HEALTH HOLDING
HAFER ALBATIN HEALTH CLUSTER
MATERNITY AND CHILDREN HOSPITAL

Department:	Maternal Intensive Care Unit		
Document:	Departmental Policy and Procedure		
Title:	Arterial Catheter Insertion in Maternal Intensive Care Unit		
Applies To:	All Maternity Intensive Care Unit Staff		
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1. PURPOSE:

1.1 To provide guidelines for arterial catheter insertion for arterial blood gas (ABG) and invasive blood pressure monitoring.

2. DEFINITIONS:

2.1 **Arterial Catheter Insertion** – an invasive procedure, where a catheter is inserted in the peripheral artery.
2.2 **Invasive** – a procedure where an instrument is inserted into the blood vessel.
2.3 **Modified Allen's Test** – Prior to placement of a radial or ulnar arterial lone, it must be demonstrated that the blood supply to the hand would not be eliminated by a catheter-induced thrombus. Described as a technique of a diagnosing occlusive arterial disease, which has been modified and serves as the most common screening test prior to radial artery cannulation. The examiner compresses both radial and ulnar arteries and ask the patient to clinch and unclench the fist repeatedly until pallor of the palm is produced. Hyperextension of the hand is avoided, as it is may cause a false-negative result, suggesting inadequate collateral flow. One artery is then released and the time to blushing of the pal noted. The procedure is repeated with the other artery. Normal palmar flushing is complete before 7 seconds (positive test); 8 to 14 seconds is considered equivocal; and 15 or more seconds abnormal (negative test).

3. POLICY:

3.1 The procedure shall be conducted by qualified and experienced ICU physician (by anaesthetist, as applicable). Physician experience with arterial cannulation is associated with increased mechanical and infectious complications. Close supervision is required. Inexperienced physician in training should initially perform cannulations on sedate, mechanically ventilated patients and only with senior supervising physicians.
3.2 All patients must be provided with local anaesthesia for pain control, unless patient already receiving regular analgesia.
3.3 Arterial catheter should be applied by radial artery. In case of shock femoral artery can be attempted. If failed to insert via these routes then dorsalis pedis artery or ulnar artery should be approached; but later route to be attempted only by the competent and experience physician.
3.4 Avoid sites with poor landmarks, anatomic defects, or recent surgery.
3.5 Patient with blood coagulation disorders shall have their derangements corrected prior to cannulation.
3.6 When no longer needed, arterial catheters shall be removed immediately to avoid long-term complications of infection and/ or thrombosis.

4. PROCEDURE:

4.1 Establish Indications for Arterial Cannulation:
  4.1.1 Hemodynamic monitoring
    4.1.1.1 Acutely hypertensive, or hypotensive patients.
    4.1.1.2 Continuous cardiac output monitoring

4.1.1.1 Acutely hypertensive, or hypotensive patients.
4.1.1.2 Continuous cardiac output monitoring
4.1.1.3 Use of vasoactive drugs.

4.1.2 Multiple Blood Sampling (≥4 times/day)
4.1.2.1 Ventilated patients
4.1.2.2 Limited venous access

4.1.3 Intra-aortic balloon pump use

4.2 Preparation for Catheter Placement

4.2.1 Obtain written informed consent for the procedure from the patient or the patient's surrogate/ family. Consent should include discussion of the following risks: bleeding infection, and thrombosis.

4.2.2 Check platelets & PT/PTT and bleeding disorders.

4.2.3 Perform Modified Allen's Test.

4.2.4 Position the hand: The hand is positioned 30° to 60° of dorsiflexion with the aid of the gauze under the wrist and arm band, avoiding hyper abduction of the thumb.

4.2.5 Apply aseptic protection barriers: Wear mask and cap, wash hands, wear sterile gown ang gloves, and create sterile field.

4.2.6 Identify anatomic landmarks.

4.2.7 Palpate radial artery at head of the radius.

4.2.8 Infiltrate anaesthetic: approximately 0.5 mL of 1% lidocaine is infiltrated on both sides of the artery through a 25-gauge or smaller needle.

4.3 Catheter-Over-Needle Apparatus

4.3.1 Insert needle over radial artery. Advance needle at 30° to 60° angle to the skin approximately 3 to 5 cm proximal to the distal writ crease. The needle and cannula are advanced until blood return is noted in the hub, signifying intra-arterial placement of the tip of the needle.

4.3.2 Once in artery, immobilized needle with free hand. Correct positioning is confirmed by pulsatile blood return.

4.3.3 If the initial attempt is unsuccessful, subsequent attempts should be more proximal, rather than closer to the writ crease, as the artery is of greater diameter.

4.3.4 Introduce and advance the guidewire.

4.3.5 Remove the needle leaving the guidewire in place.

4.3.6 Pass arterial catheter over the guidewire.

4.3.7 Remove the guidewire.

4.3.8 Connect tubing to pressure transducer, assure the system is free from air and has good arterial waveform on monitor.

4.3.9 Secure the catheter with suture and apply sterile dressing.

4.3.10 The physician and nurse write procedure note in patient medial record.

4.4 Catheter-Needle-Guidewire-

4.4.1 Percutaneous puncture is made in the same manner, but when blood return is noted in the catheter hub the guidewire is passed thought the needle into the artery, serving as a stent for subsequent catheter advancement.

4.4.2 The guidewire and needle are then removed and placement confirmed by pulsatile blood return.

4.4.3 The cannula is then secured firmly, attached to transducer tubing.

4.4.4 The physician and nurse write procedure note in patient medical record.

5. MATERIAL AND EQUIPMENT:

5.1 Syringe
5.2 Guide wire
5.3 Arterial Catheter
5.4 Pressure transducer
5.5 Electronic monitoring equipment

6. RESPONSIBILITIES:

6.1 Physician
6.2 Nurse

7. APPENDICES:

N/A

8. REFERENCES:

8.1 Guidelines for Adult ICU Care/ Ministry of Health, General Directorate of Health Centers- Riyadh, 2013

9. APPROVALS:

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