

Managing Malnutrition after Hip Fracture

A local pathway implementation & audit



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Malnutrition is common across health and social care, affecting over three million people in the UK (1.3 million being +65yrs) and costing around £23.5 billion annually.¹

Malnutrition adversely affects not only nutritional status but also functional and clinical outcomes, such as muscle wasting and weakness, psychological and physical decline, poor wound healing and reduced quality of life.²

Recent cost analysis suggests that, on average, a malnourished patient may cost £7408 – over three times more than a non-malnourished patient (£2155). This is driven by the poorer outcomes associated with malnutrition which lead to more GP visits, hospital admissions, prescription costs and greater length of hospital stay.¹

The burden of malnutrition is set to continue to rise with our ageing population as prevalence increases with age, particularly in the presence of disease, illness or injury.¹ Perhaps one of the most serious injuries to occur among frail older adults is a hip fracture, with a high mortality rate³ and a high prevalence of malnutrition. Up to 63% of hip fracture patients may be malnourished on admission to hospital⁴ and they tend to be one of the frailest patient groups with complex clinical needs.⁵

Why is malnutrition so common in hip fracture patients?

Reduced muscle mass and strength is common in malnutrition.² In turn, this may impair postural reflexes, increasing the risk of falls which are the leading cause of hip fracture in older adults.⁶ Malnutrition may also diminish the adipose tissue protecting the hip and increase bone mineral density losses,^{7,8} increasing the risk of a patient sustaining a hip fracture in the event of a fall. Moreover, the degree of malnutrition is likely to increase post hip fracture due to inadequate dietary intake,⁹ increased resting energy expenditure² and increased requirements for protein and micronutrients, related to:

- Catabolic response to the fracture, which lasts up to three months after orthopaedic surgery⁸
- Wound healing following surgery and in the presence of pressure ulcers¹⁰
- Bone repair¹¹
- Resistance exercise for physiotherapy/rehabilitation.¹²

The European Society for Clinical Nutrition and Metabolism (ESPEN) recommends protein intakes of ≥ 1.5 g/kg/day for patients with severe injury and 1.2-1.5 g/kg/day for patients at risk of malnutrition due to chronic conditions (e.g. frailty).¹³ An elderly female with a hip fracture weighing 60 kg may therefore require around 90 g protein per day. Energy

requirements are also likely to be elevated to around 1700 kcal/day due to a 20% stress factor for long bone fracture and up to 25% activity factor for physiotherapy.² Dietary intake is often poor in the elderly hip fracture patient,⁹ leading to a large deficit of energy, protein and micronutrients which contribute to the continued deterioration of nutritional status post-fracture.

Why should we manage malnutrition after hip fracture?

Studies of hip fracture patients have found that malnutrition is associated with poor clinical outcomes, including increased risk of complications (e.g. delayed wound healing, infections and pressure ulcers), increased mortality, reduced functional status, and increased risk of subsequent falls and fractures,¹⁴ with malnutrition being the strongest independent risk factor for recurrent fracture.¹⁵ These adverse outcomes have implications for health and social care resources and associated costs.¹

Therefore, to improve clinical outcomes after hip fracture and better manage the risk of subsequent falls and fractures, malnutrition must be addressed. Nutritional screening with a validated tool (e.g. the Malnutrition Universal Screening Tool [‘MUST’]) should take place on admission to hospital¹⁶ and appropriate care plans put in place to improve nutritional intakes to meet requirements for recovery.

Nutrition support after hip fracture

In most cases (besides conservative approaches in end of life care), the aim of nutritional support after hip fracture should be to correct the significant deficits of energy, protein and micronutrients in the acute recovery period and during longer term rehabilitation. Methods of dietary optimisation, such as food fortification, energy-dense snacks, feeding aids and mealtime assistance, are important. Although studies show that dietary approaches alone are insufficient in hip fracture patients,⁹ with some studies reporting intakes from food reaching only 800-1100 kcal and 34-40 g protein per day.^{17,18} In the hip fracture patient, persistent poor dietary intake may be due to a variety of factors, including pain, medication side effects, social isolation and poor physical function/dexterity which may inhibit patients from feeding themselves or preparing meals and snacks.

In light of this, ESPEN advocates the use of oral nutritional supplements (ONS) for all hip fracture patients in hospital, with those at high risk of malnutrition continuing to receive ONS for at least one month post discharge, providing ≥ 400 kcal and ≥ 30 g protein per day (Grade A recommendation).¹⁹ A ready-to-drink ONS may be most appropriate for the frail hip fracture patient due to likely poor physical function and dexterity, and studies have shown that compliance is significantly better with high energy, low volume ONS (≥ 2 kcal/ml, 125 ml) than with standard ONS (1-1.5 kcal/ml,

200 ml).²⁰ Furthermore, high protein ONS have been associated with improved clinical outcomes after hip fracture, including reduced complications, length of hospital stay, mortality and bone mineral density loss, and increases in nutritional status, favourable clinical course, functional status and quality of life.²¹

Overcoming challenges – a local pathway and audit

With around 75,000 cases of hip fracture each year in the UK³ and a high prevalence of malnutrition in hip fracture patients,⁴ the demand for dietetic input into the nutritional management of hip fracture is challenging.

Within the Dudley Group NHS Foundation Trust, it was noted that the majority of patients admitted with hip fracture (commonly fractured neck of femur

[#NOF]) were referred to the dietitian with high risk 'MUST' scores ≥ 2 . Despite their poor nutritional status on admission, the use of ONS was limited on the ward, with very few patients prescribed ONS prior to dietetic assessment.

In 2017, Gateshead Health NHS Foundation Trust implemented a nutritional care pathway to improve care in this frail and complex patient group whilst reducing the need for individual dietetic assessments.²² With kind permission from Gateshead Health NHS Foundation Trust, we adopted the pathway with some local adaptations to improve and standardise care for our patients with #NOF. We also carried out an audit of the pathway implementation on the ward. The rationale for each step of our local pathway (Figure 1) is summarised in Table 1.

Figure 1: Nutritional Care Pathway for Patients with Fractured Neck of Femur

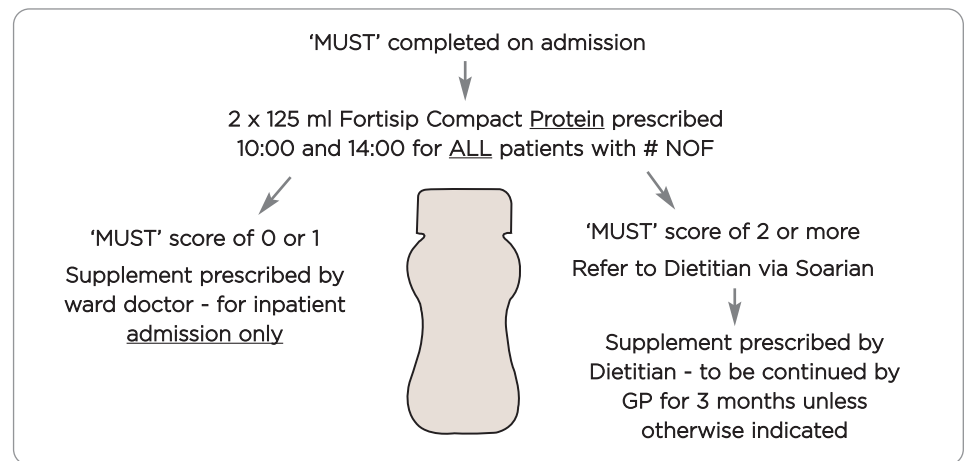


Table 1: Rationale for the Local Nutritional Pathway for Patients with #NOF

Pathway steps	Rationale
All patients are 'MUST' screened on admission and weekly throughout inpatient admission	Pre-existing malnutrition is common in hip fracture patients and often gets worse after hip fracture
All patients with #NOF receive a high energy, high protein, low volume ONS* (Fortisip Compact Protein) BD (at 10.00 & 14.00) A note was attached to the patient's drug chart stating: <i>'Patients with a #NOF continue in a hypermetabolic state for 3 months post-op; this may lead to slower recovery rates & delayed hospital discharge.'</i>	<ul style="list-style-type: none"> Hip fracture patients have significant nutritional deficit due to increased requirements and poor nutritional intakes; they are likely to be frail with long-standing poor appetite The use of high protein ONS in hip fracture is supported by clinical studies; Fortisip Compact Protein is high protein, low volume and ready-to-drink, and available within our acute nutrition contract The structured timing of ONS delivery coincided with ward rounds and encouraged patients to drink the ONS between meals The drug chart note helped educate the clinical team on the ward about the need to routinely prescribe high energy, high protein, low volume ONS for #NOF patients
Patients with a 'MUST' score 0 or 1 receive Fortisip Compact Protein BD (prescribed by ward doctor) during inpatient admission only Patients with a 'MUST' score of ≥ 2 receive Fortisip Compact Protein BD and are referred to the hospital dietitian	<ul style="list-style-type: none"> Nutritional intake during hospital is often inadequate in hip fracture patients which could lead to worsening nutritional status during admission Patients with low/medium nutritional status can be managed at ward level Patients with a high risk of malnutrition receive individualised assessment and care plan (including discussions re: follow up on discharge) from the dietitian
Patients with a 'MUST' score of ≥ 2 receive TTO of Fortisip Compact Protein BD with discharge letter requesting GP prescription for 3 months, and community follow up	<ul style="list-style-type: none"> The catabolic state may last for up to 3 months after orthopaedic surgery The Malnutrition Pathway recommends frail patients at high risk of malnutrition receive ONS bi-daily for up to 12 weeks and community follow up²³
Audit	To evaluate how well the pathway was implemented at ward level

*Exclusions – patients with chronic kidney disease stage 5 (eGFR < 15) were offered Fortisip Compact BD; patients who disliked milky drinks were offered Fortijuce BD; patients were referred to the Dietitian with 'MUST' ≥ 2 & any of the following: dysphagia/cows' milk allergy/lactose intolerance.

The primary aim of the audit was to evaluate the implementation of the pathway among the multidisciplinary team (MDT) in order to use the findings to identify opportunities for further improvements.

The main objectives were to measure the following outcomes, comparing pre and post pathway implementation:

- The percentage of patients prescribed Fortisp Compact Protein during admission
- The percentage of discharge letters requesting the GP continues this ONS prescription BD for patients at high risk of malnutrition ('MUST' ≥2)
- The percentage of discharge letters specifying that the ONS prescription should continue for 3 months for patients at high risk of malnutrition ('MUST' ≥2).

Method: Audit data was recorded for all patients who were admitted to the hospital trauma and orthopaedic ward with a #NOF over two months (N=26, 56-100 years, 69% female). Data was recorded by the dietitian during the first month prior to pathway implementation, then one month after.

Results: The audit showed increases in the percentage of patients with #NOF who received Fortisp Compact Protein

BD during their admission, the percentage of discharge letters requesting the GP continued to prescribe this ONS BD upon discharge, and the percentage of discharge letters which specified a community prescription period of three months (Table 2).

These results indicate that the implementation of the nutritional care pathway helped to improve and standardise patient care in line with the Trust agreed standard and the evidence base for nutrition support after hip fracture. However, they also highlight some areas for ongoing improvement. Prescription of Fortisp Compact Protein during hospital admission remained low at 44%, as did the specified prescription period (56%). After hip fracture, patients are particularly vulnerable to further nutritional (and subsequent clinical) decline, due to the persistent catabolic state and likely poor appetite which may persist post-discharge. These findings were disseminated at the next quality and development meeting for the ward. Following this, we have since provided the ward with informative posters on ONS, organised staff taste testing of the high energy, high protein, low volume ONS, 'MUST' training and worked closer with the MDT

to incorporate the nutritional care pathway within the internal #NOF policy. We are currently working on running sessions to the medical team to ensure high energy, high protein, low volume ONS are routinely prescribed as per the nutritional care pathway.

Conclusion

Hip fracture patients are among the frailest of patients, with complex nutritional needs and poor dietary intakes. We implemented a pathway providing high protein, low volume, ready-to-drink ONS twice daily for all #NOF patients during admission, and for three months post discharge for those at high risk of malnutrition on discharge. This has helped to improve and standardise the nutritional care received by our hip fracture patients locally, in line with the clinical evidence base. Following this project, we look forward to gaining further insights about improved clinical outcomes through community follow up. The project has highlighted the importance of evaluating the implementation of nutritional pathways to optimise adherence across the MDT and identify opportunities for continuing improvements to our clinical practice.

Table 2: Results from Local Audit of the Implementation of a Nutritional Care Pathway for #NOF

	Patients prescribed Fortisp Compact Protein BD during admission	Discharge letters requesting GP prescription of Fortisp Compact Protein BD for high risk patients	Discharge letters specifying GP prescription length of 3 months for high risk patients
Pre-pathway	15%	54%	31%
Post-pathway	44%	89%	56%

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