This technical document was based on a comprehensive and systematic review of the literature. It was submitted for consensus agreement by the National Advisory Group for the Study of Pressure Ulcers and Chronic Wounds (GNEAUPP). The result was a 68-page document that included 201 bibliographic references with two appendices of nutritional screening tools.

The document is divided into four (4) sections:

1. Introduction. This section defines the concept of wounds and wound variants as well as different treatment modalities, including the concepts of food, nutrition, and how they affect treatment. It also defines the broader concept of malnutrition, which is caused by unhealthy diets that may have an excess or deficit of food energy. Thus, malnutrition can occur in obese or underweight individuals, and in both cases, results in deficiencies of essential nutrients.

2. Current state of knowledge. This section reviews current knowledge on nutrition, pressure ulcers, and wound prevention and treatment.

The first subsection refers to epidemiology and existing reports published in the literature on nutritional status and chronic wounds. Specifically, it focuses on the epidemiology of malnutrition and wounds, and their relationship according to wound aetiology. A distinction is made between nutritional status and pressure ulcers (the type of wound most referenced in the literature and related to nutrition), and nutritional status and leg ulcers. Here, there are few references in the literature. This subsection concludes with an exploration of nutritional status and wound dehiscence.

Scientific evidence, obtained primarily from observational studies, links malnutrition directly to pressure ulcer severity and incidence. Regarding diabetic foot ulcers, good glycaemic control is thought to be important in neuropathic ulcer healing; however, little evidence exists to support this idea. Regarding ulcers of venous aetiology, few studies have investigated the role of nutrition in healing. One study reported that people with this pathology have lower levels of vitamins A and E, carotenes, and zinc; however, to date, no evidence has been presented to confirm that supplementation with these micronutrients improves healing. Regarding wound dehiscence, it is known that this complication is 8 times more common in vitamin C-deficient patients than in patients with normal vitamin C levels. In addition, obese patients are thought to have more infections and delayed wound healing, as well as a greater incidence of dehiscence.

The second subsection deals with the assessment, screening, and diagnosis of malnutrition, with special emphasis on nutritional screening and assessment tools. A description is provided of steps to follow in nutritional assessment, as recommended in the guidelines of leading societies dedicated to nutrition science. Regarding nutritional assessment and screening, recommendations are made about the collection of clinicometric data for the various instruments and tools, which are validated and based on research.

Assessment consists of two parts: nutritional screening and the nutritional assessment itself. The purpose of screening is to identify malnourished individuals or those at nutritional risk. For these individuals, a complete assessment is required.

The guidelines of the European Society for Clinical Nutrition and Metabolism (ESPEN) for nutritional screening recommend a series of steps that must be considered for all hospitalised patients:
i. Upon admission, a simple nutritional screening method must be used to identify patients at nutritional risk.

ii. Patients identified as being at nutritional risk require a complete nutritional assessment.

iii. The patient’s individual nutritional requirements should be evaluated, and patient care and nutritional therapy should be planned.

iv. The monitoring and definition of targeted outcomes should be determined.

v. Finally, screening results, full assessment, planning, and monitoring should be communicated to the other professionals involved, especially when the patient is transferred to the community or to another institution.

Rasmussen et al. recommend a series of steps for assessing nutritional risk and detecting malnutrition:

Detection: The purpose of nutritional screening

This step is to identify patients at risk of malnutrition so that nutritional interventions can be considered. Identification of an altered nutritional state enables the adjustment of patient care so that nutrition can be optimized.

Assessment: the screening methodology

The screening can be performed using various available methods. The ideal test is one that has high sensitivity (i.e. if it tests positive in patients with the condition) and high specificity (i.e. if it tests negative in patients without the condition), but it is also important that the tool has a positive predictive value (which would avoid overdiagnosis). In short, the method used should offer the best validity and reliability at the lowest cost possible, i.e. it should be easy and fast to do.

ESPEN has developed guidelines for screening tools

Screening tools should detect caloric and protein malnutrition and/or predict the likelihood of malnutrition developing or worsening of the patient’s condition. From this perspective, it should meet four principles:

i. What is the patient’s current condition? Body mass index (BMI) can provide important information about nutritional status, although this measure may be less useful for children, adolescents, and elderly individuals. Weight and height can be used to calculate BMI. Alternatively, the mid-portion of the upper arm (between the acromion and the olecranon) can be measured and compared with a table of percentiles for a particular population according to age and sex.

ii. Is the patient’s condition stable? Obtain information about the patient’s history of weight loss by asking the patient directly or, if possible, consulting medical records. Unintentional weight loss greater than 5% of total body weight over 3 months is considered significant. This approach may be helpful when malnutrition cannot be identified by calculating BMI, e.g. weight loss in obese people. Furthermore, weight loss may be predictive of subsequent nutritional deterioration.

iii. Will the patient’s condition worsen? This question could be answered by determining whether food intake has recently decreased, and if so, approximately how much and for how long. This can be confirmed by measuring the food intake of hospitalised patients or through use of a diet diary. If it is determined that food intake is lower than typically required to maintain normal weight, then weight loss will likely occur.

iv. Will the condition of nutritional deterioration accelerate? In addition to decreased appetite, the patient’s nutritional requirements may increase because of metabolic stress associated with severe illness. For example, major surgery, sepsis, or multiple traumas, which may be accompanied by chronic wounds, may cause nutritional status to worsen quickly or may result in malnutrition.
Eating problems, Shopping and Cooking problems (SCALES); Global Subjective Assessment; Malnutrition Universal Screening Tool (MUST), Mini Nutritional Assessment (MNA); and Nutrition Risk Screening 2002 (NRS 2002).

The NRS 2002 is recommended for use in hospitals, whereas the MUST tool is intended for general use. The MNA is the only tool validated in Spanish.

The third subsection presents key scientific evidence for the role of nutrition in chronic wound prevention and treatment, examining mechanisms underlying physiological and metabolic processes. Topics include energy intake; protein and/or specific amino acid intake and fatty acid intake and their potential immunomodulatory effects; liquid intake; and intake of micronutrients (zinc, iron, copper, alpha lipoic acid, and vitamins A, C, K, and E). A section focuses on nutritional interventions and their role in wound prevention and treatment.

The conclusion highlights the important role of nutrition in wound care, emphasising that nutritional screening and assessment have been, thus far, overlooked in the field of wound research. Although substantial scientific evidence is beginning to appear in this field, further research is needed.

3. **Recommendations for clinical practice.** Recommendations are presented with the level of supporting evidence based on the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group guidelines. Recommendations take into account questions that clinicians should ask such as: When should nutritional status be assessed? Who should assess nutritional status? How should nutritional risk be assessed? Which nutritional interventions can prevent and treat chronic wounds?

4. **Recommendations for researchers.** Recommendations are presented to provide researchers with guidance in fields for which further research is needed.

This document therefore provides a broad analysis of this topic and identifies existing gaps in knowledge of the relationships among nutritional status, nutritional interventions, and wound management.