Epidural Analgesia

Name:	
Ward/Site:	Band:
Date of teaching:	Date of Competency completion:

Theoretical Component:

The learner will have received epidural training and completed self-assessment.

Completed competencies ideally within 6 weeks of education.

Competencies can be assessed by Clinical Nurse Specialist, Education Co-ordinator or designated pain link nurse

Aim:
The aim of this education package is to provide nurses with the knowledge and skills to effectively and safely care for a patient receiving epidural analgesic provision for effective pain relief.

Objectives:
This is a self-directed learning pack. The nurse should be able to meet the following objectives by self-assessment.
Show an understanding of the Scope of Professional Practice.
Demonstrate an understanding of the physiology of pain.
Demonstrate an understanding of the spinal cord anatomy.
Demonstrate knowledge of the safe care and monitoring of the patient receiving epidural analgesia.
State the actions and side effects of epidural local anaesthetics and opiods.
Demonstrate an understanding of the detrimental effects of uncontrolled postoperative pain.
Demonstrate an understanding of the importance of regular pain assessment and formal written documentation.

The NMC code of professional conduct: standards for conduct performance and ethics
As a registered nurse, midwife or specialist community public health nurse, you are personally accountable for your practice. In caring for patients and clients, you must":
Respect the patient or client as an individual.
Obtain consent before you give any treatment or care.
Protect confidential information.
Co-operate with team members.
Maintain your professional knowledge and competence.
Be trustworthy.
Act to identify and minimise risk to patients and clients.
These are the shared values of all the United Kingdom healthcare regularity bodies
Nursing and Midwifery Council November (2004).

Introduction

"Pain is a category of complex experiences, not a single sensation produced by a single stimulus". (SIGN 44, 2001)

Definitions of Pain Types:

"An unpleasant,sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage" (International Association for the Study of Pain IASP 1994).

Acute Pain

Acute pain usually signals impending or actual tissue damage and thus permits the individual to avoid further injury (Melzack & Wall 2003). The complexity of acute pain requires an understanding of safe and effective principles to treat it.

Chronic Pain

"Commonly persists beyond the time of healing of an injury and frequently there may not be any identifiable cause" (Ready & Edwards 1992).
Although in most patients acute pain will resolve over time, there are some who will go on to develop chronic pain after surgery or other injury. It is possible that the risk of developing chronic pain is higher in those patients with severe acute pain (Macintyre & Schug 2007).

Neuropathic Pain

"Pain initiated or caused by a primary lesion or dysfunction in the nervous system." (IASP 1994)
Although commonly a cause of chronic symptoms, neuropathic pain can also be a component of acute pain.
The mechanisms for neuropathic pain and its treatment differ significantly from nociceptive pain.
Features in pain history that may suggest a diagnosis of neuropathic pain include:
Pain in the absence of ongoing tissue damage
Pain in an area of sensory loss
Paroxysmal or spontaneous pain
Allodynia (pain in response to non painful stimuli)
Hyperalgesia (increased pain in response to painful stimuli)
Dysaesthesia
Characteristic of pain different from nociception e.g. burning, stabbing
Poor response to opioids
Presence of major neurological deficit e.g. brachial plexus injury

(Lothian University Hospitals NHS Trust: Guidelines for the Management of Acute Pain 2006)

Physiology of Acute Pain

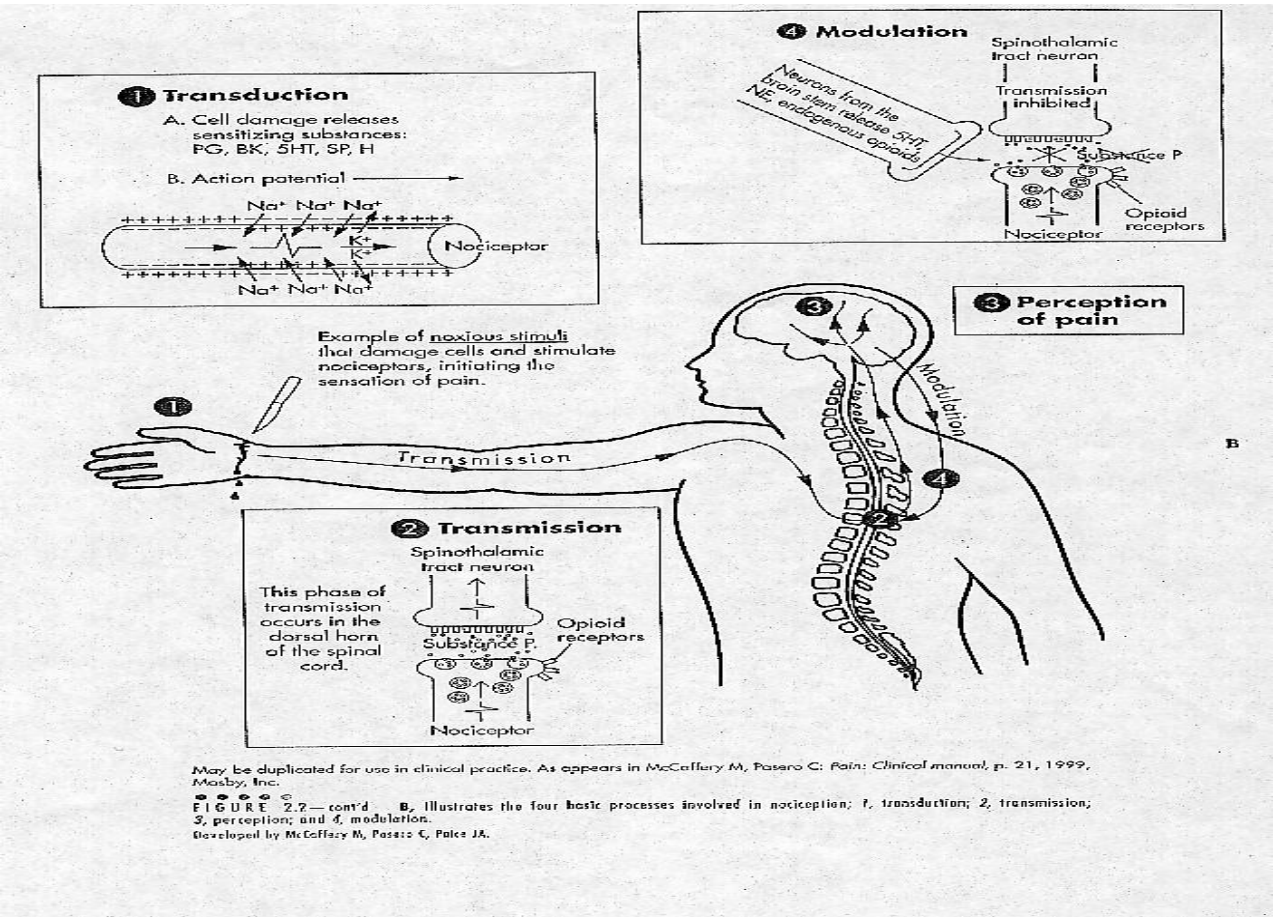
Pain perception involves multiple interacting peripheral and central mechanisms. Pain is multi-factorial and involves physical, psychological and environmental aspects in every individual.
Acute pain is initiated by stimulation of nociceptors at the site of injury. There is associated release of a variety of inflammatory mediators, which both stimulate nociceptors directly and amplify their response to noxious stimuli. The pain signal is transmitted to the dorsal horn of the spinal cord and then onwards to a variety of sites in the central nervous system, including the cerebral cortex, resulting in conscious perception of the pain. At all points along the pain pathway the pain signal may be modulated (both intrinsically and by treatment) to increase or decrease the duration and nature of the pain perceived.

The process of perception and response to pain may be summarised in four phases:
Transduction - when the stimulus is detected by nociceptive (pain) receptors

Transmission – when the message is relayed from the receptors to the central nervous system

Modulation – when the message is modified by other activity in the body, which may be activity of other peripheral nerves or may occur in the central nervous system.

Perception - when the brain perceives the sensation as pain.



May be duplicated for use in clinical practice. As appears in McCaffery M, Pasero C: *Pain: Clinical manual*, p. 21, 1999, Mosby, Inc.

FIGURE 2.2—cont'd B, Illustrates the four basic processes involved in nociception; *1*, transduction; *2*, transmission; *3*, perception; and *4*, modulation.
Developed by McCaffery M, Pasero C, Paice JA.

Possible Harmful Effects of Inadequately Treated Acute Pain		Advantages of Good Pain Management
Respiratory	Decreased lung volumes, atelectasis, decreased cough, sputum retention, infection and hypoxaemia	Improved lung expansion and ability to cough, reduced risk of atelectasis and chest infection
Cardiovascular	Tachycardia, hypertension, increased peripheral vascular resistance, increased myocardial oxygen consumption, myocardial ischaemia, altered regional blood flow, deep vein thrombosis	Improved cardiovascular stability, decreased myocardial oxygen demand
Gastrointestinal	Decreased gastric and bowel motility	Earlier return of gut motility
Psychological	Anxiety, fear and sleeplessness	Improved sleep, reduced anxiety and fear. Feels better
Musculoskeletal	Muscle spasm, immobility (increasing risk of deep vein thrombosis/PE)	Potential earlier mobilisation. Improved mobility (decreased risk of pressure sores, DVT)
Economic	Development of complications could lead to prolonged hospital stay	Good pain control may shorten hospital stay
Chronic pain	Poorly controlled acute pain is a recognised risk factor for chronic pain	Adequate acute pain management may reduce the risk of developing chronic pain

Barriers to providing effective pain relief in the clinical area include:

Nurse/Doctor
Lack of education and resources resulting in inadequate understanding of the multi dimensional nature of pain.
Under utilization of pain assessment tools.
The continuing belief of myths and misconceptions surrounding pain management.

Patient
Reluctance to report pain for several reasons including:
Desire to be a good patient.
Fear of addiction.
Fear that pain means the disease is progressing.
Patients may not comply with treatment due to a lack of information and understanding of the concept of pain assessment and interventions.

Environment
Lack of nursing staff to administer analgesia or medical staff to prescribe.
Low priority of clinical staff to effectively manage pain.

These barriers to effective pain management may result in poor decision making skills by nursing staff thus perpetuating the carrying out of ritualistic practices including:
Underestimation of the severity of the patients' pain.
Overestimation of the effectiveness of interventions.
Inappropriate treatment goals.
Reluctance to administer parenteral analgesics.
Withholding "ticked time" analgesics when the patient not in pain.
Administering the lowest dose of analgesic prescribed as opposed to the dose required to control the pain.
Administering a lower dose of analgesic at longer time interval than prescribed.

Pain Assessment

To be able to manage our patient's pain effectively it is essential that we are able to assess and document their pain score by simple means.
The use of pain scales gives a means of measuring changes in the level of pain within each patient and the effectiveness of treatment of that pain.
Measurement with a pain scale is only part of a effective assessment. Assessment of function – for example the ability to take deep breaths, cough, mobilise and cooperate with physiotherapy – gives an important indication of the effectiveness of analgesic therapies.

In this Trust we use both the Verbal Numerical Ratings Scale and the Verbal Descriptor Scale (see below).

Verbal Numerical Rating Scale
The patient is asked to rate their pain on a scale of 0-10, with 0 being no pain and 10 being the worst pain imaginable.

Verbal Descriptor Scale
Patient is asked on a score of 0 – 3 with 0 being no pain and 3 being the worst pain both at rest and at movement.

0 = No pain.
1 = Mild pain, it does not distress me.
2 = Moderate pain, it distresses me a bit.
3 = Severe pain, it distresses me a lot.

All patients should have their pain assessed at rest and on movement and documented at the same time as their vital signs and more frequent if pain is poorly controlled. Analgesia prescriptions should be tailored to individual patient requirements and efficacy reviewed regularly.

Key Points in Pain Assessment:

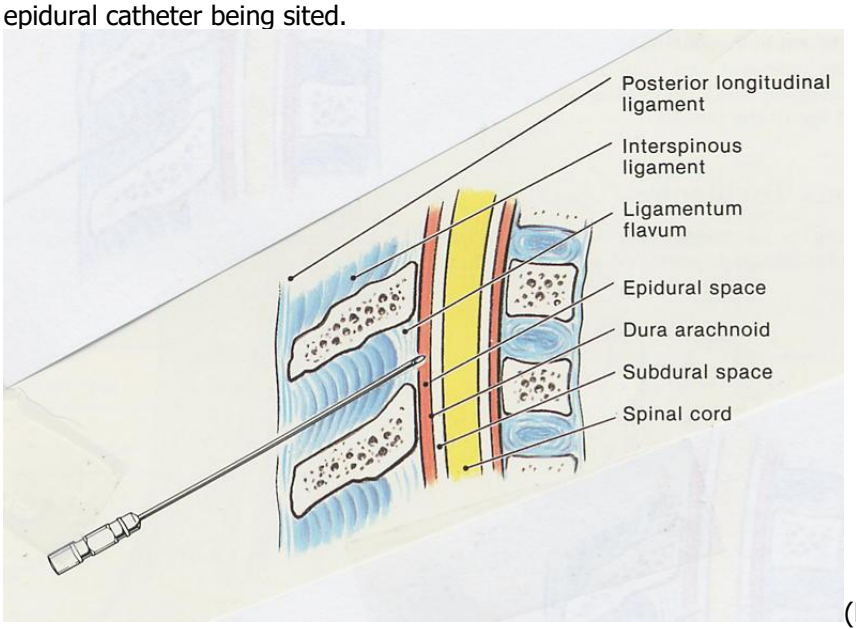
Pain is considered the 5th Vital sign.
Patients own verbal report of pain (due to pain being a subjective experience).
Pain intensity (objective, using an appropriate tool at rest and on movement).
Location of pain (ask patient to point to where the pain is, not always the wound!).
Type of pain (intermittent or constant).
Pain assessment following analgesia.
Sedation level.
Nausea and vomiting scoring.
Vital signs respirations, pulse, blood pressure,
Clinical signs: sweating, pallor.
Behavioural signs facial expressions, crying, restlessness, guarding or rubbing of the affected area (absence of these does not indicate that patient's pain is controlled).
Presence of pain that is different in nature to nociceptive pain e.g. burning, shooting, and stabbing.
Uncontrolled or unexpected pain requires a reassessment of the diagnosis and consideration of alternative causes for the pain e.g. new surgical/medical diagnosis, neuropathic pain.

Epidural Analgesia
Epidural block is the most commonly used form of continuous regional analgesia. Epidural analgesia is the only mode of analgesia so far, proven to improve outcome from major surgery with a reduced incidence of DVT, pulmonary and cardiac morbidity. The use of this technique will depend on the anaesthetists assessment of the risk benefit ratio for an individual patient.

Indications/patients likely to benefit
Major abdominal, thoracic and lower limb surgery.
Patients with significant cardiorespiratory disease.
Patients with opioid intolerance e.g. severe PONV.
Patients already receiving high dose opioids preoperatively.

Contraindications to the use of Epidural Analgesia
Untrained staff.
Patient refusal.
Contraindications to catheter/needle placement:
Local or generalised sepsis.
Some central or spinal neurological diseases.
Hypovolaemia.
Coagulation disorders.
Concurrent treatment with anticoagulant medications.
Presence of a dural puncture.
MacIntyre & Ready (2001)

Practical Aspects
In order for you to be confident in caring for a patient receiving epidural analgesia, it is helpful for you to have some knowledge about epidural catheter placement. It should be possible for you to attend theatre to see an epidural catheter being sited.



(Figure 1)

An understanding of the spinal nerves is important in order to comprehend how epidural blockade provides analgesia. Each of the spinal nerves except (c1) supplies a segment of the skin called a dermatome. The body outline (Figure 2) shows these dermatomes and identifies the spinal nerves, which supply that area.

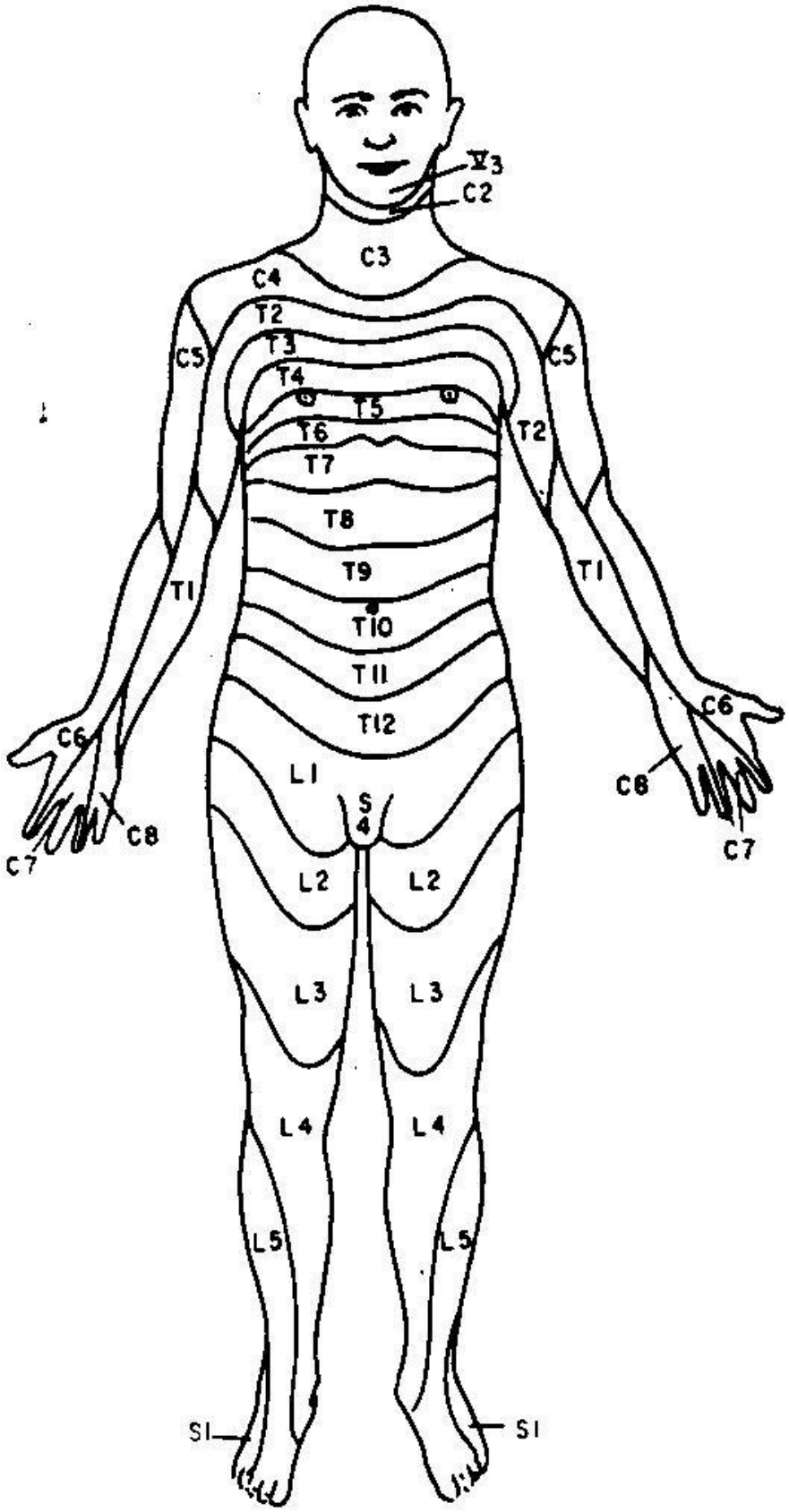

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Figure 2

Epidural Catheterisation
The epidural catheter should be placed in a position to provide optimal analgesia through appropriate nerve block without requiring excessive infusion volumes hence limiting side effects. For upper abdominal surgery e.g. hepatic resection, in the dermatomal area T7/8 the catheter should be placed at the T7/8 interspace if possible. For lower abdominal surgery e.g. abdominal hysterectomy the catheter is placed lower at around T11/12.

Epidural catheterisation is usually carried out when the patient is awake as this facilitates correct placement of the catheter. Since the patient can verbalise symptoms when asked how they feel, and it allows easier insertion of the catheter as the patient is co-operative.

The patient is asked to take up the appropriate position that will enable the spinous process to separate. The anaesthetist using a strictly aseptic technique feels for the vertebral level desired, then using a loss of resistance technique, inserts a touhy needle between the vertebrae. The catheter is secured with a sterile dressing and a bacterial filter is attached. The depth of the epidural space and the distance the catheter is inserted should be charted. Once inserted the catheter is aspirated for blood and CSF. A test dose of local anaesthetic is then usually given (4mls 2%lignocaine). If the catheter is misplaced in the subarachnoid space, this will cause a dramatic fall in blood pressure and a significant motor and sensory block. All of these precautions should ensure correct catheter placement at the time of insertion, however it should be noted that catheter migration may occur at a later time. Constant vigilance is necessary to detect signs of intravascular or subarachnoid injection so that the situation can be promptly rectified without harm to the patient. See below.

Sensory block checks
The epidural block should be checked and charted at the beginning of each nursing shift and at intervals thereafter depending on the patient's condition. The block should be checked if:
The patient has pain.
The patient is sedated.
The patient becomes hypotensive.
There is increasing motor block.
The ideal segmental block will provide sensory block to the wound and will be narrow enough to minimise the risk of complications. A block above T5 may lead to cardiac sympathetic blockade, leading to bradycardia and reduced cardiac output. Respiration may also be compromised by paralysis of the intercostal muscles. An excessively low block may lead to unacceptable motor block in the lower limbs and prevent mobilisation of the patient.
The epidural may provide a unilateral block and therefore both sides should be tested.

Epidural sensory blockade is therefore tested using ice, since pain and temperature sensing nerve fibres are of similar diameter and are therefore blocked to a similar degree by local anaesthesic.

Motor block
Patients receiving epidural analgesia should never be allowed to remain with a significant motor block. On stopping or reducing an epidural infusion motor block should show significant improvement within one hour.
The patient's ability to move their lower limbs should be **checked hourly**. Increasing motor blockade can be due to:

- excessive epidural local anaesthetic. This is the commonest cause.
- a spinal block developing indicating that the catheter has migrated into CSF
- the onset of an epidural haematoma or abscess

All Patients with a motor block must be reviewed by the relevant on call anaesthetist or Pain Team as soon as possible. Increasing motor block is an emergency, the infusion should be stopped and an urgent anaesthetic or pain team review instituted

Since motor as well as sensory fibres are affected by local anaesthesia, patients may experience some weakness of their legs particularly with a lumbar epidural block. Significant motor blockade reduces the benefits of good analgesia by reducing the patient's ability to mobilise, it should be resolved. In most instances, the epidural infusion should be reduced or stopped to allow recovery of motor function and the patient reassured. Motor block. may be avoided by using low concentrations of local anaesthetic solution, perhaps combined with opioid and avoiding frequent top ups with more concentrated local anaesthetic if possible.
Profound or increasing weakness of the legs is an emergency since it may indicate that local anaesthetic is going directly into the CSF in the sub-arachnoid space due to misplacement or migration of the catheter and

requires urgent intervention. The infusion must be discontinued immediately and the responsible anaesthetist informed urgently.

Similarly increasing motor block or weakness that does not improve rapidly (within one hour) after stopping the epidural infusion may indicate **an epidural abscess or haematoma. Untreated these will cause severe, permanent neurological damage and must be detected and managed urgently.**

Risks and Side Effects of Epidural Analgesia

A detailed audit (NAP 3) of complications of regional neuraxial blocks was carried out in 2009 by the Royal College of Anaesthetists see refs page. In this audit the incidence of serious harm from perioperative epidural analgesia was estimated at between 1 in 6,000 and 1 in 12,000. .

Needle and Catheter Related Complications:

- **Dural puncture (<1 in 100):** CSF leak may result in a postural fronto-occipital headache relieved by lying flat and associated with photophobia. The patient should be adequately hydrated and receive analgesia as required. Following discussion with the responsible anaesthetist, the patient may be treated with an epidural blood patch.
- **Neurological damage:** this is uncommon, and includes mainly reversible peripheral nerve palsies. The incidence is reduced if the epidural is sited in awake patients who can report neurological symptoms from either the tuohy needle or epidural catheter, allowing for repositioning.
- **Epidural haematoma** leading to spinal cord compression is a rare but potentially devastating complication of spinal and epidural anaesthesia. It may cause sensory loss and/or muscle paralysis of a greater degree than expected, or persisting longer than expected, or coming on after the spinal or epidural anaesthetic has worn off. Back pain sometimes also occurs. An epidural haematoma can develop up to several days after spinal or epidural anaesthesia. The consultant anaesthetist responsible for the epidural must be contacted if this complication is suspected and an MRI scan arranged in consultation with the neurosurgeons. Urgent surgical decompression (within 6 hours) is required to prevent permanent paraplegia. Epidural haematoma is more likely to occur if a spinal or epidural block is performed, or an epidural catheter removed, in a patient who is anticoagulated. (Anticoagulation guidelines available from Pain Medicine Website on NHS Lothian Intranet)
- **Infection:** Epidural catheters are a potential source of infection. This may be localised infection at the catheter insertion site, epidural abscess or septicaemia. An aseptic technique is used when inserting the catheter and it is attached to a bacterial filter. The supervising anaesthetist should be informed if the catheter becomes detached from the filter. If a disconnection occurs then the outside of the last 10 cm of the catheter should be cleaned with iodine or an alcohol wipe and cut off using sterile scissors The epidural catheter can then be reconnected to a new sterile epidural filter. If the catheter has been disconnected for a period of time and/or is likely to be contaminated then this epidural catheter will need to be removed. Consideration should be given to resiting the epidural otherwise appropriate alternative analgesia will need to be prescribed. An epidural abscess may present with signs of infection and cord compression. Urgent investigation is required as for epidural haematoma.
  The incidence of epidural catheter related infection increases if the catheter is left in situ for over 72 hours. Careful consideration of the risk/benefit ratio must be undertaken if epidural analgesia is continued beyond this time. Resiting the epidural would be an alternative option.

Epidural Drugs and Mode Of Action

The two classes of drug most often used are:
1. Local anaesthetics: producing sensory, motor and sympathetic blockade.
2. Opioids: cross the meninges, enter the CSF and interact with opioid receptors in the spinal cord. They also reach brain opioid receptors via both the CSF and bloodstream.
As with other analgesic techniques, combination therapy is often beneficial. The addition of an opioid to a local anaesthetic infusion will often provide superior analgesia and allows the dose of each agent used to be relatively less thus reducing the risk of significant side effects (Wheatly, Schug and Watson 2001).

Local Anaesthetics
Local anaesthetics act by reversibly inhibiting nerve transmission. They have been shown to be most effective in producing epidural analgesia when used in combination with opioids. A synergistic analgesic action is produced which will reduce the required dose and side effects associated with either the local anaesthetic or opioid alone (Acute Pain Management: scientific evidence 2005).

Bupivacaine is the local anaesthetic most commonly used in epidural infusions, it is metabolised in the liver. In the ward setting, low doses are administered by infusion in order to minimise the risk of toxicity. Bupivacaine offers less motor block for the same degree of sensory block and is currently the local anaesthetic of choice.

Opioids
Fentanyl is the most lipophilic opioid used epidurally and as a result has a fast acting effect. Most of the drug is absorbed, therefore, only a small amount is free in the CSF. Fentanyl should therefore present a lower risk of respiratory depression than less lipophilic drugs**. Diamorphine** is a prodrug, it is rapidly hydrolysed to 6-monoacetylmorphine (a potent analgesic) and then morphine. Diamorphine and 6-monoacetylmorphine are more lipid soluble than morphine, therefore there is a more rapid action when given by intravenous or epidural routes (Macintyre and Ready 2001). Correct dermatomal positioning of the epidural catheter remains important if lipid soluble opioids are used such as fentanyl and diamorphine since they like the local anaesthetics provide segmental analgesia. **Morphine** is the least lipid soluble opioid used in epidural analgesia. Due to its low fat solubility it has a higher risk of delayed respiratory depression, this results from rostral migration of the drug in the CSF to the brain stem and repiratory centre. The required dose of epidural morpine is age related, a suggested dose from non thoracic surgery via a lumbar catheter or for thoracic surgery via a thoracic catheter is 4mg in patients <45 to 1mg in patients>75. Preservative free Morphine is used for epidural infiltration. (Macintyre and Ready 2001)

The Effects of Epidural Infusions on the Body's Systems and the Related Nursing Care

Cardiovascular System:
Poorly controlled pain results in a sympathetic response resulting in tachycardia, hypertension and increased cardiac work. This may lead to myocardial ischaemia and infarction in susceptible individuals. Effective analgesia will block this effect.
Local anaesthetic induced sympathetic block results in peripheral vasodilation and may result in hypotension. This is usually mild, but does render the patient more sensitive to small drops in intravascular volume, so that careful attention to fluid balance is mandatory in this group of patients.
A large or sudden decrease in blood pressure in the postoperative period may be the result of other events such as haemorrhage, sepsis or cardiac failure and should not be assumed to be due to the epidural block alone.
Since extensive sympathetic block may result in postural hypotension, the patient should not sit up suddenly before a spinal or epidural block has worn off. It may be possible for the patient to sit up if this is done gradually in stages, ensuring that the blood pressure does not fall excessively and that there are no symptoms of postural hypotension such as dizziness or nausea.
If a patient has epidural blockade of sensory fibres in the cardiac region T1-T5 then cardiac sympathetic fibres will be blocked. This may result in a profound bradycardia, and reduced cardiac output in addition to the hypotension from peripheral vasodilatation.
Epidural induced hypotension is managed with a combination of intravenous fluids and vasoactive drugs as dictated by the severity of hypotension, condition of the patient and ward protocols.
When hypotension is associated with an extensive epidural sympathetic block, ephedrine, a drug which acts both as a vasoconstrictor and inotrope, is sometimes given. Typical doses are 30 mg subcutaneously or increments of 3 to 6 mg intravenously, can also be administered orally (Trust Guidelines for the Management of Acute Pain 2006).

The Respiratory System:
Randomised controlled trials comparing conventional analgesia and epidural analgesia, demonstrate a significantly lower incidence of actelectasis and significant beneficial effects on arterial blood gases in patients receiving epidural analgesia including epidural opioids (Ballantyne et al 1998).

Opioid Induced Respiratory Depression:
Respiratory depression may occur following opioid administration by any route. It may be slowly progressive or unpredictable in onset. Respiratory depression is often associated with an increase in sedation which should be acted on promptly. In patients who are confused or agitated it is important to consider hypoxia secondary to opioid induced respiratory depression as a cause.

If respiratory rate is 10/min or less but patient is easily roused:
Ensure patient has a clear airway and is in the lateral position if possible.
Give oxygen 6 litres per minute via face mask.
Continuously observe the patient.
Stop administration of opioid.
Ensure naloxone is available.
Inform responsible anaesthetist.

Severe Respiratory Depression:
If respiratory rate is 8/min or less and/or if the patient is very difficult to rouse:
Call for help, either the duty anaesthetist or cardiac arrest team as appropriate.
Ensure patient has a clear airway and is in the lateral or recovery position.
Give high flow oxygen via face mask.
Physically stimulate patient and consider bag, valve, mask ventilation with a self-inflating bag, reservoir and high flow oxygen.
Administer naloxone bolus intravenously:
Dilute naloxone 400ug in 10ml 0.9% Sodium Chloride (40ug/ml).
Administer intravenously at 1ml/min until respiratory rate is satisfactory and patient awake or easily roused.
If there is no response after a total of 400ug naloxone, reconsider the diagnosis.

Naloxone infusion:
A naloxone infusion may be indicated if there is an ongoing risk of respiratory depression:
Dilute naloxone 2mg ($5 \times 400\mu g$ ampoules) in 500 ml 0.9% Sodium Chloride or 5% glucose.
Administer intravenously according to response. Initial rate two thirds of the required bolus dose given hourly, discuss with anaesthetic staff.

An effective naloxone dose may have to be repeated every 30 - 60 minutes because of the much longer half-life of most opiates.
Naloxone antagonises analgesia and alternative pain relief may be required.
Naloxone administered to patients taking long term opioids may precipitate a withdrawal reaction.

Apnoea:
Call for help, either the duty anaesthetist or cardiac arrest team as appropriate.
Open airway.
Ventilate with high flow oxygen via bag valve mask.
Administer naloxone 800micrograms iv as a bolus and repeat after 1 minute if no response.
Ongoing management will be as directed by the anaesthetist or cardiac arrest team.

Pruritis:
Generalised itching may occur secondary to opioid analgesia and may be treated by antihistamine, or by small intravenous doses of naloxone in severe cases.
Chlorpheniramine: Dose:10mgs intramuscularly or diluted by slow intravenous injection over 1 minute.

Gastrointestinal System:

Ileus and the resulting failure to tolerate oral intake is often a major limiting factor in recovery from abdominal surgery. Systemic opioid use is often a significant factor in this. Limiting the dose of opioid by utilising effective epidural analgesia is a major factor in reducing postoperative ileus.
Also bowel motility is improved by blockade of afferent nociceptive impulses and efferent sympathetic components of the spinal reflex arc that would normally cause abdominal pain and inhibit intestinal motility. Increased blood flow to the gastrointestinal tract due to sympathetic block may also be beneficial (Lui 1995).

Nausea and Vomiting:
This is a very common side effect of opioid analgesia given by any route. It can be very distressing to the patient and should be treated promptly and regularly. An anti-emetic should always be prescribed alongside an opioid. Prophylactic treatment should be given to patients with a previous history of post-operative nausea and vomiting (PONV) (Trust Guidelines for the Management of Acute Pain 2006).

Mobilisation of patients with epidural analgesia.
One of the major advantages of effective analgesia is that it enables patients to mobilise more quickly. The benefits of early mobilisation include an improvement in pulmonary function and improved clearing of secretions. It also helps in the prevention of Deep Venous Thrombosis, Pressure Sores and is known to improve gastrointestinal function and decrease the stress response postoperatively.

Early mobilisation is a joint effort by the patient, the nursing staff and physiotherapist.
With care patients with an epidural may be mobilised safely. Due to the potential sympathetic and motor block with an epidural, patients should only be mobilised from bed to chair in stages when the following criteria are met:
The patient has adequate pain control.
The patient is symptomatically well and willing to be mobilised.
If there is a possibility that the block is extensive due to a recent top-up or a high volume of local anaesthetic is being infused the level of block should be checked immediately prior to mobilisation. An extensive block or block above T4 is a contraindication to mobilisation.
The patient is cardiovascularly stable when supine.
There is no hypotension when transferring to high sitting in bed after 15 minutes.
The patient does not have excessive motor block in lower limbs (at least able to straight leg raise).
There is no surgical contraindication to mobilisation.
There is sufficient staffing to allow mobilisation (at least 2 people).
30 minutes since last local anaesthetic top-up.

If the above criteria are met the patient can be mobilised progressively while the epidural is in situ. Severe postural hypotension may occur unpredictably some time after a patient has sat up in a chair and may be associated with profound bradycardia and loss of consciousness.
Oral ephedrine 30mg provides effective prophylaxis for epidural induced postural hypotension and is used for suitable groups of patients to facilitate mobilisation. Ephedrine should be given at least 30 minutes prior to mobilisation.

Hypotension may occur unpredictably during mobilisation and trained staff must be readily available at all times. The level of monitoring required should be dictated by the individual patient's requirements. If the patient becomes hypotensive on mobilisation they should be returned to bed immediately, (or if this is difficult in an emergency situation it may be necessary to lie an unconscious patient on the floor until help is available), positioned in a supine or head down position and further action taken as indicated (see page 28 Trust Guidelines for the Management of Acute Pain 2006).

Once the epidural is removed, patients are encouraged to mobilise independently as soon as possible (Trust Guidelines for the Management of Acute Pain 2006).

Nursing Management of Complications and Side Effects of Epidural Analgesia

Possible Complications of Epidural Analgesia

These may usefully be divided into three groups:
Related to the insertion of an epidural needle or catheter:
Related to the equipment:
Catheter/filter
Infusion pumps
Related to the drugs infused (see above) (Macintyre & Ready 2001)

Related to insertion of the catheter:
Dural puncture: may result in a throbbing headache, relieved by lying flat and associated with photophobia. The patient should be adequately hydrated and receive analgesia as required. Following discussion with the responsible Anaesthetist, the patient may be treated with a blood patch.

Neurological damage: this is uncommon, with an estimated risk of< 1% of patients mainly reversible peripheral nerve palsies.

Epidural haematoma: leading to spinal cord compression, is a rare but potentially devastating complication of spinal and epidural anaesthesia. Back pain, sensory loss and muscle paralysis persisting longer than the expected duration of the epidural must be urgently investigated. The Consultant Anaesthetist responsible for the epidural must be contacted and an MRI scan arranged in consultation with the neurosurgeons. Urgent surgical decompression is required to prevent permanent paraplegia. Epidural haematoma is more likely to occur if a spinal or epidural block is performed, or an epidural catheter removed in a patient who is anticoagulated. (See below for use of Deep Venous Thrombis prophylaxis in patients receiving epidural analgesia).

Infection: Epidural catheters are a potential source of infection. This may be localised infection at the catheter insertion site, epidural abscess or septicaemia. An aseptic technique is used when inserting the catheter and it is attached to a bacterial filter. The supervising anaesthetist should be informed if the catheter becomes detached from the filter. An epidural abcess may present with signs of infection and cord compression. Urgent investigation is required as for epidural haematoma.

Catheter Migration
This is a rare complication, the catheter may migrate into the intrathecal space or into a blood vessel. Migration of the catheter into the intrathecal space will result in spinal anaesthesia manifested by a notably extended dense sensory block, an increased motor block, initially lower limb paralysis and hypotension. If these signs are detected the epidural infusion must be stopped immediately and the patient assessed. If a bolus dose of local anaesthetic is given in this situation or the infusion continues then total spinal anaesthesia may result. This is a medical emergency since this patient will be unable to maintain spontaneous respiration due to block of the respiratory muscles and is likely to be profoundly hypotensive due to extensive sympathetic blockade. The epidural catheter may also migrate into an epidural vein. The risk of toxicity is rare in this case due to relatively small doses given by epidural infusion to produce analgesia.

Local Anaesthetic Toxicity
High blood concentrations of local anaesthetic can lead to systemic toxicity. This may occur if the drug is inadvertently injected into a blood vessel instead of the epidural space or if high doses of local anaesthetic agent are given. Systemic toxicity results from the effect of the local anaesthetic drug on the central nervous system and the cardiovascular system. Signs of local anaesthetic toxicity include light-headedness, tongue numbness, tinitus, visual disturbance, muscular twitching, drowsiness, unconsciousness, convulsions, coma, cardiovascular depression and ultimately cardiac arrest.
Recognition of the early signs of toxicity and discontinuing local anaesthetic administration as a result is mandatory.

In summary:

Intravascular Injection of Local Anaesthetic	Subarachnoid injection of local Anaesthetic
Numbness round mouth/tongue **Tinnitus** **Visual disturbance** **Drowsiness**	**Rapid onset of sensory block** **Rapid onset of dense motor block** **Extended sensory and motor block**

During a top up of local anaesthetic +/_ opioid , the patient must be monitored closely for the above signs and their blood pressure taken every 5 minutes for 20 minutes.

Equipment Problems:

- **Pump Failure**

Symptoms of increasing heaviness or weakness of legs or arms could also indicate accidental administration of drug due to pump failure or incorrect programming. Hourly pump checks should be performed and recorded for the duration of the infusion

- **Accidental Disconnection of the Epidural catheter from the filter**

Disconnection of the catheter from the epidural filter can cause contamination of the end of the catheter and migration of bacteria. The supervising anaesthetist should be informed if the catheter becomes detached from the filter. If a disconnection occurs then the catheter end and filter connection should be cleaned with an alcohol wipe, 10cm of catheter cut off and they can then be reconnected. If the catheter has been disconnected for a period of time and/or is likely to be contaminated then consideration should be given to removing the catheter and resiting the epidural or providing alternative analgesia (Trust Guidelines for the Management of Acute Pain 2006).

Epidural Infusions: Precautions

Routine monitoring of patients receiving epidural analgesia comprises of respiratory rate, oxygen saturation, sedation level, blood pressure, pain scoring and motor block. Block height is assessed if the patient's condition requires it, for pain, increasing motor block, hypotension and prior to mobilising the patient. As a result of the level of monitoring required and the potential for serious complications patients receiving epidural analgesia are managed in a High Dependency Unit (HDU) or level one facility in this trust.
As with other techniques satisfactory analgesia must be established before commencement of the epidural infusion. This will be done by the anaesthetist before the patient leaves the recovery area.
The epidural bag and infusion must be clearly labelled for epidural use only.
There should be an identified pump for epidural use only. In this trust the McKinlay Medical Bodyguard 545 is used. The use of a dedicated pump and yellow line avoids the risk of confusing intravenous and epidural infusions with potentially disastrous consequences.
An Epidural Chart must be completed.
The anaesthetist remains responsible for the infusion for its duration and he/she or a nominated deputy must be available for help and advice at all times.
If satisfactory analgesia cannot be achieved with an epidural alone then alternatives will need to be considered early, such as a plain bupivacaine epidural and PCA opioids. NSAIDs and paracetamol may be prescribed.
Patients may experience discomfort from other sources out with the block e.g. a nasogastric tube, urethral catheter or central venous catheter. Supplementary analgesia is sometimes required in addition to the epidural infusion. The use of supplementary opioids, concurrent with epidural opioids must be discussed with the anaesthetist (Trust Guidelines for the Management of Acute Pain 2006).

Bolus – Some nurses are trained to administer boluses from the epidural pump (protocol for bolus administration). Occasionally when boluses of the epidural are effective but needed frequently, it is appropriate to give the patient control i.e. PCEA.

Discontinuation of Epidural

Ideally epidurals should remain in situ for 48-72 hours post operatively. This may not always be possible due to pressure on HDU beds/ Level one, care areas.

Step down analgesia options post epidural are:
PCA: This should be considered if epidural has to be stopped prematurely or patient still nil by mouth. Also consider adjunct analgesics, NSAID and paracetamol.

If taking oral fluids: We recommend that step down analgesia should consist of oral opioids + - NSAID + - paracetamol. In addition to regular analgesia, rescue analgesia for breakthrough and incident pain should also be prescribed.

Removal Of The Catheter

Before removal of catheter ensure alternative route of analgesia has been established and efficacy has been reviewed. Careful explanation to patient prior to step down is essential. It is important prior to removal the timing of anticoagulation has been reviewed.

Administration of Prescribed Heparin

When a patient is receiving subcutaneous unfractionated heparin ("minihep").

- At least 6 hours should elapse after the administration of minihep before an epidural catheter is removed.
- The next dose of heparin should not be given until at least 2 hours after performing the block or removing the catheter.

If a patient is receiving subcutaneous low molecular weight heparin (LMWH, Enoxiparin), which has a longer duration of action than unfractionated heparin and is usually given once daily.

12 hours should elapse after LMWH is given until removing the catheter.
The next dose of LMWH should not be given until at least 4 hours after removing the catheter.

If a patient is on IV heparin, the removal of the epidural catheter should be discussed with the responsible anaesthetist and surgeon.

A coagulation screen will need to be checked prior to removal of the catheter.

The catheter should be removed with the patients spine flexed thereby preventing the catheter being trapped between the vertebrae. A slight resistance may be felt initially but the catheter should not be stretched as it may break. The catheter should be inspected to ensure that it is unbroken on removal. If infection is suspected, the catheter tip should be sent for microbiology. On removal of the catheter it should be noted that the blue tip is intact and this should be documented in the nursing notes. The entry site may be covered with a non-occlusive dressing, but this should be removed later so that the site can be seen.

It should be remembered that the onset of complications of epidural catheterisation and drug administration could still occur following removal. The duration of action of the local anaesthetic or opioid is particularly relevant. An epidural haematoma is rare but can occur after catheter removal. After removal of epidural catheter patients motor block should be recorded 4 hourly for 24hours on the bottom of the SEWS chart. NB if the patient complains of any pain at epidural site or any change in sensation or power of lower limbs in the days following removal of catheter urgent assessment is required.

Epidural infusion analgesia - management of side effects.

Problem	Intervention
Sedation Score>2 It is important to note that a change in level of consciousness as an indicator of respiratory depression may be more important than a decrease in respiratory rate.	Call Clinical nurse specialist (bleep 8292 WGH/5247 RIE/3934 St Johns) or the duty anaesthetist (bleep 8112 WGH/ 2140 RIE/3561 or 3948 St Johns)
Respiratory depression rate <8 breaths per minute or SaO2<94% and or a sedation score of >2.	Switch off the pump Call duty anaesthetist Instruct the patient to deep breathe and administer oxygen at 6 litres per minute Prepare naloxone 400mcgs in 10mls sodium chloride to administer in 1ml increments every 2-3 minutes by the anaesthetists, until the patient respiratory status improves. If the patient is not breathing Switch off pump Call 222 Insert an airway Ventilate with an ambu bag and oxygen Document events.
Motor block Symptoms of increasing heaviness/weakness of legs or arms indicates • excessive epidural local anaesthetic. This is the commonest cause. • a spinal block developing indicating that the catheter has migrated into CSF • the onset of an epidural haematoma or abscess • accidental administration or drug overdose (i.e. pump failure, wrong setting or patient sensitivity)	Switch off the pump. Call the duty anaesthetist (bleep 8112 WGH/2140 RIE/3561 r 3948 St Johns). Monitor patient continuously.
Hypotension Blood pressure parameters written on the epidural chart by the anaesthetist. Patient alert and orientated, feeling well but with a lower then normal/acceptable blood pressure. NB change in posture can cause a sudden drop in blood pressure.	Consider hypovolaemia as the most likely cause. Monior the patient. Contact duty anaesthetist (bleep 8112 WGH/ 2140 RIE/3561 or 3948 St Johns). Administer intravenous fluid (colloid) as quickly as possible unless there are specific contraindications. Check level of epidural block using ice. If raised above T4 - reduce the rate of the epidural in accordance with the patient's prescription sheet. Inform the clinical nurse specialist - (bleep 5292 WGH/5247 RIE/3934 St Johns) Return the patient to previous position and record blood pressure until within normal range.

Failed analgesia	If other analgesics/sedatives are required - please consult the duty anaesthetist first.
Severe hypotension (blood pressure parameters written on the epidural chart by the anaesthetist). Patient nauseated, clammy, confused or excessively sedated with a blood pressure lower then acceptable. Local anaesthetics block the sympathetic vasoconstrictor fibres causing decreased peripheral resistance, venous pooling and hypotension. A bolus or 'top up' of a local anaesthetic drug may produce profound hypotension because of sudden peripheral vasodilation, and lack of effective intravascular volume.	Stop epidural infusion and call the duty anaesthetist (bleep 8112 WGH/ 2140 RIE/3561 St Johns). Administer fluid intravenously over 5-10 minutes. Lie the patient flat. Raise legs. Monitor blood pressure every 5 minutes for 20 minutes following a bolus or 'top up' injection. Administer oxygen 6 litres/min. Prepare ephedrine 30mgs in 10mls normal saline to be given in 1-2ml increments every 2 minutes by the anaesthetist, until the patient's status improves. If no carotid pulse detected - start CPR. Document all events.
Nausea Nausea and vomiting are usually due to opioid action on the chemoreceptor trigger zone, and also surgery involving the viscera, hypovolaemia and pain. Unless contraindicated all patients should have an antiemetic prescribed.	Exclude or treat hypotension first. Give anti-emetic or anti-emetics as prescribed. If ineffective, call clinical nurse specialist or the duty anaesthetist.
Itching Is a common side effect. The reason is unknown, but the incidence is higher if large doses of a drug have been used. Naloxone diminishes the itching but also the effectiveness of the analgesia.	Give chlorphenamine 10mg intravenously, once only as prescribed. If ineffective, call clinical nurse specialist (bleep 8292 WGH/5247 RIE/3934 St Johns) or the duty anaesthetist (bleep 8112 WGH/2140 RIE/3561 or 3948 St Johns).
Urinary retention Bladder sensation and sphincter control is served by the lower thoracic and lumber segments and S2,3 and 4. So normal voiding mechanisms are disturbed by epidural block.	If catheterised observe urine output hourly. Patient not catheterised - observe for urinary retention every 4 hours. Encourage simple methods to help patient void. Consider catheterisation if no urine output. Inform house officer/duty anaesthetist.

Appendix 1

Scoring Systems

SEDATION SCORE

0 = None, patient alert
1 = Mild, occasionally drowsy, easy to rouse
2 = Moderate, frequently drowsy, easy to rouse
3 = Severe, somnolent, difficult to rouse
S = Normal sleep, stirs to light touch

NAUSEA

0 = None
1 = Mild nausea, no treatment required
2 = nausea/ vomiting, helped by treatment
3 = Persistent nausea/vomiting despite treatment
S = Normal sleep, stirs to light touch

MOTOR BLOCK SCORE

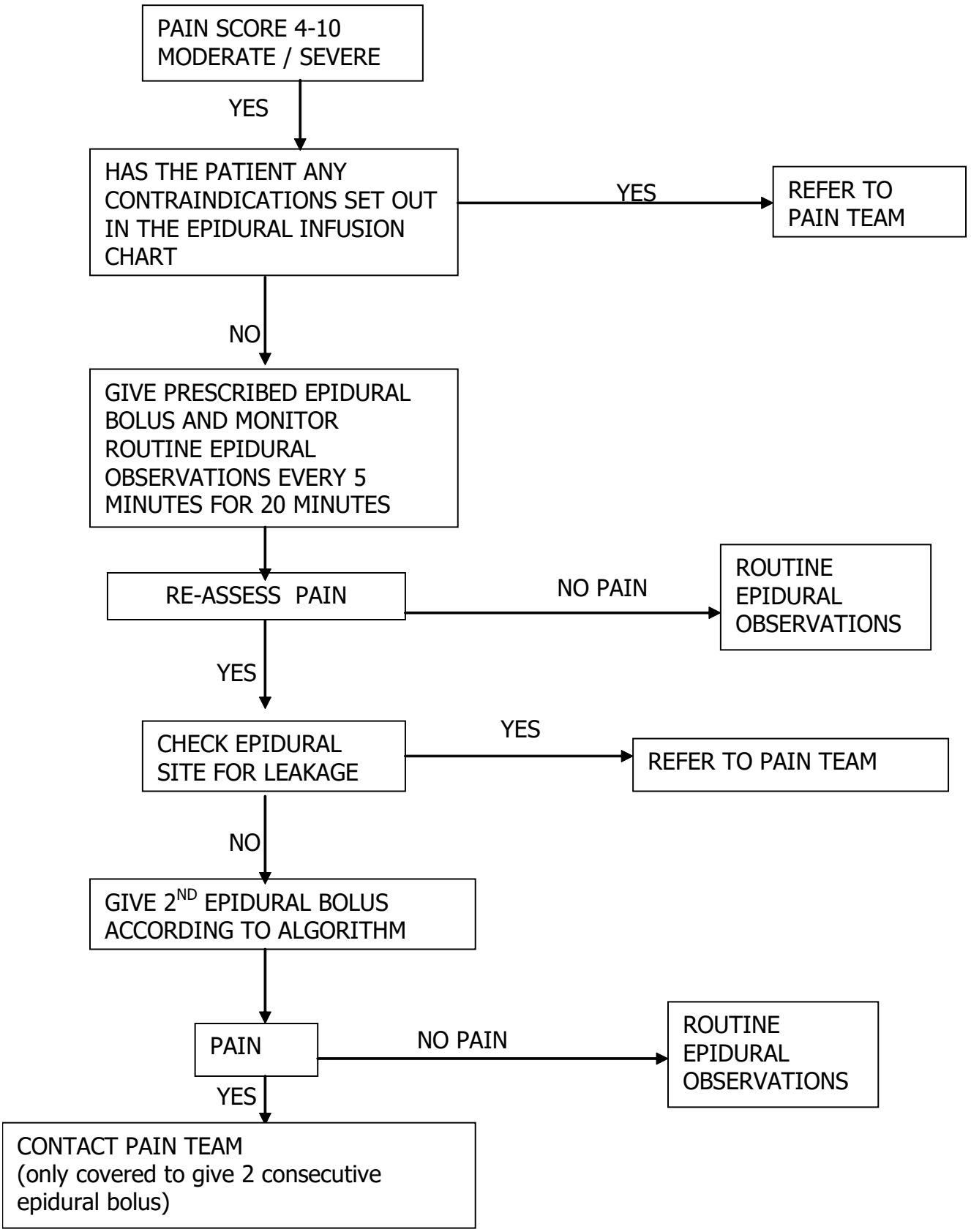
0 = Full Power
1 = Weak but able to raise legs
2 = Able to bend knees
3 = Minimal movement
4 = Paralysis

Please do not tick motor block column

NHS Lothian University Hospitals Division
Administration of Epidural Bolus via McKinlay BodyGuard 545 Infusion Device
High Dependency Area Protocol

Nurses are NOT covered to administer a prescribed epidural bolus unless they have completed:

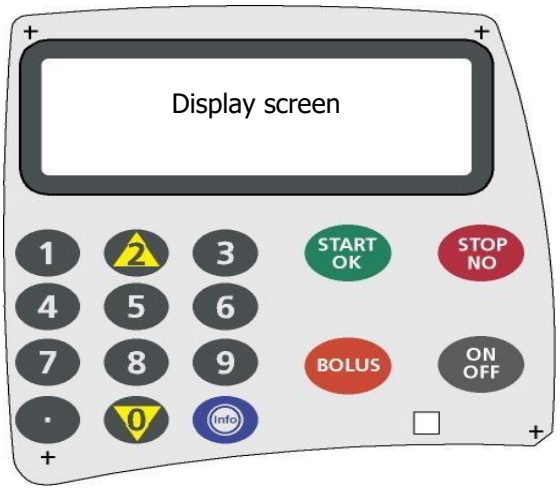
1. **LUHD Epidural Training Package**
2. **LUHD Competency training using the McKinlay Bodyguard 545 Infusion Device**
3. **LUHD Competency Training for Administration of Epidural Bolus**



Guidelines for the Management and Administration of Epidural Infusions using the McKinlay BodyGuard Ambulatory Infusion Pump

This device is used for all patients receiving an epidural infusion in the WGH. This form of analgesia is primarily used to control post-operative pain after major surgery.

McKinlay BodyGuard Ambulatory Infusion Pump



Detail of Keypad

The number 2 and 0 buttons are also used for scrolling up and down the menu screen.

Staff Education
All nursing staff should have completed the NHS Lothian Epidural Training Programme and infusion device training prior to operating the pump or caring for the patient with an epidural infusion.

Patient Education
The anaesthetist will choose the patients who are appropriate to receive this form of analgesia. The anaesthetist will explain the procedure and details for postoperative epidural care. An epidural information leaflet is available to support information provided by all members of the multidisciplinary team.

Mckinlay Bodyguard Epidural Infusion Device
The BodyGuard pump will operate on battery or mains electricity. There is a dedicated mains cable for use with this device only, this plugs in at the bottom of the device. The device must be connected to mains electricity as soon as possible.
The infusion bag is locked away in a clear plastic lock box.

Infusion Administration Sets
MicroSet for Epidural giving set for use with McKinlay BodyGuard Pump. Giving sets are yellow to distinguish them from other infusion sets. The infusion giving set is connected to the epidural catheter via a filter.

Pre-prepared Infusion Bags
250ml bags of Bupivacaine 0.1% and Fentanyl 2mcg/ml
250ml bags of Bupivacaine 0.1% and Fentanyl 4mcgs/ml
250ml bags of Bupivacaine 0.1%

Care And Cleaning
Before connecting the pump to a new patient and if contaminated by spillage, clean the unit with a water dampened lint free cloth – do not use any products containing xylene, acetone or similar solvents. Do not immerse any part of the pump or power lead in water or cleaning solution.

Pump Operation

Access codes
To operate, programme and configure the BodyGuard Ambulatory Infusion Pump three access codes are required:

Level One	CODE 700	Allows user to run preset protocols and titrate infusion rate.
Level Two	***	Allows authorised users to deliver Clinician Activated Bolus or loading dose.
Level Three	***	Allows authorised users to set up or modify standard infusion protocols & change pump configuration parameters.

Priming the giving set – all sets contain a check valve to prevent reflux/free-flow so prime as follows:
N.B. Use aseptic technique with all fluid path connections. Remove protective coverings as set up progresses.

Open infusion fluid and attach to drip stand. Open giving set & remove protective cover from spike. Open fluid port on infusion bag and insert piercing spike in fluid port.
Open the door of pump using latch on right side of door.
Insert giving set into the pump by placing the key into the keyway as shown. Close the pump door until the catch clicks.

Press the power on key (ON OFF) a short beep will sound as pump performs self test.

Enter Level One access code as requested on display screen. Press (START OK)

Main menu will appear. Select Prime from the main menu and press (START OK) Pump will prompt you to ensure the giving set is disconnected from patient. Press (START OK) again to commence priming. A display confirms priming in progress. You may stop priming at any time by pressing (STOP NO)

Press (START OK) again to commence priming. A display confirms priming in progress. You may stop

priming at any time by pressing (STOP NO)

Running a pre-set protocol – Level One users can select & run pre-set protocols.
After loading & priming a set display returns to main menu and Select Protocol is highlighted.
Press (START OK)

Display prompts New Patient? Press (START OK) to clear previous history & volume infused counters or press if you want to retain patient history data (i.e. if switching protocols on the current patient). (STOP NO)

Scroll to select protocol as per prescription
A Bupivicaine/Fentanyl
Infusion summary screen shows bag volume, volume left, volume infused (zero if New Patient confirmed) and then prompts you to press (START OK) Screen then displays rate, bolus total & lockout (for use with PCEA which is not in use) Press (START OK) again

Display prompts Start Infusion? Press (START OK) to start infusiopn.
Rate titration during infusion – infusion will always default to 10ml/hour at start up, if a different infusion rate is prescribed the rate can be changed while the infusion is running. Enter rate and press (START OK)

If rate is within the preset limits the access code prompt will appear. Enter Level One access code

and press (START OK) A beep is heard and the rate is changed as confirmed by the display.

End of Infusion – when the pump alarms and displays end of infusion.

Press (STOP NO) and enter Level One code, press (START OK) .Scroll down to Change Bag, press (START OK) to confirm.

(START OK)

Display shows Start New Bag? Press to confirm.
Infusion summary screen appears. Volume infused should show the total of all previous bags used on this patient. Press  to confirm

Display shows Start Infusion? Press  to commence infusion.

To change bag before end of infusion – if bag expired or infusion fluid prescription changes.
Press  to suspend infusion.

Press and hold  until main menu appears. Scroll to Change Bag and press  Change infusion bag as per prescription after two nurse check. Infusion summary screen appears. Volume infused should show the total of all previous bags used on this patient. Press  to confirm. Display shows Start Infusion. Press 

to commence infusion.

Viewing & Interpreting Current Patient History

If using the pole mounted LED charger the large display will alternate every 20 seconds between the current rate and the VI (volume infused). The VI is the total volume delivered since the current patients treatment began.
Pressing  repeatedly whilst the pump is running will display:-

Volume infused, Battery charge level
Boluses attempted and given (last 24 hours only)
Review protocol, time & Date

Press  to enter stop mode then  shows last 24 hours boluses & volume summary.

Pressing  again and the up & down arrows (2 & 0) allows the user to review this data hour- by-hour starting with the most recent. Further presses of the info key allow graphical data on bolus usage and volume usage for the last 24 hours to be displayed.

Useful tips

To return to main menu from stop mode (before end of infusion) – press and hold  for a couple of seconds then press again to return to main menu.

To view patient history – Press  repeatedly during operation scroll through Volume infused (total for current patient), battery level, bolus attempts vs. given (only for last 24 hours) & current program review screen.
Press  and then  to view the last 24 hours boluses, volume given and then  again

followed by UP or DOWN arrow keys to scroll through last 24 hours hour-by-hour.

To lock the keypad – Press and hold  during operation and wait for the bar to go from unlocked to locked. Repeat this procedure to unlock the keypad. Whilst the keypad is locked the STOP key will operate for obvious safety reasons but the pump cannot be returned to the main menu as described above or turned OFF ensuring that if the pump is stopped it will alarm after 2 minutes unattended.

Who To Contact For Advice

Monday - Friday 08:00 - 18:00
Clinical Nurse Specialist Acute Pain: Bleep 8292WGH/ 5247 RIE/3934 St Johns
Outwith above hours and weekends Bleep 8112 WGH/ 2140 RIE/ 3561 or 3948 St Johns
call the on call Anaesthetist

Trouble-shooting & alarms

Description	Result	Possible Cause	Required action

Air in line / Upstream occlusion	Infusion stops	Air present in giving set Occlusion of set upstream of pump (kinked/trapped) The line was not primed correctly	Disconnect line from patient and prime air from set Clear upstream occlusion Check air is primed from the line
Down Occlusion	Infusion stops	Set is kinked or clamp is on downstream of the pump Access device is locked Set is loaded incorrectly	Straighten the set and/ or open the clamp Change/flush the access device Reload the set correctly
Pump unattended	Alarm sounds	2 minutes elapsed without a button press during set-up Pump left in stop state for more than 2 minutes	Press start/OK to resume
Low battery	Infusion will continue but pump will only run for around 30 minutes LED blinks red	30 minutes of battery life are remaining	Place the pump in the charger or use the battery cable to connect it to the DC socket on the rear of the charger
End battery	Pump operation stops	Battery is depleted	Place the pump in the charger or use the battery cable to connect it to the DC socket on the rear of the charger
System error	Pump operation stops	System internal error has occurred	Record the code number displayed on the screen and contact local or McKinlay service personnel
End of infusion	Delivery stops	Current infusion protocol has completed. Volume to be infused has been delivered	Turn of the pump or return to main menu to change bag
Missing key	Pump will not start	Administration set loaded incorrectly User loading a non-proprietary set	Load set with key positioned correctly in the keyway Check set is a dedicated BodyGuard set
Lock Mode	All keys except the STOP/NO are inactive	Keypad lock is on	Turn keypad lock off by holding the info key until the lock is off

Epidural Questionnaire

Name: _____ Ward:_____ Date:_____

1. Define pain? _____
_____

2. What are the benefits of good pain control? _____
_____
_____

3. Explain the principle of epidural analgesia: _____
_____
_____

4. When would the use of epidural analgesia be indicated? _____
_____
_____

5. When would epidural analgesia be contraindicated? _____
_____
_____

6. How often should patients pain be assessed and how? _____
_____
_____

7. How should pain be managed following the discontinuation of epidural analgesia?
_____
_____

8. Name the common drugs used in epidural analgesia their mechanism of action and side effects:
_____
_____

9. Identify the possible complications of epidural analgesia and their management:
_____
_____

10. List observations required to safely care for a patient receiving epidural analgesia:
_____
_____

11. What is meant by the term "Top up"? _____
_____

12. When and how should a "top-up" be given (including what post top-up observations are required)?
_____
_____
_____

13. What would you do if the epidural catheter became detached from the bacterial filter?
_____
_____

14. Explain safe removal of the epidural catheter: _____
_____
_____

This is a self-learning exercise.

SUPERVISED PRACTICES AND FINAL OBSERVED ASSESSMENT OF COMPETENCE

McKinlay BodyGuard Ambulatory Infusion Pump

		Supervised practices				Final
Criteria No.		**1**	**2**	**3**	**4**	**Assessment**
1	Define the type of device					
2	Describe the main features of the device					
3	Identify appropriate giving set for use with BodyGuard infusion pump					
4	Outline how administration set interacts with pump					
5	Set up the system for use, load and prime administration					
6	Identify charger features, connection to pump and significance of LCD indicators					
7	Identify battery characteristics					
8	Understands the BodyGuard security access system and relevant access codes					
9	Access, select and run pre-set protocols and understand consequences of OK & NO answers to **New Patient?** prompt					
10	Interpret display screen information					
11	Change infusion rate within pump parameters (i.e. from 10mls/hr to 8mls/hr)					
12	Able to deliver clinician activated bolus and to view the number and volume of CA boluses delivered in last 24 hours					
13	Access & interpret current Patient History information (incl. Pt. Boluses)					
14	Outline consequences of alarm status and conditions under which the pump will alarm including corrective action					
15	Change bag at end of infusion					
16	Able to return to main menu from STOP state					
17	State care & cleaning of the pump					
18	Discuss observations required for a patient receiving an epidural infusion					
19	Discuss potential side effects of epidural bupivacaine administration					
20	Discuss potential side effects of epidural opioid administration					
21	Preventive and corrective strategies for the above					
22	What would you do if the Epidural catheter becomes detached from the bacterial filter?					
23	Explain safe removal of the epidural catheter?					
24	What are the advantages of epidural analgesia?					
25	What are the disadvantages of epidural analgesia?					
26	What are the contraindications to epidural catheterisation?					
27	Discuss adjunct analgesics used with epidural infusions					
28	Discuss stopping the Epidural and step down analgesia					

NHS LOTHIAN COMPETENCY STATEMENT
McKinlay BodyGuard Ambulatory Infusion Pump

ASSESSOR statement:
I confirm that ……..has achieved the required competence for the use of the McKinlay BodyGuard Ambulatory Infusion Pump

Signature of assessor:……..

Name (print):…….. Position:……..

Date of completion……..

PARTICIPANT statement:
I have attended the McKinlay BodyGuard Ambulatory Infusion Pump training, have successfully completed the theoretical assessment and have completed a period of supervised practice and final assessment of competence relating to the McKinlay BodyGuard Ambulatory Infusion Pump.

I am now satisfied that I am competent in the use of the McKinlay BodyGuard Ambulatory Infusion Pump

I will maintain my competency in this area of practice in accordance with the NMC Code (2008) and will demonstrate my ongoing competence to a clinical work-based assessor as required by NHS Lothian.

Signature……Print Name:……..……

Title/Grade ……

Clinical area ……....

Date of completion…….……..
.
Date of attendance at Infusion devices study day: ……..……

MANAGER statement:
I confirm that the above participant has met the required standard of competence for the McKinlay BodyGuard Ambulatory Infusion Pump and therefore can undertake this role in practice.

Signature of manager/charge nurse:…….…….

Print:……Position……

Date…….

Please retain this for your own records and give a copy to your manager to be inserted in your personnel file.

Your manager will also log completion of clinical competencies in your PWA

References

Acute Pain Group (2006) Guidelines for the Management of Acute Pain
8th edition Lothian University Hospitals NHS Trust.

Ballantyne JC, Carr DB, deFerranti S et al (1998) The comparative effects of postoperative analgesic therapies on pulmonary outcome: cumulative meta-analyses of randomised controlled trials Anesthesia and Analgesia 86(3): 598 –612.

International Association for the study of pain sub committee on taxonomy (1979) Pain Terms: a list with definitions and notes on usage. Pain 6, p249-252.

Lui M D. (1995) Epidural analgesia and anaesthesia. Their role in postoperative outcome. Anaesthesiology; 82 (6) 1474-1506.

Macintyre P.E. and Ready L.B. (2001) Acute pain management a practical guide London W.B Saunders
Acute pain management a practical guide London, W.B. Saunders

MacIntyre P E, Schug S A, Acute Pain Management: A Practical Guide, Saunders Elsevier, 3rd Edition, 2007.
McCaffery, M and Pasero, C (1999) Pain, Clinical manual, Mosby, London.

Melzack R & Wall PD (2003), Handbook of Pain Management, Churchill Livingstone, Edinburgh
Nursing and Midwifery Council (2004) Code of Professional Conduct.

Acute Pain Management Scientific Evidence (2005) Australian and New Zealand College of Anaesthetists Canberra.

Puntillo, K A (1998) The phenomenon of pain and critical care nursing. Heart and Lung, 17 (3), 262-271.
Royal College Of Anaesthetists (2006) Incidence of neurological damage following following epidural analgesia.
SIGN Guideline 44 (2001) Definition of Pain

Wheatley R.G., Schug S.A. and Watson D. (2001) Safety and Efficacy of postoperative epidural analgesia British Journal of Anaesthesia; 87 (1): 47-61.

Woolf CJ and Chong MS (1993) Pre emptive analgesia – treating postoperative pain by preventing the establishment of central sensitisation Anesthesia and Analgesia 77: 362-79.

Bibliography

Chapman S. (2001) Spinal anatomy and the use of epidurals. Professional Nurse (16) 6, 1174-1177.

Curatolo M, Scaramizzino P,Venuti FS, Orlando A and Zbinden A M (1996) Factors Associated with Hypotension and Bradycardia after Epidural Blockade. Anaesthesia and Analgesia ; 83, 1033-40.

Greenland S. (1995) A review of the uses of epidural analgesia Nursing Standard ; 9 (32) 32-36.

McDougal T.(2001) Epidural Analgesia Nursing Times; (96) 28, 38-40.

Melzack R. and Wall P. (1996) The Challenge of Pain Harmondsworth, Middlesex, Penguin Books.

Strathern D. (1996) Epidural analgesia: educating patients and nurses.
Nursing Standard 10, 33-36.