The role of regional anaesthesia techniques in the management of acute pain
Cowlishaw PJ, Scott DM, Barrington MJ

CRD summary
The review concluded that regional anaesthesia/analgesia was superior to conventional therapy for management of postoperative pain following a range of surgical types. Variation in characteristics of the included studies and potential for bias in the review process mean that the authors’ conclusions should be considered tentative.

Authors' objectives
To assess the efficacy of regional anaesthesia and analgesia for the management of acute pain following surgery.

Searching
MEDLINE, EMBASE and Cochrane Central Register of Controlled Trials (CENTRAL) were searched for relevant studies published between March 2009 and March 2011. There were no language restrictions. Search terms were reported.

Study selection
Randomised controlled trials (RCTs) with outcome measures of analgesia efficacy (pain scores or analgesic sparing measurements) of regional anaesthesia and analgesia techniques were eligible for the review.

The included studies included a wide range of major surgical operations. Thirty-seven per cent of studies utilised ultrasound technology.

The authors did not state how many reviewers selected studies for the review.

Assessment of study quality
Studies published in English were assessed for quality using the five-point Jadad scale.

The authors did not state how many reviewers assessed studies for quality.

Data extraction
Data were extracted on the efficacy of analgesia (pain scores or analgesic sparing measurements) according to how these were reported in the individual studies. Data were collected on functional outcomes and adverse events.

The authors did not state how many reviewers extracted data for the review.

Methods of synthesis
The included studies were synthesised in narrative format. Individual study results on analgesic outcomes were presented in a table. The results were categorised according to body location of surgery: lower limb (knee, hip and ankle/foot), upper limb (shoulder and arm), thoracoabdominal (chest wall and abdominal wall) and thyroid surgery.

Results of the review
Sixty-five RCTs (4,841 patients, range 23 to 280) were included in the review. The median Jadad score was 3 points.

Knee surgery (17 RCTs): Five out of five studies found that single shot or continuous femoral nerve blockade was associated with significantly improved analgesia when compared with systemic opioid treatment or local infiltration analgesia. Two studies found that interventions that included femoral nerve blockade were associated with significantly fewer side effects when compared to control (continuous epidural analgesia). Two out of two studies found that sciatic nerve block combined with femoral nerve blockade was associated with significantly reduced pain scores when compared with single femoral nerve block. There was no evidence of a significant difference in analgesia outcomes when femoral nerve block was compared with fascia iliaca block.

Hip surgery (six RCTs): Findings were inconsistent in two studies that compared continuous psoas/lumbar plexus block
with continuous epidural analgesia. One study that compared femoral nerve block, lumbar plexus nerve block and systemic opioids found that regional anaesthesia and analgesia techniques improved analgesia outcomes compared to opioids: lumbar plexus provided better analgesia than femoral nerve block. One study that compared lumbar plexus with femoral nerve block found that patients in the lumbar group had better function after surgery. Two studies found that fascia iliaca block was associated with significantly better analgesic outcomes than no regional anaesthesia.

Ankle and foot surgery (six RCTs): One study found that combined continuous femoral nerve block plus popliteal sciatic nerve block was associated with significantly improved analgesia compared with a single continuous popliteal sciatic nerve block. One study found that continuous sciatic nerve block was associated with a reduction in the requirement for morphine and fewer side effects when compared with morphine.

Shoulder surgery (nine RCTs): Three out of three studies that compared single shot with continuous regional techniques found that continuous therapy was associated with significantly better analgesia. Inconsistent results were found in four studies that compared various combinations of continuous interscalene block. Two out of two studies found that continuous interscalene block was associated with a reduction in pain when compared with local infiltration analgesia.

Arm surgery (three RCTs): One study found that ultrasound guided continuous infraclavicular blockade was associated with improved analgesia when compared with ultrasound guided continuous supraclavicular blockade. One other study found that ultrasound guided axillary plexus block was associated with improved analgesia when compared with general anaesthesia.

Chest wall surgery (three RCTs): One study found that paravertebral block was associated with significantly more morphine usage than continuous epidural analgesia. Two other studies found no overall significant differences when single shot paravertebral block was compared with continuous paravertebral block and when paravertebral block was compared with systemic analgesia.

Abdominal surgery (17 RCTs): Findings were inconsistent in studies that compared transversus abdominis plane blocks with placebo, depending on site of surgery (full details reported). Two studies of women who underwent caesarean section found that morphine provided significantly improved analgesia when compared with transversus abdominis plane blocks. Transversus abdominis plane blocks with ultrasound guidance were associated with significantly improved analgesia when compared with ilioinguinal block in one study but not when both treatments used ultrasound guidance. Three other studies reported analgesic benefits with use of ilioinguinal blocks. Three studies found analgesic benefits with use of paravertebral block.

Thyroid surgery: Four studies found that superficial cervical plexus block was associated with significantly improved analgesia when compared with placebo.

Authors' conclusions
Regional anaesthesia and analgesia was superior to conventional therapy for management of postoperative pain following a range of major surgical types.

CRD commentary
The review addressed a clear research question supported by limited inclusion criteria. Relevant databases were searched. There were no language restrictions. Minimal attempts were made to find unpublished studies so publication bias could not be ruled out. The authors limited the search to two years prior to the review preparation because of improvements in anaesthetic techniques but it was possible that relevant studies may have been missed. The authors did not state how many reviewers selected studies, assessed studies for quality and extracted data so reviewer error and bias could not be excluded. A valid tool was used to assess study quality. Studies varied in quality (median score of 3 out of a possible maximum of 5).

The authors appropriately analysed studies according to type and location of surgery. Studies were appropriately analysed in narrative format due to variation in types of surgery, techniques, comparison groups and outcomes. The authors acknowledged that it was difficult to make specific analgesic recommendations.

Variation in characteristics of the included studies and potential for bias in the review process mean that the authors’ conclusions should be considered tentative.
Implications of the review for practice and research

**Practice:** The authors stated that use of ultrasound to locate nerves and continuous catheter techniques to prolong anaesthesia in the postoperative period appeared to provide optimal treatment for acute pain following major surgery.

**Research:** The authors did not state any implications for research.

**Funding**
Not stated.

**Bibliographic details**

**PubMedID**
22313062

**Indexing Status**
Subject indexing assigned by NLM

**MeSH**
Acute Pain /drug therapy /etiology; Analgesia /adverse effects /methods; Anesthesia, Conduction /adverse effects /methods; Humans; Pain, Postoperative /drug therapy; Randomized Controlled Trials as Topic; Ultrasonography, Interventional /methods

**AccessionNumber**
12012007547

**Date bibliographic record published**
11/04/2012

**Date abstract record published**
27/09/2012

**Record Status**
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.