Tube Feeding Guide for the COVID-19 Emergency

Prepared by Stony Brook University Hospital Clinical Nutrition Team, April 7, 2020

Justification

To provide LIPs a guideline for initiating enteral feeding for the critically ill patient during the COVID-19 pandemic. Early nutrition support among critically ill patients, including those with respiratory failure, is associated with increased ventilator free days and more positive outcomes.¹ ² ³

Procedure

Consider tube feeding for patients on mechanical ventilation or those not able to maintain adequate intake. Before considering tube feeding, patient needs to be hemodynamically stable and tapering off vasoactive agents.

If enteral feeding is warranted, enter a nutrition consult. Guidelines below are provided if need to start tube feeding before nutrition consult completed.

If feeding pump availability is limited, prioritize assignment of pumps as follows:

- COVID-19 patients to optimize feeding tolerance and preserve personal protective equipment.
- Patients with a J-tube since intermittent feeding via bolus or gravity drip is not recommended.

**ADULTS**

- **If feeding pump available**
  - Access OVID tube feeding Power Plan
  - Select route - NG tube (if G-tube or J-tube present upon admission, use it)
  - Assess residuals – Check every 8 hours and hold tube feeding if > 250 ml
  - Select formula
    - Default – Vital 1.5; if not available Osmolite 1.2
    - With respiratory distress (pCO₂ > 50 mmHg) without signs of GI intolerance; appropriate for diabetics and if volume restriction necessary – Pulmocare 1.5
    - With renal failure/injury – Nepro 1.8 (with or without diabetes)
    - With diabetes and stable – Glucerna 1.2
    - When patient more stable – Jevity 1.5
  - Goal rate – 30-40 ml/hr (start at 20 ml/hr and advance by 10 ml every 4 hours as tolerated)
  - Duration – 24 hours

- **If feeding pump NOT available**
  - Access the COVID tube feeding Power Plan
  - Select route – NG tube (if G-tube present upon admission, use it; do NOT use J-tube for bolus or gravity drip feeding)
  - Assess residuals – Check every 8 hours and hold tube feeding if > 250 ml
  - Select formula:
    - Default - Vital 1.5 (not with gravity drip); if not available Osmolite 1.2
    - With respiratory distress (pCO₂ > 50 mmHg) without signs of GI intolerance; appropriate for diabetics and if volume restriction necessary – Pulmocare 1.5
    - With renal failure/injury – Nepro 1.8 (with or without diabetes); not with gravity drip
**If gravity drip do NOT use Nepro 1.8, Suplena 1.8, Vital 1.5 or TwoCal**

- Delivery method without pump – gravity drip or bolus as per patient tolerance and available equipment (gravity drip feeding requires a gravity feeding bag with tubing set)

**if gravity drip: 3, 8-hour feedings a day**
- initiation – 20 ml/hr or 5 drops/minute (160 ml/feeding)
- advance as tolerated – 30 ml/hr or 7 drops/minute (240 ml/feeding)
- advance as tolerated – 40 ml/hr or 9 drops/minute (320 ml/feeding)

Put appropriate volume of formula into bag based on rate (see chart below); set roller clamp for appropriate drips per minute based on rate (see chart below); each feeding should run for 8 hours; discard formula and bag after 8 hours. In between 3 feedings, formula bottle should be labeled with patient name, MRN, date and time bottle opened and refrigerated; discard after 24 hours.

**if bolus: 4 feedings a day**
- initial bolus, 80 ml/feeding
- if tolerated, advance next feeding to 120 ml/feeding
- if tolerated, advance next feeding to 160 ml/feeding

Put appropriate volume of formula into syringe based on volume (see chart below). In between the 4 feedings, formula bottle should be labeled with patient name, MRN, date and time bottle opened and refrigerated; discard after 24 hours.

- Refer to chart below for calories delivered based on volume and caloric density of formula

<table>
<thead>
<tr>
<th>Summary of Calories Provided, kcal/day (Adults)</th>
<th>Rate, (ml/hr)</th>
<th>Rate, (drops/hr)*</th>
<th>Rate, (drops/min)*</th>
<th>Hang Time (hrs)</th>
<th>Volume delivered, ml/feeding</th>
<th>Volume delivered, ml/day</th>
<th>Calories Delivered, kcal/day based on Caloric Density of Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gravity Drip - 3, 8-hour feedings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>If caloric density 1.2 kcal/ml</td>
</tr>
<tr>
<td>Initiation</td>
<td>20</td>
<td>n/a</td>
<td>n/a</td>
<td>24</td>
<td>n/a</td>
<td>480</td>
<td>576 720 864</td>
</tr>
<tr>
<td>1st Advance</td>
<td>30</td>
<td>n/a</td>
<td>n/a</td>
<td>24</td>
<td>n/a</td>
<td>720</td>
<td>864 1080 1296</td>
</tr>
<tr>
<td>2nd Advance</td>
<td>40</td>
<td>n/a</td>
<td>n/a</td>
<td>24</td>
<td>n/a</td>
<td>960</td>
<td>1152 1440 1728</td>
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<tr>
<td>Gravity Drip - 3, 8-hour feedings</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>If caloric density 1.5 kcal/ml</td>
</tr>
<tr>
<td>Initiation</td>
<td>20</td>
<td>280</td>
<td>5</td>
<td>8</td>
<td>160</td>
<td>480</td>
<td>576 720 864</td>
</tr>
<tr>
<td>1st Advance</td>
<td>30</td>
<td>420</td>
<td>7</td>
<td>8</td>
<td>240</td>
<td>720</td>
<td>864 1080 1296</td>
</tr>
<tr>
<td>2nd Advance</td>
<td>40</td>
<td>560</td>
<td>9</td>
<td>8</td>
<td>320</td>
<td>960</td>
<td>1152 1440 1728</td>
</tr>
<tr>
<td>Intermittent Bolus Feedings, 4 per day</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>If caloric density 1.8 kcal/ml</td>
</tr>
<tr>
<td>Initiation</td>
<td>80</td>
<td>384</td>
<td></td>
<td></td>
<td></td>
<td>480</td>
<td>576</td>
</tr>
<tr>
<td>1st Advance</td>
<td>120</td>
<td>576</td>
<td></td>
<td></td>
<td></td>
<td>720</td>
<td>864</td>
</tr>
<tr>
<td>2nd Advance</td>
<td>160</td>
<td>768</td>
<td></td>
<td></td>
<td></td>
<td>960</td>
<td>1152</td>
</tr>
</tbody>
</table>

* For gravity drip, assume 14 drops/ml

**During COVID-19 emergency we are extending hang time of open tube feeding systems to 8 hours as per manufacturer recommendations**

**PEDIATRICS (over 1 year of age) – start trickle feed until nutrition consult completed**

- If feeding pump available
  - Access the COVID tube feeding Power Plan
  - Select route - NG tube (if G-tube or J-tube present upon admission, use it)
  - Assess residuals – Check every 8 hours and hold tube feeding if > 250 ml
  - Select formula - Pediasure 1.0 with Fiber
 Initiation rate – 5 to 10 ml/hr and if tolerated advance to 15 ml/hr after 4 hours (Goal rate to be recommended by RD upon consult or by MD.)
 Duration – 24 hours

 If feeding pump NOT available – intermittent feedings
 Access the COVID tube feeding Power Plan
 Select route – NG tube (if G-tube present upon admission, use it; do NOT use J-tube for bolus or gravity drip feeding)
 Assess residuals – Check every 8 hours and hold tube feeding if > 250 ml
 Select formula – Pediasure 1.0 with Fiber
 Delivery method without pump – gravity drip or bolus as per patient tolerance and available equipment (gravity drip feeding requires a gravity feeding bag with tubing set)

 - if gravity drip: 3, 8-hour feedings a day
   - initiation - 15 ml/hr or 4 drops/minute (120 ml/feeding)
   - advance as tolerated – 20 ml/hr or 5 drops per minute (160 ml/feeding)
   - Put appropriate volume of formula into bag based on rate (see chart below); set roller clamp for appropriate drips per minute based on rate (see chart below); each feeding should run for 8 hours; discard formula after 24 hours.
   - In between 3 feedings, formula bottle should be labeled with patient name, MRN, date and time bottle opened and refrigerated; discard after 24 hours.

 - if bolus: 4 feedings a day
   - initial bolus, 60 ml/feeding
   - if tolerated, advance next feeding to 100 ml/feeding
   - In between the 4 feedings, formula bottle should be labeled with patient name, MRN, date and time bottle opened and refrigerated; discard after 24 hours.

 Refer to chart below for calories delivered based on volume

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**Summary of Calories Provided, kcal/day (Pediatrics)**

<table>
<thead>
<tr>
<th>Route, (ml/hr)</th>
<th>Rate, (drops/hr)*</th>
<th>Rate, (drops/min)*</th>
<th>Hang Time (hrs)**</th>
<th>Volume delivered, ml/feeding</th>
<th>Volume delivered, ml/day</th>
<th>Calories Delivered, kcal/day</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pump Assisted Continuous 24 hour Feeding</strong></td>
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<tr>
<td>Initiation</td>
<td>10</td>
<td>n/a</td>
<td>n/a</td>
<td>24</td>
<td>n/a</td>
<td>240</td>
</tr>
<tr>
<td>Advance</td>
<td>15</td>
<td>n/a</td>
<td>n/a</td>
<td>24</td>
<td>n/a</td>
<td>360</td>
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<tr>
<td><strong>Gravity Drip - 3, 8-hour feedings</strong></td>
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</tr>
<tr>
<td>Initiation</td>
<td>15</td>
<td>210</td>
<td>4</td>
<td>8</td>
<td>120</td>
<td>360</td>
</tr>
<tr>
<td>Advance</td>
<td>20</td>
<td>280</td>
<td>5</td>
<td>8</td>
<td>160</td>
<td>480</td>
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<tr>
<td><strong>Intermittent Bolus Feedings, 4 per Day</strong></td>
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<tr>
<td>Initiation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>60</td>
<td>240</td>
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<tr>
<td>Advance</td>
<td></td>
<td></td>
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<td>100</td>
<td>400</td>
</tr>
</tbody>
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