How to assess epidural blockade

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Epidural analgesia is extensively used to manage acute and chronic pain in a variety of clinical settings. It is a high-tech mode of analgesia that may be safely managed by ward nursing staff following appropriate support and training (Cox, 2001).

Why use an epidural?
The synergistic combination of a local anaesthetic (such as bupivacaine or levobupivacaine) and a strong opioid (such as fentanyl or diamorphine) in low doses infused directly into the epidural space has the potential to provide analgesia without the increased incidence of adverse effects often seen with higher doses of each agent administered alone (Melzack and Wall, 2003).

Epidural analgesia allows these agents to be injected close to the spinal nerves and spinal cord (Fig 1). Local anaesthetics block pain impulses carried by nerves (Dougherty and Lister, 2004) while opioids block specific receptors found primarily in the brain and spinal cord (Cox, 2001).

The efficacy of epidural analgesia is monitored through regular dynamic pain assessment and by testing the level of sensory and motor blockade.

How it works
Local anaesthetics block the conduction of the sensory, motor and sympathetic nerve fibres. Perception of pain and skin sensation are both altered as a result of sensory nerve blockade. The spinal nerves supply specific areas of skin, known as dermatomes. Sensitivity to changes in temperature (such as the cold of ice applied to the skin) along sensory dermatomes can be used to assess the level of epidural block (Fig 2).

The level should be checked regularly to ensure the block is:
● Covering the area of incision and/or site of pain;
● Not too high (particularly important in high thoracic epidural analgesia);
● Not too dense, causing unnecessary motor blockade.

Careful and frequent monitoring will ensure early detection of any serious adverse effects. Excessive motor weakness may indicate a too high rate of epidural infusion, migration of the catheter into the dura or the formation of an epidural abscess or haematoma, which requires anaesthetic review and rapid treatment (The Royal College of Anaesthetists et al, 2004).

The success of the blockade to provide adequate analgesia depends on the location of the epidural catheter tip and the rate and spread of the local anaesthetic infused (Cox, 2001). If the catheter is too low the correct sensory dermatomes will not be covered resulting in poor analgesia (Dougherty and Lister, 2004).

For thoracic surgery the sensory dermatome blockade needs to cover the incision and intercostal drains and may extend from T4 to T8 (Fig 3). For abdominal surgery the block should include the incision, for example T5–L1 for a midline laparotomy that extends from xiphisternum to pubis (Fig 4). For knee surgery the
level may extend from L3 to L5 (Fig 5). The areas shaded in dark green indicate no perception of cold, becoming lighter green where slight cold can be felt.

**Preparation**
- Have a piece of ice/proprietary cold pack or similar available. These can be discarded after the test to reduce cross-infection risk.
- Explain to the patient what analgesic agents are used so that she or he understands why the cold test is necessary (the numb feeling from the epidural may be similar to that left behind after local anaesthetics used in dental treatment).
- Maintain patient dignity by performing tests in privacy, as areas of the body will need to be exposed.

**The procedure**
- Obtain informed consent.
- Provide reassurance and alleviate any anxieties.
- Remove any clothing that may restrict the assessment.
- Place the ice/cold pack on the patient’s face to ensure they can feel cold sensation in an area that should not be affected by the blockade.
- Place the ice on an area close to the site of incision and ask if it feels as cold as when placed on the face.
- Continue this procedure above and below the incision site and to the right and left of the body. This will indicate if the block is unilateral or bilateral.
- Document at what level the patient can detect altered sensation as per the dermatome chart (Fig 2), for example T4–T8.
- If the block is greater on one side than the other, document each side separately, for example left: T4–T8, right: T6–T9.
- Ask the patient if they have any new or unusual weakness in any of their limbs.
- Document motor power of each limb for both sides of the body, for example arms L=R, legs L>R.

**REFERENCES**


**PROFESSIONAL RESPONSIBILITIES**

All nursing staff who assess epidural blockade must have received approved training and fulfilled a period of supervised practice. It is the responsibility of the individual to maintain and update skills and knowledge from a practical and theoretical perspective. Nursing staff should carry out this procedure in adherence to their own organisation’s policies, protocols and guidelines relating to epidural analgesia.