

analgesic benefits

The benefits of regional analgesia compared with systemic opioid-based analgesia

- Lower pain scores (visual analogue scores or verbal rating scores)
- Less time spent in post-anaesthesia recovery units (PACU)
- Longer time to first analgesic request
- Fewer requests for rescue analgesia and lower total dose required
- Less nursing time and lower nursing dependency in PACU
- Reduced opioid-based side-effects
 - Drowsiness/dysphoria
 - Respiratory depression
 - Nausea and vomiting
 - Ileus
- Earlier discharge home from day surgery units
- Reduced unplanned admission rate for day-surgery patients
- Increased patient satisfaction scores

physiological benefits

System	Effects of Epidural	Result
CVS	<ul style="list-style-type: none"> • Improved myocardial O2 supply:demand, reduced SVR • Reduced BP 	<ul style="list-style-type: none"> • Reduced myocardial ischaemia • Reduced blood loss
Coag	Improved blood flow, reduced platelet stickiness, less inhibition of fibrinolysis	Reduced venous thromboembolism Improved graft outcome
Resp	Improved lung mechanics (increased compliance), less diaphragmatic dysfunction	Improved oxygenation Earlier extubation Fewer pulmonary infections
GI	Increased motility, improved blood flow	Earlier return of bowel function
Stress response	Reduced/Abolishes neuroendocrine response to stress	Prevents complications of this

potential benefits

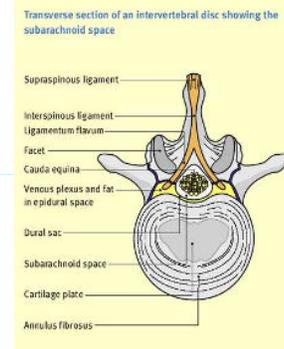
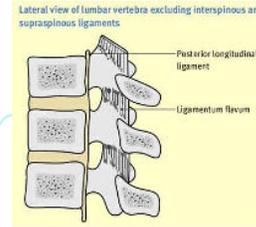
general

- An injection of an anesthetic or analgesic into the epidural space of the spinal cord resulting in regional anesthesia or analgesia

use

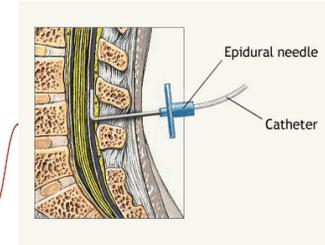
- (i) Surgical anaesthesia and post-operative analgesia
 - Thoracic / Abdo / Pelvic / Lower limb surgery
- (ii) Obstetrics
- (iii) Chronic pain

relevant anatomy



insertion

- Consent
- Preparation + position
- Asepsis
- Level (middle of surgical incision)
- Local anaesthetic
- Loss of resistance
- Thread catheter
- Position catheter
- Secure
- Test dose
- Bolus / Infusion



drugs

- (ii) Opioid
 - Fentanyl
 - Diamorphine
 - Morphine
 Supplemental analgesia
- (i) Local anaesthetic
 - Lignocaine
 - Bupivacaine
 - Ropivacaine
 Neural Blockade [Motor, Sensory, Autonomic]

side effects

- local anaesthetic side effects
 - (i) Motor block
 - Respiratory failure
 - (ii) Sensory block
 - Thermal / Pressure injury
 - (iii) Proprioception loss
 - (iv) Autonomic blockade
 - CVS
 - Hypotension (hypovolaemia)
 - Bradycardia
 - (v) Visceral dysfunction
 - opioid side effects
 - Respiratory depression
 - Pruritus
 - Nausea / Vomiting
- Treatment options for hypotension include:
- (i) Check fluid status - ? Relative hypovolaemia
 - (ii) Raise legs
 - (iii) Fluid
 - (iv) Ephedrine
 - (v) Reduce infusion rate
- Treatment options include:
- (i) Naloxone
 - (ii) Ondansetron?
 - (iii) Antihistamines

complications

Major complications of regional anaesthesia in descending order of severity and ascending order of frequency

Complications in order of frequency	Estimated frequency	Comments
1= Direct nerve damage	1:10,000 - 1:30,000	No effective treatment Most improve over 1-6 months
1= Spinal haematoma	1:150,000 - 1:220,000	Requires urgent evacuation May cause paraplegia
1= Spinal infection	1:100,000 - 1:150,000	Evacuation and aggressive antibiotic therapy required. May cause paraplegia
4= Drug error	Unknown	Avoidable. May be fatal
4= Systemic toxicity	Unknown	May be fatal unless treated promptly
6= Respiratory depression	Unknown	Beware neuraxial opioids
6= Hypotension	Common with epidural/spinal	Treat effectively to avoid complications (see text)
8 Confusional states	Common in the elderly	Beware neuraxial opioids
9 Pruritus/urinary retention/nausea	Up to 16% incidence	Treat effectively
10 Technical failure	5-25% for different techniques	Consider alternative strategy

troubleshooting

Failure of analgesia

- (i) Assess block
 - Motor
 - Sensory
 - Autonomic
 - Unilateral/Patchy/Too low/No block
- (ii) Check site
- (iii) Give top up
 - Opioid or local anaesthetic
- (iv) Withdraw catheter
- (v) Consider subdural catheter*
- (vi) Resite epidural
 - * Subdural block: Slow onset, inappropriately extensive, Horner's syndrome, patchy, asymmetrical, motor sparing, risk of total spinal

High block

- (i) Stop / reduce rate
- (ii) Do not lie patient flat
- (iii) Treat side effects

Local anaesthetic toxicity

- either due to a cumulative effect or direct intravascular injection
- Presentation
 - (i) Peri-oral tingling, slurred speech, tinnitus
 - (ii) Altered consciousness, confusion, coma
 - (iii) Arrhythmias, CVS collapse, respiratory arrest

Anticoagulation

Guidelines for central neuraxial block in patients taking drugs affecting haemostasis

- Aspirin and NSAIDs
 - No contraindication
- Clopidogrel
 - Stop 7 days preoperatively
- Unfractionated heparin
 - Subcutaneous: give 4 hours before or > 1 hour after block
 - Intravenous: stop 4 hours before block. Give > 1 hour after block. Remove catheter 2-4 hours after dose
- Low molecular weight heparin
 - Wait 12 hours after dose or give drug 2 hours after block
 - Wait 24 hours after therapeutic dose
- Warfarin
 - INR < 1.5

Post dural puncture headache

- Features
 - (i) Onset 24-48h
 - (ii) Lasts 10-14 days
 - (iii) Postural
 - (iv) Fronto-occipital, radiates to neck
 - (v) Photophobia, diplopia
 - (vi) Nausea
- Management
 - (i) Reassurance
 - (ii) Analgesia
 - (iii) Blood patch

Neurological complications

Key points are a high index of suspicion with:

- (i) Abnormal neurology
- (ii) Unexpectedly dense block
- (iii) Anticoagulation
- (iv) Difficult insertion

Management requires:

- (i) Early imaging
- (ii) Referral to a neurosurgeon