Venipuncture

Unit 3 Part 3

MI:116 Patient Care

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Parenteral Administration

SYRINGES AND NEEDLES

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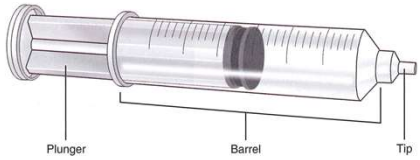
Equipment – Syringe pg. 269-273

- Standard hypodermic, insulin, tuberculin, pre-filled syringe
- Three parts of a syringe:
  - Tip
  - Barrel
  - Plunger



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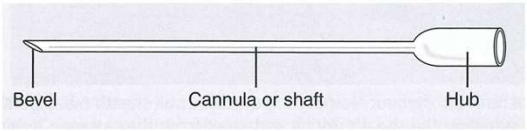
Equipment – Needle pg. 269-273

- 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

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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)

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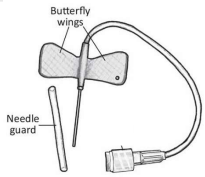
Equipment - Needle Types pg. 269-273

- 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)

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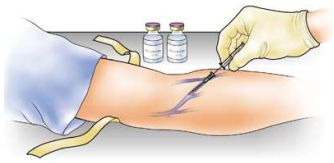
Other Equipment Needed

- Alcohol swab/wipe
- Tourniquet
- Clean gloves
- Tape
- Drug to be administered (Vial or Ampule)
- Saline flush if using venous catheter



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Alcohol Swab/Wipe

- Clean site for venipuncture with alcohol
- Use circular motion while moving from the center to the outside
- Allow area to dry (about 30 seconds)
  - If you don't patient will feel a stinging sensation upon needle insertion

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Tourniquet

- Purpose: minimize venous blood flow back to heart while allowing arterial blood to continue to flow to the extremity
- Apply 3 to 4 inches above the area of venipuncture or IV drug injection
- Do not leave on for more than 2 minutes

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Gloves and Tape

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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.

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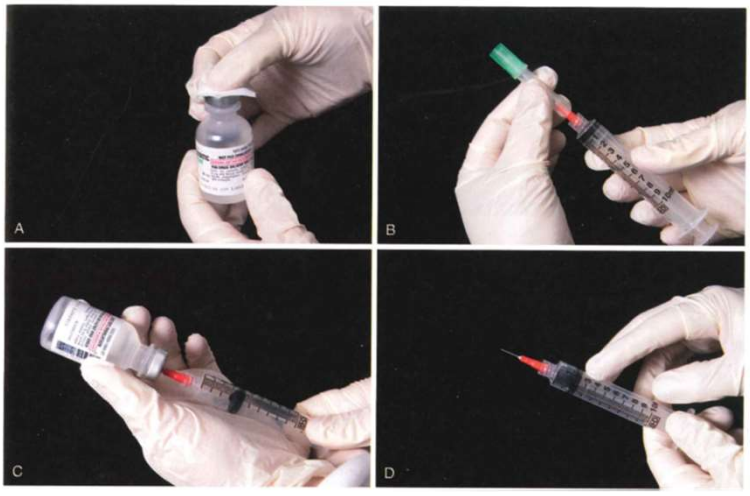

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Ampules – pg. 271-273

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

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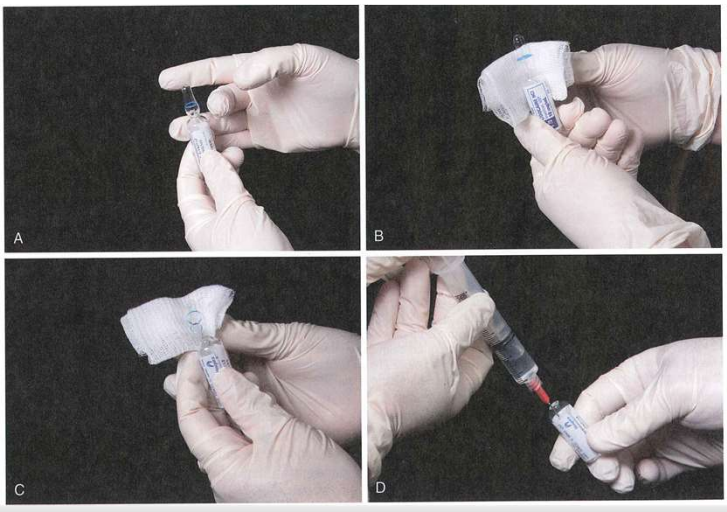

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What type of Parenteral Administration does Radiology use?

Intravenous Injection

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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

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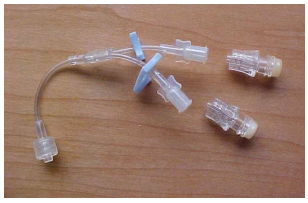
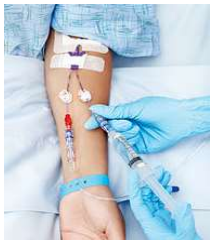
Intravenous Drug Administration

3 methods:
- Infusion
- Intermittent Infusion
- Direct Injection
  - Hand injection
  - Automatic Power Injection





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Infusion

pg.277-280

Infusion of a large volume of fluid over a certain amount of time
- sometime referred to as drip infusion

- IV fluid attached to drip chamber which allows fluid to flow one drop at a time
- An intravenous pump may be used *(most accurate)*
  - Allows precise control over flow rate and total amount delivered electronically
- Patient's receiving infusion should be monitored closely
  - Swelling and pain = infiltration
- When arriving in Radiology Department:
  - May be attached to litter or on its own IV pole
  - Has alarms to sound and flash when the infusion flails
  - Be aware of lines so they are not kinked or pinched

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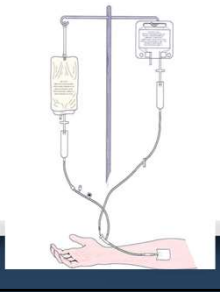
Intermittent Infusion

An infusion of a volume of fluid/medication over a set period of time at prescribed intervals and then stopped until the next dose is required.

- may be called a piggyback medication, a secondary medication, or a mini bag medication

– Drugs can be:
  - run in at same time (Y site) (dilute)
  - one higher than other – Higher drug will flow in first. Once completed, lower bag will immediately flow



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Direct Infusion – single administration

- Hand Injection – pushed in manually by hand
  – Intravenous bolus or intravenous push
- Automatic Power Injection

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Site of Adminstration

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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

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Sites of Administration

- Peripheral
  - IV administration is through a short catheter in a peripheral site *(Median Cubital Vein Cephalic Vein Basilic Vein)*
  - Used for short term use
- Central (learned in Unit 2 Part 4)
  - IV administration is through a longer catheter that its tip ends in the SVC
  - Used for long term use and for harsher medication

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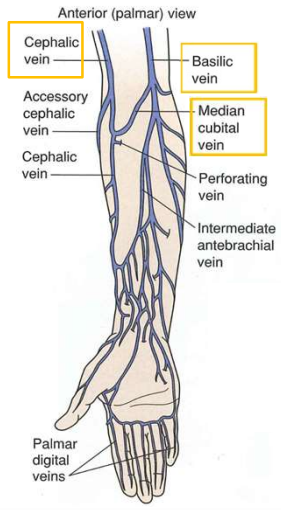
Most common Intravenous Injection sites:

pgs. 275-276

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



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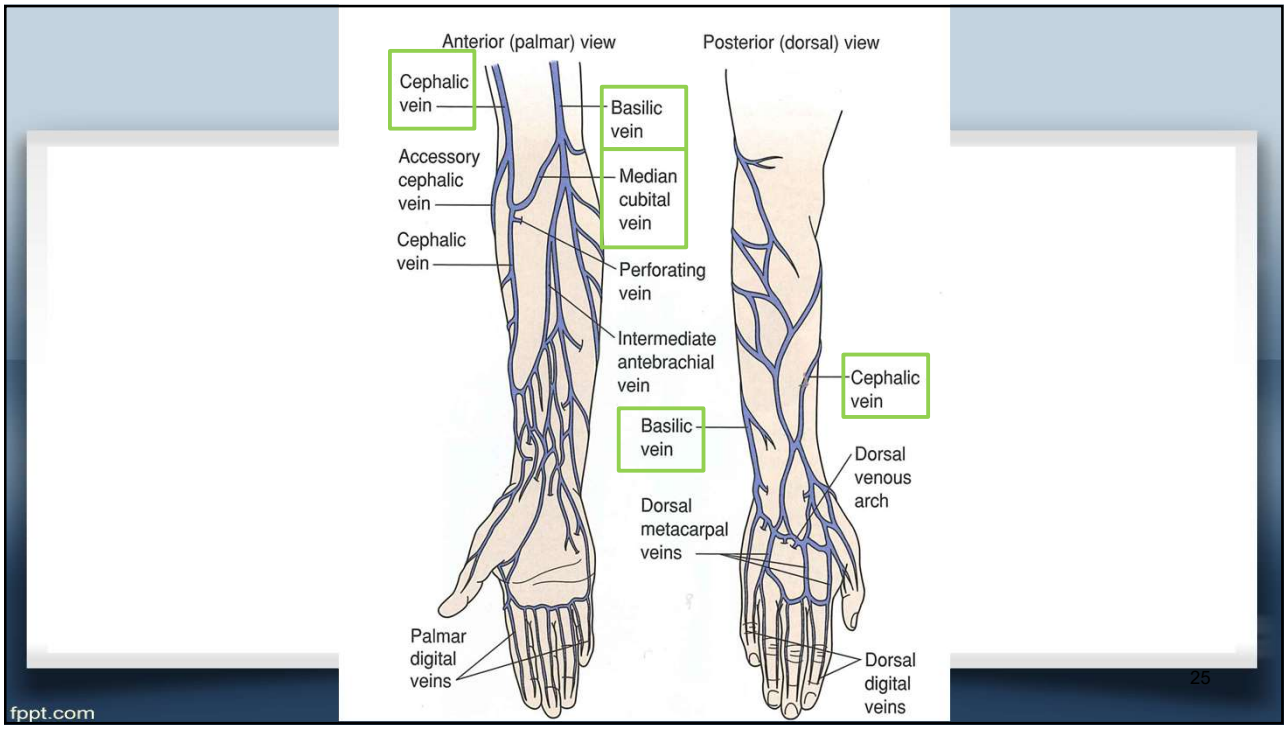

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- *Benefits to usage of veins in antecubital space*
  - Most often used
  - Accessible, large and easy to puncture
- *Drawbacks to usage of veins in antecubital space*
  - Frequently used—scarred or sclerotic
  - Motion of joint could cause dislodgement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

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Vein Selection Tips/Tricks:

- Veins must be palpated to assess elasticity & firmness
- Veins should not be hard, bumpy, or flat
- Select most distal site that can accept desired size needle, tolerate injection rate and solution
- Avoid volar (palm) side of wrist due to radial nerve
- Veins in arm/hand should be selected over the lower extremities

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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"
- *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

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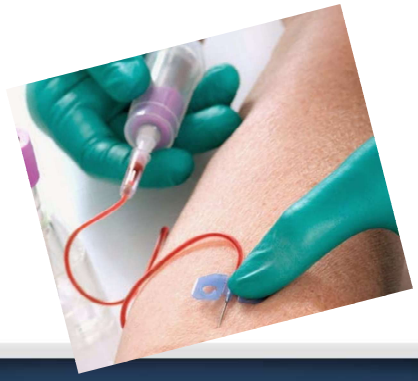
Venipuncture Procedure



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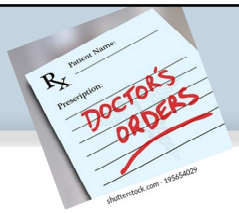

1. Obtain order
2. Hand hygiene
3. Identify patient, assessment and instructions
4. Informed consent
5. Dosage, dose calculations, and dose-response
   - Adults
   - Pediatrics

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Reading Hospital

POLICY: IV Contrast Media Screening for Diagnostic/Fluoro

Adult

Weight Based IV Contrast

Adult Weight in kg.	Contrast Volume
Up to 60 kg	70 cc
61-70 kg.	85 cc
71-80 kg.	95 cc
81-90 kg	105 cc
91-100 kg.	115 cc
101 kg. and up to	125 cc

Adult Weight in lbs.	Contrast Volume
Up to 132 lbs.	70 cc
133-154 lbs.	85 cc
155-176 lbs.	95 cc
177-198 lbs.	105 cc
199-220 lbs.	115 cc
221 lbs. and above	125 cc

Pediatric

2. Pediatric patients under 1 year of age to one month old- A radiologist's approval is needed prior to administering intravenous contrast.
3. Pediatric patients ages 1 to 13 years needing intravenous contrast receives Iso-Osmolar Contrast for comfort's sake. All normal screening protocols apply to pediatric patients.
   - Standard Contrast to administer is Visipaque 320mgI/ml
   - Standard Dosage is 2ml/kg.

The conversion of pounds (lbs) to kilograms (kg) = pounds(lbs) divided by 2.2

Example: pediatric patient weighing 40lbs.
40 divided by 2.2= 18kg
18kg x 2ml= 36ml of contrast can be administered

4. Pediatric patients ages 14-18
   - Standard Contrast to administer is Omnipaque 300 mgI/ml
   - Standard Dosage is 2ml/kg.
   - Total dose not to exceed the amount utilized for adult protocol.

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6. Patient preparation/Venipuncture preparation

- Application of Standard Precautions
- Select site
- Gather equipment
- Support arm
- Secure tourniquet (3-4" above selected site)
- Wear gloves
- Cleanse area (site of injection outward)

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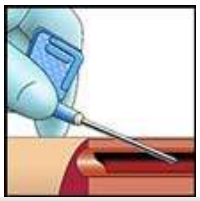
Steps of Venipuncture

7. Hold skin taut above and below insertion site
8. Butterfly needle insertion:
   - Hold the needle with the ***bevel facing upward*** and pinch the wings together tightly
   - Insert the needle into the vein at a 15°-30° angle
   - Gently advance until you feel a "pop" through the vein
   - Blood should enter tubing indicating you are in a vein *("flashback" will occur)*



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Or If Using An Existing Line

- Review from Unit 2:

Alcohol hub
Flush catheter
Inject contrast or medication
Flush catheter
Recap hub if facilities provide them

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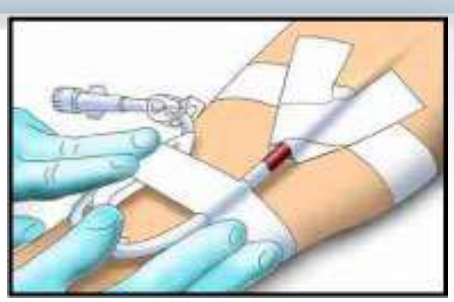
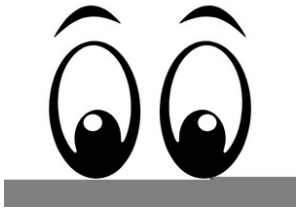
9. Release tourniquet
10. Tape needle or catheter securely in place
11. Administer contrast
12. Observe Site





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13. Remove needle and apply gentle pressure to the site

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
Observe site and patient

12. Chart all relevant information

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Discontinuation of an IV

- IVs **requires orders** to be placed and to be discontinued
- RT must be certain the IV infusion is to be discontinued and the catheter withdrawn
- Equipment:
  - Dry sterile 2”x2” gauze
  - Clean disposable gloves
  - Tape
- Make sure to observe site and patient during discontinuation

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1. Identify the patient; perform hand hygiene
2. Stope the solution that may be continuing to be instilled
3. Prepare a sufficient strip of tape to cover a small pressure dressing
4. Loosen the tape that holds the needle or catheter in place making certain the hub or the needle or catheter is clearly visible and still in the patient. DO NOT untape the actual insertion site
5. Open the sterile gauze sponge pack using aseptic technique
6. Put on the clean gloves
7. Gently withdraw the needle or catheter from the vein completely. Inspect the needle or catheter making sure it has remained intact
8. Apply pressure to the site with the dry, sterile sponge until bleeding stops – about 2 minutes
9. When the bleeding stops, use a sterile gauze sponge folded in half, place it over the site of insertion, and tape it in place using some pressure over the sponge. Inform the patient that this dressing may be removed in 1 or 2 hours
10. Dispose of the material correctly. Remove gloves and wash hands

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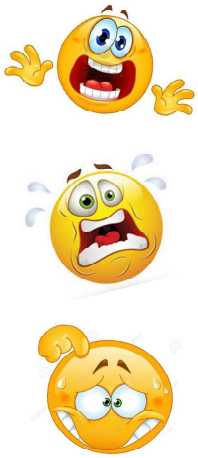
Venipuncture Complications



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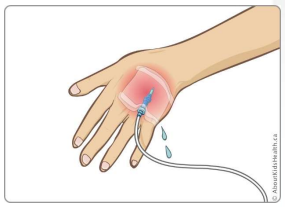
Extravasation

- The inadvertent administration of a vesicant into the tissues



- Treat as a medical emergency and action is required
- Signs of Extravasation: Discomfort, pain, burning, swelling
- To minimize chance of occurrence:
  - Check for backflow of blood
  - Immobilize needle or catheter at injection site
  - Stop injection immediately if patient complains of discomfort at site or if resistance is felt

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How to Respond if Extravasation occurs

- Explain to the patient what is suspected and what is about to be done
- Stop the infusion/injection but leave the needle in place
- Slowly aspirate any remaining contrast/vesicant mediation from the needle
- Remove the needle
- Place **COLD** pack/cloth on the site and ELEVATE the part

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Procedure: Right Wrist X-ray

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Procedure: Elbow X-ray

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Infiltration

- The accidental leakage of non-vesicant solutions out of the vein into the surrounding tissue
- One of the most common problems that can occur when fluid infuses into the tissues surrounding the venipuncture site
- Occurs due to:
  - Tip of the catheter slips out of the vein
  - Catheter passes through the wall of the vein
  - Blood vessel wall allows part of the fluid to infuse into the surrounding tissue
- A **WARM** compress is used to alleviate discomfort and help absorb the infiltration by increasing circulation to the affected area.

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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
- Symptoms: Warmth, swelling, pain, and redness around the vein

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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 are 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

- Air embolism causes:
  - Air not removed from syringe or air in syringe before use
  - Open port, lose connection
  - Poor technique with tubing/dressing changes

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Another Embolism Concern…

Low fluid level in container

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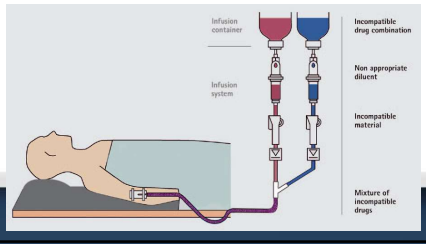
Drug Incompatibility

- 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



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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

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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 patient's chart.

***Facility protocol should be followed with documentation*

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