



Critical Care Specialist Group (CCSG) of the BDA Guidance on management of nutrition and dietetic services during the COVID-19 pandemic

The COVID-19 pandemic has led to unprecedented expansion of and challenge to our critical care services. Undoubtedly, this will require significant planning and re-structuring of dietetic services to ensure that we are able to provide a safe and effective service during this time.

This document has been developed by members from the Critical Care Dietitians Specialist Group (CCSG) of the British Dietetic Association taking into account current recommendations for planning and local experiences to date. In the absence of evidence-based guidance in this area, we have drawn upon the experiences and knowledge obtained from those already working with critically ill patients with COVID-19, including our international colleagues.

It goes without saying that it is incredibly important that we look after ourselves and each other during this uncertain time and that the health and wellbeing of staff members is of paramount importance. Continue to look after each other, communicate and share practice with others.

This document is up to date as of Monday 4th May and we will update in line with new information that arises. Please contact us if you have any information to share that might be useful for others.

Planning

Most Trusts across the UK are making provisions for the expansion of ICU beds. This will place significant pressure on all MDT members, including dietitians.

CCSG strongly recommends that planning for increasing ICU dietetic capacity occurs urgently in line with dietetic managers and critical care planning strategies.

We recommend the following:

1. Estimate the number of additional dietitians that may be needed to cover the planned increase in ICU beds. Using the [Guidelines for the Provision of Intensive Care Services](#) (GPICS) can help with this.
2. Identify dietitians in the department who have previous adult critical care experience (Level 2 and / or 3)
3. Identify dietitians who have significant experience with enteral and parenteral feeding.
4. Identify dietitians with none of the above experience, but who will be freed up from outpatient services and are willing to help.
5. Start upskilling proposed ICU dietitians immediately ([see links here for resources](#)) and arrange for computer access to ICU specific systems as appropriate.
6. Agree local criteria for how patients will be prioritised for dietetic input and agree proposed timelines for follow up. This will be dependent on local agreements and capacity.
7. Many critical care patients will be nursed in non-critical care areas e.g. recovery, theatres. Ensure early communication with nursing staff in charge of non-critical care areas (e.g. recovery or theatres) where ICU patients will be cared for to ensure they are aware of unit feeding protocols and the requirements for ordering of feed, ancillaries etc.

Additionally, consider the following:

1. Phasing the introduction of dietitians into ICU as per the increase in bed numbers, but this does not negate the need for training to commence as a matter of urgency.
2. Triaging the sickest patients to the most experienced dietitians (e.g. the less experienced dietitians would be well placed to cover high dependency / non-COVID-19 patients to free up the most experienced dietitians for the sickest patients).

Enteral feeds, feeding pumps and ancillaries

Along with staffing, provisions for increasing enteral feeds, enteral feeding pumps and ancillaries for enteral feeding need to be made. Early discussions with dietetic managers regarding the prioritisation of enteral feeding pumps from across the Trust (including the community) for ICU are imperative. Where possible, alternative feeding methods for ward-based patients rather than ICU should be used as a first step.

CCSG recommends the following:

1. Calculate the number of additional pumps and ancillaries that may be required. This includes rationalising pump usage across ICU by not using more than one pump per patient.
2. Contact your enteral feeding pump supplier to determine if they can meet the demand and order additional ancillaries. Alternative suppliers may need to be contacted.
3. Consider alternative enteral feeding methods should enough pumps not be available (e.g. gravity / bolus feeding more stable patients on the general wards so that pumps can be available for ICU patients) and devise a plan should this happen. [Manufacturers have produced guidance that may be helpful.](#)
4. Plan for the potential to have increased numbers of patients requiring volume restricted / low electrolyte enteral feeds (e.g. should dialysis machines be in short supply).
5. Contact enteral feed supplier to determine capacity to provide required enteral feeds. Provisions for flexitainers for decanting oral nutrition supplements may need to be made.
6. Consider where enteral feed stock will be delivered and stored in spaces being made available for ICU beds. In addition to increased stock supply there may be a need for alternative enteral feeds depending on your ICU normal feed provision. This requires close liaison with senior ICU management teams.

Training for non-ICU dietitians

CCSG recommends that shadowing / basic training is commenced for non-ICU dietitians as soon as possible. [Documents to help with this can be found here.](#) However, this will be site specific depending on level of experience and number of additional dietitians required.

The documents provided are examples from sites who have already commenced this training and may be used / adapted as necessary in line with local practices and requirements.

Communication

Communication is essential to the running of a safe and effective dietetic service during this time and for ensuring the health and wellbeing of staff.

CCSG recommends dietetic representation at any COVID-19 operational meetings on the ICU so that changes can be implemented in line with this.

Along with keeping up with strategy updates, it is imperative that dietitians continue to communicate with the ICU MDT regarding the management of all ICU patients. This is particularly important when remote reviews are being undertaken (see below). Decisions regarding this should be made as per local guidance, but could include:

- Attendance at morning handover
- Daily phone calls with the nurse in charge and consultant on call
- Phone calls with the bedside nurse regarding nutrition management of specific patients.

To reduce footfall on the ICU and save PPE for nurses and doctors it is likely that COVID-19 patients will be reviewed remotely. CCSG are aware that some ICUs still operate with paper medical records and remote reviews will be difficult. It is imperative to liaise with your local ICU teams for managing this with remote reviews. We acknowledge that all the below suggestions come with limitations and can make ascertaining the true clinical picture challenging.

Methods that could be considered for remote working include:

- Telephone reviews – although this can be time consuming and impacts on nursing time so need to agree best times to do this with individual units
- Use of Skype/voecera (if facilities available within critical care unit) to speak to nursing staff/nurse in charge/doctors regarding individual patients.
- Work with the nursing staff to ensure all the essential information to undertake a remote review is being included in the nursing care plans i.e. Feed name, ml/hr, volume delivered in 24hrs, GRV size, problems with delivery (e.g. frequent fasting), propofol dose, if being proned, if fluid restriction is needed.
- In those units that are completely paper based, one of the dietitians may be required to be in full PPE to review charts and speak with staff to collect data and relay this to other dietetic team members. Discuss with your local team.

Nutritional management

It is impossible to provide evidence-based guidance for the nutritional management of patients with COVID-19. The guidance provided here is based on the management of patients with severe respiratory failure / Acute Respiratory Distress Syndrome (ARDS) and taking into account current clinical management of these patients. Please use clinical judgement at the bedside, consider local practices and evidence / guidelines for the nutritional management of critically ill patients.

The average time of mechanical ventilation in COVID-19 patients is expected to be around 14 days and therefore these patients are at high nutrition risk.

Many patients will present with gastrointestinal dysfunction on admission (e.g. diarrhoea, abdominal pain, vomiting). Patients with type 2 diabetes seem to be at higher risk for COVID-19 and patients are may require very high insulin doses therefore enteral / parenteral feeding regimens will need to take these factors into account.

CCSG makes the following recommendations:

Energy and protein targets

- Energy and protein targets should be set as per current local practice. CCSG recommends using the guidance in [ESPEN 2019](#) and the [Critical Care Chapter PENG handbook 2019](#).
- If undertaking remote reviews, ensure communication with the bedside nurse regarding the accuracy of weight and height. If required, communicate with the patient's family (likely via phone, using out-patient records or GP notes) to minimise the risk of significant incorrect energy and protein target estimations. It may be appropriate to use an ideal body weight if there are significant discrepancies.
- Adjustments to the feeding plan should be made for propofol, glucose and citrate as per usual practice, to avoid overfeeding.
- Consider protein supplements in patients who are unable to meet protein targets due to significant contribution of non-nutritional calories.
- Consider early / prophylactic prokinetics in patients who have high GRVs (using your local cut-off).

Proning

Proning patients with COVID-19 has been found to be effective and may be required for long periods over several days. CCSG acknowledges that there will be a balance between restrictive fluid balance practices, reducing the risk of aspiration / regurgitation and maintaining adequate provision of nutrition.

CCSG makes the following recommendations:

- Nasogastric (NG) feeding should continue during prone positioning if there are no concerns regarding gastrointestinal intolerance (GI) (e.g. high gastric residual volumes (GRVs), vomiting).
- If your unit GRV threshold is more than 300 ml / 4 hours, consider revising this to be a maximum of 300 ml/4 hours in proned patients to reduce the risk of aspiration/regurgitation
- Consider the use of early or prophylactic prokinetics in patients who have high GRVs (e.g. >300ml/4 hours or using your local cut-off).
- Avoid 2 kcal/ml enteral feeds if possible as these may exacerbate high GRVs, although it is acknowledged that these may be required for the management of potassium or fluid restrictions.
- Aim to avoid large volumes / high rates of enteral feed. Consider 1.3/1.5kcal/ml feeds.
- If high GRVs persist for more than 48-72 hours consider bedside placement of post-pyloric feeding tube when patient is supine if able in line with infection control policies.
- If post-pyloric feeding is not available, consider alternative options such as a semi-elemental enteral feeds or Parenteral Nutrition (PN).
- If enteral feeding is stopped during proning, ensure insulin infusion is adjusted if this is being given.

Whilst gastric feeding is not contraindicated in these patients, we acknowledge that sites with no / limited experience with proning patients may be anxious about this. If you are not able to enterally feed these patients, consider ensuring that a lumen is kept free on the CVC from admission for PN if required.

Fluid management

A restrictive fluid management strategy may be used for these patients and therefore volume of enteral and parenteral nutrition many need to be limited.

CCSG recommends close communication with the medical team to manage the balance between fluid management and meeting nutrition targets.

Renal replacement Therapy

Based on current experience with COVID-19, a large proportion of patients are likely to develop Acute Kidney Injury (AKI). It is anticipated that there may be insufficient numbers of filters to meet the increased demand.

CCSG recommends that volume restricted / low electrolyte enteral feeds are considered where necessary according to usual practice.

Use of parenteral nutrition

Patients with COVID-19 may require significant levels of sedation and neuromuscular blockade which may increase the incidence of GI intolerance. Use of PN may therefore increase in sites where post-pyloric feeding is not available.

CCSG recommends the following:

- Discuss PN provisions with your local pharmacy to ensure that this service can be provided.
- Accept that if demand increases, off the shelf bags may be required with limited scope for scratch bags.

Non-invasive ventilation (NIV)

In many circumstances, patients requiring NIV do not meeting their energy and protein targets via oral intake alone. This decision for NG feeding in patients requiring NIV should be balanced with the potential for the patient to require intubation and the risks associated with this in an enterally fed patient. Close communication with the team is essential.

CCSG recommends the following:

- Consider placement of an NGT on admission to facilitate feeding and hydration.
- If this practice is not adopted, monitor oral intake and utilise oral nutrition support (ONS) if appropriate with the progression to NG feeding if oral intake remains poor (<65% of energy and protein targets).
- Patients that have been extubated to NIV are likely to have poor oral intake and NG feeding should be continued until they have been assessed and are managing sufficient oral intake.

Nutritional recovery and rehabilitation after critical illness

As with the guidance for nutritional management of ICU patients with COVID-19 strong evidence-based guidance for the nutritional rehabilitation of ICU survivors with COVID-19 is not available. The guidance provided here is based on existing evidence for nutritional care of ICU survivors, taking into account the current clinical management of patients with COVID-19.

With the reconfiguration of many hospital wards to accommodate the increasing numbers of COVID-19 patients, ICU survivors may be transferred to wards with nursing and medical staff who may be less familiar with the consequences of critical illness, especially in relation to new weakness, nutritional care, and the psychological sequelae of an ICU admission. Failure to consistently meet nutritional requirements is likely to have a negative impact on muscle mass and physical or functional ability (1). This may be compounded by sub-optimal nutrition received during the ICU stay due to frequent enteral feeding interruptions for procedures such as proning, imaging and also gastro-intestinal intolerance. Additionally, protein delivery may have been impacted by the requirement for high propofol doses for a longer than normal duration. For the post-ICU patient, good nutritional care is fundamental to the recovery process and could positively influence their clinical, physical and emotional outcomes (2).

The nutrition that patients received in their post-ICU phase of recovery is now considered equally as important as that received on the ICU, particularly for those already nutritionally compromised, frail or with sarcopenia (3). Therefore, targeted nutrition therapy individualised to the patient's physiological, physical or psychological needs, should be a core aspect of multidisciplinary rehabilitative efforts. NICE describes a clear rehabilitation pathway (4) and quality standards (5), and although there are some limited nutritional aspects, dietitians could engage with the multidisciplinary team (MDT) to optimise nutrition support alongside exercise rehabilitation.

Prior to discharge from critical care

Prior to discharge from critical care, **CCSG recommends the following:**

- Ensure that it is clear to the MDT that enteral feeding tubes should not be removed at the time of extubation / decannulation / discharge from ICU without review by the dietitian, even if the patient has started oral intake.
- Consider changing enteral feeding tubes to 8FG or 10FG prior to extubation/decannulation as many patients will require ongoing supplementary feeding.
- Consider providing breaks in feeding regimens to facilitate co-ordination of physical rehabilitation without missing feed unnecessarily. Be mindful that evidence suggests that continuing enteral tube feeding does not negatively impact on oral intake (6).
- Consider the most appropriate feeding regimen for patients stepping down on insulin where a dietetic review may be delayed. If on a 24-hour regimen, it might be safest to continue this alongside insulin until dietetic or diabetes team review.

- Ensure early identification of nutrition related issues including swallowing problems, nausea, vomiting, diarrhoea, weakness and fatigue to facilitate appropriate interventions by other members of the MDT.

Patients are likely to experience poor appetite, early satiety and taste changes particularly in the early stages of ICU recovery (2,8,13). Smell and taste changes have been particularly evident in COVID-19 patients.

CCSG recommends that an explanation is provided to the patient of these common issues and reassurance given that these symptoms will resolve over time.

Early satiety limits the volume of supplement consumed and patients often manage adequate calorie intake, but struggle to meet protein targets.

CCSG recommends that consideration is given to using a high protein oral nutrition supplement according to patient preference.

It is important to ensure a clearly documented nutritional management plan is handed over to ward dietitians and the MDT to ensure continuity of nutritional care.

CCSG recommends:

- A structured handover is provided to the ward dietitian which includes details of the current feeding regimen, any recent clinical issues and the energy and protein balances from the ICU stay.
- Using the [CC3N handover](#) (7) or similar local version if available which includes nutritional status and baseline measures of muscle mass, strength or function where possible.

During ward stay

Evidence suggests that the process of nutritional recovery is complex and influenced by a number of factors including appetite, physical ability to eat, personal preferences, and emotional influences. Superimposed on these are the systems that deliver nutrition to patients (2, 8). During the first 1-2 weeks post-extubation patients generally only consume 50% of their energy and protein targets (9). Further to this, dysphagia is likely to be highly prevalent in this population and several patients may have tracheostomies in situ. As a result of this it is highly likely that ICU survivors will need ongoing nutritional support.

CCSG recommends the following:

- Ensure that it is clear to the MDT that enteral feeding tubes should not be removed without review by the dietitian, even if the patient has started oral intake.
- Supplemental enteral nutrition and/or oral nutritional supplements are used during the ward-based phase of care in order to meet nutritional targets where required.
- Ensure the timing of enteral feeding regimens is structured around physiotherapy sessions to ensure minimal disruption to feeding.

- Educating ward-based staff about the particular nutrition issues faced by ICU survivors.
- Consider the need for dedicated staff to provide assistance and encouragement at meal-times.
- Consider providing small regular energy dense meals and snacks. Ongoing discussions with catering staff to ensure the provision of suitable snacks is imperative. It is important to ensure the availability of snacks overnight as patients may experience altered sleeping patterns.
- Ensure the provision of information to the patient about the importance of nutrition for recovery and the need to eat foods high in calories and protein to achieve this. As a high percentage of COVID-19 patients are overweight or obese, discussions will need to be tailored to achieving appropriate protein targets without exceeding calorie goals.
- Offer a supplement after rehabilitation / exercise to ensure adequate energy is provided. Educating physiotherapists on the importance of this can be helpful.
- Referring to appropriate members of the MDT, such as clinical psychology, if required.
- Ensure follow-up to the appropriate community service is arranged if required and all relevant nutrition literature is provided.
- Ensure an adequate supply of oral nutrition supplements / enteral feed is provided to the patient on discharge taking into account the fact that prescriptions may take longer to be filled on discharge.
- Consider whether additional food packs need to be provided the patient on discharge depending on their social situation and be mindful of the impact of social isolation.

After discharge from hospital

Patients often still have profound fatigue with evident muscle wasting, which can be worse for those with a longer hospital stay (10, 11). Therefore, many hospitals offer ongoing rehabilitative or follow-up care for these patients from the early stages post hospital discharge and beyond with therapists performing physical, functional and psychological assessments at defined time points (4,5).

CCSG recommends:

- Dietitians link in with the therapists and critical care staff leading this rehabilitation pathway to inform them of the nutritional aspects to look out for.
- Consider an assessment of nutritional status/ muscle mass or function (e.g. grip strength or 6-minute walk test) and where possible compare with baseline data from their hospital stay.

Nutritional issues requiring dietetic input may be multifactorial but in the initial weeks and few months post discharge there may be ongoing weight loss or continued reduced desire to eat which require a focus on nutrition support in order to facilitate the patient being able to progress with rehabilitation and regain strength(12, 13). Nutrition-related factors to note may include symptoms which could impede nutritional intake, or be an indicator of inadequacy, such as:

- physiological or gastro-intestinal symptoms impairing intake like poor appetite(13), early satiety(2), changes in taste(8) or smell(14), dry mouth(14), nausea/vomiting(12) or bowel problems(12).
- physical difficulty with food shopping or preparation(15), reduced strength affecting self-feeding, swallow dysfunction(16, 17) or breathlessness(12).
- other physical symptoms presenting in the later months of recovery can include nail changes and hair loss(18).
- psychological elements such as anxiety, low mood or self-worth(15, 19), social isolation, or alcohol use(20) which can also contribute to a disinterest in eating.

After hospital discharge, it is uncommon for enteral feeding to be used unless there is ongoing severe swallowing dysfunction (19), neurological dysfunction or gastrointestinal dysfunction where it is felt appropriate to continue in the community.

CCSG recommends:

- Ensure a clear handover to follow-on dietetic service of the nutritional care plan and information on nutrition or functional status.
- Encourage that patients are asked whether they have any new nutrition-related symptoms (listed above), and along with the above mentioned nutritional status assessment, referral criteria for dietetic counselling should be agreed.

The choice of nutrition therapy, the dose and the duration of intervention are thought to be important to optimise fat free mass, strength and/or function. It is suggested that it may require the provision of significantly more calories and protein (estimated 35kcal-40kcal/kg; and 1.5-2g/kg)(21) for several months, although further research is still required.

CCSG recommends the following

- Advising on a nutrient dense diet, with particular attention to sufficient protein or extended periods, likely better given as periodic doses.
- Utilising high protein oral nutrition supplements as required.
- Assessing the need for additional micronutrient supplementation, including Vitamin D depending on individual circumstances.

In the later phases of recovery (likely after 6 months or often years later) patients may present with weight gain but not muscle (11).

CCSG recommends:

- Dietary counselling to include increased physical activity alongside a healthy diet but still sufficient protein alongside exercise.
- That nutritional advice is individualised to the patient's pre-morbid state, medical diagnosis, phase in their recovery, their nutritional status and functional recovery, and what they feel are their most pertinent issues.

Currently patients receive very little dietary advice and often not from a dietitian, which may therefore not be fully accurate or appropriate. Patients tell us that they value advice on nutrition throughout their pathway.

CCSG recommends that patients are provided with written literature until dietetic counselling may be appropriate or possible. Local or nationally developed literature can be used. [The BDA has a range of COVID-19 Clinical Guidance available here.](#)

Monitoring of nutrition support

Monitoring of nutrition support is essential during this time given the nutrition risk of these patients, increased demand for services, potential reliance on feeding protocols for a prolonged duration and likelihood for developing GI intolerance.

CCSG recommends close attention is paid to the prescription vs. delivery of enteral and parenteral feeds and that non-nutrition sources (glucose, propofol and citrate) and considered in these calculations to avoid both significant under and overfeeding.

Additional Guidance

CCSG recommends that all critical care dietitians keep up to date with guidance from other societies regarding professional practice during this time, medical treatment of patients with COVID-19 and health and wellbeing tips. The Intensive Care Society has created a hub that contains links to many of these guides. The website can be found [here](#).

Additional links include:

- [HCPC advice on working outside of your scope](#)
- [ICNARC report on 196 patients critically ill with COVID-19](#)

References

1. Bear DE, Wandrag L, Merriweather JL, Connolly B, Hart N, Grocott MPW, et al. The role of nutritional support in the physical and functional recovery of critically ill patients: a narrative review. *Crit Care*. 2017;21(1):226.
2. Merriweather JL, Salisbury LG, Walsh TS, Smith P. Nutritional care after critical illness: a qualitative study of patients' experiences. *J Hum Nutr Diet*. 2016;29(2):127-36.
3. Singer P. Preserving the quality of life: nutrition in the ICU. *Crit Care*. 2019;23(Suppl 1):139.
4. NICE. Rehabilitation After Critical Illness: NICE Clinical Guideline 83. London: National Institute for Health and Clinical Excellence; 2009.
5. NICE. Rehabilitation after critical illness in adults. Quality Standard 158. London: National Institute for Health and Clinical Excellence; 2017.
6. Rowles A, Langan A, Bear DE. SUN-P019: Oral Intake and Appetite in the Intensive Care Unit. *Clinical Nutrition*. 2016;35:S51.
7. CC3N. https://www.cc3n.org.uk/uploads/9/8/4/2/98425184/rehabilitation_handover_june_19_final.pdf.
8. Merriweather J, Smith P, Walsh T. Nutritional rehabilitation after ICU - does it happen: a qualitative interview and observational study. *J Clin Nurs*. 2014;23(5-6):654-62.

9. Peterson SJ, Tsai AA, Scala CM, Sowa DC, Sheean PM, Braunschweig CL. Adequacy of oral intake in critically ill patients 1 week after extubation. *J Am Diet Assoc.* 2010;110(3):427-33.
10. Azoulay E, Vincent J-L, Angus DC, Arabi YM, Brochard L, Brett SJ, et al. Recovery after critical illness: putting the puzzle together-a consensus of 29. *Critical care (London, England).* 2017;21(1):296.
11. Herridge MS, Cheung AM, Tansey CM, Matte-Martyn A, Diaz-Granados N, Al-Saidi F, et al. One- Year Outcomes in Survivors of the Acute Respiratory Distress Syndrome. *The New England Journal of Medicine.* 2003;348(8):683-93.
12. Choi J, Hoffman LA, Schulz R, Tate JA, Donahoe MP, Ren D, et al. Self-reported physical symptoms in intensive care unit (ICU) survivors: pilot exploration over four months post-ICU discharge. *Journal Of Pain And Symptom Management.* 2014;47(2):257-70.
13. Merriweather JL, Griffith DM, Walsh TS. Appetite during the recovery phase of critical illness: a cohort study. *European journal of clinical nutrition.* 2018;51(1).
14. Schiffman SS. Critical illness and changes in sensory perception. *Proceedings of the Nutrition Society.* 2007;66(3):331-45.
15. Griffiths J, Hatch RA, Bishop J, Morgan K, Jenkinson C, Cuthbertson BH, et al. An exploration of social and economic outcome and associated health-related quality of life after critical illness in general intensive care unit survivors: a 12-month follow-up study. *Critical Care.* 2013;17(3):R100.
16. Brodsky MB, Huang M, Shanholtz C, Mendez-Tellez PA, Palmer JB, Colantuoni E, et al. Recovery from Dysphagia Symptoms after Oral Endotracheal Intubation in Acute Respiratory Distress Syndrome Survivors. A 5-Year Longitudinal Study. *Annals of the American Thoracic Society.* 2017;14(3):376-83.
17. Macht M, White SD, Moss M. Swallowing dysfunction after critical illness. *Chest.* 2014;146(6):1681-9.
18. Eddleston JM, White P, Guthrie E. Survival, morbidity, and quality of life after discharge from intensive care. *Critical Care Medicine.* 2000;28(7):2293-9.
19. Jackson JC, Pandharipande PP, Girard TD, Brummel NE, Thompson JL, Hughes CG, et al. Depression, post-traumatic stress disorder, and functional disability in survivors of critical illness in the BRAIN-ICU study: a longitudinal cohort study. *Lancet Respiratory Medicine.* 2014;2(5):369-79.
20. Davydow DS, Zatzick D, Hough CL, Katon WJ. A longitudinal investigation of alcohol use over the course of the year following medical-surgical intensive care unit admission. *Psychosomatics.* 2013;54(4):307-16.
21. Wischmeyer PE. Tailoring nutrition therapy to illness and recovery. *Critical care.* 2017;21(Suppl 3):316.

