



## PROCEDURE CHECKLIST

# Arterial cannulation

Placement of a radial (or femoral) arterial catheter for continuous invasive blood pressure monitoring and repeated arterial blood sampling.



EM Orbit

| Patient reference                                                                                                                                                                                                      | Date | Time                                                                                                                                                                                                                  | Completed by |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| <b>Equipment ready</b>                                                                                                                                                                                                 |      | <input type="checkbox"/> If ultrasound-guided, keep the needle tip in view and see it enter the arterial lumen before advancing further.                                                                              |              |
| <input type="checkbox"/> Personal protective equipment: sterile gloves, apron or gown as per local policy                                                                                                              |      | <b>During · Cannulation</b>                                                                                                                                                                                           |              |
| <input type="checkbox"/> 2% chlorhexidine in 70% isopropyl alcohol skin preparation                                                                                                                                    |      | <input type="checkbox"/> Integrated guidewire kit: hold the needle still and advance the guidewire smoothly into the artery.                                                                                          |              |
| <input type="checkbox"/> Sterile drape and dressing pack                                                                                                                                                               |      | <input type="checkbox"/> <b>Never force the guidewire against resistance.</b><br>Withdraw the wire, reposition and try again; forcing it can dissect or perforate the artery.                                         |              |
| <input type="checkbox"/> Arterial cannula: integrated guidewire kit or standard cannula (20 G adult radial)                                                                                                            |      | <input type="checkbox"/> Advance the cannula over the wire (or over the needle), then withdraw the needle and wire together.                                                                                          |              |
| <input type="checkbox"/> Lidocaine 1% with 2–5 mL syringe and 25 G needle                                                                                                                                              |      | <input type="checkbox"/> Standard cannula technique: lower the angle after flashback, advance a further 1–2 mm so the cannula tip is in the lumen, then thread the cannula off the needle.                            |              |
| <input type="checkbox"/> Ultrasound machine with high-frequency linear probe, sterile sheath and gel                                                                                                                   |      | <input type="checkbox"/> If flashback is lost, use a transfixion technique only if trained: pass through both walls, withdraw the needle and pull back the cannula slowly until pulsatile flow returns, then advance. |              |
| <input type="checkbox"/> Pre-primed arterial transducer set with pressure bag and 0.9% sodium chloride flush (heparinised flush only if local protocol)                                                                |      | <input type="checkbox"/> Press on the artery proximal to the cannula tip to limit bleeding while you connect the line.                                                                                                |              |
| <input type="checkbox"/> Wrist roll or padded board and tape                                                                                                                                                           |      | <input type="checkbox"/> Connect the primed transducer line promptly and flush briefly.                                                                                                                               |              |
| <input type="checkbox"/> Transparent occlusive dressing and red 'ARTERIAL' label                                                                                                                                       |      | <b>During · Confirmation</b>                                                                                                                                                                                          |              |
| <input type="checkbox"/> Suture or securement device                                                                                                                                                                   |      | <input type="checkbox"/> Confirm an arterial waveform on the monitor with a clear upstroke and dicrotic notch.                                                                                                        |              |
| <input type="checkbox"/> Sharps bin                                                                                                                                                                                    |      | <input type="checkbox"/> Level the transducer to the phlebostatic axis (fourth intercostal space, mid-axillary line) and zero it to atmosphere.                                                                       |              |
| <b>Before · Assessment and consent</b>                                                                                                                                                                                 |      | <input type="checkbox"/> Perform a fast-flush (square-wave) test to check for over- or under-damping.                                                                                                                 |              |
| <input type="checkbox"/> Confirm the indication and that invasive monitoring will change management.                                                                                                                   |      | <input type="checkbox"/> Take an arterial blood gas sample from the port if needed, using the closed sampling system.                                                                                                 |              |
| <input type="checkbox"/> Explain the procedure, risks and benefits; obtain verbal consent if the patient has capacity, otherwise act in best interests and document.                                                   |      | <b>After · Securing and labelling</b>                                                                                                                                                                                 |              |
| <input type="checkbox"/> Check coagulation and platelets if available, and review anticoagulant or antiplatelet therapy.                                                                                               |      | <input type="checkbox"/> Secure the cannula with a suture or securement device and a transparent occlusive dressing that leaves the site visible.                                                                     |              |
| <input type="checkbox"/> Choose the site: non-dominant radial artery first; femoral artery if radial fails or in profound shock; brachial artery only as a last resort.                                                |      | <input type="checkbox"/> Label the line and the three-way tap clearly as ARTERIAL (red label).                                                                                                                        |              |
| <input type="checkbox"/> Assess distal perfusion and collateral flow; a modified Allen's test may be performed but is a poor predictor of ischaemia — ultrasound confirmation of ulnar flow is preferred.              |      | <input type="checkbox"/> <b>Never inject drugs or infusions into an arterial line.</b><br>Intra-arterial injection can cause distal ischaemia, gangrene and limb loss.                                                |              |
| <b>Before · Preparation</b>                                                                                                                                                                                            |      | <input type="checkbox"/> <b>Do not use glucose-containing solutions as the flush fluid.</b><br>Sampling contamination with glucose can give falsely high results and lead to harmful insulin dosing.                  |              |
| <input type="checkbox"/> Prime the transducer set with flush, remove all air bubbles and pressurise the bag to 300 mmHg.                                                                                               |      | <b>After · Monitoring and documentation</b>                                                                                                                                                                           |              |
| <input type="checkbox"/> <b>Remove every air bubble from the transducer line before connection.</b><br>Air in an arterial line can embolise distally or retrogradely to the cerebral circulation, and damps the trace. |      | <input type="checkbox"/> Check the hand or limb for colour, capillary refill, warmth and pain at regular intervals.                                                                                                   |              |
| <input type="checkbox"/> Position the wrist in slight dorsiflexion (about 30–45°) over a roll and tape the hand to a board.                                                                                            |      | <input type="checkbox"/> <b>Remove the line immediately if there are signs of distal ischaemia.</b><br>Pallor, mottling, coolness, pain or loss of distal pulses.                                                     |              |
| <input type="checkbox"/> Scan the artery with the linear probe: confirm a pulsatile, non-compressible vessel and note its depth and course.                                                                            |      | <input type="checkbox"/> Correlate the invasive reading with a non-invasive cuff pressure; re-level and re-zero if the patient's position changes.                                                                    |              |
| <input type="checkbox"/> Perform hand hygiene, put on sterile gloves, clean the skin with chlorhexidine and allow it to dry completely; drape the site.                                                                |      | <input type="checkbox"/> Document the site, cannula size, number of attempts, ultrasound use, waveform confirmation and complications.                                                                                |              |
| <input type="checkbox"/> Infiltrate lidocaine 1% subcutaneously over the artery in the awake patient.                                                                                                                  |      | <input type="checkbox"/> On removal, apply firm pressure for at least 5 minutes (longer if coagulopathic, and longer for the femoral site) and check for haematoma.                                                   |              |
| <b>During · Puncture</b>                                                                                                                                                                                               |      |                                                                                                                                                                                                                       |              |
| <input type="checkbox"/> Palpate the pulse (or visualise the artery with ultrasound) 1–2 cm proximal to the wrist crease.                                                                                              |      |                                                                                                                                                                                                                       |              |
| <input type="checkbox"/> Insert the cannula bevel up at 30–45° to the skin, directed along the line of the artery.                                                                                                     |      |                                                                                                                                                                                                                       |              |
| <input type="checkbox"/> Advance slowly until a flashback of pulsatile bright red blood appears in the hub.                                                                                                            |      |                                                                                                                                                                                                                       |              |



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-arterial-cannulation · red rows are the steps that must not be missed