Handwashing is a very important step in preventing infection.

Total Parenteral Nutrition: Discharge Instructions

This information will help guide you in learning about Total Parenteral Nutrition (TPN). Total parenteral nutrition infuses needed nutrients into your body through a catheter in your vein. Your doctor will decide if you may also eat or drink while on TPN.

During your initial stay in the hospital, you may be on a continuous 24-hour infusion of TPN. When you go home, TPN usually is given once a day over 12 to 14 hours (during the day or night). This is called “cycling.”

Since you will be going home on TPN, it is very important that you become familiar with home TPN; your central venous catheter; proper handwashing method; and possible complications of TPN. Once you are home, you will learn how to:

- Infuse TPN for yourself.
- Care for your central venous catheter.
- Operate the infusion pump.
- Start and stop your TPN infusion.
- Heparinize the catheter.
- Prevent or correct any problems that may occur.
- Inject medicines into the TPN bag.

There may be some unfamiliar words in this handout, so please read it carefully and ask questions. One of the members of the Nutritional Support Service will work closely with you and your family to help you prepare for your home TPN program. The team also will assist you while you are on home TPN.

Patients First
When you are ready to go home, plans will be made with a home-care agency and pharmacy supplier. Until you are comfortable with the TPN process, the nurse will visit as often as twice a day. Soon, you or a family member should be able to care for your catheter and infuse your TPN independently.

Plans will be made with a home infusion supply company to deliver needed supplies to your home on the day you leave the hospital. You will be given a list of names and telephone numbers of resource people. Some are available on a 24-hour basis by telephone to help you with any problems that may arise.

**The TPN Solution**

Your TPN solution contains carbohydrates, protein, fat, vitamins, minerals, electrolytes (i.e., magnesium, potassium) and water similar to what you would receive with a balanced diet. Your body requires these calories to perform daily functions. Without needed calories, the body breaks down its own tissues to meet energy needs. If this continues, weight loss and weakness will result. The number of calories you need is determined by your weight, height, age and activity. After you have reached your goal weight, your TPN solution may be altered to help you maintain this weight level.

*Carbohydrate Source*

Carbohydrates are a source of energy in your diet. The main energy source in the TPN is dextrose (sugar), which is a carbohydrate.

*Lipid Source*

Lipids are a source of energy in your diet that provide you with essential fatty acids. Fat acts to support and protect some of your organs and insulates your body against heat loss.

*Protein Source*

Amino acids are the source of protein in TPN. They are vital for growth, the building of new tissue and the repair of injured tissue. Protein is needed for your body to make healthy bones, muscle, skin, nails and hair.

*Vitamins and Minerals*

TPN contains the suggested daily amounts of vitamins A, B, C, D, E and K. You also will receive trace minerals, which, like vitamins, are needed by the body. These minerals include zinc, copper and selenium.

*Electrolytes*

Electrolytes are important for bone, nerve, organ and muscle function. The electrolytes in your TPN solution are calcium, phosphorus, magnesium, sodium, potassium, chloride and acetate.
Water
Water is a vital part of TPN. Your solution will be adjusted to meet your specific needs so you do not become dehydrated.

The balance of electrolytes, vitamins and minerals is checked by regular blood tests. When you first go home, you will have blood tests at least once a week. According to your needs and the blood test results, your TPN solution may be changed.

Aseptic Technique
Aseptic technique keeps bacteria away from your catheter, TPN solution and supplies. If bacteria enters your catheter or the catheter insertion site, a blood infection can occur, making you very ill. To prevent this, it is important to wash your hands and the work area carefully. It also is important to keep your supplies in their packages until you are ready to use them. Store supplies in a clean, dry place, away from children and pets.

Preparing the Work Area
Tables and surfaces in your home normally have dust and some germs. The table top or surface you will use to set up your TPN should be clean and dry. It is best to choose a work area away from household traffic and other distractions.

- Choose a work surface such as a tray, countertop or table.
- If the surface is washable, clean it with soap and water and dry it with a clean towel or paper towel.
- If the surface is not washable, wipe it free of dust and spread a clean towel or paper towels over the surface.
- Avoid coughing or sneezing over the clean surface.
- Keep pets out of the room.

Handwashing
Before touching the catheter or your sterile supplies, it is important to wash your hands carefully to remove bacteria. This will help prevent infection of your catheter. Use an antibacterial liquid soap (in a pump).

1. Turn on the water.
2. Wet your hands and wrists.
3. Squirt the soap into your hands and raise a good lather.
4. Scrub your hands thoroughly for at least 2 minutes.
5. Rinse your hands holding them with your fingers pointing downward.
   Allow the water to run down from your wrists to your fingers (the dirty water flows downward).
6. Dry your hands with a clean towel.
Once you have washed your hands, do not touch anything except your catheter and supplies. If you touch anything such as the telephone or furniture, wash your hands again.

**Home TPN Administration**

Keep TPN bags refrigerated when not in use.

Check the expiration date on the label. Never infuse the bag if the expiration date has passed. Obtain a new bag from the refrigerator.

Check the bag for leaks, cloudiness or floating particles. If any of these are noted, **do not** use the bag. Obtain a new bag from the refrigerator. Call the supply company and report the problem to them.

To warm TPN to room temperature, remove the TPN bag from the refrigerator at least 2 to 4 hours before the infusion time. **Never** warm the TPN bag in the microwave. Instead, you can place the TPN bag in a sink and run warm water over it.

**Infusion Procedure**

- Collect needed supplies.
- Clean the work area and set up the supplies.
- Wash your hands.
- Prepare and inject any needed additives. (See the following section for details.)
- Refer to pump instruction sheet for connecting tubing and pump use.

**TPN Additives**

Certain medicines must be added to the TPN bag just prior to infusing. The most common additives are multivitamins, insulin, Pepcid® (famotidine), Sandostatin® (octreotide) and Reglan® (metoclopramide).

Each TPN vitamin or medicine that is added will be tailored to your needs.

Add the vitamins or medication to the TPN bag as you prepare the bag for infusion. At that time, you will have a clean work area and will have washed your hands.

**Supplies**

- Chlorhexidine pads.
- Syringe(s) with 21 gauge one-inch needle(s) attached.
- Medication vial and/or multivitamin vial.

**Procedure**

1. Remove the protective cap from the vial. Wipe the top with the chlorhexidine pad or, if using a multidose bottle, wipe the top of the bottle. (Do not open more than one multidose bottle at one time.)
2. Remove the cover from the needle. Pull back the plunger to draw back air. Draw up as much air into the syringe as you will draw up from the bottle. (Example: 10cc air when drawing up 10cc of multivitamin.)

3. Insert the needle into the bottle. Hold the bottle upside down and inject the air into the bottle by pushing on the plunger.

4. Pull back on the plunger slowly until you have drawn up the correct amount. Push the air out. Remove the needle from the bottle.

5. Wipe the injection port on the TPN bag with a new chlorhexidine pad. Insert the needle into the center of the bag’s injection port. Slowly push the plunger on the syringe, injecting the solution into the bag. Remove the needle.

6. Gently rock the bag back and forth to mix the medication into the TPN bag. Repeat this procedure for each medication or vitamin additive. Dispose of the needles in the needle box provided.

Possible TPN-Related Problems

TPN complications may occur because of an imbalance of nutrients or electrolytes in your body. Some are quite serious and can lead to severe problems if not treated. Watch for the following symptoms and take the needed actions.

**Hyperglycemia (Elevated Sugar)**

Hyperglycemia is a higher than normal level of sugar in the blood.

**Causes**

It can occur when the TPN is infused too fast or if the body cannot tolerate the sugar. Sometimes having an infection or taking a medication such as a steroid will make the body less tolerant of large amounts of sugar. If there is too much sugar in the blood, it will “spill” into the urine.

**Symptoms**

You may feel thirsty, nauseated, weak and have a headache.

**Action**

If you are spilling sugar into urine, please notify the home care nurse and your physician. Some changes may have to be made in the TPN solution.

By testing your urine during the TPN infusion, you can tell if spilling sugar. The test strip will turn colors. The home care nurse will show you how to read the test strips.

**Hypoglycemia (Low Sugar)**

Hypoglycemia is a lower than normal level of sugar in the blood.
Causes
It can be caused by stopping the TPN infusion abruptly without a “taper down,” or too much insulin in the TPN bag.
When the body is receiving a large amount of sugar, it produces more insulin. When the TPN infusion stops suddenly, the insulin takes longer to stop being produced. The result is a drop in the blood sugar below normal.

Symptoms
You may feel shaky, nervous, weak, dizzy, sleepy and sweaty. Nausea, headache, or heart palpitations may occur. You can become confused and faint.

Action
Take sugar. If you can, eat something sweet like juice with a few tablespoons of sugar. If you cannot eat or drink, dissolve a glucose tablet in your mouth. Glucose tablets can be purchased at a drug store.
Notify the home care nurse and the physician.
Prevention of hypoglycemia can be done by tapering down the TPN infusion for at least one hour.

Dehydration
Dehydration is lack of body water.

Causes
It usually occurs when the amount of fluid leaving the body is greater than what is coming in.
You can lose fluid through sweating, vomiting, diarrhea, fistula loss or nasogastric suctioning.

Symptoms
Weight loss over 2 days, thirst, decrease in urination, urine dark in color, dry mouth, dizziness or lightheadedness when standing up, shakiness, nervous feeling and/or weakness may occur.

Action
Call the home care nurse, or your doctor.
A blood test may be ordered to check your kidney function.
IV (into the vein) fluid may be ordered or additional fluid may be added to your TPN solution.

If you have any questions or concerns about your TPN care, please contact your doctor, home care nurse, or pharmacy supply company.
Health Information Resources

For more information, visit one of Northwestern Memorial Hospital’s Health Learning Centers. These state-of-the-art health libraries are located on the third floor of the Galter Pavilion and on the first floor of the Prentice Women’s Hospital. Health information professionals are available to help you find the information you need and provide you with personalized support at no charge. You may contact the Health Learning Centers by calling 312-926-LINK (5465) or by sending an e-mail to hlc@nmh.org.

For additional information about Northwestern Memorial Hospital, please visit our Web site at www.nmh.org.