

## Advanced Vascular Access

### Alternative Methods for IV Therapy:

#### 1. Intermediate Term (Midline) IV Access

- available in 24 and 22 gage,
- is 3-6 inches long
- placed in the antecubital fossa, and is threaded into the upper arm
- it winds up in a larger vein with increased blood flow
- in children, it is often used for CF, osteomyelitis, and Crohn's Disease, that require several weeks of IV antibiotics, antifungal or nutritional therapy. (traditional catheters would be impractical)

#### 2. Non-tunneled Catheters

- a) Non-tunneled peripheral catheters
  - PICC lines (peripherally inserted central catheters): are used in hospitals, out-patient departments and in home treatment
- b) Non-tunneled central catheters
  - subclavian, jugular, femoral catheters
  - in children, the subclavian is used for a three reasons. One, because the neck is shortened in infants, it can lead to occlusion, therefore the jugular is not used. Two, infants frequently adduct their legs, which could kink a femoral catheter. Three, the diaper area is not the ideal place for a central catheter because of potential contamination.
  - eg. Cordis catheters

#### 3. Tunneled Catheters

- use for long term venous access (TPN, antineoplastics)
- have 1, 2 or 3 ports (usually 1 or 2 ports in pediatrics)
- surgically implanted and placement is confirmed by x-ray
- eg. Brovaic or Groshong catheters

#### 4. Implanted Ports

- long term venous access
- usually implanted in children older than 3 years of age to ensure that there is enough subcutaneous tissue to cover the port. This will help prevent the port from eroding through the tissue and skin.
- can be a single or double port
- in CF children, can be implanted in the upper arm, because of the extensive chest physiotherapy they require
- usually implanted in right or left chest or even abdomen
- surgically implanted
- eg. Hickman port, which is accessed by a special right-angled needle called a Huber needle

#### 5. Intraosseous Access

- used for emergencies!
- used when there is no perfusion, and when iv catheterization is impossible or a 'cutdown' (actual procedure of surgically cutting into the patient to isolate the vein and directly catheterize it) will take too long. (2-40 minutes!)
- vascular access is almost instant with IO access (intraosseous)
- you can infuse blood, fluids and drugs into the bone marrow cavity (there is an extensive network of venous sinusoids in marrow, and meds given IO actually are absorbed faster than by peripheral IV)
- placement is usually in the anterior medial aspect of the tibia, avoiding the growth plate at the end of the bone. Can also be placed in the distal medial tibia, medial aspect of the distal femur, the iliac crest, humerus and the sternum.
- contraindicated in sites with infection, fractures, burns, and bone disorders like osteogenesis imperfecta (brittle bone disease).
- it is 'screwed in' to place

#### 6. Umbilical Catheterization

- used in neonatal therapy, accessing the umbilical stump
- can be accessed up to 3 days after birth

