Epidural technique for abdominal surgery-

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Department of Anaesthesiology and Intensive Care
University Hospital
Örebro, Sweden
Epidural technique for abdominal surgery - gold standard for postoperative analgesia? CON

Lecture outline

• Why EDA in the past?
• Lack of major benefits
• Role of EDA in ERAS protocols for abdominal surgery
• Alternatives to EDA
• Problems with EDA
• Role of audits, is EDA cost-effective?
• Conclusions
Epidural – a versatile technique

• Sites: cervical, thoracic, lumbar, caudal
• Drug administration: bolus, cont. infusion, PCEA
• Modification: CSE
• Drugs: la, opioids, non-opioids, adjuvants
• Indications: pain-acute(labour, postop.), chronic, cancer(home care)
Perioperative EDA and outcome after major surgery

**Advantages of EDA**

- Excellent analgesia - the best technique
- Shorter duration of postoperative ileus
- Reduced risk of pulmonary complications (Ballantyne 1998)
- Reduced risk of postoperative myocardial infarction (Beattie 2001)
- Reduced risk of persistent postoperative pain
- Some evidence of reduced risk of cancer recurrence (?)
Abdominal surgery - possible indications for epidural analgesia

- Open cholecystectomy
- Gastrointestinal surgery (obesity surgery, colorectal surgery)
- Hepatobiliary and renal surgeries
- Open aortic surgery
- C. Section and gynaecologic surgery
- Bladder surgery and prostate surgery
Meta-analysis of epidural analgesia versus parenteral opioid analgesia after colorectal surgery

E. Marret, C. Remy and F. Bonnet and the Postoperative Pain Forum Group

Marret E et al
Br J of Surgery 2008;95:1331-1338

• 16 RCTs (1987 - 2005), n=406 in EA group and n=400 in parenteral group (control)

• Epidural analgesia associated with:
  - reduced pain scores (WMD 15mm day1, 18mm day2)
  - shorter duration of ileus (WMD 1.6 days)
  - increased incidence of pruritus (OR 4.8)
  - increased incidence of urinary retention (OR 4.3)
  - increased hypotension (OR 13.5)
  - no influence on duration of hospital stay

"Despite improved analgesia and a decrease in ileus, EA has some adverse effects and does not shorten the duration of hospital stay after colorectal surgery"
Very few good RCT’s

Lack of good evidence about complication rate of epidurals

Upto 50% epidurals fail or give inadequate analgesia

In patients with pre-existing respiratory disease NNT is 17 to avoid one episode of respiratory failure

"Putting an epidural in is rarely a problem – it is in determining what we do with it after it is sited that the problem starts"

"There is a significant lack of evidence supporting the use of epidural analgesia and we question the routine use of this mode of analgesia in the postoperative period for patients having abdominal surgery"
Protective Effects of Epidural Analgesia on Pulmonary Complications After Abdominal and Thoracic Surgery

A Meta-Analysis

Daniel M. Popping, MD; Nadia Elia, MD; Emmanuel Marret, MD; Camille Remy, MD; Martin R. Tramèr, MD, DPhil

- RCT, n=188 (1971 - 2006), n=5904

- Epidural analgesia associated with:
  - decreased risk of pneumonia (OR 0.54)
  - incidence unchanged (8%) from 1971-2006 with EA but decreased (34% to 12%) with systemic analgesia
  - improved pulmonary function
  - reduced risk of myocardial infarct (NNT 48)
  - increased risk of hypotension (OR 2.0), urinary retention (OR 2.2) and pruritus (OR 6.5 morphine, OR 3.1 fentanyl, OR 1.1 sufentanil)

"Epidural analgesia protects against pneumonia following abdominal or thoracic surgery, although this beneficial effect has lessened over the last 35 years because of a decrease in the baseline risk"
Evidence-based methods* to reduce postoperative ileus

1. Thoracic epidural analgesia - reduces postoperative ileus by 24-37 h
   • Liu SS, Wu CL  Anesth Analg 2007;104:689-702
   • Marret E et al  Br J Surg 2007;94:665-73

2. Intravenous lidocaine
   • Marret E et al  Br J Surg 2008;95:1331-8
   • Vigneault L et al  Can J Anesth 2011;58:22-37
   • Mccarthy GC et al  Drugs 2010;18:1149-63

3. Chewing gum therapy
   • De Castro SM et al  Dig Surg 2008;25:39-45
   • Chan MK et al  Dis Colon Rect 2007;50:2149-57

4. Systemic prokinetic drugs (Alvimopan - peripheral mu receptor antagonist)
   • *Traut U et al  Cochrane Database of Systematic Reviews 2008 issue 1

*Metaanalysis or systematic reviews
Recommended interventions for ERAS – open colorectal surgery

- Preoperative counselling
- Preoperative feeding
- Synbiotics
- No bowel preparation
- No premedication
- Fluid restriction
- Perioperative high oxygen concentrations
- Active prevention of hypothermia
- Epidural analgesia
- Short transverse incision
- No routine use of drains
- Enforced postoperative mobilization
- Enforced postoperative oral feeding
- No systemic morphine (opioid) use
- Standard laxatives
- Early removal of bladder catheter
6 RCTs, n= 452

Number of ERAS elements 4-12 (12, 4, 12, 8, 10, 9)

Number of recommended evidence-based elements = 17

Epidural technique used in 5/6 studies

“The results from the present meta-analysis suggest that the implementation of four or more elements of the ERAS pathway leads to a reduction in length of hospital stay by more than 2 days and an almost 50% reduction in complication rates in patients undergoing major open colonic/colorectal surgery”
Problems with ER programs for colorectal surgery

- 17 components recommended but hardly any 2 protocols similar

- Several metaanalyses, no clear answers to following questions:
  - How many components essential?
  - “4 or more components adequate”- which 4?
  - Are all components equally beneficial?
  - Is epidural technique necessary?
in unselected patients undergoing gastrointestinal surgery, epidural analgesia does not seem to reduce anastomotic leakage, intraoperative blood loss, transfusion requirement, risk of thromboembolism, cardiac morbidity or hospital stay, compared with conventional analgesia"
Fast-track surgery versus conventional recovery strategies for colorectal surgery

“The (low) quality of the trials and lack of sufficient other outcome parameters do not justify implementation of fast-track surgery as a standard of care”

Spanjerberg WR et al
Cochrane Database Syst Rev 2011;2;CD 007635
Surgical procedures performed on day-care basis*—how far can we go?

- Knee and shoulder reconstruction
- Vaginal hysterectomy (laparoscopy assisted)
- Gastric fundoplication
- Splenectomy, adrenalectomy
- Pulmonary lobectomy
- Prostatectomy
- Carotid endarterectomy
- Minor craniectomy procedures

*Same day (or 23 h admission)
**Open Wide. No, Wider.**

Are we ready for an era of ‘natural-orifice surgery’?

By TINA PENG

Twenty-five years ago, typical appendectomy patients could expect to spend as many as seven days in the hospital. But today, most hospitals offer outpatient procedures, and patients are discharged within 24 hours. So is Appendix surgery now obsolete? There are already almost 500,000 appendectomies performed each year in the United States, and natural-orifice surgery is being oversold. Most of the procedures worldwide have been gallbladder removals, which are usually performed laparoscopically and are already almost riskless and scarless. With it says natural-orifice surgery is being over-sold. Most of the procedures worldwide have been gallbladder removals, which are usually performed laparoscopically and are already almost riskless and scarless. With

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**Transgastric Surgery**

Doctors at UCSD and other medical centers are pioneering natural-orifice surgery. How it will work:

1. **Down the gullet:** To perform an appendectomy, surgeons first run a flexible device—with a camera and channels to pass surgical tools through—down the patient's esophagus.

2. **Through the stomach:** They burn a small hole in the stomach wall, then inflate a balloon to enlarge it.

3. **To the appendix:** In the abdominal cavity, they cut the blood vessels to the appendix, clamp its base to prevent spillage and cut off the appendix.

4. **Extraction:** The appendix is drawn back up through the esophagus and removed via the mouth. Last, the stomach incision is closed.

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**Newsweek**

April 14, 2008
A systematic review of postoperative analgesia following laparoscopic colorectal surgery

B. F. Levy, H. S. Tilney, H. M. P. Dowson and T. A. Rockall

Colorectal Disease 2010;12:5-15

- 8 studies (6 RCTs), 5 studies EDA vs PCA, 1 study each ketolorac, i.v lidocaine and spinal morphine
- No significant differences between groups except for superior pain control with epidural
- Other methods are also effective (ketolorac may be associated with increased risk of anastomotic leak)
- Heterogeneity between studies (adherence to ERAS protocols, LOS (2.3 to 11 days), EDA in-situ (18h to 5 days)

“There is a paucity of data assessing the benefits of postoperative analgesic regimes following laparoscopic colorectal surgery and none of the protocols were shown to be clearly superior”
“…implementation of enhanced recovery protocols has shown impressive reductions in hospital stay … This is most likely due to carefully protocolized perioperative care … Currently, there is no convincing evidence that epidural analgesia as a component of such (ERAS) protocols provides any additional benefits, and this applies to open as well as laparoscopic colorectal surgery.”
Epidural technique for postoperative pain – the evidence (PROSPECT [www.postoppain.org])

<table>
<thead>
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<th>Surgical procedure</th>
<th>PROSPECT recommendation</th>
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<td>Thoracotomy</td>
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<td>Lap. cholecystectomy</td>
<td>No</td>
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<tr>
<td>Lap. colon resection</td>
<td>No (yes for open resection)</td>
</tr>
<tr>
<td>Abdominal hysterectomy</td>
<td>No</td>
</tr>
<tr>
<td>Hip replacement</td>
<td>No</td>
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<tr>
<td>Knee replacement</td>
<td>No</td>
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<tr>
<td>Abdominal prostatectomy</td>
<td>No</td>
</tr>
</tbody>
</table>
39 RCT’s (n = 1761) qualitative analysis, 45 RCT’s (n = 2031), qualitative analysis

- Surgical subgroups (abdominal, cardiothoracic, gynecologic, orthopedic, minor)

- Benefits of wound catheters:
  - decreased pain scores at rest and activity (32 % reduction)
  - decreased need for opioids (25 % reduction)
  - decreased risk of PONV (16 % reduction)
  - increased patient satisfaction (30 % increase)
  - decreased LOS in hospitalized patients (limited data, 1 day, p = 0.01)

- No increase in adverse effects

- Qualitative systematic review supported same benefits

"Continuous wound catheters appear to be an effective modality for management of postoperative pain"
Wound catheter infusions - the evidence*

"Continuous local anaesthetic infusions lead to reductions in pain scores (at rest and activity), opioid consumption, postoperative nausea and vomiting, and length of hospital stay; patient satisfaction is higher and there is no difference in the incidence of wound infections" (S) (level 1)

The transversus abdominis plane block: a valuable option for postoperative analgesia? A topical review

P. L. Petersen¹, O. Mathiesen², H. Torup³ and J. B. Dahl⁴

- 7 RCTs, n=364 (n=180 TAP blockade)
- Colon resection, C.section, abd.hysterectomy, open appendectomy, lap. Cholecystectomy
- Clinically significant reductions in opioid requirements (6/7 RCTs) and pain at rest and movement (4/6 RCTs)
- Reduction of opioid AE (sedation, PONV)

"Post-operative pain treatment with TAP block is a promising new technique, demonstrating both a substantial reduction in morphine consumption as well as improved pain scores in surgery involving anterior abdominal wall"
Transversus abdominis plane block for postoperative analgesia after Caesarean delivery performed under spinal anaesthesia? A systematic review and meta-analysis

F. W. Abdallah¹,², S. H. Halpern¹,²,³ and C. B. Margarido¹,²,³*

- 5 RCTs, n=312, C. Section under spinal
- TAP block associated with reduced i.v morphine consumption and pain scores in 1st day after surgery
- Best method: spinal with small dose morphine

“TAP block can provide effective analgesia when spinal morphine is contraindicated or not used”
• 9 RCTs (77 of 86 studies excluded), n= 524 (261 TAP blocks, 263 controls), 7 studies under spinal, 2 studies under GA
• Controls: ITM 100-200 mcg intrathecally
• TAP block associated with reduced morphine consumption at 6, 12, and 24 hr
• ITM associated with lower pain scores on movement and reduced opioid consumption at 24 hr, longer time to first analgesic but more common side effects (PONV 49 vs 16%, sedation 30 vs 12%)

“...TAP block significantly improved postoperative analgesia in women undergoing CD who did not receive ITM, and it is therefore recommended in these patients. The value of TAP block in patients receiving ITM and its comparison with ITM remains less clear and should be investigated in future studies.”
“Wound catheters” in perioperative pain - not just catheters in wound

- Incisional catheters (variety of procedures, ambulatory surgery)
- Pre-peritoneal catheters (colorectal surgery)
- Intraarticular catheters as part of LIA technique (THA, TKA)
- Subacromial catheters (shoulder surgery, ambulatory surgery)
- Intraperitoneal catheters (cholecystectomy, hysterectomy, prostatectomy)
- Periosteal catheters (iliac crest bone harvesting)
- Subfascial catheters (C.section, abdominal surgery)
Continuous Preperitoneal Infusion of Ropivacaine Provides Effective Analgesia and Accelerates Recovery after Colorectal Surgery

A Randomized, Double-blind, Placebo-controlled Study

Marc Beausser, M.D., Ph.D.,* Hanna El’Ayoubi, M.D.,† Eduardo Schiffer, M.D.,‡ Maxime Rollin, M.D.,† Yann Parc, M.D., Ph.D.,§ Jean-Xavier Mazoit, M.D., Ph.D.,‖ Louisa Azizi, M.D.,# Pascal Gervaz, M.D.,** Serge Rohr, M.D., Ph.D.,†† Celine Biermann, M.D.,‡‡ André Lienhart, M.D., Ph.D.,§§ Jean-Jacques Eledjam, M.D., Ph.D.||

- Elective, open surgery, GA, n=42
- 20 G multiple hole cath under transversalis fascia, ropivacaine 0.2% or placebo, 10 ml bolus + 10 ml/h. Rescue: i.v. PCA
- Ropivacaine group
  - pain scores significantly better at rest (up to 12 h) and movement (up to 72 h)
  - reduced morphine consumption during 72 h
  - better sleep quality for 2 nights
  - early recovery of bowel function (74 vs 105 h)
  - shorter hospital stay (115 vs 147 h)
  - plasma concentration below toxic levels

"Continuous preperitoneal administration of 0.2% ropivacaine at 10 ml/h during 48 h after open colorectal resection reduced morphine consumption, improved pain relief and accelerated postoperative recovery."


The Postoperative Analgesic Efficacy of Preperitoneal Continuous Wound Infusion Compared to Epidural Continuous Infusion with Local Anesthetics After Colorectal Cancer Surgery: A Randomized Controlled Multicenter Study

- Open colorectal surgery, n=106, GA, 72h study
- Preperitoneal CWI: 19G multiholed cath, 3-5 cm from lower end of incision, above the peritoneum within musculofascial layer
- CEI: T8-L1, ropi 0.2% 10ml bolus+10ml/h
- Rescue: i.v PCA morphine
- Early mobilization started day after, oral fluids after 12h
- CWI (vs CEI) associated with:
  - Similar analgesia at rest and movement (pain scores, rescue analgesia)
  - Shorter time to first flatus and first stool
  - Shorter LOS (7.4 vs 8.0 days)
  - Better quality of analgesia and sleep at 72h
  - Less PONV at 24,48h

“Preperitoneal CWI analgesia with ropivacaine 0.2% continuous infusion at 10ml/h during 48h after open CRC surgery provided effective postoperative pain relief not inferior to CEI analgesia”
## CWI vs other regional techniques

### 1. CWI vs Neuraxial techniques

<table>
<thead>
<tr>
<th>Procedure Comparison</th>
<th>Outcome</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td>vs epidural c.section</td>
<td>equally effective</td>
<td>Ranta PO Int J Obstet Anesth 2006</td>
</tr>
<tr>
<td>vs epidural THA</td>
<td>CWI better, ↓LOS</td>
<td>Andersen KV Acta Orthop 2007</td>
</tr>
<tr>
<td>vs epidural TKA</td>
<td>CWI better</td>
<td>Andersen KV Acta Orthop 2010</td>
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<tr>
<td>vs epidural TKA</td>
<td>CWI better, ↓LOS</td>
<td>Spreng KJ Br J Anaesth 2010</td>
</tr>
<tr>
<td>vs i.t morphine TKA</td>
<td>CWI better</td>
<td>Essving P Anesth Analg 2011</td>
</tr>
<tr>
<td>vs i.t morphine THA</td>
<td>CWI better</td>
<td>Rikalanen-Salmi R Acta Anaesth Scand 2012</td>
</tr>
<tr>
<td>vs epidural prostatectomy</td>
<td>epidural better</td>
<td>Fant F Br J Anaesth 2011</td>
</tr>
<tr>
<td>vs epidural for c.section</td>
<td>CWI better, ↓LOS</td>
<td>O’Neill P Anesth Analg 2012</td>
</tr>
<tr>
<td>vs epidural open colorectal</td>
<td>CWI better, ↓LOS</td>
<td>Bertoglio S Anesth Analg 2012</td>
</tr>
<tr>
<td>vs epidural open colorectal</td>
<td>EDA better, ↓LOS</td>
<td>Jouve P Anesthesiology 2013</td>
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</table>

### 2. CWI vs Femoral nerve block

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Outcome</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>TKA</td>
<td>CWI better</td>
<td>Toftdahl K Acta Orthop 2007</td>
</tr>
<tr>
<td>ACLR</td>
<td>femoral better</td>
<td>Dauri M RAPM 2009</td>
</tr>
<tr>
<td>TKA</td>
<td>equally effective</td>
<td>Affas F Acta Orthop 2011</td>
</tr>
</tbody>
</table>

### 3. CWI vs paravertebral block

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Outcome</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>radical mastectomy</td>
<td>CWI better</td>
<td>Sidiropoulou T Anesth Analg 2008</td>
</tr>
</tbody>
</table>

### 4. CWI vs interscalene block for arthroscopic shoulder surgery

- 4/6 studies - interscalene better (in 1 study analgesia lasted 6h)
Resource use and costs evaluated from medical records and published data

Decision analytic model (clinical trials and observational cohort, n= 85)

Total costs: medical devices, drugs, time (medical, nursing) for postoperative pain management

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<tr>
<th></th>
<th>CWI</th>
<th>EDA</th>
<th>PCA</th>
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<tr>
<td>Cost of devices, drug, staff time</td>
<td>€181</td>
<td>€158</td>
<td>€44</td>
</tr>
<tr>
<td>Total costs (mgmt of AE, hospitalization)</td>
<td>€6460</td>
<td>€7500</td>
<td>€7273</td>
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<tr>
<td>Successful pain relief</td>
<td>77.4%</td>
<td>72.9%</td>
<td>53.9%</td>
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</table>

“In conclusion, when compared with i.v-PCA and EDA, the global reduction in resource consumption outweighed the additional cost of using CWI devices….CWI was less costly than EDA but with almost equivalent efficacy, offering an alternative for pain management after abdominal surgery.”
Monitoring requirements for epidural analgesia (on surgical wards)*

- Assessment of sensory and motor block
- Regular registration of pain scores (rest, movement)
- Follow protocols for early ambulation- ERAS (“walking epidural”)
- Monitoring for side effects/complications
  - hypotension (fluid therapy, vasopressors)
  - urinary retention (catheterization protocols)
  - sedation, nausea, vomiting, pruritus - frequency and intensity
  - respiratory depression
  - early signs of spinal hematoma (anticoagulant therapy increasingly common, guidelines insertion/removal of catheters)

*Until the catheter comes out (or longer - to eliminate risk of hematoma and abscess)
Severe Neurological Complications after Central Neuraxial Blockades in Sweden 1990–1999

Vibeke Moen, M.D.,* Nils Dahlgren, M.D., Ph.D.,† Lars Irestedt, M.D., Ph.D.‡

- Total about 1,260,000 spinals, 450,000 epidurals
- Severe neurological complications = 127, permanent neurological damage = 85
- Incidence after spinal = 1:20-30,000, epidural = 1:25,000 (obstetric) 1:3,600 remaining procedures
- Osteoporosis – previously neglected risk factor, common in Scandinavian women (hip fractures, vertebral deformities, narrow spinal canal)
Age-Related Anatomical Changes of the Spine

Hyperlordosis, scoliosis

Spondylosis (calcification, sclerotic deformations, osteophyts)

Spinal stenosis

Age 85
Age 35
Incidence of spinal haematoma after epidural puncture: analysis from the German network for safety in regional anaesthesia

Thomas Volk, Alexander Wolf, Hugo Van Aken, Hartmut Bürkle, Albrecht Wiebalck and Thorsten Steinfeldt

Eur J Anaesthesiol 2012;29:170-6

• Data analysed from German Network for Safety in Regional Anaesthesia
• 2 year period (2008, 2009)
• 19 centres (10 university hospitals, 9 tertiary hospitals)
• Non-obstetric epidurals, n=34265
• Spinal hematoma  1:6628 epidurals

“We conclude that the incidence of epidural hematoma after epidural analgesia may be higher than previous calculations suggest”

“We strongly suggest that all patients with neuraxial catheters should be seen at least twice daily by qualified staff from a postoperative pain service as prescribed by the Operation and Procedure Code `complex acute pain therapy`”
The hidden cost of neuraxial anaesthesia?

- Closed claims analysis (Szypula et al, Anaesthesia, 2010;65:435-442)
- Costs awarded for obstetric RA higher vs non-obstetric RA
- Neuraxial block- 100% OB claims and 82% non-OB claims
- Neuraxial blocks- 89% of all regional anaesthesia claims
- Of above-81% related to epidurals (72% of all claims)

"The paucity of clear evidence of benefit and risk relating to the use of peri-operative epidural analgesia means that anaesthetists should still make risk-benefit calculations for each patient"
Surveys

Changing Patterns in the Acute Pain Service: Epidural Versus Patient-controlled Analgesia

G. E. POWER*, B. WARDEN†, K. COOKE‡
Department of Anaesthetics, Princess Alexandra Hospital, Brisbane, Queensland

- Audit 1998 – 2003, 6 yr
- Anonymous questionnaire to consultants (79 % response)
- Aortic, pancreatic, liver, colon surgery
- Proportion of epidural decreased from 53 % to 27 %
- Permanent complication from epidural seen by 5/35 (14 %) consultants, 1/35 (3 %) from PCA (in lifetime)
- Lawsuit against consultants: 4/35 (12 %)
- Knew someone personally who had lawsuit involving epidural = 66 % of respondents, PCA = 9 % of respondents
- 53 % respondents: patient preferences have changed
- 90 % respondents: patients now prefer PCA

"...82 %...changed their practice...performing fewer epidural anaesthetics...Two of the most common reasons...fear of litigation (34 %) and lack of evidence (21 %)"
Key points:

• Inadequate anaesthesia or analgesia may be common (upto 30% failure)

• Main causes: technical (equipment, anatomy) and pharmacological (drugs, doses)

• Use of adjuvants appears to increase success rate. Addition of opioids may substantially increase effectiveness

• Growing evidence for ultrasound in obese patients and infants

• Postoperatively, use of PCEA with background infusion appears most effective
Epidural technique for abdominal surgery - questions to consider

- **Aim:** analgesia at rest only? “walking EDA”, ERAS?
- **Cath. site:** thoracic?, lumbar?
- **Analgesic drug(s):** la only? la+ opioid?
- **Mode:** cont. infusion? PCEA?
- **Where?:** at HDU?, general ward?
- **Regular audits?**
  - effective analgesia in 90% patients?
  - failure rate? (definition of “failure”) on day1, 2, 3..?
  - serious complications
  - side effects (hypotension, N, V, UR, pruritus, resp.depression)
- **Costs:** personnel, pumps, drugs etc (vs other methods)
- **Is it cost-effective for every indication?**
Audits are performed annually and the results presented at meetings of different surgery sections (picture: department of general surgery)
Changing from epidural to multimodal analgesia for colorectal laparotomy: an audit

C. R. CHILVERS*, M. H. NGUYEN†, I. K. ROBERTSON‡
Department of Anaesthesia, Launceston General Hospital, Launceston, Tasmania, Australia

- Retrospective, records compared, multimodal (n = 54), vs. epidural (n = 59)

- Multimodal regimen: ketamine, clonidine, morphine, tramadol, paracetamol, NSAID

- Major complications (seen only in EDA group): epidural abscess 1, respiratory depression 2, pneumonia 3, VTE 3, delirium 7, high block 7

- Multimodal regimen: shorter high-dependency unit stay (0.4 vs. 4.5 days), shorter hospital stay (10 vs. 13 days)

"In our practice, changing from epidural to multimodal analgesia produced comparable pain relief with reduction in anaesthesia preparation time, high-dependency unit stay and hospital stay and the requirement for staff interventions. There was also a reduction in the incidence of major complications and side effects"
Does epidural analgesia have a future in postoperative pain management?

- Extensive surgery involving large areas of body, open abdominal aortic or colorectal (?) surgery
- Centres where peripheral regional techniques are not routine
- High risk patients undergoing major surgery
- The method of choice for labour pain
- New indications in the future? (anti-cancer effects?)
Epidural pain relief versus systemic opioid-based pain relief for abdominal aortic surgery (Review)

Nishimori M, Ballantyne JC, Low JHS

Elective open abdominal surgery, postoperative epidural versus systemic opioid-based analgesia, 13 RCTs, n=1224

Regardless of catheter site or drugs - epidural associated with:
- better analgesia with movement up to day 3
- shorter duration by 20% - tracheal intubation, mechanical ventilation
- lower incidence of cardiovascular (including MI), respiratory, gastrointestinal and renal complications
# Role of anaesthetic technique and cancer recurrence

## Improved oncological outcome with regional anaesthesia

<table>
<thead>
<tr>
<th>Cancer Type</th>
<th>Anaesthetic Technique</th>
<th>Author</th>
<th>Journal</th>
<th>Year</th>
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<tbody>
<tr>
<td>Melanoma</td>
<td>RA (vs GA)</td>
<td>Schlagenhauff B</td>
<td><em>Melanoma Res</em></td>
<td>2000</td>
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<td>Breast cancer</td>
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<td>2006</td>
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<tr>
<td>Prostate cancer</td>
<td>Epidural</td>
<td>Biki B</td>
<td><em>Anesthesiology</em></td>
<td>2008</td>
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<tr>
<td>Rectal cancer</td>
<td>EDA</td>
<td>Gupta A</td>
<td><em>Br J Anaesth</em></td>
<td>2011</td>
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## No benefit of regional anaesthesia

<table>
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<th>Cancer Type</th>
<th>Anaesthetic Technique</th>
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<td>Seebacher C</td>
<td><em>Hautratzt</em> (Ger)</td>
<td>1990</td>
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<td>Melanoma</td>
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<td>Melchi CF</td>
<td><em>Dermatol Surg</em></td>
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Can anaesthetic and analgesic techniques affect cancer recurrence or metastasis?
Á. Heaney¹ and D. J. Buggy¹,²*

**Key points**

- **Possible mechanisms by which surgery might promote metastasis**
  - physical dispersion
  - suppression of cell-mediated immunity
  - stimulation of angiogenesis

- **Data from 15 studies with regional techniques (epidural, spinal, paravertebral)**
  - 12 studies...retrospective studies
  - 3 studies... follow-up studies

- **Inconclusive evidence that anaesthetic factors influence cancer recurrence**
Taking aspirin every day could cut some cancer deaths by half

By Jenny Hope
Medical Correspondent

TAKING an aspirin every day cuts the risk of dying from a range of common cancers, according to a major study.

British researchers have discovered the first definitive evidence that aspirin reduces overall death rates by a third after just five years' use. Rates were slashed by half for some cancers and the longer people took the drug, the better the protection.

The study has led to the 100-year-old painkiller — costing just 1p a tablet — being hailed as the 'most amazing drug in the world'.

Experts say healthy middle-aged people who start taking low-dose aspirin around the age of 45 or 50 for 20 to 30 years could expect to reap the most benefit, because cancer rates rise with age.

In addition, a 75mg dose — a quarter of a standard 300mg tablet — helps prevent heart attacks and strokes even in people who have not been diagnosed with cardiovascular problems.

Millions of heart patients who already take low-dose aspirin on doctors' orders to ward off a second heart attack or stroke will be able to switch to a lower-dose aspirin instead of the more expensive statin medicines.

Millions of people take daily low-dose aspirin on medical advice because its anti-blood clotting activity cuts the chances of subsequent attacks among heart attack survivors.

The first trial evidence on the preventive potential of aspirin in cardiovascular disease emerged in the 1970s, but it has taken longer to accumulate definitive findings on cancer prevention.

Other research shows aspirin can cut dangerous complications of pregnancy such as pre-eclampsia and the autoimmune disorder Hughes Syndrome.

In some studies, aspirin users are less likely to develop dementia, and it may also prevent certain types of cataracts.

But the side effects of aspirin may cause problems ranging from dizziness to stomach pain and bleeding.

It may be unsuitable for people with uncontrolled high blood pressure or conditions that may cause internal bleeding. It is not recommended for children under the age of 16.
To summarize...
Why decreasing use of postoperative epidural analgesia?

- No major advantages in outcome (some exceptions)
- Practical obstacles due to use of newer anticoagulants

**Organizational issues:**
- lack of trained staff on surgical wards (PACU/ICU)
- analgesia not integrated into postop. rehabilitation protocols
- ”struggling” APS', audits rarely performed

- Risk of severe neurological complications greater than previously believed
- Previous in-patient procedures now ambulatory (major orthopedic, abdominal)

- Simpler alternatives almost as effective:
  - peripheral n. blocks (orthopedic procedures, thoracotomy)
  - incisional technique (lower abdominal, breast surgery, orthopedic, miscellaneous procedures)
  - intraarticular catheter techniques (LIA for THA, TKA)
  - non-regional techniques (i.e. PCA, ”multimodal” techniques)
WHOA! HALF EMPTY! DEFINITELY HALF EMPTY!!

CHASE: GASP!

JUST LISTEN TO YOU! ALWAYS THE PESSIMIST!
Epidural Analgesia

Benefits
- Superior analgesia
- Early ambulation
- Reduced morbidity?
- Shorter hospitalization?
- Prevention of cancer recurrence?

Costs
- Invasive technique
- Adverse effects
- Monitoring costs
- Neurol. complications
“The continued use of epidural techniques in your institution should be based on a careful evaluation of its risks and benefits drawn from local audit data, rather than on a tradition that is increasingly being viewed as outdated.”
Fast-track colorectal surgery – evidence-based methods

- Optimize organ dysfunction
- EDA or non-opioid multimodal analgesia*
- Avoid fluid excess or use goal-directed therapy
- No preoperative bowel clearance
- No routine use of drains or NG tube
- Early oral feeding and mobilization
- Consider preop. carbohydrate administration
- Well-defined daily care maps or discharge criteria

* Paracetamol, NSAID’s, gabapentanoids, systemic LA or wound infusion
NOTES – scarless surgery of the future

• **NOTES** (*Natural Orifice Transluminal Endoscopic Surgery*)

• Access to peritoneal cavity via digestive tract, vagina, urinary bladder

• Endoscopists (gastroenterologists, urologists, gynaecologists, surgeons)

• Potential applications*
  - transgastric approach (appendectomy, fallopian tube ligation, splenectomy, peritoneoscopy)
  - transgastric or transvaginal approach (cholecystectomy, nephrectomy)
  - transvesical and transdiaphragmatic thoracoscopy (lung biopsy, sympathectomy, phrenic nerve pacing electrode implantation)
  - ICU patients - bedside abdominal exploration

*most literature is from animal experimental studies

Kobiela J *(kobiela@amg.gda.pl)*
Prospective.

- PCEA (n = 14,223), iv PCA (n = 1591), brachial plexus cath. interscalene or axillary (n = 1737), femoral/ sciatic catheter (n = 1374)
- pain scores significantly better for regional techniques
- Complications:
  - epidural haematoma 1:4741 (0.02 %), risk greater with lumbar (vs thoracic)
  - epidural abscess 1:7142 (0.01 %)
  - severe neurological complications of perineural catheters 2: 3111 (0.06 %)
  - infection (perineural catheter) 3.7 % (no abscess)
  - respiratory depression PCEA 1.1 %, iv PCA 0.7 %

**PCEA, IV PCA and perineural catheter techniques** "--- are safe and efficient, --- close supervision of all these techniques by an acute pain service in the postoperative period is mandatory"
Local Infiltration Analgesia and Other Multicomponent Techniques to Improve Postoperative Outcome—Are We Comparing Oranges and Apples?

Narinder Rawal, MD, PhD

- Multicomponent techniques:
  - Local Infiltration Analgesia (LIA) for TKA, THA
  - Multimodal analgesia
  - Enhanced Recovery (ER) protocols (Fast-track protocols)

- Multiple drugs/interventions tested at same time and in combination

- Hardly any 2 protocols similar

- Unclear role of individual components

- Need for a consensus definition to avoid prevailing confusion
“Evidence linking the use of regional anaesthesia to clinical benefits in oncology is limited to a small number of studies with conflicting results”

“Regional anaesthetic techniques such as epidural and paravertebral anaesthesia are well established and have confirmed benefits in terms of quality of analgesia and decreased incidence of nausea and vomiting. Additional benefits in terms of cancer recurrence and survival are as yet unconfirmed but remain a possibility for certain cancer subgroups”
Efficacy of Postoperative Patient-controlled and Continuous Infusion Epidural Analgesia versus Intravenous Patient-controlled Analgesia with Opioids

A Meta-analysis

Christopher L. Wu, M.D.,* Seth R. Cohen, B.S.,† Jéffrey M. Richman, M.D.,‡ Andrew J. Rowlingson, B.A.,§ Genevieve E. Courpas, B.A.,§ Kristin Cheung, M.D.,‖ Elaina E. Lin, B.A.,§ Spencer S. Liu, M.D.**

- 299 RCT’s

- Epidural analgesia in every combination superior to i.v. PCA upto 3-days (exception epidural morphine alone)

- Continuous infusion superior to PCEA for pain at rest and activity (but more PONV and motor block, less pruritus)

- Epidural l.a. opioid better than epidural opioid alone

“In summary, almost without exception, epidural analgesia, regardless of analgesic agent, epidural regimen, and type and time of pain assessment, provided superior postoperative analgesia compared with intravenous patient-controlled analgesia”
Positive proof of global warming.
These benefits may become irrelevant with adoption of minimally invasive techniques

> 3800 clinical trials (Medline 2006)

18 metaanalyses, 10 systematic reviews, 8 additional RCT’s, 2 observational database articles

Epidural with la*:  
  a) Reduces postoperative cardiovascular and pulmonary complications only after major vascular surgery or in high-risk patients  
  b) Reduces risk of postoperative ileus after major abdominal surgery (by 24-37 h)

No effect on postoperative complications:
  a) Perineural analgesia
  b) Continuous wound catheters
  c) I.v. PCA
  d) Multimodal systemic analgesics (some evidence of increased risk of severe bleeding, renal failure, and cardiovascular complications if NSAID’s and coxibs are used)

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

* These benefits may become irrelevant with adoption of minimally invasive techniques