

LEVEL 6 ASSESSMENT SPECIFICATION

Student name:	Abbie Harries	Student ID number:	2005816
Programme:	BSc Health, Nutrition and Lifestyle / BA Physical Education		
Module:	Perspectives on Health & Physical Activity		
Module code:	BMPE6003	Contribution to Overall Module Assessment (%):	50%
Lecturer:	Alison Connaughton	Internal Verifier:	Chris Cashin
Assignment Title:	Essay: Identify a current issue or topic within the areas of sport, health, nutrition and physical education for investigation and critical review.	Word count (or equivalent):	3000
Submission deadline:	18th November, 2022	Return date of provisional marks & written feedback:	16th of December, 2022
Submission method:	All written assessments, where practical and possible, must be submitted via Turnitin unless otherwise instructed by the Lecturer. (Please DO NOT put this assessment specification into Turnitin or it will match many similarities with other students' submissions.) Alternative submission method (if applicable): Late submission of the assessment will result in a late penalty mark. Penalties for late submission: Up to one week late, maximum mark of 40%. Over one week late, 0%. Only the Extenuating Circumstances Panel may approve a change to submission dates.		
Academic honesty / referencing:	Academic honesty is required. In the main body of your submission you must give credit to authors on whose research and ideas your work is based. Append to your submission a reference list that indicates the books, articles, etc. that you have used, cited or quoted in order to complete this assessment.		

Nutrition Therapy in Critical Illness

Introduction

A vital component of health and development is nutrition (Wischmeyer, 2017). Stronger immune systems, a decreased risk of non-communicable diseases including diabetes and cardiovascular disease, and longer life spans are all associated with better nutrition (Wischmeyer, 2017).

Patients in the intensive care unit (ICU) are classified as critically ill if they have organ failure, a strong inflammatory response, insulin resistance, or abnormal metabolic response (Bo et al., 2020). Nutritional status and micronutrient status are more at risk the more unwell the patient is (Bo et al., 2020). Furthermore, a lot of patients have altered nutritional intake when they first enter the intensive care unit, this requires careful assessment this is due to the fact different people will have different nutritional requirements (van Zanten et al., 2019).

Internationally recognised as a standard of care in intensive care units is the administration of feeding to critically ill patients (Casaer et al., 2017). In addition to having the potential to improve patient outcomes, nutrition is also reasonably inexpensive when compared to other widely used treatments and is increasingly recognised as a sign of high-quality ICU care (Ridley et al., 2015). Furthermore, we are just starting to grasp its full potential, with both advantageous and harmful effects depending on how it is applied (Singer et al., 2019). The evidence is always evolving and frequently contradictory, as it is in many areas of medicine, making it challenging for the individual practitioner to evaluate and apply (Singer et al., 2019). The main objective of this narrative review is to give a summary of the body of research on nutrition therapy in critically sick patients.

The role of nutrition in critically ill patients

When the body becomes hypercatabolic, a critical sickness can occur (Sharma et al., 2019). It has been proposed that prompt and sufficient nutrition assistance may enhance the host response and subsequently decrease nutritionally associated problems, and enhance overall results (Sharma et al., 2019). Critical illnesses can exacerbate this condition as patients may become immune-compromised and unable to generate a sufficient inflammatory response; making them susceptible to negative outcomes (Berger, 2020). Any sickness might eventually result in a starved state and according to data; malnutrition is presently between 38% and 78% of the time in intensive care units and is independently linked to poor outcomes (Sharma et al., 2019). Therefore, it's crucial to investigate nutrition's potential as a preventative measure for serious illness (Sharma et al., 2019).

According to physiological insights from metabolism in the early stages of critical illness, this stage is characterised by inflammation, increased energy expenditure, insulin resistance, and a catabolic response that causes the body to use its energy reserves, including glucose, free fatty acids, and amino acids (van Zanten et al., 2019). The way ICU patients are fed differs significantly from how healthy people are fed (van Zanten et al., 2019). Nutrition therapy cannot stop the body from producing energy in the early stages of a critical disease as a result, a gradual increase over days is advised to avoid overfeeding (Casaer et al., 2017).

Compared to other widely utilised treatments, nutrition has a lower cost and has the potential to have a favourable impact on patient outcomes (Lambell et al., 2020). It is also becoming more widely recognised as a sign of high-quality ICU care (van Zanten et al., 2019). Furthermore, its full potential is only now being taken as , which can have both beneficial and harmful effects when used improperly (van Zanten et al., 2019). The research is changing quickly and is frequently contradictory, which makes it challenging for the individual therapist to evaluate and use (Lambell et al., 2020).

Guidelines for nutritional therapy

With an increase in publications and two updated worldwide clinical guidelines, there has been a lot of interest in the function of nutrition therapy in critical illness in recent years (Lambell et al., 2020). The translation of evidence into practise is difficult since trial results and guideline recommendations continue to disagree (Lambell et al., 2020). Additionally, it's becoming clear that factors like body composition and the critical illness stage may have an impact on how people respond to nutrition therapies (Lambell et al., 2020). There are currently four international clinical practice guidelines available to inform the nutrition management of critically ill patients (Taylor et al., 2016).

Table 1. Guidelines on Nutritional therapy for critically ill patients (Martindale et al., 2011).

Guideline	Basis of recommendation	Energy requirements	Protein requirements	Commencement of EN ^a	Commencement of PN
ASPEN/SCCM (2016)	Observational studies, RCTs, and consensus opinion from topic experts	Use IC (quality: very low) In the absence of IC use 25–30 kcal/kg/day (EC) Obesity: hypocaloric nutrition, 65–70% measured requirements by IC. If no IC, BMI 30–50 = 11–14 kcal/kg ABW/day; BMI > 50 = 22–25 kcal/kg IBW/day (EC)	1.2–2 g/kg/day (quality: very low) Obesity: high protein, BMI 30–40 = 2.0 g/kg IBW/day; BMI ≥ 40 = up to 2.5 g/kg IBW/day (EC)	Early EN (24–48 h) (quality: very low) Patients at low nutrition risk, well-nourished, and/or with low disease severity do not require specialised nutrition therapy over the first week in ICU (EC) Patients at high nutrition risk or severely malnourished, EN should advance to goal as quickly as tolerated over 24–48 h in (while monitoring for refeeding) (quality: very low)	Exclusive PN (when oral intake or EN contraindicated) for patients at low nutrition risk, withhold for the first 7 days (quality: very low) For patients at high nutrition risk or severely malnourished start PN as soon as possible (EC) Supplemental PN ^b should be considered after 7–10 days if unable to meet > 60% of energy and protein requirements by EN (quality: moderate)
Canadian Clinical Practice Guidelines (2015)	RCTs and consensus opinion from topic experts	Nil	Nil	Early EN (within 24–48 h) (based on 16 level 2 studies ^c)	Exclusive PN (when oral intake or EN contraindicated) should be considered early in nutritionally high-risk patients (based on 6 level 2 studies ^c) For patients who are not malnourished, are tolerating some EN, or when PN is indicated for <10 days, low dose PN should be considered (based on 4 level 2 studies ^c) Supplemental PN ^b should be assessed on case-by-case basis (based on 1 level 1 study and 7 level 2 studies ^c)
ESICM clinical practice guidelines (2017)	Observational studies, RCTs, and consensus opinion from topic experts	Nil	Nil	Early EN should be prescribed rather than delaying EN (low-quality evidence)	Nil

Guideline	Basis of recommendation	Energy requirements	Protein requirements	Commencement of EN ^a	Commencement of PN
ESPEN (2019)	Observational studies, RCTs, and consensus opinion from topic experts	Use IC (grade B ^d) In the absence of IC use VO_2 or VCO_2 predictive equations (grade 0 ^d) Obesity: if no IC, 20–25 kcal/kg ABW/day (grade 0 ^d)	1.3 g/kg/day delivered progressively (grade 0 ^d) Obesity: 1.3 g/kg ABW/day (grade 0 ^d)	Early EN (within 48 h) (grade A ^d) Hypocaloric nutrition (< 70% of EE) in the early acute phase (ICU day 1–3) (grade B ^d) If using IC—isocaloric nutrition (80–100% EE) can be progressively implemented after day 3 (grade 0 ^d) If using predictive equations—hypocaloric nutrition (< 70% of EE) for the first week (grade B ^d)	Exclusive PN (when oral intake or EN contraindicated) within 3–7 days (grade B ^d) For severely malnourished patients, consider early and progressive PN (grade 0 ^d) Supplemental PN ^b should be considered on a case-by-case basis (grade 0 ^d)

The Role of Energy in Critical illness

According to the research, achieving the best clinical results when managing a critical disease requires providing the best nutritional support (Sharma et al., 2019). As a result of their higher energy expenditure when compared to healthy individuals, critically sick patients have higher energy needs and a higher risk of malnutrition (Berger, 2020). It is crucial to evaluate each individuals' nutritional needs in order to provide them with the adequate amount of nutrients and energy, this is also the most significant challenge in critical illness as it is vital the correct targets are prescribed (Berger, 2020). There are many methods in which energy requirements can be assessed, such as indirect calorimetry; the science linked with analysing metabolic processes (Casaer et al., 2017). This method is considered the clinical recommendation, however the predictive equations are the most used in practice, as the analysis of indirect calorimetry can be difficult under intensive care conditions (Casaer et al., 2017). Some research argues that though more time consuming and difficult, the indirect calorimetry method is the most accurate and reliable (Bo et al., 2020). Inaccuracy in the equations can put those already at the higher end of their body mass index at risk of other health complaints (Wischmeyer, 2017). Malnutrition is when the body is lacking the nutrients required to keep the body functioning, this is even more of a noticeable issue when a patient is critically ill, as even a brief encounter of a critical illness can cause rapid loss of the skeletal muscle (Wischmeyer, 2017).

Based on literature, evidence was collaborated by a registered dietician to analyse the data related to unintentional weight loss, wasting of muscle mass, and inadequate nutrient intake (Mogensen et al., 2017). Both 90-day post discharge mortality and unplanned 30-day hospital readmissions were analysed (Mogensen et al., 2017). Those without malnutrition had a 5.9% risk of mortality, 11.7% with those at risk of malnutrition, 15.8% of nonspecific malnutrition, and 21.9% in patients with protein-energy malnutrition (Mogensen et al., 2017). This evidence coincides with the research suggesting the importance of energy requirements being of importance in critical illness (Mogensen et al., 2017).

Protein in Critical illness

The delivery of protein in the critically ill is still a highly debated issue, and as a result of that, research still remains limited, and most findable research agree that proteins and amino acids are minor parts of a balanced diet (Weijs, 2016). However, proteins and amino acids are essential for survival and recovery due to their wide range of additional roles in addition to their capacity to maintain active tissue mass (Weijs, 2016). For accurate clinical care, it is important to understand the ideal protein consumption during nutritional assistance (Heyland et al., 2018). Although the body can adapt to fasting in certain ways, metabolic stress in patients leads to an increase in protein synthesis and a loss of lean body mass (Heyland et al., 2018).

There have been two recent studies published, these studies have not significantly altered the general perception of nutrition support (Weijs, 2016). Recent research has demonstrated that providing proteins and amino acids to critically ill patients is crucial for their prognosis (Weijs, 2016). This was initially validated by randomised research, but only in the short term (Weijs, 2016). The other study verified that a high amino acid dosage is not associated with a better outcome. One observational study demonstrated that the relationship between protein intake and result should be corrected for energy intake and likewise, demonstrating that a sufficient protein intake is associated with an improved outcome (Mogensen et al., 2017). The other observational study gained information into how to optimise protein delivery through enteral feeding while also confirming the necessity of protein in paediatric intensive care units (Weijs, 2016).

Critical care in nutrition in children

The severe metabolic repercussions of acute disease are particularly dangerous in children and newborns (Skillman & Wischmeyer, 2008). Pre-existing obesity and malnutrition also negatively impact a patient's stay in the intensive care unit (Skillman & Wischmeyer, 2008). Even though early enteral and parenteral feeding can help with nutritional deficiencies, none have obtained adequate research to show a clinically significant impact in paediatric critical care (Skillman & Wischmeyer, 2008). Indirect calorimetry is a useful tool for determining which patients are receiving too much or too little nourishment, despite the fact that it is rarely used (Skillman & Wischmeyer, 2008).

The body's metabolism is altered, and calorie requirements decrease during serious illness (Martindale et al., 2011). Giving a child too much feed has been linked to a number of adverse outcomes, including liver issues, exacerbated inflammation, and delays in removing the child off a respiratory ventilator (Skillman & Wischmeyer, 2008).

Critical evaluation

Despite the fact that it is uncertain how much nutrition patients truly require to obtain the best clinical and functional outcomes, it has become routine practise to give nutrition to critically sick patients. However, in the absence of conclusive studies, current practise should be to utilise the information we currently have and maximise the provision of nutrients to the greatest extent possible (Sharma et al., 2019).

From the evidence gathered, and studies analysed, Optimal nutrition therapy is crucial both during and after intensive care therapy in order to improve the patient's long-term prognosis and lessen the risk of the patient developing a serious illness. Nutritional goals are frequently not met throughout any stage of recovery. Following a severe illness, individualised nutrition therapy should be recommended and closely followed while respecting various patient goals. Due to the lack of research on certain aspects of this study, for example protein intake for nutritional therapy. It is also unclear on the methodology behind calculating protein and energy requirements, which could lead to uncertainty with clinical staff taking care of critically ill patients, it sounds as though this would need to be done by a registered dietician, which raises the concern that perhaps that again wouldn't be initial priority in care.

Having researched the topic in depth, I can see how nutritional therapy would be a forward way of thinking for recovery, evidence does show that for best outcome, nutritional therapy should be implemented on admission (van Zanten et al., 2019). However, in critical situations, I can also view from the clinical perspective of what would be seen as priority in care in the initial stage of admission i.e. stabilisation, medication. In conclusion, the research collaborated covered patients who may be suffering with malnutrition, obesity, children and infants and the consensus is mainly positive for nutritional therapy in critically ill patients. It seems an area of care that needs further research and confirmation, if it has the positive effects and results proven in this research it seems a shame that it is not used more widely.

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STUDENT FEEDBACK FORM

This section details the *extent* to which the assessment criteria are demonstrated by you, which in turn determines your mark. The marks available for each category of skill are shown. Lecturers will use the space provided to comment on the achievement of the task(s), including those areas in which you have performed well and areas that would benefit from development/improvement.

Generic Assessment Criteria	Marks available	Marks awarded
1. Engagement with Literature Skills		
	20	
2. Knowledge and Understanding Skills		
	20	
3. Cognitive and Intellectual Skills		
	30	
4. Practical Application Skills		
	20	
5. Transferable Skills for Life and Professional Practice		
	10	

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)		%
	Up to 1 week late (40% Max)		
	Over 1 week late (0%)		

