Introduction

(TPN) stands for total parenteral nutrition. It provides or supplements your nutritional needs if you cannot eat or absorb enough food. Giving TPN to yourself, also known as administering, using the CADD Prizm Pump® is safe and effective. It can be done at home. TPN is given in the vein and is known as intravenous or IV.

TPN uses fluids that are placed in a special IV bag. A pump called the CADD Prizm Pump helps administer the TPN. Hand washing is very important. Always wash your hands thoroughly before touching your catheter line or administering, also known as giving, the TPN. Clean hands reduce the chance of infection. Washing your hands will kill germs that may be on them.

This reference summary explains how to do the TPN infusion using special tubing and the CADD Prizm Pump®, what supplies you need, and how to mix and add the vitamins and/or insulin. Always follow the instructions provided by your healthcare team.

TPN and the CADD Prizm Pump

TPN provides, or supplements, your nutritional needs if you cannot eat or absorb enough food. The TPN formula is made up of protein, sugar, and often fat. It contains salts like sodium and calcium.
Vitamins are essential elements to your health and are normally provided by the food you eat. When vitamins and/or insulin are needed, you will need to add these to your TPN bag just before you use it. They need to be prepared and added to the TPN bag prior to using because they only last for 24 hours. The proportion of each of these is adjusted for your metabolism. Adjustments are made based upon the results of your blood work. Lab tests must be done as ordered by your healthcare team.

The TPN bags must be kept in the refrigerator. Remove the TPN bag from the refrigerator 2-3 hours before you administer it. The vitamins, which come in 2 separate vials, must be kept in the refrigerator. The insulin which comes in a prefilled syringe must be kept in the refrigerator. Always make sure to check your TPN label to verify the patient name, and the expiration date. Check the TPN bag for any discoloration or separation of fluid.

**Supplies**

It is important to have all the supplies you need set up in an area that is clean and close to where you are doing the procedure.

For TPN Infusion you will need:
- TPN bag (Remove from refrigerator 2-3 hours before giving).
- High volume administration tubing with built-in anti-siphon valve.
- Syringes pre-filled with 10 ml of normal saline.
- Alcohol pads.
- CADD-Prizm Pump with CADD key or coin.
- Battery power pack.
- 9-volt battery (Must always be in the pump).
- AC wall adapter to charge your CADD pump when it is not in use.
- Injection cap (Primed and changed daily).
- Container for used syringes and needles.

For vitamins that need to be added you will need:
- 2 vials of Infuvite® (Vial 1 and Vial 2); these must be refrigerated.
- 2 syringes with needle attached.
- Alcohol pads.
- Any other additives as ordered, such as prefilled insulin syringe.
How to Prepare the TPN Infusion

1. Once you have the supplies needed, you need to set them up in a clean work area. Clean your work area then wash your hands. It is important that you wash your hands to kill germs that may be on them. After your hands and work area are clean, you can get the supplies together.

2. You will need to prepare the normal saline syringes before using them. Remove the normal saline syringes from the package. Remove any air from ALL the normal saline syringes. Make sure to do this before injecting.

To get rid of the air, remove the cap from the syringe. Place the cap upright on a clean surface. Hold the syringe upright with the tip pointing up. Gently tap the side of the syringe to move any bubbles to the top. Do not lay the syringe down if the cap is off.

Next, gently pull down on the plunger to “unlock the syringe,” then push the plunger up until you see a small drop of fluid at the top of the syringe. Replace the cap on the syringe. Repeat for the second saline syringe.
3. You will need to prepare the vitamins. The vitamins are located in Vial 1 and 2.

To prepare the vitamins, follow the steps a-k.

a. Remove the vials from the refrigerator.

b. Remove the cap from Vial 1. Clean the top of the vial with an alcohol pad for 15 seconds. Let it dry.

c. Pull back the plunger in the syringe to the 2 ml mark. This will pull air into the syringe.

d. Carefully remove the protective cap from the needle.

e. Insert the needle into the vial and then inject the air.

f. Turn the vial upside down. Keep the tip of the needle below the solution in the vial. Gently pull back on the syringe.

g. Tap the syringe with your finger to move the air bubbles to the top of the syringe. Inject any remaining air back into the vial. Make sure you have 5 ml of solution in your syringe. Keep the syringe in the vial.

h. Remove the protector from the port on the TPN bag. Clean the port on the TPN bag with an alcohol pad for 15 seconds. Let it dry. You must hold the port on the TPN bag. Do not let the port touch the table top.

i. Remove the syringe from the vial. Carefully insert the needle into the port on the TPN bag and inject the vitamins.

j. Discard the syringes and used supplies as directed.

k. Gently rotate the TPN bag to mix the vitamins into the TPN solution.

Repeat steps b-k with Vial 2.
4. If you have insulin to add, clean the port on the TPN bag with an alcohol pad for 15 seconds. Let it dry. You must hold the port on the TPN bag. Do not let the port touch the table top. Remove the cap on the insulin syringe and carefully insert the insulin syringe with needle attached in the port of the TPN bag. Inject the contents of the insulin syringe. Once the syringe is empty, carefully remove it from the TPN bag and discard in the appropriate container. Gently rotate the TPN bag to mix the insulin.

5. Next you will need to prepare the IV tubing and attach it to the TPN bag. Remove the IV tubing from the package and close the clamps.

6. Remove the tab from the TPN bag.

7. Remove the protective cover from the IV tubing spike and carefully insert the spike into the TPN bag.

8. Remove the clip from the cassette which is attached to the TPN tubing. Removing the clip will prevent free flow. Free flow is when fluid can escape from the bag without anything stopping it. Set the TPN bag with the tubing attached aside.

9. You will need to stop the CADD Pump and place a new bag at the designated time each day. On the CADD Prizm Pump press the “Stop/Start” key. The screen will read “STOP THE PUMP?” Press the “Y” triangle key for YES. The display will read “TPN 6230E stopped press next to advance.” Do not press the “Next” Key.

10. Close the clamps on the CADD Prizm tubing and set the pump aside.

11. You will need to disconnect the CADD tubing from the injection cap. To disconnect the CADD tubing from the injection cap, hold the injection cap and turn the CADD tubing to the left until it unlocks.
12. You will need to remove the old cassette with the empty bag attached. To remove the old cassette, insert a coin or CADD key into the slotted latch on the side of the pump and rotate ¼ turn clockwise.

13. Remove the cassette and discard with the TPN bag as instructed. The screen will read “CASSETTE UNLATCHED CLOSE CLAMP TO PREVENT FREE FLOW.”

14. Now you can attach a new cassette. Attach a new cassette with the TPN bag attached to the pump, hinged end first. Insert the coin or CADD key into the slotted latch, push in, and rotate ¼ turn counter-clockwise. The screen will read, “High volume admin set latched upstream sensor on. Next to continue.” Press the “Next” key.

15. Screen will read, “Reset Reservoir Volume. Press Y or N.”

16. Press the “Y” triangle key for YES. This will reset the program. The screen will read “Reservoir Volume (Resetting).”

17. Now the screen will read “PRIME TUBING?” Press the “Y” triangle key for YES.

18. Follow the screen directions. Make sure all CADD Prizm tubing clamps are open. Hold down the “Y” triangle key to start priming. You need to hold this key down. The pump will prime 1 ml of the solution, and then will stop. You will need to repeat this step until the fluid appears at the end of the IV tubing.

Once you see fluid at the end of the tubing, you can stop priming. The screen will read, “Continue Priming.” Press the “N” triangle key for No. Now the screen will read “Start the pump.” Press the “N” triangle key. The screen reads: “TPN 6230E Stopped. Press Next to advance.” Just set the pump aside for now.

Allow the filter to “hang-down” while you prime to help remove air. Carefully tap the filter to remove all of the air.
19. You will need to prime and change the injection cap daily. Clamp the IV extension tubing.

20. Remove the new injection cap from the package. Clean the injection cap (top and around ridged sides) with an alcohol pad for 15 seconds. Let it dry. Do not put the injection cap down after cleaning.

21. Remove the cap from the prepared normal saline syringe.

22. Hold the injection cap and gently push the normal saline syringe towards the center of the injection cap and turn it to the right (clockwise) until the syringe locks in place.

23. Once the syringe is locked in place, point the injection cap towards the ceiling and tap it while slowly pushing the normal saline into the injection cap. This is called “priming the injection cap” which will remove the air from the injection cap. Leave the tip protector attached to the injection cap. Leave the normal saline syringe attached to the injection cap. Place the normal saline syringe which is attached to the injection cap back in the original injection cap package.

24. Open the alcohol pad. Remove the old injection cap from the extension tubing by turning it to the left. Discard the old injection cap as directed.

25. Carefully wrap the alcohol pad around the extension-tubing hub. Rotate the hub within the alcohol pad for 15 seconds. Do not put the extension down without an injection cap attached. Let the hub dry.

26. Remove the protective cover from the injection cap and attach the new primed injection cap with the normal saline syringe attached to the extension-tubing hub.

27. Open the clamp on the IV extension tubing.
28. Flush the catheter with 10 ml of normal saline using the start and stop method. The start and stop method is when you start pushing the saline into the catheter line and then stop. Push 1 ml, and then stop. Repeat this by doing 1 ml at a time until all 10 ml are given.

29. Now you need to remove the syringe. Hold the injection cap and turn the syringe to the left (counterclockwise) until the syringe unlocks. Remove the syringe and discard in the appropriate container.

30. You will need to clean the injection cap again with an alcohol pad for 15 seconds. Make sure to clean the top and around the ridged sides. When you are done, let it dry. You must hold the injection cap, do not let it touch your skin.

31. Remove the cap on the 2nd normal saline syringe. Hold the clean injection cap and gently push the normal saline syringe towards the center of the injection cap. Turn it to the right (clockwise) until the syringe locks in place.

32. Once the syringe is locked, flush the catheter with 10 ml of normal saline using the start and stop method. The start and stop method is when you start pushing the saline into the catheter line and then stop. Push 1 ml, and then stop. Repeat this by doing 1 ml at a time until all 10 ml are given. You will have flushed the catheter with a total of 20 ml.

33. Now you need to remove the syringe. Hold the injection cap and turn the syringe to the left (counterclockwise) until the syringe unlocks. Remove the syringe and discard in the appropriate container.

34. Clean the injection cap with an alcohol pad for 15 seconds. Let it dry.

35. Remove the cap from the end of the IV CADD tubing.

36. Attach the tubing to the injection cap. Hold the injection cap and gently push the tubing toward the center of the injection cap, turn it to the right (clockwise) until the tubing locks in place.
37. Make sure all the clamps on the new IV tubing are open. The screen on the CADD Prizm Pump should read “TPN 6230E STOPPED.” Press “Next” to advance. If the screen is blank - press the “Next” key to bring up the screen.

The pump will display an AUTOMATIC review of each screen and beep as the entire program is reviewed. The small green light above the top right of the screen will blink every 3 seconds to indicate that the pump is on and working. The screen will go blank in 1-2 minutes. Whenever you want to see the screen, press the “Next” key.

38. Now the screen reads “TPN 6230E STOPPED. Press Next to advance.” Do not press the “Next” key, instead press the “Stop/Start” key. The screen will read “Start the Pump?” Press the “Y” triangle key for yes.

The pump will do a second automatic review. The screen will go blank after a few minutes. If at any time you want to review the program, press the “Next” key and you will see the program, screen by screen.

39. Discard the used supplies as instructed.

40. Finally, wash your hands.

41. Be sure the green light on the right side of the CADD pump is on and all your clamps are open.

**Power Source for Your Pump**

Make sure you have a 9-volt battery in the pump. The 9-volt battery alone can temporarily power the pump (8-10 hours), but is only to be used as a back-up power source. In addition to the 9-volt battery you will need to attach the power pack to the pump. If your power pack is not fully charged, you will need to attach the AC adaptor to the power pack.
To attach the power pack to your CADD Prizm Pump:
- Open the cover (on the CADD Prizm Pump) for the power jack.
- Line up the red marks on the power pack with the red marks on the pump.
- Push the connector in until it clicks.
- If you need to use the AC adaptor, line up the red marks on your power pack with the red marks on the plug on the AC adaptor.

If your battery is low, you must plug the AC adapter into the wall outlet. You should recharge your power pack while the CADD Prizm is not in use.

If your power pack has a “Battery Refresh Button” you must refresh your power pack monthly.

To do this:
- Disconnect the pump from the power pack.
- Have the power pack plugged into the wall.
- Push the BATTERY REFRESH CYCLE button on the front of your power pack.
- Leave the power pack plugged into the wall for 12 hours to refresh and recharge.

Taking Care of Your Pump
Avoid dropping or hitting the pump against a hard surface, as this could cause the cassette to become detached, the battery cover to become detached or loose, or the display screen to become damaged. If the battery door becomes detached or loose, the battery will not be properly secured. This may result in loss of power or no delivery of the TPN. Damage to the display screen could result in improper display of data.

If the pump is dropped or hit, inspect the pump to ensure that the cassette did not become detached and the battery cover did not become dislodged. Inspection should include closing the clamp on the tubing, detaching the pump and inspecting the hinges, and checking the battery door to ensure they are not broken. The pump should be powered up and the display screen should be inspected for any stripes.
If there appears to be any damage, call your health care worker to have the pump taken out of service. If there appears to be no damage, reattach the cassette following the previous instructions. Remember, if you disconnect your TPN bag from the IV tubing for more than 5 minutes, you must flush your IV with 20 ml of normal saline using the start and stop method.

**Summary**

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The proportion of each of these elements is adjusted for your metabolism. Adjustments are made based upon the results of your blood work. Lab tests must be done as ordered by your physician. The TPN bags must be kept in the refrigerator. Remove the TPN bag from the refrigerator 2 – 3 hours before you administer (give) it. The vitamins which come in 2 separate vials must be kept in the refrigerator. If you are adding insulin, the insulin must be kept in the refrigerator.

Make sure to wash your hands and keep your working area clean. Follow all cleanliness instructions while working with your catheter and syringes. Hand washing is very important. Always wash your hands thoroughly before touching your catheter line or administering (giving) the TPN infusion. Clean hands reduce the chance of infection. Washing your hands will kill germs that may be on them. If you have any questions or concerns, make sure to ask your healthcare team.