Protocol: Arterial Line Insertion

Purpose: To describe the procedure for inserting of a radial or femoral arterial pressure line.

Indication: Used in trauma patients requiring invasive arterial blood pressure monitoring based on organ injury, hemodynamic instability, monitor effects of vasoactive medications, frequent arterial blood gas and lab sampling, or at the discretion of the trauma attending or fellow.

Procedure:
A. Equipment
   1. arterial line insertion supplies box (obtain from Service Center) – includes sterile towels, betadine solution, sterile gloves, arterial catheter with guidewire (18 Ga. & 20 Ga – use radial arterial catheterization set for radial artery cannulation and arterial catheterization set (not radial) for femoral artery cannulation), 2 – 0 silk suture, pressure tubing with transducer, 500 mL bag normal saline with pressure bag
   2. 4 x 4s
   3. local anesthetic (lidocaine 1% plain)
   4. syringe with 18 Ga and 25 Ga needles
   5. transparent biocclusive dressing

B. Procedure for Radial Arterial Line Insertion
   1. perform Allen Test to confirm ulnar collateral circulation
   2. position patient’s wrist / hand: dorsiflex wrist over towel pad or padded bedside table; tape palm and upper forearm to armboard or bedside table
   3. prep entry site with betadine solution and sterile drape entry site
   4. instill local anesthetic at entry site using small wheal (1 – 2 mL) lidocaine 1% plain
   5. identify radial artery – start distally
   6. using sterile technique, insert arterial needle into the skin just distal to palpated artery site at 30 – 60 degree angle
   7. advance needle into artery until spontaneous pulsatile bright red blood enters column
   8. advance guidewire
   9. advanced plastic catheter over guidewire – modified Seldinger technique
   10. connect to pressure tubing and transducer – level and zero, and verify arterial waveform.
   11. suture arterial line and dress with transparent biocclusive
12. write procedure note in patient’s chart documenting: need for arterial blood pressure monitoring, results of Allen Test if radial arterial line is inserted, prep and sterile drape of site, amount of local anesthetic agent used, size of arterial catheter used and site used, modified Seldinger technique used (catheter over guidewire), pulsatile blood return and verification of adequate arterial waveform, complications encountered if any, and patient tolerance of procedure

C. Due to high complication rates, the NP must perform 3 successful arterial line placements under the direct supervision of a resident/fellow/attending before performing independently. As well, NP must perform at least 10 arterial line placements per year in order to maintain competency.

D. Complications to assess for:
   1. arterial thrombosis
   2. air embolism
   3. hematoma
   4. arterial vasospasm
   5. bleeding
   6. infection

E. Document procedure on skill check off sheet

References