BAPEN COVID-19 Service Improvement & Innovation Awards Entry Form

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Summary of the Service Improvement & Innovation:

Snap shot review of Nutritional Support for Adult Intensive Care Unit for patients with COVID -19. Data was collected for the 'first wave' period across two hospital sites, Leicester Royal Infirmary and Glenfield Hospital and focused on patient demographics and nutritional parameters to help inform if future practice changes were required. Glenfield Hospital is also a tertiary ECMO centre.

Challenges faced and how they were overcome:

Challenge	Solution
High patient numbers (an increase of 65% in bed base and around double the usual numbers of patients on enteral feed in a 3 month period	• There are 44 Dietitians working in UHL • There are 12 Dietitians working in Critical Care (27%) • A further 28 dietitians (63%) received training on how to remotely work on intensive care under the supervision of a senior Dietitian. • Tools were created to help Dietitians with calculations • Remote working was used and so senior Dietitians were working next to new Dietitians to support them • Protocols developed in addition to standard ICU feeding protocol for Medical and Nursing Staff to use if a Dietitian review was not possible
• Unable to enter ICU hot zone due to limiting numbers of staff in there and preserving PPE	• Remote working commenced using Nerve Centre® • Photographs of all the charts were uploaded to view
• Sicker patients, requiring ventilation for longer leading to weight loss and muscle mass loss	• Use of protein supplements on ICU • Follow up post ICU and hospital discharge for COVID-19 patient • Development of a nutritional support leaflet for all COVID-19 patients
• Patients with high Body Mass Index (BMI), leading to problems meeting	• Review of enteral feeds available as part of enteral feed contract

protein requirements	• Review of UHL guideline on calculating protein requirements in obese patients
• More patients than normal developing Acute Kidney Injury and therefore not enough renal filtration devices to cope with demand	• Higher use of renal feeds • Training received by renal dietitians on use of intermittent haemodialysis and feeding plans to accompany this • Monitoring demand of renal feeds across the service to ensure the patients most in need got these to prevent running out of stock
• High numbers of enterally fed patients leading to stock issues	• Stock control of enteral feeds temporarily taken over by Dietitians (usually pharmacy role)
• Predicted lack of enteral feeding pumps	• Contingency plans made for bolus feeding, and feeding over 12 hours to share pumps between patients
• Lack of available weights due to lack of equipment, instability of patient group, and impact of wearing PPE	• Patient Transfer Scales ® ordered • Increase in equipment ordered • Further training on use of Ulna length to gain height in the absence of measured or recalled height

Evaluation and Outcomes:

Data was collected for a total of 122 patients: 94 non-ECMO and 28 ECMO.

Patient demographics

1. Gender

Male = 94 Female = 28
ECMO: Male = 22 Female = 6

2.Age

Average 54 years (Range 28-77 years)
ECMO: 48 years (Range 28-60 years)

3. Comorbidities

Many of the patients presented with co-morbidities including:
Diabetes = 24 (18.8%)
Hypertension = 25 (20.4%)
Heart Disease= 15 (12.3%)
Asthma = 10 (8.2%)

41 patients presents with nil PMH (33.6%)

4. ICU length of stay (LOS)

14.28 days (including RIP)

5. RIP

56 patients RIP on ICU (45.9%).
ECMO = 12 (9.8%) or 42.7% of ECMO population (12/28).

Nutritional parameters

6. BMI

Average BMI 30.4kg/m²
BMI < 25kg/m² = 18 (14.8%)
BMI >25 – 29.9kg/m2² = 37 (30.3%)
BMI 30-39.9kg/m² = 46 (37.7%)
BMI > 40kg/m² = 9 (7.3%)

A total of 35 patients who had no past medical history had a BMI > 25kg/m².

12 patients (9.8%) did not have height measured so an accurate BMI could not be obtained.

7. Dietitian input

All 122 patients were seen by a Dietitian (100%).

8. Route of nutrition support

Oral nutrition support = 5 (4.1%)
Nasogastric feeding = 117 (95.9%) of which 4 patients went on to require (3.3%) parenteral nutrition due to poor enteral feed tolerance.

9. Energy Requirements on ICU admission

Average energy requirement = 1703kcal
BMI >30.0-39.9 = 1589kcal
BMI >40 = 1804kcal

10. Protein Requirements on ICU admission

Average protein requirement = 106g (1.2g/kg actual body weight)
BMI >30.0-39.9 kg/m² = 162.9g (using 2g/kg ideal body weight – BMI 27.5)
BMI >40 kg/m² = 202.5g (using 2.5g/kg ideal body weight – BMI 27.5)

Current high protein enteral feed used formula used on UHL ICUs contains 125kcal and 6.3g protein/100ml with additional modular protein supplement used up to a maximum of QDS and so can be challenging to achieve high protein requirements without significantly overfeeding energy.

Future Plans:

Review of protein requirements and deficit in the obese (BMI>30kg/m^2) patient population and review of the enteral feed formulas/modular supplements available to best meet the needs of these patients.

Potential in-depth review of long-stay ICU patients that completed their hospital admission with UHL and looking at specific parameters, such as length of stay (LOS), weight change and functional recovery on discharge from hospital.

Consideration of routine serum micronutrient testing on ICU admission (e.g. Vitamin D) for specific 'at risk' patient populations to guide development of supplementation protocols if required.

Evaluation project on the use of Patient Transfer Scales once these are received within UHL.

Training for ICU staff on taking ulna length measurements and proactive requesting by Dietitians and the use of this to obtain an estimation of BMI, where either a height is unavailable or where an available height this is deemed unreliable.

Use all the resources and intelligence gained during this pandemic to allow for preparation in the event of an expected second wave.