Improving epidural safety through new documentation.

Improving epidural safety through new documentation. Nursing Times; 104: 12, 26–27.

Epidural infusions can be safe and effective for providing perioperative analgesia. However, they are not without risk. This article describes how changes in practice, including new documentation, were used to make epidural analgesia as safe as possible. A pain management nurse and a specialist pharmacist developed and implemented an epidural prescription chart, streamlined infusions and optimised storage. These changes were all undertaken in addition to an ongoing education programme for all staff involved with epidural analgesia.

Identifying the need for change

The practice of providing epidural analgesia with bupivacaine and ropivacaine has been well established at Royal Brompton and Harefield NHS Trust, managing acute pain associated with thoracic surgery. This has expanded to include patients having cardiac surgery. As a result of this growth, an increasing number of different analgesic combinations were used according to the type of surgery, the block required, the anaesthetist’s preference and patient need.

A multidisciplinary medication safety initiative (MSI) group was formed to try to reduce the risk of medication-related adverse events. Every three months, all medication-related adverse events for that period were reviewed and trends explored.

At the time the NPSA published its epidural alert, the trust complied with all the practice recommendations, with the exception of epidural storage.

Minimising confusion

To minimise confusion around the variety of concentrations and combinations of local anaesthetics and opioids, the 50ml syringes of epidural infusates prepared in the ward by nurses were replaced with standard minibags. The local drugs and therapeutics committee supported this as they agreed that, although it was more expensive, this would:

- Minimise the risk of drug dilution errors as the medicine was commercially prepared and pre-diluted;
- Reduce the risk of contamination, as the frequency of breaking the administration set circuit (giving set, filter, epidural catheter) to change the infusion was decreased because a large infusate volume was provided.

When epidural minibags were introduced, the only low-dose local anaesthetics commercially available were plain bupivacaine 0.1% or ropivacaine 0.2% (100ml) and an opioid-containing combination (bupivacaine 0.1% + fentanyl 2mcg/ml 250ml). Although fentanyl is unlicensed for administration into the epidural space, it is a commonly administered epidural opioid. Unlicensed preparations such as the combination of bupivacaine and fentanyl for epidural use are known as ‘specials’ and are manufactured by industry and a small number of licensed hospital pharmacies.

Since the introduction of the potentially safer local anaesthetic levobupivacaine and following problems with the supply of bags of ropivacaine, the pain management service has revised the types of epidural infusions that are available.

Levobupivacaine is now the sole available local anaesthetic for epidural infusion that is supplied by the pharmacy. It is supplied in a pre-diluted form, as either levobupivacaine 0.125% or levobupivacaine 0.125% with fentanyl 4mcg/ml. The 200ml plain minibag is supplied by the manufacturer in a silver foil pouch (Chirocaine, Abbott Laboratories).

The fentanyl/levobupivacaine combination is supplied as a 500ml minibag by the ‘specials’ division of Fresenius Kabi in a striped wrapper. The fentanyl/levobupivacaine combination is stable in solution and in the minibag presentation.

Optimising storage

Two different volumes (200ml, 500ml) were chosen deliberately to provide a contrast between the two presentations. The opioid-containing bag is stored in a locked cupboard that meets or exceeds regulations (Department of Health, 2007) while the plain local anaesthetic-only bag is stored in a separate locked cupboard that is clearly labelled and geographically isolated from infusions for IV use (NPSA, 2007).

Initiating the infusion

Registered staff (nurses and operating department practitioners) may only initiate an epidural infusion if they meet the following criteria:

- They have attended the local IV therapy study day and completed drug calculations;
- They have attended the local epidural study day;

Implications for practice

Nurses should implement the following:

- Use commercially prepared epidural infusates to reduce the risk of concentration errors and contamination;
- Store epidural infusions in a separate cupboard away from IV fluids;
- Attend an epidural update session and ensure your competency-based assessment has been completed;
- Use pre-printed epidural prescriptions to streamline prescribing;
- Use a dedicated infusion device and a yellow administration set for epidural analgesia.

Keywords: Safety, drugs, epidural analgesia, documentation.
BACKGROUND

- A National Patient Safety Agency (NPSA) alert revealed that, between 2000 and 2004, there were three patient deaths associated with the inadvertent intravenous administration of epidural bupivacaine infusions (NPSA, 2007).
- Bupivacaine is a long-acting amide local anaesthetic that is commonly used for nerve blocks and regional analgesic techniques. Given intravenously, it may cause adverse changes to cardiac rhythm and contractility (Zimmer et al, 2007).
- Although newer local anaesthetics such as ropivacaine (a pure S-enantiomer) and levobupivacaine (a single isomer of bupivacaine) are less toxic than bupivacaine, they must be regarded as ‘safer’ rather than ‘safe’ (Veering, 2003).

The infusion is delivered using a dedicated yellow infusion device (Hospira’s GemStar infusion system) as recommended by the NPSA (2007), via a yellow-striped administration set. The device has been programmed for epidural infusion use only. Preset parameters devised by the pain service prevent a bolus-only programme, such as that used for patient-controlled analgesia (PCA), being programmed through the epidural device. This should prevent PCA happening with the incorrect device.

The catheter and administration set are clearly labelled with ‘EPIDURAL’ stickers (black text on a yellow background). The prescription chart for all other medicines is labelled on the front page with a similar ‘EPIDURAL CHART ALSO IN USE’ sticker.

DOCUMENTATION

To complement the introduction of the commercially prepared infusates, a combination prescription, troubleshooting guide and nursing assessment document were developed. The contents of the document were approved by the drugs and therapeutics committee. The final document was professionally designed.

The international convention for regional analgesia uses the colour yellow and this has been incorporated where possible into all aspects of the management of epidurals, including the prescription chart. The front page uses colour to draw the reader’s eyes to the word EPIDURAL. A variety of colours makes the chart instantly recognisable and attractive so staff will want to complete it.

The combination prescription illustrates the limited choice of infusates that are available. An anaesthetist or a member of the acute pain service may wish to reduce the concentration of fentanyl, or change or remove the opioid. The option of the plain levobupivacaine bag allows prescribers to do this. The insertion level and depth of the epidural catheter is recorded, which allows the pain service to easily determine if the catheter has migrated without the need to consult the anaesthetic record.

The troubleshooting guide allows nursing staff to access guidance about caring for patients with epidural analgesia at the bedside. Evidence-based advice about the management of patients experiencing pruritus, hypotension, altered sensation or loss of motor power in limbs is provided. The frequency of observations is outlined. For the prescription sheet and troubleshooting guide see nursingtimes.net.

ASSESSING THE IMPACT OF CHANGES

Regular prospective audit is undertaken to ensure that patient assessment is carried out and recorded. Pain intensity scores at rest and on movement are compared with previous audit findings and the results shared with anaesthetic, surgical and nursing colleagues.

Medication-related adverse events are all reported and discussed every three months by the MSI group. Serious events are reported immediately to the senior nurse for pain management, who is responsible for exploring the event as well as devising and implementing an action plan. The significant reduction in adverse events since the changes related to epidural analgesia has been reported previously (Cox et al, 2007).

Staff attendance at the epidural study day and completion of the competency document are continuously reviewed. The need to update staff who last attended the study day more than three years ago was highlighted. These staff have been able to attend a two-hour update session on patient selection, pharmacology, troubleshooting and patient safety. Recent trends in adverse incidents are reviewed and discussed at the update session.

CONCLUSION

Epidural analgesia can be a safe, effective means of providing pain relief after surgery. The role of the multidisciplinary acute pain team is to provide guidance and minimise the risks associated with epidural analgesia and ensure that NPSA recommendations and those of professional societies are adhered to in clinical practice.