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 patients
      - 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

Parenteral Nutrition (PN)
   - 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

Nutritional Goals:
   - 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/CRRRT): 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.
Combination Feeding (EN/PN) Protocol  
(SCC NUTRITION MANAGEMENT ORDER SET)

- **Functional GI tract?**
  - **YES**
    - **Patient able to take PO?**
      - **YES**
        - **Oral diet initiated.**
          - Start with clear or full liquid diet, advance diet as tolerated.
          - **Tolerating diet?**
            - **YES**
              - **Monitor % meals consumed if on combined PO diet & EN/PN**
                - Patient consuming at least 60% of meals provided for 48 hours?
                  - **YES**
                    - **WEAN PN/EN**
                      1. Reduce PN/EN by ⅓ of goal
                        A. PN can be reduced by ~⅓ of goal
                           (discontinue lipids and decrease dextrose)
                           per TPN team
                        B. EN can be cycled to 12 hour nighttime cycle to encourage appetite during the day
                      2. Follow % meals consumed
                        - **NO**
              - **NO**
          - **NO**
        - **Tolerating diet?**
          - **YES**
          - **NO**
    - **NO**
  - **NO**

- **Patient previously healthy or malnourished?**
  - **YES**
  - **NO**
  - **Malnourished**
    - **≥ 7 days without meeting 60% of nutritional needs?**
      - **YES**
        - **PN initiated/continued.**
          - **PN needed long term?**
            - **YES**
            - **NO**
            - **NO**
          - **NO**
      - **NO**
  - **Healthy**
    - **PN initiated/continued.**
      - **PN needed long term?**
        - **YES**
        - **NO**

- **Tolerating TF?**
  - **YES**
  - **NO**
Critical Care Nutrition Practice Management Guidelines
Vanderbilt University Medical Center

**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

- **Pivot 1.5** (for the first 10 days)
- **LOS > 10 days**

Non-Critically Ill Post-Op Patient

- **Standard Formula**
  - Promote 1.0
  - Osmolite 1.2
  - Osmolite 1.5
  - Two Cal HN

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

Collier and Mills
Revised 2010
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)

\[
\begin{align*}
\text{GRV} & \geq 500 \text{ ml} & \text{GRV} & \leq 500 \text{ ml} \\
\times 2 \text{ consecutive residuals} & & & \\
\end{align*}
\]

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

- Replace residuals

\[
\begin{align*}
\text{GRV} & \geq 500 \text{ ml} & \text{GRV} & \leq 500 \text{ ml} \\
\end{align*}
\]

Physical signs of intolerance present?

\[
\begin{align*}
\text{YES} & & \text{NO} \\
\end{align*}
\]

- Consider starting medication
  - Prokinetic Agents
    - 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

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

\[
\begin{align*}
\text{GRV} & \geq 500 \text{ ml} & \text{GRV} & \leq 500 \text{ ml} \\
\end{align*}
\]

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

- Turn feeds off just prior to OR departure or beside procedure.
- Gastric tube will be flushed and aspirated.
- Turn feeds off 6 hours before planned anesthesia.
- Gastric tube will be flushed and aspirated prior to OR departure.
- 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: