Enteral (Tube) Feeding – Dietitian Guidelines (in Acute Care)

Site Applicability

All VCH and PHC Acute Care Sites

- If a Long-Term Care resident chooses to be fed by tube, this DST may be used to guide initiation of enteral feeding when there is access to daily RN, Dietitian and/ or MRP oversight to manage complications.

Practice Level

Registered Dietitian (RD): Basic Skill with Restricted Activity A

Requirements

- A provider order is required for insertion of feeding tube, verification of tube placement, initiation of feeds and electrolyte monitoring (Refer to Guidelines for Nutritional Management of Patients at Risk for Refeeding Syndrome – (BD-00-07-40058)).
- Dietitian must be consulted for tube feed assessment and recommendations.
- Where available, Tube Feeding Initiation Orders must be implemented.
- Blue dye (i.e. Methylene blue) must not be added to tube feeding formula due to potential toxicity concerns.

Need to Know

1. Refer to VCH Ethical Decision-Making Framework for Tube/Other Feeding Options/PHC Ethical Decision Making Tool for Feeding Options for the ethical considerations and decision making process for the initiation of enteral feeding.
2. The tube feeding plan is ordered by the provider in consultation with the dietitian and nurse. If "Tube Feed as per Dietitian" has been ordered, the dietitian may order and adjust the tube feed. The order should include:
    - Type of feeding formula,
    - Method of delivery (closed or open system with enteral feeding pump; gravity or syringe feeding)
    - Amount/volume
    - Flow rate
    - Flushes
    - Feeding schedule

3. There are two types of feeding delivery systems for tube feeding; open and closed. The closed tube feeding system is the preferred method to minimize the risk of bacterial contamination. The dietitian will determine the type of delivery system to be used.

4. If patient is receiving insulin, alert provider to tube feed schedule changes that may require changes to insulin orders.

5. Consider modifying tube feed schedule or holding tube feeds as appropriate to support a safe transfer to home or facility. When developing the transfer care plan, consult with patient/family and consider transfer distance, medical condition, mode of transfer, and risk of aspiration when modifying the tube feeding schedule.

Procedure

A. Complete nutrition assessment using the nutrition care process (refer to eNCPt)

1. Ensure patient meets criteria for tube feeding:

- Tube feeding aligns with goals of care.
- GI tract is functional. Some examples of when GI tract dysfunction may limit ability to feed enterally include: bowel discontinuity, mechanical obstruction, paralytic ileus, high-output fistula that is too distal to bypass with feeding tube, bowel ischemia, and severe GI bleed.
- Can be safely positioned for tube feeding (e.g. head of bed at minimum of 30 degrees)
- Oral intake is inadequate (less than 50% of estimated needs) or not possible:
  - Malnourished and/or chronic history of inadequate intake and unlikely to improve

    OR
  - Previously well-nourished, low nutrition risk and NPO/inadequate intake for 7 days

    OR
  - Metabolically stressed and/or condition limiting oral intake (e.g., critical illness, major trauma/burns, mechanical ventilation, head/neck surgery, dysphagia).

2. Determine nutrition requirements

- Assess for risk of refeeding syndrome (see BD-00-07-40058).
- Assess fluid status in collaboration with provider.
- Estimate macronutrient, micronutrient and fluid needs.

3. Determine appropriate tube type and tube feeding route

- See Appendix A: Selection of Tube Type and Route

4. Determine appropriate tube feeding formula(s)

- Refer to VCH/PHC Master Oral Enteral Formulary and VCH/PHC Oral and Enteral Formulary – Selection Guide.
- Standard Meal Replacement Formulas and Standard Meal Replacement Formulas with Fibre should be considered first. Use of all alternate formulas should be considered only when supported by clinical assessment and indications for use.
- Consider allergies when determining appropriate tube feeding formula.
- Refer to Standard Operating Procedures:
  - Non-formulary nutrition products Approved for Use in Canada (BD-00-16-40088)
  - Non-Formulary nutrition products Not Approved for Use in Canada (BD-00-16-40089)
  - Home Blenderized Tube Feedings (BD-00-16-40087).
- Mixtures of 2 formulas (e.g., 1:1 mixes) may be utilized to meet specific nutrient requirements.

5. Formula Delivery

- Most new tube feeds are initiated as continuous feeds and infused with a tube feeding pump over 24 hours/day.
- All formulas are initiated at full strength, 25 mL/hour unless otherwise indicated. Increase rate:
  - By 25 mL/hour every 4 hours, OR
  - As tolerated to goal rate, OR
  - As specified by provider or dietitian (e.g., consider refeeding risk and disease conditions impacting tolerance).
- Transition to intermittent feeding is initiated when ongoing tube feeding is required and patient is medically stable. In some cases nocturnal tube feeding can be used to promote oral intake during the day. See Appendix B: Transition from Continuous to Intermittent Tube Feeding.
- The closed feeding system is the preferred method of tube feeding whenever possible. Use the closed feeding system for flow rates of at least 30 mL/hour for standard formula and 20 mL/hour for concentrated formulas. Closed system formulas may still be used for lower rates for immunocompromised patients or when a rate increase is anticipated.
- The closed system cannot be used if a mixture of formulas is required.

6. Water Delivery

- Determine total fluid requirements (e.g., 1mL/kcal or mL/kg) or as ordered by physician
- Determine volume provided by IV infusion, formula volume and medication flushes/mixtures

- To meet total fluid requirements, provide additional water flushes as needed.
- Feeding tubes should be flushed at least every 4 hours for continuous feeds and before and after each intermittent feed/medication administration unless otherwise indicated.

B. Monitoring and Evaluation

1. Establish relevant monitoring parameters. These may include:

   - GI tolerance (e.g., bowel movements, nausea, vomiting, reflux, abdominal distension/pain).
   - Standard lab tests: serum sodium, phosphorus, potassium, magnesium, urea, creatinine, glucose prior to the initiation of feeds, then daily for 5 days. Selection and frequency of lab tests vary depending on patient's medical condition.
   - Weight changes (note if edema/ascites present when weighed).
   - Fluid status (e.g., edema/ascites, hydration status, intake and output).
   - Changes in clinical status possibly related to tube feeding (e.g., respiratory status, temperature, coughing up material that looks like formula, change in tube position, and suctioning formula-like material from mouth and/or throat).

2. Follow up daily or as per patient condition and until feeds established at goal rate with no tolerance / monitoring problems. Follow up at least weekly thereafter.

3. Monitor for readiness for transition to intermittent tube feeding (see Appendix B) or oral intake (see Appendix C).

Discharge Considerations

1. For discharge home on tube feedings allow at least 4 business days to ensure home tube feeding supplies have been procured and appropriate education and referrals have been completed for tube feeding at home. See Appendix D: Tube feeding at Home - Client Education Checklist, Dietitian checklists and site specific procedures. Note: A supply of enteral formula is not to be provided for the patient by the discharging hospital upon discharge.

2. Complete appropriate community referral forms for Dietitian and Home Health Services. Inform Transitional Services/Discharge Coordinator and complete Transfer Information for Enteral Feeding Form. Consider making other arrangements for Dietitian follow up if Home Health Dietitian services are not available. See Appendix E: Transfer Information for Enteral Feeding.

   Prior to discharge to long term care or rehabilitation, ensure intermittent tube feeding schedule is established. Liaise with the receiving facility dietitian well in advance of discharge to ensure that adequate notice is provided to allow for procurement of enteral formula and equipment/supplies in time for transfer. A supply of enteral formula is not to be provided for the patient by the discharging hospital upon discharge Complete Transfer

Information for Enteral Feeding Form (see Appendix E: Transfer Information for Enteral Feeding).

Documentation

Nutrition Support Assessment Form, VCH.0104
Nutrition Support Re-Assessment Form, VCH.0105
Nutrition Report Form, FNS 53
Tube Feeding Initiation Orders VCH.VA.PPO.586
Tube Feeding orders – Continuous VCH.VA.PPO.597
Tube Feeding orders – Intermittent VCH.VA.PPO.596
Tube Feeding orders – Transitional VCH.VA.PPO.595
Acute Care Nutrition Care Plan VCH.RD. RH.0351
ICU nutrition Assessment Form VCH.RD.0407
Acute Care Interdisciplinary Progress Notes VCH 00051844
Nutrition Support Care Plan PHCDI283
Interdisciplinary Progress Notes PHCNF205
Tube Feeding at Home Client Education Checklist and Dietitian Checklist (Appendix D)
Transfer Information for Enteral Feeding Form (Appendix E)

Patient and Family Education

Patient Health Education Materials available at http://vch.eduhealth.ca/ (search for 'tube feeding').

Tube Feeding at Home (BB.210.T79)
Your Tube Feeding Plan (BB.210.Y68)
Tube Feeding by Enteralite Infinity Pump: Closed System (BB.210.H6)
Tube Feeding by Enteralite Infinity Pump: Open System (BB.210.H61)
Tube Feeding by Kangaroo Joey Pump: Closed System (BB.210.H63)
Tube Feeding by Kangaroo Joey Pump: Open System (BB.210.H64)
Tube Feeding by Syringe (BB.210.H65)
Blended Food for Tube Feeding – Is it right for me? (BB.210.T56)
Using Blended Food for Tube Feeding (BB.210.U97)

Evaluation

Patient is tolerating tube feeds and nutrition/hydration needs are met.

Related Documents

VCH/PHC Master Oral and Enteral Formulary
VCH/PHC Oral and Enteral Formulary – Selection Guide

References

1. Elsevier Clinical Skills online (2017)
2. Boullata, JI, Carrera, AL, Harvey, l, et al, ASPEN Safe Practice for Enteral Nutrition Therapy. Journal of Parenteral and Enteral Nutrition. 2017 Vol 41(1): 15-103.
3. Escuro, AA, Hummell, MS. Enteral formulas in nutrition support practice: Is there a Better Choice for your patient? Nutrition in Clinical Practice. 2016 Vol 31(6): 709-722.
4. Nejo, T. and Yamaguchi, N. Limitations of routine verification of nasogastric tube insertion using x-ray and auscultation: two case reports of life –threatening complications. Nutrition in Clinical Practice. 2016 Vol 31(6): 780-784.
5. Bechtold, ML, Boumitri, C, Evans, DC, Nguyen, DI. Long-term Nutrition: A clinician's guide to successful long-term enteral access in adults. Nutrition in Clinical Practice. 2016 Vol 31(6): 737-747.
6. Rice, T. Sterile water and enteral feeding: fear over logic. Practical Gastroenterology. 2016 Series #156 :35-40.
7. The ASPEN Adult Nutrition Support Core Curriculum, 3rd Edition, 2017 Silver Spring MD, USA
8. Academy of Nutrition and Dietetics. Nutrition Care Manual, October 20, 2018.
9. FH Enteral Nutrition Handbook, August 2017.
10. Solseng, T, Vinson, H, Gibbs P, Greenwald, B. Biofilm growth on the Lopez enteral feeding valve cultured in enteral nutrition:potential implications for medical-surgical patients, nursing care and research. Med Surg Nurs. 2009; 18(4): 225-233
11. Tannenbaum, SL, Castellanos, VH, George, V, Arheart, KL. Current formulas for water requirements produce different estimates. Journal of Parenteral and Enteral Nutrition. Vol 36 (3): 299-305.

Appendices

- Appendix A: Selection of Tube Type and Route
- Appendix B: Transition from Continuous to Intermittent Tube Feeding
- Appendix C: Transition from Tube Feeding to Oral Intake
- Appendix D: Tube Feeding at Home Client Education Checklist
- Appendix E: Transfer Information for Enteral Feeding

Appendix A: Selection of Tube Type and Route

Factors to consider when determining tube feeding access include:

- Patient's medical history, current status, and progress (i.e, improvements with swallowing ability)
- Goals of care
- Expected length of enteral nutrition
- GI function and anatomy

Tube Type	Consider when:
Oral Tubes	• EN in critical care with intubation or • With facial fractures or basal skull fractures
Nasal Tubes	• Short term EN required (i.e. less than 4 weeks)
Enterostomy Tubes	• Long term EN required (i.e. greater than 4-6 weeks) OR • Nasal or oral tube placement is contraindicated (e.g., esophageal obstruction)

Tube Route	Consider when:
Gastric	• Normal gastric emptying
Small bowel (duodenal or jejunal)	• Demonstrated intolerance to or failure of gastric feeding (e.g., nausea, vomiting, abdominal distention, previous aspiration event with gastric feeding) • Severe gastroparesis • Gastric outlet obstruction • Altered upper GI anatomy (e.g., Hiatus hernia, gastric pull-up) • Severe gastroesophageal reflux disease (GERD) or any condition that increases the risk of aspiration • Positioning that may increase risk of aspiration (e.g. prone position)

Appendix B: Transition from Continuous to Intermittent Tube Feeding

The goal of intermittent feeding is to mimic meal times and to facilitate rehab/more mobility or when long-term tube feeding is desired for home tube feeding or transfer to residential care. This is done by increasing the delivery rate and by reducing the total number of hours per day of tube feeding. Patients must be medically stable before transition to intermittent tube feeding is initiated.

Suggested Steps for Transition to Intermittent Tube Feeding

1. Determine appropriateness for transition to intermittent tube feeding. Consider:
    a. Patient tolerating continuous tube feedings at goal rate for greater than 48h.
    b. Patient is hemodynamically stable and not critically ill.
2. Reassess energy, protein and fluid requirements.
3. Divide total volume of formula into 3 to 4 feedings. If using the open system, use full tetras (e.g., 250 mL) when possible to minimize risk of contamination. The maximum volume per feeding should usually not exceed 500 mL. Consider patient size, position of tube, GI tolerance and aspiration risk to determine maximum feeding volume.
4. Space feedings over daytime hours, with gaps of at least 2 hours between feedings. Start and end feeding times should be coordinated with patient's medication (e.g., phenytoin, insulin, oral hypoglycemic agents), nursing shift change times, rehabilitation schedules and personal preferences.
5. Increase incrementally from current rate to new intermittent goal rate as tolerated. Suggested rate increases are 50-75 mL/hour every 24 hours for gastric feeding; or 25-50 mL/every 24 hours for post pyloric feeding. Tolerance varies, use clinical judgment to determine incremental rate increases and timing.
6. If a more rapid transition is required and tolerance is expected, rates may be increased every feed instead of every 24 hours.
7. Provide additional water as pre and post-feed flushes to meet fluid requirements; if large volumes are required, consider providing additional water flushes between feedings. The feeding tube must be flushed with a minimum of 30 mL before and after each feed and before and after each medication administration.
8. The maximum goal rate for gastric feeding does not typically exceed 250 mL/hour. The maximum goal rate for post pyloric feeding does not typically exceed 150 mL/hour. Rates higher than these must be carefully evaluated.

Appendix C: Transition from Tube Feeding to Oral Intake

1. Determine if the patient meets the criteria for transition from tube feeding to oral intake (all must be present):
   - Where appropriate, patient has passed swallow screen or swallow assessment
   - Patient has a diet order and is willing and able to eat safely by mouth.
   - Patient is anticipated to be able to consume at least partial meals (e.g., ¼ to ½ portions)
2. If the patient does not meet the criteria noted above, continue full enteral feeding and reassess regularly.
3. If the patient meets the criteria noted above, modify the tube feeding plan as appropriate for the patient's condition, rehabilitation schedule and environment. Options may include:
   - Hold tube feeding for 1 to 2 meals and discontinue tube feeding if intake is adequate.
   - Modify tube feeding schedule if supplemental nutrition is required (See table below)
4. Monitor oral intake and determine if the patient is ready to be fully weaned from tube feeding. A recommendation that the feeding tube be removed is appropriate when all of the following criteria are met:
   - Able to consistently consume greater than or equal to 75% of estimated nutrient requirements
   - Able to meet hydration requirements with oral intake alone; if not patient may need continued tube feed access for additional fluids and/or medication administration.
   - Able to take medications orally if required.

Supplemental Tube Feeding Strategies

<table>
<tr><th>Strategy</th><th>Sample Scenario and Schedule</th></tr>
<tr><td>A. Nocturnal
Continuous, overnight feedings delivered over 6 to 12 hours
Aim to hold feeds 2 to 3 hours prior to breakfast
Encourages normal meal patterns
Minimal impact on appetite
Indications: Anticipated poor intake or expected need for additional nutrient provision</td><td>Example: Patient previously on Continuous Tube Feed Schedule of Novasource Renal® at 40mL/hour and is to start a dysphagia diet. This patient is delirious and expected to have inadequate oral intake, therefore recommend Nocturnal Tube Feed schedule to provide approximately 50 to 60% of requirements.
Example of Nocturnal Supplemental Tube Feed Schedule:<table><tr><th>Time</th><th>Formula and Volume</th><th>Rate (mL/hour)</th><th>Flush ac/pc feeding (mL)</th></tr><tr><td>2000-0600</td><td>Novasource Renal® 500mL</td><td>50</td><td>60</td></tr></table>Note: start and end times are approx. 2 hours after dinner and 2 hours before breakfast. If at all possible, avoid starting or ending feed during staff shift change time.</td></tr>
<tr><td>B. Intermittent, reduced volume
Reduced volume of formula delivered by tube after meals; does not vary based on oral intake
Indications: patient consistently eating a suboptimal amount and has had excellent tolerance with intermittent tube feeding; overnight feeding is not desired</td><td>Example: Patient previously on Intermittent Tube Feed Schedule– 500 mL Isosource 1.2® provided at 250 mL/hour, TID. The patient has a Full Fluid diet ordered. This diet will provide only small portions of food and meets only 40% of the patient’s nutrition needs. It is appropriate to recommend a reduced volume tube feeding after meals that will provide approximately 60% of requirements.
Example of Intermittent Schedule:
300 mL of Isosource 1.2® delivered at 250 mL/hour with 60 mL water flushes before and after each feeding; delivered after breakfast, lunch and dinner</td></tr>
<tr><td>C. Transitional
Supplemental formula and water provided by tube after meals
Volume provided varies depending on oral intake at the meal; as patient’s oral intake increases, the supplemental feeding decreases
Indications: patients with variable oral intake, at risk for overall suboptimal intake; overnight feeding is not desired.</td><td>Example: Patient previously on Intermittent Tube Feed Schedule of 500 mL Isosource 1.2® provided at 250 mL/hour TID. Patient has passed swallowing assessment for a regular diet but has had ongoing fluctuation in their level of consciousness. They may eat well when alert, but there may be times where intake will be limited due to drowsiness.
Example of Transitional Feeding Schedule:<table><tr><td></td><td colspan="4">Amount of tube feeding formula to give after meal based on po intake</td><td></td><td></td></tr><tr><td>TIME</td><td>Under 25% of meal</td><td>25 to 50% of meal</td><td>50 to 75% of meal</td><td>Over 75% of meal</td><td>Rate (mL/hour)</td><td>Flush (mL)</td></tr><tr><td>After breakfast</td><td>375mL</td><td>250mL</td><td>0</td><td>0</td><td>250</td><td>60</td></tr><tr><td>After lunch</td><td>375mL</td><td>250mL</td><td>0</td><td>0</td><td>250</td><td>60</td></tr><tr><td>After dinner</td><td>375mL</td><td>375mL</td><td>250mL</td><td>0</td><td>250</td><td>60</td></tr><tr><td>HS/overnight</td><td colspan="4">375 mL</td><td>50</td><td>60</td></tr><tr><td colspan="6">Give flushes before and after each feeding</td></tr></table></td></tr>
</table>

Appendix D: Tube Feeding at Home Client Education Checklist

Appendix E: Transfer Information for Enteral Feeding

Effective Date:	20-MAR-2020	
Posted Date:	20-MAR-2020	
Last Revised:	20-MAR-2020	
Last Reviewed:	20-MAR-2020	
Approved By: *(committee or position)*	PHC	VCH
	Endorsed By: PHC Professional Practice Standards Committee	**Endorsed By:** (Regional SharePoint 2nd Reading) Health Authority Profession Specific Advisory Council Chairs (HAPSAC) Health Authority & Area Specific Interprofessional Advisory Council Chairs (HAIAC) Operations Directors Professional Practice Directors **Final Sign Off:** Vice President, Professional Practice & Chief Clinical Information Officer, VCH
Owners: *(optional)*	PHC	VCH
	Development Team Member(s): PL Clinical Nutrition, PHC	**Developer Lead(s):** PL Clinical Nutrition, VA **Development Team Member(s):** • PL Clinical Nutrition, Richmond • PL and Manger, Clinical Nutrition, LGH • PC Clinical Nutrition, VGH • Dietitian, VGH • Dietitian, VGH