Memorial Sloan Kettering Cancer Center

PATIENT & CAREGIVER EDUCATION

# Home Total Parenteral Nutrition (TPN)

This information will help teach you and your caregiver how to give total parenteral nutrition (TPN) at home. You will also get a copy of the *HPN (Home Parenteral Nutrition) Complication Chart*.

## About TPN

TPN is a mixture of nutrients put directly into your vein. Your mixture will contain whatever nutrients your body needs and may also include some medications. It's used to help people who can't get enough nutrients through eating alone.

You will get TPN through a central venous catheter (CVC). A CVC is a thin, flexible tube placed in a large vein near your collarbone. Your nurse will teach you about your CVC when you have it placed. Your TPN is given through your CVC during the night. This usually takes 10 to 12 hours.

## Checking and storing your TPN

Your TPN is shipped to you. Store it in the refrigerator at a temperature of 35° F (1.6° C). To make sure that you got the right mixture:

- Check the label on the bag to make sure that the name and mixture are what your healthcare provider ordered for you. Call your healthcare provider if there is a mistake.
- Check the expiration date on the bag of TPN. Call the company who sent the mixture if it's expired.

## Getting your TPN mixture ready

Follow these steps to get your TPN mixture ready.

1. **Take your TPN out of the refrigerator 2 hours before you need to use it so that it can come to room temperature.**
2. Find a clean place to prepare the TPN mixture. **Do not make your TPN in your bathroom or near pets.** Use a place in your home that isn't messy or dirty. A good place is the kitchen or dining area. Choose a smooth surface, like a table or a counter-top, that isn't near an open window or doorway. Clean the surface with soap and water and dry it with a paper towel.
3. Make sure you have all the equipment listed below:

- A sterile barrier
- A TPN solution administration set
- 1 or 2 (10 mL) syringes
- An insulin syringe (if needed)
- Alcohol wipes
- Multivitamin infusion (MVI), as ordered
- A sharps container (container for sharp objects, like needles)
- Garbage can

4. Wash your hands with soap and water for at least 20 seconds. Dry them with a clean towel or a paper towel. Keeping your hands clean is very important. If you need to stop during any of the steps below to do something else, make sure you wash your hands before starting up again.
5. Open the sterile barrier (see Figure 1) and place it on your clean surface.

Figure 1. Opening the sterile barrier

6. Open 5 or 6 alcohol wipes. Do this by tearing off 3 edges of the wrapping. Peel the top back and don't touch the inside (see Figure 2). Place each wipe on the sterile barrier.

Figure 2. Peeling open the alcohol wipe wrapper

7. Take the syringes out of their wrappers. Push in the plungers. Place them on the sterile barrier.
8. Take the TPN out of its protective bag. Check it for cloudiness, particles, or a change in color. If lipids (fat) have been added to the bag, check the solution for fat or separation of the lipids from the solution. **If you see any of these, do not use the mixture and return it to your infusion company**. If the solution looks okay, place the bag on the sterile barrier.
9. Remove the TPN administration set from its container. Close the roller clamp and place the set on the sterile barrier.
0. Gather any prescribed medications and place them on the sterile barrier. Your nurse will mark the names of the

medications and how often you should take them in the chart below.

| Medication | Syringe | Amount | Frequency |
|---|---|---|---|
| Regular Humulin® insulin | Insulin syringe | As instructed | |
| Ranitidine/famotidine | 10 mL | As instructed | |
| Adult MVI | 10 mL | Two 5 mL vials | |
| Pediatric MVI with 5 mL vial of sterile water | 10 mL | 5 mL | |
| Thiamine | 3 mL | As instructed | |

Make sure your work area isn't cluttered. Throw out all wrappers and anything else that can be thrown away in the garbage after you use them.

## Preparing and adding medications to your TPN

### Follow these steps to add medications to your TPN, if needed.

Some bags have a divider near the middle of the bag that separates the mixture from the lipids. If your bag has this,

you will remove it **after** you've added all of your medications.

1. Check the medication label and expiration date. Make sure you have the correct medication and that it isn't expired (see Figure 3).

Figure 3. Checking the medication label

2. Take off the protective cover from the top of the medication bottle. Keep the alcohol wipe in its foil and clean the top of the bottle with the wipe (see Figure 4). Place the bottle on the sterile barrier. Repeat this step for all medications that you will add to your TPN bag.

Figure 4. Cleaning the top of the medication bottle with an alcohol wipe

3. Clean the medication port of the TPN bag with an

alcohol wipe (see Figure 5). This is the port where you will inject the medication. The medication port may be located on the outside or middle of the TPN bag.

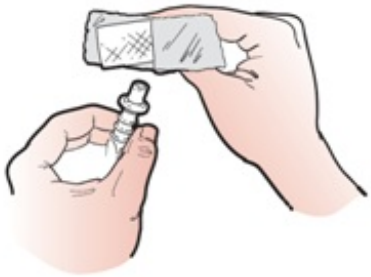

Figure 5. Cleaning medication port of TPN bag with an alcohol wipe

4. Open another alcohol wipe fully. Put the clean medication port on a new alcohol wipe (see Figure 6).

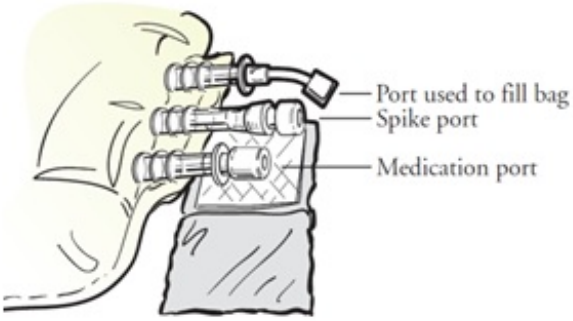


Figure 6. Putting the medication port on an alcohol wipe

5. Pick up a syringe and take off the protective cap (see Figure 7).

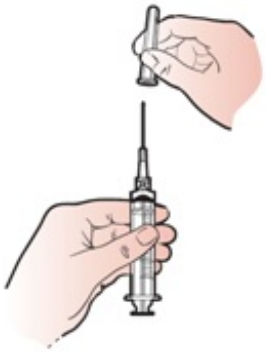

Figure 7. Taking off the protective cap from the syringe

6. While holding the round end of the plunger at the bottom of the syringe, pull it back to the dose of medication that your healthcare provider prescribed (see Figure 8).

Figure 8. Pulling back the syringe to the prescribed dose of medication

7. Clean the top of the medication bottle with an alcohol wipe. Hold the syringe like a pen or pencil. Push the needle of the syringe into the rubber top of the medication bottle (see Figure 9). Push down the plunger so that the air enters the vial.

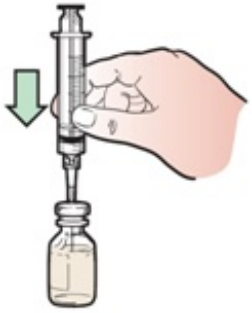

Figure 9. Pushing syringe into the medication vial

8. Carefully turn the vial upside down with the needle still in it. Make sure that the medication covers the tip of the needle. Pull back the plunger to fill the syringe with the prescribed amount of the medication (see Figure 10). Check to make sure that you have the right amount of medication in the syringe. Take the needle out and put the bottle to the side.

Figure 10. Pulling back plunger to fill the syringe with medication

9. Put the needle into the medication port of your TPN bag. Inject the medication into the bag (see Figure 11). When all the medication is in the bag, put the medication port

on the alcohol wipe again. Put the syringe into your sharps container.

Figure 11. Injecting medication into the TPN bag

0. Repeat steps 5 through 9 until all of your prescribed medications are injected into the TPN bag. Use a new syringe for each type of medication. Store any bottles that you will use more than once in your refrigerator until they're empty or expired.
11. Gently rock the TPN bag to mix the medication(s) into the mixture. The mixture will go from clear to yellow. Check it for cloudiness or particles.**If you see any discoloration, cloudiness, or particles, do not use the bag.** Save the bag and tell your home care provider from your infusion company. Then, go back to step 1 and start this process again.
12. If you have added all your medications, you can now remove the divider from the middle of the TPN bag, if you have one (see Figure 12). Gently rock the bag to mix

the lipids with the mixture. Check the bag for fat or separation of lipids. **Do not use the solution if you see any of fat or separation of lipids**. Instead, return the bag to your infusion company and start the procedure over with a new bag.

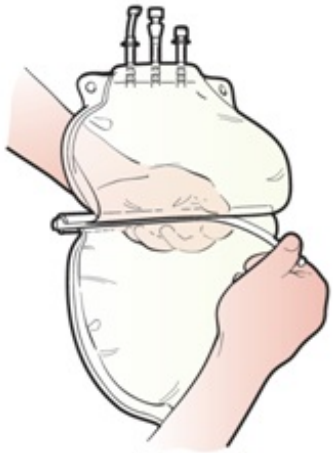

Figure 12. Removing the divider in the middle of the TPN bag

## Attaching the administration set to the TPN Bag

1. Take the protective covering (pull-tab) off the TPN bag spike port and put it on the sterile barrier. **Do not touch the exposed end or let it come in contact with anything.**
2. Pick up the TPN administration set. Hold it below the sharp end of the spike tip in one hand, and remove the protective covering (see Figure 13).

Figure 13. Removing protective covering from spike tip of the administration set

3. Insert the tip of the administration set completely into the spike port of the TPN bag using a twisting motion (see Figure 14).

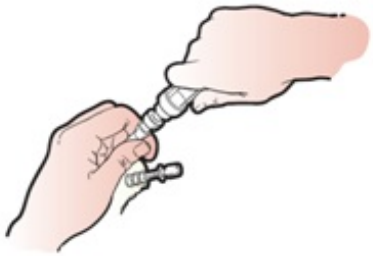

Figure 14. Inserting tip of the administration set into spike port of TPN bag

## Starting your TPN

1. Hang the TPN bag on an IV pole or hook (see Figure 15). If you have a portable pump, you don't need an IV pole.

Figure 15. Hanging TPN bag on IV pole

2. Hold the end of the TPN bag tubing over the garbage can. Squeeze the chamber of the administration set 1 time (see Figure 16).

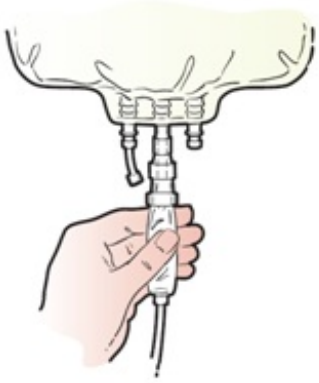

Figure 16. Squeezing the chamber of the administration set

3. Open the roller clamp and let the solution fill the entire length of the tubing, including the filter. The filter is a safety device that traps air bubbles and any particles while the solution is running through the tubes. Make sure that there is no air trapped in the tubing.
4. When the tubing is filled, close the roller clamp. Thread

the tubing through the infusion pump, using the instructions on your pump as a guide.

5. Clean the CVC connection at the end of the lumen with an alcohol wipe.
6. Flush the lumen that you'll be using for the infusion with 10 mL of normal saline (see instructions in the "Disconnecting the TPN Tubing and Flushing Your CVC" section).
7. Remove the protective cap from the TPN tubing (see Figure 17).

Figure 17. Removing the protective cap from TPN tubing

8. Carefully attach the TPN tubing to the CVC lumen (see Figure 18). If you have a CVC with 2 or more lumens, try to switch between them when you do your TPN infusion. This way you know that each lumen works. **Do not touch any open connections or allow them to touch anything.** If the end of the TPN tubing accidentally touches something, replace it with a new administration set.

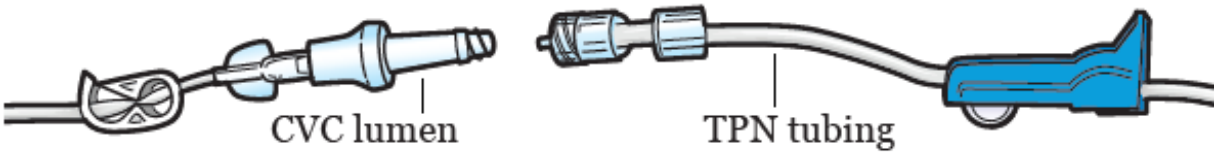


Figure 18. Attaching the TPN tubing to the CVC lumen

9. To start the TPN, open the clamps on the lumen and the TPN tubing. Turn the infusion pump on.

## Disconnecting the TPN tubing and flushing your CVC

Your pump will sound an alarm when your infusion is done. Now you will need to disconnect your TPN tubing from the CVC and flush your CVC. Your nurse will teach you how to do this and give you the supplies you will need.

1. Gather your supplies. You will need:
    - One prefilled, 10 mL syringe of normal saline solution. You will need 1 syringe for each lumen.
    - Nonsterile gloves
    - Alcohol wipes
    - One disinfection cap for each lumen
2. Wash your hands with warm water and soap for at least 20 seconds. Dry them with a clean towel or a paper

towel.

3. Put on a pair of nonsterile gloves.
4. Turn off the infusion pump.
5. Close the clamp in the TPN tubing and disconnect the TPN tubing from your CVC.
6. To release the air bubbles in the syringe, gently tap the side of the syringe. Point the syringe up as you do this. Loosen but do not remove the cap on the syringe. Press the plunger on the syringe until the air is pushed out. Retighten the cap.
7. Pick up 1 lumen and unclamp it.
8. If you have a disinfection cap, remove it. If you don't have a disinfection cap, scrub the end of the needleless connector with an alcohol wipe for 15 seconds and allow it to dry for 15 seconds.
9. Remove the cap from the syringe. Throw away the cap. Make sure that nothing touches the clean end of the needleless connector while you are doing this.
0. Carefully push the saline syringe into the needleless connector and twist it in a clockwise (to the right) until the connection feels secure.
11. Start to inject the saline solution. If you can't inject the saline, stop and check to be sure there are no twists or

other blockages in the tubing. Try to inject the saline again. If you still can't inject the saline, don't use extra pressure to flush the line. Remove the syringe, re-clamp your catheter, and call your healthcare provider.

12. Use the push/pause method to flush your catheter:
    - Quickly inject ⅓ of the saline
    - Pause
    - Repeat
    - Inject the last ⅓ of the saline.
    - After the last injection, clamp your catheter
13. Untwist the syringe from the lumen and throw it away.
14. Attach a disinfection cap to the end of the needleless connector.
15. Repeat steps 7 to 14 for each lumen.
16. Re-clamp the lumens.
17. Secure your catheter in a way that makes you feel comfortable.
18. Throw away your gloves and wash your hands.

You have now finished giving yourself TPN. Throw away all the disposable materials in the garbage.

Your home infusion nurse will help you and a caregiver

practice these steps until you're both comfortable doing it. If you have any questions, ask your healthcare provider.

## Call your healthcare provider if you have:

- A fever of 100.4° F (38° C) or higher
- Severe pain around your catheter
- Chills
- Shortness of breath
- Problems flushing your catheter
- Any issues putting the TPN solution into your body
- Blood or fluid leaking from your catheter tubing
- Tubing that is broken or damaged
- Any complications from the *HPN Complication Chart*

## Contact information

If you have any issues or delays with your supplies, contact your home infusion company for help.

If you have any questions or concerns, call your healthcare provider at 212-639-6985. You can reach a staff member Monday through Friday from 9:00 a.m. to 5:00 p.m. After 5:00 p.m., during the weekend, and on holidays, please call 212-639-2000 and ask for the doctor on call for your doctor.

For more resources, visit www.mskcc.org/pe to search our virtual library.

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