SPECIMEN COLLECTION AND PREPARATION

Patient Identification:
- The Joint Commission now requires two sources of patient identification. See CCHS policy for specific instructions on identification of inpatients, outpatients and those in the Emergency Department. Also, see appropriate departmental policies for further information.
- The Joint Commission now requires us to label collection tubes at the bedside.

Venipuncture:
- Try to limit the time the tourniquet is applied to less than 1 minute.
- Have patient make a fist, but not “pump” the fist.
- Select vein carefully, to avoid any artery.
- With the bevel up, puncture the vein with the needle at an angle of $<30^\circ$.
- During tube fill, have patient open the hand to relax the muscles in the arm.
- Release the tourniquet as soon as blood begins to flow.
- Fill the tubes to the proper volume and in the proper order, as outlined below.

Proper tube fill order to minimize contamination:
- Blood cultures
- Light blue tops (citrate)
- Red or yellow top plastic and glass tubes with or without gel and with or without clot activators
- Green top tubes (lithium heparin)
- Lavender top tubes (EDTA)
- Gray top tubes (NaF, potassium oxalate/sodium fluoride)

After filling all collection tubes with blood, gently invert them 8 times to adequately mix clot activator in red-top tubes or anticoagulant in other tubes. Light blue top tubes, used in coagulation studies, should only be gently inverted 4 times to mix the specimen. Inversion more than 4 times will initiate the clotting process.

- NEVER pour blood from one collection tube into another! Doing so may cause critical values on several tests.
- Remove and dispose of needle safely.
- Label tubes at the patient’s bedside and record the date and time of draw on the tube.
**Line Draw Discard Volumes:**
Line draws pose a particular problem with contamination of specimens. The minimum whole blood discard volume is 5 mL or 6 dead-space volumes (i.e., 6 volumes of the tubing), whichever is greater. Heparin lines should be flushed with a minimum of 5 mL saline and the first 5 mL of whole blood or 6 dead-space volumes should be discarded prior to blood collection. It is preferred that Coagulation tests and blood cultures be drawn only by venipuncture.

**Use of Syringes:**
Always mix blood in syringe, using the “rock and roll” method to ensure adequate mixing immediately prior to dispensing into collection tubes. Laying syringe down on flat surface causes blood cells to sediment, resulting in more cells in one tube and more plasma in another.

Small bore needles (23 gauge) are more likely to cause hemolysis of specimen than larger bore needles (18-20 gauge). Applying too much pressure to fill syringe or dispense blood from a syringe will cause hemolysis. Use gentle pressure to aspirate or dispense blood from a syringe.

**Preanalytic Causes of Hemolysis:**
- Leaving tourniquet on too long
- Drawing blood too close to the tourniquet
- Excessive fist clenching
- Infiltrated vein (traumatic draw)
- Excessive probing with needle
- Needle too small
- Applying too much pressure to fill syringe
- Expelling blood from syringe into tube too rapidly
- Shaking tubes to mix blood with anticoagulants, instead of gentle inversion
- Milking skin punctures (heelsticks and fingersticks) too vigorously

**References:**