# Implementing the Professionally Endorsed 'Managing Malnutrition in COPD' Pathway

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In 2016, a multi-professional panel with expertise and an interest in malnutrition and chronic obstructive pulmonary disease (COPD) developed a new practical guide to assist healthcare professionals in identifying and managing people with COPD who are at risk of disease-related malnutrition; 'Managing Malnutrition in COPD' (**www.malnutritionpathway.co.uk/copd**) is based on clinical evidence, clinical experience and accepted best practice. The guidance is in line with NICE guidelines and has been endorsed by a number of key professional and patient associations.[1]

In light of the development of this guidance, coupled with COPD being highlighted as a Clinical Commissioning Group (CCG) priority, the Dietetic Team at Great Western Hospitals NHS Foundation Trust instigated a pilot project to look at the effect of implementing the 'Managing Malnutrition in COPD' guidance to manage COPD patients at high risk of malnutrition. This article gives an overview of nutrition in COPD, the project, and its results, which include a reduction in malnutrition risk and healthcare use with associated cost savings.

## Background

### COPD and malnutrition

**Disease-related malnutrition (DRM) is estimated to cost more than £19 billion each year in England alone, which equates to more than £90 million per CCG.[2,3]**

These costs are due to the consequences of malnutrition, which include increased GP visits, increased length of hospital stay and more frequent admissions and readmissions to hospital.[2]

Malnutrition in COPD can develop gradually over several years, or as a result of exacerbations. Using the 'Malnutrition Universal Screening Tool' ('MUST') to identify risk, it has been estimated that the overall prevalence of malnutrition in COPD outpatients is 21%, suggesting that up to 630,000 people in the UK suffering with COPD may be at risk of malnutrition.[4]

Patients with COPD who are at risk of malnutrition have a higher risk of being admitted to hospital and typically require a longer stay in hospital, as well as having a higher risk of mortality than those not at risk.[5]

Malnutrition is often associated with increased energy and protein needs and this requirement is augmented in chronic disease, such as COPD. Therefore, malnourished COPD patients may benefit from a high energy, high protein oral nutritional supplement, in a low volume to aid compliance, alongside dietary advice.[1,6]

### NICE guidelines

The importance of nutrition support to manage malnutrition is widely recognised by NICE. Clinical Guideline (CG) 32[7] and the supporting Quality Standard (QS) 24[8] provide guidance to healthcare professionals in identifying and managing malnourished individuals and choosing the most appropriate nutrition support. Clinical Guideline (CG) 101[9] provides specific guidance on the management of COPD patients.

The guidelines state that:

- *'Healthcare professionals should consider oral nutrition support to improve nutritional intake for people who can swallow safely and are malnourished or at risk of malnutrition'*
- *'BMI should be calculated in patients with COPD'*
- *If a (COPD) patient's BMI is <20 kg/m$^2$, they should be given 'nutritional supplements to increase their total calorific intake'.*

### Nutritional requirements of patients with COPD

Poor nutritional intake in patients with COPD is common.[10] The causes of this are varied and can include the physiological effects of the disease, such as breathlessness and fatigue, but also psychological, social and environmental factors, such as depression, social isolation and living conditions.[1] Coupled with this, patients are likely to have increased energy expenditure due to systemic inflammation, as well as the increased work of breathing,[10] putting them at increased risk of disease-related malnutrition.

A recent systematic review and meta-analysis found that nutritional support in COPD, primarily using ready-made liquid oral nutritional supplements (ONS), results in significant improvements in a number of clinically relevant functional outcomes, such as respiratory and peripheral muscle strength. The work also established that these functional improvements were associated with a weight gain of 2 kg, suggesting this could be a therapeutic target in malnourished COPD patients.[11] As well as overall energy needs, it is important to consider protein requirements in this group, see Figure 1.

### The cost saving implications of managing malnutrition in patients with COPD

NICE has shown that substantial cost savings can result from identifying and treating malnutrition, and the implementation of CG32[7] and supporting QS24[8] have been shown to be high impact with respect to cost savings. This cost saving is calculated by taking the increased costs of implementing appropriate nutritional screening and management away from the overall cost savings due to better nourished patients resulting in reduced healthcare use and gives a net cost saving of £71,800 per 100,000 of the population – see Figure 2.

More recent work carried out by the National Institute for Health Research (NIHR) and BAPEN has shown that this figure could now range from £119,200-£145,090 per 100,000 population.[2]

## The Project

### Project aim

A pragmatic pilot project to assess the potential benefits of managing COPD patients in the community at high risk of malnutrition according to the Managing Malnutrition in COPD guideline.

## Methods

### Step One: Review of current caseload and local policy

Having considered the background information as a team, we began by reviewing our local population. We took the total CCG numbers and used national statistics to break this down to calculate the number of adults in the CCG. From this, prevalence data was used to estimate the number of adults with COPD and the proportion of these likely to be malnourished. We estimated that 676 adults with COPD in Swindon CCG may be malnourished or at risk of malnutrition and would benefit from appropriate management – see Table One for detail.

We reviewed our local Nutrition and Hydration policy to look at how this patient group were being managed currently. The Great Western Hospitals' 'Nutrition and Hydration for Adults Policy & Guidance' states:

- *Patients cared for in their own home by the community teams should be weighed on the first visit by a relevant community healthcare professional*
- *'MUST' should be carried out for all adult patients cared for by the community teams (except in those who are pregnant or at the end of life)*
- *If patient is found to be at risk of malnutrition complete 'Food is a 'MUST' care plan.*

### Step Two: Identify patients with COPD who are at high risk of malnutrition

It was decided that COPD patients at high risk of malnutrition would be the focus of the project. Identification of this group was carried out by referral from the respiratory nurse, as well as case note review.

Figure 1: Protein Requirements

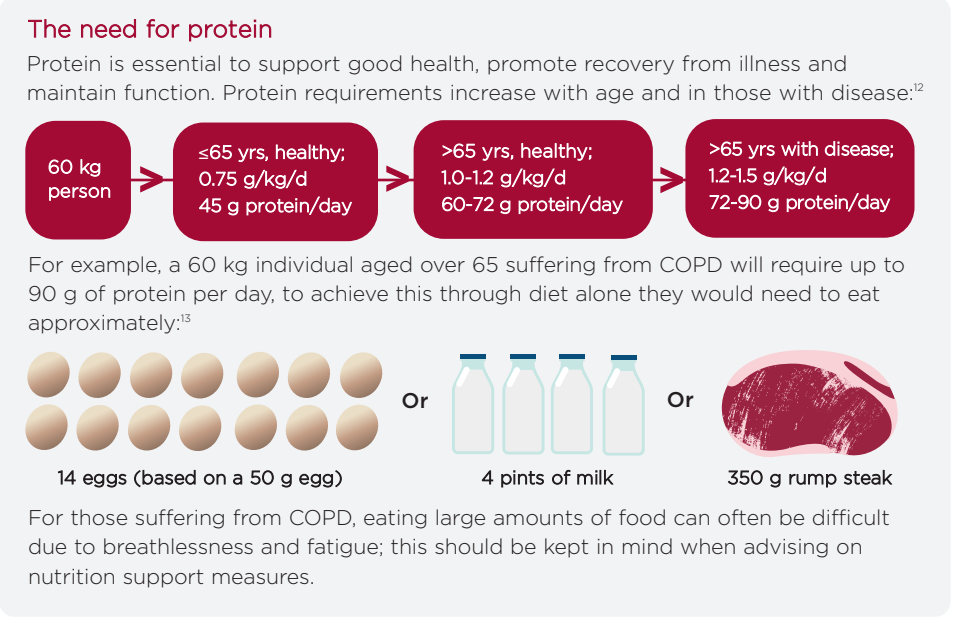



Figure 2: Cost-savings


Table One: Local Population Information

| | |
|---|---|
| Total Swindon CCG numbers | 231,227 |
| 80% adults (based on population data[14]) | 184,982 |
| Number with COPD (5.8% of adults suffer with COPD, based on national statistics of 3 million people suffering with COPD in UK out of total adult population of 52 million) | 10,729 |
| 30% of those with COPD have a diagnosis[15] | 3,219 |
| 21% with COPD diagnosis are malnourished[4] | 676 |

### Malnutrition risk of patients with COPD in Swindon

There were approximately 200 patients with COPD on the caseload of the community respiratory nurse at the start of the project; these were COPD patients within the CCG who had received input from the community respiratory nurse in the last year. Not all patients on the caseload were being routinely screened as per local policy. Review of the 200 patients showed:

- 53 had either insufficient information available to assign a 'MUST' score (48), or were not able to be reviewed (5)
- Of the other 147 patients:
  - 121 were identified as low risk of malnutrition (82%)
  - 26 were identified as 'at risk' of malnutrition (high risk 'MUST' and medium risk 'MUST' with a BMI <20 kg/m$^2$) (18%).

Nineteen of the 26 'at risk' patients from the caseload were followed up using the 'Managing Malnutrition in COPD pathway' (5 had passed away on review and 1 did not wish to take part).

### Step Three: Initial Dietetic Assistant (DA) visit

The 19 patients who had been classified as 'at risk' were visited and reviewed by the DA, **Table Two** displays the routine measures that were assessed. Characteristics of the group are displayed in **Table Three**.

The DA then commenced the patients on to the Managing Malnutrition in COPD pathway, this involved:

- Setting nutritional goals with the patient; the primary nutritional goal being weight maintenance and the secondary nutritional goal weight gain over the 12 weeks. These goals were considered appropriate for a COPD population at high risk of malnutrition
- Giving dietary advice and providing the 'Nutrition Support in COPD' patient advice leaflet – a supporting resource to the pathway, available via the website[1]
- Arranging a prescription of 2 low volume, high energy, high protein oral nutritional supplements (ONS) per day (as recommended in the Managing Malnutrition in COPD pathway).

### Step Four: 6 and 12-week DA visit

The DA visited all patients at six and 12 weeks to review their healthcare use, repeat health rating, CAT and anthropometric measures and assess compliance with ONS. This compliance check was important to ensure any patient barriers to compliance were identified and resolved in order to avoid ONS wastage.

At 12 weeks patient satisfaction was also measured. The patients were asked to rate their satisfaction with their ONS prescription, the dietary advice provided and their overall nutritional management using a 0-10 scale, with 0 being completely unsatisfied and 10 being completely satisfied.

At the end of the project, the ONS prescription was stopped if clinically appropriate, as per the pathway. If the patient remained at risk of malnutrition a referral was sent to the dietetic team for follow up.

## Results

### Malnutrition risk

At the end of 12 weeks there was a significant reduction in overall malnutrition risk in the group (based on 'MUST' risk category). The number of patients at high risk of malnutrition fell from 19 to 10 over the 12 weeks.

Fifty-three per cent of the group met the primary nutritional goal (weight maintenance over 12 weeks) and 47% of the group met the secondary nutritional goal (weight gain over 12 weeks).

### CAT score

- A significant improvement was seen in total CAT score at both 6 weeks and 12 weeks
- The number of patients in the CAT *very high impact* group reduced from 6 to 1 over the 12 weeks (see **Figure 3**).

### Health rating

A significant improvement was seen in average health rating over the 12 weeks, suggesting that patients felt an improvement in their health whilst on the pathway.

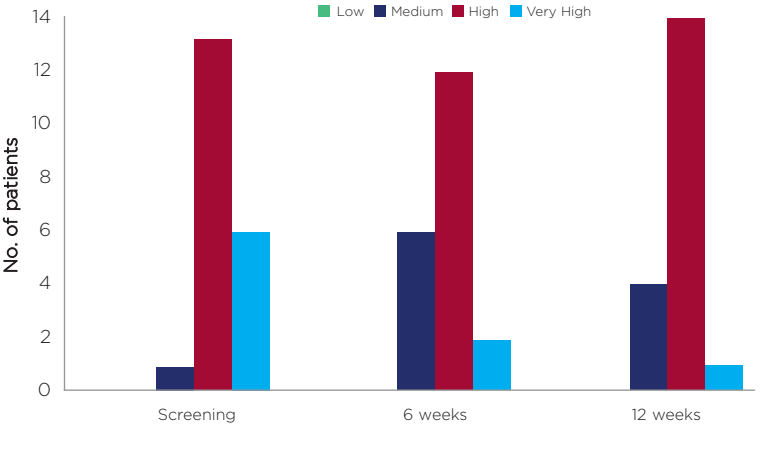
Table Two: Routine Measures Assessed at 6 and 12-week Visit

| Anthropometrics | Healthcare usage over the previous 12 weeks | COPD Assessment Test (CAT) | Health rating |
|---|---|---|---|
| • Weight<br>• Height<br>• BMI<br>• 'MUST' | Patients were asked questions by the DA to quantify:<br>• Number of GP appointments for COPD exacerbations<br>• Number of hospital admissions due to COPD exacerbations<br>• Length of hospital stay<br>• Number and length of steroid and antibiotic prescriptions for COPD | Patients were also asked to complete the CAT (see **www.catestonline.org/english/indexEN.htm** for further information on the test). This gave us a measure of the impact of COPD on the individual's life and how this changed over the course of the project | Patients were asked to rate their health on that day using a 1-10 scale, with 1 being bad health and 10 being great health |

Table Three: Initial Review Characteristics

| Characteristic | Group at screening (n=19) | | |
|---|---|---|---|
| | Mean (SD) | n (%) | Range |
| Age/yrs | 75 (9.4) | - | 50-88 |
| Gender:<br>Male<br>Female | <br>-<br>- | <br>11 (58%)<br>8 (42%) | <br>-<br>- |
| Height/m | 1.65 (0.1) | - | 1.49-1.86 |
| Weight/kg | 50.1 (12.1) | - | 31.0-76.0 |
| BMI/kg/m$^2$ | 18.3 (3.1) | - | 13.1-25.8 |
| BMI <18.5 kg/m$^2$ | - | 10 | - |
| BMI <20 kg/m$^2$ | - | 16 | - |
| BMI >20 kg/m$^2$ | - | 3 | - |

Figure 3: Change in CAT Scores Across the 12 Weeks



### Patient satisfaction

Patient satisfaction with the management of their malnutrition was very high (average rating of 9.6 out of 10).

### ONS compliance

ONS compliance was defined as: reported *consumption of one or more 125 ml bottles per day for 12 weeks.*

Overall compliance was good with 90% of the patients commenced on the pathway compliant with the ONS prescription over the 12 weeks.

### Healthcare use

Implementation of the pathway resulted in reduced healthcare usage. A reduction was seen in all healthcare use measures over the 12-week period. Due to small patient numbers in this pilot study, the findings were not statistically significant but may be considered both clinically and economically relevant. See **Table Four** for the percentage reduction in the various healthcare use measures.

On the basis of these results and using average costs,[16] as well as the cost of ONS,[17] we were able to estimate the cost savings of the project to the CCG. The results showed a total cost saving of £80.82 per patient, which equates to a total saving of £1,535.58 across the 12 weeks.

## Conclusions and recommendations

**This is a small pragmatic implementation of a pathway to manage malnourished COPD patients in the community with some limitations, namely: a small cohort of patients, patient reported healthcare use and not all healthcare use costs captured by the measures in the project. Despite that, this local data gives us a real insight in to the benefit of appropriate nutritional management of malnourished COPD patients, for both the patients and the wider healthcare economy.**

The results support existing literature which suggests that the use of nutrition support in malnourished COPD patients leads to improved patient outcomes. Future projects should consider the appropriate nutritional management of patients with COPD across the disease trajectory so that the impact of implementing the pathway to appropriately manage patients at medium risk of malnutrition, as well as helping to prevent malnutrition in patients at low risk can be assessed.

As a team, we plan to continue to implement the pathway in this patient group and are working to integrate this into the local discharge care bundle for COPD patients. It is hoped that this data can be collated with the existing data to build a larger sample size over time.

Table Four: Healthcare Use Reduction

| | Percentage reduction |
|---|---|
| Number of patients with ≥1 GP appointment for COPD exacerbation | 45% |
| Total number of GP appointments for COPD exacerbation | 20% |
| Number of patients with ≥1 steroid prescription for COPD | 17% |
| Number of patients with ≥1 antibiotic prescription for COPD | 20% |
| Number of patients with ≥1 hospital admission due to COPD exacerbation | 83% |
| Total number of hospital admissions for COPD exacerbation | 50% |
| Total length of hospital stay (days) | 48% |

**Case Example:**
**Mr A aged 73 years**

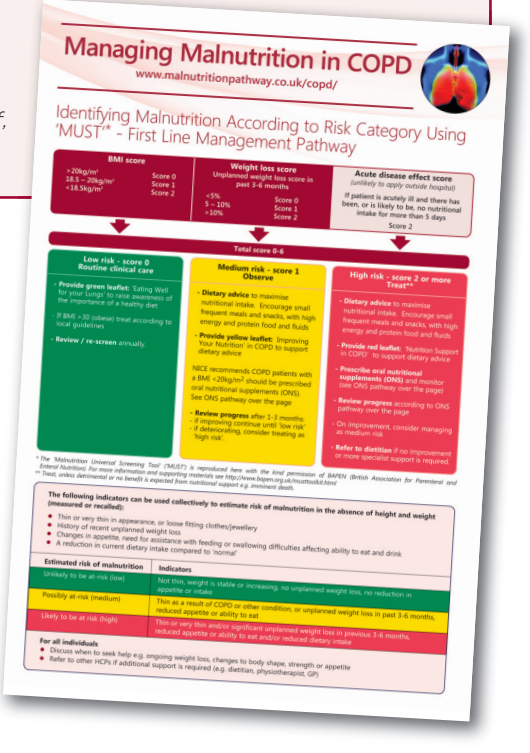
At initial appointment:

- 'MUST' score of 3 ('high risk') (Scored 1 for low BMI and 2 for 18% involuntary weight loss over last 3-6 months)
- CAT score of 21 ('high impact')
- Commenced on 12-week high risk pathway according to 'Managing Malnutrition in COPD' guidance. Provided with dietary advice and prescribed a low volume, high energy, high protein, ready-to-drink ONS twice daily.

At 12-week review:

- Compliant with ONS
- 'MUST' score 0 ('low risk')
- CAT score 17 ('medium impact')
- Total weight gain 2.5 kg (clinically significant).[11]

Mr A says: *"I can feel a change in myself, my energy levels are improving."*

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