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. 
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?

**D2**

- **Yes**
  - Is patient complaining of pain and/or distension, or do physical exam or x-rays indicate intolerance?  **D2**
  - **Yes**
    - Hold TF and reassess to determine cause.
    - If resuming feeding is feasible, consider all measures to reduce risk of aspiration:
      - Elevate head of bed (HOB) at 30 – 45°
      - Prokinetic agents where feasible
      - Post-pyloric tube placement
      - Continuous infusion vs. bolus
      - Reduce rate to previously tolerated level
      - Chlorhexidine mouthwash twice a day
    - If feasible, return residuals < 250 mL
    - Continue to advance TF rate towards goal rate or maintain goal rate.
    - Continue standard precautions to reduce risk of aspiration:
      - Elevate HOB at 30 – 45°
      - Continue to follow residuals and monitor D2, D3
  - **NO**
    - Return residuals to previous level and continue to monitor
    - Continue TF as ordered and continue to monitor stool pattern

- **NO**
  - **YES**
    - Continue to advance TF rate towards goal rate or maintain goal rate.
    - Continue standard precautions to reduce risk of aspiration:
      - Elevate HOB at 30 – 45°
      - Continue to follow residuals and monitor D2, D3

### IS PATIENT HAVING DIARRHEA? (≥300 mL per day or >4 loose stools/day)?

**D6, E4**
- **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

- Peptamen® Family
- Impact® Peptide 1.5
- Nutrisource® Fiber

### NESTLE PRODUCTS TO CONSIDER:


5 Delegge M, Rhodes B, Storm H et al. Malabsorption Index And Its Applications To Enteral Tube Feeding. JPEN. Critical Care Nursing. 2001;1469.

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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 goal 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 hemorrhagic compromise, EN should be withheld until the patient is fully resuscitated and/or stable. Section A5 (Grade: E)

**HOLD PN**
- If there is evidence of protein-calorie malnutrition on admission and EN is not feasible, it is appropriate to initiate PN as soon as possible following admission and adequate resuscitation. Section B2 (Grade C)

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

**CALORIES**
- 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), INFCN ratio 0.71 - 1.01, and may likely be even higher in burn or multi-trauma patients. Section C6 (Grade E)

**PROTEIN**
- 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. Section A5 (Grade C)

**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; Section E4 Grade B; Section E5 Grade D

**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. Insoluble fiber should be avoided in all critically ill patients. Both soluble and insoluble fiber should be avoided in patients at high risk for bowel ischemia or severe dysmotility. Section F4 (Grade C)

**Admission to ICU**
- Expected stay > 3–8 days

**IS PATIENT ABLE TO EAT?**
- YES

**IS PATIENT PATIENT HEMODYNAMICALLY STABLE?**
- NO

**IS EN CONTRAINDICATED?**
- NO

**ENERGY**
- NO

**IS EN CONTRAINDICATED?**
- YES

**PLACE ENTERAL FEEDING TUBE**
- EN is the preferred route of feeding over PN

**NESTLE FORMULAS TO CONSIDER**
- IMPACT® Family
- PEPTAMEN® Family
- VIVONEX® Family

**SELECT EN FORMULA**
- Evaluate need for adjunctive therapy

**CALCULATION OF CALORIE AND PROTEIN NEEDS**
- Consider calories contributed by protein

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

- if BMI >30
  - C5
  - 22 – 25 kcal/kg
  - 1 – 2.0 g protein/kg ABW

- if BMI >40
  - C6
  - 22 – 25 kcal/kg
  - 11 – 14 g protein/kg ABW
  - 2.5 g protein/kg IBW

**DO NOT FEED**
- Places
- A

**Place of decision – supported by**

- A - at least two Level I investigations
- B - Level II investigation
- C - Level III investigations only
- D - at least two Level IV investigations
- E - Level IV or Level V evidence

**Level of Evidence**

- 1: Clear, randomized trials with clean-out results
- 2: Clear, randomized trials with uncertain results
- 3: Non-randomized contemporaneous control
- 4: Non-randomized historical comparison
- 5: Case series, uncontrolled studies, and expert opinion

**ADDITIONAL NUTRITIONAL INTERVENTIONS TO CONSIDER:**
- ARGINAID® E1
- GLUTASOLVE® E1, F3
- BENEPROTEIN® C4, F3
- NUTRISOURCE® FIBER F4

**Does patient have pre-existing malnutrition?**
- B2

**Does use of EN become possible within 7 days?**
- B1, B2

**MAP > 65 mm Hg**
- A5

**NO**

**YES**

**ORAL DIET**
- graded B1, B2, B3, B4

**MAP < 65 mm Hg**