Marsing Ambulance

Procedures – Intravenous and Intraosseous

Objectives

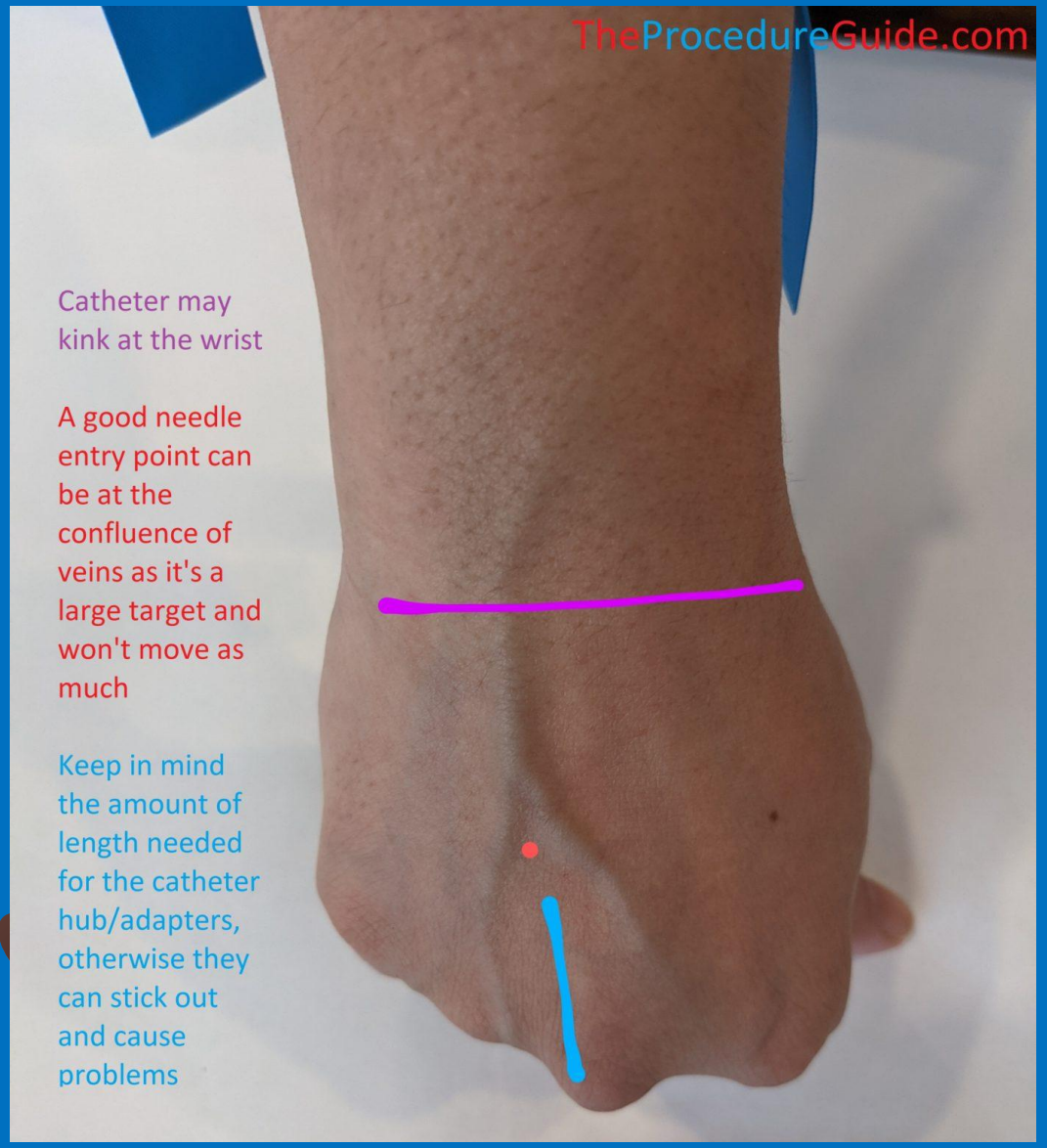
IV’S

- Vein locations
- Angles of attach
- Flash! – Not Gordon
- Threading
- Floating

IO’S

- Landmarks
- Drilling for oil – no not that deep
- Step by step
- Checking placement
- Lidocaine?

Location of Veins



Steps

- Place the tourniquet
- Assess the arm
- Start distal and work proximal
- Feel don’t look
- Pick the right size needle

Size	Color	Recommended use
14G	Orange	In massive trauma situations.
16G	Gray	Trauma, surgeries, or multiple large-volume infusions
18G	Green	Blood transfusion, or large volume infusions.
20G	Pink	Multi-purpose IV; for medications, hydration, and routine therapies.
22G	Blue	Most chemo infusions; patients with small veins; elderly or pediatric patients
24G	Yellow	Very fragile veins; elderly or pediatric patients

Entry Points

All about the hold

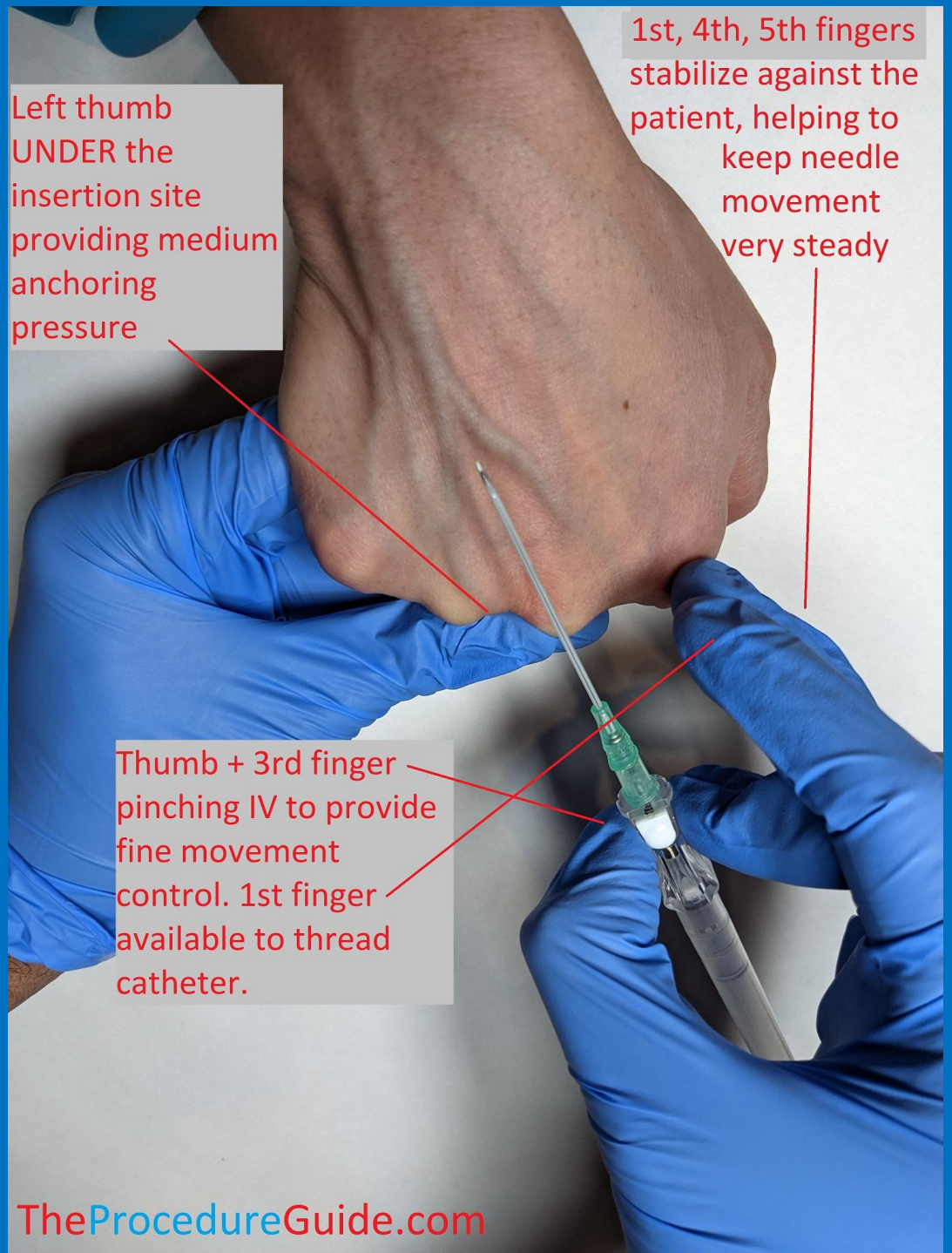
Control the arm

Control the vein

All about the hold

Control the arm

Control the vein

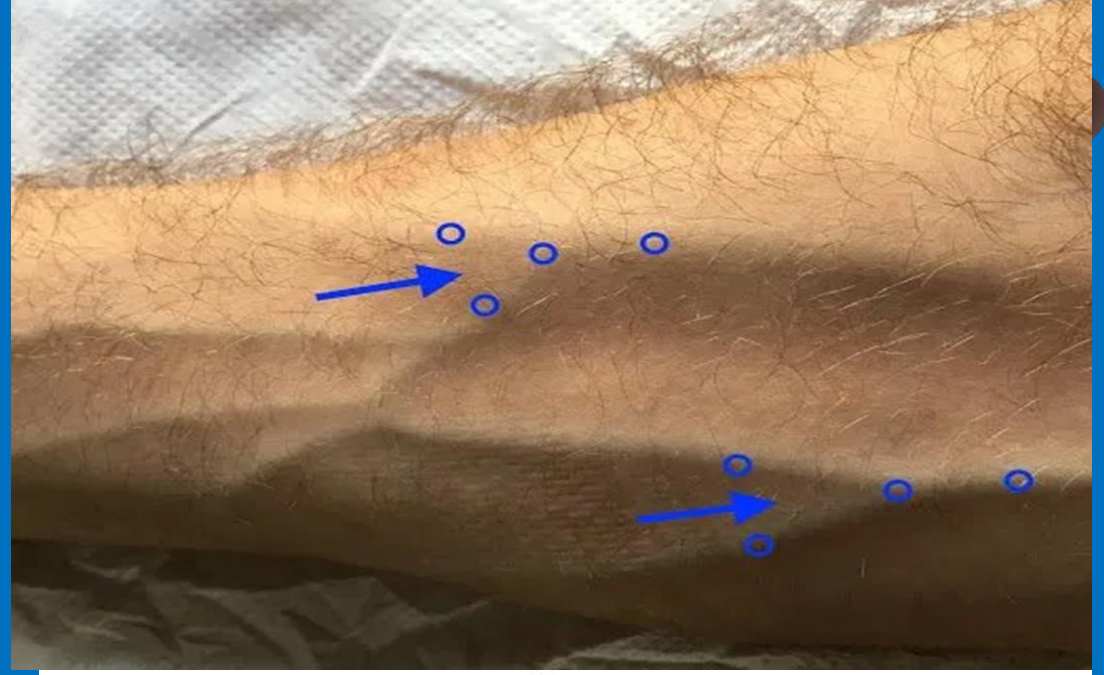


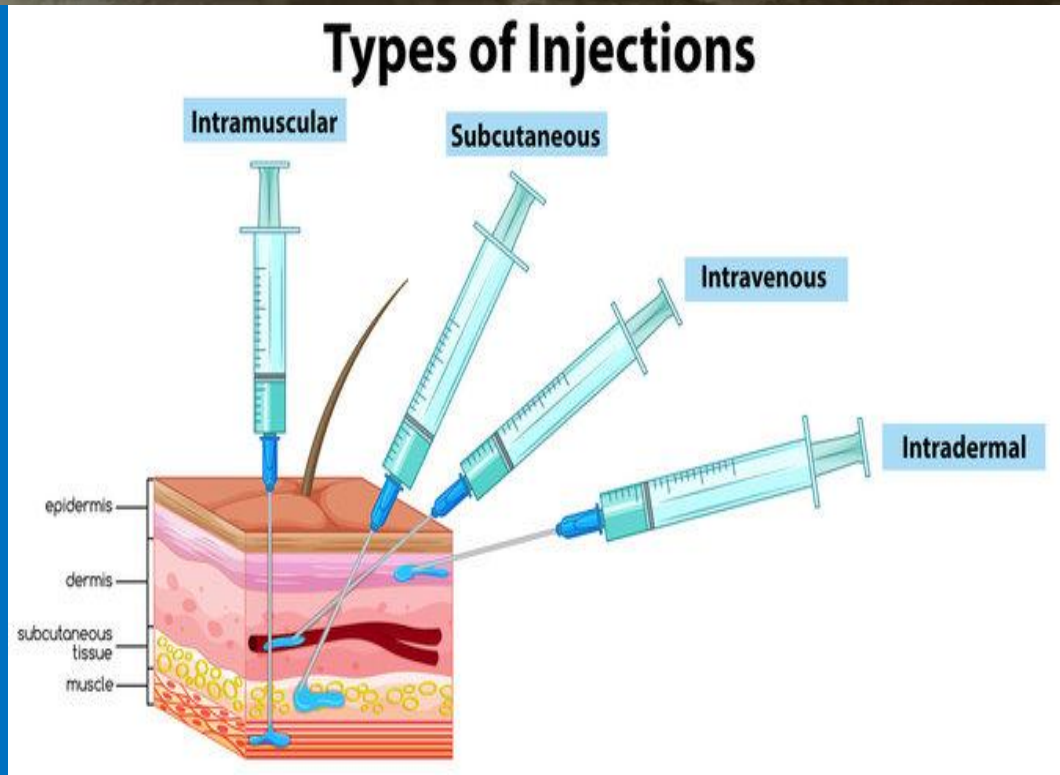
Steps

- Tourniquet – tight enough to occlude veins but not arteries – single loop/quick release
- Cleanse with alcohol wipe – circular motion
- Retract the skin
    - Resistance/vein control
- Push cath off of needle but don’t remove needle
- Remove tourniquet
- Occlude the cath tip
- Pull the needle and place IV tubing
- Flush/tape

Angle of attack

- Approx 15- 20 degree entry
- Direct to vein vs bifercation
- With flash – stop entering and drop to skin level (direct vein)

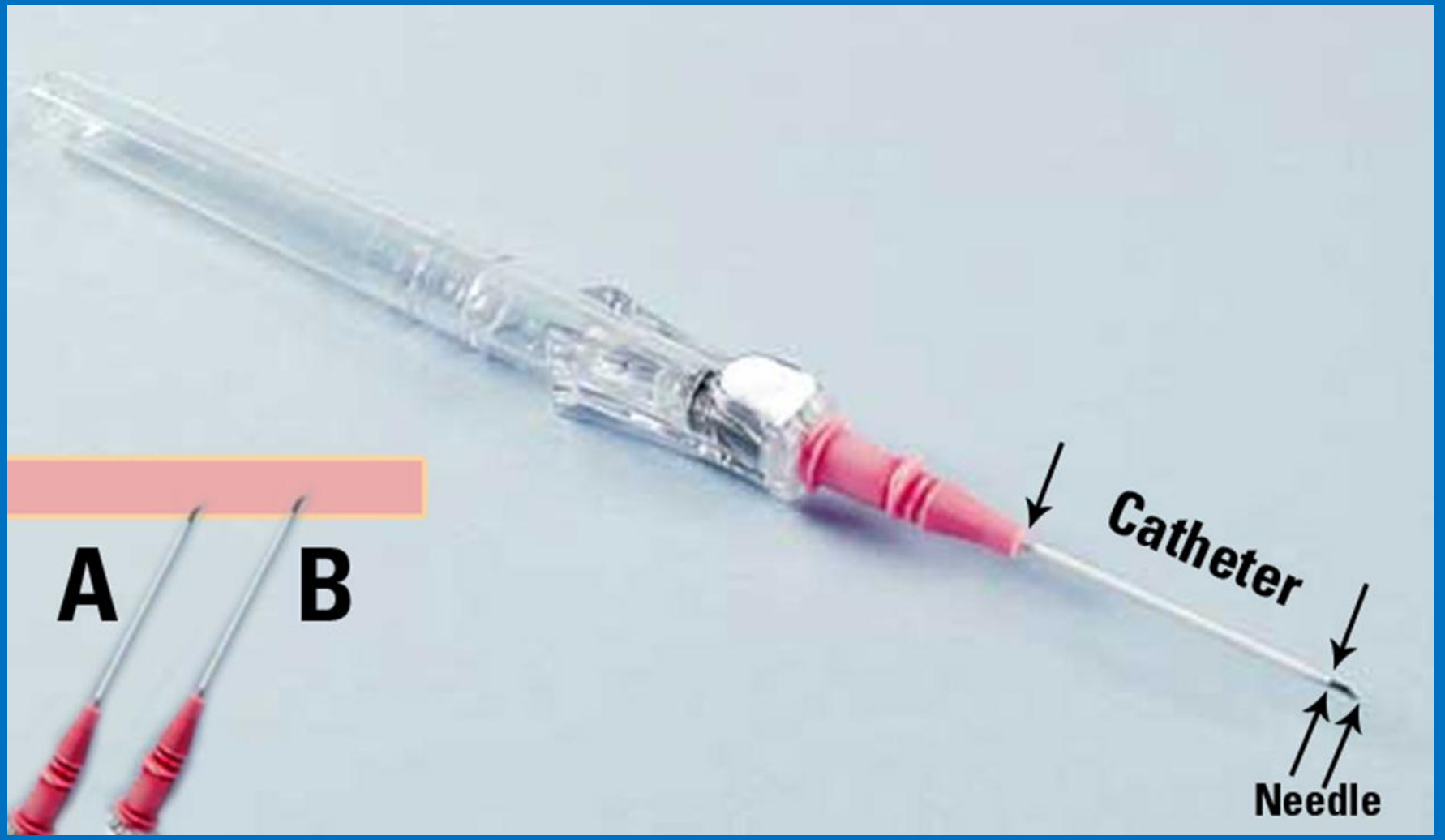




Angle of attack

Advance to clear the tip of the catheter

Let’s look at the cath



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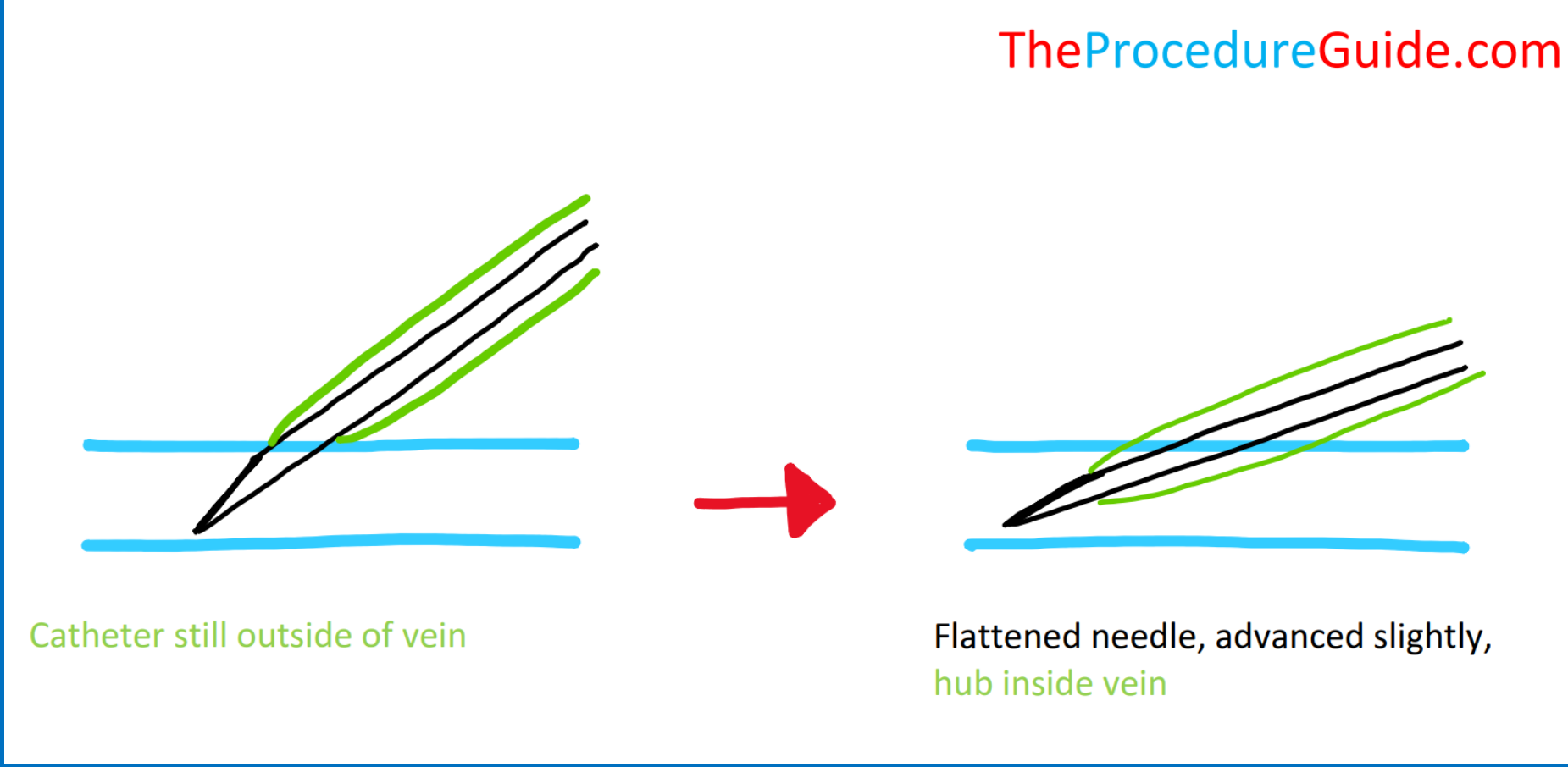
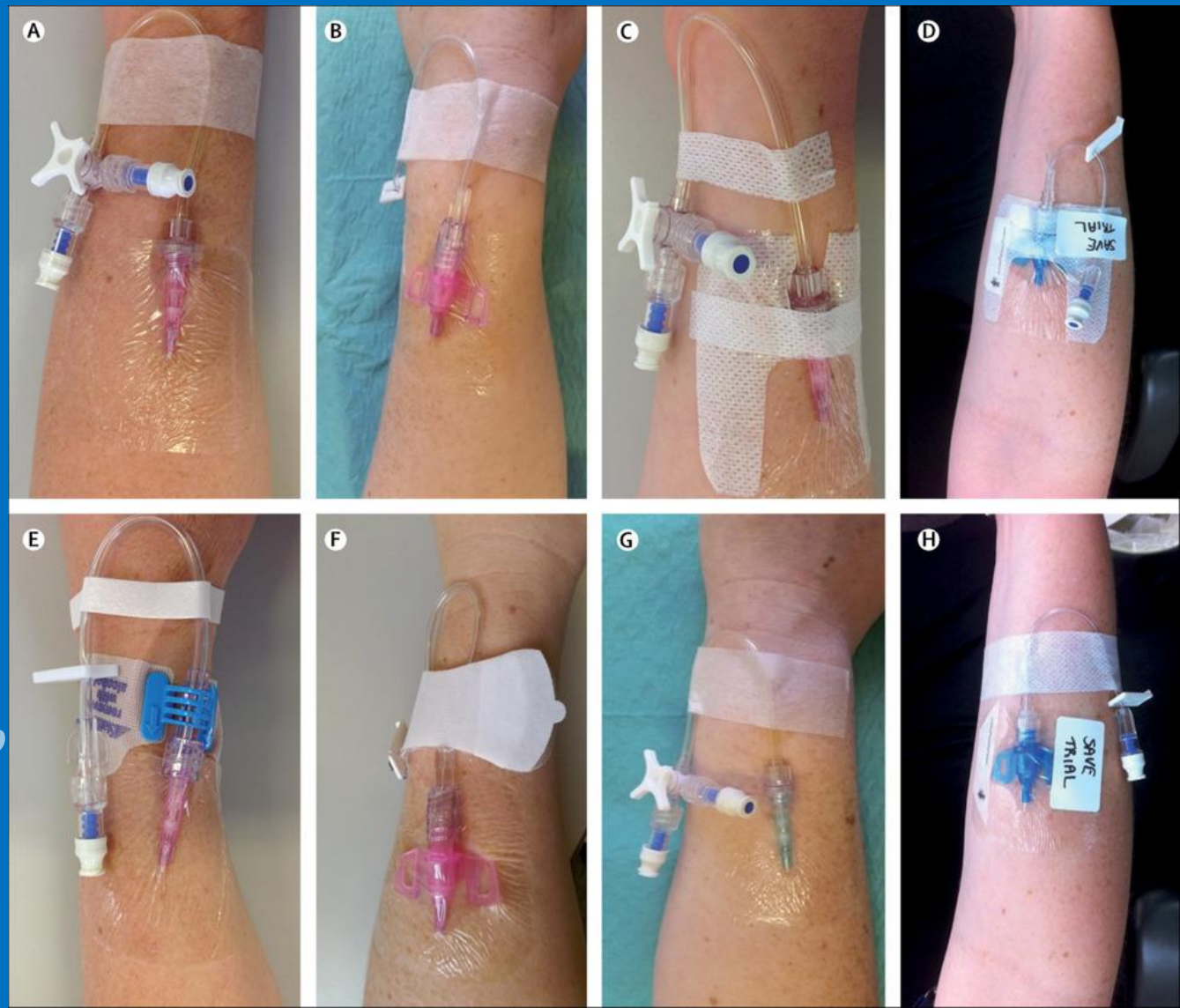


Threading

- Hold everything still and use your index finger to push the catheter forward off the needle

Connecting to tubing/taping

- Proximal occlusion
- Connect and flush
- Avoid circumferential taping
- Fragile old skin – less tape, more dressing



Oops – how do I fix this?

- Valves prevent the catheter from going all the way in
- Flushes but won't advance
- Won't flush unless you pull back slightly
  - Attach syringe and try advancing while flushing
  - Catheter does not have to be all the way in – secure it well!
- Through the vein – needle feeds off but no blood return
  - Attach a syringe, easily draw backwards until blood return is achieved (tip is in the vein)
  - Advance and rotate
  - Attempt to flush – no infiltration? – you're good

Practice practice practice
Practice practice practice

Intraosseous

Who said drills were just for wood?

2007 study – 87% success rate for field IO placement in infants under 2 y/o

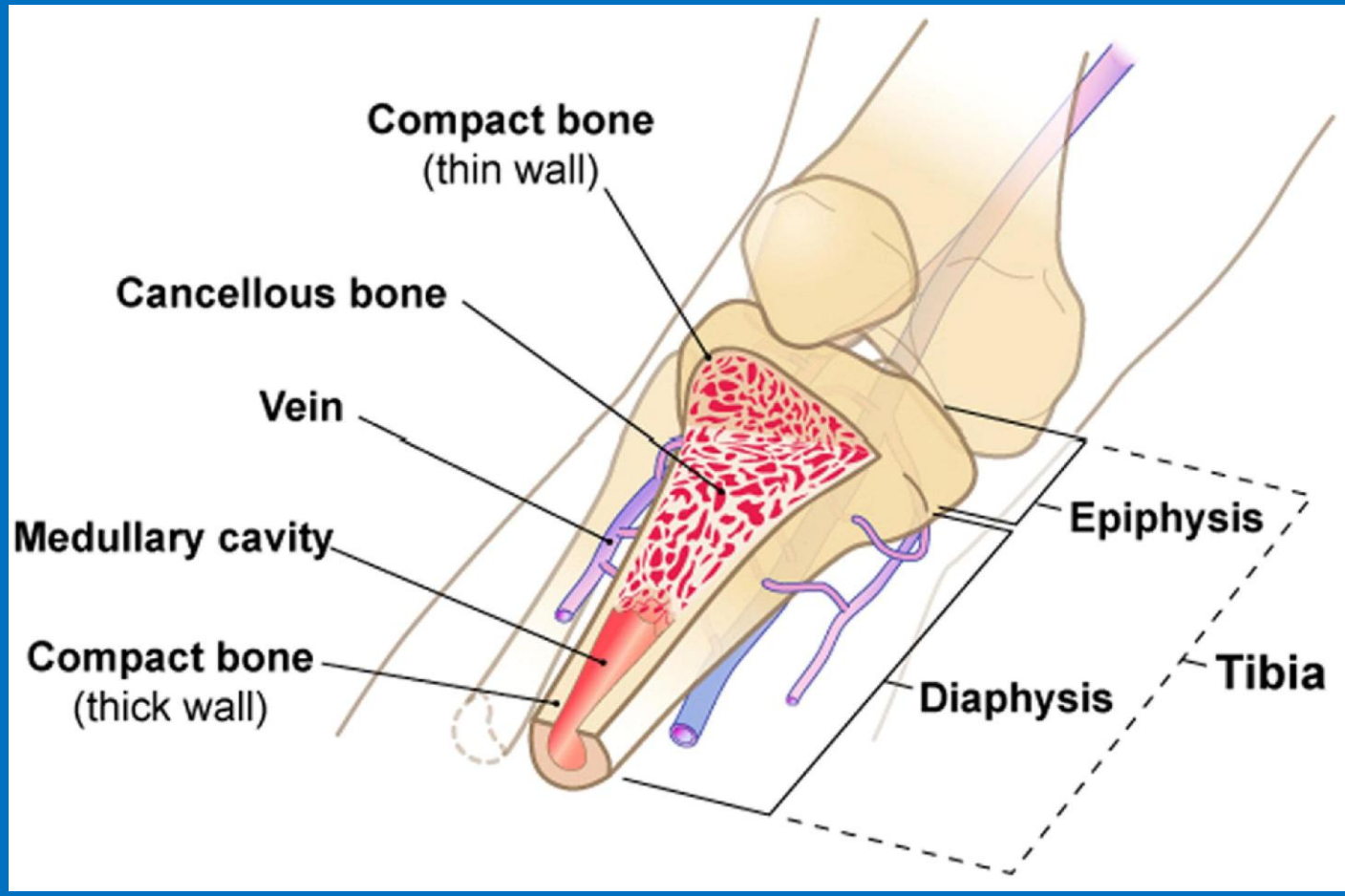
In a trial comparing success rates and time to insertion between IO and peripheral IV access among children requiring fluid resuscitation for severe dehydration in a hospital setting, the IO route was successful within five minutes for 100 percent of patients, as compared with 67 percent success within five minutes for peripheral IV placement

IO vascular access was achieved in less than one minute for 85 percent of cases in a prospective report evaluating the time to insertion and success rate of IO cannulation in a variety of prehospital settings

In an observational study of 95 pediatric emergency department patients receiving IO placement with a battery-driven device, successful insertion and infusion were achieved in 94 percent of individuals. Insertion time was 10 seconds or less in 77 percent of the one-attempt successful cases

Anatomy…again

- Cancellous bone
- Medullary cavity
- Pressure gradient – trapped fluid under pressure diffuses into the veins



Protocol

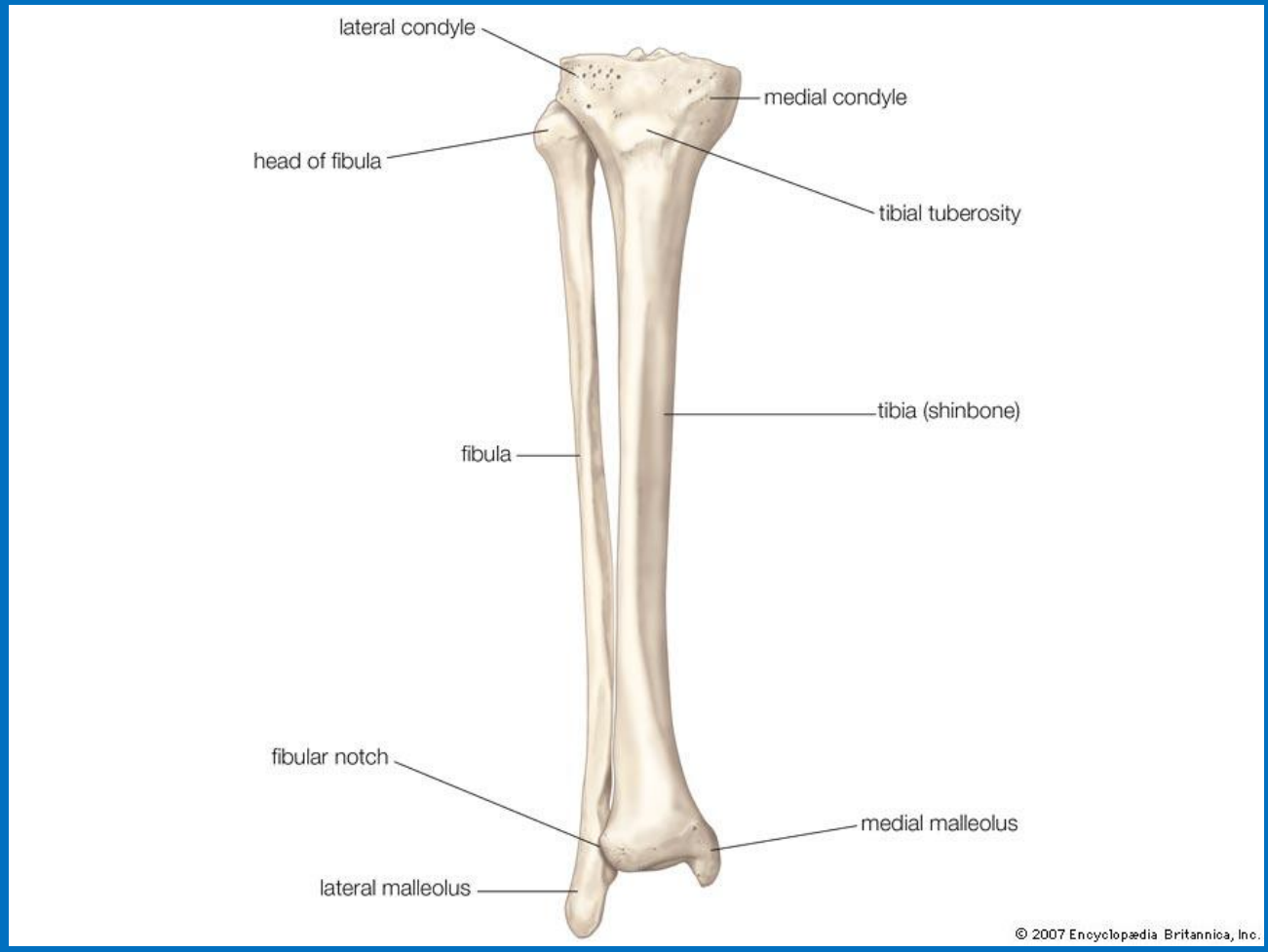
- Indications
  - Patient who needs infusion therapy or medication administration urgently
  - Unable to obtain peripheral IV ***and*** patient has an altered mental status (GCS of 8 or less), respiratory compromise, hemodynamically unstable (BP <90mmHg), or in cardiopulmonary arrest
- Contraindications
  - Fracture of the tibia, femur, or humerus
  - Previous orthopedic procedure (knee or shoulder replacement) or IO within 24 hours
  - Infection or burn
  - Inability to locate landmark due to:
    - Significant edema
    - Excessive tissue

For a conscious patient, administer 20-40mg of LIDOCAINE 2% over 30-45 seconds, wait 20-60 seconds then flush with normal saline

For a conscious pediatric patient, administer 0.5mg/kg of LIDOCAINE 2% over 30-45 seconds, wait 20-60 seconds then flush with normal saline.

Landmarks – Proximal Tibia

- Medial and distal of tibial tuberosity
- 1 to 2 cm (one finger breadth) below the tibial tuberosity and up to 1 cm medially on the tibial plateau



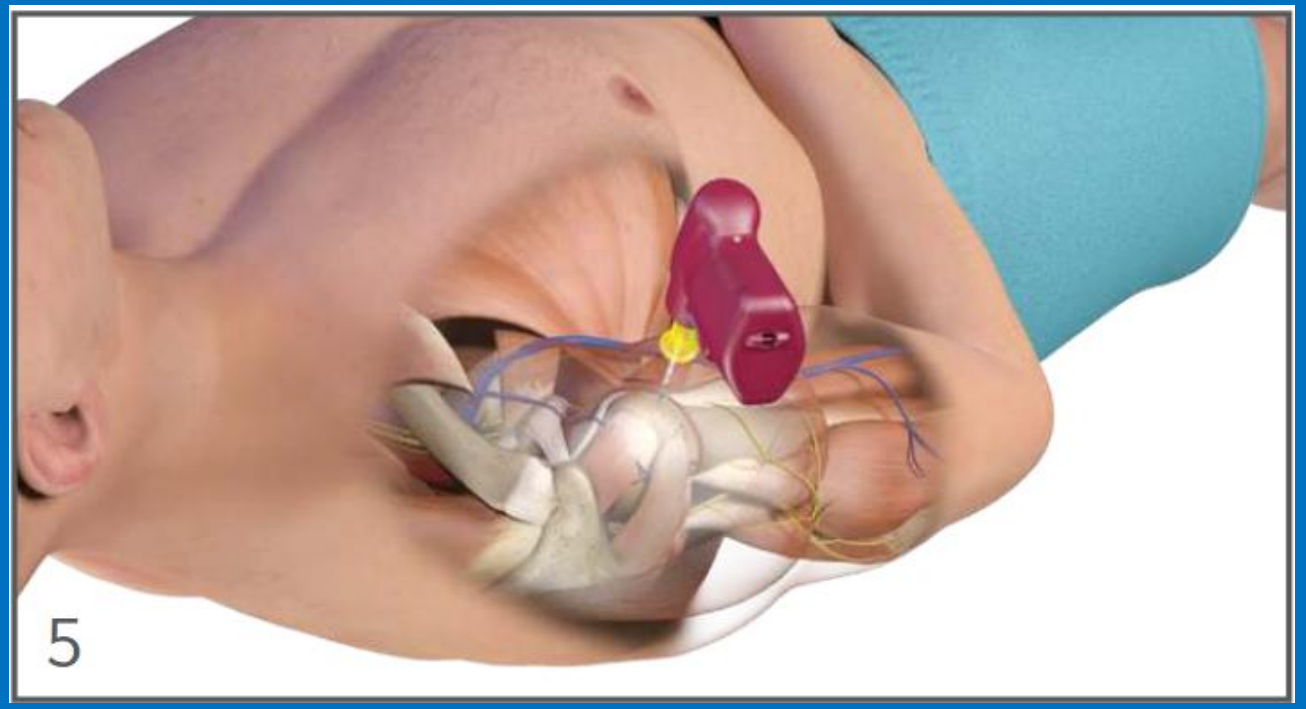
Landmarks – Proximal Humerus

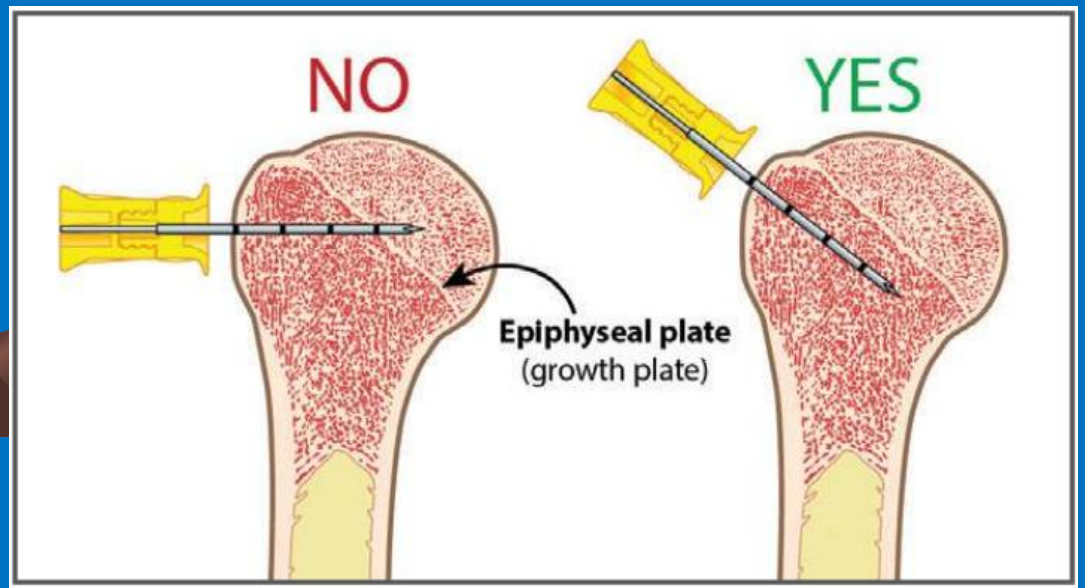
- Appropriate for IO placement in skeletally mature adolescents and adults

- Pt's hand on the umbilical
- Tuck elbow to body
- Causes a rotation of the humoral head to make it more pronounced
- The greater tubercle of the proximal humerus is located approximately 2 cm below the acromion process

Landmarks – Proximal Humerus

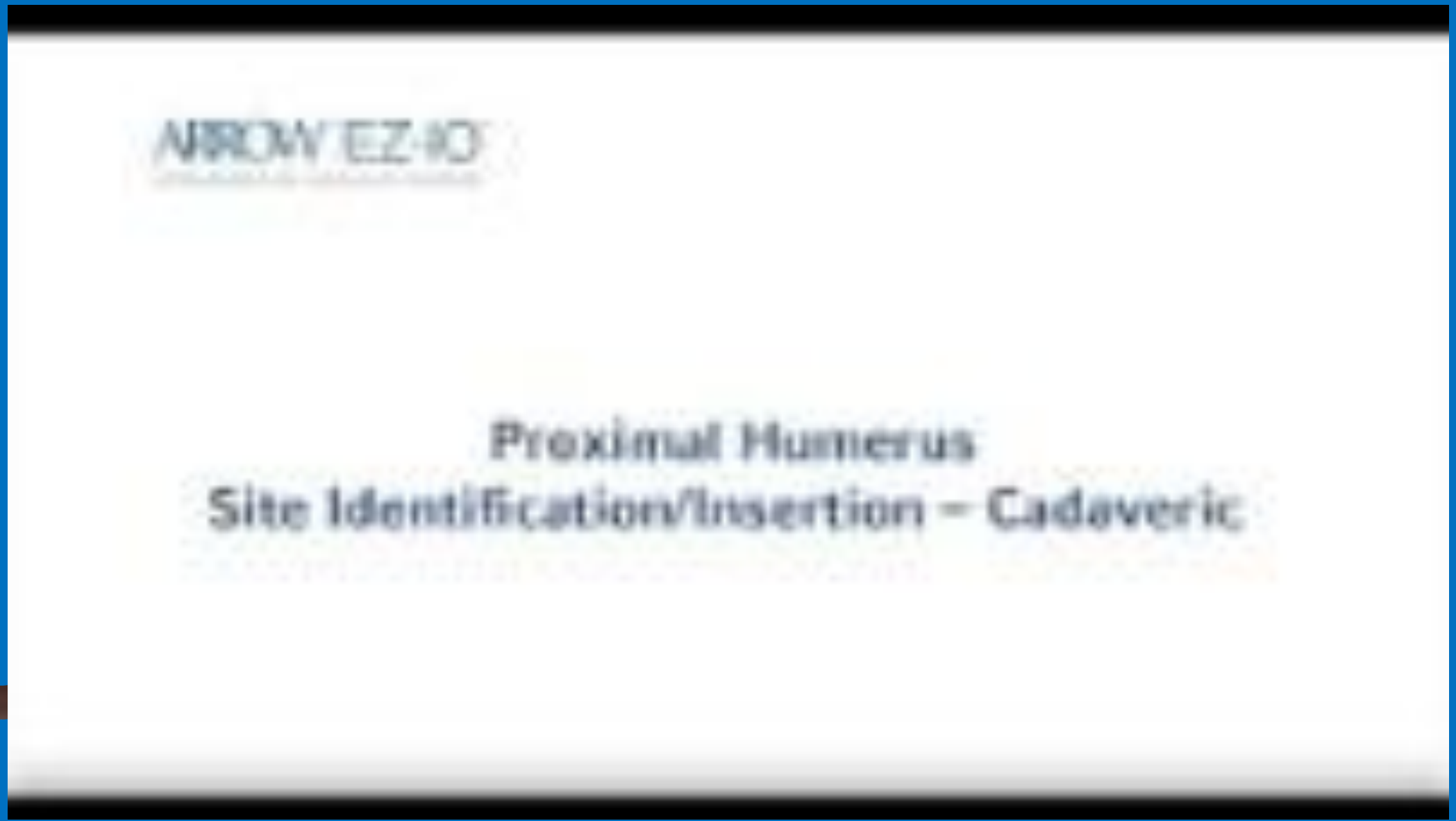
- Insertion angle - Point the needle tip at a 45-degree angle to the anterior plane and posteromedial





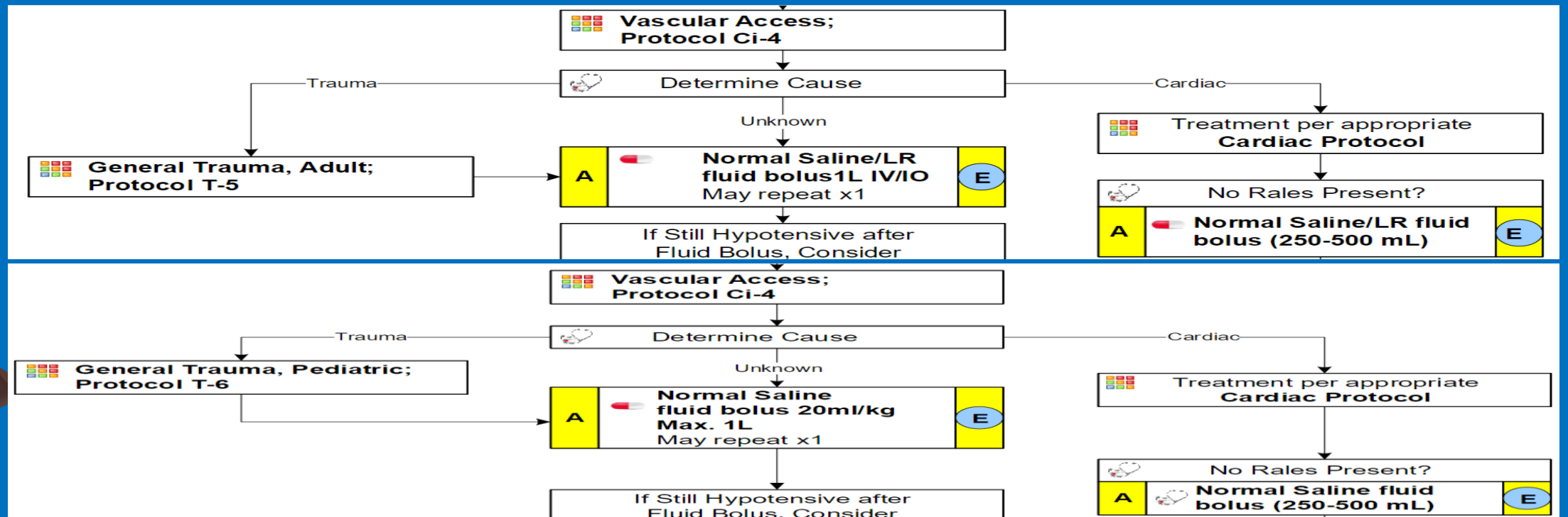
Insertion – Proximal Tibia

Insertion – Proximal Humerus



It's in….now what?!

- Infusion will likely require pressure – firefighter IV pole squeezing bag or BP cuff on bag
- Watch site for swelling – discontinue use if uncertain – drill another location
- Be mindful of your infusion volumes – especially in peds!
- Protocol for hypotensive shock:



yep – you guessed it…

Practice practice practice practice

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