Good practice in the management of continuous epidural analgesia in the hospital setting



The Royal College of Anaesthetists



The Royal College of Nursing



The Association of Anaesthetists of Great Britain and Ireland



The British Pain Society



The European Society of Regional Anaesthesia and Pain Therapy

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Introduction

Epidural analgesia (EA) is highly effective for controlling acute pain after surgery or trauma to the chest, abdomen, pelvis or lower limbs. Usually the combination of excellent pain relief associated with minimal side effects provides high patient satisfaction when compared with other methods of analgesia. Epidural analgesia, however, can cause serious, potentially life-threatening complications and its safe, effective management requires a co-ordinated multidisciplinary approach.

The potential complications of continuous epidural analgesia include:

- 1 Hypotension.
- 2 Motor block.
- 3 Urinary retention.
- 4 Pruritus.
- 5 Pressure sores.
- 6 Respiratory depression.
- 7 Post dural puncture headache.
- 8 Epidural haematoma or abscess.
- 9 Neurological damage.
- **10** Inadequate analgesia.

These recommendations:

- 1 Apply to epidural infusions administered to hospital inpatients in the acute setting and are not intended for use in palliative care or the specialist management of persistent non-cancer pain where circumstances may require an approach tailored to individual needs.
- 2 Apply to adults and children.
- **3** Apply to continuous epidural infusions, intermittent top-up injections and patient controlled epidural analgesia.
- **4** Specify the core characteristics of an epidural pain management service but, at the same time, allow individual anaesthetic departments to implement these to fit local circumstances.
- **5** Consider the specific requirements of continuous epidural analgesia although many of the points are also applicable to intrathecal infusions.

Continuous epidural analgesia should not be introduced into a hospital unless the clinical systems within the hospital are able to cope with the technique and conform with the following recommendations.

Recommendations

1 Patient selection and consent

- **1.1** Patient selection for epidural analgesia should be based on a careful risk/benefit analysis for each patient.
- **1.2** Continuous epidural analgesia carries risks over and above those associated with general or regional anaesthesia for surgery so specific consent should be obtained. The process of obtaining consent from the patient before an epidural injection is performed must comply with the current guidance published by the General Medical Council and the Department of Health. This process should include a discussion of the risks and the potential benefits of epidural analgesia as well as the features of other options for postoperative analgesia. A summary of this discussion should be entered in the patient's notes and the anaesthetic record could be used for this purpose. A patient information sheet may facilitate this process; the Royal College of Anaesthetists and Association of Anaesthetists have published a leaflet that can be modified for local requirements. Copies of this non-copyrighted document can be downloaded from the College website (www.rcoa.ac.uk).

2 Personnel and staffing levels

- **2.1** The Department of Anaesthesia should ensure that there are designated personnel and clear protocols to support the use of continuous epidural analgesia.
- **2.2** One way of doing this is with a multidisciplinary Acute Pain Service. Normally the Acute Pain Service will include anaesthetist, clinical nurse specialist and pharmacist. Ultimate responsibility for the epidural infusion must remain with the individual who instituted it (and in the case of trainees, the supervising consultant), but immediate supervision of the patient may be passed to the Acute Pain Service and ward staff. An agreed form of communication should be used for this transfer of supervision.
- **2.3** In the absence of an Acute Pain Service there should be a named consultant anaesthetist responsible for the supervision of acute pain management in the hospital. The consultant must be allocated time to perform these duties, the primary ones being development of the necessary documentation, administrative routines and audit.
- **2.4** Doctors in training must possess defined competencies before performing epidural injections and establishing infusions without the direct supervision of a consultant or senior colleague. Additional competencies are required when dealing with paediatric cases. All the

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competencies are defined in the training manuals for the *CCST in Anaesthesia* (available from the Royal College of Anaesthetists website: www.rcoa.ac.uk).

- **2.5** Practitioners in non-training grades must ensure that they possess the competencies defined for trainees if they wish to perform epidural injections and/or train others.
- **2.6** There must be adequate handover of information between on-call staff about patients who are receiving continuous epidural analgesia. It is particularly important that the Acute Pain Service or responsible consultant is informed when a trainee institutes an infusion.
- 2.7 There must be nurses with special training and skills in the supervision of epidural infusions available on the ward, on every shift, throughout the 24-hour period. In many institutions there will be designated clinical nurse specialists or acute pain nurses working at, or aspiring to work at, a Higher Level of Practice in the field of acute pain management. (*Recommendations for Nursing Practice in Pain Management*, The British Pain Society 2002).
- **2.8** To ensure patient safety and continuous service, staffing levels should be sufficient to provide prospective cover for all personnel. Staffing arrangements and the provision of protocols or guidelines must ensure safe practice when core staff are not on duty.

3 Wards and nursing areas

- **3.1** Continuous epidural analgesia should only be used in wards or units where the technique is employed frequently enough to ensure expertise and safety.
- **3.2** Patients receiving continuous epidural analgesia must be nursed in a setting that allows close supervision appropriate to the clinical circumstances. Oxygen must be available.
- **3.3** When patients receiving continuous epidural analgesia are nursed in individual rooms, they should be close to the nurses' station, so as to allow close supervision.
- **3.4** Patients receiving continuous epidural analgesia must always be under the close supervision of a nurse, or nurses, competent in the management of continuous epidural analgesia and able to be with the patient within seconds of being summoned. This requires at least one such nurse available on the ward at all times throughout the 24-hour period with an increase determined by the number of patients and patient dependency levels.
- **3.5** There must be 24-hour access to anaesthetic advice for the management of continuous epidural analgesia. For many hospitals a resident anaesthetist will provide this advice.
- **3.6** There must be 24-hour availability of staff competent to recognise and manage the more serious complications of continuous epidural analgesia.

- **3.7** There must be 24-hour availability of a resuscitation team with a resident doctor who is competent in resuscitation.
- **3.8** A system of communication should exist to inform the anaesthetist of inadequate ward staffing if continuous epidural analgesia is planned for a patient from that ward.

4 Technique for catheter insertion

- **4.1** Epidural catheter insertion must be performed using an aseptic technique. This should include: hand washing, sterile gloves, sterile gown, hat, mask (worn to cover the nose), skin preparation and sterile drapes around the injection site.
- **4.2** The tip of the epidural catheter should be positioned at a spinal level appropriate for the planned surgery.
- **4.3** Consideration can be given to tunnelling the epidural catheter if it is anticipated that the epidural infusion will be prolonged.
- **4.4** The catheter should be secured appropriately so as to minimise movement into or out of the epidural space.
- **4.5** The dressing should allow inspection of the insertion site.
- **4.6** Because of the risks of hospital acquired infection advice should be obtained from a bacteriologist about the need for a hospital policy on antibiotic prophylaxis. This should include management of patients at particular risk of infection such as those with diabetes, steroid therapy or immunosuppression and patients who have been in hospital for more than 48-hours prior to epidural catheter insertion.

5 Equipment for continuous epidural analgesia

- **5.1** The equipment should ensure safe and effective utilisation of epidural infusion techniques in adults and children.
- **5.2** The equipment should be standardised throughout the institution so that it is familiar to all staff involved in providing or supervising epidural infusions. Staff must be trained in the use of the equipment.
- **5.3** The pumps should be configured specifically for continuous epidural analgesia with pre-set limits for maximum infusion rate and bolus size.

- **5.4** To safeguard patient safety the pumps should be used exclusively for epidural analgesia or, if not, the pump should be marked clearly and unambiguously that it is for epidural infusion only when being used for that purpose.
- 5.5 There should be maintenance contracts and a rolling replacement programme for pumps.
- 5.6 The epidural infusion lines should be clearly identified and this might include the use of coloured tubing and labels attached near to any connector. It would be advantageous to have a universally agreed standard colour for epidural infusion lines but at present tubing colour varies from place to place. (In many centres red = arterial, blue = venous and yellow = nerve block.)
- **5.7** The tubing connecting the pump to the epidural catheter must be appropriate for the required flow rates.
- **5.8** The epidural system between the pump and the patient must be considered as closed and should not be breached. The infusion systems must not include injection ports.
- **5.9** An anti-bacterial filter must always be used in the infusion line, at the junction of epidural catheter and infusion line.
- **5.10** Resuscitation equipment, oxygen and appropriate drugs must be readily available wherever epidural infusions are employed.

6 Drugs for continuous epidural analgesia

- **6.1** In each hospital there should be a strict limitation on the number of drugs and the concentrations of these drugs used for epidural infusions. The drugs and concentrations should be described clearly in hospital protocols or guidelines. Any variation from these protocols should occur only in exceptional circumstances and with the agreement of the responsible consultant.
- **6.2** Solutions for continuous epidural analgesia should use the lowest possible effective concentration of local anaesthetic in order to preserve motor function as much as possible. This will aid detection of neurological complications that might otherwise be masked by epidural blockade. If infusions of higher concentrations are required, there should be periodic reduction of the infusion rate to allow assessment of motor block.
- **6.3** When drugs are used in the epidural infusion beyond licence the anaesthetist must follow the requirements for patient information and consent (see *The Use of Drugs Beyond Licence in Palliative Care and Pain Management* www.britishpainsociety.org).

- 6.4 Except in special circumstances, the solutions should be prepared aseptically in a special unit.
- **6.5** The above requirement (6.4) complicates the preparation of diamorphine-containing solutions, so specific local arrangements should be agreed between anaesthetists, pharmacists and ward staff (including recovery ward). The same principle would apply to other drugs added in operating theatre or ward.
- **6.6** Clear labelling must be used to distinguish solutions for epidural infusion from all other infusions.
- **6.7** Epidural solutions must be stored separately from those intended for any other use, e.g. intravenous fluids.

7 Monitoring of patients

- **7.1** There must be close monitoring of the patient, appropriate to the clinical circumstances, throughout the period of continuous epidural analgesia.
- **7.2** In addition to the epidural analgesia the requirements for monitoring will be determined by the nature of the surgery, patient's age and general condition.
- 7.3 Observations should be more frequent for the first six to 12 hours of the epidural infusion. Observations also need to be more frequent for the first hour following a top-up injection or a change in the infusion rate. More frequent observations will be necessary for children and for patients whose general condition is poor.
- **7.4** Monitoring of circulation and respiration will be needed to detect complications that may be related to the epidural. Epidural blockade can cause hypotension but all staff must be aware that the most likely causes of post-operative hypotension are surgical bleeding and hypovolaemia.
- **7.5** Pain scores (at rest and on movement or deep breathing) and sedation scores will help to identify inadequate or excessive epidural drug administration.
- **7.6** Monitoring of sensory and motor block is essential so that potentially serious complications can be detected early. This may be difficult in children. Sensory levels may not be obvious with dilute local anaesthetic solutions. An increasing degree of motor weakness implies excessive epidural drug administration, dural penetration of the catheter, or the development of either an epidural haematoma or abscess. Cases not caused by excessive drug administration are potentially serious and a senior anaesthetist must be informed immediately.

- **7.7** Records must be kept of epidural infusion rate, inspection of epidural insertion site, patency of intra-venous access and integrity of pressure areas.
- **7.8** Patients who have undergone orthopaedic or vascular operations must be observed to detect possible development of compartment syndromes.

8 Documentation, guidelines and protocols

- 8.1 Contemporaneous records must be kept of events throughout the period that the continuous epidural is in use. This includes: obtaining consent, insertion of the catheter, prescription of the infusion, monitoring, additional doses and notes about any complications or adverse events.
- **8.2** Safety is enhanced by the use of standard pre-printed prescription forms rather than hand written prescriptions that might be misinterpreted. One solution is to use a prescription form that is printed on self-adhesive paper and stuck into the patient's drug chart.
- **8.3** Contact telephone and/or bleep numbers for expert medical and nursing personnel must be printed on documents that are kept on the ward, and near to the patient, so that expert advice is available at all times.
- **8.4** Protocols and guidelines should describe:
- Overall management of patients with epidural infusions.
- Instructions for the use of the pump and for troubleshooting.
- Description of the drug concentrations used in the hospital.
- Description of infusion rates and how to adjust these rates.
- Instructions for changing epidural solution bags or syringes.
- Frequency of observations.
- Maintenance of intravenous access throughout the infusion period.
- Identification and management of complications, including late developing complications.
- Management of inadequate analgesia.
- Management of accidental catheter disconnection.
- Instructions for removal of the epidural catheter.
- Insertion and removal of epidural catheters in patients receiving anticoagulants, including peri-operative heparin, low molecular weight heparin, anti-platlet agents and new synthetic anticoagulants.
- Instructions on the timing of subsequent opioid analgesia following cessation of the epidural infusion.

9 Audit

- 9.1 There should be audit of the efficacy of the epidural service.
- 9.2 There should be audit to ensure the epidural service adheres to these agreed standards.
- **9.3** There should be audit of serious complications and adverse events associated with the continuous epidural.
- **9.4** There should be audits of the use of epidural infusions for different surgical procedures or particular clinical areas.

10 Education

- **10.1** There should be formal induction course and regular updates for doctors and nurses who will be responsible for supervising patients receiving continuous epidural analgesia.
- **10.2** There should be additional education for staff when changes are made to protocols, equipment or drugs.

The editorial process

These recommendations were prepared by a working party with representation from The Royal College of Anaesthetists, The Royal College of Nursing, The Association of Anaesthetists of Great Britain and Ireland, The British Pain Society and The European Society of Regional Anaesthesia and Pain Therapy. A draft version of the recommendation was given wide circulation and many helpful suggestions received during that consultation were incorporated into the final version.

Grateful thanks is offered to everyone who contributed to the preparation of the document. In future, any changes to these recommendations will be made on the version posted in the publications section of The Royal College of Anaesthetists website (www.rcoa.ac.uk) and it will be advisable to check that you are using the most up-to-date version.

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