IV SETs

Parts & Pieces

- **Spike**: insert into IV bag/bottle
- **Vent**: only needed if bottle is unvented so won’t create vacuum, no need when using vented bottles or when working with plastics because PVC/polyolephin will collapse
- **Drip chamber**
  - Facilitates continuous flow
  - To allow air to rise up from the fluid so that it is not passed downstream (prevent embolism)
  - Allows an estimate of drip rate
    - Adults: 10, 15, 20 drops/ml
    - Pediatrics: 60 drops/ml
  - Squeeze to about ½ full
- **Tubing**: usually PVC, nylon is cloudier and less flexible, and polyesters are never used for pumps
- **Clamp**: most control to least: dial > screw > roller > slide (DSRS)
- **Y site**
  - Where medication or other IV solutions can be delivered through a rubber stopper
  - Gum rubber, self-sealing
  - 1° tubing has 1+, 2° tubing has none
  - Near the top: for piggy backs (closer to drip chamber)
  - Near the bottom: for IV push (closer to catheter)
  - Flash ball
- **Needle adapter**: allows for attachment of needles
- **Priming**: open package, close clamp, squeeze drip chamber, insert spike into IV container, invert container, release drip chamber to half full, open clamp fully to purge air from tubing, set correct flow rate using clamp

IV Piggyback (2°)

- **Differences**:
  - Shorter tubing, PVC, no y-sites, no back check valves, clamp is usually slide (or roller)
- **Back check valve and hydrostatic pressure prevents 1° IV line from going while 2° goes**
- **Always hung higher up than 1°**
- **Heparin Lock**
  - Has latex seal
  - Can hook up with 1° bottle or IVPB
  - Has to use a roller clamp
- **Buretrol**
  - Used for pediatrics to better control flow rate and to prevent errors
  - Advantages: used where small or precise volumes are required, where volume intake must be monitored
  - Disadvantages: only 1 drug at a time, need to change daily to avoid contamination

Special IV Sets

- **Nitroglycerin**: drug will bind to PVC tubing → need nylon tubing that resists adsorption
- **IV fat/lipids**: extracts out plastimer out of tubing into fat → need nylon tubing that resists adsorption
- **Filter sets**
  - Have 3 requirements
    - 0.2 micron size
    - Large surface area
    - Eliminates air: so air doesn’t collect on filter and block flow
  - Can be in-line or end-or-line
- **Y sets**: for administration of two solutions simultaneously: e.g. blood with normal saline
  - Has a ball with ions (Na and Cl ions) to prevent RBCs from stacking up; RBCs stack up due to electrostatic charge
- **Transfer sets**: used in compounding
  - Slide clamp (on/off) only
  - Short tubing, no drip chamber
  - Used to transfer one solution into another
- **Irrigation tubing**: pinch clamps (on/off)
Both liquids mix
Have rubber hose so if you want to get more force to irrigate the wound, squeeze the rubber hose

Electronic Infusion Devices

- **Flow rate** based on: surface area, tolerability of fluids, etc. (decided by doctor)
- **Exact flow rate** needed for medical emergencies
  - Cardiac arrhythmias
  - Blood pressure control
  - Drug admin of toxic agents
  - Nutrition
- **Inaccuracies**
  - Solutions contain 2-3% extra liquid which allows for priming waste
  - Drop orifice size varies
  - Viscosity: changes number of drops per ml
  - Clamps: distorts plastic tubing; slipping
  - Filters decrease flow rate
  - Patients' bp, movement, position
  - Extravasation: accidental admin of IV fluid to surrounding tissue due to leakages or punctures
  - Height of container
  - Tubing: kinked, bent out of shape
- **Dangers**
  - Delayed response
  - Toxic response
  - ↑ Phlebitis
  - Pulmonary edema
  - Speed shock
- **Controller/Regulator**
  - Non-volumetric (drops/min) mostly
  - No positive pressure exerted
  - Gravity
  - Simpler: less maintenance, less costs, no moving parts
  - Detects changes in flow rate and sounds alarm
  - Electric eye clipped onto drip chamber
- **Pumps**
  - People prefer pumps over controllers
  - Volumetric (ml/min) mostly
  - Positive pressure created
  - Electric pump
  - Types of pumps
    - **Peristaltic**: linear or rotary; as rotor turns, the part of the tube compressed closes it forces the fluid to move through the tube, and as it opens, fluid flow is induced to the pump
    - **Cassette**: often used to deliver nitroglycerin
    - **Syringe**: used to gradually admin small amounts of fluid, usually over several minutes
- **Rate** is how fast a dose runs, **Schedule** is how often dose is given

- **Hep Lock**
  - A small tube connected to a catheter in a vein in the arm for easy access. It is an alternative in some cases to using an IV. Its called heplock because of the order of medicating using it which is saline, medication, saline then heparin. The final heparin dose being introduced to prevent blood clots in the line should more medication be needed later. Generally a saline lock is used for lines in the arm but it is sometimes refered to as a heplock for historical reasons.