Medical Nutrition Therapy Diet- NPO/Peripheral Parenteral
Melissa Girgis
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1. Purpose
   a. Nutrition Indicators
      An NPO (nothing by mouth)/ peripheral parenteral diet is required in clinical
      situations in which patients are unable to meet their needs orally or with the help
      of enteral nutrition products. Often, these patients do not have a functioning
      gastrointestinal tract, so it is necessary to utilize a feeding route that bypasses the
      digestive tract. Nutrition indications for PPN diet include abdominal trauma,
      injury, or infection, impaired GI motility, GI tract obstruction, excessive
      vomiting, or inability to digest/absorb nutrients as a result of bowel resection, or
      short bowel syndrome.

   b. Criteria to Assign the Diet
      While total parenteral nutrition (administered through a large vein in the center of
      the body, such as the jugular, subclavian, or femoral veins) is often used for long
      periods of time, peripheral parenteral nutrition is not sustainable for more than a
      few days. This feeding method delivers large volumes of dilute nutrient solutions
      through veins of the back of the hand or arm. Because large volumes are required
      to meet the nutritional needs of the patient, patients with limited fluid intake
      would not use this feeding method.

   c. Rationale for Diet
      PPN is not used frequently. This diet is for patients whose gastrointestinal tract
      requires a few days of rest to heal properly before transitioning to an oral diet.
      This diet allows for healing while providing readily available nutrients.

2. Population
   a. Overview
      Patients with Crohn’s disease, ulcerative colitis, or other conditions that may
      require surgical interventions such as ileostomy or colostomy, would use a PPN
      diet for a few days post-surgery to allow bowel rest and healing before
      transitioning back to an oral diet. Surgical complications, other existing medical
      conditions, or damage to the gastrointestinal tract due to accidents or trauma may
      also require temporary disuse of the digestive tract.

   b. Disease Process
      Diseases of the gastrointestinal tract such as Crohn’s disease and ulcerative colitis
      can have a severe effect on normal digestion and absorption of nutrients. Patients
      typically do not meet their calorie, protein, and fluid/electrolyte needs. Due to
      malabsorption these patients are at high risk for deficiency of iron, magnesium,
      zinc, calcium, vitamin D, B12, folate, fat-soluble vitamins and water-soluble
      vitamins. If the disease continues to be unresponsive to medication and diet
      therapy, surgical resection of the gastrointestinal tract is indicated. Disease
complications such as abscess, obstruction, or perforation may also necessitate surgery. Post-surgery the patient will use PPN to allow for intestinal adaptation and healing of the GI tract, as well as delivery and supplementation of nutrients.

c. Biochemical and Nutrient Needs
For patients with malabsorption, trauma, infection, or other serious cases, a very high amount of calories, protein, and nutrients will need to be delivered, often much higher than the general population. Most pharmacies use multiple vitamin infusions rather than adding vitamins individually. The levels provided are often higher than those required by the general population because it is assumed that the PPN patient is dealing with some type of stress. Medications may also be delivered through parenteral nutrition. The following vitamins and minerals and their dosing is provided in the table below. Since vitamins are administered intravenously, absorption is not a problem. If toxicity is a concern, supplements may be administered every other day.

<table>
<thead>
<tr>
<th>Vitamin/Mineral</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thiamin</td>
<td>6 mg</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>3.6 mg</td>
</tr>
<tr>
<td>Niacin</td>
<td>40 mg</td>
</tr>
<tr>
<td>Folic acid</td>
<td>600 mcg</td>
</tr>
<tr>
<td>Pantothenic acid</td>
<td>15 mg</td>
</tr>
<tr>
<td>Pyridoxine (B6)</td>
<td>6 mg</td>
</tr>
<tr>
<td>Cyanocobalamin (B12)</td>
<td>5 mcg</td>
</tr>
<tr>
<td>Biotin</td>
<td>60 mcg</td>
</tr>
<tr>
<td>Ascorbic acid</td>
<td>200 mg</td>
</tr>
<tr>
<td>Vitamin A</td>
<td>3300 IUs</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>200 IUs</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>10 IUs</td>
</tr>
<tr>
<td>Vitamin K</td>
<td>150 mcg</td>
</tr>
<tr>
<td>Chromium</td>
<td>10-15 mcg</td>
</tr>
<tr>
<td>Copper</td>
<td>0.3-0.3 mg</td>
</tr>
<tr>
<td>Iron</td>
<td>Not usually included</td>
</tr>
<tr>
<td>Manganese</td>
<td>60-100 mcg</td>
</tr>
<tr>
<td>Selenium</td>
<td>20-60 mcg</td>
</tr>
<tr>
<td>Zinc</td>
<td>2.5-5 mg</td>
</tr>
</tbody>
</table>

3. General Guidelines
a. Nutrition Rx
A parenteral nutrition order form will be filled out for the patient based on the recommendations of the dietitian, doctor, and pharmacist. Steps involved in writing the nutrition prescription are (1) Consider dosing weight and energy needs (2) establish protein goal (3) divide remaining kilocalories between lipid and carbohydrate (4) consider electrolyte needs (5) evaluate vitamin and mineral
requirements (6) evaluate fluid needs (7) calculate final parenteral prescription.
An example order form is shown below.

**GURE 7.9 Sample Adult PN Order Form**

**Physician Orders**
**PARENTERAL NUTRITION (PN) – ADULT**

**Primary Diagnosis:** Intestinal Resection  
**Ht:** 5'6"  
**Wt:** 70 kg

**PN Indication:**  
**Allergies**

**Instructions:** This form must be completed for a new order or continuation of PN and faxed to the Pharmacy by [Insert Time] to receive same day preparation. PN administration begins at [Insert Time]. Contact the Nutrition Support Service at (XXX) XXX-XXXX for additional information.

**Administration Route:** CVC or PICC  
**Note:** Proper tip placement of the CVC or PICC must be confirmed prior to PN infusion

**Peripheral IV (PIV) [Final PN Osmolality = __________ mOsm/L]**

**Monitoring:**  
*Daily weights, Strict input & output, Bedside glucose monitoring every ___ hours*

**Na, K, Cl, CO2, Glucose, BUN, Scr, Mg, Po4 every ___ d,c,y**

**T, Bil, Alk Phos, AST, ALT, Albumin, Triglycerides, Calcium every ___ d,c,y**

**Base Solution:** Parenteral nutrition MUST be administered through a dedicated infusion port and filtered with a 1.2-micron in-line filter at all times. Discard any unused volume after 24 hours.

**Select one**

**PERIPHERAL 2-in-1**
- Dextrose 20% g
- Amino Acids (Brand) ___ g

**CENTRAL 2-in-1**
- Dextrose g
- Amino Acids (Brand) ___ g

For patients with PIV and established glucose tolerance; Provides ___ kcal; Maximum Rate not to exceed ___ mL/hour

For patients with CVC or PICC and established glucose tolerance; Provides ___ kcal; Maximum Rate not to exceed ___ mL/hour

**CENTRAL 3-in-1**
- Dextrose ___ g
- Amino Acids (Brand) ___ g
- Fat Emulsion (Brand) ___ g

For patients with CVC or PICC and established glucose/fat emulsion tolerance; Provides ___ kcal; Maximum Rate not to exceed ___ mL/hour

Use of additional fat emulsion not required with 3-in-1 base solution

**RATIO & VOLUME:** 1.2 mL/hour for ___ hours = ___ mL/day

**or CYCLIC INFUSION:** mL/hour for ___ hours, then mL/hour for ___ hours = ___ mL/day

**Fat Emulsion (Brand) – via PIV or CVC with 2-in-1 base solutions**

(Select caloric density & volume)

10% 250 mL  
20% 500 mL  

Infuse at mL/hour over ___ hours  
Frequency ___
Discard any unused volume after 12 hours.

**Additives: (per day)**

- **Sodium Chloride** 20 mEq  
- **as Acetate** 20 mEq  
- **as Phosphate** 30 mmol of PO4
- **Potassium Chloride** 30 mEq  
- **as Acetate** 30 mEq  
- **as Phosphate** 20-40 mmol/day (1 mmol Pkcs = 1.5 mEq K)

**Calcium Gluconate** ___ mEq/day  

**Magnesium Sulfate** ___ mL/day  

**Adult Multivitamins** 10 mL/day

**Adult Trace Elements** 5 mL/day

**H2 Antagonist** ___ mg

**Other:**

**Physician’s Signature:**  
**Pager Number:**  
**Date/time:**

**Orders transcribed by:**  
**Date/time:**

**Orders verified by:**  
**Date/time:**

**SEND COMPLETED ORDERS TO PHARMACY**

http://jacquelinefarrallportfolio.files.wordpress.com/2012/12/parenteral-nutrition-3.jpg
b. Adequacy of Nutrition Rx
To check for tolerance and adequacy, patients will be monitored regularly. Weight, and fluid input and output will be monitored daily, glucose will be checked three times per day until consistently below 200mg/dL, blood work will be done three times per week, triglycerides, CBC, PT, PTT will be checked weekly, and nitrogen balance will be checked as needed.

c. Goals
1. Promote healing of illness, infection, injury, or disease state,
2. Deliver necessary fluids, vitamins, minerals, protein, calories, and fat
3. Avoid complications associated with inadequate intake such as weight loss, muscle wasting, and malnutrition

d. Does it Meet DRI
PPN exceeds the DRI due to the assumption of increased needs in critically ill or stressed patients.

4. Education Material
a. Nutrition Therapy
The patient will likely receive PPN for 1-5 days then progress to a clear liquid diet. With toleration, patient can progress to all liquids, then to a low-residue diet. Four to six smaller meals throughout the day are recommended. Patients should eat slowly, drink plenty of fluids, chew food completely, and avoid any foods that may not be completely digested such as fruit skins, seeds, spinach, corn, peas, popcorn, and tough meats. The goal is for the patient to be eating their usual diet by the eighth week post-operatively. Enteral products may be used as necessary.

b. Ideas for Compliance
If a patient is determined to be in a healthy and stable condition they may be given the option to continue PPN in the comfort of their own home. Home care has proven to improve patient outlook and decrease health care costs. Before approving this option it must be determined that the patient’s living environment is appropriate, the patient possesses ability for self-care, caregivers/friends/family are available, and insurance coverage is available.

5. Sample Menu
a. Foods Recommended/ b. Foods to Avoid
NPO means nothing by mouth. Patients on this diet who are receiving peripheral parenteral nutrition will not eat or drink any food at all.

c. Example of a meal plan
The parenteral nutrition will be infused at a constant rate that is controlled with a pump. Cyclic PN where the patient is fed at night and fasts during the day is only used for patients receiving long-term PN to allow them freedom from the pump during their waking hours.
6. Websites/ 7. References


