VANDERBILT UNIVERSITY MEDICAL CENTER
DIVISION OF TRAUMA AND SURGICAL CRITICAL CARE

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Trauma and Surgical Critical Care Nutrition Guideline – Revised 5/10/2011

Clinical judgment may supersede guidelines as patient circumstances warrant

Initial Nutrition Evaluation (SCC NUTRITION MANAGEMENT ORDER SET)

- Resuscitation goals met?
  - No → Continue resuscitation. Do not start nutrition provision
  - Yes → Consult Nutrition Service and start enteral nutrition (see below, Enteral Nutrition)
    - Ensure all patients should have nutrition regimen by day 2
    - Enteral nutrition (EN) is preferred over parenteral nutrition (PN)(see protocols below)
- Protocols
  - GI Stress Ulcer Prophylaxis – refer to unit specific protocol
  - Antioxidant Protocol – given to all adult trauma ICU patients for 7 days
    - Supplementation **(TRAUMA ANTIOXIDANT ORDER SET)**
      - Ascorbic acid 1,000 mg PO/PT/IV q 8 hours
      - α-tocopherol 1,000 IU PO/PT q 8 hours
      - Selenium 200 mcg PT/IV qd
    - Excludes:
      - Excludes pregnant patients (ascorbic acid & selenium= pregnancy category C)
      - Excludes patients with creatinine > 2.5 mg/dL
  - Lab Protocol
    - Enter HEO **(SCC NUTRITION SUPPORT LAB ORDER SET)** on all critically ill patient
      - Obtain pre-albumin and CRP levels at day 2 if anticipated ICU stay is > 3 days.
      - Repeat and re-assess every Monday/Thursday.
  - Glucose Control – refer to protocol
  - Wound Healing Protocol (for open abdomen, burns, large wounds, or fistulas): **(TRAUMA WOUND HEALING ORDER SET)**
    - Ascorbic acid (Vitamin C) 500mg BID PO/PT/IV x 10 days
    - Vitamin A 10,000 IU, PO/PT/IM x 10 days
    - Zinc 220mg PO x 10 days PO or PT -50mg/10ml elemental oral solution **(Order set)**
  - Severe Cachexia/Malnourishment Protocol:
    - Consider use of Oxandrolone 10mg po/pt twice daily

Enteral Nutrition (EN)

- Initiation of EN
  - Start Pivot at 50% of goal (~25-30ml/hr) within 24 – 48 hours of admission
  - Advance as tolerated to goal by day 5 with improvement of SIRS or critical illness
  - If not at 60% of goal after 7 days, consider PN supplementation (refer to protocol)
- Withhold EN if hemodynamically unstable
- EN Access
  - Placement
    - Begin with blind bedside nasogastric feeding tube
    - Consider bedside endoscopic, fluoroscopic, Cortrak, or intraoperative placement
    - OGT and NGT placement confirmed by physical exam
    - Small bore feeding tube placement confirmed by radiology

- Gastric access
  - Short-term: OGT, NGT, small bore feeding tube
  - Long-term: PEG (initiate TF at 6am post PEG placement)
- Post-pyloric access
  - Short-term:
    - If placement unsuccessful after 2 attempts consider endoscopic placement of PEG/J (long-term)
  - Indications
    - Gastroparesis with persistent high (500ml) Gastric Residual Volume (GRV) despite prokinetic agents or recurrent emesis
    - Severe active pancreatitis (endoscopic placement for jejunal feeds)
    - Open abdomen
    - Abdominal Trauma Index (ATI) > 15

<u>Parenteral Nutrition (PN)</u>

- If previously healthy, initiate PN only after the first 7 days of hospitalization if EN is not feasible.
- If protein-calorie malnutrition present and EN not feasible, start PN immediately after resuscitation.
- **Weaning TPN when:**
  - TFs tolerated at 60% of goal
    - Decrease TPN to ~half, d/c lipids and decrease dextrose/AA per PN team order
    - Wean off TPN as TF rate advances to goal or per clinician judgment
  - POs tolerated at 60% of meals consumed
    - Decrease TPN to ~half, d/c lipids and decrease dextrose/AA per PN team order
    - Weaned off TPN per clinician judgment

<u>Nutritional Goals:</u>

- Dosing Weight:
  - Use IBW for height if actual body weight is ≥ IBW
  - Hamwi method:
    - Men:106# (48kg)1st 5 ft, then add 6# (2.7kg) per inch >5ft, +/-10%
    - Women: 100# (45kg)1st 5 ft, then add 5# (2.3kg) per inch >5ft, +/-10%
  - Use actual body weight if weight is < IBW
- Caloric Goals:
  - 25 – 35 kcal/kg dosing weight
  - If BMI > 30, use 22 – 25 kcal/kg IBW
- Protein needs:
  - General: 1.2 – 2.0 g/kg dosing weight
  - Obesity
    - BMI of 30 – 40, use > 2 g/kg IBW
    - BMI > 40, use > 2.5 g/kg IBW
  - Renal Failure (HD/CRRT): 1.2 – 2.5 g/kg dosing weight
  - Hepatic Failure: 1.2 – 2.0 g/kg dosing weight
- Fluid Needs - 1 ml/kcal baseline
  - Cover Additional losses – (ie. fever, diarrhea, GI output, tachypnea)
  - Fluid restriction – CHF, renal failure, hepatic failure with ascites, CNS injury, and electrolyte abnormality

If LOS>7 days and pt has not consistently met near 100% needs consider nutritional provision from a combination of PO/EN/PN routes.

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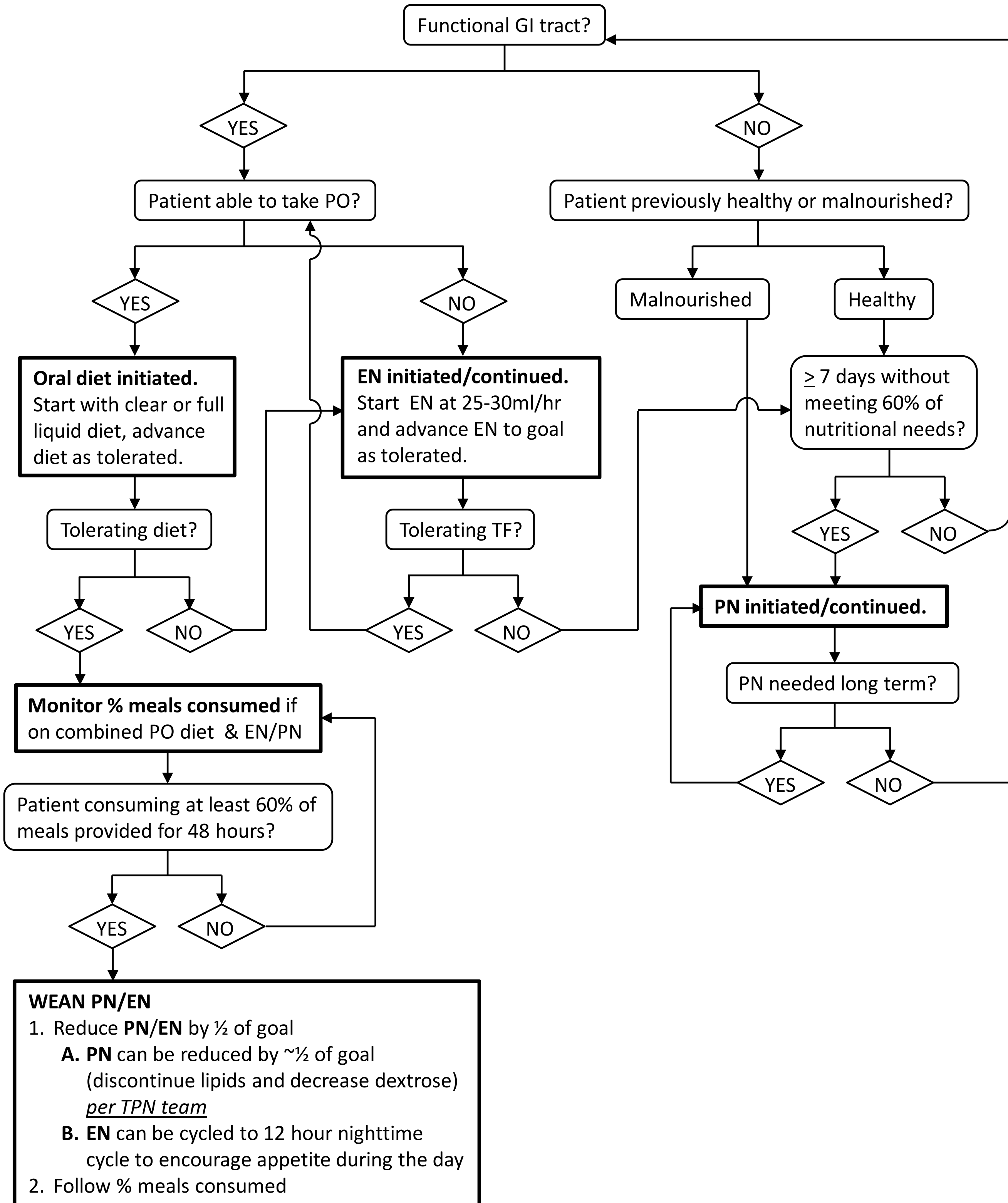
Revised 2011

Combination Feeding (EN/PN) Protocol

(SCC NUTRITION MANAGEMENT ORDER SET)



Critical Care Nutrition
Practice Management Guidelines
Vanderbilt University Medical Center

Collier and Mills
Revised 2010

Total Enteral Nutrition Flow Diagram

Start EN within 24-48 hours of admission

(SCC NUTRITION MANAGEMENT ORDER SET)

TICU and SICU

Critically Ill Surgery, Burn or Trauma Patient

Non-Critically Ill Post-Op Patient

Pivot 1.5
(for the first 10 days)

LOS > 10 days

Standard Formula
Promote 1.0
Osmolite 1.2
Osmolite 1.5
Two Cal HN

Consider other conditions

Consult RD for details to use disease specific formulas

Persistent Uncontrolled Hyperglycemia
Glucerna 1.2

ARDS (P/F <200)
ALI (P/F < 300)
Oxepa 1.5

Renal Failure
(On RRT / Cr > 2.5)
Nepro 1.8 (for IHD)
Promote (for CRRT)

Hepatic Failure with Refractory Encephalopathy
NutriHep 1.5

Acute Pancreatitis (Moderate to Severe)
Vital 1.5
Vivonex RTF 1.0

MODS/Chyle Leak
Vivonex RTF 1.0

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Gastric Residual Volume (GVR) Protocol

Check Residuals Every 4 Hours After Initiating/Continuing TF
(Prior to starting TF – always check position of tube with KUB)

GRV ≥ 500 ml
x 2 consecutive residuals

- Replace residuals
- Hold feeds
- **Check residuals after 4 hours**

GRV ≥ 500 ml

Physical signs of intolerance present?

YES

- Consider starting medication
  - Prokinetic Agents

  <u>(SCC NUTRITION MANAGEMENT ORDER SET)</u>
    - **Erythromycin 200 mg IV or per tube q6h x 3 days.** (If history of diabetic gastroparesis, continue on erythromycin. Consider prolongation of QTc.
    - **Metoclopramide 10 mg IV q6h x 3 days**
    - **Naloxone 8mg q 8hr,** then 8mg q 6hr if needed
- Reduce risk of aspiration by elevating HOB to 30-45° and switching to continuous infusion if receiving bolus
- **Recheck residuals in 4 hours**

GRV ≤ 500 ml

GRV ≥ 500 ml

Consider:
- Small bowel feedings if gastroparesis present
- TPN if ≥ 7 days of not achieving 60% goal rate of EN or ileus present

NO

- Replace residual
- Restart feeds at 50% of goal
- **Recheck residuals in 4 hours**

GRV ≥ 500 ml

GRV ≤ 500 ml

GRV ≤ 500 ml

GRV ≤ 500 ml

- Replace residuals

Pre-Operative Protocol for Enteral Nutrition (EN) Feeding For Protected Airway Patients

- **Non-Abdominal Surgery**

- **Abdominal Surgery**
- **Operative Intervention requiring Prone Positioning**

- **Upper GI Endoscopy**

Non-Abdominal Surgery:

- Turn feeds off just prior to OR departure or beside procedure.
- Gastric tube will be flushed and aspirated.

Abdominal Surgery / Operative Intervention requiring Prone Positioning:

- Turn feeds off 6 hours before planned anesthesia
- Gastric tube will be flushed and aspirated prior to OR departure

Upper GI Endoscopy:

- Turn feeds off 1 hour prior to elective endoscopy
- Place NGT tube to suction

Stop insulin infusion prior to OR transport

Alert anesthesiologist to perform Accucheck perioperatively in OR if SQ insulin given within 2 hours

Restart feedings post surgery unless orders to hold TF post surgery.

- For patient with confirmed post-pyloric feeding tube consider perioperative continuous feeding by anesthesiologist and surgeon
- If patient is on insulin infusion, continue along with tube feedings.

Sources:

- Bankhead R, Boullata J, Brantley S, Corkins M, Guenter P, Krenitsky J et al. Enteral nutrition practice recommendations. *Journal of Parenteral and Enteral Nutrition*. 2009.
- McClave SA, Martindale RG, Vanek VW, McCarthy M, Roberts P et al. Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient. *Journal of Parenteral and Enteral Nutrition*. 2009; 33 (3): 277-316.