



PROCEDURE CHECKLIST

Intraosseous needle insertion

Rapid vascular access through the marrow cavity of a long bone when intravenous access is impossible or delayed in a critically ill adult or child.



EM Orbit

Patient reference	Date	Time	Completed by
Equipment ready			
☐ Gloves and apron		☐ Powered driver: squeeze the trigger and apply gentle, steady pressure; let the driver do the work.	
☐ 2% chlorhexidine in 70% alcohol or local skin preparation		☐ Manual needle: advance with a firm twisting motion until a loss of resistance is felt.	
☐ Powered intraosseous driver with needle sets (15 mm, 25 mm, 45 mm), or a manual intraosseous needle		☐ Do not rock or lever the needle.	
☐ Extension set primed with 0.9% sodium chloride		Rocking enlarges the hole and causes extravasation.	
☐ 10 mL syringes and 0.9% sodium chloride flush		☐ Hold the hub, unscrew and remove the stylet, and place it directly in the sharps bin.	
☐ Lidocaine 2% (preservative-free) for the conscious patient			
☐ Pressure bag or syringe for infusion		During • Confirmation	
☐ Securement dressing or stabiliser and wristband with insertion time		☐ Check that the needle stands firmly in the bone without support.	
☐ Sharps bin		☐ Attach the primed extension set; aspirate marrow if possible (samples can be sent for glucose, blood gas, crossmatch; tell the laboratory the sample is marrow).	
Before • Decision		☐ In the conscious patient, before flushing, give lidocaine slowly through the extension set per local protocol (manufacturer guidance: adult 40 mg of 2% preservative-free lidocaine over about 2 minutes; children per EM Orbit paediatric calculator), then wait about 1 minute.	
☐ Confirm that intravenous access has failed or would cause unacceptable delay.		☐ Flush firmly: 10 mL 0.9% sodium chloride in adults (5 mL in infants and small children).	
☐ Tell the team you are placing an intraosseous needle; in cardiac arrest, do not interrupt chest compressions.		☐ Watch and feel the surrounding tissue and the posterior aspect of the limb during the flush.	
☐ Explain the procedure briefly to a conscious patient or carer.		☐ Stop the infusion and remove the needle if swelling, firmness or tissue blanching appears.	
Before • Site selection		Extravasation can cause compartment syndrome and tissue necrosis.	
☐ Adult first choice: proximal humerus (greater tubercle) or proximal tibia.		During • Infusion	
☐ Proximal tibia (adult): about 2 cm below the patella and 2 cm medial to the tibial tuberosity, on the flat anteromedial surface.		☐ Give all resuscitation drugs, fluids and blood products at the same doses as intravenous; follow each drug with a flush.	
☐ Proximal tibia (child): about 1–2 cm (one finger-breadth) below the tibial tuberosity on the flat anteromedial surface, avoiding the growth plate.		☐ Use a pressure bag or push fluid by syringe; gravity flow is usually too slow.	
☐ Alternatives: distal tibia (about 2–3 cm above the medial malleolus in adults) or distal femur in infants and young children.		After • Securing and monitoring	
☐ Proximal humerus: adduct the arm with the hand on the abdomen (internal rotation); the greater tubercle is the most prominent point about 1 cm above the surgical neck.		☐ Secure the needle with the stabiliser dressing and avoid kinking the extension set.	
☐ Check the site against the contraindications above.		☐ Apply the wristband and record the time of insertion.	
Before • Preparation		☐ Check the site and limb regularly for extravasation, swelling and pulses.	
☐ Choose the needle length: with the needle tip touching bone through the skin, at least 5 mm of needle (one black line) must be visible above the skin.		☐ Obtain definitive intravenous or central access as soon as possible.	
☐ Prime the extension set with 0.9% sodium chloride.		After • Removal and documentation	
☐ Clean the skin and allow it to dry.		☐ Remove the intraosseous needle as soon as other access is available and within 24 hours.	
During • Insertion		Longer dwell increases the risk of osteomyelitis.	
☐ Stabilise the limb with your non-dominant hand, keeping your hand away from the needle path.		☐ Remove by attaching a syringe (Luer-lock) to the hub and rotating clockwise while pulling straight out; do not rock.	
☐ Insert the needle at 90° to the bone surface (tibia); at the humerus, angle about 45° anterior-to-posterior-inferior along the axis of the humeral head.		☐ Apply pressure and a sterile dressing.	
☐ Push through the skin until the tip touches bone, then check that a black line is still visible.		☐ Document site, needle size, number of attempts, confirmation, analgesia given, insertion time and removal time.	



A drafted procedure checklist, awaiting senior review. Perform procedures only within your training, competence and local policy. It does not replace your clinical judgement.

EM Orbit • Emergency medicine, in one orbit • proc-intraosseous • red rows are the steps that must not be missed