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specific population groups; particularly those who may be obese, require CRRT or are receiving high dose dexamethasone in an ICU setting.

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### NUTRITIONAL MANAGEMENT OF MITOCHONDRIAL DEPLETION SYNDROME: A CASE STUDY

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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 had 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 aspiration pneumonia. His nutritional requirements were estimated using the Henry equation. There is a paucity of evidence regarding the nutritional requirements. After discontinuing ONS, his bodyweight had increased by 7% over 3 months using food fortification and oral nutritional supplements (ONS) to meet his estimated nutritional requirements. 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 hyperglycaemia [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.

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

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Patients receiving Continuous Positive Airway Pressure (CPAP) therapy for severe COVID-19 are at high risk of malnutrition. This is related to poorer outcomes and longer durations of hospital stay. British Dietetic Association guidance recommends nasogastric (NG) feeding for all COVID-19 patients on CPAP. 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.

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**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                         |
STEPWISE APPLICATION OF A PILOT PREHABILITATION PROGRAM FOR COLORECTAL CANCER PATIENTS PREVENTS NUTRITIONAL DECLINE AND IMPROVES PATIENT-REPORTED OUTCOMES

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Prehabilitation refers to a multimodal preoperative strategy aiming to enhance patients’ functional capacity. Evidence for the implementation of a prehabilitation program has demonstrated favourable patient reported and healthcare cost outcomes (Gillis et al. 2018). A stepwise implementation of a pilot prehabilitation program was undertaken in a colorectal unit.

Prehabilitation was offered to a cohort of all newly diagnosed colorectal cancer patients planned for curative treatment. Patient demographics, oncological characteristics, anthropometric data, frailty scores and patient-reported global health assessment were recorded at baseline and during follow up after intervention and treatment (surgery). Crude clinical outcomes included hospital length of stay (LOS), morbidity, mortality, readmission rates.

39 patients were treated ‘straight to surgery’. Time available for dietetic prehabilitation was a median 14 days (2–62) and for physiotherapy prehabilitation 10 days (1–31). One third of patients had experienced significant weight loss pre-operatively. Dietetic prehabilitation impeded further decline: there was no difference in median Body Mass Index (BMI) between baseline and 6 weeks post-op. Physiotherapy prehabilitation seemed to confer an observed improvement trend in the Rockwood frailty score (RFS): Baseline median RFS = 1.5 (range 1–4), Follow-up median RFS = 2, (range 1.5–5, ns). Similar trend was observed in self-reported general health scores: Median ED5q5L score at follow up was 90% (range 70–99%), improved from median baseline pre-op score 75% (range 50–83%, ns). Favourable clinical outcomes were recorded with no mortality or readmission. The total hospital LOS did not differ from historical data.

Prehabilitation can impede the nutritional and functional decline of colorectal cancer surgery. Holistic clinical approach to prehab and physiotherapy-targeted tailoring to individual patient needs can build on the above preliminary experience.

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ASSESSING THE SEVERITY OF PRE-OPERATIVE MALNUTRITION IN CANCER PATIENTS DUE TO UNDERGO POTENTIALLY CURATIVE SURGERY: A REVIEW OF A VIRTUAL DIETETIC PREHABILITATION SERVICE.

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Malnutrition is associated with increased pre- and post operative complications1. Dietetic prehabilitation aims to improve surgical outcomes by assessing patients’ nutritional status and instituting early educational and dietetic interventions1. In this review, we aimed to assess the severity of nutritional risk in both colorectal and hepatobiliary cancer patients referred for potentially curative surgery and understand the need for dietetic prehabilitation as part of cancer services. All patients were nutritionally assessed using the Patient Generated Subjective Global Assessment short form and patients were triaged as universal (score <4, low nutritional risk), targeted (score 5-9, medium nutritional risk) or specialist (score >9, high nutritional risk). 20 patients with hepatobiliary cancer and 53 patients with colorectal cancer were referred for surgical intervention between 12th February 2020 and 5th November 2020. In the hepatobiliary cohort, 15/20 patients (75%) required targeted or specialist dietetic prehabilitation. Median weight was 75kg (47kg-114.8kg) and median BMI was 22.9kg/m² (15.7-34.3kg/m²). 5/ 20 (25%) patients had a BMI less than 20.0kg/m², 12/20 patients (60%) had experienced ≥5% unintentional weight loss over the past 6 months. 13/18 patients were started on pancreatic enzyme replacement therapy pre-surgically. 1 patient was admitted for pre-surgical nutritional optimisation. In the colorectal cohort, 21/53 (40%) required targeted or specialist dietetic prehabilitation. Median weight was 74.2kg (44kg-121.35kg) and median BMI was 24.9kg/m² (18.3-41.7kg/m²). 3/53 (6%) patients had a BMI less than 20.0kg/m². 14/53 (26%) patients experienced ≥5% unintentional weight loss over the past 6 months. 18/53 patients required low fibre dietary modification due to risk of colorectal obstruction. No patients from either cohort lost further weight prior to surgery.

A large proportion of patients with colorectal and hepatobiliary malignancy referred for surgical resection are at high nutritional risk. A prehabilitation program can identify patients at nutritional risk and initiate early interventions to optimise pre-operative nutritional status, and provide education on dietary aspects important for post operative recovery. Findings from this review highlight the importance of robust dietetic screening and the importance of early referral to a Prehabilitation or Oncology Dietitian to meet the unmet nutritional needs of pre-surgical hepatobiliary and colorectal cancer patients.

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