Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Additional drug administration  
Virtual patient assessments and training  
Support/facilitate virtual clinics  
Condensed patient training to aid reduced number of visits for training  
Rapid discharge for nurse patients

We reduced the number of nursing visits our patients were having to reduce the risk through contact:

- Patients were offered training for themselves or a carer
- Where clinically safe and in agreements with the referring centres and our patients, we reduced patient’s visits to once a day from twice per day by administering 24-hour infusions, thus reducing contact and exposure to nurses and patients

We offer a 24hour nurse Advise Line to support our patients and nurses in the community. As part of the ‘Why Hospital Why Today’ initiative, the Advice Line worked hard to find ways to keep patients safely at home rather than advising hospital, along with discussions with the manager on call were able to reduce the number of out of hours hospital admissions. We also considered our patients mental health and well-being. Our patient cohort is a vulnerable group and they were being isolated from family and friends as well as reduced nursing visits which could impact on their mental health and well-being. We initiated weekly supportive calls to all our patients which were well received.

During 2020 at the height of the pandemic, 27 hospital admissions were avoided, 6 patients completed the condensed patient training package, 160 patients had amendments to their prescription regime to reduce number of visits, 63 patients initiated 24-hour parenteral nutrition infusions, halving their contact with nurses.

ENHANCING THE NUTRITION SERVICE IN AN ACUTE HOSPITAL TRUST

Wendy-Ling Relph, East Kent Hospitals University NHS Foundation Trust.

Nutrition is a fundamental aspect of care, is a basic human right and there is an expectation that all patients receive optimal nutritional care. The Nutrition Steering Group identified that there were safety concerns and patient experience issues relating to the all aspects of nutritional care that an acute hospital provides. In order to understand this further, a decision was made to benchmark the service provision against national and local standards to enable a gap analysis to be undertaken and the development of an options appraisal.

National guidance was reviewed. NICE Guidance states that ‘All acute hospital trusts should have a multidisciplinary nutrition support team which may include…..and a nutrition steering committee working within the clinical governance framework….all acute hospital trusts should employ at least one specialist nutrition support nurse’. The advice in NICE guidance is not specific.

The review of the organisation of nutrition services within a number of hospital trusts was undertaken to enable benchmarking. Within the majority of Acute Hospital Trusts, nutrition services appear to have been developed in a piecemeal way, developing individual professional groups, such as Dietetics, Gastroenterology and Speech & Language Therapy, in isolation from the perspective of the wider nutrition multidisciplinary service. A Gold Standard Nutrition Service appears to be implemented by those Trusts with designated Intestinal Failure Units and Home Parenteral Nutrition Services.

The result is that there are a variety of options for organising Nutrition Services across the country making benchmarking difficult and identification of an excellent service within an acute hospital subjective.

The nutrition steering group drafted a Nutrition Strategy based around clinical inputs, services and outcomes. A comprehensive Nutrition Risk Register was developed. A business case and options paper was developed including the risks and safety concerns, the benchmarking summary and the potential costs to the organisation. A solution of replication of the triumvirate model already implemented across each care group and review of all clinical staff within nutrition in a staged approach to implementation was provided. This was presented to multiple Board Level groups for discussion.

The outcome of the submission is that the first stage of the business case was approved, which has enabled the appointment of a Trustwide clinical and service lead, a lead nutrition practitioner, 3 Nutrition specialist practitioners and 3 nutrition support workers. This group of staff are currently being recruited and improvements and outcomes are already apparent.

The Five Year Nutrition Strategy has been approved and a review of the non nursing aspects of the service is being undertaken. The aim has been to develop a Gold Standard Nutrition Service in an Acute General Hospital, to enable benchmarking nationally. It is important to share this work and enable the benchmarking to start at the Bapen conference.

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THE CHALLENGE OF MEETING PROTEIN REQUIREMENTS IN CRITICALLY ILL PATIENTS IN THE COVID ERA

S. Verdaasdonk, K. Lomax, A. Morgan, M. Price, L. Fixter. Department of Dietetics, Royal Free Hospitals London NHS Foundation Trust, Pond Street, London, NW3 2QG

Critically ill patients often face progressive and rapid losses of body and muscle mass due to hypermetabolism and increased protein catabolism. Certain population groups (such as obese patients or those requiring Continuous Renal Replacement Therapy (CRRT)) require a higher protein provision as advised by both ASPEN1 and ESPEN2. Furthermore, critically ill patients often receive significant energy provision from non-nutritional sources such as propofol. As a consequence, calorie provision via enteral feed is commonly restricted to avoid overfeeding, and protein provision to the patient is further compromised.

Retrospective data was collected for 58 patients who were either confirmed or suspected of COVID-19 and admitted to the Intensive Care Unit (ICU) during April 2020. 31% (n=18) of patients were unable to meet their protein requirements from the feed formula alone, based on initial dietetic assessment. Recommended protein requirements were not achieved in any patients who were obese (n=10; defined as BMI ≥30 kg/m²) or receiving CRRT (n=6). The maximum protein provision for obese patients was 1.5g/kg IBW and 1.6g/kg for patients receiving CRRT. The situation was exacerbated for patients receiving high dose propofol (defined as >10 ml/hr), where protein provision decreased to 0.8 – 1.2g/kg and 1.1 – 1.3g/kg respectively.

Figure 1 Protein provision in non-obese, non-CRRT patients in ICU

In the non-obese, non-CRRT ICU population, the available enteral feeding regimes were appropriate to meet the majority of patients’ protein requirements (as shown in Figure 1). However the review almost certainly overestimates protein provision, as percentage feed delivery was not assessed and the results assume 100% feed delivery. We know from
Table 1 Anthropometric and nutritional information of a patient with mitochondrial depletion syndrome.

| Date         | Weight (Kg) | BMI (Kg/m²) | Estimated energy requirements (kcal) | Estimated protein requirements (g) | Estimated energy intake (kcal) | Estimated protein intake (g) |
|--------------|-------------|-------------|-------------------------------------|-----------------------------------|-------------------------------|-----------------------------|
| 19/03/21     | 51.2        | 17.1        | 1280 – 1792                         | 41 – 78                           | 1900 – 2000                   | 82 – 87                     |
| 25/03/19     | 43.3        | 14.6        | 1083 – 1516                         | 35 – 65                           | 2000                         | 78                          |
| 12/04/18     | 48.6        | 16.3        | 1165 – 1631                         | 37 – 70                           | 1500 – 1800                   | 40 – 48                     |
| 19/10/17     | 43.4        | 14.5        | 1825 – 2225                         | 53 – 81                           | 1020                         | 60                          |

NUTRITIONAL MANAGEMENT OF MITOCHONDRIAL DEPLETION SYNDROME: A CASE STUDY

J.B. Freemantle, B. Doyle, D. MacCallum, P. Young, M.A. Thomson. Fife NHS, Lynebank Hospital, Halbeath Road, Dunfermline, Scotland, KY11 4UW

Mitochondria are organelles found in every cell of our body, except for red blood cells, and regulate energy metabolism, apoptosis, and oxidative stress. Proteins controlling these processes are encoded by nuclear or mitochondrial DNA [1]. Mutations in this DNA may result in mitochondrial disease, which are a group of incurable, multi-systemic, and progressive diseases, including mitochondrial depletion syndromes (MDS) [1]. This is a case study on the nutritional management of a patient diagnosed with encephalomyopathic MDS caused by mutations in the nuclear gene RRM2B, required for mitochondrial nucleotide synthesis [2].

This patient was diagnosed as a teenager upon presenting with ptosis and weakness of his upper and lower limbs, which limited his mobility. He was referred to Nutrition and Dietetics aged 47 years in October 2017 due to being at high risk of malnutrition (Table 1). On initial presentation the patient was on a soft diet secondary to dysphagia, and at high risk of refeeding syndrome [3]. Our primary aims were to (i) manage refeeding risk and (ii) improve his nutritional status and body weight to maintain functional status. His nutritional requirements were estimated using Henry equation. There is a paucity of evidence regarding the nutritional management of this patient group, however, NICE (2006) guidelines for nutrition support for adults and ESPEN (2018) guidelines for clinical nutrition in neurology are frequently used for this patient group [3,4]. The patient’s bodyweight increased by 7% over 3 months using food fortification and oral nutritional supplements (ONS) to meet his estimated nutritional requirements. After discontinuing ONS, his bodyweight had increased by a total of 11% over 6 months and he was discharged. The patient was referred back to our service a year later following an episode of severe aspiration pneumonia that resulted in admission to ICU and subsequent placement of a percutaneous endoscopic gastrostomy (PEG) feeding tube. He had been established on level 4 pureed diet and normal fluids, which later progressed to increased aspiration risk, and his BMI had once again significantly decreased. He had also commenced non-invasive nocturnal ventilation.

Our aims were to (i) meet his estimated nutrition requirements, (ii) promote weight gain, and (iii) maintain functional status. This was achieved via bolus feeding with 4 Ensure TwoCal daily alongside level 4 pureed diet taken at risk by patient choice. Either bolus or continuous tube feeding is recommended for this patient group to avoid a catabolic state and hypoglycaemia [2,5]. His fluid requirements were met via the gastrostomy. Although supplementation with vitamins, including riboflavin and thiamin, may be practiced, these have shown little benefit in slowing disease progression [2]. Despite an increase in the patient’s bodyweight, weakness of his respiratory muscles and reflux from gastrostomy feeding resulted in repeated occurrences of aspiration pneumonia. Unfortunately, this would see the patient succumb to his condition at 51 years, 2 years after commencing gastrostomy feeding.

The role of nutrition in supporting patients with mitochondrial diseases places Dietitians as key members of the multidisciplinary team. This case study highlights the importance of regularly monitoring patients’ nutritional status and bodyweight throughout their disease course. Although the heterogeneous nature of mitochondrial diseases makes this challenging to study, the need exists for disease-specific nutrition guidelines. 1. Parikh S, Goldstein A, Koening M K et al. Diagnosis and management of mitochondrial disease: a consensus statement from the Mitochondrial Medicine Society. Genet Med 2014: published online December 11. https://doi.org/10.1038/gim.2014.177

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A QUALITY IMPROVEMENT PROJECT TO OPTIMISE NUTRITION IN COVID-19 PATIENTS RECEIVING CPAP THERAPY IN A WARD BASED SETTING

I. Davies, H. Hartnett, V. Alderman, J. Agbetile. Homerton University Hospital, Homerton Row, London, UK, E9 6SR

Patients receiving Continuous Positive Airway Pressure (CPAP) therapy for severe COVID-19 are at high risk of malnutrition[1,2]. This is related to poorer outcomes and longer durations of hospital stay[3]. British Dietetic Association guidance recommends nasogastric (NG) feeding for all COVID-19 patients on CPAP[4]. The aim of this Quality Improvement Project (QIP) was to optimise nutrition in COVID-19 patients receiving CPAP therapy in a ward-based setting at a UK District General Hospital.

Table 1 Anthropometric and nutritional information of a patient with mitochondrial depletion syndrome.