Managing Intolerance based on critical care nutrition guidelines

**Summary of Select Guidelines**

### Use of Protocols

- Use of enteral feeding protocols increases the overall percentage of goal calories provided and should be implemented. Section D3 (Grade C)

### Gastric Residuals

- Patients should be monitored for tolerance of EN and inappropriate cessation of EN should be avoided. (Grade: E)
- Holding EN for gastric residual volumes <500 mL in the absence of other signs of intolerance should be avoided. Section D2 (Grade B)

### Risk of Aspiration

- The following measures have been shown to reduce risk of aspiration: Section D4
  - Elevate the head of bed 30° – 45°. (Grade C)
  - Switch to continuous infusion for high risk-patients or those intolerant to intermittent or bolus gastric feeding. (Grade D)
  - Initiate agents to promote motility such as prokinetic drugs or narcotic antagonists where clinically feasible. (Grade C)
  - Consider post-pyloric tube placement. (Grade C)

### Diarrhea

- Development of diarrhea associated with enteral tube feedings warrants further evaluation for etiology. Section D6 (Grade: E)
- If there is evidence of diarrhea, soluble fiber-containing or small peptide formulations may be utilized. Section E4 (Grade E)

**Are TF Gastric Residuals ≥ 500 mL?**

- Yes: Hold TF and reassess to determine cause.
  - If feasible, return residuals < 250 mL.
  - Continue to advance TF rate towards goal rate or maintain goal rate.

- No: Is patient complaining of pain and/or distension, or do physical exam or x-rays indicate intolerance? Section D2
  - Yes: Continue TF as ordered and continue to monitor stool pattern.
  - No: Continue to advance TF rate towards goal rate or maintain goal rate.

**Is Patient Having Diarrhea?**

- Yes: Address use of:
  - Hyperosmolar medications (e.g. sorbitol)
  - Antibiotics
  - Aseptic formula technique
  - Culture for C. difficile or other infectious etiology
  - Utilize Malabsorption Index™

- No: Continue TF as ordered and continue to monitor stool pattern.

**Consider Formula that Contains Small Peptides or Soluble Fiber**

- Use Nestlé products to consider:
  - Peptamen® Family
  - Impact® Peptide 1.5
  - Nustrisource® Fiber

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Enteral Nutrition Decision and Calculation of Needs Based on Critical Care Nutrition Guidelines

Summary of Select Guidelines

**Use of Protocols**
- Use of enteral feeding protocols increases the overall percentage of oral calories provided and should be implemented. Section D3 (Grade C)

**Route**
- EN is the preferred route of feeding over parenteral nutrition (PN) for the critically ill patient who requires nutrition support therapy. Section A3 (Grade B)

**Access**
- Either gastric or small bowel feeding is acceptable in the ICU setting. Critically ill patients should be fed via an enteral access tube placed in the small bowel if at high risk for aspiration or after showing intolerance to gastric feeding. Section A7 (Grade C)

**Stability**
- In the setting of hemodynamic compromise, EN should be withheld until the patient is fully resuscitated and/or stable. Section A5 (Grade: E)

**Hold PN**
- In the patient with no evidence of protein-calorie malnutrition prior to critical illness, use of PN should be reserved and initiated only after the first 7 days of hospitalization when EN is not available. Section B1 (Grade E)

**Initiate PN**
- If there is evidence of protein-caloric malnutrition on admission and EN is not feasible, it is appropriate to initiate PN as soon as possible following admission and adequate resuscitation. Section A2 (Grade C)

**Calories**
- Energy requirements may be calculated by simplistic formulas (25–30 kcal/kg/d), predictive equations or with indirect calorimetry. Section C1 (Grade E)

**Protein**
- In patients with body mass index (BMI) <30, protein requirements should be in the range of 1.2–2.0 g/kg actual body weight (ABW), INPC-N ratio 7.0-1 – 100-1, and may likely be even higher in burn or multi-trauma patients. Section C4 (Grade E)

**Ostomy**
- Patients receiving hemodialysis or continuous renal replacement therapy (CRRT) should receive increased protein, up to a maximum of 2.5 g/kg/d. Protein should not be restricted in patients with renal insufficiency as a means to avoid or delay initiation of dialysis therapy. Section I2 (Grade C)

**Obesity**
- For all classes of obesity where BMI is >30, the goal of the EN regimen should not exceed 60-70% of target energy requirements or 22–25 kcal/kg ideal body weight. Protein should be provided in a range of ≥2.0 g/kg (BMI 31-40) to ≥2.5 g/kg (BMI >40) ideal body weight (IBW). Section C5 (Grade D)

**Immune Modulating**
- Immune-modulating enteral formulations (supplemented with agents such as arginine, glutamine, nucleic acid omega-3 fatty acids, and antioxidants) should be used for the appropriate patient population (major elective surgery, trauma, burns, head and neck cancer, and critically ill patients on mechanical ventilation), being cautious in patients with severe sepsis. Section E1 Grade A: SICU; Grade B: MICU

**Glutamine**
- The addition of enteral glutamine to an EN regimen (not already containing supplemental glutamine) should be considered in burn, trauma and mixed ICU patients. The glutamine powder, mixed with water, should be given in divided doses to provide 0.3 – 0.5 g/kg/d. Section F3 (Grade B)

**Fiber**
- Soluble fiber may be beneficial for the fully resuscitated, hemodynamically stable critically ill patient receiving EN who develops diarrhea. It should be avoided in patients at high risk for bowel ischemia or severe dysmotility. Section F4 (Grade C)

Calculation of Calorie and Protein Needs

- Consider calories contributed by propofol

- If BMI <30
  - C1, C4
  - 25–30 kcal/kg
  - 12–2.0 g protein/kg ABW

- If BMI ≥30
  - C5
  - 22–25 kcal/kg IBW
  - ≥2.0 g protein/kg IBW

- If BMI ≥40
  - C5
  - 22–25 kcal/kg IBW
  - 11–14 kcal/kg ABW
  - ≥2.5 g protein/kg IBW

Select EN Formula

- Evaluate need for adjunctive therapy

Place Enteral Feeding Tube

- EN is the preferred route of feeding over PN

Nestlé Formulas to Consider:
- IMPACT® Family
- PEPTAMEN® Family
- VIVONEX® Family

Additional Nutritional Interventions to Consider:
- ARGINAID® E1
- GLUTASOLVE® E1, F3
- BENEPROTEIN® C4, F3
- NUTRISOURCE® FIBER F4

Admission to ICU
- Expected stay = 2–3 days

Grade of Recommendation – supported by:
- A At least two Level I investigations
- B One Level I investigation
- C Level II investigations only
- D At least two Level II investigations
- E Level IV or Level V evidence

Level of Evidence:
- I Large, randomized trials with clear-cut results
- II Small, randomized trials with uncertain results
- III Non-randomized, contemporaneous controls
- IV Non-randomized, historical controls
- V Case series, uncontrolled studies, and expert opinion

* Mean Arterial Pressure ** >10% unintentional loss of usual body weight (UBW) in the past 6 months.