Current evidence in acute pain management

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Optimal analgesia

- Best possible pain relief
- Lowest incidence of side effects

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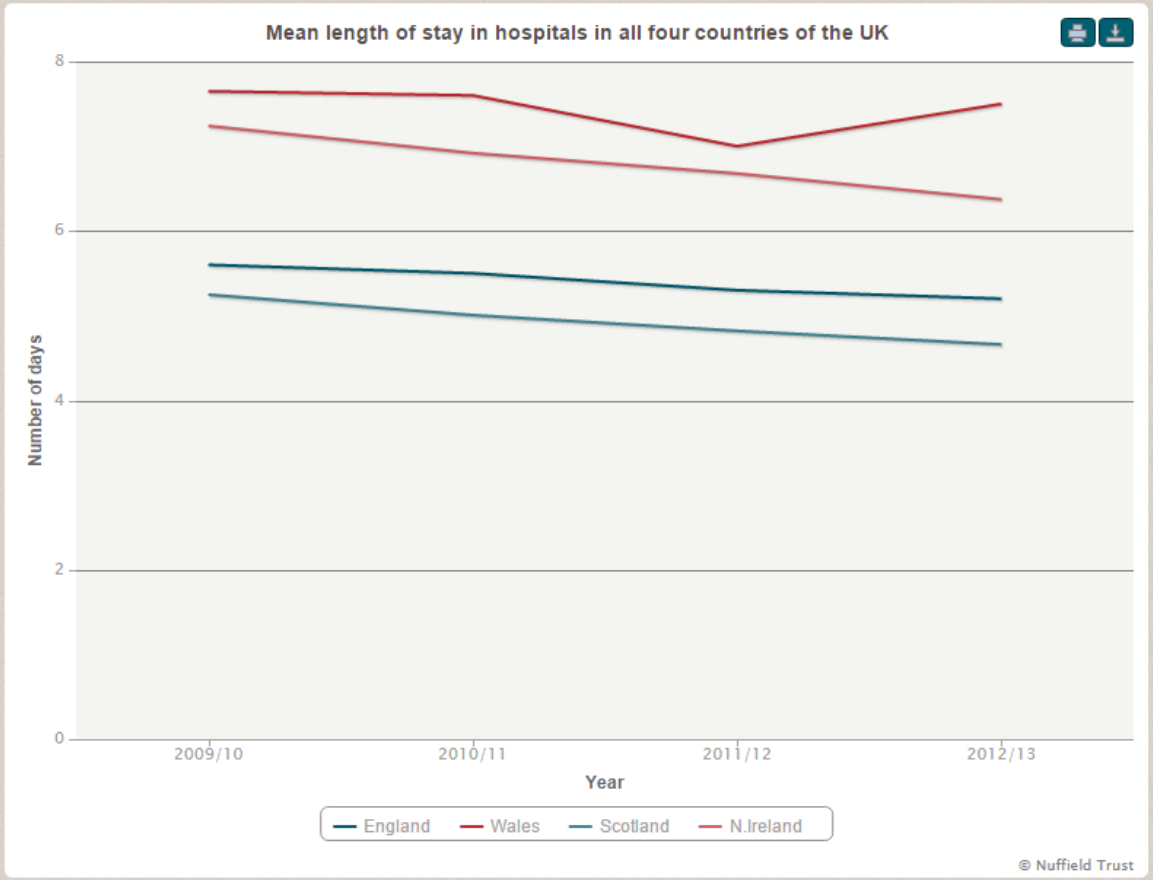
- Lowest incidence of side effects
- Reduced organ dysfunction
- Earlier mobilisation
- Earlier discharge

Mean length of stay in UK hospitals



Information Service Division; N.Ireland Department of Health, Social Services and Public Safety.

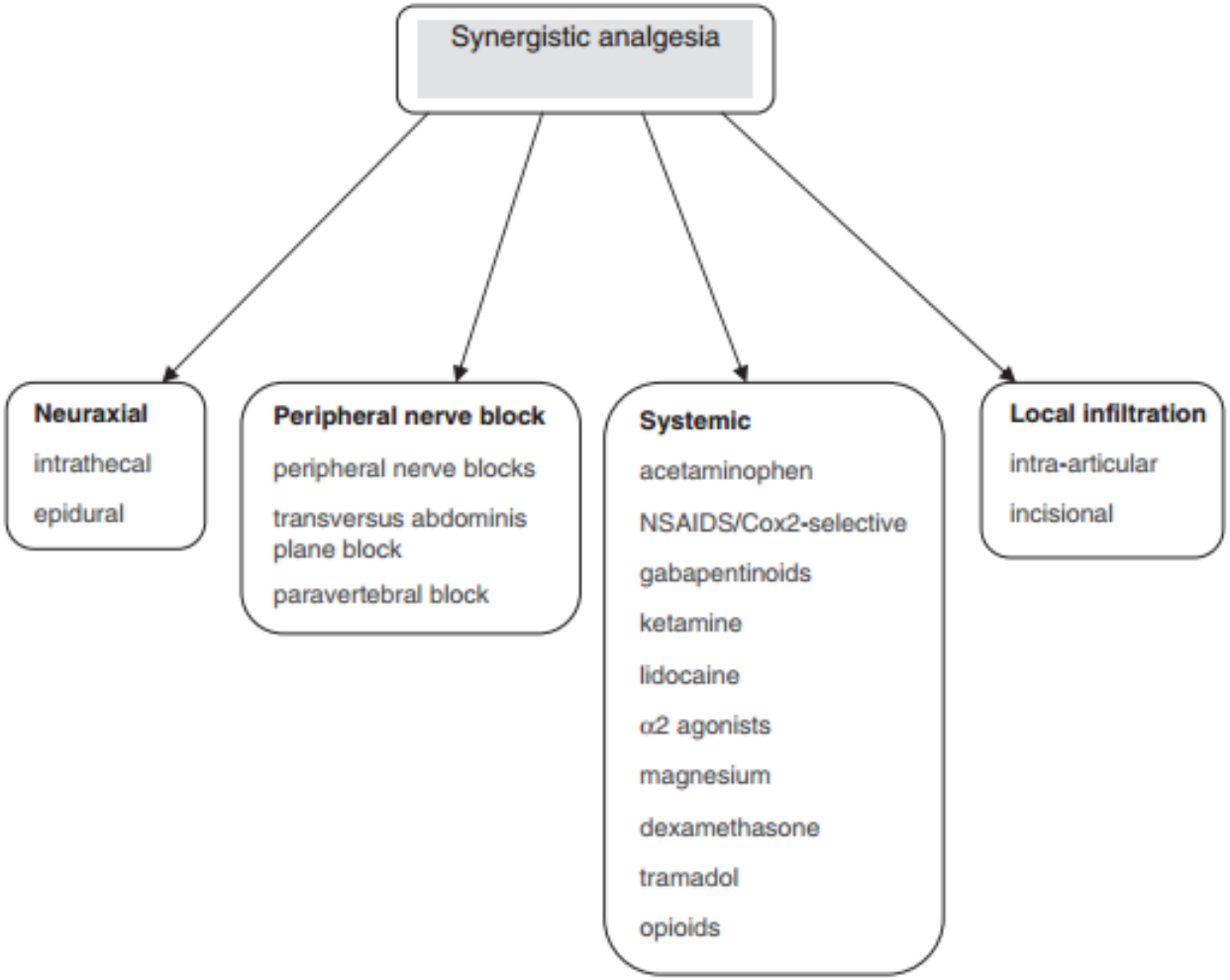
This chart shows the mean length of stay in hospital in the four countries of the UK for the years between 2009/10 to 2012/13.

Multimodal approach to achieving optimal analgesia

Combining different analgesics that act by different mechanisms, administered in different ways, resulting in additive/synergistic analgesia in order to reduce overall adverse

- Opioid reduction strategies
- Opioid avoidance strategies

Components of Synergistic Analgesia Regimens



Neuraxial Block

Epidural Analgesia

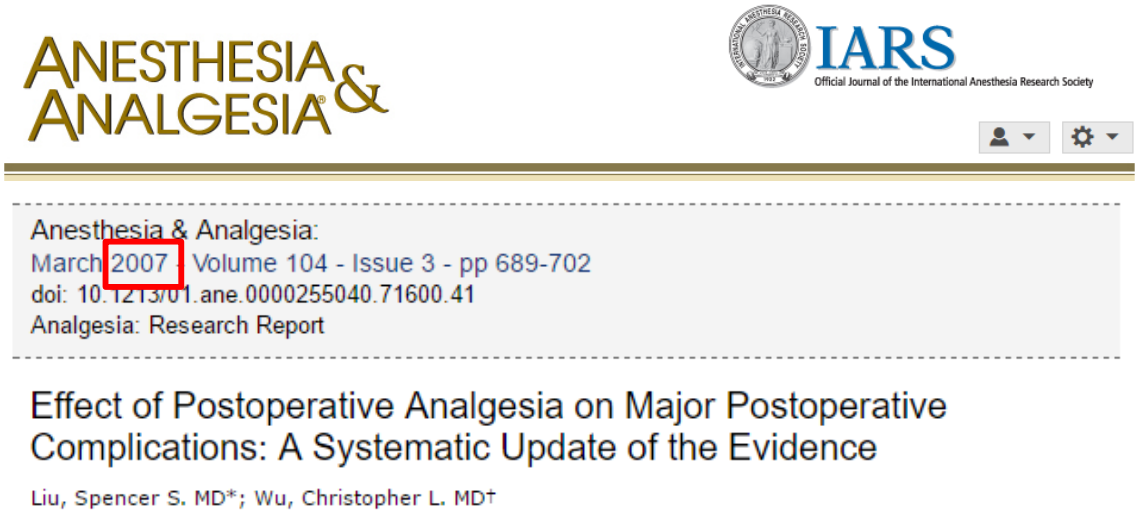
The standard against which all other techniques are compared

Pro's:

- Superior analgesia
- Positive effect on recovery
- Reduces stress response with 'open' surgery
- Superior QOL scores postoperatively

Cons:

- Perioperative hypotension
- High failure rate with periods of inadequate analgesia
- ?Use in presence of intercurrent sepsis
- Neurologic complications; perioperative blocks account for 80% of total incidence of permanent harm (NAP-3)



ANESTHESIA & ANALGESIA

IARS
Official Journal of the International Anesthesia Research Society

Anesthesia & Analgesia:
March 2007 - Volume 104 - Issue 3 - pp 689-702
doi: 10.1213/01.ane.0000255040.71600.41
Analgesia: Research Report

Effect of Postoperative Analgesia on Major Postoperative Complications: A Systematic Update of the Evidence

Liu, Spencer S. MD*; Wu, Christopher L. MD†

	Epidural	Other
18 meta-analyses 10 systematic reviews 8 additional RCTs	16,500	21,500
2 observational databases (Medicare)	92,000	-

Findings

- Poor evidence that epidural analgesia reduces mortality
- Epidural analgesia reduces postoperative cardiovascular and respiratory complications only after major vascular surgery or in high-risk patients
- Epidural analgesia with local anaesthetics is associated with faster resolution of postoperative ileus after major abdominal surgery
- No evidence of clinically significant beneficial effect on postoperative complications from perineural analgesia, continuous wound catheters, IV-PCA, or addition of multimodal systemic analgesics

Conclusion

Overall, there is insufficient evidence to confirm
or deny the ability of postoperative analgesic techniques
to affect major postoperative mortality or morbidity

SPECIAL ARTICLE

Epidural Technique for Postoperative Pain

Gold Standard No More?

Narinder Rawal, MD, PhD

Regional Anesthesia and Pain Medicine • Volume 37, Number 3, May-June 2012 *Epidural Technique for Postoperative Pain*

13 meta-analyses
16 systematic reviews
13 additional RCTs
3 observational databases

Additional findings

- Epidural use is generally declining
- CV, RS and GI benefits only seen with thoracic epidural and only when local anaesthetic alone is used
- In colorectal surgery better analgesia and reduced incidence of ileus not associated with ↓anastamotic leakage or ↓LOS
- No reliable data on failure rates but ~30% is often quoted

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Conclusion

- Pain relief can be outstanding but benefits are not as significant as previously thought
- Decrease morbidity only in high risk patients undergoing major open vascular or cardiac surgery
- Less invasive regional analgesic techniques are just as effective

Decline in popularity of epidural analgesia

Epidural rate

- Tasmania (2002) - ↓65% to 11% overall
- Brisbane (2003) - ↓50%
  "fear of litigation"
  "lack of evidence of beneficial effect"
- Toronto (2013) - 6% overall
- Edinburgh (2014) - ↓35%
- St George's (2016) - ↓90%

Anaesth Intensive Care 2007; 35: 230-8
Anaesth Intensive Care 2005; 33: 501-5
Br J Anaesth 2016; 116: 804-810
www.erasuk.net/uploads/2/6/4/0/26401678/pain_management_j_balson.pdf

9 Cochrane Reviews of neuraxial blockade (spinal or epidural)

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Findings

For intermediate-to-high cardiac risk patients:

- Neuraxial blockade ↓30-day mortality 29% compared with GA
- Neuraxial blockade+GA no reduction in 30-day mortality

Intrathecal Opioids

Intrathecal opioids ± local anaesthetic mainly studied in laparoscopic colorectal surgery.

Provide effective analgesia that is comparable with epidural analgesia

- High degree of patient satisfaction
- Low incidence of side effects
- Significantly decrease opioid consumption ≤72 hours, more after abdominal than cardiothoracic surgery
- Do not reduce the time to return of bowel function
- Do not reduce duration of hospital stay

Colorectal Dis 2013; 15: 146-55
Br J Anaesth 2009; 102: 156-67

Peripheral Nerve Block

Transversus abdominis plane and rectus sheath blocks

Provide analgesia of the abdominal wall but not the viscera

Limited good quality evidence of beneficial effect of TAP block on opioid consumption and pain scores after abdominal surgery, less evidence for rectus sheath block

Cochrane Database Sys Rev 2010; 12: CD007705

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Compared with epidural analgesia, TAP block had:

- Lower success rate (epidural 78%; subcostal TAP 63%)
- Comparable pain scores but increased rescue analgesia
- No catheter-related complications

Authors concluded “no significant advantage of epidural analgesia over subcostal TAP catheter bolus analgesia”

Anaesthesia 2011; 66: 465-71

Local Infiltration

Intraperitoneal instillation of local anaesthetic

Level 1 evidence of benefit in upper GI and pelvic surgery.
Many studies in colorectal surgery show no benefit

- Larger volume
- Higher concentration

May be some benefit from combining with pre-emptive local anaesthetic infiltration at laparoscopic port sites

RCT of intraperitoneal local anaesthetic ±infiltration at port sites in laparoscopic colorectal surgery found:

- No difference pain scores
- No difference opioid requirements
- No difference LOS

Br J Surg. 2011; 98: 29-36
J Minim Invasive Gynecol. 2012; 19: 545-53
Surg Endosc 2012; 26: 1617-13

Wound infiltration

Very few good quality studies of the beneficial effects of wound infiltration

Compared with epidural analgesia, wound infiltration:

- Comparable pain scores ≤ 48 hours
- Higher opioid requirements
- No difference between continuous infusion or bolus administration

Br J Surg 2013; 100: 1280-9

Tumescent analgesia

Pain Physician 2016; 19:205-214 • ISSN 1533-3159

Systematic Review

Local Infiltration Analgesia Versus Regional Blockade for Postoperative Analgesia in Total Knee Arthroplasty: A Meta-analysis of Randomized Controlled Trials

Bin Hu, MD[1], Tiao Lin, MD, PhD[2], Shi-gui Yan, MD[3], Song-lin Tong, MD[1], Jian-hao Yu, MD[1], Jian-jie Xu, MD[1], and Yi-ming Ying, MD[1]

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Background: Total knee arthroplasty (TKA) is one of the most commonly performed procedures while postoperative analgesia still remains challenging. The efficacy and safety of local infiltration analgesia (LIA) versus regional blockade (RB; epidural analgesia and/or peripheral nerve blocks) for pain management after TKA are controversial.

Methods: Literature in English was searched using EMBASE, Medline, Cochrane Library, CINAHL, Web of Science, and Scopus from inception to April 2015. RCTs that compared LIA and RB for postoperative analgesia following TKA were included. Methodological quality was assessed using the Cochrane Back Review Group checklist, and a sensitivity analysis was performed. Sixteen RCTs with a total of 1,206 patients were finally included in our study.

Conclusion: Our results have indicated that LIA provided better analgesia than RB at rest and preserved quadriceps function in the immediate postoperative period, which may be beneficial to early functional recovery. And its safety profile is reliable. With the biases in our meta-analysis, a rigorous and adequately powered RCT is needed to validate our results.

Systemic Analgesia

Intravenous lidocaine infusion

In open and laparoscopic colorectal surgery iv lidocaine infusion associated with:

- Significant reduction in early pain ≤ 4 hrs
- More rapid gastrointestinal recovery
- Reduced side effects
- Earlier time to home readiness

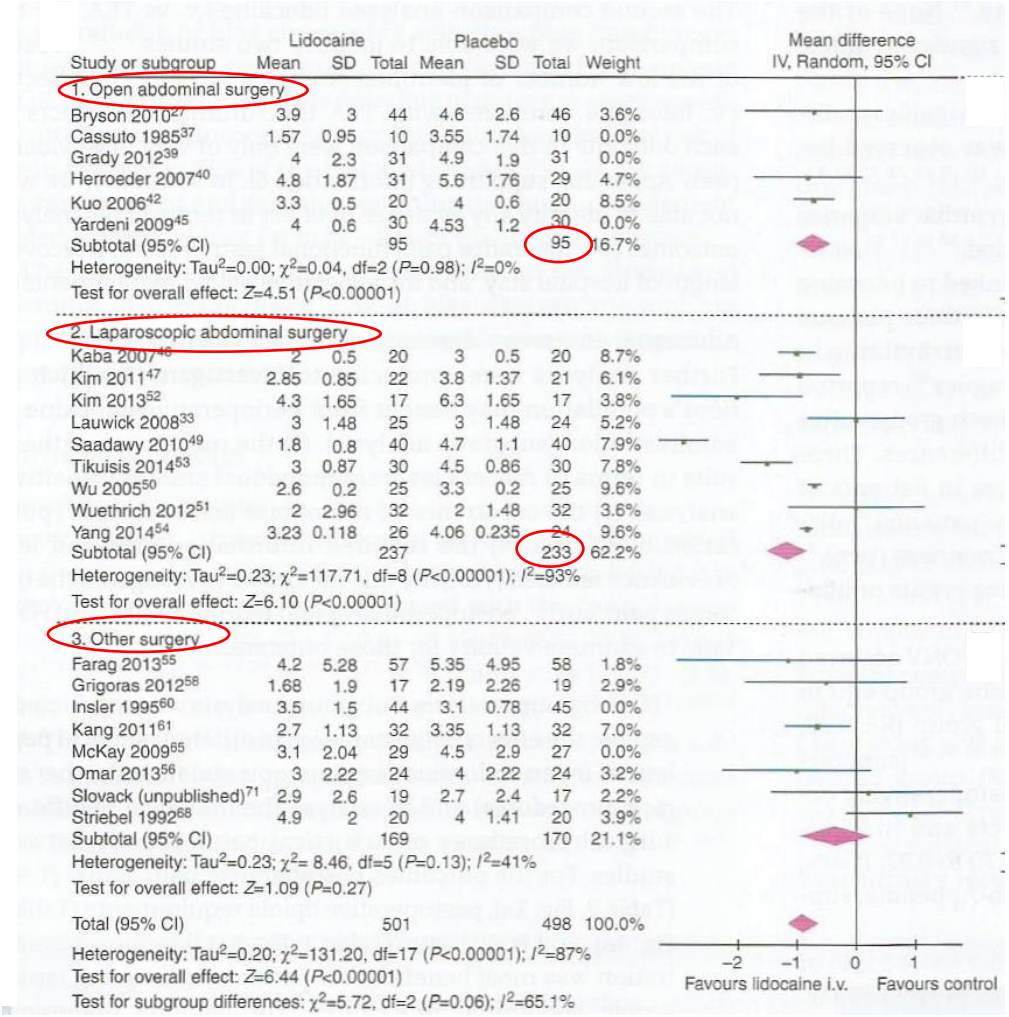
Cochrane Database Syst Rev 2015; CD009642
Br J Anaesth 2016; 116: 770-83

In open colorectal surgery, compared with epidural analgesia, iv lidocaine infusion associated with:

- Comparable pain scores
- Equivalent recovery of gut function and LOS

Reg Anesth Pain Med 2010; 35: 370-6

Postoperative pain at rest (0-4h)



Br J Anaesth 2016; 116: 770-83

Gabapentinoids

Systematic review of 7 RCTs found that gapentinoids reduce opioid consumption for up to 24 h after lumbar spinal surgery; gabapentin>pregabalin

Recent RCT of gabapentin in major bowel surgery found no reduction in opioid consumption, opioid-related side effects, time to return of bowel function, or time to hospital discharge

Emerging evidence in other types of surgery of:

- Modest reduction in pain and opioid consumption
- Beneficial effect on hospital LOS

Appropriate dose/timing of administration not yet elucidated

Spine 2013; 38: 1947-52
Pain Pract 2014; 14:132-9
Acta Anaesthesiol Scand 2011; 55: 927-43

NMDA Antagonists

Ketamine

Perioperative ketamine reduces opioid consumption, and opioid-related side effects. The benefits are greatest in patients with severe pain (VAS >7/10)

The benefits of adding ketamine to the opioid in the PCA pump is limited to thoracic surgery

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Magnesium

Magnesium is opioid-sparing without reducing opioid-related side effects. Combining magnesium with ketamine reduces opioid consumption by a further ~30%

ANZCA Scientific Evidence (2015)
Acta Anaesthesil Scand 1024; 58: 572-9

Other

Nicotine

There is low quality evidence that nicotine (intranasal or transdermal) may reduce postoperative pain at 24 hours but not opioid use or opioid-related side effects
Nicotine increases the risk of nausea in non-smokers

Chewing gum

There is some evidence that chewing gum after an operation is associated with slightly quicker return of bowel function after colorectal surgery, reduced nausea and vomiting and other complications and reduced LOS

Cochrane Review 2016: CD009634
J Gastroenterol Hepatol 2013; 28: 1122-32

Journal of Pain Research

Dovepress
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Open Access Full Text Article

ORIGINAL RESEARCH

No evidence of real progress in treatment of acute pain, 1993–2012: scientometric analysis

Darin J Correll
Kamen V Vlassakov
Igor Kissin

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This article was published in the following Dove Press journal:
Journal of Pain Research
11 April 2014
Number of times this article has been viewed

Identified 30 **surveys** but only reviewed 6 national **surveys**
Used 3 publication parameters as signs of success

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Identified 30 **surveys** but only reviewed 6 national **surveys**
Used 3 publication parameters as signs of success

Conclusions

Compared with techniques/drugs introduced 30+ years ago ones that have achieved widespread use over past 20 years have not improved national outcomes for acute pain relief

Changes in surgical technique

- In the UK between 2008 and 2015 the proportion of bowel cancer resections performed laparoscopically almost doubled from 25% to 48%
- In Toronto 31% of all colorectal surgery was performed laparoscopically 2008-2013
- In the UK EVAR accounted for 66% of elective infra-renal AAA repairs in 2014

"Laparoscopic surgery negates the need for epidural analgesia"

National Bowel Cancer Audit (2015)
Br J Anaesth 2016; 116: 804-810
NVR 2015 Annual Report

Evidence Gaps

An interdisciplinary panel of the ASA has identified a number of critical research gaps where only low-quality or insufficient evidence is found:

- Optimal methods and timing of perioperative patient education
- Non-pharmacological modalities
- Combinations of analgesic techniques
- Monitoring of patient response to treatment
- Techniques for neuraxial and regional analgesia
- Organisational care delivery models

J Pain 2016; 17: 158-66

Summary

- Multimodal analgesia is the mainstay for pain management
- There is increasing appreciation of the importance of analgesic techniques on organ function and LOS
- Changes in surgical technique have necessitated a re-evaluation of analgesic techniques
- Epidural analgesia is superior to other forms of analgesia but increasingly risk/benefit considerations limit its use
- Local anaesthetic techniques such as tumescent analgesia may be more appropriate than epidural for some types of surgery
- IV lidocaine infusion shows promise as an effective technique for colorectal surgery