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**Kingston Health  
Sciences Centre**

Centre des sciences de  
la santé de Kingston

**Kingston Health Sciences Centre**

# **ESTABLISHMENT OF INTRAVENOUS ACCESS**

## **LEARNING GUIDE**

**Prepared by: Professional Practice  
Nursing**

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This learning guide has been developed  
By  
Kingston Health Sciences Centre Professional Practice Nursing

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**NOTE:** This learning guide contains information that is current at the time of publication and distribution. Policies and procedures frequently change with the regular review process. Please refer to the most up to date policy on the KHSC intranet.

## 1.0 INTRODUCTION

This learning guide has been developed for use by regulated health care providers (RCHP) employed at Kingston Health Sciences Centre. The purpose of this learning guide is to provide RCHP's the necessary theoretical knowledge to competently establish and care for intravenous (IV) access devices.

## 2.0 AUTHORIZATION FOR ESTABLISHMENT OF IV ACCESS

Staff must meet the following authorization requirements prior to independent initiation of an IV

- Review of the IV establishment learning guide.
- A score of 80% or greater on the written or online exam
- Demonstrated proper technique for IV insertion in three separate circumstances. One of which must be successful and assessed by the CLS or delegate
- Note: Reauthorization will be required only when the need is identified by the RHCP, CLS, or the immediate manager.

If the RCHP is experienced in IV access and has practiced this skill within the past three years, the criteria related to performance of three insertions of 3 IV cannulae for the purpose of initiating an infusion may be waived at the discretion of the program manager or delegate.

Nursing students (RN and RPN) may perform establishment of IV access when:

- Theory, including classroom experience, is part of the student's basic curriculum;
- The added nursing skill is commonly practiced by nurses on the assigned clinical unit;
- The student is in their consolidating experience at the end of their education program and is-under **direct** supervision of the authorized nurse preceptor/delegate; and
- The student completes a written test with a score of 80% or greater.

### **3.0 Learning Objectives**

- i] Prepare the necessary equipment for the establishment of intravenous therapy:
- ii] State the uses of different IV solution types.
- iii] Apply knowledge of anatomy and physiology during vein selection.
- iv] Demonstrate the correct procedure for establishing an intravenous infusion:
- v] Demonstrate the required procedural documentation.
- vi] Demonstrate the required nursing care for an IV infusion.

## **4.0 Theoretical Content**

### **4.1 Preparation**

#### **4.1.1 Reasons for Intravenous Infusion**

- To maintain or replace body stores of water, electrolytes, vitamins, proteins, calories and nitrogen;
- To restore acid-base balance;
- To replenish blood volume or administer blood components;
- To provide a route for the administration of medications.

#### **4.1.2 Prepare the Patient**

Although you may feel comfortable with establishing IV's, your patient may have a fear of the unknown, needles, pain, or that an IV means that one's condition is critical.

After confirming the patient's identity according to hospital policy, ask if they have ever had an IV. Patient teaching is important to increase the patient's cooperation and comfort. Include the following, if possible:

- Why patient needs IV;
- How you will start the IV;
- How the patient can help you with positioning;
- What discomfort the patient will feel;
- How the IV might limit his/her activities; and
- How the patient can help the IV flow properly.

Equipment preparation involves collecting the equipment listed in KGH Policy I-5500 Establishment of Intravenous Access and Lock Devices.

### **4.1.3 Safety Precautions**

Correct patient, prescriber order, appropriate needle gauge, adhering to infection control precautions, and patient's understanding and cooperation all must be considered prior to IV establishment. Errors in technique that might cause breakage or shearing must be avoided. Never reintroduce the needle stylet into the catheter even if it has been partially withdrawn. The needle can shear off part of the catheter, creating an embolus. Avoid drawing more than one blood sample from an IV site as this risks the integrity of the vein.

### **4.1.4 Needle Selection**

Consider the purpose for the IV when selecting a catheter size. The smallest cannula appropriate for the type of therapy should be selected, as a large cannula may restrict the flow of blood through the vein. Review the types of IV catheters available at KHSC with your CLS.

## **4.2 Solution Types**

### **4.2.1 Hypotonic**

Hypotonic solutions have less osmotic pressure than plasma, therefore water is drawn into the cells causing the cells to expand or swell.

Hypotonic solutions are used to replace hypotonic losses, for example, urine or low specific gravity. One of the main reasons for IV therapy is fluid replacement. People require water daily, but do not always need the electrolytes (Na, K, and Cl).

Example: Saline 0.45%

### **4.2.2 Hypertonic**

Hypertonic solutions have a greater osmotic pressure than plasma, therefore, water is drawn out of the cells into the plasma, and the cells shrink.

Examples: Saline 3%  
Mannitol

Hypertonic solutions are used to:

- Replace electrolyte losses, for example, sodium, in severe hyponatremia.
- Infuse high calorie TPN solutions containing glucose and amino acids
- Increase water flow from body cells to the extracellular compartment (e.g., treatment of cerebral edema).

### **4.2.3 Isotonic**

Isotonic solutions have the same osmotic pressure as that found across the semi-permeable membrane of the cell.

Examples: Dextrose 5% in Water  
Normal Saline  
Lactated Ringer's  
2/3 & 1/3

Isotonic solutions are used to replace fluids lost through surgery, burns or GI tract to correct dehydration or sodium depletion.

#### **4.2.4 Blood Transfusion**

With blood transfusion, the chosen solution is normal saline. Blood is infused with a fluid that has the same concentration of sodium and chloride that is found in plasma. A Dextrose solution, such as D5W, when, infused with a blood transfusion, changes during the infusion. After a while, the glucose is absorbed and utilized by the blood cells, leaving water outside the cells. The resulting hypotonic solution leads to hemolysis of the transfused blood cells.

### 4.3 Selection of IV Site

#### 4.3.1 Factors Affecting Site Selection

The overall best IV site:

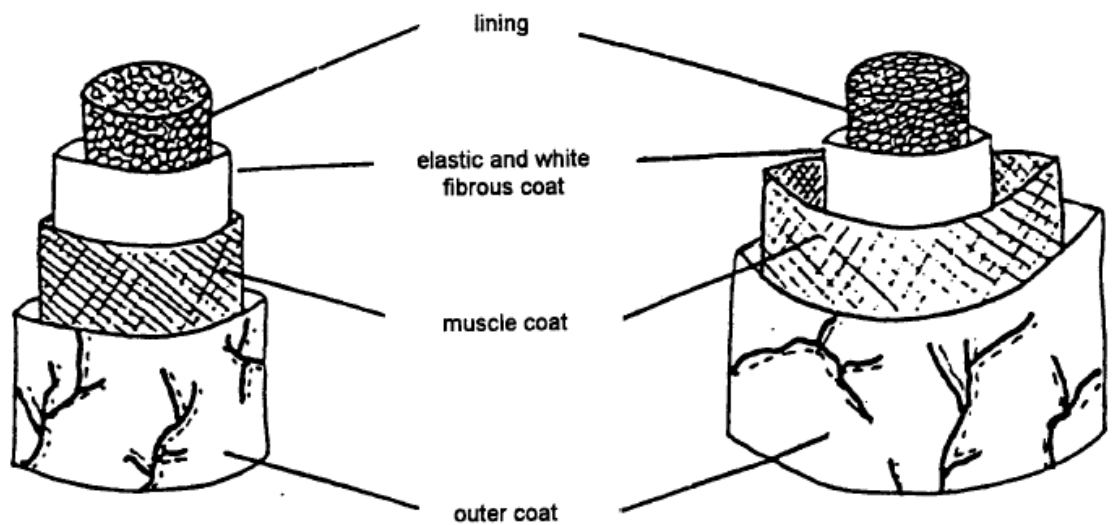
- Tolerates the type and rate of solution
- Is satisfactory for the medications/solutions being infused
- Will accommodate the required cannula size
- Will not greatly affect the patient's daily activities.

<b>Factor</b>	<b>Rationale</b>	<b>Nursing Interventions</b>
Patient's Condition	<ul style="list-style-type: none"> <li>• May impair circulation, be uncomfortable or be covered by dressings if in body area already compromised or injured and increase complications</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid infected, injured or irritated areas</li> </ul>
Patient's Level of Consciousness	<ul style="list-style-type: none"> <li>• Patient restraints can interfere with IV</li> </ul>	<ul style="list-style-type: none"> <li>• If patient restrained, avoid sites near restraints</li> <li>• Use arm board, if site near restraints</li> </ul>
Activity of Patient	<ul style="list-style-type: none"> <li>• Patient may need hands to function</li> </ul>	<ul style="list-style-type: none"> <li>• If using walker or crutches, patient needs hands, wrists free</li> </ul>
Age of Patient	<ul style="list-style-type: none"> <li>• Infants do not have as many accessible sites as adults</li> <li>• Choose the site based in part on the infant's history, physical examination and type of medication to be delivered</li> <li>• Consider the potential for scarring when selecting a scalp vein site</li> <li>• Veins of the elderly are often fragile</li> </ul>	<ul style="list-style-type: none"> <li>• May use a trans-illuminator in pediatrics to access sites such as hands, feet, legs, arms and scalp.</li> <li>• Fragile veins must be approached cautiously.</li> </ul>
Dominant Hand	<ul style="list-style-type: none"> <li>• If used, it can limit patient activity</li> <li>• Active arm has increased risk of infiltration</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid using dominant hand</li> </ul>
Special Situations	<ul style="list-style-type: none"> <li>• May affect site, R or L arm or cannula size</li> <li>• Patients with vascular disease or dehydration often have limited venous access</li> <li>• Patients on chemo may have poor access and poor vein texture</li> <li>• The veins in the arm with a dialysis fistula carry blood under arterial pressure</li> <li>• To facilitate patients undergoing anesthesia</li> </ul>	<ul style="list-style-type: none"> <li>• Use opposite arm if patient has had a radial mastectomy</li> <li>• Avoid sites near joints.</li> <li>• Use opposite arm to avoid 'arterial' puncture in arm with AV fistula</li> <li>• For OR, use left arm as able</li> <li>• For bronchoscopy, use right arm as able</li> </ul>
IV Therapy	<ul style="list-style-type: none"> <li>• Long term use increases risk of complications</li> </ul>	<ul style="list-style-type: none"> <li>• Start as distally as possible</li> <li>• Alternate sites and arms</li> <li>• If no signs of inflammation, site may be maintained longer</li> <li>• Use appropriate cannula and infusion rates</li> </ul>



Factor	Rationale	Nursing Interventions
Solution Type	<ul style="list-style-type: none"> <li>• Hypertonic solutions, low pH and high pH solutions can be irritating</li> <li>• Irritating solutions can cause vessel damage when passing by previous site</li> <li>• In neonates, high dextrose concentrations can cause extravasations</li> </ul>	<ul style="list-style-type: none"> <li>• Select a large vein, start distally</li> <li>• Ensure proper infusion rate</li> <li>• In neonates, a dextrose concentration of greater than 12.5% should be delivered via a central line.</li> </ul>
IV Cannula Size	<ul style="list-style-type: none"> <li>• Want to avoid irritation of vein</li> </ul>	<ul style="list-style-type: none"> <li>• Cannula should be smallest possible gauge for particular use of IV therapy</li> </ul>
Conditions of Veins	<ul style="list-style-type: none"> <li>• Rolling veins increase risk of infiltration</li> <li>• Fragile veins are usually narrow</li> <li>• Complications increase in damaged veins and tissues</li> <li>• Vein at awkward angle</li>   <li>• Repeated venipunctures cause scarring, irritation and sclerosis</li> <li>• Can lead to non-patent vessels and permanent damage</li> </ul>	<ul style="list-style-type: none"> <li>• If only vein available, use counter tension when inserting</li> <li>• Apply heat, then slowly enter vein so you can feel the release of pressure, then adjust insertion angle to feed catheter along vein</li> <li>• Avoid veins that are thrombosed, inflamed, bruised, fragile, mobile, near bony prominences or sites of infection</li> <li>• Pad needle with gauze if needle needs to be at an angle in order to be parallel to the vein</li> <li>• Tape and secure gauze with cannula</li> <li>• Avoid if possible</li> </ul>

### 4.3.2 Review of Blood Vessel Anatomy



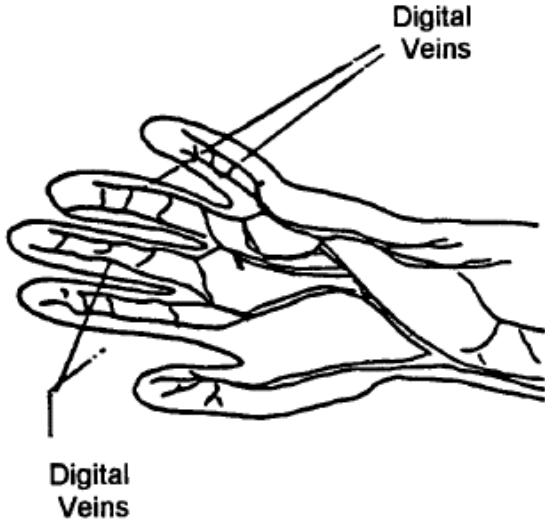
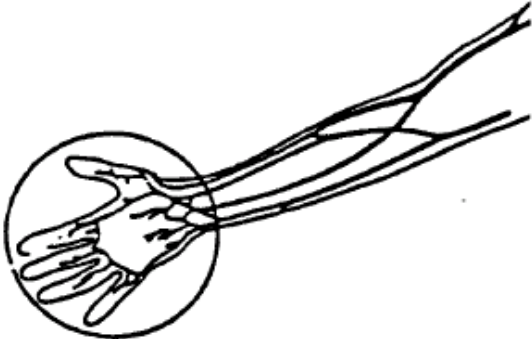
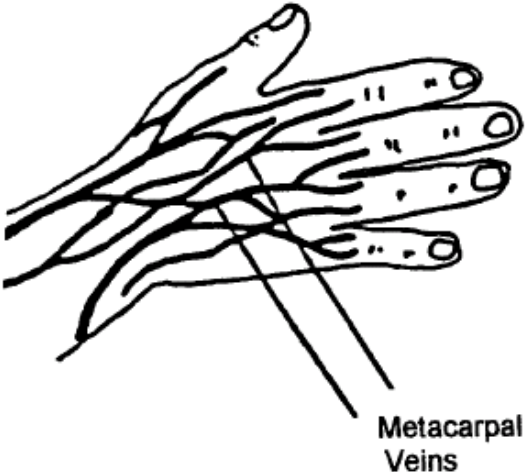
#### Vein

- no pulsation
- sluggish flow
- Blood is dark red in colour
- shorter duration of pressure needed to stop flow from venipuncture site
- valves to prevent backflow
- thin muscular wall
- veins are unlikely to spasm and are more prone to collapse but may spasm with irritating solutions or trauma blanching and ischemic injury

#### Artery

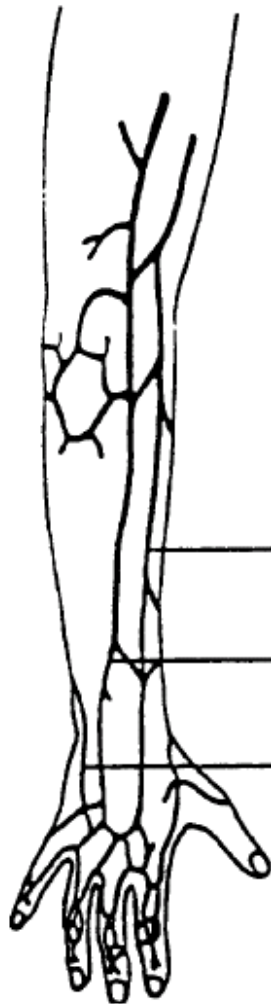
- pulsates
- blood is under pressure and flows rapidly
- Blood is bright pink-red colour
- longer duration of pressure needed to stop blood flow from venipuncture site
- no valves
- thick muscular wall
- if fluid is infused into a superficial artery, the arterial spasm results

### 4.3.3 Anatomy of the Veins of the Arm

<p><b><u>Digital Veins Location</u></b></p> <ul style="list-style-type: none"> <li>• Found along lateral and dorsal surfaces of the fingers.</li> </ul>  <p>Digital Veins</p> <p>Digital Veins</p>	<p><b><u>Use</u></b></p> <ul style="list-style-type: none"> <li>• A small gauge cannula can be inserted when larger veins are unavailable, and as a last resort.</li> </ul> <p><b>NOTE:</b> This site is not often used, but can be considered as a last resort. The thumb site might be considered when the digital vein becomes a metacarpal vein.</p>
<p><b><u>Metacarpal Veins Location</u></b></p> <ul style="list-style-type: none"> <li>• Formed by the union of the digital veins on the dorsum of the hand, between the knuckles;</li> <li>• Easy to find, most people have three.</li> </ul> 	<p><b><u>Use</u></b></p> <ul style="list-style-type: none"> <li>• Useful as they are large veins;</li> <li>• Best place to begin IV therapy as they are most distal;</li> <li>• Avoid catheter which may reach the wrist and be affected by wrist movement. This can cause infiltration or phlebitis;</li> <li>• Arm board is not necessary as they bones of the hand act as a splint.</li> </ul>  <p>Metacarpal Veins</p>
<p><b><u>Cephalic Veins Location</u></b></p> <ul style="list-style-type: none"> <li>• Cephalic vein runs along the radial bone as a continuation of the metacarpal vein in the</li> </ul>	<p><b><u>Use</u></b></p>

thumb;

- Runs the entire length of the arm, raining into the antecubital fossa;
- Accessory cephalic vein branches off cephalic vein, just below antecubital fossa.



Cephalic vein  
(thumb side)

Accessory  
cephalic vein

Basilic vein

POSTERIOR

- One of the best sites;
- Larger size and can handle large cannulas for rapid infusion.
- Bones of the arms (radial bones) act as splints.

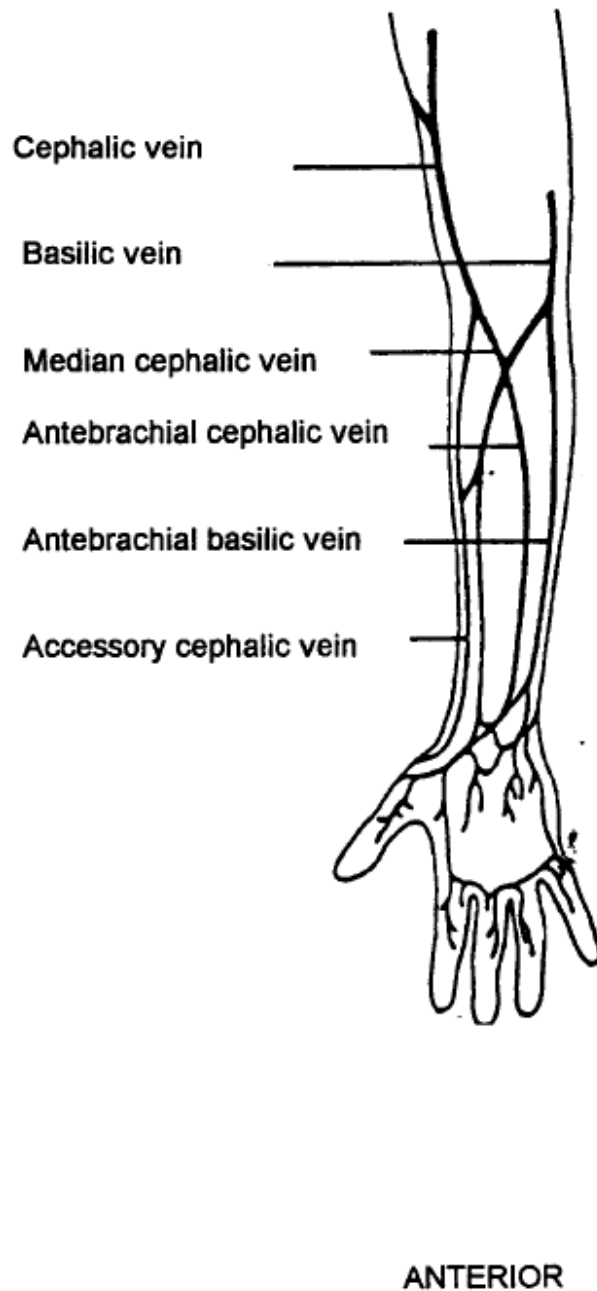


### Basilic Veins Location

- The basilic vein is also a continuation of the metacarpal vein, but on the ulnar portion of the forearm;
- Also empties into the antecubital fossa;
- These are prominent veins.

### Use

- Can take a large gauge cannula;
- Is splinted by ulnar bone;
- Tends to move easily (rolling veins).

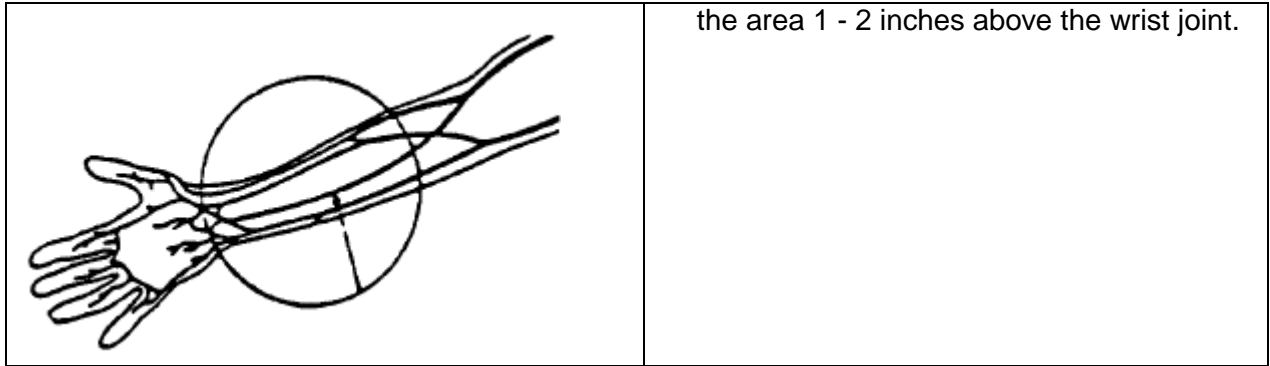


### Median Veins Location

- Median vein originates from network of veins on palm of hand;
- Runs along ulnar side of inner forearm.

### Use

- Relatively small vein which cannot always take a large gauge cannula;
- Not always easy to find, but do not tend to roll due to supporting musculature;
- Sometimes more painful at time of insertion;
- **Avoid** inner aspect of wrist, because of sensitivity of area; more specifically this is



### 4.3.3 Vein Dilation Methods

The following methods may be used to assist in the dilation of the selected vein:

Dependent position	<ul style="list-style-type: none"> <li>• Lower the extremity below the heart</li> <li>• Gravity slows the venous return and thus distends the vein.</li> </ul>
Tourniquet	<ul style="list-style-type: none"> <li>• Apply so that only venous return is occluded ensuring that the tourniquet is not too tight. The goal is to slightly distend the vein. The tourniquet should be approximately 10cm above the insertion site and not be left on for more than 1 minute at a time.</li> </ul>
Heat	<ul style="list-style-type: none"> <li>• Warm blankets or towels applied to the entire limb distend the muscular layer of the vein, causing venous dilation.</li> </ul>

**Note:**

**Avoid having the patient clench their fist, massaging or tapping the vein. This may damage the integrity of the site or sample.**

#### **4.4 Establishment of Intravenous Access**

##### Equipment

Alcohol swab (chlorhexidine 2% alcohol free for paediatrics)

Tourniquet

Clean gloves

Transparent semipermeable dressing

Non allergic tape

Prefilled syringe with sterile 0.9% sodium chloride for injection

Vascular closed IV catheter system.

IV administration set

Prescribed solution

Required Medication if ordered

Medication Administration Record (MAR) or unit specific flowsheet

**NOTE:** Type and volume of solution may vary depending upon the prescriber order

**NOTE:** Sterile 0.9% sodium chloride only is used for neonates

##### Procedure

1. Verify patient care order.
2. Perform hand hygiene.
3. Verify patient's identity using two identifiers (see KGH Administrative Policy 13-10 Patient Identification).
4. Determine gauge of IV catheter required.
5. Assess extremities for appropriate placement of IV catheter.  
**NOTE:** Identify contraindications for insertion.
6. Prepare IV solution (if ordered).
7. Perform hand hygiene and don clean gloves.
8. Apply a tourniquet 8 to 10 cm above the selected insertion site.  
**NOTE:** for paediatric patients have a second person hold the limb.
  - 8.1. Activities to dilate veins may include:
    - 8.1.1. Lowering extremity
    - 8.1.2. Apply warm compress to extremity for a maximum of 15 minutes.
9. Cleanse skin at selected vein using appropriate solution for at least 30 seconds, and allow to dry. (3 minutes in the NICU)
  - 9.1. Maintain aseptic technique for insertion.  
**NOTE:** If vein must be palpated again, cleanse site.
11. Prepare catheter system following appropriate product directions. (See Appendix A and B)
12. Stabilize the blood vessel and perform venipuncture following appropriate product directions. (See Appendix A and B)

**NOTE:** Pulsations in the blood return indicate that the IV cannula is in an artery. If this occurs, release the tourniquet and remove the needle. Apply pressure over the site for a minimum of 5 minutes.

13. Release the tourniquet.

14. Secure dressing.

15. Record date and time of catheter insertion in an obvious location near catheter insertion site.

16. Document the procedure and the following:

- Time;
- IV insertion site;
- IV Attempts
- Type and gauge of cannula;
- For IV infusions:
  - IV solution hung, including additives if any;
  - Volume of IV solution hung;
  - Rate of flow established.



## 4.5 Complications

COMPLICATION	SIGNS & SYMPTOMS	POSSIBLE CAUSES	NURSING ACTIONS	TIPS
Infiltration	<ul style="list-style-type: none"> <li>• Coolness of skin around site.</li> <li>• Swelling around site.</li> <li>• Swelling of entire limb.</li> <li>• Absence of blood backflow.</li> <li>• Sluggish flow rate.</li> </ul>	<ul style="list-style-type: none"> <li>• Needle or catheter displacement (either partial or complete).</li> </ul>	<ul style="list-style-type: none"> <li>• Discontinue the infusion and remove the needle or catheter immediately.</li> <li>• Document what you have done.</li> <li>• Notify prescriber.</li> <li>• Elevate affected limb.</li> <li>• Have extravasation kit available when irritant fluids are infused.</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid sites over joints.</li> <li>• Monitor the site closely for signs of infiltration.</li> <li>• Use a splint to stabilize the needle or catheter when the site is over a joint or the patient is active.</li> <li>• Select largest available vein.</li> </ul>
Thrombophlebitis	<ul style="list-style-type: none"> <li>• Sluggish flow rate.</li> <li>• Edema in limb.</li> <li>• A vein that is sore, hard, cord-like and warm to the touch. It may look like a red line above the venipuncture site.</li> </ul>	<ul style="list-style-type: none"> <li>• Injury to the vein, either during venipuncture or from needle movement later.</li> <li>• Irritation to the vein Sluggish flow rate which allows a clot to form at the end of the needle or catheter.</li> <li>• Large bore needles increase incidence of phlebitis.</li> </ul>	<ul style="list-style-type: none"> <li>• Discontinue the infusion and remove the needle or catheter immediately.</li> <li>• Apply warm compresses to the site.</li> <li>• Notify the prescriber.</li> <li>• Restart IV in another limb</li> <li>• Monitor patient's temperature</li> <li>• Document your actions.</li> </ul> <p><b>NOTE:</b> In the case of a sluggish flow rate, <b>never</b> try to irrigate the line. In addition to increasing the risk of infection, you may flush a clot into the blood stream, causing an embolus.</p>	<ul style="list-style-type: none"> <li>• If you have used an irritating additive, try to find a vein large enough to dilute it.</li> <li>• Make sure drug additives are compatible.</li> <li>• keep the infusion flowing at the prescribed rate;</li> <li>• stabilize the needle or catheter with a splint, if necessary;</li> <li>• Choose the appropriate gauged catheter for the patient's needs.</li> </ul>

<b>COMPLICATION</b>	<b>SIGNS &amp; SYMPTOMS</b>	<b>POSSIBLE CAUSES</b>	<b>NURSING ACTIONS</b>	<b>TIPS</b>
Circulatory Overload	<ul style="list-style-type: none"> <li>• Rise in BP and central venous pressure (CVP);</li> <li>• Dilation of veins, with neck veins sometimes visibly engorged;</li> <li>• Rapid breathing, shortness of breath, rales, dyspnea;</li> <li>• Wide variance between liquid input and urine output;</li> <li>• Syncope.</li> </ul>	<ul style="list-style-type: none"> <li>• Too much fluid;</li> <li>• Fluid delivered too quickly;</li> <li>• Failure to monitor IV infusion accurately.</li> </ul>	<ul style="list-style-type: none"> <li>• Slow the infusion.</li> <li>• Raise patient's head;</li> <li>• Keep patient warm to promote peripheral circulation and ease the stress on the central veins;</li> <li>• Monitor vital signs;</li> <li>• Notify the prescriber.</li> <li>• Oxygen Therapy Protocol as ordered;</li> <li>• Document your actions.</li> </ul>	<ul style="list-style-type: none"> <li>• Be aware of the patient's cardiovascular status and history.</li> <li>• Notify the prescriber if the fluid volume or flow rate may be more than the patient can tolerate.</li> <li>• Monitor the patient's urine output.</li> <li>• Use the correct tubing and infusion rate.</li> </ul>
Air Embolus	<ul style="list-style-type: none"> <li>• Hypotension.</li> <li>• Rise in CVP.</li> <li>• Weak, rapid pulse.</li> <li>• Cyanosis.</li> <li>• Loss of consciousness.</li> </ul>	<ul style="list-style-type: none"> <li>• Solution runs dry.</li> <li>• Air in tubing.</li> <li>• Loose connections.</li> </ul>	<ul style="list-style-type: none"> <li>• Turn the patient on left side. Check system for leaks;</li> <li>• Notify prescriber immediately;</li> <li>• Oxygen Therapy Protocol as ordered;</li> <li>• Document your actions.</li> </ul>	<ul style="list-style-type: none"> <li>• Clear all air from the tubing before attaching it to the patient;</li> <li>• Change Solution before it is empty.</li> <li>• Secure all connections.</li> </ul>
Vein Spasm	<ul style="list-style-type: none"> <li>• Pain near or distal to the IV site.</li> </ul>	<ul style="list-style-type: none"> <li>• Irritating fluids.</li> <li>• Chilled medications.</li> <li>• Rapid flow rates.</li> </ul>	<ul style="list-style-type: none"> <li>• Allow IV fluid to reach room temperature.</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure adequate dilution of medication;</li> <li>• Use appropriate gauged cannula.</li> <li>• Temporarily decrease rate;</li> <li>• Apply warm compresses to site.</li> </ul>
Catheter Embolism	<ul style="list-style-type: none"> <li>• Discomfort along the vein in which the catheter fragment is lodged.</li> <li>• Hypotension</li> <li>• Increased CVP.</li> <li>• weak, rapid pulse;</li> <li>• Cyanosis.</li> <li>• Loss of consciousness.</li> </ul>	<ul style="list-style-type: none"> <li>• Withdrawing the catheter before the needle or attempting to re-thread a catheter with the needle.</li> </ul>	<ul style="list-style-type: none"> <li>• Notify the prescriber immediately.</li> </ul>	<ul style="list-style-type: none"> <li>• Do not re-thread a catheter once removed.</li> <li>• Check catheter for defects prior to insertion.</li> </ul>

COMPLICATION	SIGNS & SYMPTOMS	POSSIBLE CAUSES	NURSING ACTIONS	TIPS
Infection	<ul style="list-style-type: none"> <li>• Sudden rise in temperature and pulse.</li> <li>• Foul-smelling discharge.</li> <li>• Fever, malaise and pain.</li> <li>• Redness or swelling at the insertion site.</li> <li>• Chills</li> </ul>	<ul style="list-style-type: none"> <li>• Poor aseptic technique.</li> <li>• Contamination of equipment.</li> </ul>	<ul style="list-style-type: none"> <li>• Discontinue infusion and remove catheter immediately.</li> <li>• Clean site and apply a sterile dressing.</li> <li>• Restart IV in another limb.</li> <li>• Document your actions.</li> <li>• Notify prescriber.</li> </ul>	<ul style="list-style-type: none"> <li>• Practice universal precautions.</li> <li>• Review and improve aseptic techniques.</li> <li>• <b>Perform hand hygiene before and after the procedure.</b></li> <li>• Check solution prior to hanging for precipitate.</li> <li>• Change tubing and dressing according to policy;</li> <li>• Keep site dry.</li> </ul>
Allergic Reaction	<ul style="list-style-type: none"> <li>• Itching.</li> <li>• Rash swelling of site.</li> <li>• Shortness of breath.</li> <li>• Elevated blood pressure.</li> <li>• Lowered pulse and respiratory rate.</li> </ul>	<ul style="list-style-type: none"> <li>• Sensitivity to an IV fluid (especially an additive), skin prep solution or IV cannula.</li> </ul>	<ul style="list-style-type: none"> <li>• Discontinue infusion immediately and notify the prescriber.</li> <li>• Document your actions.</li> </ul>	<ul style="list-style-type: none"> <li>• Check the patients allergy status prior to initiation an IV medication or infusion.</li> </ul>
Positional IV	<ul style="list-style-type: none"> <li>• Irregular or stopped IV flow.</li> </ul>	<ul style="list-style-type: none"> <li>• Location of catheter near wrist or elbow.</li> <li>• Condition of vein is crooked or abnormal.</li> </ul>	<ul style="list-style-type: none"> <li>• Gently pull back on catheter until solution flows freely.</li> <li>• May need to start IV in another site.</li> </ul>	<ul style="list-style-type: none"> <li>• Choose sites away from joints.</li> <li>• Examine veins prior to insertion.</li> </ul>
Nerve Damage	<ul style="list-style-type: none"> <li>• Numbness or tingling of the extremities.</li> <li>• Extremity pain.</li> </ul>	<ul style="list-style-type: none"> <li>• Too tight wrapping or taping.</li> <li>• Restraints.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove wrapping or tape.</li> <li>• Examine the skin and check neurovascular status.</li> <li>• Notify prescriber as appropriate</li> </ul>	<ul style="list-style-type: none"> <li>• Do not wrap restraints around arm and board.</li> <li>• Use padded arm board.</li> <li>• Monitor neurovascular status closely during IV infusion.</li> </ul>

## 5.0 Related Policies and Learning Resources

I-5500 Intravenous (IV) Access and Lock Devices

1-7000 Tubing Changes: Intravascular Catheter and Device Management

Administrative Policy 13-010 Patient Identification.

### 5.1 Additional Resources

- Clinical Learning Specialists (CLS)
- Fellow nursing staff
- KHSC Intranet
- E Mosby

## 6.0 Bibliography

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- McCutcheon, J. A., & Doyle, G. R. (2017). Clinical Procedures for Safer Patient care. Flushing a Saline Lock and Converting a Saline lock to a continuous infusion. Open textbooks, BC.
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- Nickel, B. (2019). Peripheral Intravenous Access: Applying Infusion Therapy Standards of practice to Improves Patient Safety. *Critical Care Nurse* 39(1). 61-71. doi: <https://doi.org/10.4037/ccn2019790>
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## 7.0 AUTHORIZATION RECORD

Nurse's Name: \_\_\_\_\_

Dates of: 1) Post Test \_\_\_\_\_

2) Observation \_\_\_\_\_

3) Practice Arm \_\_\_\_\_

### Authorization Checklist for Establishment of Intravenous Infusion Access

SKILL COMPONENTS	#1	#2	#3
Checks physician's orders prior to establishment.			
Correctly identifies patient.			
Explains procedure to patient.			
Washes hands.			
Prepares equipment, solution and tubing.			
Evaluates site correctly.			
Chooses appropriate sized gauge of catheter.			
Applies tourniquet correctly.			
Advances catheter or needle appropriately.			
Removes stylet and attaches IV tubing.			
Tapes and secures needle and tubing.			
Splints extremity if required.			
Ensures patient comfort and safety.			
Disposes of needle and equipment safely.			
Successful attempt.			
Documents on parenteral record or unit specific flowsheet.			
Date			
Signature of Observer			

## 8.0 EVALUATION OF LEARNING GUIDE

Your feedback and comments are appreciated. We will consider your comments and suggestions in any future revisions of this learning guide. **Thank you.**

Please circle your responses to the following:

		Strongly Agree			Strongly Disagree	
1.	Content was relevant - it covered what I needed to learn. Comments:					
2.	The level of difficulty made it easy to understand. Comments:					
3.	The pace of the package was satisfactory. Comments:					
4.	I consider that my learning objectives were met. Comments:					
5.	Overall, I found that the guide was too basic. Comments:					
6.	Overall, the package was useful in learning intravenous skills. Comments:					

Comments:

**Please return completed questionnaire to your Clinical Learning Specialist**