Vanderbilt University Medical Center
Trauma ICU Nutrition Management Guidelines

Trauma Critical Care Nutrition Guidelines

Clinical judgment may supersede guidelines as patient circumstances warrant

ASSESSMENT AND EVALUATION

- All patients admitted to the Trauma Intensive Care Unit require a nutrition risk assessment within 24 hours and a nutrition plan within 48 hours
- Consult Nutrition Service as needed for specific recommendations (i.e. tube feeding formulations, oral supplements, poor oral intake, education)

ADMINISTRATION

- Enteral nutrition (EN) preferred over parenteral nutrition (PN)
- Reduce risk of aspiration by reducing sedation, elevating HOB 30 – 45 degrees, performing mouth care per VAP Guidelines and minimizing transport out of ICU

Oral Nutrition

- Oral intake preferred method of nutrition if appropriate for patient
- Initiate regular diet with oral diet advancement (add oral supplement to optimize po intakes)

Enteral Nutrition

- Initiate EN 24 – 48 hours following onset of critical illness and admission to ICU, after resuscitation efforts completed and/or hemodynamic stability achieved
- Initiate tube feedings and advance as quickly as tolerated in 24 – 48 hours to goal within 48 – 72 hours
  - Weaning EN (transitioning to PO diet)
    - Cycle EN x 12hr, 7p to 7am (for 50% of needs during first few days of transition)
  - Wean off EN once patient consistently consumes and tolerates on average 50% or more of meals
- Lower GI tract preferable if EN access needed, especially with high aspiration risk, but nutrition should not be delayed if only gastric access obtained
  - Access
    - Gastric
      - Short term: Orogastric tube (OGT), Nasogastric tube (NGT), Dobhoff tube (DHT)
      - Long term: Percutaneous endoscopic gastrostomy (PEG)
    - Post-pyloric:
      - Short term: DHT (via Cortrak and placement confirmed by abdominal radiographic imaging (KUB))
      - Long term: PEG-Jejunostomy (for unsuccessful placement DHT for post-pyloric access)

Parenteral Nutrition

- If low nutrition risk and unable to meet > 60% energy and protein requirements via EN within 7 - 10 days, then initiate PN
- If high nutrition risk present (malnutrition upon admission, inability to use GI tract expected for more than 3-5 days) and EN not feasible, initiate PN as soon as possible after resuscitation efforts completed
- If high nutrition risk present (malnutrition upon admission determined by AND/ASPEN criteria and inability to use GI tract expected for more than 3-5 days), initiate PN as soon as possible after resuscitation efforts completed
- Wean TPN when 60% of TF goal met or 60% of meals consumed
  - Decrease TPN to ~half, decrease dextrose/AA per PN team order
  - Wean off TPN as TF rate advances or per clinical judgment

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

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DOSING

- Dosing weight
  - Use ideal body weight (IBW) or upper IBW for height if actual body weight > 20% IBW
  - Hamwi Method:
    - Men: 106# (48kg) for 1st 5 feet, then add 6# (2.7kg) per inch >5 feet, +/-10%
    - Women: 100# (45kg) 1st 5 feet, then add 5# (2.3kg) per inch >5feet, +/-10%
  - Use actual body weight if weight < IBW
- Energy goals:
  - 25 – 35 kcal/kg dosing weight/day
  - If BMI >35 (Class II or Class III Obesity), use 22 – 25 kcal/kg IBW/day
- Protein goals:
  - General 1.2 – 2.0 g/kg dosing weight/day
  - Obesity
    - If BMI 35 – 40, use > 2g/kg IBW/day
    - If BMI > 40, use 2.5g/kg IBW/day
  - Renal Failure:
    HD 1.5 to 2.0 g/kg dosing weight
    CRRT: 2.0 - 2.5g/kg dosing weight
  - Hepatic Failure: 1.2 - 2.0/kg dry or actual body weight/day
  - Spinal Cord Injury: 2.0/kg dosing weight
  - Traumatic Brain Injury: 1.5-2.0/kg dosing weight
  - Open Abdomen: 15 – 30G/liter of exudate lost
- Fluid Needs
  - 1ml/kcal baseline
  - Cover additional losses (i.e. fever, diarrhea, other GI output)
  - Fluid restriction (i.e. CHF, renal failure, hepatic failure w/ ascites, CNS injury, electrolyte abnormality)
  - Open abdomen: 1.5 – 2ml/kcal (unsure of reference SICU reference-ask Brad about)

MONITORING

- Serum protein markers (i.e. prealbumin, CRP) not recommended for evaluation of nutritional status or goals
- GI Intolerance
  - Gastric residual volume (GRV) not utilized as routine evaluation of tolerance. Daily physical examination, patient symptoms, clinical risk factors, and abdominal radiographic films should be utilized to determine tolerance
  - Prokinetic agents may be introduced if GI intolerance suspected or for patients with high risk of aspiration. Consider QTc prolongation.
    - Erythromycin 200mg IV or per tube q6h x 3 days
    - Metoclopramide 10mg IV q6h x 3 days
    - Naloxone 8mg q8h x 3 days, then 8mg q6h prn
- For persistent diarrhea and C. Diff infection ruled out, initiate Nutrisource fiber 4 packets in 24 hours (reference ?) remove this highlighted statement
- Special considerations
  - **Refeeding syndrome**
    - Replete electrolytes, provide thiamine, folic acid and MVI prior to initiation of tube feedings
    - Patients at risk for refeeding syndrome, initiate trophic feedings (no more than 25% of goal) and then check BMP, phosphorus and magnesium levels
    - Advance tube feedings slowly over 3 – 4 days
    - Check BMP, phosphorus and magnesium levels daily as EN advances to goal
  - **Open Abdomen**
    - Early EN recommended 24 – 48 hours after injury, without evidence of bowel injury

Hyperglycemia: (VUMC EN formulary does not have a “diabetic” EN formula) per gram protein provided Replete or Peptamen Intense VHP will provide lowest amount of carbohydrate per TF goal.

ASSOCIATED MDSCC PROTOCOLS

- Glycemic Protocol

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- Gastrointestional Stress Ulcer Prophylaxis
- VAP Protocol

Appendix 1

TICU ENTERAL NUTRITION TUBE FEEDING FORMULATIONS

Critically Ill Patient	**Obese Critically Ill Patient**	**Non-Critically Ill Patient**
Replete (Nonimmune modulating formula)	Peptamen Intense VHP (very high protein formula)	Isosource HN Nutren 1.5 Nutren 2.0 Replete

Consult Nutrition Service for disease specific formulations in TICU

Respiratory failure Nutren 2.0	Admitted with pre-existing renal failure Novasource Renal (electrolyte restricted formula)	**Renal failure Develops** HD: Novasource Renal CRRT: Replete	**Acute Pancreatitis** Replete Peptamen 1.5	**MODS/Chyle Leak** Vivonex RTF 1.0	**Modulars** **Nutrisource Fiber** **Prostat Max (Protein)**

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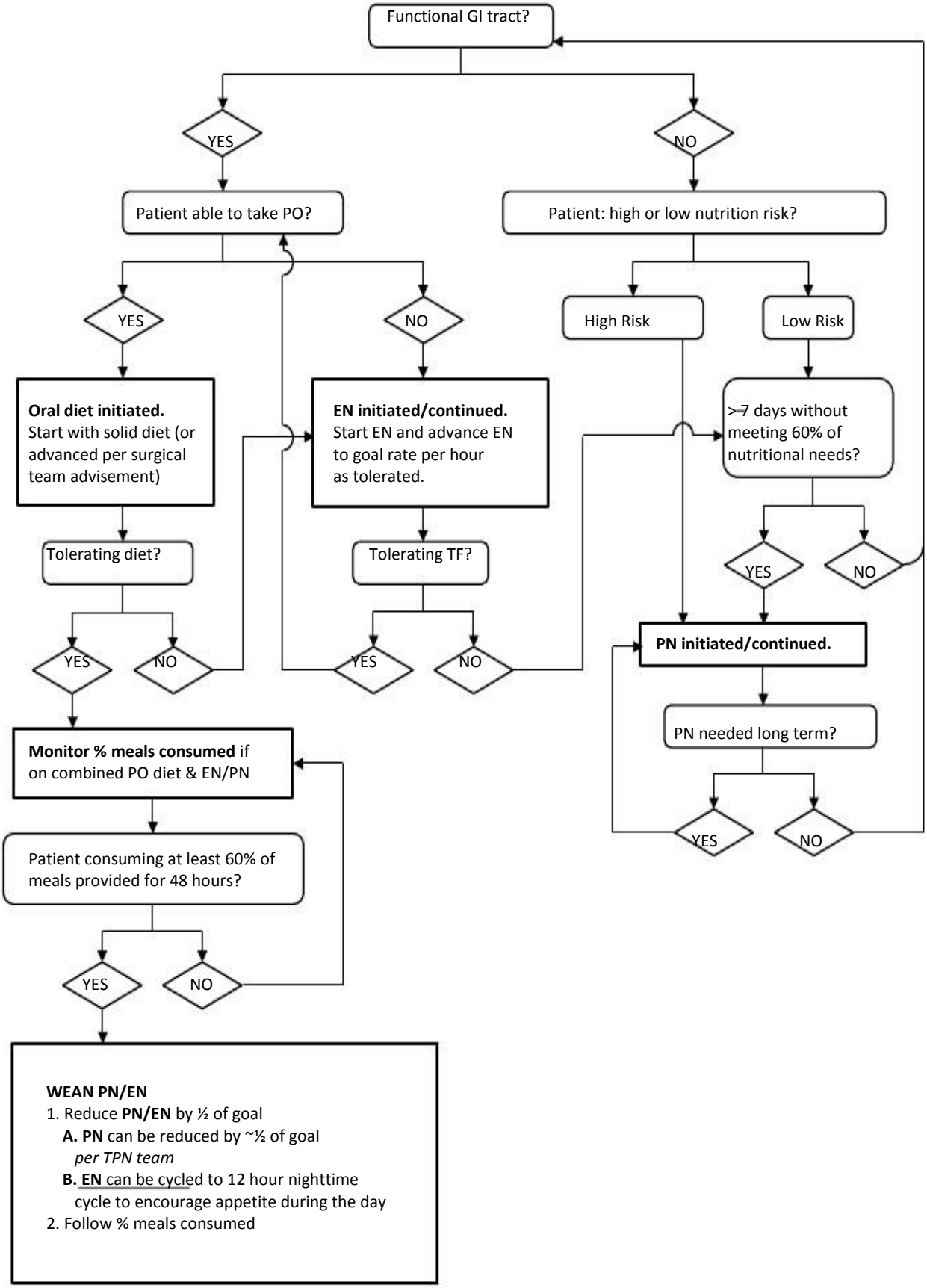
Appendix 2

ENTERNAL/PARENTERAL NUTRITON FLOW DIAGRAM



Appendix 3

PREOPERATIVE ENTERAL NUTRITION PROTOCOL FOR PATIENTS WITH PROTECTED AIRWAY (Trach/Oral ETT)

NON-ABDOMINAL SURGERY

- Turn tube feedings off just prior to OR departure or bedside procedure
- Gastric tube will be flushed and aspirated

ABDOMINAL SURGERY OR OPERATIVE INTERVENTION REQUIRING PRONE POSITIONING

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

UPPER GI ENDOSCOPY

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

OTHER CONSIDERATIONS

- Stop insulin infusion prior to OR transport
- Alert anesthesiology to perform accucheck perioperatively in OR if SQ insulin given within 2 hours
- Restart tube feedings post-surgery unless orders to hold post-surgery
- Patient with confirmed post-pyloric feeding tube, consider perioperative continuous feeding by anesthesiology and surgeon

Sources:

- Boullata JI, Carrera AL, Harvey LH, Hudson L, et al. ASPEN Safe Practices for Enteral Nutrition Therapy. *Journal of Parenteral and Enteral Nutrition*. 2017; 41(1):15 - 103.
- McClave SA, Taylor, BE, Martindale RG, Warren MM, et al. Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society of Parenteral and Enteral Nutrition (ASPEN). *Journal of Parenteral and Enteral Nutrition*. 2016; 40 (2): 159-211.
- Taylor BE, et al. Guidelines for the Provision and Assessment of Nutrition Support Therapy in the Adult Critically Ill Patient: Society of Critical Care Medicine (SCCM) and American Society for Parenteral and Enteral Nutrition (ASPEN). Critical Care Medicine. 44(2): 390 – 438, February 2016.

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