PATIENT CARE MANUAL POLICY

NUMBER IV-45
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PAGE 1 OF 2

APPROVED BY: Vice President, Covenant Health Rural Health Services and Executive Lead for Professional Practice & Research

CATEGORY: Fluid / IV / Parenteral Therapy

TITLE: Peripheral IV Catheter

Purpose
To outline the educational requirements for clinical competency for initiation of peripheral intravenous catheters.

Policy Statement
Prior to initiation of a peripheral intravenous catheter, Covenant Health qualified staff shall have successfully completed theory and a demonstration of competency

If a qualified staff member has made two unsuccessful attempts at catheter insertion, the qualified staff on the unit with the most advanced IV skills should evaluate the patients' venous access. Further insertion attempts should be made only if venous access is deemed adequate. Multiple unsuccessful attempts limit future vascular access and cause unnecessary trauma to the patient. If the patient has limited venous access, the physician/Nurse Practitioner should be notified; another type of vascular access device should be established; or alternative routes for medication administration need to be evaluated. (For example, dehydrated patients may require hypodermoclysis. Once hydrated, the patient may have adequate venous access.)

Requirements: Education / Demonstrated Skills
Prior to initiation of a peripheral intravenous catheter, Covenant Health qualified staff shall have successfully completed a course of study consisting of theory which covers the following content:

- IV therapy and Infection Control
- Selection of venipuncture site
- Selection of IV device
- Preparing the patient for venipuncture
- Insertion of the catheter
- Securing the device
- Care of the IV site
- Local complications of IV therapy
- Systemic complications of IV therapy
- Practice on an artificial arm or simulator to become familiar with the procedure and the equipment
The theory portion may be completed by self study including a written exam.

Once theory has been successfully completed, the qualified staff must demonstrated competency by successfully inserting a minimum of three successful insertions prior to independently initiating peripheral IV catheters. The Clinical Nurse Educator (CNE) or designate may indicate that additional IV starts may be required to obtain competency.

If theory and practicum have been completed at an educational institution, or another hospital, a letter or certificate will be accepted as proof of completion. At least one successful insertion must be demonstrated prior to performing the skill independently. Demonstration of additions insertions may be required at the discretion of the CNE.

**Applicability**
This policy and procedure is applicable to Covenant Health, Edmonton Acute Care, and patient care provider staff.

**Responsibility**
Venipuncture for the initiation of peripheral IV access is a skill that requires practice and frequency to maintain competency. After initial competency is demonstrated, it is the qualified staff members’ responsibility to maintain their knowledge and ability so they are able to safely implement the skill at all times.

It is the staff members’ responsibility to identify and communicate when they are no longer qualified to initiate peripheral IV catheters. If this skill is a unit expectation, notify the unit supervisor or clinical nurse educator so that further education can be provided.

**Principles**
Venipuncture done to initiate a peripheral IV is commonly seen by patients as one of the most painful and frequently performed invasive procedure done by nurses and other staff. Multiple venipuncture attempts can heighten patient anxiety and suffering, delay vital treatment and increase costs. Failed attempts can compromise the trust and confidence the patient and family has in the nursing staff.

**Definition**
Qualified Staff are health practitioners who are authorized to initiate peripheral intravenous catheters in accordance with their respective practice Regulation under the Health Professions Act (or other legislation) and who are permitted to initiate peripheral intravenous catheters in accordance with Covenant Health policy.
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Attachments:
ProtectIV® Safety I.V. Catheter
Accuvance® Safety IV Catheter
BD Insyte™ Autoguard™ Shielded IV Catheters
BD DecisIV™ Educational Brochure – Complications of Peripheral IV Access
BD DecisIV™ Educational Brochure – Phlebitis – Inflammation of the Intimal Lining of the Vein
StatLock® IV Premium Stabilization Device
Interlink® I.V. Access System Blood Collection Techniques - poster
TITLE: Peripheral IV Catheter

1.0 PURPOSE

An IV catheter may be inserted for the following reasons:

- To correct or maintain fluid and electrolyte balance.
- To administer blood or blood components.
- To correct or maintain nutritional state.
- To administer continuous or intermittent medication.
- To establish venous access in case of emergency.
- To maintain a route for the purpose of administering general anaesthesia or diagnostic reagents.

2.0 GENERAL INFORMATION

2.1 A physician's / NP order is required. An order must include the type of IV solution, the rate of infusion, the physician's /NP signature and date (eg. June 24, 2010 IV 2/3-1/3 at 100 mL/hour Dr. E. Jones).

2.2 A nurse may not attempt to initiate an IV more than two times on any one patient. Attempts must be documented.

2.3 Consider alternate devices:

2.3.1 If the patient does not have three possible sites for peripheral catheter placement,
2.3.2 The infusate is greater than 600mOsm/L or pH less than 5 or greater than 9.
2.3.3 The patient will require IV therapy for more than one week.

2.4 Two patient identifiers must be used prior to initiation of procedure per Covenant Policy #II-38, Identifying Patients Using Two Identifiers. Always explain procedure and obtain verbal consent from patient. Do not attempt insertion if patient refuses to cooperate with procedure.

2.5 Venipuncture in lower extremities should be reserved for unusual or emergent situations. Lower extremity peripheral veins should be AVOIDED due to sluggish circulation and increased risk of frequency of complications such as pulmonary embolism and thrombophlebitis. Do not use the lower extremity in diabetic patients.

If a catheter is inserted in the lower extremity of an adult patient, it should be changed as soon as central venous access or an appropriate site in an upper extremity can be established.
2.6 An IV catheter should not be left in if any complications are observed; i.e. tenderness, redness, swelling, leaking, pain, or phlebitis. Remove the cannula at the first sign of complications.

Observe insertion site and document observations in patient care record.

- prior to attaching/administering any intermittent intravenous medication and
- hourly for continuous infusions.

2.7 IV catheter should be removed as soon as it is no longer required.

2.8 An IV inserted under emergency situations should be restarted as soon as patient is stabilized but within 24 hours of the emergency.

3.0 EQUIPMENT

- IV solution
- IV administration set (primed) and tubing label or
- Extensions set and flush solution as appropriate
- Individually packaged IV start kits
- Catheter
- Pole / infusion pump
- Protective gloves
- Peripheral catheter stabilization device (optional).

Note: A new administration set is used for new IV sites.

4.0 PROCEDURE

4.1 Perform hand hygiene with alcohol based hand rub, or if hand are visibly soiled, soap and water. Assemble equipment and bring to bedside.

4.2 Identify the patient using two identifiers. Ensure patient has armband on.

4.3 Explain procedure to patient. Ensure the patient is comfortable and is screened for privacy.

4.4 Remove any garment that will be difficult to remove following insertion or that impedes IV flow.
4.5 **Select intravenous site and vein.** Examine both arms carefully. Care must be taken when selecting a site in order that insertion is successful and that veins are protected for future IV therapy. Use the smallest gauge cannula in the largest vein to decrease complications. See "Guidelines for Vein and Site Selection" (Table 1).

**GUIDELINES FOR VEIN AND SITE SELECTION**

- **TABLE 1 –**

1.0 **Suitable Location**

- Avoid hand veins in the elderly.
- Use patient’s non-dominant arm, if possible, to maximize patient’s independence.
- Avoid areas of flexion (wrist or antecubital fossa).
- Use hand and forearm veins (do not perform Venipuncture in lower extremities in adults due to the risk of phlebitis).
- Choose site above infiltration, phlebitis or hematomas or away from traumatized tissue.
- Avoid using an arm with diminished sensation or mobility (i.e. hemiplegia, circulation, neurological impairment, burn area, amputated limb, etc.)
- DO NOT USE affected arm of a post-mastectomy patient.
- DO NOT USE arm with arteriovenous (AV), graft, shunt, or fistula for dialysis.
- DO NOT USE the palm side of the wrist because the radial nerve is located near the vein, causing excessive pain during insertion and potentially causing nerve damage.

If the IV is to be inserted pre-operatively, the location is determined by the type of surgery.

Cannulation should be made proximal to a previously cannulated site.

2.0 **Condition of the Vein**

- Avoid previously used veins.
- Select a vein that is large enough to allow adequate blood flow around the catheter.
- Choose soft and “bouncy” veins.
- Avoid hard, cordlike or discoloured veins (sclerosed).
- Avoid vein bifurcation.
- Avoid valves (detected by hard lump or knot-like feeling).
- Avoid antecubital veins for routine IV therapy.
- Do not cannulate veins of lower extremities in adults because of the increased risk of phlebitis.
### GUIDELINES FOR VEIN AND SITE SELECTION - TABLE 1 –continued

#### 3. Purpose of the Infusion
- Small veins may be used for short term IV fluids.
- Choose a large vein if large volumes of fluid, or a Pressure Infuser is used.
- A large vein is required for hypertonic solutions (i.e. PPN [peripheral parenteral nutrition]), viscous solutions (i.e. packed cells), and irritating medications (i.e. KCl, antineoplastic drugs, and antibiotics).
- Therapies with an osmolality greater than 600 mOsm/L, vesicant therapy, Parenteral Nutrition and infusates with a pH less than 5 or greater than 9 are not appropriate for peripheral-short catheters. Consider CVC if these therapies are required.

#### 4.0 Duration of IV Therapy
- If prolonged therapy, use alternating arms to help conserve veins.
- Use distal veins first.

#### 5.0 Patient Considerations
- Patient preference, if possible.
- Patient cooperation/comfort.
- Patient age - avoid use of metacarpal veins in elderly patients.

#### 6.0 Preoperative Considerations
- IV’s for surgical patients should be 20 gauge or larger.
- Initiation attempts are restricted to two on a single patient. Attempts are restricted to one for each patient if only one arm can be used because of surgical site or mastectomy with nodes.
- IV tubing should be securely seated in the IV catheter before tightening the luer connection to prevent leakage.
- Secure the IV well to prevent accidental dislodgement/ use securement device.
- Use a macro-bore extension set for high flow infusions.

#### 4.6 Select IV Catheter:
- Choose the smallest gauge and shortest length that will accommodate the prescribed therapy, and insert into a large vein. Using the smallest/shortest catheter reduces trauma to the vein, promotes proper hemodilution of the infusate and allows blood flow around the cannula.
- When determining the size of catheter needed, consider: The size and location of the vein; the condition and age of the patient; the purpose of the infusion. See "Guidelines for Selecting IV Catheter Gauge" - Table 2.
### GUIDELINES FOR SELECTION IV CATHETER GAUGE

**- TABLE 2 -**

<table>
<thead>
<tr>
<th>Gauge</th>
<th>Description</th>
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<tbody>
<tr>
<td>14 - 18 g</td>
<td>life threatening emergencies, trauma, surgery, rapid infusions of blood* and blood products, rapid infusion of large volumes</td>
</tr>
<tr>
<td>20 g</td>
<td>infusions of blood, surgery or viscous infusates</td>
</tr>
<tr>
<td>22 g</td>
<td>TPN, intermittent medication administration or general infusions, children and elderly</td>
</tr>
<tr>
<td>24 g</td>
<td>fragile veins for intermittent or general infusions, children or elderly</td>
</tr>
</tbody>
</table>

* Blood and blood components may be infused through a 24g catheter if necessary, but rate will be very slow (the unit should be divided by the Blood Bank).

**NURSING ALERT:**

- Gauge of IV catheter must be smaller than lumen of the vein entered to ensure adequate hemodilution and blood flow around the catheter.
- Always use a short catheter unless patient is obese.

4.7 Dilate vein. Assess each patient to determine which method should be used.

4.7.1 Tourniquet Application Method

- Apply enough pressure to impede the venous flow while arterial flow is maintained.
- Initially apply tourniquet above antecubital fossa to allow visualization and assessment of entire limb.
- Apply tourniquet 10 - 15 cm (4-6”) above the intended puncture site.
• Ensure tourniquet is snug but not painful or too tight. A radial pulse should ALWAYS be palpable. Allow veins time to fill.

• NEVER leave tourniquet in place for longer than 2-3 minutes. During site preparation, remove tourniquet to minimize discomfort for patient and reapply before actual Venipuncture.

• If pressure exerted by the tourniquet does not fill the veins sufficiently, the patient may open and close the fist. The action of the muscles will force the blood into the veins, causing them to distend considerably more.

• For fragile veins (such as elderly patients and patients receiving anticoagulant therapy), tourniquet may be applied loosely - only if necessary.

NOTE: Tourniquets are single use items, discard after use.

4.7.2 Dangling the Arm Method

• Lower the extremity below the heart level to increase the blood supply to the veins and have patient open and close the fist.

4.7.3 Heat Method

• When veins are difficult to visualize the application of heat allows vasodilation and vein relaxation.

• Wrap a warm, moist towel around entire extremity and apply an outer covering, secure covering with tape. (Ensure tourniquet has been removed.)

• Remove after 10 - 15 minutes, reapply tourniquet and reassess the veins.

• This method may be very useful to patients who are cold or anxious.
4.7.4 Relaxation Method

- Deep breathing, distraction and visualization may help relax the frightened or anxious patient. Anxiety may cause vasoconstriction.

- Administering a warm liquid or warm blanket can also promote vasodilation.

**NURSING ALERT:**

- Further vein dilation may not be required for patients who are muscular or severely hypertensive.

- Avoid using a tourniquet on patients that are severely hypertensive or have fragile or sclerosed veins (eg. elderly) as tourniquet may cause the wall of vein to rupture.

- Protect the fragile skin of patients that bruise easily by using the gown sleeve or a pad under the tourniquet.

4.8 Prepare the Site:

4.8.1 If the patient's skin is not clean prior to insertion, wash it with soap and water. Allow to dry thoroughly.

4.8.2 **Clip** excessive hair at the site with surgical clippers or scissors. To avoid cross-contamination, **DO NOT SHAVE** as this may cause micro abrasions and predisposes the patient to infection.

   **NOTE:** To avoid cross-contamination, clipper heads are single patient use.

4.8.3 Cleanse site with chlorhexidine/alcohol swabs using friction in a circular motion from intended venipuncture site outward for at least 30 seconds in a 5 - 7 cm (2-3 inches) diameter. Allow at least 30 seconds for the chlorhexidine to air dry. (If patient is allergic to chlorhexidine gluconate, use 70% Isopropyl alcohol [alcohol swabs].)

4.8.4 Allow site to dry completely (at least 30 seconds). Do not contaminate site by touching once site has been prepared.
NURSING ALERT:

- If you must palpate the vein at the insertion site, maintain aseptic technique by prepping your finger with the chlorhexidine or alcohol swab at the time you prep your patient's skin.

4.9 Prepare equipment:
- prepare two tapes for securing the tubing
- open package of IV transparent dressing
- open package of 5 x 5 cm gauze
- open IV catheter package
  Open catheter securement device if using

4.10 Apply protective glove(s).

4.11 IV Insertion Method

4.11.1 Remove needle cover from IV catheter and inspect carefully.

4.11.2 Anchor the vein by placing your non-dominant thumb below the site of insertion to stretch the skin taut against the direction of insertion. Maintain good traction on skin.

NURSING TIP:

Skin stabilization is an important element of successful Venipuncture.

4.11.3 "GO LOW". Hold flashback chamber of IV catheter with the bevel up and enter the skin directly on top of the vein at a 10 to 30 angle in the direction of venous flow. A vein located superficially requires a smaller cannula angle. A vein located deeper in subcutaneous tissue requires a greater angle. "GO SLOW". A less aggressive approach to the vein prevents posterior wall penetration. NOTE: Catheter is very sharp.
**NURSING ALERT:**

- Indirect method of vein entry can be alternately used when veins are small and rolling or skin is tough or fragile. The IV catheter enters at a $10^\circ - 30^\circ$ angle piercing the skin beside the vein. The catheter is inserted laterally into the vein once blood is visualized in flashback chamber.

4.11.4 Upon blood flashback visualization stop, then drop the angle of the IV catheter to almost a horizontal position to the skin and advance the IV catheter 3 mm ($1/8"$) to ensure catheter tip as well as stylet tip is in the vein.

4.11.5 Use "hooding" technique as follows to minimize the risk of posterior wall penetration and advance catheter into vein.

- Pull stylet out 6 mm ($1/4"$) from catheter hub then advance entire "unit" into the vein by grasping catheter hub and advancing into the vein.

**NURSING ALERT:**

- DO NOT reinsert stylet.
- Only two attempts by one person permitted.
- A sterile catheter is used for each attempt.

If a nurse has made two unsuccessful attempts at catheter insertion, the nurse on the unit with the most advanced IV skills should evaluate the patients’ venous access. Further insertion attempts should be made only if venous access is deemed adequate.

4.11.6 Hold IV catheter steady and release tourniquet.
4.11.7 Place sterile 5 x 5 cm gauze under the hub of the IV catheter. Activate needle safety device before removing stylet. See attached posters for directions for enabling safety devices for ProtectIV® Safety I.V. Catheter, Accuvance® Safety IV Catheter, and BD Insyte™ Autoguard™ Shielded IV Catheters. Remove the stylet while applying firm digital pressure **above** the catheter with one finger. Dispose of stylet in sharps container.

4.11.8 Connect the new primed IV administration set to catheter hub or attach IV extension set with Interlink® injection cap. Remove digital pressure. Remove gauze and dispose.

**NURSING TIPS:**

- You may apply transparent dressing to IV insertion site prior to connecting IV administration set.
- To make a luer lock connection, first turn the tubing anti-clockwise until it enters a groove, and then tighten clockwise.
- To avoid contamination do not touch end of hub or insertion site.

4.11.9 Open clamp on administration set slowly or flush and lock IV catheter. Observe the site for infiltration or leaking.

4.11.10 Regulate the infusion rate. You may tape tubing to secure prior to dressing application to minimize the risk of accidental dislodgement of the IV catheter.

4.11.11 Protect the IV catheter with 6 x 7 cm IV transparent dressing. Attach securement device if using. See attached poster for directions for use for StatLock Premium.

4.12 Ensure site is clean and dry.

4.12.1 See figures below to apply transparent dressing. **Apply the dressing to top edge of the hub.**

4.12.2 Do not stretch the dressing during application. Relax the film around the hub so the dressing edges can be pinched together under the catheter to assure a good seal. Figure 1
4.12.3 Firmly smooth down the dressing edges as the frame is slowly removed. Figure 2

4.12.4 Gently pinch and seal the dressing snugly around the catheter. Figure 3

4.12.5 Smooth down the entire dressing from the center out to the edges, using firm pressure to enhance adhesion. Figure 4

4.12.6 Document insertion in Patient Care record:
  • Record when initiating, discontinuing or attaching a unit of fluid or if multiple attempts were necessary.
    ▪ catheter insertion date, gauge, location on body
    ▪ unsuccessful attempts
    ▪ date of dressing change.
  • Record any local or systemic complications and care given in patient care record.

NURSING TIP:

No Sting® Barrier swab may be used on the skin to form a protective barrier (for fragile skin) and to increase dressing adhesion and comfort. To apply No Sting® Barrier, simply swab skin in a “painting” motion to form a single layer of barrier. Allow to dry. Apply transparent dressing.
4.13 Anchor IV administration set with tape. Secure IV tubing with one tape below insertion site and one tape above insertion site. **Do not** place tape over the transparent dressing.

4.14 Adjust flow rate as ordered using regulating flow clamp or programming infusion pump.
TITLE: Peripheral IV Catheter

NURSING ALERT:

· To calculate drop rate per minute use formula:
  \[
gtts/\text{min.} = \frac{\text{mL/hr} \times \text{gtts/ml}}{\text{min/hr} (60)}
\]

· To calculate hourly infusion rate use formula:
  \[
  \text{mL/h} = \frac{\text{total volume to be administered}}{\text{total number of hours}}
\]

· To Calculate flow rates by dose:
  \[
  \frac{\text{dose on hand}}{\text{dose desired}} \times \text{dilution} = \text{infusion rate/hr}
\]

4.16 Monitoring of IV site and infusion for local complications:
  4.16.1 Q1h for continuous infusions. Observe infusion rate q1h.
  4.16.2 Before, during and immediately after intermittent IV medications are administered
  4.16.3 Saline locks every shift
# 5.0 COMPLICATIONS

<table>
<thead>
<tr>
<th>Complication</th>
<th>Signs and Symptoms</th>
<th>Cause</th>
<th>Prevention</th>
<th>Action</th>
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<tbody>
<tr>
<td>Phlebitis – Mechanical and/or post infusion</td>
<td>See attachment - BD Phlebitis poster for pictures of Phlebitis scale</td>
<td>Rapid catheter advancement</td>
<td>-Insert catheter slowly</td>
<td>Remove catheter.</td>
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<tr>
<td>Thrombosis / thrombophlebitis. The formation of a blood clot within a blood vessel caused by insertion of the catheter. Platelets adhere to the vessel wall and a thrombus is formed.</td>
<td>Phlebitis Scale 0 = No clinical symptoms 1 = Erythema at access site with or without pain 2 = Pain at access site with erythema and/or edema 3= Pain at access site with erythema, streak formation, and/or palpable venous cord 4= Pain at access site with erythema, streak formation, palpable venous core &gt; 1 inch in length and/or purulent drainage. Swelling of the extremity, tenderness</td>
<td>-Catheter advancement without anchoring the skin and vein by holding traction on the skin Insertion of catheter too large for lumen of vein Insertion of catheter close to area of joint flexion without adequate support from arm board location of catheter tip that causes impingement of tip on vein wall Inadequate catheter stabilization, allowing for motion of catheter Infusion of hypertonic or hypotonic solutions/infusion of solution with pH less than 5 or greater</td>
<td>-Anchor skin and vein by holding traction on skin Insert small catheter into large vein avoid areas of flexion or use an arm board Pick area were vein is straight/avoid valves Stabilize catheter well; consider use of a stabilization device manufactured specifically for peripheral IV sites.</td>
<td>Obtain culture swab if drainage from site prior to cleaning skin. Cover with sterile gauze. Apply warm compresses. Do not massage site. If streak formation or palpable cord, measure and document. Physician or NP may order insertion site to be treated with oral diclofenac or NSAID or topical diclofenac. If IV still required, place catheter in the other arm if possible, or in a separate vein that does not form a tributary of the traumatized vessel. Use a new infusion set and new solution container. Access patient for systemic infection or pulmonary embolism. If infection suspected, culture the catheter tip. Notify physician or NP.</td>
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<td>Ecchymoses (Infiltration of blood into the tissue) Hematoma Uncontrolled bleeding at insertion site</td>
<td>Bruising around insertion site Bleeding from site during venipuncture</td>
<td>Unskilled inserter Patients receiving anticoagulants/patients with bleeding abnormalities Patients receiving long term steroids</td>
<td>-Have highly skilled professional attempt insertion -Avoid multiple entries into a vein Avoid attempts into veins that are difficult to visualize or palpate</td>
<td>-If bleeding noted during Venipuncture, remove the catheter immediately and apply direct pressure. And elevate the extremity. Cold may be applied to prevent further enlargement of the hematoma. Monitor for circulatory, neurological and motor function.</td>
</tr>
<tr>
<td>Occlusion (Occluded catheters present a risk of thrombophlebitis or pulmonary emboli)</td>
<td>No evidence of solution infusing Downstream occlusion pump alarms Resistance when attempting to flush</td>
<td>Flush solutions not administered appropriately Empty IV containers Administration of incompatible solutions or medications</td>
<td>Follow flushing guidelines/ never try to flush an occlusion into the bloodstream Change solution containers when less than 100mL remain. Use a time tape Ensure all fluids and medications infused into one IV site are compatible</td>
<td>Remove catheter</td>
</tr>
<tr>
<td>Site Infection at skin catheter junction</td>
<td>Erythema, edema and/or purulent drainage from insertion site</td>
<td>Break in aseptic technique either during catheter insertion, care or removal</td>
<td>Maintain aseptic technique</td>
<td>Remove catheter and; send tip for culture; Obtain culture swab from insertion site. After obtaining swab, clean skin with 70% isopropyl alcohol and cover with sterile gauze. Consider obtaining blood culture. Re-site IV in other arm. Apply warm, moist compresses.</td>
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<tr>
<td>Septicemia / bacteremia</td>
<td>Fever / chills / increased WBC count</td>
<td>Break in aseptic technique either during catheter insertion, care or removal</td>
<td>Maintain aseptic technique</td>
<td>Remove catheter; send tip for culture; Obtain blood cultures Notify physician or NP</td>
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<tr>
<td>Infiltration (leakage of fluid or non-vesicant medication into surrounding tissue)</td>
<td>See attachment – BD DecisIV™ Educational Brochure – Complications of Peripheral IV Access for pictures of Infiltration Scale</td>
<td>Catheter dislodgement caused by joint movement when catheter placed in area of flexion</td>
<td>-Avoid areas of flexion or use arm board to protect site Note: arm boards should be well padded and applied so that they will not cause constriction or pressure areas. -place smallest gauge and shortest length catheter to accommodate infusion -Avoid subsequent sites proximal to previous sites</td>
<td>Remove catheter immediately when signs and symptoms occur. To determine if the catheter is in the vein, apply pressure to the vein 2 inches above the insertion site, if the catheter is in the vein, the infusion will stop or slow. If the infusion continues despite the venous obstruction and infiltration has occurred. Monitor site closely for evidence of infiltration (Watch for blanching, stretched skin, firm tissues and coolness. Compare one arm to the other, watch for dependant edema)</td>
</tr>
<tr>
<td>Note: Infiltration may cause significant morbidity, including skin necrosis, finger stiffness, and nerve irritation, and neuropathy and compartment syndrome.</td>
<td>Previous IV sites distal to the current site</td>
<td>Inflammation resulting from irritating solutions</td>
<td>Infusion of hypertonic or hypotonic solutions/infusion of solution with pH less than 5 or greater than 9 or if infusate is greater than 600 mOsm/L.</td>
<td>Stabilize the catheter to minimize in/out movement</td>
</tr>
<tr>
<td>Complication</td>
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<tr>
<td>Extravasations</td>
<td>Is the inadvertent administration of a vesicant solution or medication into the surrounding tissue. See list of irritant/vesicant medications. – in development A vesicant is a solution or medication that can cause blistering sloughing of tissues and tissue necrosis when extravasation occurs. Irritant is a medication that may cause itching, phlebitis, or reaction along the vessel or at the injection site.</td>
<td>-Catheter dislodgement caused by joint movement when catheter placed in area of flexion -previous IV sites distal to the current site Previous IV sites distal to the current site Consider using a central venous catheter for infusion of vesicants</td>
<td>Complete assessment of the patient, the IV site, the involved extremity, and the infusion system at regular intervals during the infusion of vesicant medications The nurse must know if the patient has a history of multiple venipunctures, where they were located and how long ago the sites were used. Vesicants may seep into the tissue at previous vein entry sites Secure the catheter properly to prevent an in and out motion, which can enlarge the vein entry site and cause the vesicant to seep into the interstitial tissues, resulting in an extravasations. Avoid digits, hands, wrists and areas of flexion because of the close network of tendons and nerves that would be destroyed if extravasations occur.</td>
<td>Stop infusion. Call physician/NP. Consider consulting plastic surgery Extravasation/Infiltration and Care of the Patient for immediate nursing care.</td>
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6.0 REMOVAL OF IV CATHETER

6.1 Wash hands with soap and water or alcohol based hand rub.

6.2 Assess insertion site for evidence of local complications.

6.3 Clamp tubing, remove tape and transparent dressing. (TIP: To remove transparent dressing, grasp one edge of dressing and slowly peel dressing in direction of hair growth while securing IV catheter. Use alcohol swab or double-sided tape to lift edge of dressing [Figure 7] or use the tape as a tab to help you slowly peel back the dressing [Figure 8].)

6.4 Apply protective gloves.

6.5 Remove catheter using a slow steady movement and keeping the hub parallel to the skin.

6.6 With extremity elevated, gently apply pressure with dry sterile gauze to insertion site until bleeding stops.

6.7 Assess IV catheter’s integrity and length. Dispose of IV catheter into sharps container.

**NURSING ALERT:**

If catheter is not removed intact, place a tourniquet on upper portion of extremity and notify physician/NP immediately.

7.0 PATIENT TEACHING

7.1 Explain procedure to patient prior to venipuncture.

7.2 Instruct patient not to adjust flow rate or bend or pinch the tubing.

7.3 Instruct patient to inform nurse if any sensations of swelling, heat, pain, burning or drainage are noted at insertion site or if blood is backing up in tubing.

7.4 Instruct patient not to manipulate dressing or catheter.
7.5 Demonstrate precautions for ambulating with an IV if patient is ambulatory.

7.6 Instruct patient to inform nurse if infusion stops or infusion pump alarms. Instruct patient not to try adjusting pump on own.

7.7 Instruct patient how to bathe with IV site.

8.0 DOCUMENTATION

8.1 Patient Care Record

- Record when initiating, discontinuing or attaching a unit of fluid or if attempts were unsuccessful.
- Record any local or systemic complications and care given in patient care record.

8.2 Medication Record

- Record all medications added to primary or auxiliary unit.
- Record locking solution.

8.3 Intake and Output Record

- Record amounts of all IV fluids infused in each 8 or 12 hour period on appropriate form used in your area. Record each special product separately (i.e. IV Fluid, TPN solutions, Mini-bag, Blood, etc.)
- Inpatients on continuous IV therapy require intake and output q shift.

9.0 REFERENCES

3M Health Care - Tegaderm.


Infusion Nurses Society. Infusion Nursing Standards of Practice. Supplement Jan/Feb 2006 Vol 29, Number 1S


Registered Nurses Association of Ontario. (2005). Nursing Best Practice Guideline: Care and Maintenance to reduce vascular access Complications

Rickard C. McCann D, Munnings J, McGrail M. (2010) Routine resite of peripheral intravenous devices every 3 days did not reduce complications compared with clinically indicated resite: a randomised controlled trial. BioMed Central 8:53


INSERTION TECHNIQUES

ONE-HANDED TECHNIQUE

2a
Place finger on primary push-off tab and withdraw catheter to desired length. As you thread, the needle guard begins to open. DO NOT INSERT NEEDLE INTO CATHETER AT ANY TIME - needle could penetrate skin.

3a
Using finger to stabilize device at push-off tab, insert needle into needle guard by rotating ribbed needle housing with thumb and index finger. The needle will "click" when locked.

4a
Apply digital pressure to withdraw and ream tip of catheter. Holding the ribbed needle housing with one hand and the hub with the other, remove needle guard by twisting gently, pulling head of the catheter hub.

TWO-HANDED TECHNIQUE

2b
Holding the ribbed needle housing steady with one hand, place thumb of other hand behind primary push-off tab and withdraw catheter to desired length. As you thread, the needle guard begins to open. DO NOT INSERT NEEDLE INTO CATHETER AT ANY TIME - needle could penetrate skin.

3b
With thumb behind primary push-off tab, stabilize device at ribbed needle housing with other hand and securely locked into place. The needle will "click" when locked.

4b
Apply digital pressure to withdraw, just allow tip of catheter, pulling the ribbed needle housing with one hand and the hub with the other, remove needle guard by twisting slightly, pulling it out of the catheter hub.
ACUVANCE® SAFETY I.V. CATHETER

Pre-insertion

Now you see it...
Now you don’t.

Post-insertion

Whatever your technique—ACUVANCE® lets you keep it.

This device is designed to reduce the risk of accidental needlesticks. However, care must be taken to avoid needlesticks, Universal Precautions must be followed, and in accordance with CDC/OSHA standards for bloodborne pathogens, when starting, maintaining, or disconnecting any I.V. catheter to avoid the risk of exposure to contaminated blood.

For complete product details, see Instructions for Use. Call your Medex® Account Manager for additional information.

The Safety I.V. Catheter that combines safety, performance, and ease of use.

Innovative self-blunting needle requires no change in technique and no extra steps.

Distinctive design provides optimal combination of safety, performance, and ease of use.

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44 (0)211/32773-26 fax

Infusion Therapy
Select and prepare the site by standard skin prep. Apply the tourniquet. Remove the needle cover and inspect the catheter. The needle will be sharp. Insert the needle into the skin using an approximately 90° angle. Flashback may occur before the catheter hub has entered the vein. To avoid inadvertently puncturing the posterior wall of the vessel, lower the needle until is is parallel to the skin (B).

As the needle enters the vein, a flashback of blood into the flash chamber will confirm vein entry. The catheter is shorter than the introducer needle. Therefore, flashback may occur before the catheter tip is fully in the vein.

If necessary, slightly advance the catheter and needle together, as a unit, to assure full catheter entry into the vein lumen. Once both the needle and the catheter are in the vein, thread the catheter, as described in Step 5. A small blunt tip will automatically extend beyond the needle bevel point as the catheter is threaded on the introducer needle. Once the catheter hub appears from the introducer, the safety blunting mechanism is automatically activated.

Holding the flashback chamber and introducer needle steadily, thread the catheter into the vein for the desired length using either the “One-handed” or “Two-handed” technique. (See Side Bar B) by advancing the “Push-off” tab forward. Remove the tourniquet, then apply gentle pressure beyond the catheter tip, and remove the introducer needle, which is now blunted, and discard immediately in a puncture-resistant, leak-proof, disposable sharps container. Connect the Luer-Lock or Luer-slip device to the catheter hub following the manufacturer’s connection recommendations for that device. Secure the connection with a firm push and twist motion for a tight fit. Take extreme precaution when appropriate (e.g., neonates, critically ill, elderly) to ensure firm and secure connection. Improper securing may lead to less than optimal access, plug and dress as per institutional policy.

Safety couldn't be easier with the self-blunting needle. Extreme care should be taken not to cut the catheter and possibly cause an embolus. Do not use scissors or sharp instruments near IV catheters. Needles which extend into a catheter may pierce and/or sever the catheter. The needle, sharp or blunted, could damage the catheter, resulting in a catheter embolus. Never advance the introducer needle inside the catheter once the needle has been retracted or withdrawn. If the procedure is not successful, discard both the needle and catheter after engaging the safety mechanism.

Note: Remember to slide the “Push-off” tab using forward pressure, not downward pressure, for smooth and easy threading.

Note: For those users changing from:
- A) a thick-walled IV catheter to any thin-wall catheter or
- B) from an FEP polymer IV catheter to any polyurethane I.V. Catheter. It is recommended that threading the catheter into the vein be completed before removing the needle.

This catheter tip diagram indicates the parameter known as trim length. This measurement varies from manufacturer to manufacturer and should be assessed whenever converting from one product to another.
BD Insyte™ Autoguard™
Shielded IV Catheters

POINTS TO PRACTICE

1 PREPARATION
   • Make sure all items are accessible throughout the procedure
   • Prepare site according to your facility’s policy and procedure
   • Prior to venipuncture hold catheter hub and rotate barrel 360 degrees
   • Make sure catheter is seated back in the notch

2 VENIPUNCTURE
   • Approach vein slowly at a low angle
   • Observe early flashback along the catheter (20, 22, 24 gauge only)
     In larger gauge sizes observe flash behind white button

3 ADVANCEMENT
   • Upon flashback visualization, lower catheter almost parallel to the skin
   • Advance entire unit slightly before threading catheter
   • Thread catheter into vein while maintaining skin traction

4 NEEDLE REMOVAL
   Before Pressing the Button
   • Release tourniquet
   • Apply digital pressure beyond the catheter tip
   • Gently stabilize catheter hub
   • Press the white button

5 SECUREMENT
   • Secure catheter and apply sterile dressing according to your facility’s policy and procedure

CAUTION REMINDERS
   • Do Not withdraw needle from catheter hub before pressing the white button.
   • Needle should be retracted prior to disposal in a puncture-resistant, leak-proof sharps container.
   • Never Reinsert Needle into the catheter as this could shear the catheter.
   • Do Not Use Scissors at or near the insertion site.

Refer to package insert for complete instructions for use.
BD Insyte™ Autoguard™
Shielded IV Catheters

TIPS FOR SUCCESS

INSERTION SUCCESS
- Make sure tip seal is released before insertion, by rotating the barrel 360°
- Make sure catheter is seated back in the notch
- Slow down the speed of insertion
- Use less force to penetrate the skin
- Lower the initial insertion angle keeping the elbow low
- After flash, lower the angle and advance 1/8 inch

SEEING THE FLASH
- Trust your instinct and take a pause
- Look for the flash along the catheter
- Be aware of patient factors such as small veins, small patient, blood pressure, condition of vein, dehydration, etc., that may impact flash

THREADING WITH EASE
- After flash, lower the angle and advance 1/8 inch
- Avoid the push-pull technique when advancing
- Make sure tip seal is released before insertion, by rotating the barrel 360°
- Maintain traction on the skin

RETRACTING THE NEEDLE
- Make sure tip seal is released before insertion, by rotating the barrel 360°
- Make sure to place digital pressure beyond the tip of the catheter
- Make sure needle is not being inadvertently bent while attempting to activate the button

MINIMIZING THE BLOOD
- Release tourniquet before pressing the button
- Place digital pressure beyond the catheter tip
- Have IV connector or tubing close by and ready

AVOID EARLY ACTIVATION
- Be aware of where your fingers are
- Remove needle cover in a straight, outward motion
Phlebitis
Inflammation of the intimal lining of the vein.
Phlebitis is a progressive complication.
Early recognition and management is key to limiting progression.

Types and Causes of Phlebitis

**Chemical Phlebitis**
- Medications and solutions with osmolarity >450 mOsm/L
- Medications and solutions with pH <5 or >8
- Drugs classified as irritants or vesicants
- Solutions with large amounts of particulate

**Mechanical Phlebitis**
- Trauma from the IV catheter during insertion or while indwelling
- Rigid catheter material (i.e., Teflon®)
- Larger gauge and/or longer length catheters
- Lower skill level of inserting clinician
- Inadequate stabilization of the catheter
- Insertion across a joint

**Bacterial Phlebitis**
- Compromised skin integrity (i.e., shaving)
- Palpating site after applying skin prep
- Other breaks in aseptic technique
- Immunocompromised patient
- Non-occlusive dressing

**Clinical Criteria**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No symptoms.</td>
</tr>
<tr>
<td>1</td>
<td>Erythema at access site with or without pain.</td>
</tr>
<tr>
<td>2</td>
<td>Pain at access site with erythema and/or edema.</td>
</tr>
<tr>
<td>3</td>
<td>Pain at access site with erythema and/or edema. Streak formation. Palpable venous cord.</td>
</tr>
<tr>
<td>4</td>
<td>Pain at access site with erythema and/or edema. Streak formation. Palpable venous cord &gt; 1 inch in length. Purulent drainage.</td>
</tr>
</tbody>
</table>

**Management of Phlebitis**
- Remove the catheter
- Elevate extremity
- Apply warm moist heat
- Provide comfort measures

**Phlebitis Rate Calculation**

\[
\text{Number of Phlebitis Incidents} \times \frac{100}{\text{Total Number of Peripheral Lines}} = \% \text{ of Phlebitis}
\]

**Causes**
- Probing during venipuncture attempt
- Poor vein and skin integrity
- Tourniquets too tight or failure to promptly remove
- Inexperienced clinician

Hematoma
A swelling or mass of blood confined in the tissue caused by a break in the blood vessel.
**StatLock IV Premium Stabilization Device**

**Application Technique**

**Prep**
1. Cleanse and degrease insertion and securement site with Chloraprep® solution, alcohol, or per hospital policy and procedure. Allow to dry completely.
2. Insert catheter and connect extension set per manufacturers’ directions for use.
3. Apply sterile adhesive strip and/or transparent dressing to stabilize catheter.
4. Apply skin protectant to securement site. Allow to dry completely (10–15 seconds).

**Press**
5. Align anchor pad so directional arrow points toward the insertion site. Press StatLock® device retainer over extension set luer-lock while supporting the extension set underneath.
6. Ensure arm of retainer extends over and captures front edge of luer-lock. If not, push retainer forward until it snaps in place.

**Peel & Place**
7. Pinch StatLock® device retainer as you peel away paper backing from anchor pad, then place on skin.
8. If not already done, apply transparent dressing per hospital policy and procedure.

**Removal Technique**

**Dissolve**
1. Remove transparent dressing using “stretch-technique.”
2. First lift edge of anchor pad using 3–4 alcohol pads. Then continue to stroke undersurface of pad with alcohol to dissolve anchor pad away from skin.
   
   **Do not pull or force pad to remove.**

**Disengage**
3. Discontinue IV.

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**C.R. Bard, Inc.**
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Covington, GA 30014

Customer Service: 800.536.4514

Fax: 800.932.1109

www.statlock.com

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EASTERN CANADA: 1.800.351.7511

FAX: 1.800.361.2100

StatLock™ device should be resterilized daily and replaced when visibly indicated, at least every 7 days.

Catheter insertion site should be cleaned per established hospital policy and procedure. StatLock™ devices are contraindicated in patients with known latex orسهأ, allergic reactions. Please consult product manuals and labels for any additional contraindications, cautions, warnings, and directions for use.

StatLock™ devices are sterile and latex-free.

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