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>7 days and pt has not consistently met on average near 100% estimated needs consider

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nutritional provision from a combination of PO/EN/PN routes.

**DOSSING**
- **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 >5 feet, +/-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-as about 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
- Gastrointestinal Stress Ulcer Prophylaxis
- VAP Protocol

**Appendix 1**

**TICU ENTERAL NUTRITION TUBE FEEDING FORMULATIONS**

<table>
<thead>
<tr>
<th>Critically Ill Patient</th>
<th>Obese Critically Ill Patient</th>
<th>Non-Critically Ill Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Replete (Nonimmune modulating formula)</td>
<td>Peptamen Intense VHP (very high protein formula)</td>
<td>Isosource HN Nutren 1.5 Nutren 2.0 Replete</td>
</tr>
</tbody>
</table>

*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) |
ENTERNAL/PARENTERAL NUTRITION FLOW DIAGRAM

Functional GI tract?

YES

Patient able to take PO?

YES

Monitor % meals consumed if on combined PO diet & EN/PN

YES

Patient consuming at least 60% of meals provided for 48 hours?

YES

WEAN EN/EN

1. Reduce PN/EN by ½ of goal
   A. PN can be reduced by ~½ of goal 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

NO

Patient: high or low nutrition risk?

YES

PN initiated/continued. Start EN and advance EN to goal rate per hour as tolerated.

Tolerating TF?

YES

NO

NO

NO

NO

High Risk

Low Risk

> 7 days without meeting 60% of nutritional needs?

YES

NO

PN needed long term?

YES

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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:
