Resus Topic of the Week: Vascular Access

1. Where are central lines (CVCs kept)?
In the procedure trolley in resus and in the store room

2. What are indications for CVCs in ED?
No other access available
Extra access needed for multiple infusions
High concentrations of potassium
Running vasoactives eg. noradrenaline, although these can be started peripherally

- We don't measure CVP these days!
- TPN not usually given in ED

3. Which veins do we put CVCs in?
subclavian, internal jugular, femoral

4. What are the pros and cons of these sites?
No difference in overall complication rates
Infection less with subclavian but pneumothorax more likely
Femoral and IJV equivalent in terms of infection rates

See Parienti J-J, Mongardon N, Megarbane B, Mira J-P, Kalfon P, Gros A, et al. Intravascular Complications of Central Venous Catheterization by Insertion Site. N Engl J Med. 2015 Sep 24;373(13):1220–9

5. How do we reduce the risk of catheter-related blood stream infection when inserting CVCs in the ED?
Don't rush! (start vasoactives peripherally)
Hand washing with soap and water
Full sterile precautions (hat/mask/gown/gloves)
Full body draping
Chlorhexidine/alcohol skin prep
Aseptic technique when accessing lines
NSW Recommendations:
A chlorhexidine impregnated sponge (BIOPATCH®) must be placed around the catheter at insertion site - see ACI recommendations for post-insertion management
See also CVC Insertion Checklist

6. What lines other than the multi-lumen CVCs are available for resuscitation through a central vein?
14G Angio catheter

7. Where are these kept?
Resus bay(also in breathing drawer of resus trolley as useful for tension pneumothorax decompression)

8. Where is the EZ-IO kept?
Resus bay on left hand side, and in red transfer bag

9. Which two main sites can be cannulated intraosseously with this device?
Humeral head and proximal tibia

10. Which site allows more rapid infusion?
Humeral head
- Larger fluid volumes, Superior flow rates to the heart, More accessible, No compartment syndrome, Less pain

11. When would you use a pink, blue, or yellow IO needle?
Choosing a slightly large needle is better than one that is too small to reach the intraosseous space, and there is generally more soft tissue to traverse at the humerus compared with the tibia. Most adults therefore require a yellow (large) needle and most children a blue (standard adult) needle with small children & babies only warranting the red (paediatric needle).

The most important thing is to follow insertion instructions in terms of having a black line visible on the needle above the skin when the tip is against bone, before you start drilling.
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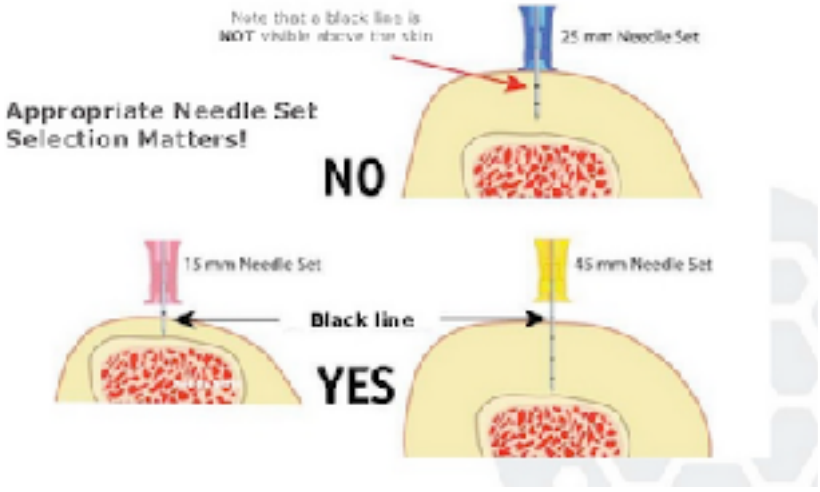

12. Describe the landmarks for proximal humeral insertion
For proximal humeral insertion, adduct and internally rotate the shoulder (by putting the patient's hand on their opposite hip). Insert from an anterolateral approach into the head of the humerus.
See https://www.youtube.com/watch?v=TE_UxUUlndU

13. Describe the landmarks for proximal tibial insertion
See https://www.youtube.com/watch?v=o4A-T4A80uQ
Manufacturer's guidance states: Insertion site is approximately 2cm **medial** to the tibial tuberosity, or approximately 3cm (two finger widths) below the patella and approximately 2cm **medial,** along the flat aspect of the tibia.

14. What lab tests can be done on an intraosseous specimen?
Our lab will do creatinine, glucose, albumin. Electrolyte results can't be guaranteed.
You must alert lab that the specimen is an intraosseous sample!
NEVER put intraosseous samples in the blood gas analyser