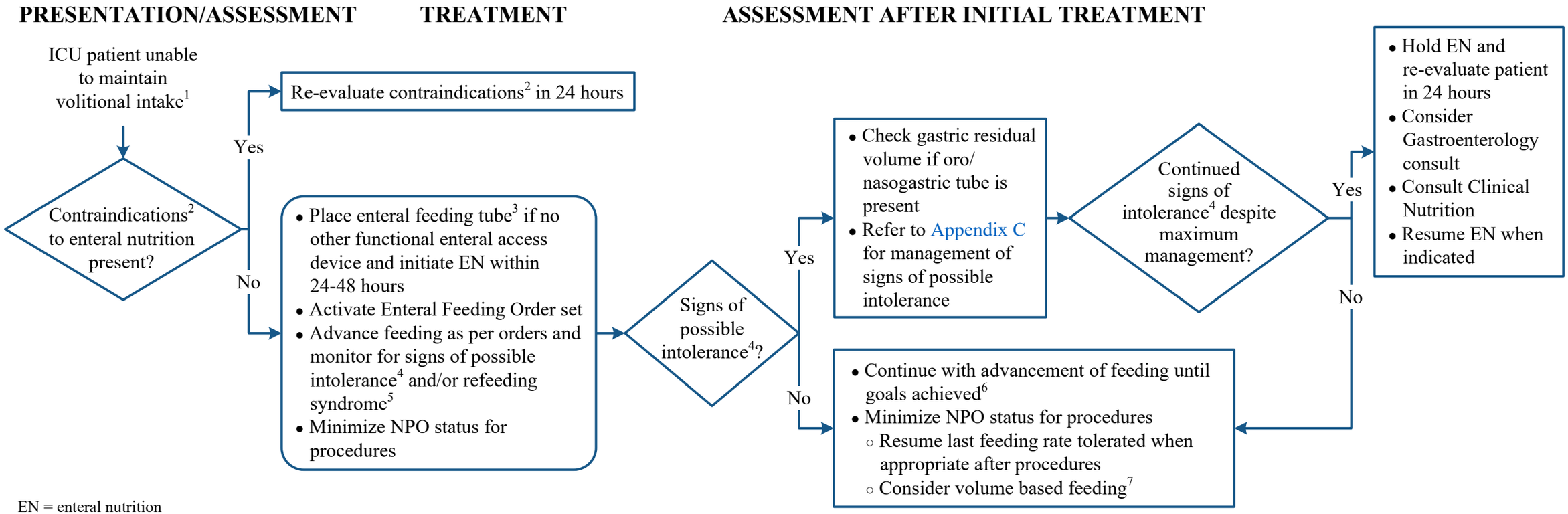
ICU Adult Early Nutrition

Disclaimer: *This algorithm has been developed for MD Anderson using a multidisciplinary approach considering circumstances particular to MD Anderson's specific patient population, services and structure, and clinical information. This is not intended to replace the independent medical or professional judgment of physicians or other health care providers in the context of individual clinical circumstances to determine a patient's care. This algorithm should not be used to treat pregnant women.*



EN = enteral nutrition

[1] If patient meets criteria for malnutrition, add malnutrition to problem list (see Appendix A: Malnutrition Criteria)

[2] **Contraindications: Note**: Contraindications do NOT include absence of bowel sounds or flatus, ileus, diarrhea, or increased gastric residual volume
- Bowel ischemia
- Bowel obstruction
- Gastrointestinal bleeding
- Hemodynamic instability defined as norepinephrine > 15 micrograms/minute or phenylephrine > 150 micrograms/minute or vasopressin > 0.02 units/minute or need for > 2 vasoactive infusions

[3] Consider post pyloric feeding tube placement for patients at risk for aspiration (see Appendix B), gastroparesis, and/or major abdominal surgery. If expertise in placement of post pyloric feeding tube is not available, it is acceptable to initiate gastric feeding.

[4] **Signs of Possible Intolerance:**
- Abdominal distention
- Nausea
- Decreased passage of stool
- Diarrhea: at least 3-5 loose, liquid, or watery bowel movements/day
- Development of contraindications[2]
- Gastric residual volume > 300 mL (frequently occurs in the setting of other signs of intolerance)

[5] Refer to American Society for Parenteral and Enteral Nutrition (ASPEN) Consensus Recommendations for Refeeding Syndrome (see Page 7)

[6] Goal is to provide < 70% of estimated needs for first 7 days. If tolerating, may increase to 80-100% of estimated needs with 1.3 grams protein/kg/day after day 3

[7] Consult Clinical Nutrition for recommendations

Department of Clinical Effectiveness V3
Approved by the Executive Committee of the Medical Staff on 03/18/2025

APPENDIX A: Malnutrition Criteria

This document is a reasonable guideline for the identification of malnutrition in the adult population (medical, surgical, rehabilitation and behavioral health) when used with professional clinical judgment.

- If the clinical dietitian/nutritionist identifies evidence from a nutritional assessment that patient meets criteria below, the diagnosis of malnutrition is added to the Problem List. At least two criteria are required to identify Severe or Non Severe malnutrition.
- Criteria may apply at all Body Mass Index calculations
- Criteria noted below may encompass patient data prior to admission as determined from medical record documentation and/or information provided by the patient/reliable caregivers

ICD-10 Code: E43 **Severe, Protein-Calorie Malnutrition**	**Severe Malnutrition in context of Acute Illness/Injury**	**Severe Malnutrition in context of Chronic Illness**	**Severe Malnutrition in context of Social/Behavioral/Environmental Circumstances**
Weight Loss - Evaluated in light of other clinical findings including hydration. Weight change over time is reported as a percentage of weight lost from baseline.	**Weight Loss** > 2% in 1 week > 5% in 1 month > 7.5% in 3 months	**Weight Loss** > 5% in 1 month > 7.5% in 3 months > 10% in 6 months > 20% in 12 months	**Weight Loss** > 5% in 1 month > 7.5% in 3 months > 10% in 6 months > 20% in 12 months
Intake - RD obtains diet history and estimates energy needs. Suboptimal intake is determined as a percentage of estimated needs over time.	**Energy Intake** ≤ 50% energy intake compared to estimated energy needs for ≥ 5 days	**Energy Intake** ≤ 75% energy intake compared to estimated energy needs for ≥ 1 month	**Energy Intake** ≤ 50% energy intake compared to estimated energy needs for ≥ 1 month
Body Fat - Loss of subcutaneous fat *e.g.*, orbital, triceps, fat overlying ribcage	**Body Fat** Moderate depletion	**Body Fat** Severe depletion	**Body Fat** Severe depletion
Muscle Mass - Loss of muscle *e.g.,* temples, clavicles, shoulders, scapula, thigh and calf	**Muscle Mass** Moderate depletion	**Muscle Mass** Severe depletion	**Muscle Mass** Severe depletion
Fluid Accumulation - General or local fluid accumulation *e.g.,* extremities, ascites or vulvar/scrotal edema	**Fluid Accumulation** Moderate to Severe	**Fluid Accumulation** Severe	**Fluid Accumulation** Severe
Functional Assessment - ECOG Performance Status	**ECOG Performance Status** Decline from baseline	**ECOG Performance Status** Decline from baseline	**ECOG Performance Status** Decline from baseline

RD = registered dietitian
ECOG = European Cooperative Oncology Group

Continued on next page

APPENDIX A: Malnutrition Criteria - continued

ICD-10 Code: E440 **Malnutrition of Moderate Degree**	**Non-Severe Malnutrition in context of Acute Illness/Injury**	**Non-Severe Malnutrition in context of Chronic Illness**	**Non-Severe Malnutrition in the context of Social/Environmental Circumstances**
Weight Loss - Evaluated in light of other clinical findings including hydration. Weight change over time is reported as a percentage of weight lost from baseline.	**Weight Loss** 1-2% in 1 week 5% in 1 month 7.5% in 3 months	**Weight Loss** 5% in 1 month 7.5% in 3 months 10% in 6 months 20% in 12 months	**Weight Loss** 5% in 1 month 7.5% in 3 months 10% in 6 months 20% in 12 months
Intake - RD obtains diet history and estimates energy needs. Suboptimal intake is determined as a percentage of estimated needs over time.	**Energy Intake** < 75% energy intake compared to estimated energy needs for > 7 days	**Energy Intake** < 75% energy intake compared to estimated energy needs for ≥ 1 month	**Energy Intake** < 75% energy intake compared to estimated energy needs for ≥ 3 months
Body Fat - Loss of subcutaneous fat *e.g.*, orbital, triceps, fat overlying ribcage	**Body Fat** Mild depletion	**Body Fat** Mild depletion	**Body Fat** Mild depletion
Muscle Mass - Loss of muscle *e.g.,* temples, clavicles, shoulders, scapula, thigh and calf	**Muscle Mass** Mild depletion	**Muscle Mass** Mild depletion	**Muscle Mass** Mild depletion
Fluid Accumulation - General or local fluid accumulation *e.g.,* extremities, ascites or vulvar/scrotal edema	**Fluid Accumulation** Mild	**Fluid Accumulation** Mild	**Fluid Accumulation** Mild
Functional Assessment - ECOG Performance Status	**ECOG Performance Status** Decline from baseline	**ECOG Performance Status** Decline from baseline	**ECOG Performance Status** Decline from baseline
ICD-10 Code: E441 **Malnutrition of Mild Degree**	Applicable for Pediatric only		
ICD-10 Code: E440 Moderate Protein Malnutrition	Malnutrition of Moderate Degree (Protein)		
ICD-10 Code: E440 E43 Severe Protein-Calorie Malnutrition	Malnutrition of Severe Degree (Protein-Calorie)		

APPENDIX B: Risk Factors and Prevention for Aspiration

Risk Factors	Interventions for Prevention in Patients with Risk Factors (including in those not tolerating gastric enteral nutrition)
• Inability to protect airway • Presence of naso/oro-gastric enteral access • Mechanical ventilation • Age > 70 years • Reduced level of consciousness • Poor oral care • Inadequate nurse:patient ratio • Neurologic deficits • Gastroesophageal reflux • Use of bolus intermittent enteral feeding	• Post-pyloric feeding • Elevate head of bed 30-45° • Switch delivery to continuous infusion • Chlorhexidine mouthwash twice daily • Prokinetic agents (see Appendix C)

APPENDIX C: Management of Signs of Possible Intolerance

Gastric Residual Volume (GRV) > 300 mL	• For initial GRV > 300 mL: ◦ Do not hold EN in the absence of other signs of intolerance ◦ Replace up to 500 mL of aspirate and discard remaining ◦ Review stooling pattern ◦ Consider pro-kinetics[1] and continue GRV measurements every 4 hours - Metoclopramide 10 mg IV every 6 hours - Erythromycin 250 mg IV every 6-8 hours for 48 hours ◦ If GRV > 500 mL, consider reducing EN rate by half while evaluating causes of increased residuals	• For GRV > 300 mL for two consecutive measurements: ◦ Do not hold EN in the absence of other signs of intolerance ◦ Replace up to 500 mL of aspirate and discard remaining ◦ Review stooling pattern ◦ Initiate pro-kinetics[1,2] and continue GRV measurements every 4 hours - Metoclopramide 10 mg IV every 6 hours - Erythromycin 250 mg IV every 6-8 hours for 48 hours ◦ If continued GRV > 300 mL on pro-kinetics, consider switch to post-pyloric and discontinue pro-kinetics ◦ If GRV > 500 mL, hold EN while evaluating causes of increased residuals
Diarrhea: At least 3-5 loose, liquid, or watery bowel movements/day	• EN should not be automatically interrupted for diarrhea; evaluate etiology of diarrhea to determine appropriate therapy • Evaluate patient history to determine pre-existing conditions which could cause diarrhea (*e.g.*, ulcerative colitis) • Assess the abdomen and consider imaging if indicated • Consider evaluating for Clostridium difficile • Evaluate medications which may be contributing to diarrhea including but not limited to those containing sorbitol, chemotherapy, antibiotics, scheduled bowel management medications, and metoclopramide • Rule out stool impaction • Consider fecal incontinence management system • If fiber is not contraindicated, 10-20 grams of fermentable soluble fiber is suggested, given in divided doses over 24 hours as adjunctive therapy • Use of small peptide formulations in the patient with persistent diarrhea, suspected malabsorption, or lack of response to fiber is suggested • Avoiding both soluble and insoluble fiber in patients at high risk for bowel ischemia or severe dysmotility is suggested. A fermentable soluble fiber should be considered for routine use in all hemodynamically stable medical and surgical patients. • Consider the use of anti-diarrheal medications if indicated such as loperamide hydrochloride[1] (Imodium® A-D) or diphenoxylate and atropine (Lomotil®). Probiotics, such as lactobacillus acidophilus/bulgaricus (Lactinex) may be considered for antibiotic-associated diarrhea in the absence of neutropenia.	

EN = enteral nutrition

[1] Monitor QTc. QTc prolongation resulting in torsades de pointes is a risk but only under certain conditions such as excessive dose, hypokalemia, congenital long QT, or drug-drug interaction.

[2] Consider adding second pro-kinetic if initial pro-kinetic not effective

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APPENDIX C: Management of Signs of Intolerance - continued

Decreased passage of stool: No stool for > 48 hours	• Initiate stools softeners and/or laxatives as indicated: ◦ Docusate 100 mg enteral feeding tube every 12 hours scheduled ◦ Sennosides 17.6 mg enteral feeding tube every 12 hours scheduled ◦ Lactulose 20 grams enteral feeding tube every 12 hours PRN no bowel movement > 48 hours ◦ Bisacodyl suppository 10 mg rectal daily PRN no bowel movement > 48 hours • Consider methylnaltrexone for patients experiencing opioid-induced constipation with inadequate response to other laxative therapy and no known or suspected mechanical gastrointestinal obstruction
Abdominal pain	• Hold EN while evaluating causes • Evaluate for bowel ileus or obstruction • Resume EN at prior rate if clinically indicated
Nausea	• Consider addition of anti-emetics(s) as indicated ◦ Ondansetron[1] 4 mg IV every 6 hours or 8 mg IV every 8 hours PRN ◦ Prochlorperazine[1] 2.5-10 mg IV every 6-8 hours PRN ◦ Promethazine[1] 12.5-25 mg IV every 6 hours PRN ◦ Metoclopramide 5-10 mg IV every 6 hours PRN • Evaluate for other causes of nausea and treat as indicated ◦ Refer to Adult Antiemetic Management of Chemotherapy-Induced Nausea and Vomiting (CINV) algorithm ◦ Refer to Nausea/Vomiting Associated with Surgery - Adult algorithm
Development of contraindications	Hold EN

EN = enteral nutrition

[1] Monitor QTc. QTc prolongation resulting in torsades de pointes is a risk but only under certain conditions such as excessive dose, hypokalemia, congenital long QT, or drug-drug interaction.

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DEVELOPMENT CREDITS

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