



# Nutritional impact in wound care

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## Abstract

The body's largest organ is the skin, which when breached leads to many biological activities aimed at restoring function. With the number of wounds in the community setting rising, it is important to prevent where possible, and treat where needed in the most effective way. Whilst nutrition in general terms is well recognised to improve healing outcomes, the impact to prevent wound care is not well understood. Furthermore, whilst adequate nutrition is recognised to improve the chances of wounds healing, the evidence has been largely anecdotal. In 2015 an extensive study on the NHS burden for wounds was published, including data on the nutritional status of patients. This article extracts data from this earlier publication to highlight the nutritional impact on wound healing.

**Keywords:** Wound care, Nutrition, NHS, Malnutrition

## Introduction

### Burden of wounds

As the largest organ, the skin consists of several layers and performs several functions. Its primary function is a mechanical barrier protecting from infection, pressure and stress. It also regulates temperature and has sensory responses including pain and touch [1]. Wounds are defined as injuries to this tissue including where the skin is breached. However, for the elderly, infirm or immobile patient, one must also ensure the integrity of the skin is maintained to prevent more serious wounds from occurring. In the UK, there are an estimated 2.2 million adult wounds being treated by the NHS at a cost of £5.3 billion [2], which is greater than the burden incurred due to obesity-related conditions at £4.2 billion – which receives greater media attention [3,4]. We know that of the £5.3 billion, £2.1 billion is attributed to effective wound healing and £3.2 billion for unhealed wounds. It is therefore clear that significant cost advantages can be gained when clinical staff are able to prevent injury, have the education required to provide early diagnosis, and knowledge and access to appropriate dressings and other treatments.

## Treatments

Wound treatments have evolved with mankind, with the earliest recorded evidence dating back to 2200BC. This describes 'three healing gestures' – washing, making plasters and bandaging - a practice not dissimilar to what we do today (Oxford clinical communications, 1998). Modern wound care was born from combat medicine during the Crimean War (1853-6) and accelerated due to advancements in the Industrial Revolution. There is a large number of wound care products available today which comprise these seven main categories:

- Foam
- Superabsorbers
- Hydrogels/hydrocolloids
- Alginates
- Silicones
- Films
- Barriers



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The variety of wound dressings available is extensive, and each serves particular needs. Education in early detection and diagnosis are key to understanding the appropriate dressing choice. The healthcare professional must be proficient in understanding which dressing types are best used with the presenting aetiology. The shape is very important in order to effectively conform and cover wounds that are seldom on flat anatomical surfaces, and they must be easy to apply, supporting good aseptic techniques. There are no wrong dressings, just wrong dressing choices.

### Nutrition in wound care

Nutrition has long been recognised as important to health, as has the increased prevalence of malnutrition in the elderly [5]. With the increasing ageing population, we see increasing numbers of elderly patients presenting with chronic wounds. Therefore the importance of nutritional assessments must be noted to ensure optimal chances of patient outcomes. Adequate balanced nutrition is key to supporting wound repair mechanics. A number of key components are described in table 1[6-8].

Guest et al [2] reported in 2015 the results of a retrospective cohort analysis using The Health Improvement Network (THIN) database [9]. This database holds electronic information on more than 11 million anonymised patients entered by General Practitioners (GPs) from 562 practices across the UK and has been shown to be representative of the UK population. In addition to identifying patients with wounds, this study compared patients against 1000 random (control) patients matched based on age, gender, managed at the same general practice, no his-

tory of wounds in records and a continuous medical history during the time under review.

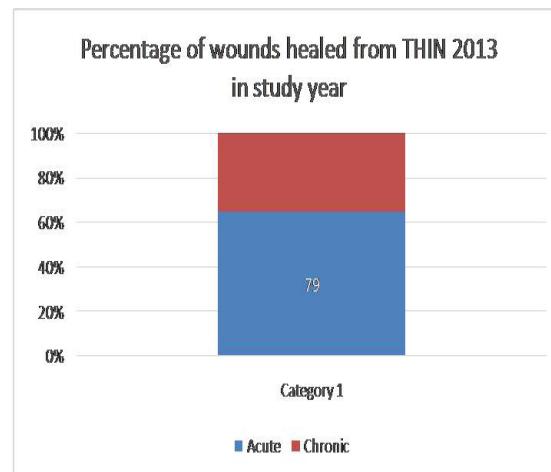
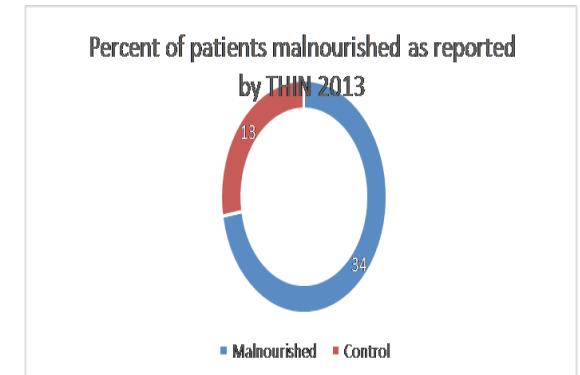
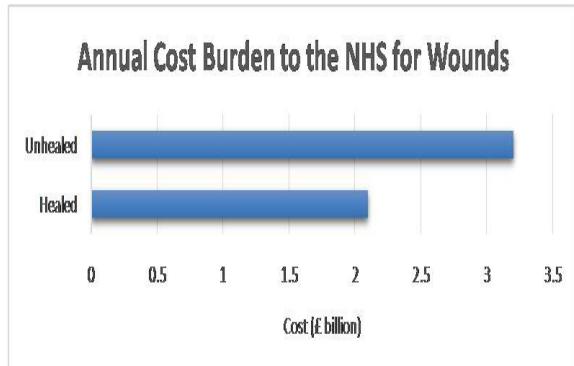
A review of comorbidities [2] present within 12 months of the wound developing reported that 34% of patients with a wound had reported malnutrition compared to 13% of the control ( $p < 0.001$ ). 61% of all wounds healed in the study year; 79% of acute wounds healed and 43% of chronic wounds. Binary logistic regression was performed on patients' age, gender, smoking status and comorbidities. The results show that nutritional deficiency leads to a 2.3% increased risk of developing a wound (OR 0.53 (95% CI 0.41 to 0.70)). Furthermore, the data demonstrate that those suffering from malnutrition experience a 4-week delay before healing starts and are 50% less likely to heal when compared to control groups without malnutrition.

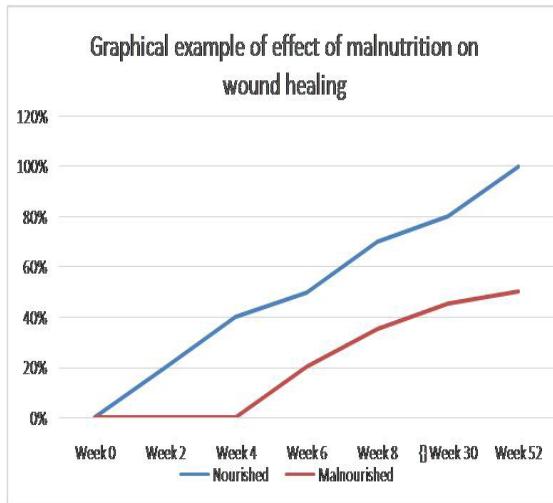
### Summary

The past 30 years have seen huge technological advances in wound care, leading the industry to create solutions to address various clinical indications. With the personalisation of medicine, and recognition that every patient, their wound and underlying pathology are a unique combination of attributes, there is likely to be a suitable dressing available. There is no wrong dressing, just wrong dressing selection. That said, recent data demonstrates the significant delay that malnutrition can impose on the wound prevalence and healing. Ensuring patients with wounds have adequate nutrition will increase the rate of healing and improve their quality of life. In addition, ensuring optimal nutritional balance can impact on their cost of care and should be key to a patient's holistic management.

### Tables

Component	Use
Zinc	Protein and collagen synthesis, immune function
Protein	All stages of tissue repair. Significant protein can be lost during exudation.
Vitamin C	Collagen synthesis
Vitamin A	Cellular differentiation, collagen synthesis, epithelialization
Glutamine & Arginine	Essential amino acids, low levels indicated for grade III-IV pressure ulcers
Glucose	The primary energy source for angiogenesis.





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