



ThinkAskLearn
Health Professional Education

**IV Access –
From Simple to Complex**

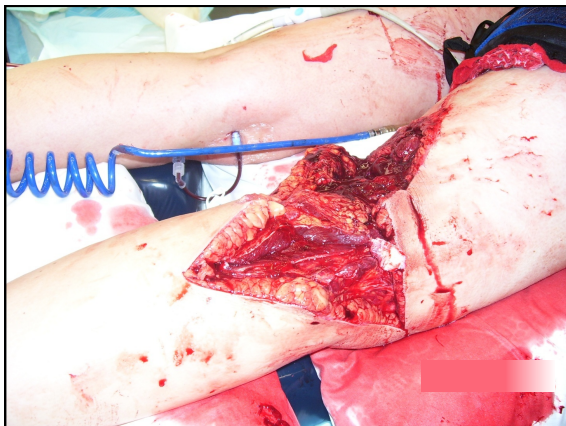
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EZ-IO Drill



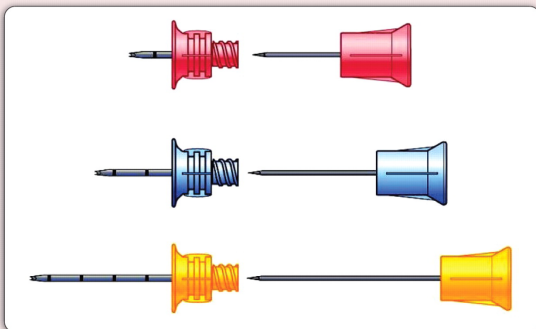




EZ-IO

- 15g Cannula all sizes
- Quick easy access
- Better than a CVL
 - Cleaner
 - Faster
 - Less risk of complications
- Stop over to Femoral Line






Drawing courtesy of Vidacare Corp, San Antonio, Texas.



Assess | Rule out contra-indications

Rule out contraindications



Prosthesis

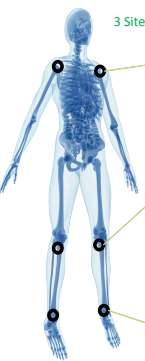
Trauma to bone

No Anatomical Landmarks

Local Infection

Recent IO
(in same bone 48 hrs)

3 Sites, 6 Options



Proximal Humerus
Preferred site for adults
Optimal site for high flow and quick drug uptake
Awake, responsive patients
Less painful

Proximal Tibia
Unresponsive
Unfamiliarity with other sites
Unable to landmark other sites

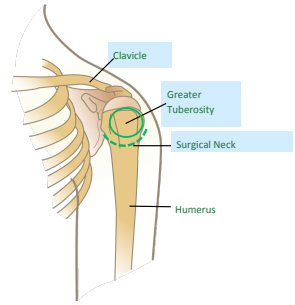
Distal Tibia
Larger patient
Unable to access other sites

Site selection
Dependent upon:

- No previous IO in 48 hours
- Absence of contraindications
- Accessibility
- Ability to secure & monitor

Site | Proximal humerus

Proximal humerus



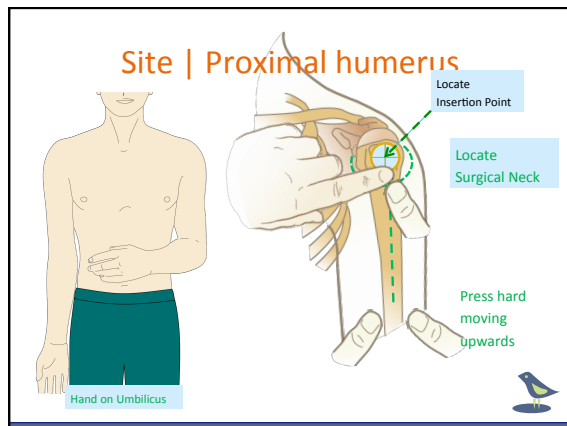
Clavicle

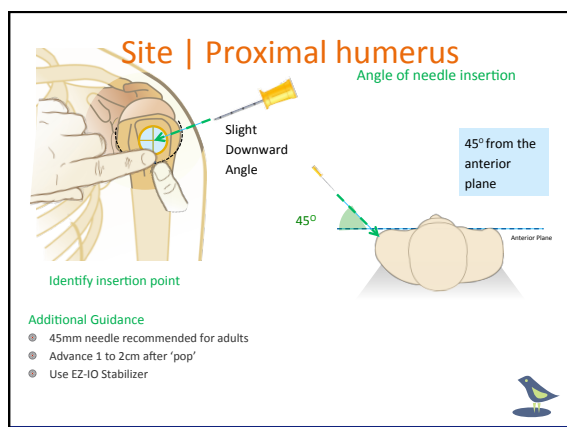
Greater Tuberosity

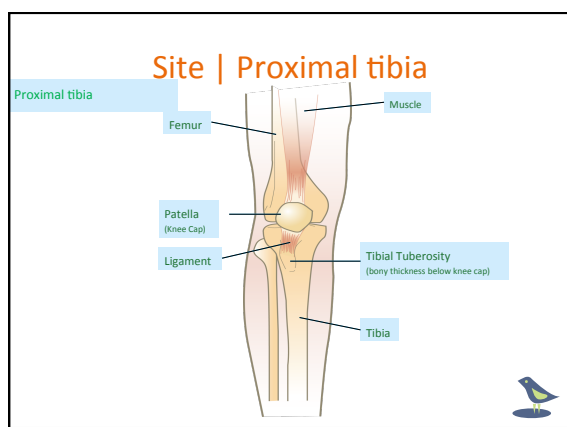
Surgical Neck

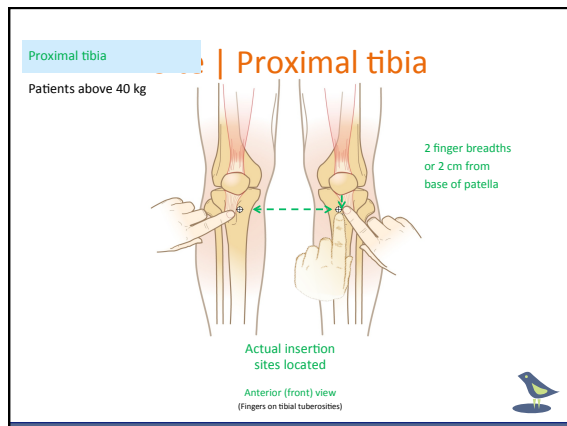
Humerus

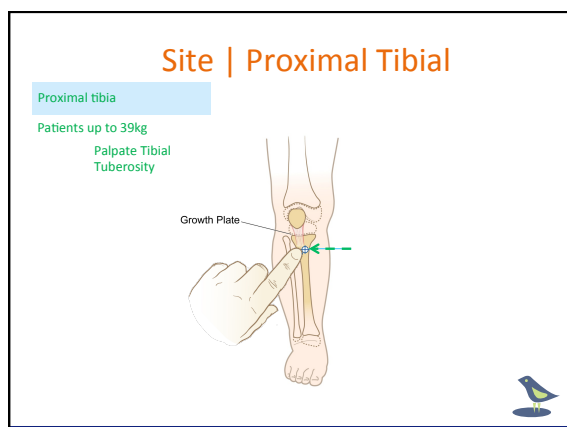
Proximal Humerus insertion site

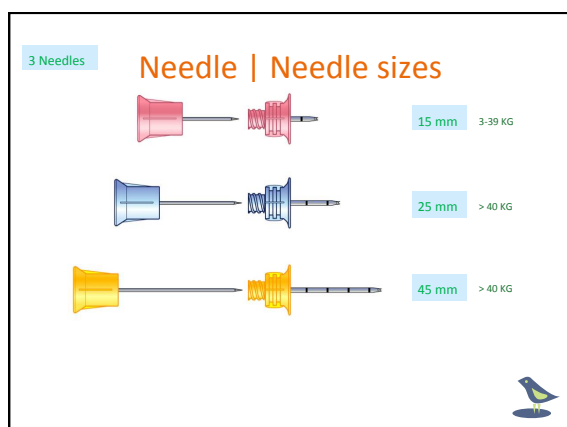


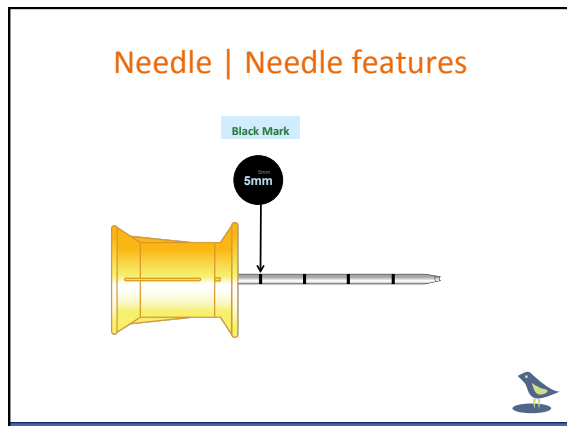


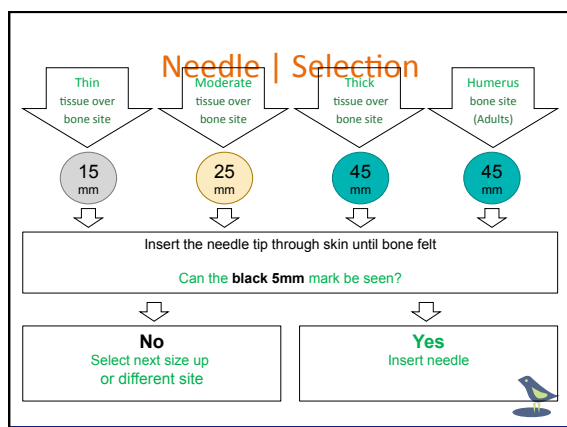


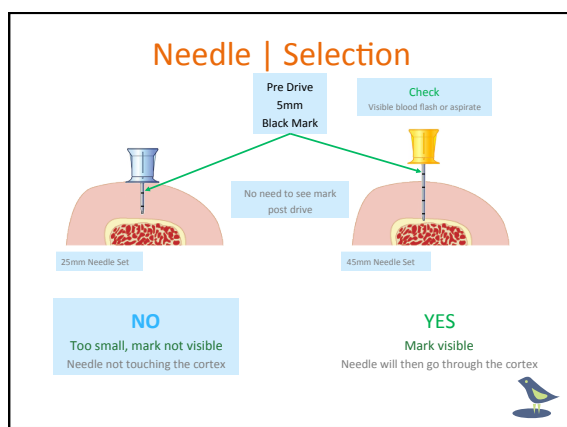














Insertion




Insertion of the EZ-IO

- Stabilize Extremity
- Insert Needle Set through the skin at a 90 degree angle
- Assess for black line when touching the bone





Needle | Check



After insertion, check...

- Firmly seated needle
- Flash of blood
- No leaking around site
- No sign of extravasation
- Secure using EZ Stabilizer
- Use EZ Connect
- EZ-IO wrist band placed




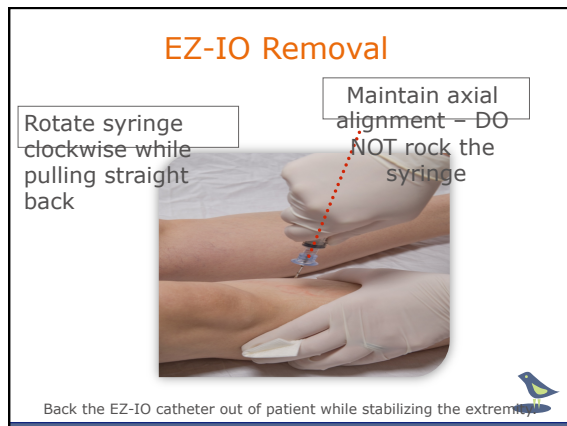


EZ-IO - What to monitor and record

Suggest adapting local policies for the management of IV cannula and CVC lines

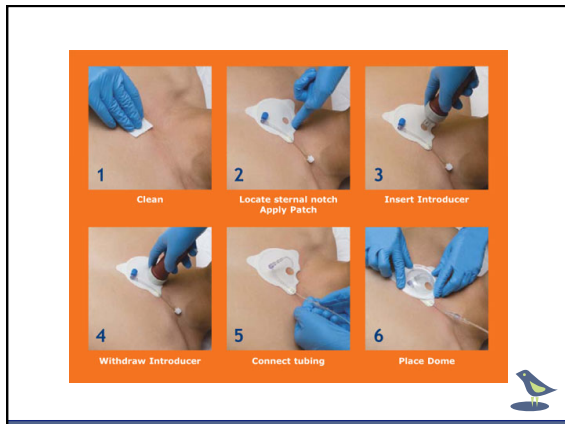
Site	Needle	Patient	Flow
No leaking Limb perfusion Signs of: Extravasation Compartment Syndrome Infection	Is secure Is intact EZ Stabilizer is secure Connections are secure	No pain from IO infusion EZ-IO Band placed on patient	Pressurized Infusion (adults) Expected flow achieved Pharmacological effects














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Neonate Emergency

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**OMG I think I need a
coffee break right now**

- 27 year old female presents to ED
- You are asked to provide assistant in car on the ramp
- 38/40 pregnant - G₄P₃
- On arrival she is delivering a baby
- Another nurse cares of the mother
- You get handed a blue floppy baby
- **What are you going to do now?**



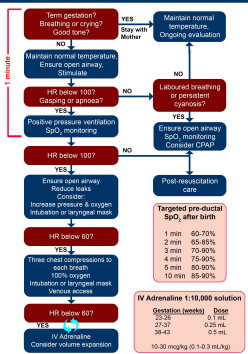
“Slapping, shaking, spanking, or holding the newborn upside down are potentially dangerous and should not be used. During all handling, care should be taken to ensure that the infant’s head and neck are supported in a neutral position, especially if muscle tone is low”

ARC 2016



Newborn Life Support

At all stages ask: do you need help?





The Numbers

- 1 in 10 babies will need some assistance to breath
- Only less than 1% will need extensive resuscitation
- The need for intubation, CPR, medication is 'uncommon' (ARC 2016)

ARC 2016



The Well Child at Birth

- Must be dried and kept warm
- Provide on the mother's chest and
- Not require separation of mother and baby





Neonatal Anatomy

- Lungs change from fluid-filled to air-filled
- Pulmonary blood flow increases dramatically
- Intracardiac and extracardiac shunts initially reverse direction and subsequently close
- May require high pressure ventilation for first few breaths ~80cmH2O
- O2 sats are normally low
 - Takes about 5-10 mins to get to 90%!!!!
 - 25th centile for oxygen saturation is 80% at 5 minutes




"That there is insufficient published human evidence to suggest routine use of endotracheal intubation to suction meconium from the trachea in meconium-exposed infants"

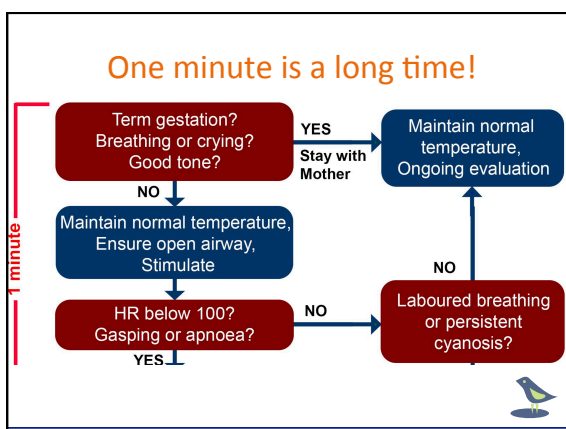
ARC 2016

Cord Clamping

- Delayed cord clamping
- Full term babies - 1mins or pulsating ceases
 - Improved iron status through early infancy, but a greater likelihood of jaundice
 - Increased risk of phototherapy
- Well preterm babies - 30 sec to 3 min
 - Increases blood pressure, reduces risk of intraventricular haemorrhage and need for blood transfusion
 - Greater likelihood of jaundice
- Consideration of deferred cord clamping in preterm infants who do not require resuscitation ARC 2016





Oxygen Saturations Targets

Targeted pre-ductal SpO₂ after birth

1 min	60-70%
2 min	65-85%
3 min	70-90%
4 min	75-90%
5 min	80-90%
10 min	85-90%

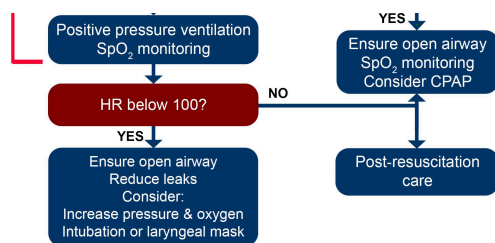
- Initially, resuscitation occurs with air
- Attempt to match newborn O₂ sats
- Even brief exposure to excessive oxygenation can be harmful



Effective ventilation is the key to successful neonatal resuscitation

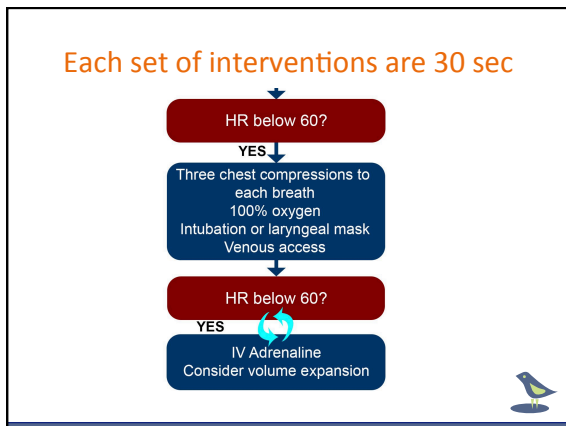


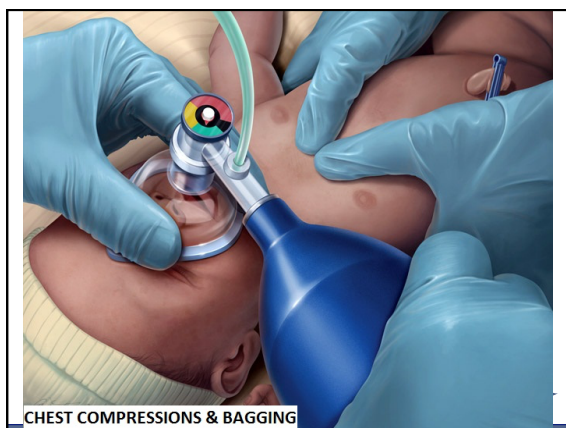
Each set of interventions are 30 sec

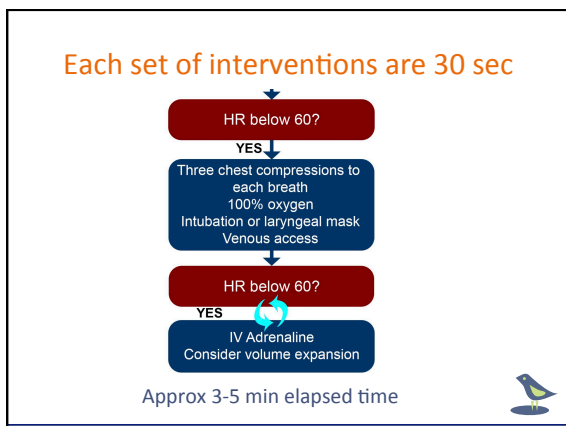


Approx 2 min elapsed time

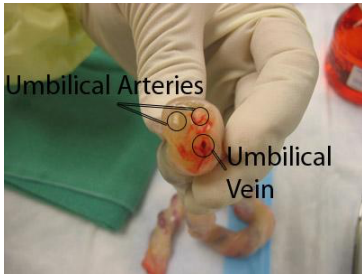









Venous Access



Umbilical Arteries

Umbilical Vein

ARC 2016 – Greater emphasis of Umbilical Catheterisation first, if available



Newborn Life Support

At all stages ask: do you need help?

1 minute

```

graph TD
    Start([Start]) --> Term{Term gestation?}
    Term -- YES --> MaintainNormal[Maintain normal temperature, Good tone?]
    MaintainNormal -- YES --> StayWithMother[Stay with Mother]
    StayWithMother --> End([End])
    Term -- NO --> MaintainNormalTemp[Maintain normal temperature, Ensure open airway, Stimulate]
    MaintainNormalTemp --> HR{HR below 100?}
    HR -- YES --> LabouredBreathing{Laboured breathing or persistent limpness?}
    LabouredBreathing -- YES --> EnsureOpenAirway[Ensure open airway, SpO2 monitoring, Consider CPAP]
    LabouredBreathing -- NO --> End
    HR -- NO --> HR{HR below 90?}
    HR -- YES --> EnsureOpenAirway2[Ensure open airway, Reduce leaks, Consider increase pressure & oxygen ventilation or surgical mask]
    EnsureOpenAirway2 --> HR{HR below 90?}
    HR -- YES --> ThreeChestCompressions[Three chest compressions to midline, 100% oxygen, Intubate or oropharyngeal mask, Venous access]
    ThreeChestCompressions --> HR{HR below 90?}
    HR -- YES --> IVAdrenaline[IV Adrenaline 1-10,000 solution]
    IVAdrenaline --> End
    HR -- NO --> PostResuscitation[Post-resuscitation care]
    PostResuscitation --> End
  
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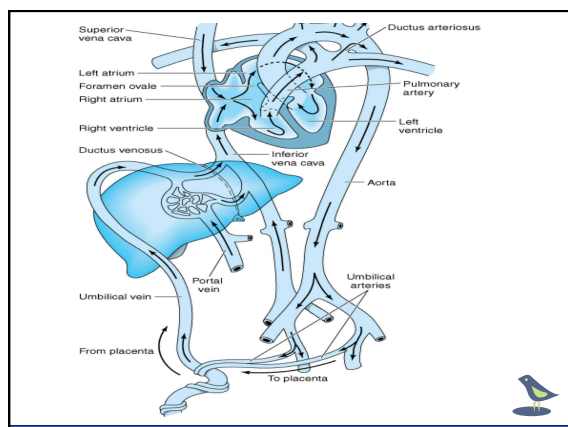
Targeted pre-ductal SpO₂ after birth

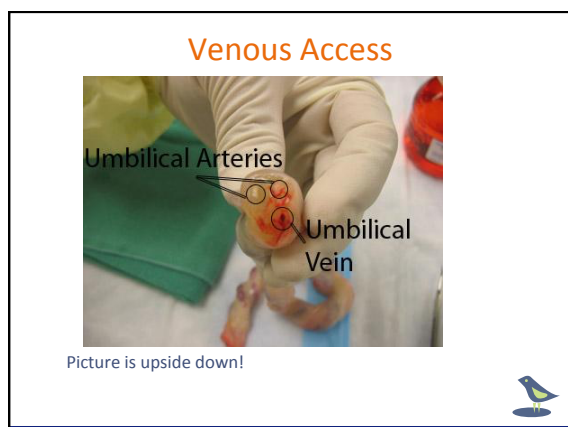
Time	SpO ₂
1 min	60-70%
2 min	65-85%
3 min	70-90%
4 min	75-90%
5 min	80-90%
10 min	85-90%

IV Adrenaline 1-10,000 solution

Weight (kg)	Dose
25-30	0.1 mL
27-37	0.2 mL
38-43	0.3 mL

10-30 mcg/kg (0.1-0.3 mL/kg)





Emergent Umbilical Vein Catheterisation

- Tie cord tape around base of umbilicus
 - Cut off flow but allow passage of tube
- Cut cord with scalpel
 - Leave about 1 cm distal from tape
- Identify the umbilical vein
 - Arteries located inferiorly
- Fill a 5Fr Feeding with saline
 - Some suggest a 3 way tap

Emergent Umbilical Vein Catheterisation

- Insert the catheter into vein
 - Advance it 3-5cm
 - Avoid any 'difficulties' or blockages



