, an example of a suitable timeframe for the total curriculum may be a three-year programme, and an adequate allocation of time for the curriculum may be 46 hours (1% of the total time allocation of 4600 hours over a three-year time period). These hours would include classroom teaching, applied learning in clinical practice and assessment. If the content is defined via the European Credit Transfer and Accumulation System (ECTS), the total programme is suitable for adjustment to 2% of the total ECTS**.

*Professional nurses' refers to registered nurses in a specific country who are allowed to work independently.

**There are European Credit Points (ECTS) conversion tables available (insert references) that can be used to convert the amount of time per module into hours, in terms of student workload. The accepted conversion is that 1 credit corresponds to approximately 25–30 hours of the students' workload.

2. Learning goals and outcomes

The curriculum summarises the required learning goals associated with the interprofessional and interdisciplinary work related to managing individuals with wounds.

Learning goals (outcomes) are presented under all the units in the following categories, according to Bloom's Taxonomy (original taxonomy).¹

- Knowledge/cognitive (K)
- Pragmatic, psychomotor skills (P)
- Awareness/behaviour (A)

The category 'knowledge/cognitive' (K) includes theoretical knowledge about the principles of skin and wound care as well as treatments of skin and wounds. The category 'pragmatic, psychomotor skills' (P) includes the application of knowledge in practice and clinical skills. Finally, the category 'awareness/behaviour' (A) refers to the implementation of knowledge and skills into practice and to interactions with individual patients.

For each category, a taxonomy is defined with increasing levels of expertise. The taxonomy expresses the level of expertise required to achieve each learning outcome. Learning outcomes should be measurable, and higher levels of expertise require more sophisticated assessment methods. This curriculum constitutes the basic level, as it is intended as a pre-registration curriculum. The learning outcomes should reflect this.

As this curriculum is proposed for incorporation into existing programmes in different European countries, specific details of the teaching and learning methods and assessment and evaluation methods are not included. These should follow the structures defined by the specific education provider, while incorporating the content and learning objectives provided in this curriculum according to local legislation and procedures (law and accreditation processes).

References

1. Martin KS. The Omaha System: A Key to Practice, Documentation, and Information Management. Health Connections Press, 2005.

3. Units of study

The units of study included in this curriculum are divided into two categories:

1. Principles of skin and wound care
2. Applied skin and wound care principles

The total list of units of study can be found below.

Principles of skin and wound care

- Unit 1. Anatomy and physiology of the skin
- Unit 2. Skin care
- Unit 3. Wounds and wound healing
- Unit 4. Assessment of patients and wounds
- Unit 5. Wound management (cleansing, debridement, wound bed preparation)
- Unit 6. Dressings
- Unit 7. Wound microbiology / infection
- Unit 8. Wound pain

Applied skin and wound care principles

- Unit 9. Acute wounds: Surgical and trauma
- Unit 10. Pressure ulcers (PU)
- Unit 11. Moisture-associated skin damage
- Unit 12. Skin tears
- Unit 13. Venous leg ulcers (VLU)
- Unit 14. Ischemic leg ulcers
- Unit 15. Diabetic foot ulcers (DFU)

3.1 Unit content

Unit 1: Anatomy and physiology of the skin

1) Aim:

This unit aims to provide knowledge and understanding of the anatomy of the skin and the physiology of the skin, including changes due to aging.

2) Timeframe:

This unit should be taught early in the nursing programme, preferably during the first half of the first year.

3) Learning outcomes:

These learning outcomes must be related to (or aimed at) the competences in wound care described in the previous section.

After completing this unit, students will be able to:

- Describe the anatomical structure of the skin (K)
- Describe the function of the skin (K)
- Identify changes in the skin due to aging (P)
- Recognise the importance/effect of aging in the function of the skin (A)
- Recognise that skin conditions can present differently in people with darker skin tones (A)

4) Content:

- Skin anatomy
- Skin physiology: function
- Effect of ageing on the skin
- Skin colour and skin conditions in darker skin tones
- Practical examples

Unit 2: Skin care

1) Aim:

This unit aims to provide knowledge and understanding of the principles of skin assessment, recognising fragile skin in all skin colours and common skin conditions.

2) Timeframe:

It is recommended that this unit be taught early in the nursing programme, preferably during the first half of the first year.

3) Learning outcomes:

After completing this unit, students will be able to:

- Discuss the principles of skin assessment

in relation to a range of skin colours (K)

- Describe the principles of skin care to maintain healthy skin (K)
- Discuss the principles of periwound skin assessment and management (K)
- List the range of common skin conditions related to moisture-associated skin damage (P)
- Recognise the importance of identifying individuals with fragile skin (A)

4) Content:

- Principles of skin assessment in all skin colour types
- Skin cleansing and moisturisation
- Atopic and contact dermatitis
- Introduction to moisture-associated skin damage (MASD)*
- Periwound skin management
- Documentation of skin assessment and care planning
- Education of the patient / carer in self-care to maintain healthy skin
- Practical examples

*MASD is covered in greater detail in Unit 11

Unit 3: Wounds and wound healing

1) Aim:

This unit aims to describe the physiological process of healing, the phases of this process and the factors that may alter it. The unit will also introduce the basic principles of the moist environment therapy for wounds.

2) Timeframe:

It is recommended that this unit be taught early in the nursing programme, preferably during the first half of the first year.

3) Learning outcomes:

After completing this unit, students will be able to:

- Describe the physiological healing process and its phases (K)
- Explain the concept of hard-to-heal or chronic wounds (K)
- Explain the factors that can delay or stop the

healing process (K)

- Explain the concept underpinning the use of moist environment therapy for wounds (K)
- Associate the clinical presentation of a wound with the healing phases (P)
- Apply the principles of moist therapy and wound bed preparation (such as the TIMER model) to the care of patients with wounds (P)
- Be aware of the importance of the correct identification of the situation of the wound in the healing process for wound management (A)

4) Content:

- Wound healing: Physiology of healing and phases
 - Normal wound healing
 - Phases of wound healing: haemostasis, inflammation, proliferation and remodelling
- Wound healing: types
 - Primary healing
 - Secondary healing
- Wound healing: Factors affecting healing
 - Intrinsic and extrinsic factors that delay healing
 - Factors that promote healing.
- Nutrition: Effects on healing
- Basic nutritional assessment
- Principles of moist wound therapy
 - Wound bed preparation
 - TIMER and TIME-CDST models
- Practical examples

Unit 4: Assessment of patients and wounds

1) Aim:

This unit aims to provide knowledge and understanding of the principles of assessment of patients' overall status related to wound care and the local assessment of wounds for managing individuals with a range of acute and chronic (non-healing / hard-to-heal) wounds.

2) Timeframe:

It is recommended that this unit be taught early in the nursing programme, preferably during the first year, in relation to the general assessment and evaluation of patients' needs.

3) Learning outcomes:

After completing this unit, students will be able to:

- Outline how to use wound assessment tools and clinical judgement correctly to assess patients with different skin tones (K)
- Define screening tools based on their characteristics and features for overall patient status assessment and local wound assessment (K)
- Recognise the characteristics of different assessment tools in relation to different chronic wounds, such as diabetic foot ulcers (DFU), leg ulcers (LU) and pressure ulcers (PU) (P)
- Regard the assessment tools in wound healing as a starting point for the recognition of types of wound, wound beds and treatment (A)
- Be aware of the consequences of appropriate and accurate assessment and the impact on the healing process and healing outcomes (A)

4) Content:

- Definition and philosophy of patient assessments related to wounds (sources, timing, goals)
- Generic tools for assessing patients' overall status (nutrition, mobility, self-care, risk of different chronic wound development)
- Specific tools for assessing patients' overall status related to wound care (overview of the special tools for different types of wound evaluation and wound-healing process monitoring)
- Documenting general patient status assessments and local wound assessments
- Practical examples

Unit 5: Wound management (cleansing, debridement, wound bed preparation)

1) Aim:

This unit aims to provide students with knowledge on the basic principles of wound management and wound cleansing, in order to optimise the physiological process of wound-healing.

2) Timeframe:

It is recommended that this unit be taught early in

the nursing programme, preferably during the first year, as the unit represents a key pillar of wound care.

3) Learning outcomes:

After completing this unit, students will be able to:

- Describe the benefits of wound bed preparation (K)
- Describe and differentiate the terms 'wound cleansing' and 'debridement' (K)
- Explain the purpose of wound cleansing or debridement to healthcare professionals or persons with wounds and their relatives (K)
- Recognise adequate wound-cleansing strategies, depending on wound bed assessment (P/K)
- Perform wound cleansing according to best practices guidelines (hygiene, economics, law, pain, etc.) (P)
- Describe the criteria for making a referral to a specialist in wound care (K)

4) Content:

- Principles of wound bed preparation
- Variety in wound cleansers (tap water, shower, cleansing solutions)
- Varieties of debridement (autolytic, maggot therapy, sharp and surgical debridement, etc.)
- Indications and contraindications for wound cleansing and debridement
- Indications and contraindications of antiseptics
- National recommendations regarding debridement or the use of specific materials
- Practical examples

Unit 6: Dressings

1) Aim:

This unit aims to provide knowledge and understanding of the principles of dressing choice for managing individuals with a range of acute and chronic wounds.

2) Timeframe:

It is recommended that this unit be taught early in the nursing programme, preferably during the first half of the first year.

3) Learning outcomes:

After completing this unit, students will be able to:

- Describe the properties of different generic dressing categories (K)
- Explain the indications and contraindications for the use of a range of generic dressing categories (K)
- Select an appropriate dressing according to the wound characteristics and common wound aetiologies (P)
- Recognise the importance of appropriate dressing choice in the wider context of holistic management of an individual with a wound (A)

4) Content:

- Properties and characteristics of different dressings
- Generic dressing categories, according to local / national formularies
- Dressing choices in relation to principles of skin care and preventing periwound skin damage
- Dressing choice as part of a holistic approach in the management of an individual with acute and chronic wounds
- Documentation of dressing choice and care planning
- Patient / carer education in relation to dressing choice
- Practical examples

Unit 7: Wound microbiology/infection

1) Aim:

This unit aims to describe wound microbiology and presents an overview of wound infection. The unit will introduce commonly used terms relating to wound infection and will present principles of prevention, identification and management of wound infection.

2) Timeframe:

It is recommended that this unit be taught early in the nursing programme, preferably during the first year.

3) Learning outcomes:

After completing this unit, students will be able to:

- Describe wound microbiology (K)
- Describe signs of an infected wound (K)
- Explain antimicrobial resistance (AMR) and antimicrobial stewardship (AMS) (K)
- Apply AMS concepts into their own clinical practice (A)
- Explain and apply principles of asepsis into their own clinical practice (A/P)

4) Content:

- Microbiology – bacterial burden
- Wound infection continuum – contamination, colonisation, local and systemic infection
- Bioburden and biofilm
- Signs and symptoms of infection – covert and overt signs of infection
- Appropriate choice of antimicrobial wound dressings
- Antimicrobial resistance (AMR)
- Antimicrobial stewardship (AMS)
- Cleansing of a wound – choice of cleansing solution
- Identifying infection – wound swabs, biopsy, use of devices (e.g., microlight)
- Practical examples

Unit 8: Wound pain

1) Aim:

This unit aims to provide knowledge and understanding of the principles of pain management related to wounds in individuals with a range of acute and chronic (non-healing / hard-to-heal) wounds.

2) Timeframe:

It is recommended that this unit be taught during the first half of the second year (3rd semester).

3) Learning outcomes:

After completing this unit, students will be able to:

- Define wound-related pain (its importance as a symptom, pathophysiology and characteristics) (K)
- Define tools for wound-related pain assessment (unidimensional, multidimensional) (K)
- Demonstrate an understanding of the need for

- continuous wound-related pain assessment (K)
- Recognise the characteristics of different assessment tools for wound-related pain assessment (P)
- Demonstrate an understanding of the appropriate non-pharmacological and pharmacological treatments for wound-related pain, and know when to refer to a specialist (K)
- Know and use assessment tools to evaluate wound-related pain (K/P)
- Be aware of the consequences of appropriate and accurate wound-related pain assessment and their impact on the healing process, healing outcomes and on the patient's quality of life (A)

4) Content:

- Definition and concept of wound-related pain (its importance as a symptom, pathophysiology and characteristics)
- Assessment methods and tools for wound-related pain (anamnesis, VAS, NRS, McGill pain questionnaire, PAINAD, etc.)
- Intrinsic and extrinsic factors that induce wound-related pain
- Non-pharmacological methods for treating wound-related pain
- Pharmacological methods for treating wound-related pain
- Documentation of wound-related pain assessments
- Practical examples

Unit 9: Acute wounds

1) Aim:

This unit aims to introduce the different types of acute wounds, according to their aetiology, and the basic principles for their management.

2) Timeframe:

It is recommended that this unit be taught during the first part of the nursing programme, preferably during the second year (3rd or 4th semester).

3) Learning outcomes:

After completing this unit, students will be able to:

- Describe the main types of acute wounds (K)
- Describe the characteristics of acute wounds

- according to their aetiology (K)
- Differentiate acute wounds from chronic wounds (P)
- Explain the characteristics of wound healing by primary intention (P)
- Recognise the importance of asepsis and appropriate surveillance for acute wounds (A)

4) Content:

- Classification / types of acute wounds
 - Surgical wounds and surgical site infections
 - Trauma wounds
 - Burn injuries
- Basic principles of acute wound management
- Practical examples

Unit 10: Pressure ulcers

1) Aim:

This unit aims to develop knowledge and understanding about pressure ulcers (PU, also known as pressure injuries). The unit also describes the pathophysiology, diagnosis, prevention and management of pressure ulcers.

2) Timeframe:

It is recommended that this unit be taught during the first part of the nursing programme, preferably during the first or second year.

3) Learning outcomes:

After completing this unit, students will be able to:

- Explain the pathophysiological mechanisms involved in PU development (K)
- Describe the risk factors for PU development (K)
- Explain and apply the appropriate preventive measures according to the patient's situation and current guidelines (K/P)
- Identify and classify PU according to current guidelines/local policies (K/P)
- Explain and apply the appropriate management/ treatment measures according to the patient's situation and current guidelines (K/P)
- Recognise the importance of PU prevention in any setting as part of a multidisciplinary

team (A)

4) Content:

- Definition of pressure ulcer / pressure injury
- International classification of PU (NPIAP/ EPUAP/PPPIA)
- Pathophysiology and risk factors of PU
- Epidemiology of PU: PU as an important health problem
- Prevention of PU: risk assessment, skin care, repositioning, the use of medical devices and pressure-redistributing equipment
- Management of PU as chronic wounds
- Practical examples

Unit 11: Moisture associated skin damage

1) Aim:

This unit aims to describe and introduce moisture-associated skin damage.

2) Timeframe:

It is recommended that this unit be taught during the first part of the nursing programme, preferably during the first or second year.

3) Learning outcomes:

After completing this unit, students will be able to:

- Describe moisture-associated skin damage (MASD) (K)
- Recognise and explain the four specific types of MASD (K/A)
- Explain common symptoms of MASD (K/P)
- Describe differences between MASD and pressure damage (A/P/K)
- Describe individuals who are at risk of MASD (K)
- Describe prevention & treatment of MASD (K)

4) Content:

- Aetiology of MASD
- Four specific types of moisture-associated skin damage, including:
 - Periwound moisture-associated dermatitis, peristomal moisture-associated dermatitis, incontinence-associated dermatitis and intertriginous dermatitis

- Symptoms of MASD:
 - Erythema and irregular or diffuse edges, as opposed to PU, which typically have distinct edges
 - Excess exudate, increased pain, burning or itching as a result of skin damage
- Risk factors:
 - Obesity, diabetes, urinary and faecal incontinence, malnutrition, poor hygiene, individuals with poor mobility
- Treatment & interventions, including:
 - Prevention
 - Skin cleansing routines, monitoring of the periwound area
 - Treatment
 - Management of excess exudate, application of barrier films and skin protectants
 - Documentation of any changes in the skin condition
- Practical examples

Unit 12: Skin tears

1) Aim:

This unit aims to provide knowledge and understanding of the prevention, assessment and management of skin tears.

2) Timeframe:

It is recommended that this unit be taught during the first part of the nursing programme, preferably during the first or second year.

3) Learning outcomes:

After completing this unit, students will be able to:

- Define a skin tear (K)
- Discuss the risk factors associated with the development of a skin tear (K)
- Explain the principles of skin tear prevention (P)
- Discuss the appropriate management of individuals with different types of skin tears (K)
- Recognise the importance of maintaining healthy skin to reduce the risk of skin tears (A)

4) Content:

This unit builds on the content presented in Units 1 and 2, so this should link back to the structure and

function of the skin, changes to skin due to ageing (Unit 1) and maintaining healthy skin (Unit 2).

- Definition of a skin tear
- Risk factors associated with skin tears
- Principles of skin tear prevention
- Classification systems for skin tears
- Principles of management for skin tears
- Documentation of skin tear assessment, management and care planning
- Education of the patient / carer
- Practical examples

Unit 13: Venous leg ulcers

1) Aim:

This unit aims to provide knowledge and understanding of the prevention, assessment and management of leg ulcers.

2) Timeframe:

It is recommended that this unit be taught during the second or third year of the nursing programme.

3) Learning outcomes:

After completing this unit, students will be able to:

- Demonstrate an understanding of venous insufficiency as a cause of venous leg ulcers (K)
- Describe the signs and symptoms related to venous leg ulcers (K)
- Describe the indications, contraindications and regulations for use and range of available options for compression therapy (K)
- Describe a wound and disease situation using an appropriate classification system (P)
- Apply different types of compression systems based on the specific patient situation and be aware of the potential complications (P)
- Appreciate the specific therapy of the underlying disease as a basic part of the treatment (A)

4) Content:

- Classification of venous leg ulcers
- Varicose veins and varicosities
- Chronic venous insufficiency
- Venous oedema

- Lymphatic oedema
- Prophylaxis/prevention
- The fundamentals of compression therapy (hosiery and bandages)
- Different techniques of compression therapy and practical learning
- Local therapeutic options
- Practical examples

Unit 14: Ischaemic leg ulcers

1) Aim:

This unit aims to provide knowledge and understanding of the prevention, assessment and management of ischaemic and arterial ulcers

2) Timeframe:

It is recommended that this unit be taught during the second or third year of the nursing programme.

3) Learning outcomes:

After completing this unit, students will be able to:

- Describe the aetiological causes of ischaemic and arterial ulcers (K)
- Describe the signs and symptoms related to ischaemic and arterial ulcers (K)
- Explain the indications for use and range of the most important options for therapy (K)
- Recognise different manifestations of ischaemic and arterial ulcers (K)
- Appreciate the specific therapy of the underlying disease as a basic part of the treatment programme (A)
- Be aware of the need for different actions/interventions depending on an ischaemic and/or arterial ulcer (A)

4) Content:

- Manifestation of ischaemic and/or arterial ulcers
- Peripheral arterial occlusive disease
- Mixed pathology
- Prophylaxis/prevention
- Local therapeutic options
- Surgery
- Practical examples

Unit 15: Diabetic foot ulcers (DFU)

1) Aim:

This unit aims to provide knowledge and understanding of the prevention, assessment and management of diabetic foot ulcers (DFU).

- Identification and education of patients at risk of DFU or amputation
- Practical examples

2) Timeframe:

It is recommended that this unit be taught during the second or third year of the nursing programme.

3) Learning outcomes:

After completing this unit, students will be able to:

- Describe the pathophysiological processes related to neuropathy and arterial changes that occur as a consequence of diabetes (K)
- Describe the risks (i.e., DFU development, infection, amputation) related to sensory, motor and autonomic neuropathy and arterial disease in the foot of the patient with diabetic foot disease (K)
- Be aware of the importance of pressure reduction (off-loading) interventions for the foot (A)
- Be aware of the benefits of interdisciplinary management that considers the multifactorial nature of diabetic foot disease (A)
- Promote person-centred, self-care engagement for individuals at risk of or with DFU or following an amputation (A)
- Undertake a simple foot examination (i.e., 3-minute foot exam)

4) Content:

- Epidemiology of diabetes and DFU (prevalence, costs, etc)
- Pathways to ulceration or amputation
- Risk factors for ulceration or amputation
- Prevention of complications (off-loading, infection)
- Pathophysiology of DFU (sensory, motor and autonomic neuropathy, ischaemia)
- Simple foot examination
- Interdisciplinary teamwork (roles, activities, communication)
- Principles of DFU prevention and management (offloading devices, prevention of infection)

4. Curriculum implementation

The Level 4 curriculum can be used not only as the basis for a professional pathway leading to registration, but also as a vocational pathway (i.e., one that does not lead to professional registration). Where appropriate, teaching institutions may consider adopting the Level 4 curriculum as part of a spiral curriculum, such as one that begins with Level 4 as the starting point and then builds the level across the subsequent years by integrating Levels 5 and 6 learning outcomes as part of a three-year degree programme, or by including Level 7 for an integrated master's programme.

4.1 Case example: The Geneva School of Health Sciences

This section of the curriculum provides a case study from the University of Applied Sciences and Arts (HES-SO), Geneva, Switzerland as an example of how existing curricula for nurses^{2,3} were implemented into an existing nursing framework to meet the needs of nursing students.

The Geneva School of Health Sciences offers bachelor's degrees for five health professions. One of them is the Bachelor of Science in Nursing programme, which involves, as of September 2021, 215 students in the first year. This degree is conferred after a three-year curriculum that alternates theory and practice with an equivalent of 180 ECTS. Depending on their school leaving qualification and before starting the bachelor's studies, most of the students have to complete a one-year preparatory year covering aspects of the socio-sanitary field.

The University also provides post-graduate education in wound care with a Certificate of Advance Studies (CAS; 10 ECTS) and a Diploma

of Advanced Studies (DAS; 30 ECTS) that is unique in French-speaking Switzerland.

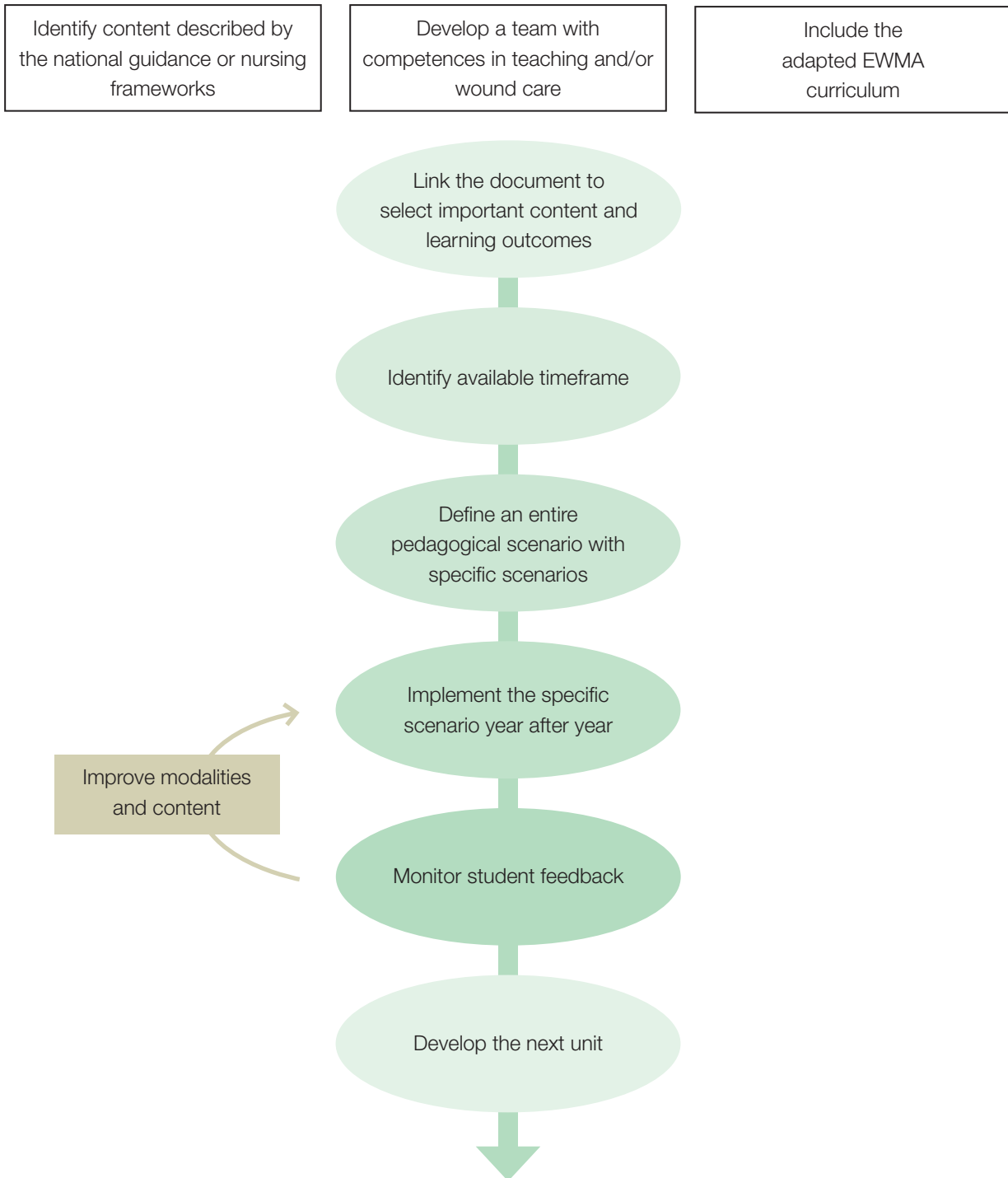
The development and implementation of wound care curricula^{2,3} into a current undergraduate nursing programme was challenging because of the broad scope of nursing. Selecting the relevant content or deciding how much time can be dedicated to wound care needed consensus; this was achieved as part of the development process for this curriculum. Figure 2 provides an overview of the implementation process.

The teaching team includes a professor of tissue viability, a lecturer, three assistant lecturers, support from clinical nurse specialists in wound care and a teaching assistant to help with the implementation of the curriculum and develop the online learning resources.

The experience of the Geneva School of Health Sciences showed that working in a team where members have various levels of wound care or teaching expertise is beneficial. This approach allowed the team to highlight the importance of the different wound care units' content and to discuss the best-suited teaching modalities (i.e., face-to-face teaching in large or small groups, e-learning, workshops or blended learning), depending on learning outcomes. Additionally, the learning outcomes and the logistical resources could be adjusted as needed.

When adapting the curriculum to the previous programme, we first linked the EWMA curricula^{2,3} to the local nursing education framework⁴, taking into consideration the existing content. This task was carried out using group discussions. This was an opportunity to reflect on the aims, content and modalities of the future programme.

Figure 2: Overview of the implementation process



Using our expertise of teaching in the scope of wound care, we adapted the objectives of EWMA's Level 5 curriculum according to local and national recommendations and guidelines.

Second, we designed the entire pedagogical

scenario covering the three years of bachelor's studies in nursing. Thereby, we linked the important wound care units to the existing modules and took into consideration: 1) the complexity of wound care content, 2) previous acquired skills in nursing education and 3) the taxonomic level of learning

outcomes. Despite our desire for consistency in the content related to wound care, malignant fungating wounds are taught during the oncology module, even though this unit is presented in the early stage of the second year. Furthermore, research skills are taught in another module, so the use of research articles in wound care courses increased following the specific research courses. The overall learning outcomes were adapted in the curriculum to facilitate a smooth increase in complexity over the three years. Due to available timeframes in the curriculum, it was challenging to increase the complexity of the taught units in relation to other units.

Third, to prevent a work overload for lecturers and to be consistent with the prior curriculum, we implemented the specific scenarios progressively year after year. We took the opportunity to create content using the best suited pedagogical method, incorporating both e-learning and blended-learning approaches. The learning outcomes guided the decisions about which learning units would benefit from online learning and which might be better presented with a blended-learning design, for example by including workshops. Additionally, implementing the new curriculum was an opportunity to revisit our teaching methods.

Each new unit was developed in line with student feedback. Their comments provided insights to improve the unit from the users' perspective. They also guided the development of future units, to avoid repetitive pitfalls. In addition, we took into consideration informal feedback from clinical nurse specialists involved in the workshops. Through this process, the content and clarity of our e-learning modules and workshops improved.

The integration of the objectives of the EWMA curricula Levels 5 and 6 to develop the new nursing curriculum improved the clarity of the overall pedagogical scenario. Moreover, the students had the opportunity to gain new knowledge and skills in wound care. Our reflective approach allowed

us to design a completely new curriculum that combined e-learning and blended-learning units.

In general, student feedback was positive. The pedagogical scenarios and learning outcomes were described as 'clear'. Taking into consideration student feedback when developing the next unit improved satisfaction, and preliminary difficulties associated with online learning were resolved in the next unit. From the teachers' perspective, the entire process of development and implementation was time consuming; however, the improvements in the curriculum allowed us to work as a team, and students' satisfaction provided great motivation during this project. Further research will be needed to demonstrate the effectiveness of our learning units to improve nursing students' knowledge and skills. We expect this pedagogical scenario will enhance congruence among the Bachelor's in Nursing degrees across Europe.

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6. Suggested literature

The following list is not an exhaustive list of literature, but includes potential literature for inclusion in the course.

6.1 Textbooks:

- Ayello EA, Baranoski S (Ed): Wound Care Essentials: Practice Principles, 5th Edition, Wolters Kluwer, 2020
- Bryant R., Nix D: Acute and Chronic Wounds: Current Management Concepts, 5th Edition, Elsevier, 2016
- Edwards-Jones, Valerie, editor; Essential Microbiology for Wound Care, Oxford University Press, Oxford, United Kingdom, First edition, 2016
- Flanagan M (ed): Wound Healing and Skin Integrity: Principles and Practice, Wiley-Blackwell, 2013
- Kifer ZA: Fast Facts for Wound Care Nursing, Springer Publishing Company, 2012
- Krasner D: Chronic Wound Care: The Essentials, HMP Communications, 2014
- Probst S (Ed): Wound Care Nursing: A Person-centred Approach. 3rd Edition, Elsevier, 2021

6.2 Reviews:

- Broughton G, Janis J E, Attinger CE, Wound Healing: An Overview, *Plast. Reconstr. Surg.* 2006; 117: 1e-S.
- Venus M, Waterman J, McNab I. Basic physiology of the skin, *Surgery.* 2011; 29:10.

6.3 Online resources:

- Agency for Healthcare Research and Quality:

- <https://www.ahrq.gov/gam/index.html>
- Australian Wound Management Association Guidelines: <http://www.awma.com.au/publications/>
- Cochrane Library: <https://www.cochranelibrary.com/>
- ECTS Users Guide: https://ec.europa.eu/education/resources-and-tools/european-credit-transfer-and-accumulation-system-ects_en
- European Commission: Learning Opportunities and Qualifications in Europe. Information about courses, work-based learning and qualification: <https://europa.eu/europass/en>
- European Commission: European Credit Transfer and Accumulation System (ECTS): http://ec.europa.eu/education/ects/ects_en.htm
- European Wound Management Association: <http://ewma.org/english/publications.html>
- European Pressure Ulcer Advisory Panel: <http://www.epuap.org/guidelines/>
- International Skin Tear Advisory Panel: <http://www.skintears.org/>
- National Institute of Health and Care Excellence (skin conditions): <https://www.nice.org.uk/guidance/conditions-and-diseases/skin-conditions>
- National Pressure Injury Advisory Panel: <https://npiap.com/>
- National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Quick Reference Guide. Emily Haesler (Ed.). Cambridge Media: Perth, Australia; 2014. <https://www.epuap.org/wp-content/uploads/2016/10/quick-reference-guide-digital-npuap-epuap-pppia-jan2016.pdf>
- Scottish Intercollegiate Guideline Network:

- <https://www.sign.ac.uk/our-guidelines/>
 - Welsh Wound Network: <https://www.welshwoundnetwork.org/>
 - World Union Wound Healing Societies Consensus Guidelines: <https://wuwhs2022.org/>
 - Wounds International Clinical Guidelines: <https://www.woundsinternational.com/resources>
 - Wounds UK Best Practice Statements: https://www.wounds-uk.com/resources/all/0/date/desc/cont_type/21
- J Wound Care. 2010; 19(6): 237-68.
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 - European Wound Management Association (EWMA). Position Document: Identifying criteria for wound infection. London: MEP Ltd, 2005.
 - European Wound Management Association (EWMA). Position Document: Wound bed preparation in practice. London: MEP Ltd, 2004.
 - European Wound Management Association (EWMA). Position Document: Understanding compression therapy. London: MEP Ltd, 2003.
 - European Wound Management Association (EWMA). Position Document: Pain at wound dressing changes. London: MEP Ltd, 2002.

6.4 EWMA Documents

Organised according to publication date:

- Gethin G, Probst S, Stryja J et al. Evidence for person-centred care in chronic wound care: A systematic review and recommendations for practice, *J Wound Care*. 2020; 29(9): Suppl9.
- Stryja J, Sandy-Hodgetts K, Collier M et al. EWMA document: Surgical site infection: preventing and managing surgical site infection across health care sectors. *J Wound Care* 2020; 29(2): Suppl 2b, S1–S69, <https://doi.org/10.12968/jowc.2020.29.Sup2b.S1>.
- Franks, P., Barker, J., Collier, M. et al. Management of patients with venous leg ulcer: challenges and current best practice, *J Wound Care*, 2016; 25(6): Suppl, 1–67.
- Probst S., Seppänen S., Gethin G. et al. EWMA Document: Home Care-Wound Care,. *J Wound Care* 2014; 23(5 Suppl.): S1–S44.
- Gottrup, F., Apelqvist, J., Bjansholt, T. et al. EWMA Document: Antimicrobials and Non-healing Wounds—Evidence, Controversies and Suggestions. *J Wound Care*. 2013; 22(5 Suppl.): S1–S92.
- Strohal, R., Apelqvist, J., Dissemond, J. et al. EWMA Document: Debridement. *J Wound Care*. 2013; 22(Suppl. 1): S1–S52.
- Gottrup P, Apelqvist J, Price P. Outcomes in controlled and comparative studies on non-healing wounds: Recommendations to improve the quality of evidence in wound management.

7. Glossary

Assessment:

In this curriculum, assessment refers to the clinical patient and wound assessment that will encompass history-taking and the overall holistic examination of a patient with a wound, as well as local status (wound and periwound skin).

Angiology:

Angiology is a medical specialty that studies the diseases of the circulatory system and of the lymphatic system (i.e., arteries, veins and lymphatic vases and its diseases).

Antiphlogistic:

An antiphlogistic is an agent that reduces inflammation.

Case management:

Case management is a general term referring to the facilitation of treatment plans to assure that appropriate medical care is provided.

Charcot neuroarthropathy:

Charcot neuroarthropathy refers to the progressive degeneration of a weight-bearing joint, a process marked by bony destruction, bone resorption and eventual deformity.

Debridement:

Debridement is the process of removing non-vital tissue from different types of wounds (e.g., pressure ulcers, burns) and others.

EBN (Evidence-based nursing):

EBN is an approach based on personal clinical expertise in combination with the most current, relevant research available on the topic. The goal of EBN is to improve the health and safety of patients while also providing care in a cost-effective manner

to improve the outcomes for both the patient and the healthcare system.

EBP (Evidence-based practice):

EBP is an approach in which the goal is to integrate the implementation of the best research evidence with clinical expertise and patients' values.

ECTS (European Credit Transfer and Accumulation System):

The European Credit Transfer and Accumulation System is a standard for comparing the study attainment and performance of students of higher education across the EU and other collaborating European countries. One academic year corresponds to 60 ECTS credits, which are normally equivalent to 1500–1800 hours of total workload, irrespective of standard or qualification type.

EQF (European Qualifications Framework):

The European Qualifications Framework aims to relate different countries' national qualifications systems to a common European reference framework and to compare the qualifications levels of different countries and different education and training systems. Since 2012, all new qualifications issued in Europe carry a reference to an appropriate EQF level (https://ec.europa.eu/ploteus/search/site?f%5B0%5D=im_field_entity_type%3A97).

EWMA (The European Wound Management Association):

The European Wound Management Association (EWMA) is a European not-for-profit umbrella organisation that links national wound management organisations, individuals and groups with interest in wound care. Central to EWMA's objectives is supporting the implementation of interdisciplinary

and cost-effective high quality wound care (www.ewma.org).

EPUAP (European Pressure Ulcer Advisory Panel):

EPUAP is a European organisation working for European research, education and advocacy for pressure ulcer prevention and treatment. The mission is to provide relief to persons suffering from or at risk of pressure ulcers, in particular through research and the education of the public, and by influencing pressure ulcer policy in all European countries towards adequate patient-centred and cost-effective pressure ulcer care (www.epuap.org).

IAD (Incontinence-associated dermatitis):

Incontinence-associated dermatitis is inflammation of the skin that occurs when urine and/or stool comes into contact with the skin.

Maggot therapy:

Maggot therapy (also called bio-knife) is a type of biotherapy involving the introduction of live, disinfected maggots (fly larvae - *Lucilia sericata*) into the non-healing skin and soft tissue of a wound for the purpose of cleaning out the necrotic tissue within a wound (debridement) and disinfection.

Malum perforans:

Malum perforans, also known as neurotrophic ulcer, is a long-lasting, usually painless ulcer that penetrates deep into or through the skin, usually on the sole of the foot. It is often a complication of diabetes and other conditions affecting the nerves.

MASD

Moisture-associated skin damage is caused by prolonged exposure to various sources of moisture, including urine or stool, perspiration, wound exudate, mucus, saliva and their contents. MASD is characterised by inflammation of the skin, occurring with or without erosion or secondary cutaneous infection. It includes incontinence-associated dermatitis (IAD); intertriginous dermatitis (intertrigo); and toxic contact dermatitis, including periwound dermatitis and peristomal dermatitis.

MDS (Minimum data set):

A minimum data set is a list of names, definitions and sources of data items needed to support a specific purpose.

MRSA (Methicillin-resistant Staphylococcus aureus):

Methicillin-resistant *Staphylococcus aureus* (MRSA) infections are caused by a type of staph bacteria that has become resistant to many of the antibiotics used to treat ordinary staph infections.

NANDA Int.:

NANDA is an international organisation providing standardised terminology / NANDA International Nursing Diagnosis Glossary of Terms for use in nursing practice (www.nanda.org/).

Hospital-acquired infection (HAI):

A hospital-acquired infection (HAI) is one that is acquired in a hospital or other health care facility.

NPUAP (The National Pressure Ulcer Advisory Panel):

The National Pressure Ulcer Advisory Panel (NPUAP) is a US-based independent not-for-profit professional organisation dedicated to the prevention and management of pressure injuries (www.npuap.org).

NPWT (Negative pressure wound therapy):

Negative pressure wound therapy is a therapeutic technique that uses a vacuum dressing to promote healing in acute or chronic wounds and enhance healing in several types of either acute or chronic/non-healing wounds.

Nursing diagnoses:

The nursing diagnosis drives interventions and patient outcomes, enabling the nurse to develop a patient care plan. Diagnostic procedures are provided by different professional organisations (e.g., NANDA Int.).

Podiatrist/podiatric management:

In many countries, the term 'podiatrist' refers to allied health professionals who specialise in the

treatment of the lower extremity, particularly the foot. Podiatrists in these countries are specialists in the diagnosis and treatment of foot pathology, but not through surgical means.

In the United States and some other countries, Doctors of Podiatric Medicine are physicians and surgeons who practice on the lower extremities, primarily the feet and ankles.

Podology:

The specialty concerned with the diagnosis and/or medical, surgical, mechanical, physical and adjunctive treatment of the diseases, injuries and defects of the human foot. This may also be referred to as chiropody.

Post-graduate education:

Post-graduate education refers to studies that take place following the finalisation of a general nursing education (see registered nurse).

Pan-Pacific Pressure Injury Alliance (PPIAP):

The Pan-Pacific Pressure Injury Alliance (PPIAP) has contributed to the European and US National Pressure Ulcer Advisory Panels (EPUAP and NPUAP) to publishing the International Pressure Ulcer Guidelines.

Pyoderma gangrenosum:

Pyoderma gangrenosum is a rare skin condition that causes tissue to become necrotic. Major symptoms include small pustules that develop into large ulcers at various sites on the body. It may or may not be associated with other illnesses. It often, but not invariably, reflects underlying systemic disease.

Registered nurse:

The definition of a registered nurse across Europe is governed by European Union (EU) law through directives/EU legislation (Directive 2005/36/EC on the recognition of professional qualifications). A registered nurse is a nurse who has graduated from a nursing programme and met the requirements outlined by a country, state, province or similar licensing body to obtain a nursing license. A

registered nurse's scope of practice is determined by legislation and is regulated by a professional body or council.

TCC (Total contact casting):

Total contact casting is a specially designed cast that takes weight off of the foot (off-loading) in patients with diabetic foot ulcers (see wounds).

Ulcer:

Ulcer typically refers to a chronic/non-healing wound (e.g., a pressure ulcer, a diabetic foot ulcer or a leg ulcer (venous/arterial/mixed)). An ulcer is defined as a discontinuity or break in a bodily membrane that impedes the organ of which that membrane is apart from continuing its normal functions. An ulcer is often accompanied by the disintegration of tissue, and ulcers often become infected.

The European Union of Medical Specialists (UEMS):

The European Union of Medical Specialists (UEMS) is the representative organisation of the National Associations of Medical Specialists in the European Union and its associated countries (www.uems.net).

Undergraduate nursing education:

Undergraduate nursing education refers to educational programmes for pre-registration nurses.

Wound:

This curriculum covers the management of both chronic/non-healing/hard-to-heal and acute wounds.

Acute wounds occur as a result of surgery or trauma. They move through the stages of healing within a predicted timeframe. An acute wound becomes a chronic wound when it does not follow the healing stages, resulting in a lengthened recovery.

Chronic, non-healing or hard-to-heal wounds refer to wounds that, for various reasons, do not

heal normally/are characterised by a delayed healing process that may be caused by different aetiologies. The most common types of chronic/non-healing/hard-to-heal wounds include:

- Leg ulcers (LU) (arterial, venous, mixed)
- Pressure ulcers (PU) (also referred to as pressure injuries, pressure sores or decubitus)
- Diabetic foot ulcers (DFU) (diabetic foot syndrome, DFS)