

# HPN Complication Chart



**The Oley Foundation**  
For Home Parenteral and Enteral Nutrition

*Users are strongly advised to review this chart with their MD, noting any differences in protocols/procedures, prior to taking any actions recommended by this chart. The chart is intended as a helpful reference, and should not replace the advice of your MD. Users should read the entire chart, at least briefly, comparing symptoms listed in each section with those actually experienced by the consumer, before taking any action.*

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## METABOLIC

*(Catheter/Pump Complications on Back)*

### Infection A. systemic infection:

**Symptoms:** Temperature one degree or more above baseline/normal temperature; chills, especially occurring with infusion; sweating; lethargy; body aches; urine spot checks may show glucose levels greater than 1/2%.

**Cause:** Poor aseptic technique during connection/disconnection procedures; contaminated tubing or heparin or saline flushes; contaminated IV solution; exposure to illness outside body (flu, cold, chicken pox, etc.) or inside body (urinary tract infection, dental abscess/caries, fistulae, ileostomy/colostomy/gastrostomy sites, etc.); routine dental work without prophylactic antibiotic coverage.

**Immediate Action:** Call MD immediately. If MD unavailable, go to local emergency room.

**Prevention:** Use proper aseptic technique at all times, including meticulous handwashing. Inspect all solutions beforehand for clouding/particulate matter. If possible, avoid individuals with known illnesses or possible exposure to communicable diseases. Schedule routine dental checkups; inform dentist of indwelling central venous access (catheter) and follow protocol for prophylactic antibiotic coverage for dental work as prescribed by primary MD (call Oley for suggested protocol if needed).

### Infection B. exit site/tunnel infection or inflammation:

**Symptoms:** Redness; pain; swelling or drainage at insertion site or along the catheter tract.

**Cause:** Poor aseptic technique during site care; retained sutures in skin.

**Immediate Action:** Call your physician/nurse. If unavailable, go to local emergency room.

**Prevention:** Use proper aseptic technique during site care, including meticulous handwashing. Change dressing if loose, wet or soiled.

### Hyperglycemia

**Symptoms:** Nausea; weakness; thirst; headache; urine spot checks show glucose levels greater than 1/2%; anxiety spells, nightmares.

**Cause:** Fluids infused too fast; too little insulin in infusion solution if diabetic; improper mixture of HPN solution; infection (hyperglycemia can be a very early warning sign, even before fever is present); certain medications (steroids and some chemotherapy agents).

**Immediate Action:** Call MD immediately; may need to decrease infusion rate or add insulin as directed by MD.

**Prevention:** Maintain prescribed drip rate – never try to “catch up” if rate slows. Maintain aseptic technique at all times. Inspect labels of all HPN bags closely for consistency in formula; changes in formula should be indicated to you by your primary MD/pharmacist/RN prior to shipment of new bags, any questions call MD; if requested, return bag to MD for analysis of solution. Monitor temperature. Alert nutrition MD if started on any new medications by other physicians, or if you start any over-the-counter medications or herbal supplements.

### Hypoglycemia

**Symptoms:** Sweating; pale facial color; heart palpitations; nausea; headache; shaky feeling; blurred vision; hunger pains; lightheadedness.

**Cause:** HPN fluids stopped abruptly without adequate period of tapering; HPN bag finishing early due to malfunction of pump or decreased volume in bag; too much insulin in infusion solution. Hypoglycemia can come on during infusions but is more likely to come within 15-30 minutes of stopping.

**Immediate Action:** Drink a glass of orange juice with 2 teaspoons of sugar in it (if you are unable to tolerate fluids by mouth, place hard candy or cake decorating gel under tongue or let a teaspoon or two of sugar dissolve in mouth); **then call MD immediately.** Stay in bed. Restart HPN, if able, and taper slowly. If directed by MD, adjust infusion rate or decrease insulin in infusion. Follow instructions on other side of chart for specific pump or catheter-related problems if applicable.

**Prevention:** Close monitoring of glucose tolerance by MD/RN during tapering process in hospital before discharge; monitor blood glucose levels at home as directed by MD. Always cycle off infusion over 1 hour or longer period decreasing rate by 50% every 15 minutes or as directed by MD (depending on the model/program, tapering may be done automatically by the pump). Verify volume of bag and that pump is functioning correctly, prior to infusing; report any discrepancies or problems to provider. See also “Prevention” for Hyperglycemia.

### Dehydration

**Symptoms:** Decreased urine output; rapid weight loss; thirst; weakness; shakiness; muscle cramping; numbness; light-headedness/dizziness; rapid heart rate.

**Cause:** Depletion of fluids/electrolytes due to increased losses from vomiting, diarrhea, fistula/ostomy output; inadequate intake of HPN infusion/extra fluids as ordered.

**Immediate Action:** Call MD and relate signs and symptoms, describe any change in fluid intake or output. Start measuring urine output. Bring HPN bag or label to MD.

**Prevention:** Infuse complete volume of HPN and fluids as ordered by MD. Keep daily input and output log; report any significant changes from usual pattern to MD. Follow orders and guidelines given to you during training period and upon discharge from hospital. Monitor weight at least 3 times per week. Inform MD if taking any over-the-counter medications or herbal supplements.

*Special thanks to the editors of  
this chart:*

Pat Brown, RN, CNSN, OCN, and  
Marcia Wise, RN

## Important Telephone Numbers

\_\_\_\_\_  
Doctor

\_\_\_\_\_  
Home Care Company

\_\_\_\_\_  
Emergency Room

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## CATHETER/PUMP COMPLICATIONS

*(Metabolic Information on Front)*

### Air embolism

- Symptoms:** Chest pain; coughing; shortness of breath; loss of consciousness.
- Cause:** Air siphoned into catheter due to IV tubing becoming disconnected or injection cap falling off; air in line below filter; tubing not primed.
- Immediate Action:** A) Lie on left side with head lower than feet for 20 minutes. B) Meanwhile, prepare usual flush (heparin or saline). Attach to catheter. Hold syringe vertically and withdraw any accessible air until only blood returns. Flush catheter. C) Call 911.
- Prevention:** Use luer lock attachments on tubing. Use an adequate length of tubing for connection. Tighten all tubing connections. Secure tubing for active consumers with catheter holder/ protective clothing (Call Oley for information on specific products). Prime tubing prior to infusing.

### Blood in catheter

- Symptoms:** Blood seen in tubing.
- Cause:** Injection cap not attached securely; cracking of hub; tear in line; not flushing immediately after infusion is complete.
- Immediate Action:** *If caused because injection cap is not attached securely;* A) clamp catheter; B) remove injection cap; C) flush with saline and heparin again; D) replace with new injection cap.  
*If caused by cracking of hub, or tear in line (see specific category below).*
- Prevention:** Attach injection cap properly. Flush immediately after infusion is complete. Clamp before disconnecting the last flush syringe or use a positive pressure connector.  
*If caused by cracking of hub or tear in line (see categories below).*

### Cracking of hub

- Symptoms:** Cracking sound with insertion of IV tubing upon hookup or disconnection of tubing; fine cracking seen in hub.
- Cause:** Excessive pressure in hookup/disconnection; faulty hub; wear and tear of aged catheter.
- Immediate Action:** A) clamp catheter; B) remove IV tubing if attached; C) unclamp catheter, flush as per protocol and attach injection cap, if able; D) clamp catheter; E) notify MD or provider for hub replacement (catheter should be repaired as soon as possible).
- Prevention:** Avoid excessive pressure in hookup/disconnection. If repeated cracking occurs, report to primary supplier of catheter, noting type and lot # (if available). Assess older catheters for thinning of silicone and cracks.

### Catheter tear

- Symptoms:** Leakage of blood or fluid from catheter tubing; broken/damaged tubing.
- Cause:** Catheter tubing damaged by a sharp object (scissors, unpadded clamp, etc.), excessive pressure in line when flushing, or excessive twisting of tubing in hookup/disconnection; wear and tear of aged catheter; faulty tubing.
- Immediate Action:** Attempt to instill flush solution into line to keep patent. Clamp catheter between the break and your body. **Do not place tape over tear.** If infusing, stop infusion, follow precautions to prevent hypoglycemia. Call MD or provider to schedule repair as soon as possible.
- Prevention:** Handle catheter gently: use padded clamp only at reinforced area of tubing (if no reinforced area, clamp at different places of tubing daily); avoid excessive pressure/twisting of tubing with hookup/disconnection; avoid contact with sharp objects; do not secure catheter with a safety pin. As catheter ages, watch for signs of wear, and repair/replace as needed.  
*If unable to dislodge tubing (unbroken):* Apply padded clamp to IV tubing (holding catheter hub firmly in hand or use another padded clamp) and gently twist tubing to dislodge from hub. If repeated incidences happen due to faulty tubing, save boxes with product code and lot number, and report to provider.

### Catheter clot

- Symptoms:** Increased resistance or inability to flush catheter; unable to infuse HPN solution.
- Cause:** Blood or precipitate in catheter lumen; catheter not flushed properly following last infusion; catheter not clamped prior to last flush procedure.
- Immediate Action:** Clamp catheter; call MD/provider for further directions. If infusing, follow precautions to prevent hypoglycemia.
- Prevention:** Flush catheter before and after infusing as directed. Maintain prescribed drip rate. Inspect line/hub daily for weakness, tears, cracking.

### Inflammation of vein in PICC users (Phlebitis)

- Symptoms:** Pain, tenderness, swelling, hardness felt along the path of the vein.
- Cause:** Typically not an infectious problem, but rather an irritation of the vein caused by the insertion procedure.
- Immediate Action:** Apply warm compress and elevate extremity. Notify MD immediately and proceed as directed. Typically subsides following treatment and does not require catheter removal.
- Prevention:** None. (This complication occurs with approximately 15-20% of insertions.)

### Pump or power failure

- Symptoms:** Unable to start/use pump; pump alarming incorrectly.
- Cause:** Inadequate power supply; loss of power source; malfunction of pump; low battery.
- Immediate Action:** Check to see if pump is plugged into wall socket or that battery is installed correctly. Call home care company to troubleshoot pump problem, and if necessary to obtain a replacement. Follow steps to prevent hypo/hyperglycemia.
- Prevention:** Contact local power company for inclusion on list of customers having durable medical equipment at home in case of major power loss. Follow recommendations by pump manufacturer for routine service and maintenance. Recharge battery daily. Carry extra battery supply.

*Understand that many clinicians are unfamiliar with the use of long term central venous access devices for HPN. To protect your access, always carry an ID card or Medic Alert Bracelet on your person that describes vital information about your medical condition and catheter. HPN consumers should also keep their Travel/Hospital Admission Packet updated and handy for emergency or scheduled hospital admissions. Call (800) 776-OLEY/(518) 262-5079 or E-mail DahlR@mail.amc.edu for a copy of the packet.*