Safe Practices for Sustaining Yourself on Home Parenteral Nutrition (HPN)

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Why is this topic important?

• Complex therapy
• Potential for life-threatening events if errors made in:
  - Prescribing
  - Compounding
  - Labeling
  - Administration
• Process checks can identify error and prevent harm
Objectives

• Learn what you can do as a consumer or caregiver to prevent error
• Understand the importance of seeking qualified health care practitioners
• Learn how to read a TPN label
• Learn how to take care of your IV catheter
• Understand what measures should be taken for self-monitoring
Writing HPN Orders

• Complex prescription with 10-15 components
• Customized to each patient
• No standardized order. Various formats used by various institutions
• Are your nutrient requirements being met?
• Requires a qualified team of health care professionals
Seek Qualified Health Care Practitioners

- Multidisciplinary/team approach is optimal
  - Physician
  - Pharmacist
  - Dietitian
  - Nurse
  - Social work, case management
  - Psychiatrist, psychologist
Seek Qualified Health Care Practitioners

• Ask about their training and experience in:
  – home parenteral nutrition
  – intestinal failure/intestinal rehabilitation

• Are they board certified in nutrition support?

• Consider referral to regional medical center
  – Working in partnership with local primary care physician
**Adult PN Label Template**

Dosing weight: 70 kg

<table>
<thead>
<tr>
<th>Base Formula</th>
<th>Amount/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amino Acids ®</td>
<td>100 g</td>
</tr>
<tr>
<td>Dextrose</td>
<td>350 g</td>
</tr>
<tr>
<td>Lipid ®</td>
<td>50 g</td>
</tr>
</tbody>
</table>

**Electrolytes**

| Sodium chloride       | 150 mEq  |
| Potassium chloride    | 80 mEq   |
| Sodium phosphate      | 20 mmol  |
| Calcium gluconate     | 10 mEq   |
| Magnesium sulfate     | 30 mEq   |
| Multiple trace elements ® | 1 ml    |

Volume 2000 ml Infuse over 12h, taper down over 1h

**Central Line Use Only**
### Pediatric PN Label Template

**Dosing weight:** --- kg

<table>
<thead>
<tr>
<th>Base Formula</th>
<th>Amount/kg/d</th>
<th>Amount/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amino Acids ®</td>
<td>---- g</td>
<td>---- g</td>
</tr>
<tr>
<td>Dextrose</td>
<td>---- g</td>
<td>---- g</td>
</tr>
</tbody>
</table>

**Electrolytes**

- Sodium chloride: ---- mEq ---- mEq
- Potassium chloride: ---- mEq ---- mEq
- Potassium phosphate: ---- mmol ---- mmol

**Vitamins, trace elements and medications**

- Multiple vitamins ®: ---- ml
- Multiple trace elements ®: ---- ml

**Volume** ----- ml **Infuse over** ----- h

- **Central Line Use Only**
HPN Compounding

- Consider visiting the facility of your home infusion provider
- Look for clean, organized facility
- Inspect integrity of TPN bags, supplies upon delivery
- 24-hour, 7-day/wk availability
- Experience managing other HPN consumers
HPN Compounding

- Batch preparation (typically once/week)
- Classified as “Medium Risk” under USP Chapter 797
- Store under controlled refrigerator temperature
  - 2-8°C (36-46°F)
- Certain vitamins can degrade over time, so must be added just prior to admin.
In-Line Filtration

- Prevents admin. of particulate matter, air, and microorganisms
- Use a 0.2- or 1.2-micron filter for non-lipid formulations
- Use a 1.2-micron filter for lipid containing formulations
Venous Access

- Distal tip placed in SVC or adjacent to R atrium
- Placement must be confirmed prior to initiation of PN and when malposition suspected
Catheter Care Technique

• Transparent (bio-occlusive) dressing changed at least weekly
• Gauze/tape dressing changed daily
• Keep dressing clean and dry
• Skin antisepsis w/ chlorhexidine, PVP, or 70% isopropyl alcohol
• IV connector cap change at least weekly
Catheter Flushing Procedure

- **Flush w/ 0.9% Sodium chloride 10ml:**
  - Before and after TPN infusion
  - Before and after medications
- **Flush w/ Heparin 100u/ml (adults) or 10u/ml (pediatrics) 2-3ml:**
  - To “lock” catheter after saline flush
  - To prevent blood from occluding catheter
- **SASH → saline, administer medication, saline, heparin**
Guidelines for Swimming and Bathing: *Tunneled Catheters and Implanted Ports*

- You may take a bath for the first 2 weeks after placement as long as the dressing stays dry.
- Wait 2 weeks before showering. It is best to remove the needle before showering if you have a port.
- Wait 4 weeks before submerging under bath water.
- Wait 4 weeks before swimming in a chlorinated pool.
Guidelines for Swimming and Bathing:
*Tunneled Catheters and Implanted Ports*

- Avoid swimming in any natural sources of water, such as lakes, ponds, or oceans
- Avoid using hot tubs and whirlpools
HPN Administration Issues

• Verify accurate HPN label prior to administration

• Visually inspect bag prior to administration
  – Expiration date (Rotate bags with each delivery)
  – If clear bag, check for cloudiness or sediment
  – Gently squeeze bag to check for leak.

• Complete infusion of PN within 24 hours of room temperature conditions
## Monitoring Guidelines

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMP: Sodium, potassium, chloride, bicarbonate, BUN, Cr, calcium, glucose</td>
<td>Weekly until stable, then every other week, then monthly</td>
</tr>
<tr>
<td>Magnesium, Phosphorus</td>
<td>Weekly until stable, then every other week, then monthly</td>
</tr>
<tr>
<td>CBC</td>
<td>Monthly</td>
</tr>
<tr>
<td>Liver function, albumin, PT, INR</td>
<td>Monthly</td>
</tr>
</tbody>
</table>
Fingerstick Glucose Monitoring

- **Initial monitoring, 3 times daily:**
  - 1 hour after starting TPN infusion
  - Mid-cycle
  - 1 hour after stopping TPN infusion
- **Contact your clinician if glucose <60 or >180 mg/dL**
- **When stable, routine fingerstick monitoring can be stopped**
- **Urine glucose monitoring may be useful method to screen for problems**
### Monitoring Guidelines

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron studies (iron, ferritin, TIBC, %sat)</td>
<td>Every 3 months</td>
</tr>
<tr>
<td>Trace elements (zinc, selenium, copper, manganese)</td>
<td>Baseline, then every 6-12 months</td>
</tr>
<tr>
<td>Vitamins</td>
<td>As needed based on clinical condition</td>
</tr>
<tr>
<td>Bone Density (DEXA)</td>
<td>Every 1-2 years</td>
</tr>
</tbody>
</table>
Self-Monitoring

- Weight
- Temperature
- Changes in intake
- Changes in output
  - urine
  - ostomy
  - stool

- Catheter function
- Catheter site
  - Redness
  - Swelling
  - Tenderness
  - Drainage
Patient Education

- PN administration (prime tubing, connect, disconnect, proper flushing)
- Technique for adding medication to the bag, such as multivitamins, insulin
- Catheter care
- Proper storage of PN & supplies
- Use of infusion pump
- When to call homecare provider or MD
Use of HPN Bags When Hospitalized

• Many hospitals hesitant to use TPN bags prepared by another facility
• Based on institution policy
• Advantages of bringing a TPN bag when presenting to ED/hospital:
  – Provides the clinician specific information regarding PN contents
  – No interruption in therapy
  – Prevents wastage
Use of HPN Bags When Hospitalized

- Disadvantages to bringing a TPN bag when presenting to ED/hospital:
  - Adjustments in contents may be required
  - Logistics of who adds multivitamins and possibly other additives
  - Staff may be unfamiliar with bag or formulation
- If using, ensure adequate storage conditions of PN bag in transit to hospital
- For elective admissions, notify home infusion provider and plan TPN delivery accordingly
Comments

- Multiple processes must be in place to ensure HPN safety
- Benefits of achieving independence
- Learn how to be your own best advocate!