IV Therapy, Initiation & Maintenance

After reviewing the information you should be able to describe essential concepts of the nursing management of the patient requiring IV therapy

– Ways to decrease risks associated with IV infusions.
– Initiation of peripheral IV access devices (IVAD) according to CFV policy.
### IV Therapy Purposes

IV therapy for hospitalized patients is utilized for fluid and electrolyte replacement. In addition, IV access provides a route for:

- Medications
- Nutritional support
- Transfusion of blood products
- Venous access for drawing blood for labs
Asepsis

But they also carry increased risk to our patients – including pain, tissue damage, and infection.

Any break in the skin barrier can lead to infection that might ultimately lead to sepsis.

**Strict aseptic technique** for actual venipuncture and care and maintenance of the site is mandatory.

Remember, the patient is at the center of all that we do!
Site Selection

When selecting a vein to perform venipuncture, consider the following:

- Type of Solution & medications ordered
- Condition of vein
- Duration of therapy
- Cannula size
- Patient age
- Patient preference
- Patient activity
- Presence of disease or prior surgery
- Presence of a shunt or graft
- Mastectomy
Site Selection

- Type of Solution & medications ordered
  - Hypertonic solutions & various medications can be chemically irritating to the vein. Consult with the pharmacist regarding properties of the medication or solution. If the infusate is a known irritant, select a large vein in the lower forearm.

- Condition of vein
  - If the vein has been recently used for an infusion, is bruised, red, swollen, sore or is near a previously affected site, do not use vein.

- Duration of therapy
  - Long-term therapy will require frequent venipunctures. Preservation of veins is important. If possible, alternate arms and remember to begin distally and work proximally

- Cannula size
  - The cannula should be as small as possible and yet be able to effectively deliver the therapy.
Site Selection

• Patient age
  • Infants have fewer accessible sites than older children and adults.
    – Hands, feet and the antecubital region are generally the most accessible sites.
  • The elderly may have fragile veins. The tourniquet may need to be loose or not used at all.

• Patient preference
  • Use the nondominant side whenever possible. Advise the patient of the optimal sites and ask which site he/she prefers

• Patient activity
  • Consider allowing hands to be free, particularly if the patient uses a walker, crutches or a wheel chair
Site Selection

- Presence of disease or prior surgery
  - Avoid the affected side (mastectomy, paralysis, burns, lymphedema, scars)
  - Avoid if patient has a fracture or dislocation proximal to the site
- Presence of a shunt or graft
  - Never use the side that has a shunt or graft used for Hemodialysis
- Why the patient needs the IV
  - If patient is in cardiac arrest, we don’t care about choosing the most distal vein. We want one as close to the patient’s heart as possible and ideally vein is large enough through which we can infuse fluids quickly
Sites to AVOID

Some sites may have apparently good veins for IV access but for one reason or another are a poor choice in most situations.

- Anterior or palm side of the wrist because the radial nerve is very superficial, and insertion can be very painful for patients.

- Feet & leg veins are not good choices because of increased risk of thrombophlebitis and embolism.
  - **Must have LIP order** except in [CODE BLUE](#).

- Varicose or sclerosed veins

- Arm with an AV fistula, gortex graft or mastectomy

- Swollen or bruised areas

- Green armband denotes limb restriction
Remember ...

In a **CODE BLUE** situation the best vein is the one you can get.

Almost anything is fair game!
General Guidelines

If you have an unsuccessful IV start (blown vein), then you cannot use a vein distal to the blown site.

Reserve antecubital veins to take blood samples, for PICC lines and for CODE BLUE.
General Guidelines

When disconnecting an intermittent infusion such as IVPB antibiotics, don’t just hang the tubing over the IV pole or stick the connector into a port in the IV tubing.

Always cap in an aseptic fashion. **Blue caps** are available for preventing contamination of the tubing while not in use.
General Guidelines

A physician order is required for each saline lock, IV medication or solution administered except in CODE BLUE situations.

- Use “Peripheral IV Therapy - Adult” protocol order set when IV meds are ordered but no IV access is specified. Print order set from Form-Fast, sign, scan to pharmacy and flag for physician signature.

- It is the responsibility of the nurse when any doubt or confusion exists, to clarify the order with the physician.
General Guidelines

Patients should be observed for signs of sensitivity when introducing a new drug by vein.

Unfavorable reactions should be recognized promptly, reported to the attending physician and pharmacy and documented in medical record.

Hospital wide KVO rate = 20 ml/hour unless otherwise ordered.
## Complications to Anticipate

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Symptoms</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pyrogenic</td>
<td>Chills &amp; fever</td>
<td>Elements containing pyrogen present in contaminated apparatus.</td>
</tr>
<tr>
<td>Circulatory</td>
<td>Headache, dyspnea, flushed skin, irregular or rapid pulse, rales, engorgement of neck veins</td>
<td>Fluid overload. Too rapid administration.</td>
</tr>
<tr>
<td>Embolus</td>
<td>Sudden, severe pain, pallor, dyspnea, shock, collapse</td>
<td>Failure to clear IV set of air before administration of fluid or a piece of catheter is broken in the vein &amp; enters the circulatory system</td>
</tr>
</tbody>
</table>
### Complications to Anticipate

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Symptoms</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phlebitis</td>
<td>Pain, redness, warmth along vein path, possible cording of vessel</td>
<td>Irritation to vein from movement of cannula, chemical irritation.</td>
</tr>
<tr>
<td>Infiltration</td>
<td>Edema &amp; pain, blanching of tissue, sometimes cool to touch</td>
<td>Perforation of vein wall. Too rapid administration of fluid. Vein fragility.</td>
</tr>
<tr>
<td>Accidental Intraarterial injection</td>
<td>Pulsatile or bright red blood return</td>
<td>Inadvertent puncture of artery.</td>
</tr>
<tr>
<td>Transfusion reaction</td>
<td>Fever, chills, flushing of face, chest pain, shock, hemoglobinuria</td>
<td>Blood incompatibility</td>
</tr>
</tbody>
</table>
## Complications to Anticipate

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Symptoms</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thrombophlebitis</td>
<td>Pain, redness, warmth along vein path, possible cording of vessel</td>
<td>Injury, irritation, or sluggish flow rate can cause a clot to form, which if dislodged, becomes an embolism. This places the patient at risk for CVA, MI, pulmonary embolism.</td>
</tr>
<tr>
<td>Bleeding</td>
<td>Bleeding, Bruising, Hematoma</td>
<td>A missed IV site unattended may become a steady bleeder, especially if the patient is on an anticoagulant medication.</td>
</tr>
</tbody>
</table>
Filters

Final filters are added only when medication requires filtration.

Medications requiring filters are sent from Pharmacy with a label stating “filter required”.

Some examples of drugs requiring filters include:

- Mannitol
- TPN
- Reopro
- Dilantin
Infection Prevention

IV tubing and filters (if applicable), CVP manometers & stopcocks are all to be changed *every 72-96 hours*.

Tubing used to infuse TPN is changed every 24 hours.

Tubing for Lipids and lipid based solutions are changed every 12 hours.
Infection Prevention

SCRUB the HUB with alcohol prior to access
  • At least 15 seconds!

IV tubings should be labeled with the colored day of the week sticker denoting day next change is due:
  – Date
  – Time changed
  – Nurse’s initials
Patient/Family Teaching

Instruct patient/family:

– Purpose & steps of procedure
– Importance of keeping limb still during procedure
– Inquire about desire for use of Lidocaine or topical anesthetic spray & verify any allergies
– Instruct to notify nurse should tubing become disconnected, or they note any swelling, redness or pain at or near the IV site.
– Advise to keep site clean and dry
Use of Lidocaine

This is optional for the patient not the nurse! If the patient is conscious & aware, then you need to offer this or Pain-Ease™ topical anesthetic spray!

Remember pain management is a Joint Commission initiative!
Procedure for Lidocaine use

Verify physician order.

Gather equipment:

- IV Fluids
- IV administration set, and extension set
- Correct size catheter
- IV start kit
- TB syringe with 27 gauge 1/2” needle
- Lidocaine 1% \textit{without} epinephrine
- IV pump and IV pole
Procedure for Lidocaine use

Using TB syringe, draw up 0.1-0.2 mL Lidocaine without Epinepherine

Tighten skin at puncture site and insert needle, bevel up, into intradermal space about $1/8^{th}$ inch from vein

Aspirate slightly and inject Lidocaine slowly into skin making a bleb

Remove needle quickly & rub Lidocaine into skin using an alcohol swab

Proceed with IV insertion
Pain-Ease™ is a topical anesthetic spray to decrease the pain of IV sticks, IM injections or venipuncture for blood sampling.

Use with caution on patients with circulatory conditions or those sensitive to cold

Multi-use, multi-patient container should be wiped off with germicidal wipes before entering and upon leaving the patient’s room.
Use of Pain-Ease™ spray

Prep the skin per policy

Hold can 3-7 inches from the injection site & spray steadily 4-10 seconds - until skin begins turning white or 10 seconds maximum.

Perform IV insertion immediately. The effect lasts approximately 1 minute.

May reapply if necessary
Vein Selection

Begin distally & work proximally.

Identify long straight veins—that feel spongy when palpated
  • Use the same two fingers every time to develop sensory “memory” of what a good vein feels like

Don’t use tourniquet:
  – With fragile veins
  – Already distended veins

Be cautious with delicate skin
  • Tourniquet may cause skin tears. Use a towel under the tourniquet, or use a BP cuff
Vein Selection (cont.)

Apply tourniquet 4-6” above the intended site; check radial pulse; apply tight enough to distend without occluding arterial flow.

Apply 1-2 minutes

If tourniquet does not cause distension, remove and apply warm, wet compress.

After heat compress, reapply tourniquet. Patting vein or rubbing vein in one motion (proximal to distal) may assist in venous distention.
Peripheral IV site – Initiation

Verify LIP orders.

Inspect IV solution for discoloration or debris & check expiration date.

**Wash your hands.**

Prime mini extension set/injection cap using pre-filled normal saline syringe

Aseptically spike IV container and prime IV tubing removing all air and bubbles.

Identify the patient using **full name** and date of birth.
Peripheral IV site – Initiation

Ask the patient about pain control (Lidocaine or Pain-Ease spray) and verify any allergies.

Select IV site.

Clip hair if needed – no shaving

Distend vein sufficiently to perform venipuncture:

- Apply tourniquet
- Lower arm below heart level
- Instruct patient in opening & closing fist
- Tap site to distend vein
Peripheral IV site –
Initiation

Prepare insertion site:

- Swab entry site with Chlorascrub & allow to dry 30 seconds
- Remove excess with sterile 2x2 gauze

Provide pain control – Lidocaine 1% without Epi

- **DO NOT** use Lidocaine if patient indicates allergy
- Using TB syringe with Lidocaine, insert the needle, bevel up into intradermal space about 1/8” from vein
- Aspirate slightly, checking for blood
- Inject Lidocaine slowly into skin
- Remove needle quickly and smoothly
- Rub in gently with alcohol swab
Peripheral IV site – Initiation

- Topical anesthetic cream (LMX) may be used per package insert instructions for pediatric patients. LIP order required for cream for adults. Works in 30 minutes.

- Remove needle cover from catheter. Release the catheter needle seal by rotating the catheter hub 360 degrees. (Failure to do so may affect needle retraction)

- Proceed with IV insertion using Lidocaine penetration site as a point of entry.

- Place your thumb on the vein distal to the puncture site-press down lightly until skin over the vein is taut
Peripheral IV site – Initiation

• Insert catheter/needle at a 10 – 15 degree angle about 1/8” from vein using Lidocaine puncture site.
  • Remember: the needle insertion will be sharp – with little or no “popping” sensation when entering the vein

• Note blood return/flashback.

• Lower and advance the entire unit slightly to ensure catheter is inside the vein. Then, gently push catheter off stylet into the vein until the hub is next to the insertion site or resistance is felt.
Peripheral IV site – Initiation

Release tourniquet with your free hand.

Apply transparent dressing before connecting tubing while stylet is still in place (DO NOT cover catheter wings with dressing).

Apply digital pressure above the tip of the catheter & activate safety mechanism to retract stylet BEFORE removal from vein.
Peripheral IV site – Initiation

Connect catheter to mini-extension set and slowly flush with remaining saline using positive pressure technique while inspecting site.

Secure catheter and tubing by Chevron or “window pane” technique.

– Catheters without wings should be taped in a crisscross method.

Avoid taping directly over hub-tubing connection.

Place another ½” wide strip across hub
Peripheral IV site –
Initiation

Remember, insertion site needs to be clearly visible at all times for assessment purposes so **do not put multiple layers of tape over the insertion site** – there should only be one layer of transparent dressing over it!

Loop tubing into a small loop and tape down across hub.

Connect IV tubing to injection cap and slowly infuse while inspecting site. Adjust to ordered rate if no infiltration noted.

Tape tubing to arm several inches above insertion site.
Peripheral IV site –
Initiation

Apply label to dressing stating:

• Catheter size
• Date
• Time
• Initials of person performing IV start

Do not apply label directly over insertion site
Peripheral IV site –
Initiation

Document procedure including the following:

• Date & time
• Catheter gauge
• Site of placement
• Patient response/tolerance
• Initials of person performing
• Number of attempts
Peripheral IV site – Initiation

After **two unsuccessful attempts**, call a 2\textsuperscript{nd} person to attempt **once**.

- Rapid Response, ICU, ED or Anesthesia may be used.

If IV team is needed, complete form and then call IV team and leave a message.

- Give form to Unit Secretary so that he/she can answer questions when IV Team returns call.

### IV Team Request

<table>
<thead>
<tr>
<th>Choose one</th>
<th>Reason for restart</th>
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<tbody>
<tr>
<td>□ Restart</td>
<td>□ Rotation</td>
</tr>
<tr>
<td>□ New Start</td>
<td>□ Infiltration</td>
</tr>
<tr>
<td></td>
<td>□ Phlebitis</td>
</tr>
<tr>
<td></td>
<td>□ Other ______</td>
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<thead>
<tr>
<th>Choose one</th>
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<tbody>
<tr>
<td>□ Routine</td>
</tr>
<tr>
<td>□ Deteriorating patient condition</td>
</tr>
<tr>
<td>□ Critical infusion such as dopamine, nipride, etc</td>
</tr>
<tr>
<td>□ Blood/blood products currently infusing</td>
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<tr>
<td>□ Pre-op medication/pre-procedural IV access</td>
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<tr>
<td>□ Pain medication</td>
</tr>
<tr>
<td>□ Other ______________________________</td>
</tr>
</tbody>
</table>

**Nurse:** ________________________________

**Date:** ________________ **Time:** ________________

Lawson #014261 8/01
Site Maintenance

The site should be checked at least every 4 and before and after any IVPB or push meds, inspecting for:

- Redness
- Swelling
- Signs of localized infection:
  - Palpable cord
  - Purulent drainage
- Coolness or warmth
- Pain

If any signs of infection are present, a new IV site should be initiated and the old IV should be discontinued.

- In addition, change all tubings, extensions and solution bags
Site Maintenance

If purulent drainage is noted, the staff nurse should contact the patient’s doctor for an order to culture the site & catheter tip, as well as the IV Fluids.

Peripheral IV sites should be rotated every 72 to 96 hours. Establish a new IV site before removing the old.

• If site left longer than 72-96 hours a clinical exception documenting rationale for NOT rotating must be documented in Nursing Notes.
• If site left longer than 72-96 hours, the tubings etc. should still be changed.
IV Infiltration Guidelines

Assessment of IV site includes:

- Compare extremities for size and color
- Assess IV site for coolness of skin
- Assess circulation distally
- Patient complaints of pain or tenderness

Following an IV infiltration, IV is discontinued & the physician is notified for any specific follow-up treatment, including antidotes for medication infiltration.

When an antineoplastic vesicant drug infiltrates, the chemotherapy extravasation policy is to be followed.
IV Infiltration

IV infiltration of fluids requiring fasciotomy and resulting in significant nerve damage
IV infiltration led to compartment syndrome requiring fasciotomy
Vesicant Medications

Vesicant medications are irritating to veins and surrounding tissues. If infiltration occurs, tissue damage is likely.
A partial list includes:

<table>
<thead>
<tr>
<th>Vesicant Medications</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium Chloride</td>
<td>Valium</td>
</tr>
<tr>
<td>Calcium Gluconate</td>
<td>Levophed</td>
</tr>
<tr>
<td>Doxycycline</td>
<td>Aramine</td>
</tr>
<tr>
<td>Mannitol</td>
<td>Dopamine</td>
</tr>
<tr>
<td>Foscarnet</td>
<td>Phenytoin</td>
</tr>
<tr>
<td>Nembutal</td>
<td>Ganciclovir</td>
</tr>
<tr>
<td>Sparine</td>
<td>Phenergan (Central Line ONLY)</td>
</tr>
<tr>
<td>Vancomycin</td>
<td>Dobutamine</td>
</tr>
<tr>
<td>Ceftriaxone</td>
<td>Methicillin</td>
</tr>
</tbody>
</table>
Vesicant Medications

Dopamine Infiltration
Drawing Blood when IVs are Present

1st Choice: Check the arm without IV for a collection site and perform venipuncture there.

2nd Choice: Perform finger stick rather than venipuncture.

3rd Choice: Inspect below the IV for a venipuncture collection site

Note: if the IV is below the wrist, do not perform venipuncture on that arm

• Turn off IV for at least 5 minutes before performing venipuncture
• Use a vein other than the one with the IV
• Draw 3-5 ml. Discard before drawing labs ordered
• Label specimen with “blood drawn below IV”
Blood samples may be drawn through the saline lock by nursing personnel.

All saline lock sites are to have mini-extensions and Luer lock injection caps.

This maintains a closed system & provides the means to maintain positive pressure when flushing the catheter.
Patient/Family Teaching

Do not assume that all patients understand what a saline lock is, or why they have it. Explain that saline lock allows intermittent administration of IV medication or access to vein in an emergency.

Instruct the patient to keep the site dry.

Instruct patient to notify the nurse if the site becomes:
- Reddened
- Swollen
- Tender
Converting Peripheral IV to Saline Lock

Assemble equipment and check physician’s order:
- Pre-filled 10 mL normal saline syringe
- Alcohol swabs

Wash hands

Put on gloves

Turn off pump.

Clamp extension set.

Disconnect IV tubing from injection cap.

Open slide clamp.

Swab injection cap with alcohol.
Converting Peripheral IV to Saline Lock

Attach saline syringe and aspirate gently for blood return.

Inject remainder of saline, disconnect the syringe & then close clamp.

Caps & extension sets have positive pressure valves to prevent backflow.

Should be flushed once every 12 hours (if it has not been used for intermittent administration of IV medication) and flushed automatically before and after each medication administration with the infusion pump.
A functioning IV device is not removed from a critical or pediatric patient until another successful venipuncture has been performed!!

Patient/Family Teaching:

- Explain procedure to patient & warn patient that a slight burning sensation may be experienced.
- Instruct patient to avoid vigorous activity with the extremity for at least 15 minutes following removal of device.
- Encourage the patient to increase fluid intake, if appropriate
- Keep site clean and dry for 24 hours
D/C Peripheral IV Guidelines

Digital pressure @ puncture site is maintained until bleeding has stopped.

Patients receiving anticoagulant medication should have pressure applied for at least five (5) minutes:

- ASA
- Heparin
- Coumadin
- Etc.
D/C Peripheral IV-Documentation

Document the following with IV site discontinuation:

– Time, site, and type catheter removed
– Reason for removal
– Condition of catheter
– Assessment of venipuncture site
– Amount of solution infused, if appropriate
– Patient teaching done and level of understanding
Discontinuation of Peripheral IV

Verify new order or D/C for phlebitis, infiltration or time for 72-96 hour rotation of site.

Gather equipment: 2X2, Band-Aid, gloves

Identify patient (full name and Date of Birth)

Wash hands

Put on gloves

Close clamp and turn off IV pump

Remove tape and dressing by pulling tape in direction of hair growth.
Discontinuation of Peripheral IV

Hold catheter in one hand while pulling transparent dressing from outer edge to center.

Hold a dry sterile gauze over injection site.

Remove the catheter quickly and smoothly at an angle parallel with the skin.

Assess tip of catheter – is it intact?

Apply digital pressure with sterile 2x2 gauze instantly and firmly, until bleeding stops.

A Band-Aid may be applied AFTER bleeding has stopped.

Discard equipment and wash hands.
Central Line Management, Dressing Change, and Removal

After reviewing the information, you should be able to describe essential concepts of the nursing management of central venous catheters and CFVHS, including:

– Ways to decrease risks of accessing, dressing and removing central venous catheters
– Steps to access, dress, and remove central venous catheters
Overview

Central venous catheters provide important vascular access when peripheral lines are not indicated or available. They provide a route for:

Medications such as IV antibiotics or continuous infusions

Nutritional support such as TPN

Transfusion of blood and blood products

Blood sampling for lab analysis
But they also carry place patients at increased risk for complications such as infection, sepsis, and air embolism. This presentation will give you the information you will need to practice safely within the policies of CFV to decrease these risks and provide exceptional care without exception to those patients with a Central Venous Catheter. Remember, the patient is at the center of all that we do!
General Guidelines

Central venous catheter ports vary in number from one to four. Each port is labeled as to where the lumen empties and if the port is power-injectable.

The distal lumen opens up at the tip of the catheter, and each subsequent lumen exit point is about 2 cm proximal.
General Guidelines

To decrease the chance of drug interactions, precipitate formation, and blood clots, each port of the central line is used for the same purpose each time:

- Proximal: used for general infusions
- Medial: TPN, general infusions
  - Once a port has been used for TPN, that lumen should be labeled for TPN use ONLY.
General Guidelines

– Distal: CVP readings, blood sampling, blood product administration, general infusions.
  – Blood will infuse faster due to the larger lumen size
  – CVP readings are more accurate
General Guidelines

Peripherally-inserted central venous catheters (PICC) are also used at CFV. Because they are inserted peripherally, they have a much lower risk of air embolus. Nonetheless, there is still a risk for complications and they must be managed appropriately.
General Guidelines

PICC lines at CFV may be single, double or triple lumen. While each lumen is a separate channel, they all open out in the same area.
General Guidelines

When selecting a port on a multi-lumen PICC, the center port is preferred for blood transfusion and blood sampling as it is the largest port.

As with central venous catheters, it is important to label any port used for TPN and to avoid drawing lab specimens from any port used for TPN.
Solo versus Non-Solo PICCs

Solo PICCs: Single lumens or Double lumens
  – They have a valve at the hub.
  – Saline-only device **without** clamps.
  – Requires a positive pressure end cap.

Non-Solo PICCs: Triple lumens
  – Treat the same as your standard Central line.
  – Has clamps.
  – Flush, removing the syringe during the last 0.5ml of the flush, clamp **after** syringe has been removed.
PICC lines

Power PICC
Requires Clamp

SOLO power PICC
Does **NOT** Require Clamp
General Guidelines

Pressure injectable ports are used for mechanical instillation of radio-opaque dye in CT scan and other diagnostic studies. It is important to know how to recognize these “Power” ports.

- Dual & single lumen lines are NOT pressure injectable with the exception of PICC lines.
- Triple lumen catheters used at CFV have 3 pressure injectable (power) ports.
- Quad lumens have 2 pressure injectable ports. The remaining two ports are not pressure injectable.
- PICC lines that are power injectable at CFV - “Power PICCS” - are easy to identify by their purple color.
If you have any open ports without continuous infusions, always leave one of the pressure injectable ports free for CT contrast media administration.
General Guidelines

In order to decrease the risk of line failure due to clotting, there are some practices we follow with all central venous catheters.

**All infusions should be on an infusion pump**

Flush ports with 10 mL normal saline after blood draws then reconnect fluids.

Ports without continuous infusions are covered with positive pressure caps and flushed with 10 mL of Normal Saline every 12 hours.
General Guidelines

In order to decrease the risk air embolus or CLABSI –

Positive pressure injection caps are changed every 7 days or PRN if soiled or contaminated.

Change tubing every 72-96 hours (every 24 for TPN) & label with appropriate day of week sticker.

All central lines have a CHG-impregnated dressing (BIO-Patch) applied to the site of insertion per 2010 CDC recommendations.
General Guidelines

Central line dressing changes are performed every 7 days and PRN if soiled or loose

All patients with a CVC, PICC, Vascath, Permacath, accessed Port-a-Cath, or other central lines must be bathed daily with CHG.

This intervention has been shown to decrease CLABSI and has been initiated throughout the health care system.
CVC Phlebitis

Fig. 2  Progressive exit site infection in a neutropenic patient. Note erythema and induration extend more than 2 cm from the exit. Redness at neck is sunburn.
General Guidelines

Central line dressings should be labeled with initial insertion date or date of access (Port-a-Cath) as well as the dressing change date and the nurses initials.

– Cap changes are documented in nurses notes.

All flushes & medications are also documented in medication record/MAK

(Note that prefilled normal saline flushes stocked in the clean utility rooms are considered medications and must not be stored on or in the MAK cart.)
General Guidelines

Assessment and documentation of central venous catheters includes:

- Position of catheter (subclavian, femoral, right, left)
- Centimeter mark which is closest to the insertion site
- Condition of site (red, drainage, tender)
- Dressing integrity (intact, loose, soiled)
- Original date of insertion (CVC, PICC) or access (Port-a-cath)
- Which solution or medication is infusing into each lumen
Cap Changes

Cap changes should be done every 7 days, and PRN for contamination or obvious blood trapped within the cap.

First, gather the equipment you will need.

- Gloves
- Alcohol preps
- Positive pressure injection caps
- Prefilled 10 mL normal saline syringes (one per cap to be changed)

Wash your hands.
Cap Changes

Close the slide clamp and put on your gloves.

Maintain the sterility of the new cap.

Attach the normal saline syringe to the new cap and prime.

Leave the syringe attached to the cap.

Quickly twist off the old cap, cleanse the connection thoroughly with alcohol swab, and allow to dry.

Apply new cap.

Open slide clamp.
Cap Changes

Flush with remainder of 10 mL normal saline.

IMPORTANT – Disconnect the syringe from the positive pressure cap and THEN close the slide clamp.

Discard the syringe in a sharps container.

Wash your hands.
Dressing Change Procedure

• Obtain dressing change kit, extra mask for patient if needed & Benzoin swab or skin prep if needed

• Wash hands thoroughly

• Position patient with head turned away from insertion site. (Mask patient if unable to follow directions)

• Don mask from kit & put on nonsterile gloves
Dressing Change Procedure

• Remove old dressing by gently grasping edge and slowly pulling from skin toward insertion site. Inspect catheter & hub for integrity.

• Discard old dressing & gloves

• Open kit aseptically. Use the overwrap as a sterile field.

• Don sterile gloves
Dressing Change Procedure

• Cleanse skin with alcohol swab
• Cleanse site about 4-5 inches in diameter from insertion site with Chlorascrub using back & forth repeated strokes for 30 seconds
• Allow area to dry for 30 seconds
Dressing Change Procedure

- May apply skin prep or Benzoin along outer edge of prepped area
- Apply Bio-patch, blue side up
- If sutures not intact, apply steristrips across catheter to secure it. Notify LIP.
- Center transparent dressing, mold to patient’s skin & label with date line inserted & date dressing changed.
Documentation

Document in nurse’s notes or on IV Therapy Record what is infusing into each lumen, condition of site & location & position of catheter each shift.

Position is noted by documenting which centimeter mark is closest to the insertion site.

Cap changes are documented in nurses notes or IV therapy record.

All flushes & medications are also documented in medication record/MAK.

Label dressing & tubing with date, time and initials as well as when injection caps were changed.
Removal of Central Venous Catheter

Requisite – RN & LPN who have completed the competency

The potential for air embolus exists as long as there is a tract between the central vein and the skin. (There is minimal risk of embolus with the PICC)

Patients whose catheters have been in place the longest, take the longest time to heal, & thus are at increased risk for air embolus.
Signs & Symptoms of Air Embolism

Chest Pain

Shortness of breath

Weak rapid pulse

Immediately place in Trendelenburg position on left side, get a crash cart & notify LIP, monitor vital signs
PICC Removal Guidelines

Verify trimmed length of catheter before removing.

Rapid jerky removal of PICC may cause venospasm and/or catheter breakage.

Warm compresses applied to the arm may alleviate venospasm & vasoconstriction making removal easier

Valsalva is not necessary for removal of PICC or femoral CVC

When PICC removed, apply petroleum gauze or Povidone-iodine ointment, sterile 2x2 gauze & transparent dressing to site

If breakage occurs, apply tourniquet 4-6” above insertion site & notify physician & rapid response STAT. Monitor VS, place on C/A monitor
Patient/Family Teaching

- Explain procedure & rationale
- Demonstrate Valsalva maneuver & have patient return demonstration (if not PICC or femoral line)
- Encourage patient to remain in bed for at least 30 minutes following removal of catheter
- Instruct patient to keep dressing clean & dry
- Instruct that dressing should remain in place for at least 48 hours
CVC Removal Procedure

• Verify physician’s order
• Assemble equipment:
  • Suture removal set
    • Remember that you will need two sets if tip to be cultured
  • Petroleum gauze or Povidone-iodine ointment
  • Sterile 4 x 4s
• Central line dressing change kit
  • (Elastoplast if Vas Cath for hemodialysis)
CVC Removal Procedure

- **Wash hands**
- Put on non-sterile gloves
- Identify patient by asking full name & DOB & checking ID band
- Open sterile objects using sterile technique
- Place open vaseline gauze dressing on sterile 4X4 or apply one dot of Povidone-iodine ointment to sterile gauze
- Place head of bed **flat**
- Have patient turn head to opposite side
CVC Removal Procedure

- Remove dressing
- Remove non-sterile gloves
- **Wash hands**
- Put on sterile gloves
- Cleanse site with alcohol then with Chloraprep applicator using back & forth strokes for about 30 seconds over 4-5 inch diameter
- Allow area to dry for about 30 seconds
CVC Removal Procedure

- Clip sutures *carefully* to avoid clipping catheter
- Have patient hold breath or perform Valsalva maneuver (if not a PICC or femoral line)
- Withdraw catheter using smooth motion.
  - If patient is comatose or unable to follow directions, withdraw catheter *during expiration*. 
CVC Removal Procedure

- Assess that tip of catheter is intact. Maintain sterility of catheter tip if culture is to be obtained.
- If culture is needed: use scissors from second suture removal kit & clip about 2” of catheter tip into sterile container (second person may be needed to maintain sterile technique)
- Apply 4X4 with petroleum gauze or Povidone-iodine ointment immediately.
CVC Removal Procedure

- Hold pressure for:
  - 5 minutes for PICC & regular catheter
  - 15 minutes for hemodialysis catheters or patients receiving anticoagulants
- Have patient cough & observe site for hemostasis. Continue pressure if site is still bleeding.
  - Assess at 5 minute intervals
- Secure 2 x 2 dressing over petroleum gauze or Povidone–Iodine ointment & cover with op-site when hemostasis obtained.
- Write date/time of dressing removal on dressing. Dressing to stay on 48 hours
Hemodialysis Catheters

Vas caths are not to be removed within 4 hours of hemodialysis.

Direct pressure should be held for 15 minutes after removal on all patients.

Secure the 4 x 4 dressing with Elastoplast tape to create a “pressure dressing” after pressure has been held & hemostasis achieved after removal.
More on Vas Caths

NOTE: Only RNs & LPNs completing a separate competency to access hemodialysis catheters may access & utilize them! (Nephrology & IV Team)

A nephrologist’s order is necessary to unblock/access a hemodialysis catheter for IV access except in event of an emergency when no other site is available.

Hemodialysis catheters are always dual port (arterial & venous) with a red port & a blue port.

When in doubt, call Nephrology or IV team to identify if a catheter is hemodialysis or not!
Documentation

How patient tolerated removal of catheter
Length of time pressure was held
Type of dressing applied
Condition of site, catheter & tip intact
Tip sent for culture (if applicable)
Instructions given for dressing care and removal
Date & time catheter removed
Blood Sampling from CVC

- Draw blood samples from distal lumen whenever possible
  - Never draw blood from lumen used to infuse TPN
- Use vaccutainer or syringe on CVC’s
  - Syringe only on PICC lines
- DO NOT use < 10cc syringe due to increased pressure created by smaller sizes
- All blood cultures must be drawn into a syringe then transferred into the container using transfer device
- Patients receiving Heparin infusions are to have venipuncture for lab draws
Blood Sampling from CVC

If the lumen is in use, turn off infusion for 5 minutes prior to draw. The lumen being used for TPN is turned off for 15 minutes prior to drawing blood from any other lumen. Do not use a lumen that TPN has had infusing through it for blood draws.

STAT blood draws are placed in blue ziplock bags.
Blood Sampling from CVC

Unclamp port & swab with alcohol, allow to dry

Attach 10cc syringe, withdraw 5 mL of blood to discard.

Clamp port. Remove injection cap & attach second 10 cc syringe or vacutainer, unclamp & withdraw amount needed for specimen(s).

Attach blood transfer device to syringe & fill blood tube(s) or insert blood tubes into vacutainer & allow to fill to designated volumes

– Fill tubes using recommended order of draw
– Invert immediately to mix with additives
Blood Sampling from CVC

After blood sampling, flush line with 10 mL normal saline or until line & cap are clear of blood.

Replace cap & restart IV infusion or flush with 10 mL of Normal Saline (always use 10mL or > size syringe), close slide clamp, then disconnect syringe.

Label all blood specimens at the bedside using armband labels. Add date, time & name of person drawing & place sticker for “line draw” on tube.
“Order of Draw”

- **Sterile**
  - Plain (Waste Tube)

- **Coag**

- **Additive:**
  
  “Go Greet Lucy Gray”

- **Other Additives**
Mix Gently by Inversion

<table>
<thead>
<tr>
<th>Color</th>
<th>Inversion Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Invert 3-4 times</td>
</tr>
<tr>
<td>Gold</td>
<td>Invert 5 times</td>
</tr>
<tr>
<td>Green</td>
<td>Invert 8-10 times</td>
</tr>
<tr>
<td>Lavender</td>
<td>Invert 8-10 times</td>
</tr>
<tr>
<td>Gray</td>
<td>Invert 8-10 times</td>
</tr>
<tr>
<td>Other Additives</td>
<td>Invert 8-10 times</td>
</tr>
</tbody>
</table>

Exception: Black tube for FDP/FSP – after 1-2 inversions, tube will clot.
Add the barcode label

Place the “Zebra” lab barcode label in straight alignment onto the tube. Assure that the MR# is visible. Do not leave wrinkles in the label.

» “Zebra” lab barcode label below

<table>
<thead>
<tr>
<th>(0000)0001234567890</th>
<th>ST</th>
</tr>
</thead>
<tbody>
<tr>
<td>07-200-01234</td>
<td>CBC</td>
</tr>
<tr>
<td>Doe, John</td>
<td>1400</td>
</tr>
<tr>
<td>3.0ml Lav Top</td>
<td>23 Jul 07</td>
</tr>
</tbody>
</table>
Place a “Line Draw” label or hand write “Line Draw” on each specimen. (Lab supplies these labels.)

Laboratory policies for collection and labeling can be found on the Lab Infoweb.
Examples of I/D/T

You can record your Initials/Date/Time above or below the barcode on the zebra label.

barcode label here I/D/T
not here /////////// not here
or here I/D/T
How much is enough?

Allow tubes to fill completely.

If it is a difficult collection, fill as much as possible.

Examples of some Minimums:

Lavender ➔ 1.5ml (3.0 to fill) (e.g. CBC only)

Green ➔ 2.0 ml (3.0 to fill)

Light Blue ➔ Less than a full tube will be rejected.

This tube MUST be filled completely.
What Causes Hemolysis?

- Hemolysis - red blood cells are broken up and hemoglobin is released into serum or plasma causing a red appearance.

- Most common cause is improper collection techniques:
  - needle too small,
  - mixing or shaking vigorously
  - alcohol contamination
  - pulling back on syringe plunger too fast or too hard
  - Pushing blood from a syringe into a tube.

- A patient with a hemolytic disease or transfusion reaction, may hemolyze in vivo.
Hemolysis – What does it do?

- Falsely elevates test results:
  - Potassium
  - AST (SGOT)
  - LDH
  - Magnesium
  - Phosphorus
  - Ammonia
  - Total Protein

- Falsely decreases test results:
  - RBC
  - Hgb
  - HCT

- Erroneous results:
  - Type and Screen/Crossmatch
What causes a “clotted” sample?

Delayed specimen transfer from the syringe into the lavender or blue top tube.

Improper or inadequate mixing of the sample.

Coagulation abnormalities.

Myths

Blood sitting in a tube too long will not cause the sample to clot if mixed properly.

The Pevco tube system & centrifuge do not cause hemolysis
Catheter Occlusion

Use Cathflo Activase to restore function to CVCs as assessed by difficulty or the inability to withdraw blood.

Indications of blockage:
- Lack of free-flowing blood return
- Inability to infuse fluids
- Increased resistance when flushing
- Sluggish flow

Try to flush the line

Inspect line for kinked tubing or catheter malpositioning
Guidelines in de-clotting

Cathfio Activase is administered per LIP order only

Avoid excessive pressure when injecting to avoid catheter rupture or expulsion of clot into general circulation

When declotting a central line, use only 10 mL LuerLock syringe
De-clotting CVC Procedure

• Confirm occlusion
• Notify LIP & obtain order:
  • “Instill Catflo Activase 2mg/2mL into occluded CVC. Allow to dwell from 30 min.-2 hrs. May repeat dose x 1”
• Reconstitute Cathflo Activase with 2.2 mL sterile water.
  • Swirl vial gently until dissolved. **Do Not Shake**
• Withdraw 2 mL of solution into 10mL syringe
• Clamp the catheter & remove injection cap or IV tubing
• Scrub the hub with alcohol, connect syringe, unclamp & instill Cathflo Activase. Close clamp
De-clotting CVC Procedure

• Leave syringe connected & secure with tape. Label syringe “Activase 2mg/2mL”, date & time, and “Do Not Flush”.

• Allow to dwell 30 minutes.

• Assess patency after 30 min. Unclamp catheter & attempt to aspirate 5 mLs of fluid
De-clotting CVC Procedure

If able to aspirate fluid (blood return is restored):

- clamp catheter
- remove & discard syringe
- Wipe hub with alcohol & attach a flushed, sterile injection cap to hub
- unclamp catheter & flush with 20 mL NS using “push, pause” method
- Clamp catheter, remove 2nd syringe & resume infusion or lock per procedure
De-clotting CVC Procedure

- If unable to aspirate:
  - Re-clamp & reassess patency again after 90 additional minutes
- If catheter function has not been restored after 90 more minutes, a second dose of Cathflo Activase may be instilled as before
- If catheter remains occluded after 2 doses of Activase, contact LIP
Midlines

Although Midline catheters are not Central Lines, there are a few things to be aware of when managing them.

- They are not peripheral IVs (PIV)
- They are not Central Lines
- They must be removed prior to discharge
- They can be kept for 29 days
- They are 8-10 cm long
- They look like a PIV
- They are removed like PIV
Midlines

• They may be used like PIV
• They are dressed like Central Lines
• The PICC team will dress them weekly
• They may be used for power infusion (5mL/sec)
• They can be used for blood draw
• They require power flushing to maintain patency
• The PICC team is willing and able to answer any questions regarding the Midline catheter
Venous Access Systems

**Venous ports** are usually located in the chest wall, and may be either single lumen or dual lumen devices.

**P.A.S. ports** are similarly implanted devices usually located in the basilic or cephalic vein of the arm, below the antecubital space.

**Power ports** function very similarly to standard venous ports but may also be used for power injection of contrast media when used with a Powerloc needle.
Venous Access Systems

Once a device has been accessed the FIRST time after placement, an order is **not** required to access it.
Venous Port: Accessing and Care

RNs and LPNs may access the port, initiate IV therapy, administer medications, draw blood samples, and de-access after performing a competency check.

Only chemotherapy-certified RNs may administer chemotherapeutic drugs via the venous port.

Accessing a port of any kind is always done under aseptic conditions.
Needles for Accessing Port

Use only a Huber Needle Extension Set (non-coring needle) when accessing the port.

**Do not** use standard hypodermic needles, as these may damage the septum.

Huber needle with extension is available in 20 gauge \(\frac{3}{4}\), 1, and 1 \(\frac{1}{2}\) inch lengths.

If patient has P.A.S. Port, use only 20 gauge, \(\frac{1}{2}\) inch or \(\frac{3}{4}\) inch Huber needle.
Power Port

Power Loc safety infusion sets are available for patients with Power Ports who are going for CT scans when they don’t have other IV access to administer the contrast.

Standard Huber needles may also be used on Power Ports if no CT is ordered, but then it is **not** considered a Power Infusion System.
Verify Power Port

Verify for the presence of a Power Port using at least 2 of the 4 options prior to accessing with Power Loc needle:

– Check the chart for a Power Port sticker if it is newly implanted.
– Ask the patient for an ID card, bracelet, or key ring providing information on the product.
– Palpate for triangular shape.
– Palpate for 3 bumps on port surface.

Document the methods used to verify the presence of a Power Port in the nurses notes.
Power Port

Once identified as a Power Port, access it with a Power Loc needle.

Date and initial the purple flag label included in the Power Loc infusion set package.

Affix the label to the infusion set tubing to alert other staff that this is a Power infusion because **both** the port and the needle are POWER injectable.
P.A.S Ports

Avoid drawing blood or infusing medications into the arm in which the P.A.S Port system is located unless you are actually using the port.

Do not measure the patient’s blood pressure on this arm.

Place a green arm-restrict wristband on the affected extremity. This will signal to all staff members that this limb is NOT to be used for Blood pressure monitoring, phlebotomy, or other IV access.
Venous Access Systems

Exercise care when administering fluid through the system.

Excessive pressure, which may damage the catheter, can easily be generated with small syringes. **It is recommended that a 10-mL or larger syringe be used to inject fluids through the system.**

Disconnect the syringe from the cap, then clamp the tubing to prevent blood backflow into the catheter tip.
Confirm Catheter Integrity

It is **essential** to confirm the port’s integrity before any injection or infusion therapy by completing the following steps.
Confirm Catheter Integrity

Inquire if the patient has experienced any symptoms that might warn of catheter fragmentation or embolization since the system was last accessed. These might include:

- Shortness of breath
- Chest pain
- Palpitations

If any of these symptoms are reported, an x-ray is recommended to determine catheter integrity.
Venous Port: Accessing

A Physician’s order to access a venous port is only required for the first access on a newly implanted port.

Ports are de-accessed and re-accessed every 7 days with dressing change (inpatient).

Dressing changes are done every 7 days or when soiled, damp, or loose.

Don’t forget the BIO-Patch!
Assess Port Pocket

Examine and palpate the port pocket and catheter tract for signs which might indicate system leakage:

– Erythema
– Swelling
– Tenderness
– Bruising
– Wound hematoma
– Accumulation of serous fluid at the implant site

If system leakage is suspected, an x-ray is recommended to determine if there are problems with the system.
Wash your hands.

Set up the sterile field and supplies.

Sterile pre-filled NS syringes are available and can be placed on the sterile field (specified on syringe and not to be confused with individually packaged non-sterile syringes).

If the patient desires, anesthetize the site with 1% Xylocaine (0.2mL), LMX-4 topical anesthetic, or Pain Ease vapocoolant spray.
Put on sterile gloves.

Cleanse the site with chlorhexidine prep for 30 seconds using a back and forth motion while applying friction. Cover an area approximately 4 - 5 inches in diameter. Allow to dry completely.

Prime the extension set and non-coring needle to remove all air from the fluid path and check patency. Leave the syringe attached.
Venous Port: Accessing

Locate the port by palpation.

Immobilize the port using the thumb and fingers of the non-dominant hand. Assess if the port is single or dual lumen.

Insert the needle steadily through the skin and portal septum at a 90° angle to the septum and slowly advance the needle until it touches the bottom of the portal chamber.

Avoid excessive pressure on the needle once it has reached the bottom of the port.
Venous Port: Accessing

Using a 10mL syringe, flush with 3mL NS, then aspirate for blood return. **Stop aspirating as soon as blood visualized.**

If blood is inadvertently mixed in the NS syringe, clamp the tubing and replace with a fresh syringe and flush.

Otherwise, flush with the remaining saline using push/pause technique.

**Note:** If accessing a dual-lumen port, perform the previous steps for both chambers.
Venous Port: Accessing

Difficulty in withdrawing blood may indicate catheter compression or obstruction.

During this saline flush, observe the port pocket and catheter tract for swelling, and inquire or observe whether the patient is experiencing burning, pain, or discomfort.

If any of these symptoms are noted, and/or swelling of the port pocket or tract is noted, fluid infiltration into pocket or catheter tract should be suspected.

Notify the LIP.
Venous Port: Accessing

When using a bent needle or winged infusion set, the needle hub should lie flush against the skin.

If the hub of the needle does not lie flush against the skin, you may use a 2x2 sterile gauze to support the infusion set.

Do not place a 2x2 gauze over the insertion site itself.

Apply a Bio-patch™ and bioclusive dressing.
Venous Port: Accessing

Close the clamp, disconnect the syringe, and attach a primed injection cap.

Connect IV fluids if a continuous infusion is ordered.

- Or -

Heparin Lock with Heparin 5mL (10 units/1 mL) and flush every 12 hours with Heparin 5 mL (10 units/1 mL).

Complete the label supplied in the dressing kit - including date, length, and gauge of needle used - and attach to the dressing with tape. Remove gloves and ...
Venous Port: Accessing

Wash your hands
When giving IV piggybacks or push meds., remember the mnemonic “SASH”

- **S**: Saline (10 mL)
- **A**: Administer Drug
- **S**: Saline (10 mL)
- **H**: Heparin – 5 mL (10 units/mL)
Venous Port: Deaccessing

For outpatients and patients being discharged: flush with 10mL NS followed by 5mL (100 units/mL) Heparin solution.

Immobilize the port with your non-dominant hand while removing the needle. Activate the safety on the Huber needle as you withdraw so that opportunities for needle-stick are minimized.

Discard the needles and syringes into the sharps container.

Cover the site with a sterile 2x2 gauze.

Document the procedure in the patient’s medical record.
## Troubleshooting: Difficulty Flushing

<table>
<thead>
<tr>
<th>Signs and Symptoms</th>
<th>Possible Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resistance felt when pushing on plunger during flush</td>
<td>Clamps may be closed on tubing or extension set</td>
</tr>
<tr>
<td>Unable to flush or infuse</td>
<td>Catheter may be wedged against vessel wall or in smaller vessel</td>
</tr>
<tr>
<td>Gravity infusions noted to be “sluggish”</td>
<td>If it is a chest-placed system, the catheter may be kinked or “pinch-off syndrome” may be occurring</td>
</tr>
</tbody>
</table>
Troubleshooting: Difficulty Flushing

“Pinch-off syndrome” signs:

– Unable to flush or aspirate when the patient is sitting, but able to easily flush or aspirate fluid when the patient lies flat.

– May be an initial sign that catheter is susceptible to fracture or clotting off.
Troubleshooting: Difficulty Flushing

Possible Solutions:

– Re-access the portal with a new needle of appropriate length. Insert the needle completely through portal septum at a 90° angle.

– Using a 10mL or larger syringe, flush with NS, alternating between irrigation and aspiration. Check flow. If resistance still detected and thrombosis is suspected, a fibrinolytic agent may be necessary.

– If there is a problem due to drug precipitation, a fibrinolytic will not be effective.
# Troubleshooting: Pain when Port Palpated

<table>
<thead>
<tr>
<th>Signs and Symptoms:</th>
<th>Possible Causes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Redness, tenderness, and swelling at or around the portal site and/or along the catheter tract.</td>
<td>Portal pocket or catheter insertion site may be infected.</td>
</tr>
<tr>
<td>Skin is warm to the touch.</td>
<td>Vein irritation because of implantation technique, infusion of acidic or alkaline solutions, or infection of vein related to contaminated catheter.</td>
</tr>
<tr>
<td>May or may not see drainage at the non-coring needle insertion site.</td>
<td>Needle may have been accidentally pulled out of the septum and is in the surrounding tissue. Fluid may be infusing into the tissue.</td>
</tr>
</tbody>
</table>
Troubleshooting: Pain when Port Palpated

Check for drainage or discharge at the insertion site and assess the patient for other signs or symptoms of infection such as:

– Fever
– Chills

If any of these signs or symptoms are present, notify the physician.

Re-evaluate the site care regimen and procedure as well as the implantation procedure.
### Troubleshooting: Moisture At Or Around Insertion Site

<table>
<thead>
<tr>
<th>Signs and Symptoms:</th>
<th>Causes:</th>
<th>Solutions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dressing is damp or saturated.</td>
<td>Dressing may have been exposed to water or excessive perspiration.</td>
<td>Inquire about patient’s recent activity, which may explain the dampness of the dressing.</td>
</tr>
<tr>
<td>Noticeable amount of fluid has collected under the dressing.</td>
<td>Connections between the non-coring needle extension set tubing and injection cap or extension set hub may be loose.</td>
<td>Change the dressing if necessary.</td>
</tr>
</tbody>
</table>
### Troubleshooting: Moisture At Or Around Insertion Site

<table>
<thead>
<tr>
<th>Signs and Symptoms:</th>
<th>Causes:</th>
<th>Solutions:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swelling is noted under the dressing.</td>
<td>Needle may be displaced.</td>
<td>Tighten connections.</td>
</tr>
<tr>
<td>Upon palpation, fluid may leak from the portal site.</td>
<td>Septum integrity may have been compromised.</td>
<td>Re-access the portal with a new needle of the appropriate length. Determine the correct needle placement by aspiration of blood. If unable to aspirate blood, notify the physician.</td>
</tr>
</tbody>
</table>
Done!

This completes the section on IV therapy.
To review the functions of the IV pump used at CFVHS ...

BBraun Infusomat

Infusomathttp://www.youtube.com/watch?v=7L1J4p4PXPU