Feeding the Patient with Obesity in the Critical Care Setting: 
A Case-Based Application

Introduction

• According to the American Hospital Association, there are more than 106,000 ICU beds in US hospitals, almost 80% are currently filled.\(^1,2\)

• More than 42% of US older adults are obese, and possibly half of ICU patients are obese.\(^3\)

• A study of COVID-19 cases suggests that risks of ICU admission, invasive mechanical ventilation, and death are higher with increasing BMI.\(^4\)

• Sarcopenia, which is the gradual loss of muscle mass as a result of aging and obesity, individually contribute to poor clinical outcomes.\(^5\)

• Sarcopenic obesity is a combination of low skeletal muscle mass coupled with high obesity and can be found in older critically ill patients and are related to health complications and limited functionality.\(^5\)

• Critically ill patients with sarcopenic obesity may not be viewed as at risk for malnutrition due to higher fat stores and stigma/bias associated with obesity, and therefore these patients may not receive early nutrition support.

• Care teams should view all patients as individuals and work to overcome any body weight biases among clinicians and family members that may limit treatment approaches.

• Nutrition practices within the ICU have been shown to improve patient-related outcomes, be hypocaloric, and increase protein provision.\(^5\)

Case Study

• A 66-year-old patient with obesity (BMI=38), has COVID-19 respiratory compromise
• Admitted to ICU, intubated, prone, and placed on ventilator
• Fever, on propofol, elevated energy expenditure
• Sarcopenic obesity is likely in this individual as patients lose 2-4% of muscle mass each day in the ICU\(^5\)

How and when to feed? See principles for feeding below.

General Principles and Goals for Feeding the Obese Critically Ill Patient\(^5,6\)

• Support lean body mass
• Promote anabolism and positive nitrogen balance
• Avoid overfeeding and worsening co-morbid conditions such as hyperglycemia, increased CO\(_2\) production, fluid overload
• Promote glycemic control and wound healing
• Include an exercise program (early mobility or physical activity approaches) to optimize lean muscle mass

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How to Accomplish these Goals: ASPEN/SCCM Recommendations for Feeding Critically Ill Patients with Obesity

Based on ASPEN/SCCM expert consensus, we suggest that:

- Early EN start within 24–48 hours of admission to the ICU for obese patients who cannot sustain volitional intake.
- Nutrition assessment of the obese ICU patient focuses on biomarkers of metabolic syndrome, an evaluation of comorbidities, and a determination of level of inflammation, in addition to those parameters described for all ICU patients.
- Nutrition assessment of the obese ICU patient focuses on evidence of central adiposity, metabolic syndrome, sarcopenia, BMI >40, SIRS, or other comorbidities that correlate with higher obesity-related risk for cardiovascular disease and mortality.
- High-protein hypocaloric feeding be implemented in the care of obese ICU patients to preserve lean body mass, mobilize adipose stores, and minimize the metabolic complications of overfeeding.
- For all classes of obesity, the goal of the EN regimen should not exceed 65%–70% of target energy requirements as measured by indirect calorimetry (IC). If IC is unavailable, we suggest using the weight-based equation 11–14 kcal/kg actual body weight per day for patients with BMI in the range of 30–50 and 22–25 kcal/kg ideal body weight per day for patients with BMI ≥50. We suggest that protein should be provided in a range from 2.0 g/kg ideal body weight per day for patients with BMI of 30–40 up to 2.5 g/kg ideal body weight per day for patients with BMI ≥40.
- If available, an enteral formula with low caloric density and a reduced NPC:N be used in the adult obese ICU patient. While an exaggerated immune response in obese patients implicates potential benefit from immune-modulating formulas, lack of outcome data precludes a recommendation at this time.
- Additional monitoring to assess worsening of hyperglycemia, hyperlipidemia, hypercapnia, fluid overload, and hepatic fat accumulation in the obese critically ill patient receiving EN.
- The obese ICU patient with a history of bariatric surgery receive supplemental thiamine prior to initiating dextrose-containing IV fluids or nutrition therapy. In addition, evaluation for and treatment of micronutrient deficiencies such as calcium, thiamin, vitamin B12, fat-soluble vitamins (A, D, E, K), and folate, along with the trace minerals iron, selenium, zinc, and copper, should be considered.5

Transition Out of the ICU

- Dietitian should communicate verbally and in writing, the nutrition assessment, intervention, and progress with healthcare facility where patient is discharged.
- Avoid excessive weight loss, promote adequate protein intake and repeat estimated needs calculations.
- Optimize exercise plan to increase muscle mass, function, and ambulation.
- Include family and caregivers in plan and communication.
- Encourage receiving dietitian to monitor intake and set minimum intake level to prevent nutrition regression.

References


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