Professor Narinder Rawal, MD, PhD, FRCA (Hon), EDRA
Department of Anaesthesiology and Intensive Care
University Hospital
Örebro, Sweden

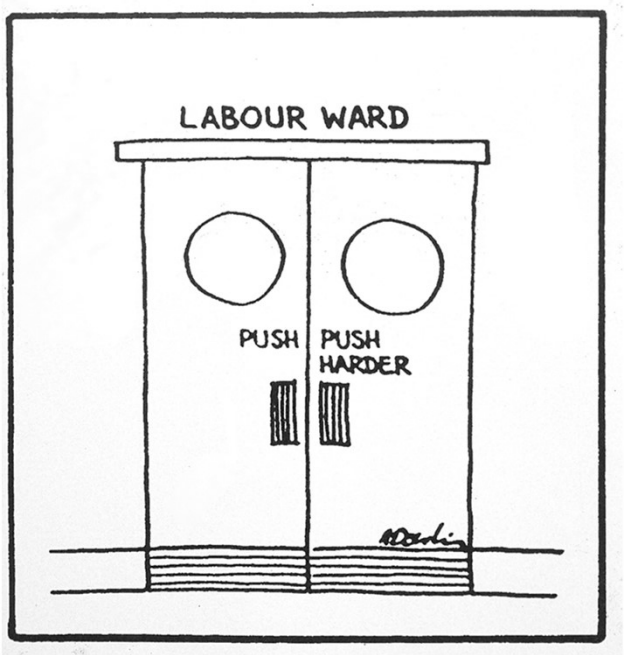
Epidural Analgesia

Benefits	**Costs**
Superior analgesia	Invasive technique
Early ambulation	Adverse effects
Reduced morbidity?	Monitoring costs
Shorter hospitalization?	Neurol. complications
Prevention of cancer recurrence?	

Epidural for postoperative analgesia after major surgery *CON*

Lecture outline

- **No major benefits in postoperative outcome (some exceptions). New evidence- EA may be harmful**
- **Increasing use of minimal invasive surgery is making EA unnecessary**
- **High failure rates (audits rarely performed)**
- **Risks of serious complications greater than previously believed**
- **Less invasive regional techniques equally effective and safer (PVB, CWI, LIA, TAP, IP)**



REVIEW ARTICLE

Protective Effects of Epidural Analgesia on Pulmonary Complications After Abdominal and Thoracic Surgery

A Meta-Analysis

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

Popping D M et al Arch Surg 2008;143:990-999

- **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"

ANESTHESIA & ANALGESIA

REVIEW ARTICLE

Improving Outcome After Major Surgery: Pathophysiological Considerations

Vanessa M. Banz, MD,* Stephan M. Jakob, MD, PhD,† and Daniel Inderbitzin, MD*

Anesth Analg 2011;112:1147-55

"..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"

Systematic review

Meta-analysis of epidural analgesia *versus* parenteral opioid analgesia after colorectal surgery

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

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

- **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 colorectalsurgery"

Anesthesia & Analgesia
Volume 123(6) pgs. 1345-1646 December 2016
ISSN: 0003-2999

META-ANALYSIS

Epidural Local Anesthetics Versus Opioid-Based Analgesic Regimens for Postoperative Gastrointestinal Paralysis, Vomiting, and Pain After Abdominal Surgery: A Cochrane Review

Joanne Guay, MD,*† Mina Nishimori, MD,‡ and Sandra L. Kopp, MD§

- Postoperative epidural l.a vs systemic or epidural opioids
- 22 RCTs, GRADE scoring, n= 1138
- Epidural l.a (with or without opioid) associated with:
  - accelerated GI transit (high quality evidence)
  - decreased pain after abd. surgery(moderate quality evidence)
  - reduced LOS (very low quality evidence) (open surgery)

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

- *Fitzgerald JEF, et al World J Surg 2009;33:2557-2566*
- *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*

THE COCHRANE LIBRARY
Independent high-quality evidence for health care decision making

Chewing gum for postoperative recovery of gastrointestinal function

- **81 RCTs, n= 9072, surgery: colorectal, C.Section, others**
- **Effect of chewing gum on:**
  - **time to first flatus (TFF)**
  - **time to bowel movement (TBM)**
  - **time to bowel sounds (TBS)**

. **Use of chewing gum associated with:**

- **reduction of TFF by 10.4 hours**
- **reduction of TBM by 12.7 hours**
- **length of hospitl stay by 0.7 days**
- **reduced risk of nausea, vomiting, other complications (only some studies)**

Short V et al
Cochrane Database Syst Rev 2015, Feb 20

THE COCHRANE LIBRARY
Independent high-quality evidence for health care decision making

Continuous intravenous lidocaine infusion for postoperative pain and recovery

- **45 RCTs (2 RCTs vs epidural), n= 2802**
- **Surgical procedures: open abdominal(12 RCTs), lap.abdominal (13 RCTs), other(20RCTs)**
- **Use of i.v lidocaine associated with reduction in:**
  - **postoperative pain upto 24 h in lap. and open abdominal**
  - **risk of paralytic ileus**
  - **LOS**
  - **postoperative nausea**
  - **opioid requirements (intra and postoperative)**

" There is low to moderate evidence that this intervention…

Kranke P

Cochrane Database Syst Rev 2015, jul 16

Analgesia after open abdominal surgery in the setting of enhanced recovery surgery. A systematic review and meta-analysis

Hughes MJ et al

JAMA Surg 2014;149:1224-1230

- **7 RCTs, n= 378, ERAS protocols**
- **Epidural vs alternative analgesic methods (i.v PCA 4 RCTs, CWI 3 RCTs)**
- **Complications assessed: pulmonary, cardiac, ileus, thromboembolism, anastomotic leak, confusion**
- **Fewer complications with PCA**
- **Lower pain scores and faster return of gut function but no effect on LOS**

" Epidurals may be associated with superior pain control but this does not translate into improved recovery or reduced morbidity when compared with alternative analgesic techniques when used within an enhanced recovery protocol"

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)***

EJA European Journal of Anaesthesiology

Eur J Anaesthesiol 2012;29:170-6

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

- **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`"

ANESTHESIA & ANALGESIA

Epidural Hematoma After Epidural Blockade in the United States: It's Not Just Low Molecular Heparin Following Orthopedic Surgery Anymore

Terese Horlocker, MD and Sandra Kopp, MD

Horlocker T, Kopp S (Editorial)
Anesth Analg 2013;116:1195-1197

Key points:

- **Risk higher than reported 2 decades ago when thromboprophylaxis was less aggressive**
- **Epidural hematoma occurs more frequently than initially estimated, ranging from 1:2700 to 1:19,505, there are patient populations at significantly higher risk**
- **Diminished utilization of epidural analgesia for major orthopedic surgery and continued application among high-risk patients undergoing major abdominal, thoracic or open vascular surgery**
- **Increasing evidence that alternative analgesic techniques, such as wound infiltration with sustained release (liposomal) bupivacaine, wound catheter infusions, and single injection peripheral blocks are as effective as epidural analgesia for many patients**

Anesthesiology

Hamilton Acute Pain Service safety study. Using root cause analysis to reduce incidence of adverse events

Paul JE et al 2014;120:97-107

- **Comparison of incidence of AEs on APS in 3 tertiary hospitals, n= 35,384**
- **Root cause analysis (RCA) process, ″before″ and ″after″ study**
- **Overall AE reduced to 1:68 from 1:42**
  - **respiratory depression 0.41% vs 0.71%**
  - **severe hypotension 0.78% vs 1.34%**
  - **PCA programming errors 0.00% vs 0.08%**
- **RCA process did NOT reduce:**
  - **severe pain (increased by 1/3)**
  - **cardiac arrest (1:5000)**
  - **epidural abscess (1:2700)**
  - **epidural hematoma (1:5400)**
  - **inappropriate coagulation, severe sedation, delirium**

″Comparing data from more than 35,000 postoperative patients before and after root cause analysis-led intervention showed a reduction by 1/3 in major adverse events, accompanied by an increase by 1/3 in incidence of severe pain″

Editorial

Anaesthesia
Journal of the Association of Anaesthetists of Great Britain and Ireland
Anaesthesia, 2010, **65**, pages 435–442

The hidden cost of neuraxial anaesthesia?

Bedforth N. M., Hardman J. G.

- **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"

Anaesth Intensive Care 2005; 33: 501-505

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**
- **Annonymous 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 %)

*Monitoring requirements for epidural analgesia (on surgical wards)**

- **Assessment of sensory and motor block**
- **Frequent 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 haematoma (anticoagulant therapy increasingly common, guidelines insertion/removal of catheters)

***Until the catheter comes out (or longer - to eliminate risk of hematoma and abscess)**

ANESTHESIA & ANALGESIA

Does regional analgesia for major surgery improve outcome? Focus on epidural analgesia

Kooij FO et al 2014;119:740-744

Key messages:

•Cardiovascular complications: minimal benefits, limited to high-risk patients

• Pulmonary complications: if advantages, limited to high-risk intrathoracic procedures and high-risk patients (endovascular aortic aneurysm repair, thoracoscopic and lap. surgery further diminish EA benefits)

• Quality of analgesia: Statistically but not clinically significant analgesia, 13%-47% have inadequate pain relief. On a group level EA not superior to systemic analgesia.

• ERAS programs: No evidence that TEA should be compulsory part of ERAS

• Complications: thoracic epidural catheter carries a 10-to 100-fold higher risk

"..epidural analgesia can no longer be considered the standard of care for a general surgical population"

BJA British Journal of Anaesthesia

British Journal of Anaesthesia **111** (3): 382–90 (2013)
Advance Access publication 23 April 2013 · doi:10.1093/bja/aet120

BJA

CLINICAL PRACTICE

Neuraxial block, death and serious cardiovascular morbidity in the POISE trial†

K. Leslie[1,2*], P. Myles[4,5,7], P. Devereaux[8,9,10], E. Williamson[3,6], P. Rao-Melancini[11], A. Forbes[6], S. Xu[12], P. Foex[13], J. Pogue[11], M. Arrieta[14,15], G. Bryson[16], J. Paul[17], M. Paech[18,19], R. Merchant[20], P. Choi[21,22], N. Badner[23], P. Peyton[24,25], J. Sear[13] and H. Yang[26]

*** Non-cardiac surgical patients at high risk of cardiovascular complications (n= 8351)**

- **Neuraxial block (spinal, lumbar, thoracic epidural)**
- **Logistic regression for association between neuraxial block and outcomes**
- **Neuraxial block associated with:**
  - **increased risk of cardiovascular death, non-fatal MI, non-fatal cardiac arrest (3-fold increased risk if GA+TEA *vs* GA alone)**
  - **increased risk of MI (but not stroke or death)**

"Those anaesthetists who maintain strong convictions that thoracic epidurals in particular reduce death and major cardiovascular morbidity in high risk surgical patients should reassess these convictions in light of our results"

Epidural technique for postoperative pain – the evidence (PROSPECT www.postoppain.org)

Surgical procedure	PROSPECT recommendation	
• Thoracotomy	Yes	(or paravertebral - grade A)
• Breast surgery	No	
• Lap. cholecystectomy	No	
• Lap. colon resection	No	(yes for open resection)
• Abdominal hysterectomy	No	
• Total hip replacement	No	
• Total knee replacement	No	
• Abdominal prostatectomy	No	
• C. section	No	

Editorial

Is the pursuit of DREAMing (drinking, eating and mobilising) the ultimate goal of anaesthesia?

N. Levy, P. Mills, M. Mythen

Anaesthesia 2016;71:1008-12

Key points:

- Indicators for anaesthesia quality (pt satisfaction, pt related outcome measures(PROMS), pain scores, PONV, functional and cognitive performance, anaesthetist communication skills)
- Analgesia – EDA,PNB and i.v opioid PCA hinder recovery (i.t morphine + oral opioids better for lap colorectal surgery, LIA for joint arthroplasty)
- DREAMing – audits allow benchmarking

Editorial

Is the pursuit of DREAMing (drinking, eating and mobilising) the ultimate goal of anaesthesia?

N. Levy, P. Mills, M. Mythen

Anaesthesia 2016;71:1008-12

" For many years, epidural analgesia and patient-controlled intravenous opioid analgesia (PCA) were regarded as the optimal form of analgesia after major surgery (26-28). It is only now being appreciated that these techniques may paradoxically hinder postoperative recovery. Both techniques require the co-administration of intravenous fluids and oxygen, which may delay or obstruct mobilisation. Epidurals are also associated with relative hypotension which may compromise mesentric blood flow(26).

There is now evidence that other analgesic techniques…may be superior and allow faster mobilisation and earlier discharge(29)"

Anaesthesia
Journal of the Association of Anaesthetists of Great Britain and Ireland
Anaesthesia, 2008, **63**, pages 1–3

Editorial

Low J et al

Epidural analgesia: first do no harm

- **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"

CURRENT STATUS

Evaluation of Novel Local Anesthetic Wound Infiltration Techniques for Postoperative Pain Following Colorectal Resection Surgery: A Meta-analysis

Nicholas T. Ventham, M.R.C.S.(Engl.), M.B.B.S.
Stephen O'Neill, M.R.C.S.(Edinb.), M.B.Ch.B. • Neil Johns, M.R.C.S.(Edinb.), M.B.B.S.
Richard R. Brady, M.D., M.R.C.S.(Edinb.), M.B.Ch.B.
Kenneth C. H. Fearon, M.D., F.R.C.S.(Glasg., Edinb., Engl.)
Department of Colorectal Surgery, Western General Hospital, Edinburgh, United Kingdom

Ventham NT et al
Dis Colon Rectum 2014;57:237-250

- **12 RCTs, infiltration technique (wound catheter, TAP, intraperitoneal) versus placebo or routine analgesia**
- **Local anesthetic techniques associated with:**
  - **significant reduction of opioid requirements at 48 h**
  - **lower pain scores on movement at 24 and 48h**
  - **shorter length of stay**
  - **earlier resumption of diet**
  - **no increase in complications**

"Novel local anesthetic wound infiltration techniques in colorectal surgery appear to reduce opiate requirements ,to reduce pain scores, and to improve recovery in comparison with placebo/routine analgesia"

Ropivacaine for continuous wound infusion for postoperative pain management: A systematic review and meta-analysis of randomized controlled studies

Raines S et al
Eur Surg Res 2014;53:43-60

- **14 RCTs, n= 756, ropivacaine *vs* placebo, 48-72h infusion**
- **Types of surgery: cardiothoracic, general (colorectal, nephrectomy, bariatric), gynaecological, urological, orthopaedic surgeries (THA,TKA,shoulder, spine)**
- **WCI ropivacaine associated with:**
  - **decreased rescue opioids (mean 22.4 mg)**
  - **decreased pain scores at rest and movement**
  - **plasma conc. below toxic levels (8-20 mg/h ropi infusion for 48h)**
  - **no difference in wound infection or wound healing**

" CWI of ropivacaine is effective for postoperative pain management for a wide range of surgical procedures…robust and clinically meaningful ..outcomes with no major adverse effects"

BJS

Systematic review and meta-analysis of continuous local anaesthetic wound infiltration versus epidural analgesia for postoperative pain following abdominal surgery

Ventham NT et al
Br J Surg 2013;100:1280-1289

- **9RCTs, n=505**
- **Type of surgery: aortic aneurysm, liver resection, colorectal, radical prostatectomy, c.section**
- **WCI associated with:**
  - **similar pain scores at rest after 48h**
  - **similar pain scores with movement at 24h, 48h**
  - **reduced incidence of urinary retention**
  - **similar trreatment failures (n= 137 vs 138)**

" This meta-analysis demonstrates that local anaesthetic infiltration via wound catheters is not inferior to epidural with regard to pain scores in abdominal surgery..Epidural analgesia was associated with a higher incidence of urinary retention ".

TAP blocks – meta-analyses

- **Charlton S et al** **Abdominal surgery** ***Cochrane database 2010***
- **Johns N et al** **Abdominal surgery** ***Colorectal Dis 2012***
- **Abdallah FW et al** **Abdominal surgery** ***Reg Anest Pain Med 2012***
- **Champaneria R Hysterectomy** ***Eur J Obstet Gynecol Reprod Biol 2013***
- **De Oliveira GS et al** **Laparoscopic surgery** ***Anesth Analg 2014***
- **Mishriky BM et al** **C. Section** ***Can J Anesth 2012***

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

THE COCHRANE COLLABORATION®

Cochrane Database 2006, issue3.CD005059.DOI

- **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**

Cochrane Database of Systematic Reviews

Neuraxial blockade for the prevention of postoperative mortality and major morbidity: an overview of Cochrane systematic reviews

Review | Overview

Joanne Guay ✉, Peter Choi, Santhanam Suresh, Natalie Albert, Sandra Kopp, Nathan Leon Pace

First published: 25 January 2014

- 9 Cochrane reviews, vs GA
- Neuraxial blockade (epidural, caudal, spinal or CSE)
- Death, chest infection, myocardial infarction, serious AE

"Compared with general anaesthesia, a central neuraxial block may reduce zero to 30-day mortality for patients undergoing surgery with intermediate to high cardiac risk (level of evidence, moderate)"

British Journal of Anaesthesia **109** (S1): i17–i28 (2012)
doi:10.1093/bja/aes421

BJA

Can anaesthetic and analgesic techniques affect cancer recurrence or metastasis?

Á. Heaney[1] and D. J. Buggy[1,2*]

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**

Daily Mail

TUESDAY, DECEMBER 7, 2010 www.dailymail.co.uk 50p

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

MAKING US FEEL BETTER SINCE 400BC

THE 'wonder drug' aspirin is more than 100 years old, but its healing effect has been known since ancient times.

It was introduced as a painkiller in 1899 by Bayer in Germany. But its active ingredient – belonging to a family of drugs called salicylates – was originally found in willow bark and leaves prized for their pain-relieving qualities around 400BC.

Plants contain salicylates to suppress infection and tumours, although modern farming methods has reduced levels in crops.

Aspirin affects the central nervous system via the brain and spinal cord to inhibit the perception and transmission of pain signals.

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.

Aspirin, The wonder drug

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.

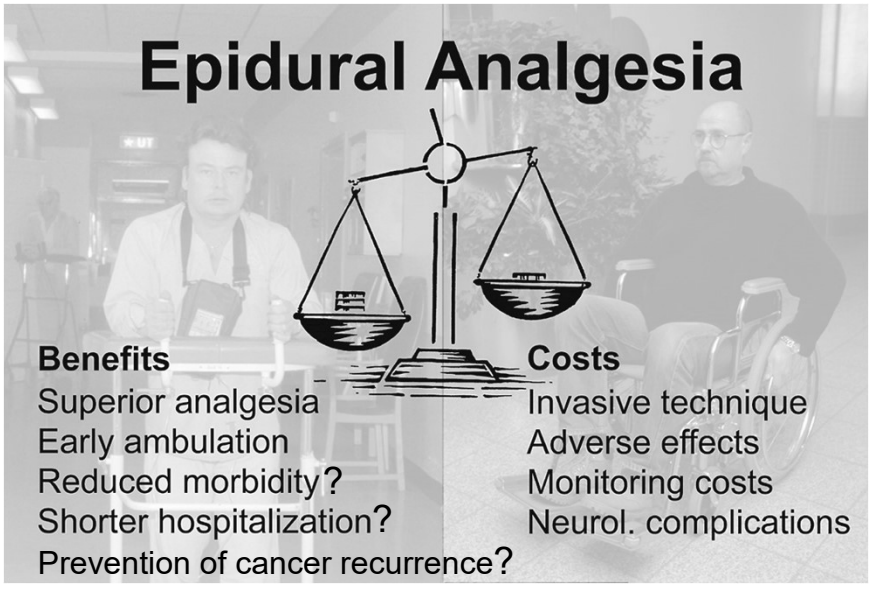
Other research shows aspirin can cut dangerous complications of pregnancy such as pre-eclampsia and the auto-immune disorder Hughes Syndrome.

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.

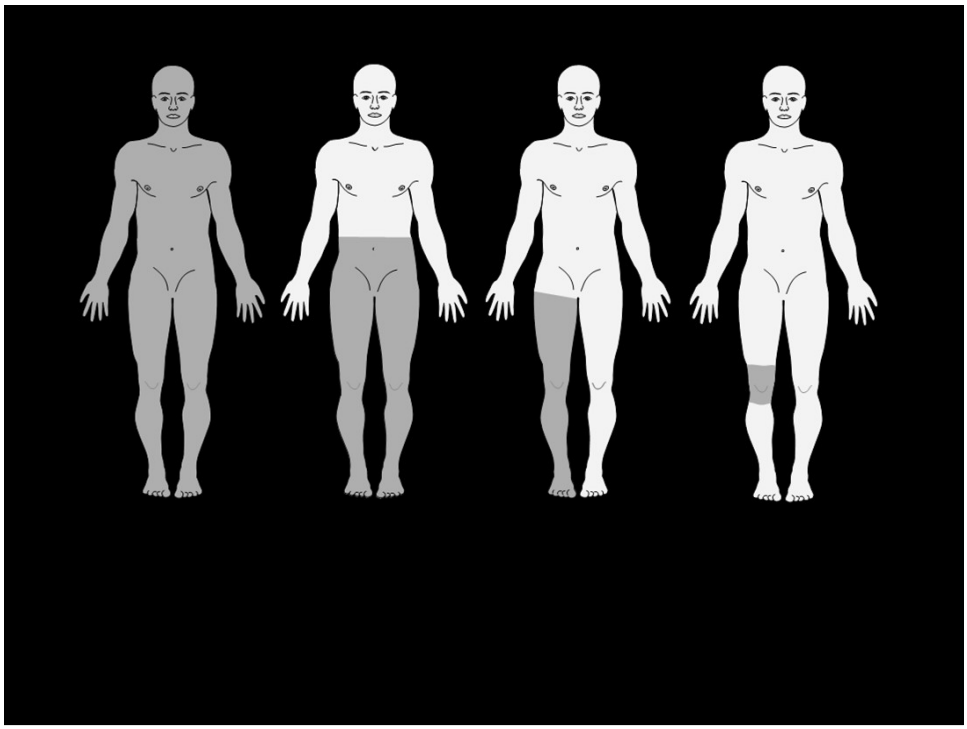
It may be unsuitable for people with uncontrolled high blood pressure or conditions that may cause internal bleeding. It is not recommended for children under the age of 16.

To summarize…



Why decreasing use of postoperative epidural analgesia?

- **No major benefits in postoperative outcome (some exceptions)**
- **Practical obstacles due to use of newer, long-acting anticoagulants**
- **High failure rates (above 30%), audits rarely performed**
- **Risk of severe neurological complications greater than previously believed**
- **Labor intensive monitoring, patients nursed at HDUs in many institutions**
- **'Minimal invasive surgery' has decreased the need for epidurals. Many previous in-patient procedures now ambulatory**
- **Hardly any cost-effectiveness data in spite of decades of use**
- **As good or better and safer regional techniques now available:**
  - **thoracotomy, mastectomy: paravertebral block, CWI**
  - **major abdominal surgery: intraperitoneal, TAP, CWI, i.v lidocaine**
  - **THA, TKA: peripheral n blocks (ACB), LIA, CWI**
  - **'Wide range of surgical procedures': CWI**



REGIONAL ANESTHESIA AND PAIN MEDICINE

SPECIAL ARTICLE

Epidural Technique for Postoperative Pain

Gold Standard No More?

Narinder Rawal, MD, PhD

Reg Anesth Pain Med 2012;37:310-317

"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"