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Dietitians in Critical Care - A Fundamental and Evolving Role



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Nutrition in Critical Care

Patients in the critical care setting are at risk of malnutrition (Heyland et al. 2011). The provision of nutrition support (enteral or parenteral) to critically ill patients is vital, but achieving the optimum quantity and balance is a contentious topic. There are two major and contradictory perspectives with respect to how much to feed critically ill patients. The first maintains that overfeeding is potentially harmful in the early phase (Casaer et al. 2011; 2013), and argues for permissive underfeeding (Arabi et al. 2015). The other argues that critically ill patients are underfed, and that the resultant kilocalorie and protein deficit results in poor outcomes, such as an increase in infections, longer ICU and hospital stays (Alberda et al. 2009; Dvir et al. 2006; Villet et al. 2005). Understanding the safety of different routes of feeding has been contentious, as historically it has been believed that utilising the gastrointestinal tract is safer than intravenous feeding (Taylor et al. 2016).

This approach can limit the options and quantity of nutrition provided. The CALORIES trial (Harvey et al. 2014), the largest ICU feeding trial in the United Kingdom, demonstrated that, among adults with an unplanned ICU admission for whom early nutritional support could be provided through either the parenteral or the enteral route, there was no significant difference in mortality and infection rates at 30 days. This has a dramatic impact on patient care, as the focus can now be on how much nutrition support is optimal, with the knowledge that nutrition support can be safely delivered by either or both routes and thus achieve the target feeding rates. The problem of the optimum target for energy and protein intake, together with patient selection, still remains and needs to be urgently resolved.

Whilst feeding protocols have long been standard practice on the ICU, evidence continually suggests that their use in isolation is not sufficient to prevent nutritional deficits and thus individualised nutrition support is recommended (Heidegger 2013). This may be in the form of supplemental parenteral nutrition or post-pyloric feeding, which require careful review to avoid complications. Even with the recognition of the importance of nutrition in critically ill patients and the use of protocols to promote nutritional care, a difference between knowledge and actual practice exists (Alberda et al. 2009; Heyland et al. 2004; 2014). On average critically ill patients only receive approximately 60% of calories and 57% of protein prescribed (Alberda et al. 2009; Heyland et al. 2014), with the majority of patients failing to meet the standard of at least 80% of energy targets.

A multiprofessional approach to the treatment of critically ill patients is required to provide optimal nutritional care. The critical care dietitian is the principal professional who is best placed to provide nutritional advice to the multidisciplinary team on the optimal way to manage the nutritional needs of critically ill patients (Masterson and Baudouin 2015). They have a solid science-based educational background, informed by current evidence, and are therefore perfectly positioned to be able to evaluate and advise on the complex relationship between critical illness and nutritional status.

Dietitians Improve Nutritional Management of Critically Ill Patients

Over the last 20 years, the interest in nutrition support as a therapeutic intervention has increased, thus leading to the requirement for more skilled dietitians working in critical care. Evidence is emerging that nutritional care is better provided and superior patient outcome achieved, when a critical care dietitian is involved in the multidisciplinary team (Doig et al. 2008; Braga et al. 2006). Analysis from the International Nutrition Survey continually shows a direct correlation between total amount of funded dietitians in critical care, the enhanced provision of nutrition support and earlier initiation of enteral nutrition (Heyland et al. 2010; 2011). The presence of a critical care dietitian was associated with better performance in terms of compliance with guidelines, providing at least 80% of target energy, the use of enteral nutrition, initiating enteral nutrition within 24 hours and the use of strategies to optimise delivery (Heyland et al. 2010). The combination of a dedicated ICU dietitian and an enteral feeding protocol was required to increase energy provision, increase the use of combined feeding methods to achieve targets and reduce inappropriate use of parenteral nutrition (Sogel et al. 2012). Braga et al. (2006) showed that patients had a significantly shorter length of stay when they received enteral nutrition according to the advice of a critical care dietitian. These studies clearly support the role of dietitian as a key contributor to the nutritional care of critically ill patients.

Varied Roles of the Critical Care Dietitian

The critical care dietitian has the highly developed knowledge, skills and expertise within the field of critical care to manage the complex nutritional issues observed in these patients. Provision of nutrition support to ICU patients is complicated, and not all patients will benefit to the same degree (Alberda et al. 2009). The critical care dietitian is best placed to identify those at nutritional risk and those who are more likely to suffer harm if underfed. They will assess and take account of the many factors influencing the nutrition support treatment plan. These include assessing nutritional risk, age, and the degree of inflammation, number of organ failures, comorbidities, projected length of stay and gastrointestinal function. Critical care treatment modalities also need to be considered. For example, continuous renal replacement therapy, as it is associated with a significant amino acid loss (Honore et al. 2013) and the sedation agent propofol, which can contribute significant calories (Taylor et al. 2005). Patients with malnutrition on admission to ICU have a significant increase in 30- and 90-day mortality (Mogensen et al. 2015). The critical care dietitian effectively identifies patients who are malnourished and implements appropriate nutritional treatment plans.

The critical care dietitian is not only fundamental to the successful nutritional management of patients, but also leads on promoting the benefits of good nutritional care to the ICU team. This involves the development and implementation of evidence-based guidelines and protocols, as well as being central to the provision of teaching and education for clinicians, nurses and allied health professionals. As a key member of the multidisciplinary team, they will contribute to consultant-led ward rounds, advising on the most appropriate evidence-based nutritional treatment plans, setting nutritional goals and providing ongoing monitoring and support (Heyland 2010). They are a useful knowledge repository for junior doctors on electrolyte replacement, prokinetic agents, bowel management and feeding complications. As a core member of the ICU team, they will contribute to the ICU quality improvement agenda, e.g. developing fasting guidelines to limit unnecessary enteral feed interruptions and reducing inappropriate parenteral nutrition (PN) prescribing. Suitably skilled and experienced ICU dietitians will undertake extended scope practitioner roles, including inserting a variety of feeding tubes, using ultrasound techniques to track muscle wasting and indirect calorimetry to determine individualised energy needs (Bear et al. 2015; Taylor et al. 2010). ICU dietitians regularly participate in audit to ensure the effectiveness of nutritional protocols (Segaran et al. 2015; Wandrag et al. 2011) in addition to undertaking research activities such as PhD fellowships and participating as key authors in large multicentre nutritional trials (Harvey et al. 2014). Leading senior critical care dietitians are helping shape the evidence base for critical care nutrition by authoring international nutrition support guidelines (Dhaliwal et al. 2014; Taylor et al. 2016). The increase in dietitians as authors from one in 2009 to five in the new 2016 Society of Critical Care Medicine guidelines (Taylor et al. 2016) reinforces the recognized value of critical care dietitians.

Future for Dietitians in Critical Care

Historically, dietitians have not been adequately funded in adult intensive care units and thus input has been limited. A survey of UK practices demonstrated serious limitations in dietetic services in critical care units. No unit actually achieved the national guidance for funded dietitians (whole-time equivalents) and the staff bandings were inconsistent (Windle 2007). This situation is also seen in adult Australian and New Zealand intensive care units, where only 25% of units had formal provision for weekly dietetic hours (Ferrie and Allman-Farinelli 2011). It is hoped that the 2015 UK Guidelines for the Provision of Intensive Care Services (GPICS), will help to rectify this situation (Faculty of Intensive Care Medicine and Intensive Care Society 2015). The role of the dietitian was recognised as an integral part of critical care services, with its own standalone chapter. The chapter showcases the work, roles and clinical input, including recommendations for a dedicated lead ICU dietitian, who practises at an advanced level and is suitably experienced. These UK national guidelines are already being used to assist in obtaining funding for the correct staffing levels for dietitians in critical care.

For the dietitian to significantly improve the ICU teams' capacity to implement and deliver prompt and appropriate nutrition support, adequate funding is required to ensure consistent and established dietetic input. For the dietitian to influence nutritional practices, they need to be present on the ICU and participate when important decisions are being made, such as during ward rounds, handovers, multidisciplinary team (MDT) meetings and clinical discussions with visiting teams. Having clinical privileges such as automatic referral, ability to order oral, enteral and parenteral nutrition and ordering of relevant laboratory tests combined with attendance on MDT ward rounds all are influential with increasing the dietetic profile, and establishing ICU involvement (Ferrie AND Allman-Farinelli 2011). In the UK, Health and Care Professions Council (HCPC)-registered dietitians, who are working at an advanced level, have recently gained supplementary prescribing rights. It is anticipated that the critical care dietitian will be perfectly positioned to take on the supplementary prescribing of parenteral nutrition. Most are already formulating parenteral nutrition regimens on ICU, assessing macro and micro requirements to ensure patients are neither over- nor underfed. They also provide in-depth monitoring and management of complications. Skilled advanced practice critical care dietitians should be accountable for their own parenteral nutrition prescribing, rather than relying on junior doctors to sign off prescriptions for patients that the doctors have not nutritionally assessed.

For a motivated dietitian, ICU is an exciting place to work, offering many opportunities. The extra effort put in by the critical care dietitian to gain the trust and respect from ICU team members will be rewarded with a stimulating and fulfilling career. There is growing evidence to suggest the critical care dietitian is an essential member of the ICU team.

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