Fast Track Surgery and Surgical Carepath in Optimising Colorectal Surgery

R Sim
Centre for Advanced Laparoscopic Surgery, TTSH
Conventional Surgery

Postop care
- Nasogastric tube
- Enteral feeds when ileus resolves
- Opioid analgesics

Results
- Morbidity, mortality
- LOS
- Oncologic outcomes – recurrence, survival
Lessons from Laparoscopic Surgery

Postop care
- Early feeding possible
- Smaller incisions, less pain, faster recovery
- Early ambulation

Results
- Return to work
- Fatigue level, QOL
- Cost vs Charge
What is fast track surgery?

Fast track surgery aims to accelerate postoperative recovery by taking advantage of knowledge about the stress response to surgery to prevent the postoperative cascade that prolongs recuperation.

Diagram:

- Surgery
  - Pain
  - Stress response/organ dysfunction
  - Nausea, vomiting, ileus
  - Hypoxaemia, sleep disturbances
  - Fatigue
  - Immobilisation, semistarvation
  - Drains/nasogastric tubes, restrictions
  - Delayed recovery

Diagram:

- Minimal invasive surgery
- Surgical stress:
  - Pain, catabolism, immuno-dysfunction, nausea/vomiting, ileus, impaired pulmonary function, increased cardiac demands, coagulatory-fibrinolytic dysfunction, cerebral dysfunction, fluid homeostasis alteration, sleep disturbances and fatigue

- Pharmacological intervention:
  - Non-opioid, multimodal analgesia
  - Anti-emetics
  - Glucocorticoids (anti-inflammatory, anti-emetic, analgesic)
  - Statins
  - β-blockade
  - α2-agonists
  - Insulin (glycemic control, anti-inflammatory)
  - Anabolic agents (growth hormone, androgens)
  - Nutrition
  - Systemic local anesthetics

- Other interventions:
  - Prevention of intraoperative hypothermia
  - Pre and intracop fluid optimization
  - Preop carbohydrate

Source: Ann Surg © 2008 Lippincott Williams & Wilkins

N=32

**CONCLUSION:**

Postoperative ileus and gastrointestinal transit normalized within 48 h after colonic resection in the patients who received multimodal rehabilitation. No significant difference was observed between the patients who underwent the laparoscopic procedure and those who underwent the open procedure.
| Protocol for Anesthesia, Surgery, and Rehabilitation Program After Colonic Resection With Conventional Care (Group 1) and Multimodal Rehabilitation (Group 2) |
|---|---|
| **Group 1** | **Group 2** |
| **Anesthesia** | **Epidural catheter** |
| Premedication: oral diazepam 10 mg | Premedication: none |
| Epidural catheter | Epidural catheter |
| \( T_1 \) | Right hemicolectomy: \( T_6-T_7 \) |
| Carbocaine 2% (4 + 4) ml with epinephrine | Sigmoid resection: \( T_9-T_{10} \) |
| Carbocaine 2% 4 ml with epinephrine hourly | Test: lidocaine 2% 3 ml with epinephrine |
| General anesthesia | Bupivacaine 0.5% (6 + 6) ml |
| Fentanyl 0.1 mg | Bupivacaine 0.25% 5 ml 2 hours intraoperatively |
| Thiomebural 3-5 mg/kg | Morphine 2 mg if < 70 year |
| Rocuronium | Morphine 1 mg if ≥ 70 year |
| O2-N2O-sevoflurane | General anesthesia |
| Dextran 70 (Macrodex®) 500 ml | Remifentanil 1 μg/kg/min |
| Saline 3000 ml (max) | Propofol 2-4 mg/kg/h |
| **Surgery** | **Transverse or curved incision** |
| Median laparotomy | **Postoperatively** |
| Continuous epidural analgesia (3 days): bupivacaine 0.25% 4 ml and morphine 0.2 mg hourly |
| Breakthrough pain: morphine im or IV | Continuous epidural analgesia (2 days): bupivacaine 0.25% 4 ml and morphine 0.2 mg/h |
| After removal of epidural catheter: morphine 10 mg pn orally | Breakthrough pain: ibuprofen 600 mg orally |
| No standard care program: fluid, food, mobilization and discharge depending on the attending surgeon | Bupivacaine 0.125% 6 ml epidurally |
| Postoperative nasogastric tube depending on surgeon who performed the operation | Morphine 10 mg orally (last choice) |
| Physiotherapy: breathing exercise 10 min per day during the first 2 postoperative days and only on working days | Food, protein drink 60–80 g protein per day and mobilization from the day of surgery following a well-defined nursing care program |
| **Day of surgery start:** acetaminophen (slow release) 2 g 12 hourly |
| Magnesia 1 g 12 hourly | 1st postoperative day: remove bladder catheter in the morning |
| Cisapride 20 mg 12-hourly | 2nd postoperative day: remove epidural catheter in the morning; discharge after lunch |
Epidural analgesia shortens postop ileus after IPAA
Epidural analgesia does not shorten postop ileus after IPAA
PCA after uncomplicated colectomy increases the risk of prolonged postoperative ileus.

N=44

CONCLUSION:
Thoracic epidural anesthesia-analgesia has a significant and favorable impact on dietary tolerance and length of stay after LAC. A thoracic epidural appears to be an important component of a postoperative care protocol, which adds further advantage to LAC without the need for labor-intensive and costly patient care plans.

N=38

CONCLUSION:
Thoracic epidural analgesia significantly improved early analgesia following laparoscopic colectomy but did not affect the length of hospital stay.
Reduction of postoperative mortality and morbidity with epidural or spinal anaesthesia: results from overview of randomised trials.
Rodgers et al. BMJ 2000;321:1-12

N=141 trials including 9559 patients

CONCLUSION:
Neuraxial blockade reduces postoperative mortality and other serious complications. The size of some of these benefits remains uncertain, and further research is required to determine whether these effects are due solely to benefits of neuraxial blockade or partly to avoidance of general anaesthesia.

I/v lidocaine speeds the return of bowel function, decreases postop pain and shortens hospital stay in patients undergoing radical retropubic prostatectomy
Surgical manipulation of the gut elicits an intestinal muscularis inflammatory response resulting in postsurgical ileus.
N=24

CONCLUSION:
Treatment with a single high-dose glucocorticoid before colonic surgery may improve postoperative pulmonary function and mobilization and reduce plasma cascade system activations, the inflammatory response, and immunofunction, but without detrimental effects on wound healing.

N=17 trials, >1200 patients

CONCLUSION:
Dexamethasone significantly reduced postoperative nausea (by 41%), vomiting (by 59%), and nausea or vomiting (by 45%). Doses of 8 to 16 mg were significantly more effective than doses of 2 to 5 mg in reducing postoperative nausea or vomiting and postoperative pain.
Maintain body temperature in OR

Forced-air warming units
Early postoperative ambulation

All patients undergoing laparotomy
First postoperative day
Educate, encourage, enforce
Adequate pain relief
Walk
24 hours after
op

By Ng Wan Ching
weecho@spn.com.sg

Major abdominal surgery can leave a scar stretching down the middle of your torso.
But 24 hours after the operation, don’t be surprised if your doctor says: “Get up and walk.”

It is happening at Tan Tock Seng Hospital, where a six-month clinical programme

So Mr Yeo decided to try and walk, as doctors and nurses were all encouraging him to do so.
“I walked and walked and it was fine. I’m very happy I didn’t have to bother the nurses when I wanted to go to the toilet,” he said.

He was discharged a week later.
Dr Bernard Lee, director and consultant at pain management services and the department of anaesthesiology, is spearheading the

These included:
- The most seriously ill patients,
Early enteral feeding versus “nil by mouth” after gastrointestinal surgery: systematic review and meta-analysis of controlled trials.

Lewis et al. BMJ 2001;323:773-6

N=11 trials including 837 patients

CONCLUSION:

Early feeding reduced the risk of any type of infection and the mean length of stay in hospital. Risk reductions were also seen for anastomotic dehiscence, wound infection, pneumonia, intra-abdominal abscess, and mortality, but these failed to reach significance. The risk of vomiting was increased among patients fed early.

N=19

CONCLUSION:
The first passage of flatus was seen, on average, on POD 2.1 in the gum-chewing group and on POD 3.2 in the control group (p < 0.01). The first defecation was 2.7 days sooner in the gum-chewing group (POD 3.1) than in the control group (POD 5.8; p< 0.01). The postoperative hospital stays for the gum-chewing and control groups were 13.53 days and 14.56 days, respectively.
Does mechanical massage of the abdominal wall after colectomy reduce postop pain and shorten the duration of ileus? Results of a randomized study. Le Blanc-Louvry et al. J Gastrointest Surg 2002 Jan-Feb;6(1):43-9

N=50

CONCLUSION:
From the second and third postop days, respectively, VAS pain scores (P<0.001) and doses of analgesics (P<0.05) were significantly lower in patients receiving active massage compared to the placebo group. Time to first passage of flatus was also significantly shorter in the active-massage group (1.8 days vs. 3.6 days, P<0.01).
Drugs to decrease postoperative ileus

Propranolol, dihydroergotamine, neostigmine, erythromycin, cisapride, metoclopramide, cholecystokinin, octreotide and vasopressin - most with either limited effect or limited applicability because of adverse effects.

5HT4 receptor agonist - prucalopride, tegaserod

New peripherally selective mu-opioid antagonists - Alvimopan, MNTX

N=4 trials, 1409 patients

CONCLUSION:
Less likely to experience POI-related morbidity (alvimopan, 7.6%; placebo, 15.8%, odds ratio=.44, p<0.001). There was also a lower incidence of postoperative NGT insertion, and other GI-related adverse events on postoperative day 3 to 6 in the alvimopan group than the placebo group. Opioid consumption was comparable between the two groups.
Prospective randomized, double-blind, placebo-controlled study of pre- and postoperative administration of a COX-2-specific inhibitor as opioid-sparing analgesia in major colorectal surgery

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*Department of Surgery, Tan Tock Seng Hospital, †Department of Surgery, National University Hospital and ‡Department of Anaesthesiology, Tan Tock Seng Hospital, Singapore

Received 12 October 2005; accepted 9 December 2005

Abstract

**Purpose** To demonstrate the opioid-sparing effect and reduction in postoperative ileus obtained with valdecoxib 40 mg administered pre- and postoperatively in patients undergoing colorectal resection.

**Methods** Patients for elective colorectal resection from December 2002 to June 2004 were randomized to receive either valdecoxib or placebo with standard patient-controlled analgesia (PCA) morphine. In the study arm, the first dose of valdecoxib 40 mg was administered orally as close as possible to 1 h prior to the start of surgery. Each subsequent dose was administered according to incision length, and duration and types of operations. Mean PCA doses at 12 and 24 h were 18.6 and 28.3 mg in the study arm vs 26.2 and 41.2 mg in controls, representing a one-third opioid reduction. Bowel sound and movement first appeared at medians of 12 and 72 h in the study arm vs 24 and 84 h, respectively, in controls (P < 0.05). Tolerance of solid diet was at a median of 60 h and discharge at a median of 4 days in the study arm vs 72 h and 6 days in controls (P < 0.05 and P < 0.01, respectively). Seven (18%) morbidities occurred in the control vs six (15%) in the study arm.
Main Findings

- Preemptive analgesia works in major abdominal bowel surgery
- Oral works, Parenteral not required
- Could not demonstrate the degree to which the preemptive administration of the COX-2 inhibitor contributed to the observed benefits of reduction of POI and opioid usage
- POI was also reduced probably as result of (1) reduced opioid usage, (2) early ambulation with better pain control and (3) attenuated inflammatory response
- Did not address the relative contribution of each factor toward the reduction of postoperative ileus though it is evident that all these factors can be attributed to COX-2 inhibition
Conclusions

- Postoperative ileus is multifactorial in origin and hence a multimodal approach is likely to be the best means to enhance postoperative recovery.

- The addition of an oral COX-2-specific inhibitor pre- and postoperatively can reduce opioid use, postoperative ileus and length of stay when compared with a standard postoperative patient-controlled analgesia (PCA) morphine regimen after colorectal resection.

N=20

CONCLUSION:
Positive salt and water balance sufficient to cause a 3 kg weight gain after surgery delays return of gastrointestinal function and prolongs hospital stay in patients undergoing elective colonic resection.

N=172

CONCLUSION: Cardiopulmonary (7% versus 24%, \( P = 0.007 \)) and tissue-healing complications (16% versus 31%, \( P = 0.04 \)) were significantly reduced and no patients died in the restricted group compared with 4 deaths in the standard group. Restricted periop iv fluid regimen aiming at unchanged body weight reduces complications after elective colorectal resection.
What are carepaths?

Carepaths are guidelines and goals to standardise management. They are not intended to establish standards of practice, nor replace individual physician judgment.
<table>
<thead>
<tr>
<th>Clinical Pathway for Colorectal Surgery</th>
<th>Date: __________________________</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DOCTOR’S ORDERS</strong></td>
<td><strong>NURSING INTERVENTIONS</strong></td>
</tr>
<tr>
<td><strong>Action</strong></td>
<td>AM</td>
</tr>
<tr>
<td>Daily Post-op review:</td>
<td>by SN</td>
</tr>
<tr>
<td>Respiratory complication Y/N</td>
<td>Pain Assessment</td>
</tr>
<tr>
<td>Urinary problem Y/N</td>
<td>INFORM</td>
</tr>
<tr>
<td>Thrombophlebitis / DVT Y/N</td>
<td>Case Manager if not done</td>
</tr>
<tr>
<td>Cardiac problems Y/N</td>
<td>Physical if done</td>
</tr>
<tr>
<td>Incision / Obstruction Y/N</td>
<td>Stoma Nurse/Clinician if indicated</td>
</tr>
<tr>
<td>Malignancy Y/N</td>
<td>ACTIVITY</td>
</tr>
<tr>
<td>Blood loss anemia Y/N</td>
<td>Apply anti-thrombotic stockings</td>
</tr>
<tr>
<td>Electrolyte abnormal Y/N</td>
<td>NUTRITION</td>
</tr>
<tr>
<td>Specify</td>
<td>NUTRITION</td>
</tr>
<tr>
<td>Others:</td>
<td></td>
</tr>
<tr>
<td>Wound problems</td>
<td>OBSERVATIONS</td>
</tr>
<tr>
<td>Vital Signs 4 hourly</td>
<td>Wound Care</td>
</tr>
<tr>
<td>Review:</td>
<td>Wound Care</td>
</tr>
<tr>
<td>Oxygen: □ Continue □ Off</td>
<td>Check stoma colour</td>
</tr>
<tr>
<td>NG tube: □ Keep □ Off</td>
<td>SMED / NG / Urinary output</td>
</tr>
<tr>
<td>Intake/Output</td>
<td>Intermittent / change dressing if indicated</td>
</tr>
<tr>
<td>□ NEM</td>
<td>EDUCATION</td>
</tr>
<tr>
<td>□ Small feeds □ Soft diet □ DOC</td>
<td>Stoma Care</td>
</tr>
<tr>
<td>Appointment to speak to relatives</td>
<td>Wound Care</td>
</tr>
<tr>
<td><strong>DISCHARGE PLANNING</strong></td>
<td></td>
</tr>
<tr>
<td>Date:</td>
<td>Evaluate discharge needs</td>
</tr>
<tr>
<td>Time:</td>
<td>Re-evaluate discharge plan/needs</td>
</tr>
<tr>
<td>Doctor:</td>
<td>Purchase stoma appliances</td>
</tr>
<tr>
<td>Allied Healthcare Team’s Activity</td>
<td>Signature</td>
</tr>
<tr>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Desired Outcomes</td>
<td></td>
</tr>
<tr>
<td>Patient is haemodynamically stable</td>
<td></td>
</tr>
<tr>
<td>Pain score &lt; 3</td>
<td></td>
</tr>
<tr>
<td>Stoma is healthy &amp; pink</td>
<td></td>
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<tr>
<td>Nurse’s Name</td>
<td>Signature</td>
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<tr>
<td>Dr’s Name:</td>
<td>PM</td>
</tr>
<tr>
<td>MCR No:</td>
<td>ND</td>
</tr>
<tr>
<td>Admission / Pre-Operation Day</td>
<td>Pre &amp; Post Operation Day</td>
</tr>
<tr>
<td>------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td><strong>Arrival at Emergency Department</strong></td>
<td><strong>You will be assessed and monitored closely for pain. Painkiller will be given to you either</strong></td>
</tr>
<tr>
<td>Check temperature, pulse, respiration and blood pressure</td>
<td>Prepare, change and send to operating theatre</td>
</tr>
<tr>
<td>Doctor will examine and explain your current condition, need for operation and nature of operation</td>
<td>Duration of surgery depends on severity of the condition</td>
</tr>
<tr>
<td>Blood investigations to analyze your blood count</td>
<td>You will be transferred back to the general ward from operating theatre. Your condition will be monitored closely</td>
</tr>
<tr>
<td>Chest x-ray ordered to check your heart and lung if required</td>
<td>Intravenous therapy will be continued till reviewed by surgeon.</td>
</tr>
<tr>
<td>Electrocardiography (ECG) ordered to check your heart activity if required</td>
<td>You have to continue to be on nil by mouth. Food and drink will only be allowed when your bowel movement is heard (bowel sound)</td>
</tr>
<tr>
<td>Consent will be taken from you or next of kin once clinical &amp; laboratory findings confirmed the diagnosis of appendicitis (Inflammation of the Appendix)</td>
<td>Wound site will be monitored closely for sign of bleeding and infection</td>
</tr>
<tr>
<td>You will be put on nil by mouth. Intravenous therapy will be administered prior to operation</td>
<td>Doctor will review and update you and your family on your progress after surgery</td>
</tr>
</tbody>
</table>
### Post Operative Day One

**Check temperature, pulse, respiration and blood pressure**

- **Doctor’s review:**
  - listen to your bowel sound
  - inspect your wound site
  - order treatment
  - update progress
  - discuss discharge plan

  You may be discharged if:
  - no sign of wound infection
  - diet tolerated
  - no severe pain

- **You will be assessed and monitored closely for pain. You may be taken off the pump and replaced with oral painkiller.**

- **Oral intake will be ordered once bowel sound is heard. Start with liquid and progressively to soft diet once tolerated.**

- **The nurse will give you and your family advice on the following:**
  - wound care
  - pain control
  - follow up appointment

- **Wound care and self care management and follow up care for removal of stitches if required.**

- **Advice on healthy diet**

- **Advice on smoking cessation**

- **Types of medication, their effects and side effects**

- **Affix sticker**

  **WARD & BED NO:**

  **PATIENT/CAREGIVER’S SIGNATURE:**

  **DATE:**
Original Article

Colorectal Clinical Pathways: A Method of Improving Clinical Outcome?

Jane J.Y. Tan, Angel Y.Z. Foo and Denis M.O. Cheong, Department of General Surgery, Tan Tock Seng Hospital, Singapore.

OBJECTIVE: Clinical pathways are intended to improve the quality of care. In March 2001, our unit implemented a pathway for patients undergoing major colorectal surgery. The aim of this study was to assess its impact on the quality of patient care.

METHODS: We reviewed 204 patients managed using this pathway in 2001, and compared their outcomes with those of a control group of 204 patients who had undergone similar procedures the year before. The endpoints measured were postoperative morbidity, length of stay and readmission rates.

RESULTS: Both groups were similar in terms of patient demographics, diagnosis, and nature of surgery performed. In the study group, 61% of patients underwent elective surgery compared with 62% in the control group. The incidence of postoperative morbidity in the study group was 20% compared with 33% in the control group \( (p = 0.003) \). The rate of readmission as a result of surgical complications was 6% in the study group versus 13% in the control group \( (p = 0.029) \). The average length of stay was 10.4 days in the study group and 12.1 days in the control group \( (p = 0.105) \).

Improving outcomes

"What cannot be measured, cannot be improved"
VARiANCE RECORD FORM  
Clinical Pathway for Colorectal Procedures

Instructions:  
1. Document variance if patient is oxytensive  
2. Track & record key indicators  
3. Record Co - morbid Conditions  
4. Track factors that will prolong LOS & affect patient's outcomes.  
5. Upon discharge submit this form to Case Managers

<table>
<thead>
<tr>
<th>Date</th>
<th>V Code</th>
<th>Description</th>
<th>Action Taken</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>

Variance Code (V Code):

A. Patient related:  
- Wound Infection  
- Severe Illness  
- Pain Management  
- Other

B. Health Care Provider:
- Decision to postpone  
- Decision to discharge  
- Decision to readmit  

C. Community / Family  
- No care given  
- Family request for admission

Co morbid Conditions: Yes No
- CEDD / COLD  
- NDDM (Type 1)  
- NDDM (Type 2)  
- Hypertension  
- Hyperlipidemia  
- Others (to specify)

Principal Specialist in charge: ________________________________
Principal Diagnosis: ________________________________
Principal Procedure: ________________________________
Stoma: Yes No

Date: ____________________ Time of Surgery: ____________________ Surgeon: ____________________

Planned discharge date: ____________________ Actual discharge date: ____________________

Discharge to:
- Home  
- Community Hospital - AMKCH / St Andrew / St Luke's  
- Rehab. Services (TTSH)  
- Step-down facilities (to specify)  
- Nursing Home (to specify)  
- Others (to specify)

ADL status:  
- Pre-mobil: Independent: Assis: Total

Upon discharge: Independent: Assis: Total
## General Surgery Colorectal Clinical Pathway Indicator Report

**Tabulated by:**

**Time Period:** 1st January to 31st December 2007

<table>
<thead>
<tr>
<th>1. No of Patients on Colorectal Clinical Pathway</th>
<th>324</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. No of Patients with colon surgery performed</td>
<td>267</td>
</tr>
<tr>
<td>b. No of Patients with rectal surgery performed</td>
<td>57</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2a. Elective vs Emergency Admission rate</th>
<th>Elective</th>
<th>%</th>
<th>Emergency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>68</td>
<td>21%</td>
<td>153</td>
<td>47%</td>
</tr>
<tr>
<td>2b. SDA rates</td>
<td>103</td>
<td>32%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3. LOS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Mean</td>
</tr>
<tr>
<td>b. Median</td>
</tr>
<tr>
<td>c. Range</td>
</tr>
<tr>
<td>d. 50th Percentile</td>
</tr>
<tr>
<td>e. 90th Percentile</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4. Pre-Operation vs Operation status</th>
<th>Elective</th>
<th>%</th>
<th>Emergency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>195</td>
<td>60%</td>
<td>129</td>
<td>40%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. LOS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Mean</td>
</tr>
<tr>
<td>b. Median</td>
</tr>
<tr>
<td>c. Range</td>
</tr>
<tr>
<td>d. 50th Percentile</td>
</tr>
<tr>
<td>e. 90th Percentile</td>
</tr>
</tbody>
</table>

| 5. Median ASA                           | 11       |

| 6. Stoma rates                          | 81       | 25% |

| 7. No complication vs system variance rates | 252 | 78% | 72 | 22% |
Interventions for major improvement in surgical outcome

- Staff training/reorganisation and procedure specific care plans
  - Preoperative information and optimisation of organ function
  - Stress reduction
    - Regional anaesthesia
    - Minimal invasive operations
    - Normothermia
    - Pharmacological modifiers
  - Effective pain relief and prophylaxis for nausea and vomiting
  - Modification of perioperative care
    - Early mobilisation
    - Minimal use of tubes, drains, and catheters
    - Oral nutrition

- Fast track surgery
  - Documentation
    - Morbidity
    - Safety
    - Cost
    - Patient satisfaction
Conclusion

- Postoperative pain and ileus are two major determinants that prevent early discharge after major abdominal surgery.

- Multimodal fast tracking involves thorough patient education, a multidisciplinary team approach to surgical management, minimally invasive techniques, epidural anesthetic, avoidance of opioids, maintenance of the patient's body temperature in the OR, early enteral nutrition and ambulation, and judicious postoperative intravenous fluids.