



# ENTERAL NUTRITION SUPPORT FOR PATIENTS ON MECHANICAL VENTILATION

PRACTICAL TIPS AND GUIDANCE FROM THE LITERATURE



## ENTERAL NUTRITION SUPPORT FOR PATIENTS ON MECHANICAL VENTILATION

This review provides a summary of what we know from the literature relating to nutrition guidelines when managing patients on mechanical ventilation with acute respiratory illness in the ICU. These guidelines are based on pre-COVID-19 literature. COVID-19 is a disease caused by a newly emerging coronavirus, and therefore specific nutrition requirements in patients with COVID-19 are not known yet.

For some patients with COVID-19, severe acute respiratory illness including pneumonia and acute respiratory distress syndrome (ARDS), will lead to the need for mechanical ventilation in an intensive care unit (ICU), placing them at high nutrition risk.<sup>1</sup> Nutritional support in patients needing mechanical ventilation has the primary objective of preventing cumulative caloric deficits, malnutrition, loss of lean mass and loss of strength of the respiratory muscles.

Furthermore, in critically ill patients, dysfunctions of the gastrointestinal tract can occur, characterised by alterations in absorption, transport and use of nutrients that contribute to malnutrition<sup>2</sup>. It is therefore important that nutritional support is optimised.

Enteral nutrition (EN) is often the nutrition therapy of choice in critically ill patients who are on mechanical ventilation.<sup>3</sup> Current nutrition practice guidelines, developed prior to the COVID-19 pandemic, indicate delivery of early enteral nutrition to critically ill patients may reduce disease severity, diminish complications, decrease length of stay in the ICU, and favourably impact patient outcomes.<sup>4</sup> Specific WHO Guidelines on COVID-19 also recommend initiation of early enteral nutrition within 24-48 hours of admission.<sup>5</sup>

## NUTRITIONAL CONSIDERATIONS FOR CRITICALLY ILL PATIENTS ON MECHANICAL VENTILATION:

- **Initiation of Enteral Nutrition:**
  - Provide early enteral nutrition, within 24–48 hours of admission to ICU.<sup>5</sup>
- **Protein and Calorie Requirements:**
  - Critical illness is associated with protein breakdown and altered gut absorption<sup>2,3</sup>
  - Adequate provision of protein is associated with lower mortality and increased likelihood of being discharged alive from the ICU<sup>6,7</sup>
  - In critically ill patients, achieving protein goals should take precedence over meeting energy needs.<sup>8</sup>
- The European Society for Parenteral and Enteral Nutrition (ESPEN) guidelines on clinical nutrition in the intensive care unit recommends a protein intake of 1.3 g/kg/day in critically ill patients, which can be delivered progressively.<sup>9</sup>
- Similarly, the American Society for Parenteral and Enteral Nutrition (ASPEN) recommend a minimum protein intake of 1.2g /kg/day in critically ill patients. The table below summarises the guidelines for the assessment of protein and energy needs in the adult critically ill patient.<sup>4</sup>

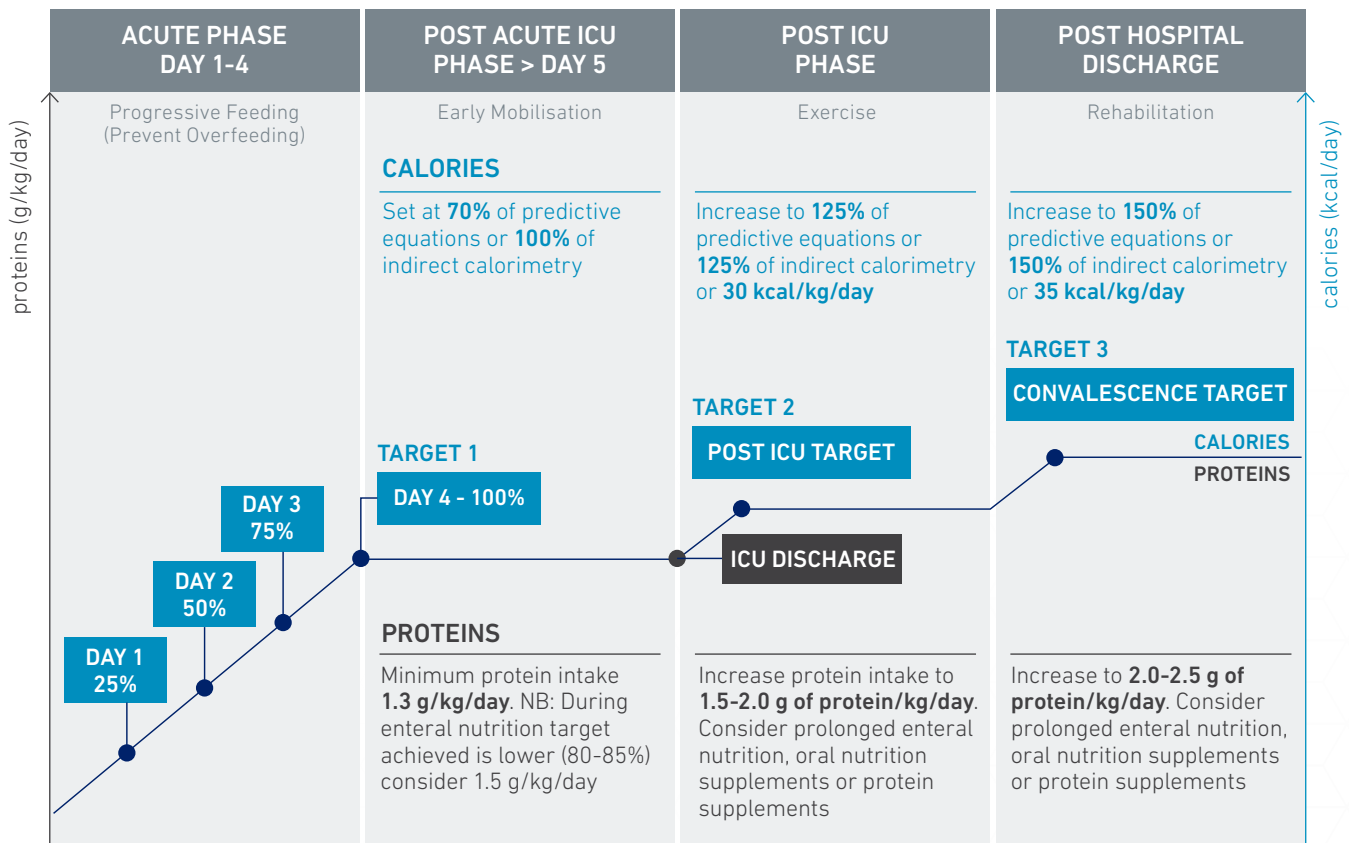
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PATIENT SUBGROUP	PROTEIN REQUIREMENTS		ENERGY REQUIREMENTS	
	ACTUAL BODY WEIGHT	IDEAL BODY WEIGHT	ACTUAL BODY WEIGHT	IDEAL BODY WEIGHT
NON-OBESE (BMI <30)	1.2-2.0 g/kg/d		25-30 kcal/kg	
OBESE (BMI 30-40)		2.0 g/kg/d	11-14 kcal/kg	
OBESE (BMI >40)		2.0 - 2.5 g/kg/d	11 -14 kcal/kg	
OBESE (BMI >50)		2.0 - 2.5 g/kg/d		22-25 kcal/kg
ACUTE KIDNEY INJURY NO RRT	1.2-2.0 g/kg/d		25-30 kcal/kg	
ACUTE KIDNEY INJURY ON RRT	up to 2.5 g/kg/d		25-30 kcal/kg	

RRT = Renal replacement therapy

- Feeding tube placement: Patients at high risk for aspiration may benefit from post-pyloric feeding tube placement.
- Tube feeding formula should be initiated at approximately 25 mL/hour and advanced as tolerated to the goal feeding rate over 72 hours.<sup>10</sup>

## SUGGESTED PRACTICAL APPROACH TO PROVIDE PROTEIN AND CALORIES DURING THE PHASES OF CRITICAL ILLNESS AND CONVALESCENCE<sup>11</sup>



Adapted from Van Zanten et al. 2019<sup>11</sup>

### SELECTION OF TUBE FEEDING FORMULA

Formula should be selected based on nutritional priorities for each individual patient, with attention to tolerance, nutritional adequacy and disease specific requirements.

When additional protein is required or there is limited availability of high-protein feeds, using a whey protein powdered supplement as flushes, may be beneficial. This addition can help patients on mechanical ventilation achieve their protein requirements.<sup>12</sup>

### SUGGESTIONS FOR MONITORING ENTERAL NUTRITION

- Refeeding syndrome:** Some patients on mechanical ventilation are at risk for refeeding syndrome. Refeeding syndrome is defined as the potentially fatal shifts in fluids and electrolytes that may occur in malnourished patients receiving artificial feeding. The hallmark biochemical feature of refeeding syndrome is hypophosphatemia. However, the syndrome may also feature abnormal sodium and fluid balance, changes in glucose, protein, and fat metabolism, thiamine deficiency, hypokalemia, and hypomagnesaemia. For patients at risk of refeeding syndrome, enteral

nutrition should be started at trophic (10-25 mL/hour) or half rate and increased slowly over 72 hours. Monitor serum phosphate, potassium and magnesium daily for approximately 4 days.<sup>13</sup>

- Prokinetic agents:** Prokinetic agents should only be used as needed; use prophylactically in patients at high risk for aspiration.<sup>4</sup>
- Vasopressor agents:** Caution should be exercised when providing EN to patients who are haemodynamically unstable and on vasopressors. Patients should be fully resuscitated prior to initiation of EN.<sup>4</sup>
- Observe for intolerance:** Including abdominal distention, diarrhoea, constipation, abdominal pain, nausea and vomiting.<sup>3</sup>

### ON DISCHARGE FROM THE ICU

- Individuals discharged from the ICU remain at high risk of malnutrition, as nutritional needs continue to be elevated and inadequate oral nutrition is prevalent.<sup>14</sup>
- Continuing with EN in the post-ICU period improves the adequacy of nutrition intake until needs can be met orally.<sup>14</sup>

**For more information, please contact your Nestlé Health Science Account Specialist or call 1800 671 628.**



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