Venipuncture

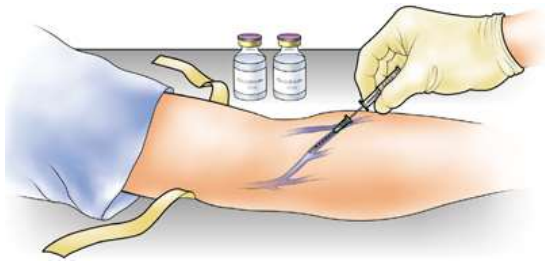
Unit 3 Part 3

MI:116 Patient Care

Equipment
Parenteral Drug Administration

Equipment

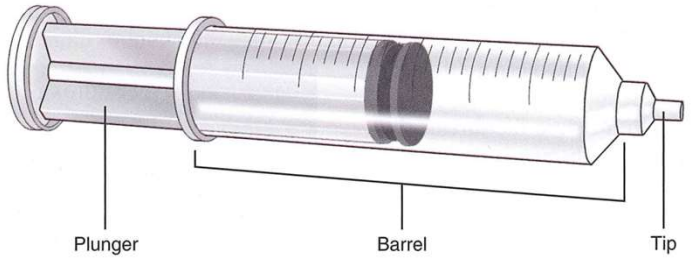
- Tourniquet
- Syringe (transfer set if needed)
- IV cannula – butterfly or venous catheter
- Alcohol swab/wipe
- Clean gloves
- Tape
- Drug to be administered (Vial or Ampule)
- Saline flush if using venous catheter



Equipment – Syringe pg. 269-273

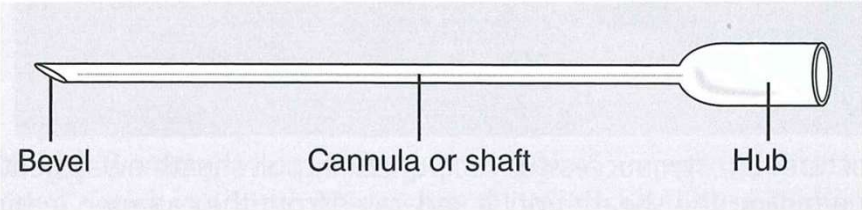
- Standard hypodermic, insulin, tuberculin, pre-filled syringe

- Three parts of a syringe:
  - Tip
  - Barrel
  - Plunger



Equipment – Needle pg. 269-273

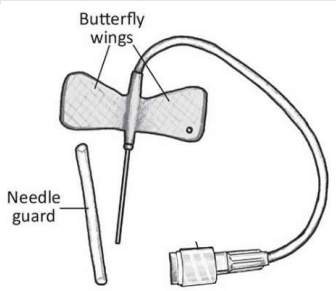
- Three parts of a needle:
  - Hub
  - Shaft (cannula)
  - Bevel



- Sized according to length and gauge
  - *Gauge* – Thickness/diameter of needle (14-28 gauge)
  - *Length* – Measurement in inches of shaft portion of needle

Equipment - Needle Types pg. 269-273

- Butterfly
  - –Short term use (Example 2 Hours); Plastic appendages (wings) aid with insertion and anchoring (Tubing 3-12”, Length ¼ - 1 ¼”, 18-22 gauge common)



- Hypodermic
  - –Single use; Small injections (Length $^1/_2$” port access,1-2” IV access, $4^1/_2$” intrathecal length, 18-22 gauge common)

Equipment - Needle Types pg. 269-273

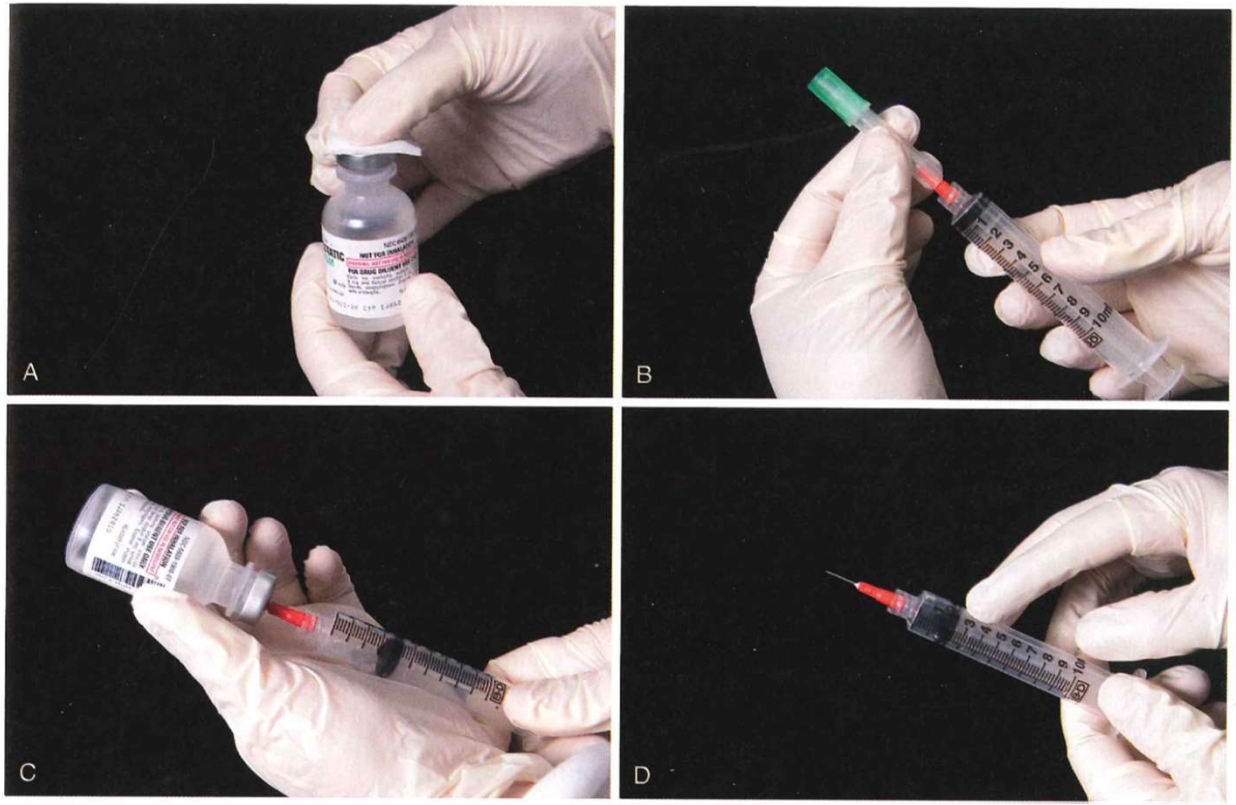
- Angiocath, Venous Catheter
  - –Used for repeated or continuous IV use (injections or infusions
  - –2 Part system: over the needle catheter
    - – (Length $^1/_2$" port access,1-2" IV access, $4^1/_2$" intrathecal length, 16-24 gauge common)

Equipment – Vials pg. 273-274

- Small glass/plastic bottle with sealed rubber cap
  - Multi-dose or single-dose
  - Top must be cleansed before inserting needle for use

Natáhnutí látky z ampule s gumovým uzávěrem.

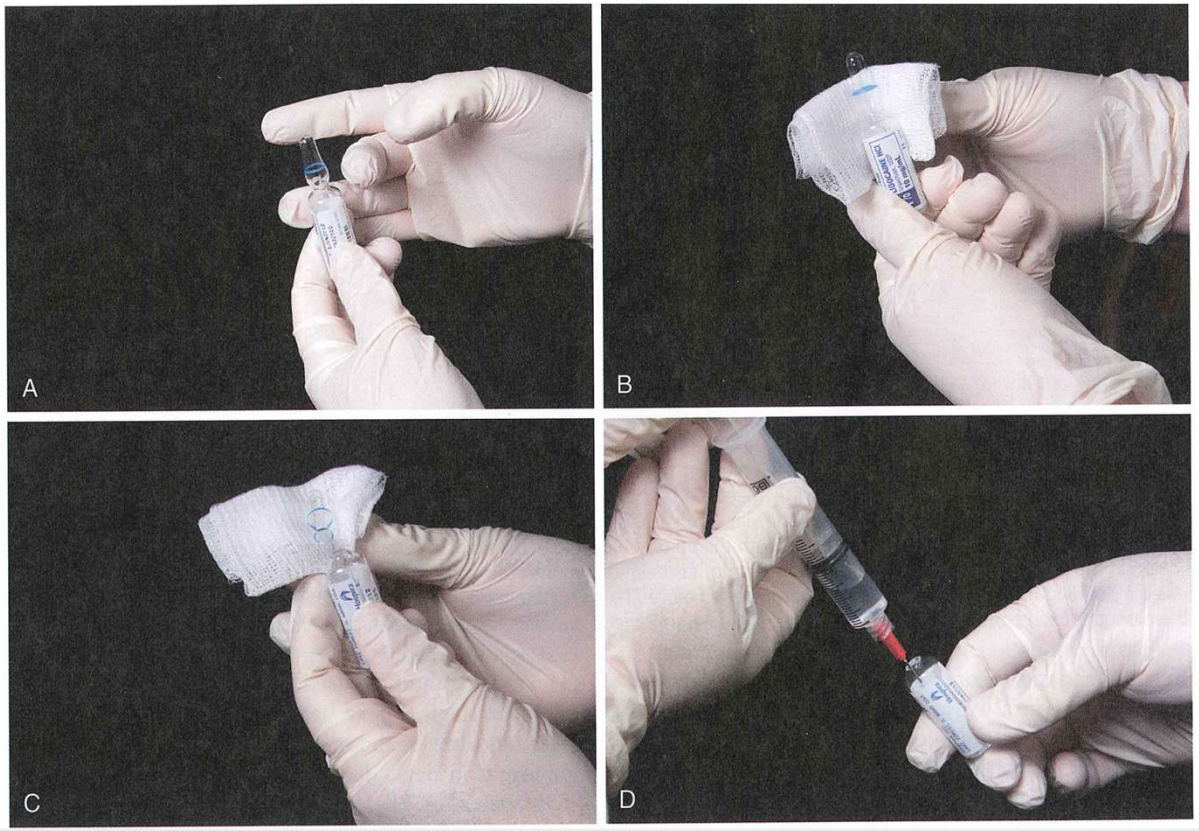
Equipment – Vials – pg. 274



Equipment – Ampules – pg. 271-273

- Ampules – Sealed glass container with scored neck that is weakened so it breaks open easily
  - –Single dose

Equipment – Ampules pg. 273



Intravenous Injection Methods

QUESTION?

Why is IV drug administration chosen over other methods of drug administration???

- Instantaneous effect of a drug is wanted
- Drug would be damaging to body tissues if injected into them

Why is IV administration one of the most hazardous routes???

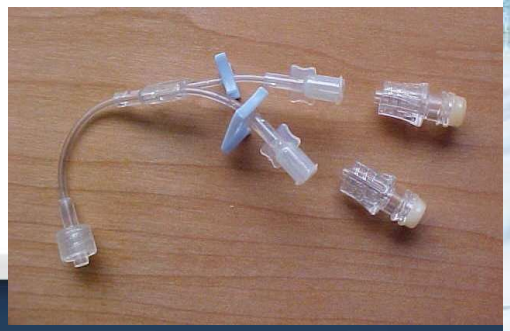
- Reaction is instantaneous – injected directly into circulatory system

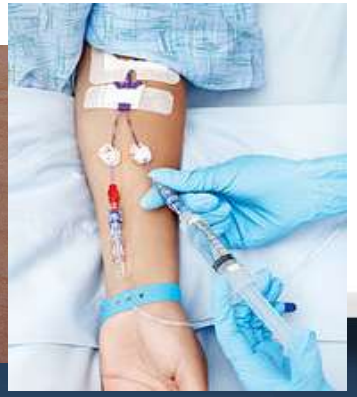
Intravenous Drug Administration

pg.277-280

Medications/Drugs administered by IV through one of ***three*** ways:

1. *Single Administration* – Slow injection; Smaller amount injected from a syringe
2. *Bolus or Intravenous (IV) Push* – Certain amount of fluid injected at a certain rate at one time (usually rapid injection)
   - ❖ Often used in ED settings where immediate drug action is required
   - ❖ CT/MRI-Contrast





Intravenous Drug Administration

pg.277-280

3. *Intravenous Infusion* - Infusion of a large volume of fluid over a certain amount of time (could involve use of additional equipment to ensure proper delivery)

- *Gravity drip* - IV fluid attached to drip chamber which allows fluid to flow one drop at a time
  - Chamber is attached to long tube with a clamp to regulate or stop the flow
  - Connector needed to attach the line to the port
  - Average flow rate 10-20 drops per minute at height of 18-24" above the site

Intravenous Drug Administration

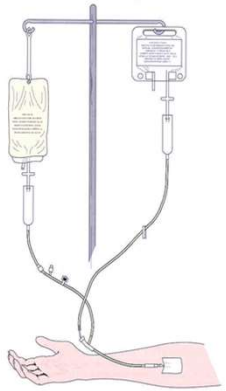
pg.277-280

3. *Intravenous Infusion (Continued)* - Infusion of a large volume of fluid over a certain amount of time *(could involve use of additional equipment to ensure proper delivery)*
   - ❖ *Infusion Pump*- Allows precise control over flow rate and total amount delivered electronically
     - More accurate method
     - Alarm capability when infusion fails to flow at desired flow rate and duration

Intravenous Drug Administration

IV Piggyback:

- Small IV Infusion attached to an already existing line
- When administered, original IV solution continued and piggyback is discontinued
  - Drugs can be run in at same time (Y site) (dilute)
  - ***Or*** one higher than other – Higher drug will flow in first. Once completed, lower bag will immediately flow



Intravenous Drug Administration

Considerations/Precautions:

- If drip/infusion stops, the site could be leaking into surrounding tissue (infiltration)
  - Evidence of swelling/pain around site:
    - Infusion must be stopped immediately
    - Needle removed
      (*By an IV trained Technologist)
    - Warm cloth applied to area
    - Nurse/MD notified and
      documentation of infiltration
      if this was a contrast
      infiltration (follow facility protocol)

Site Selection

Site Selection

Factors that affect site selection:

- Suitability of location
- Purpose
- Duration of therapy

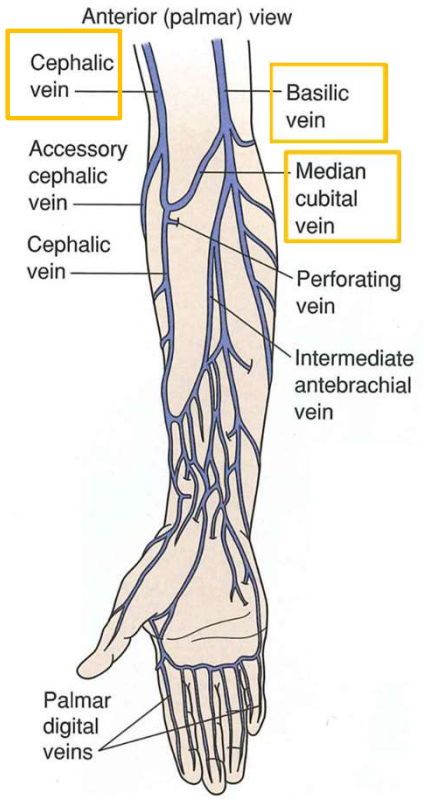
Type of drug, purpose of administration, and age/condition of patient are factors that affect needle selection

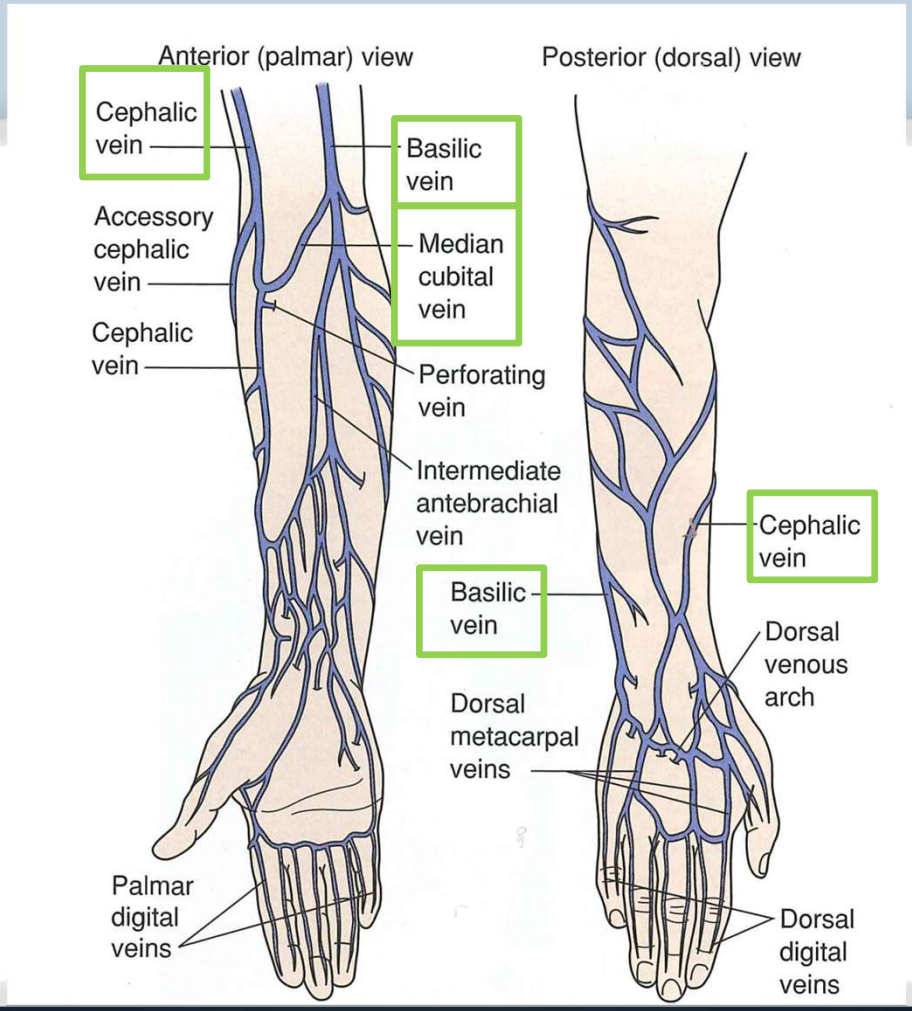
Site Selection pg.275-276

Most common sites:

- *Median Cubital Vein* – Superficially overlying cubital fossa
- ***Cephalic Vein* – Lateral aspect of forearm
- ***Basilic Vein* – Medial aspect of the forearm

**Cephalic and Basilic are located on posterior aspect of hand*

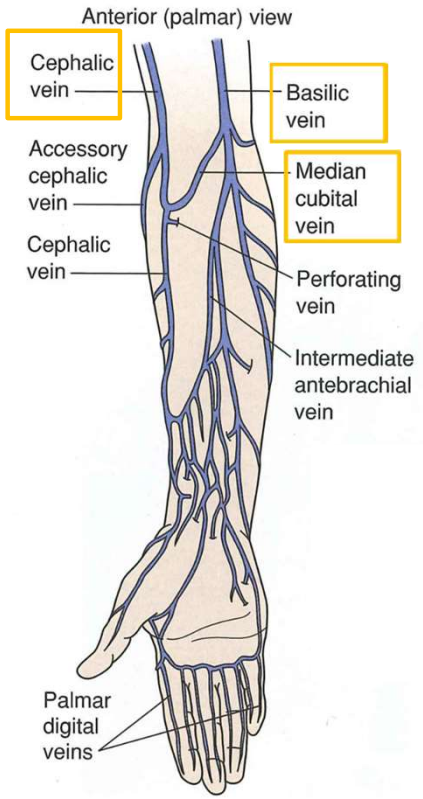



Anterior (palmar) view
Posterior (dorsal) view
Cephalic vein
Basilic vein
Accessory cephalic vein
Median cubital vein
Cephalic vein
Perforating vein
Intermediate antebrachial vein
Basilic vein
Cephalic vein
Dorsal venous arch
Dorsal metacarpal veins
Palmar digital veins
Dorsal digital veins

Site Selection pg.275-276

Most common sites: ***(Continued…)***

- *Benefits to usage of veins in antecubital space*
  - Most often used
  - Accessible, large and easy to puncture
- *Drawbacks to usage of veins in antecubital space*
  - Frequently used—scarred or sclerotic
  - Motion of joint could cause dislodgement and/or injury



Site Selection

Vein Selection Tips/Tricks:

- Veins must be palpated to assess elasticity & firmness
- Veins should not be hard, bumpy, or flat
- Try to select most distal site that can accept desired size needle, tolerate injection rate and solution
- Try to select site over a joint if administering by bolus
- Avoid volar (palm) side of wrist due to radial nerve is in that area – extreme pain
- Veins in arm/hand should be selected over the lower extremities

Site Selection

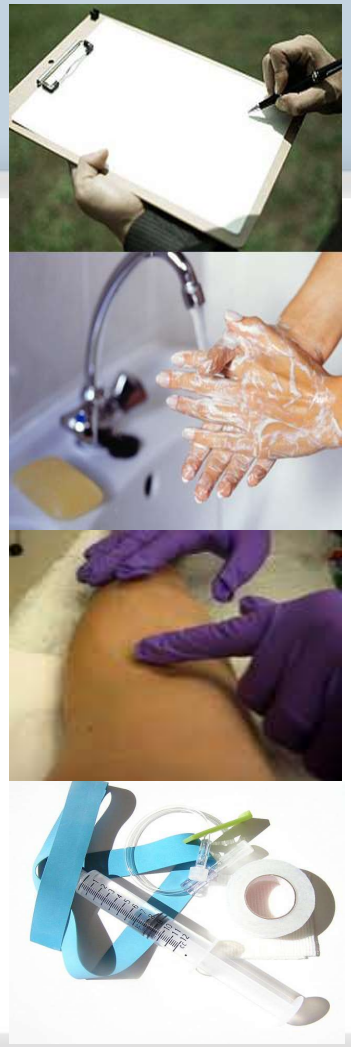
Considerations/Precautions:

- *Recently Accessed Vein* - Attempt injection above the previous injection site because of possible scarring or clotting
- *Elderly Patients* – Veins more fragile & have greater tendency to "roll"
  - May need smaller needle or catheter
  - Tissue also fragile, apply tourniquet carefully
- *Mastectomy Patients* – Do not access the same side as the mastectomy
- Jewelry/restrictive clothing should be removed from area
- Infection, tissue damage, pain, and discomfort are hazards of IV administration

Steps of Venipuncture

Steps of Venipuncture –p.278

1. Obtain order
2. Hand hygiene
3. Identify patient, obtain history, and explain procedure
4. Assess for allergies
5. Select site. If vein difficult to palpate, tap lightly, close fist, and/or apply warm compress
6. Gather equipment *(when preparing media, remove air from tubing by running contrast completely through)*



Steps of Venipuncture

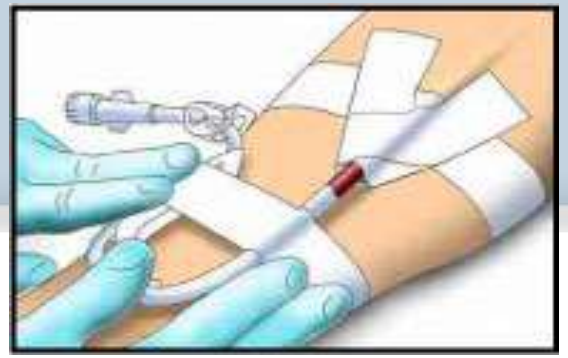
7. Support arm
8. Secure tourniquet 4-8” above selected site *(secure so it can be releases by pulling one end)*
9. Wear clean gloves
10. Cleanse area from site of injection outward using firm strokes – allow area to dry
11. Hold skin taut above and below insertion site

Steps of Venipuncture

12. When using a butterfly needle, hold the needle with the *bevel facing upward* and pinch the wings together tightly.
13. Insert the needle into the vein at a 15° angle—gently advancing it into the vein.

- Use quick, sharp, darting motion to enter skin until you feel a "pop" through the vein
- Blood should enter tubing indicating you are in a vein *("flashback" will occur)*
- If the tubing of the butterfly needle has not been previously filled with solution, then allow the blood to flow from the hub before attaching the syringe to ensure that no air bubbles are contained in the system

Steps of Venipuncture



14. Release tourniquet
15. Tape needle or catheter securely in place
16. Administer contrast *(medication may be given by bolus or infusion)*
    - IVs – if in for long period or inserted by IV team – date, time, and initials of inserter will be documented on tape **(documented also in EPIC)**
17. Remove needle and apply gentle pressure to the site
18. Dispose of syringe/needle properly
19. Chart all relevant information

Steps of Venipuncture

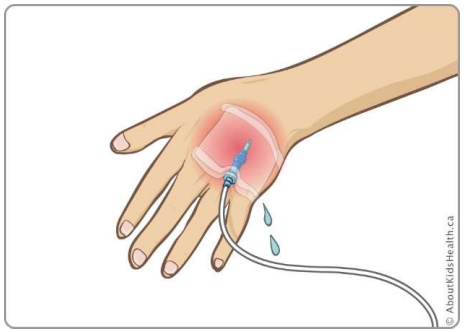
*TO REMOVE ---**IV Catheter***

- Wear clean gloves
- Remove tape
- Place clean gauze over site (can put Band-Aid on now)
- Remove needle (catheter) at straight angle
- Dispose of needle and syringe in ***RED*** Sharps Container
- Cover area with gauze and Band-Aid or Koflex
- May need to apply pressure
- Hand hygiene

Venipuncture Complications

Complications

1. ***Extravasation/Infiltration*** – IV fluid or contrast injected into area of tissues surrounding vein



   – Discomfort, pain, burning, swelling
   – To minimize chance of occurrence:
      - Check for backflow of blood to determine you are in a vein before injecting;
      - Immobilize needle or catheter at injection site;
      - Stop injection immediately if patient complains of discomfort at site or if resistance is felt

Procedure: Right Wrist X-ray

Complications

2. ***Phlebitis*** – Inflammation/irritation of a vein
   - Mechanical
     - Irritation of catheter due to unskilled insertion, too large for vein, improper anchoring causes movement, extended dwell time
   - Chemical
     - Irritating medication, solution
   - Bacterial
     - Poor aseptic technique with hand washing, infusion system, solution, and insertion; poor taping; extended dwell time

Complications

3. ***Embolism*** – A blood clot or other solid mass, as well as an air bubble, can be delivered into the circulation through an IV and end up blocking a vessel

   – Air bubbles of less than 30 milliliters thought to dissolve into the circulation harmlessly
   – A larger amount of air can cause life-threatening damage to circulation
      •If extremely large (3-8 milliliters per kilogram of body weight), can stop the heart

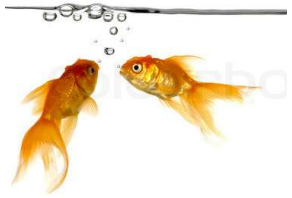
Complications

3. Embolism (continued..)

•Air embolism causes

- Air not removed from syringe or air in syringe before use
- IV solution ran dry
- Open port, lose connection
- Poor technique with tubing/dressing changes

4.Low fluid level in container– Could lead to air embolism

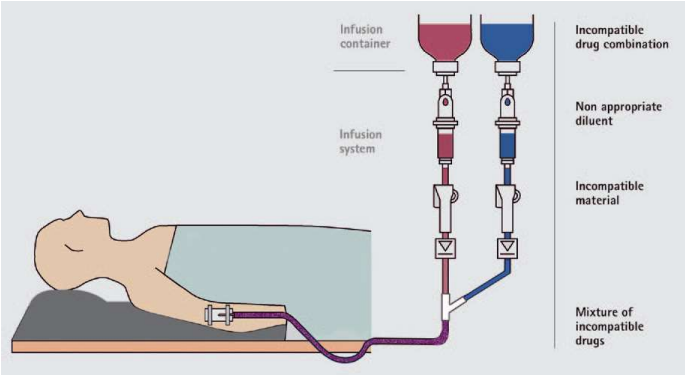


Complications

5. ***Drug Incompatibility***– Interactions between two or more substances which lead to changes in chemical, physical, therapeutic properties of the pharmaceutical dosage form

Consequences:

- Severity of side effects from the two substances is increased
- Particulate emboli from crystallization and separation
- Therapeutic failure



Complications

6. ***Unplanned Removal of IV (IV Dislodgement)***

Possible reasons for dislodgement:

- IV improperly secured in place
- Patient movements: rolling over in bed, catching the lines on the bedrails, transferring to or from different beds
- Patient disorientation – patient induced dislodgement
- Pediatric patients

Complications:

- Discomfort to the patient with re-insertion of a new IV
- Increased risk of phlebitis, infiltration, air embolisms and blood infections
- Delay in treatment

Misc Policies

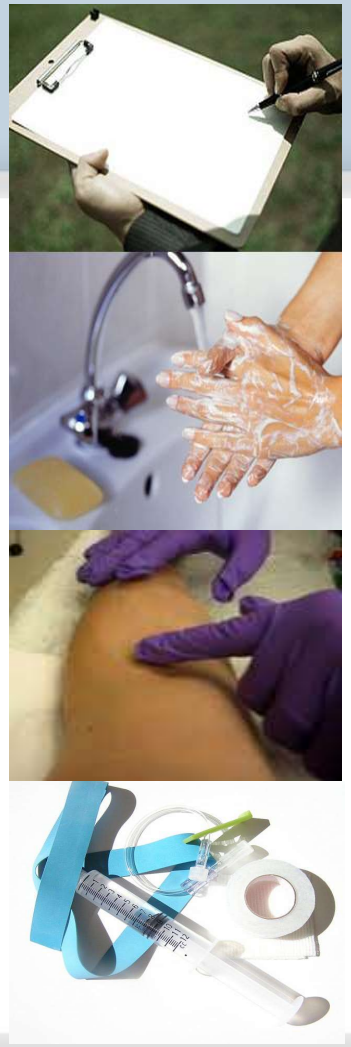
- Venipuncture Training
- IV Contrast Administration Training
- Sharps injury Prevention
- Contrast Extravasations

Any type of reaction/interaction or safety issue should result in either an incident report being completed or documentation must occur within the patients chart.

***Facility protocol should be followed with documentation*

Demonstration: Steps of Venipuncture

1. Obtain order
2. Hand hygiene
3. Identify patient, obtain history, and explain procedure
4. Assess for allergies
5. Select site
6. Gather equipment (when preparing media, remove air from tubing by running contrast completely through)
7. Support arm
8. Secure tourniquet 4-8” above selected site



Steps of Venipuncture

9. Wear clean gloves
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11. Hold skin taught above and below insertion site
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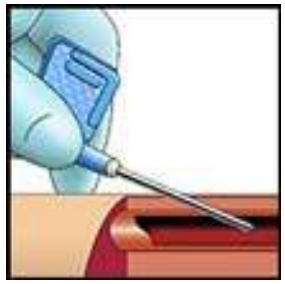

Steps of Venipuncture

15. Tape needle or catheter securely in place
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17. Remove needle and apply gentle pressure to the site
18. Dispose of syringe/needle properly
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