HEALTH HOLDING

HAFER ALBATIN HEALTH CLUSTER MATERNITY AND CHILDREN HOSPITAL

Department:	Anesthesia Care		
Document:	Departmental Policy and Procedure		
Title:	Epidural Anesthesia Policy and Procedure Guideline		
Applies To:	All Anesthesia Staff		
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1. PURPOSE:

1.1 To provide guideline for technique and procedure of epidural anesthesia.
1.2 List the advantages and disadvantages of epidural anesthesia.
1.3 Identify complications of epidural anesthesia.
1.4 Discuss the action of epidural opioids and anesthetics.
1.5 Describe side effects/complications of epidural anesthesia.

2. DEFINITONS:

2.1 **Anesthesia** – consists of general anesthesia and spinal or major regional anesthesia. It does not include local anesthesia.

3. POLICY:

3.1 Epidural anesthesia should be provided by anesthetist who has appropriate experience of the technique and procedure of epidural anesthesia, and should be provided if indicated for surgical cases in operating theatre, on the other side labor analgesia in our hospital is provided in delivery rooms by nitrous oxide / oxygen mixture.

4. PROCEDURE:

4.1 Technique:
- 4.1.1 There is some contra - indications for epidural analgesia, e.g.
  - 4.1.1.1 Abnormal coagulation profile, and low platelet number <100 000/m^3.
  - 4.1.1.2 Previous vertebral operation or back pain.
  - 4.1.1.3 Some neurological problems, e.g. problems with sensation, motor power, exaggerated reflexes and others.
  - 4.1.1.4 Psychologically unstable patients.
  - 4.1.1.5 History of allergy to local anesthetics.
  - 4.1.1.6 Patient is hemodynamically unstable.
- 4.1.2 Needles:
  - 4.1.2.1 Rigidity and low internal resistance are desirable qualities in needles used for epidural anesthesia. The ski – like bevel of the Tuohy needle promotes greater deflection off its course compared with pencil point needles. Increasing the size of the Tuohy needle decreases the degree of deflection, thus larger needles (16 - 18 gauges) are recommended for epidural anesthesia. The low internal resistance of larger needles also better transmits changes in tissue pressure and facilitates the loss of resistance technique. Unnecessarily large needles, however, can potentially cause more patient discomfort during the procedure
- 4.1.3 Positioning:
  - 4.1.3.1 Epidural anesthesia is performed with the patient in either the lateral decubitus or sitting position. In parturient, the choice makes little difference in patient comfort

or incidence of complications. In the lateral decubitus position, the patient lies with the knees drawn up to the abdomen, the upper arm resting across the chest, he lower arm lying at a right angle to the body, and head flexed and resting on a small pillow. The vertebral column should rest at the edge of the bed and parallel to the table. Flexion of the lumbar spine opens the interspaces. When performing the procedure without an assistant to hold the patient in this position, one can ask the patient to clasp her hands behind her head and flex her back to make the elbows and knees touch.

4.1.4 Sitting position:

4.1.4.1 In the obese patient, the weight of subcutaneous tissue in the lateral position can pull the skin line marking the middle of the back some distance below the spinous processes. The sitting position may facilitate the identification of the midline. The patient sits on the edge of the bed with the feet supported by a stool. The head is flexed on the chest and arms folded across the upper abdomen, or supported in front of the chest on a table or Mayo stand. An assistant stands in front of the patient to hold the shoulder and prevent lateral flexion or rotation of the spine.

4.1.4.2 The distance from the skin to the epidural space is less when epidural puncture is performed in the sitting compared with the lateral decubitus position. Outward migration of the catheter may occur when the catheter is fixed to the skin and the distance to the epidural space is increased by a change from the sitting to the lateral position.

4.1.5 Landmarks:

4.1.5.1 The intercristal line (the line between the highest points of the two iliac crests) runs through the spinous processes of L_4. The spinous processes identify the midline. Grasping the process transversely with the thumb and forefinger helps determine their width. The spinous processes immediately above and below the site of needle puncture are marked. The interspace immediately above or below the L_4 process is the usual site for needle insertion. This avoids the termination of the spinal cord at the $L_1 – L_2$ level.

4.1.6 Structures Encountered During the Midline Approach:

4.1.6.1 The needle should meet little resistance as it passes through skin and subcutaneous tissue. As it engages the tough supraspinous ligament, the tissue should support the needle perpendicular to the skin. With the loss of resistance technique, the thumb of the dominant hand places continuous pressure against the plunger of the syringe while the needle is advanced through the interspinous ligament with the non – dominant hand. The anesthesiologist feels an increase in resistance.

4.1.7 Loss of Resistance Technique: Midline Approach

4.1.7.1 After checking the availability of resuscitation drugs and equipment, appropriate monitors are placed and the patient is positioned. The intercrest line and midline are identified. The point of needle insertion is marked with a skin marker or with a cruciform mark made of thumbnail pressure applied in the vertical and horizontal planes.

4.1.7.2 The skin is widely prepped and the field draped.

4.1.7.3 A skin wheal of 1 % Lidocaine is made with a short 23 gauge needle or 25 gauge 1.5 inch standard bevel needle is used to infiltrate 1% Lidocaine in the supraspinous and interspinous ligaments.

4.1.7.4 An 18 gauge Tuohy needle with a stylet is inserted perpendicular to the skin with the bevel facing cephalad (Depth of the needle in the supraspinous ligament is limited to 2 cm before the stylet is removed. A 5 or 10 ml saline – filled loss of resistance syringe is then attached to the needle hub. Authorities recommend that the anesthesiologist stand when advancing the needle for the loss of resistance.

4.1.8 Bromage describes the technique as follows:

4.1.8.1 "The needle is gripped with the thumb on top and the proximal and distal phalanges of the crooked forefinger below. The hand is supinated and the wrist partially flexed and the back of the carpus braced against the patient's back. Forward motion is imparted on the needle by a gradual extension of the wrist, and the carpus and metacarpus roll is toward the back line an eccentric can driving a piston."

4.1.8.2 The non – dominant hand rests against the patient's back and stabilizes the needles to prevent any sudden forward motion. Constant unremitting is placed on the plunge of the saline – filled syringe with the thumb.

4.1.8.3 A sudden loss of resistance is felt when the bevel pierces the ligamentem flavum. Injection, which was previously obstructed, should suddenly become "as easy as discharging the syringe into an empty space". The forward motion of the needle should be stopped immediately. The jet on saline pushes the dura away from the advancing needle. The average depth of the epidural space measures 5 cm with a range between 2 – 8.5cm. No CSF or blood should flow from the needle after the syringe is detached from the hub.

4.1.8.4 Rotation of the needle during needle advancement and after entering the epidural space may increase the likelihood of lacerating epidural veins as well as the dura. Subdural or subarachnoid placement of the needle bevel and epidural catheter.

4.1.8.5 The rebound test may confirm entry into the epidural space. One to 1.5 ml of air is rapidly injected into the space through the needle and the pressure on the plunger quickly released. A glass syringe will refill with only 0.1 – 0.2 ml of air. If the needle is incorrectly placed in a ligament, the syringe will refill with 0.5 – 1.0 ml. injection of 1 to 2 ml of sterile water has also been described as a test to confirm epidural placement. Water produces pain in the awake subject, and reflex movements in lightly anesthetized patients.

4.1.8.6 Some anesthesiologists recommend injection of a volume of saline or part of the initial dose of local anesthesia through the needle prior to threading the catheter. This may open up the epidural space, facilitate passage of the catheter, decrease the incidence of Parasthesias and intravenous cannulation, and shorten the onset of the initial dose. The incidence of intravenous cannulation is decreased significantly (1 % vs 14 %) when 10 ml of saline are injected through the needle, but is no different when volumes of less than 10 ml are injected prior to catheter insertion. A 20 gauge epidural catheter is threaded through the needle with attention paid to the depth markings on the catheter. Moderate pressure might be required to pass the catheter tip beyond the orifice of the needle, but only light and delicate pressure should be needed to advance it further. Catheter advancement frequently produces a mild paraesthesia described as a poorly localized burning sensation radiating to the hip or leg. The optimal distance in the space probably ranges between 2 – 6 cm.

4.1.8.7 The potential for shearing the catheter with the needle exists once the tip of the catheter tip beyond the orifice of the needle. The catheter should not be removed with the needle left in place.

4.1.8.8 The catheter is grasped at its entry into the skin between the thumb and the index finger as the needle is removed. The depth of the catheter at the skin is noted.

4.1.8.9 Spontaneous flow of CSF or blood from the catheter should be absent when the end of the catheter is held in a dependent position. An aspiration test for CSF or blood is attempted with a 3 ml syringe. Following a negative aspiration, an appropriate test dose is administered.

4.1.10 Para Median Approach: Technique

4.1.10.1 A mark is made 1.5 cm lateral to the inferior border of the spinous process. After a skin wheal of local anesthetic is made, a 1.5 inch gauge needle is used to infiltrate local anesthetic in the paraspinous muscles in a path directed ventrally and slightly medially. The needle is used to contact paraspinous muscles in a path

directed ventrally and slightly medially. The needle is used to contact and identify lamina. The needle is then withdrawn to the skin, redirected slightly more cephalic and advanced until either lamina or the superior edge of the lamina is contacted. In this manner the needle is "walked" in fine increments off the superior edge of the lamina. Longer (spinous needles may be required to identify lamina in patients with generous subcutaneous tissue with the bevel facing cephalad. The stylet is removed and the needle advanced to contact lamina. The needle is then "walked" off the superior edge of the lamina until ligamentum flavum is contacted. The needle is advanced using the loss of resistance technique.

4.1.11 Assessing level of sedation:

4.1.11.1 To help determine whether the patient is receiving an appropriate level of pain control – one that keeps him free from pain, but not overmedicated – try using the Modified Ramsey Scale. Level 2 is what you are trying for?

4.1.12.1.1 Level 1: Anxious, agitated or restless.

4.1.12.1.2 Level 2: Cooperative, oriented or tranquil.

4.1.12.1.3 Level 3: Responsive to command only.

4.1.12.1.4 Level 4: Brisky responsive to loud auditory stimulus or glabellar tap.

4.1.12.1.5 Level 5: Sluggishly responsive to loud auditory stimulus or glabellar tap.

4.1.12.1.6 Level 6: Not responsive to loud auditory stimulus or glabellar tap.

4.1.13 Epidural Analgesia:

4.1.13.1 Opioids (All must be free of preservatives)

Drug	Dose	Onset	Duration
Morphine Sulphate	2 – 5 mg/hr	30 – 60 minutes	6 – 8 hours
Fentanyl Citrate	50 – 100mcg/hr	10 – 20 minutes	2 – 4 hours
Sufentanil Citrate	10 – 30 mcg/hr	10 – 20 minutes	3 – 6 hours

4.1.13.2 Local Anesthetics (All must be free of preservatives)

Drug	Onset	Duration
Lidocaine HCL	15 minutes	80 – 180 Minutes
Bupivacaine HCL	10 – 20 minutes	60 – 240 Minutes
Ropivacaine HCL	20 – 30 minutes	60 – 90 Minutes

5. MATERIALS AND EQUIPMENT:

5.1 Standard ready to use sterile epidural sets.

6. RESPONSIBILITIES:

6.1 Anesthesia Technician
6.2 Anesthesiologist on Duty
6.3 Consultant Anesthetist

7. APPENDICES:

7.1 N/A

8. REFERENCES:

8.1 American Society of Anesthesiology

9. APPROVALS:

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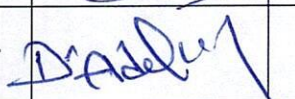
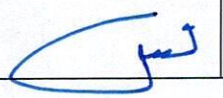
Reviewed by:	Dr. Tamer Mohamed Naguib	Medical Director		January 12, 2025
Approved by:	Mr. Fahad Hazam Al - Shammari	Hospital Director		January 19, 2025