ASCS Bangkok 16th Jan 2009

Fast Track Surgery and Surgical Carepath in Optimising Colorectal Surgery

R Sim

Centre for Advanced

Laparoscopic Surgery, TTSH

National Healthcare Group

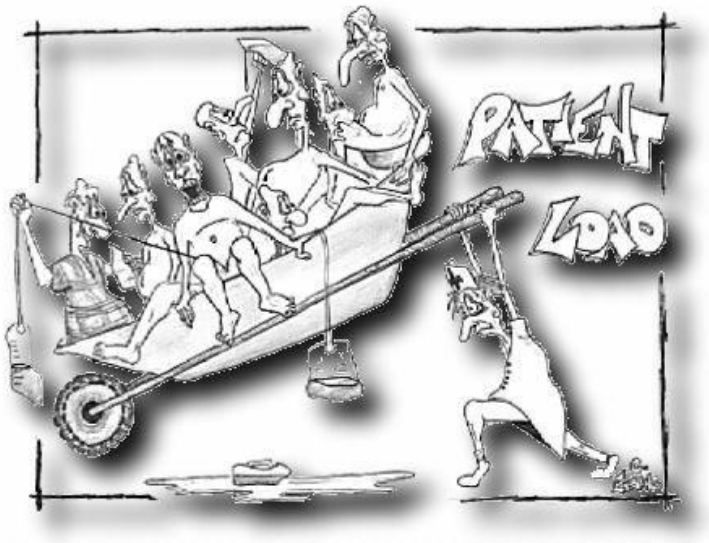
Adding years of healthy life

CALS

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

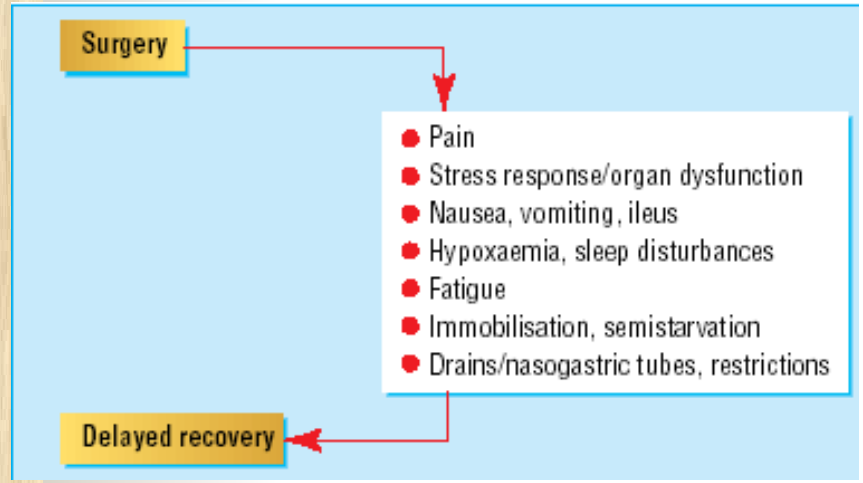
- Early feeding possible
- Smaller incisions, less pain, faster recovery
- Early ambulation

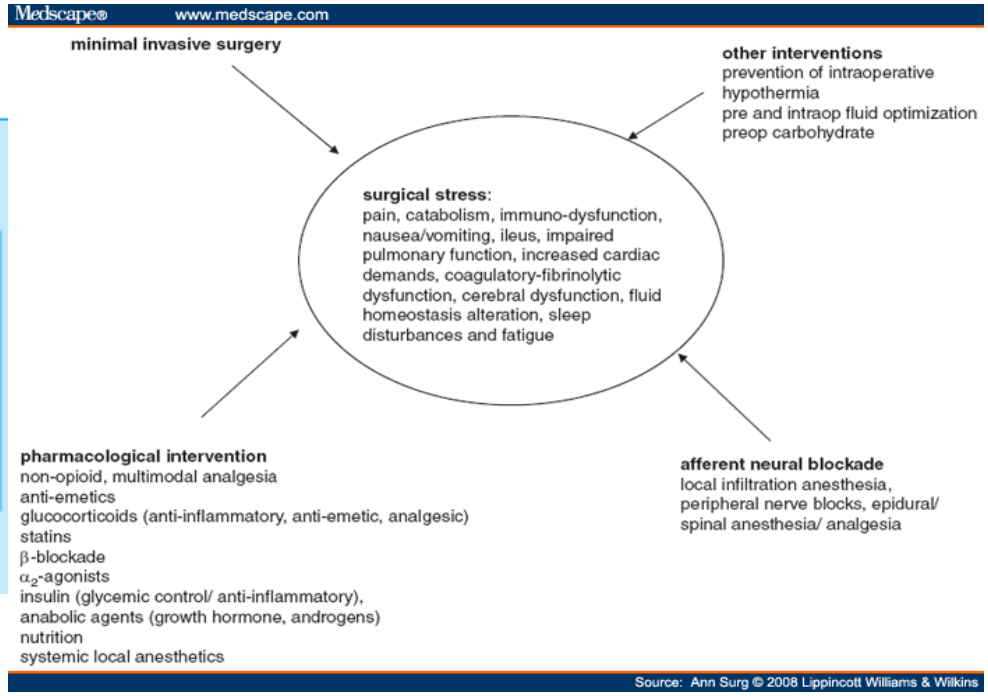
Results

- 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





Gastrointestinal transit after laparoscopic vs open colonic resection. Kehlet et al. Surg Endosc (2003) 17: 1919–1922

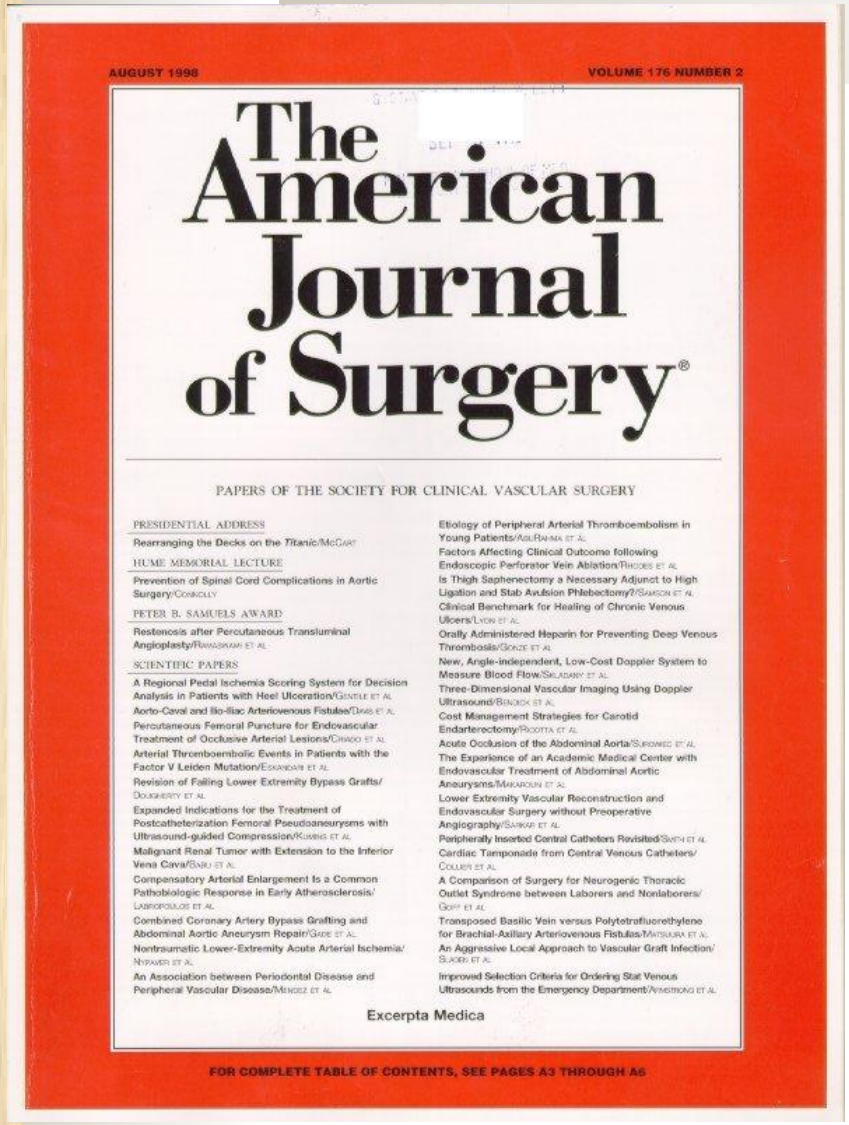
N=32

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.

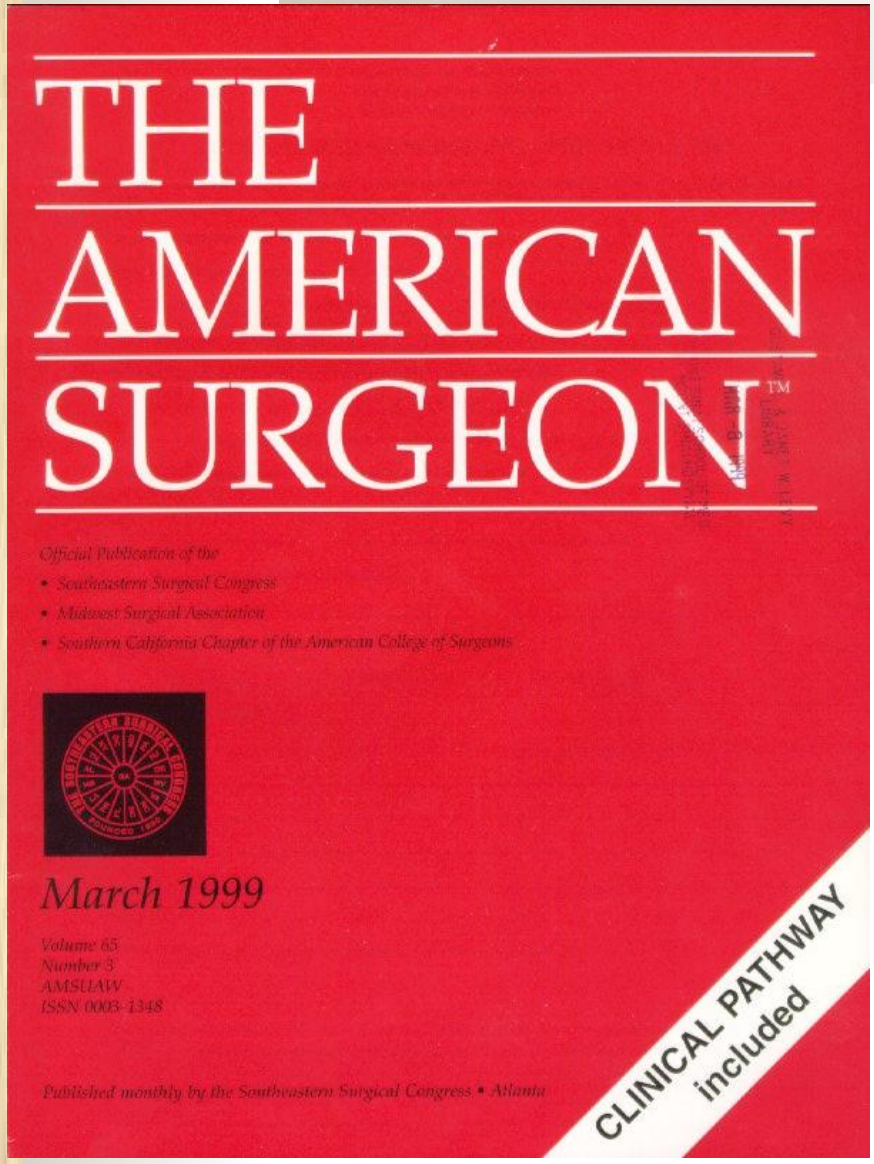
Protocol for Anesthesia, Surgery, and Rehabilitation Program After Colonic Resection With Conventional Care (Group 1) and Multimodal Rehabilitation (Group 2)

	Group 1	Group 2
Anesthesia	Premedication: oral diazepam 10 mg Epidural catheter T_8-T_{10} Carbocaine 2% (4 + 4) ml with epinephrine Carbocaine 2% 4 ml with epinephrine hourly General anesthesia Fentanyl 0.1 mg Thiomebumal 3-5 mg/kg Rocuronium O2-N2O-sevoflurane Dextran 70 (Macrodex®) 500 ml Saline 3000 ml (max)	Premedication: none Epidural catheter Right hemicolectomy: T_6-T_7 Sigmoid resection: T_9-T_{10} Test: lidocaine 2% 3 ml with epinephrine Bupivacaine 0.5% (6 + 6) ml Bupivacaine 0.25% 5 ml 2 hours intraoperatively Morphine 2 mg if < 70 year Morphine 1 mg if ≥ 70 year General anesthesia Remifentanil 1 µg/kg/min Propofol 2–4 mg/kg/h Cisatracium 0.15 mg/kg Hydroxyethyl starch (HAES®) 500 ml Saline 1,500 ml (max) Ondansetron 4 mg Ketorolac 30 mg Bupivacaine 0.25% 20 ml (incision)
Surgery	Median laparotomy	Transverse or curved incision[2]
Postoperatively	Continuous epidural analgesia (3 days): bupivacaine 0.25% 4 ml and morphine 0.2 mg hourly Breakthrough pain: morphine im or IV After removal of epidural catheter: morphine 10 mg pn orally No standard care program: fluid, food, mobilization and discharge depending on the attending surgeon Postoperative nasogastric tube depending on surgeon who performed the operation Physiotherapy: breathing exercise 10 min per day during the first 2 postoperative days and only on working days	Continuous epidural analgesia (2 days): bupivacaine 0.25% 4 ml and morphine 0.2 mg/h Breakthrough pain: ibuprofen 600 mg orally Bupivacaine 0.125% 6 ml epidurally Morphine 10 mg orally (last choice) 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 Cisapride 20 mg 12- hourly 1st postoperative day: remove bladder catheter in the morning 2nd postoperative day: remove epidural catheter in the morning; discharge after lunch



1995 Jan; 169(1): 79-82

Epidural analgesia shortens postop ileus after IPAA



1996 Jun; 62(6):499-502

Epidural analgesia does not shorten postop ileus after IPAA

1995 Oct; 170(4):371-4

PCA after uncomplicated colectomy increases the risk of prolonged postop ileus

Epidural anesthesia-analgesia shortens length of stay after laparoscopic segmental colectomy for benign pathology. Senagore et al. Surgery 2001;129(6):672-6

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.

Randomized clinical trial comparing epidural anaesthesia and patient-controlled analgesia after laparoscopic segmental colectomy.

Senagore et al. Br J Surg 2003;90(10):1195-9

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

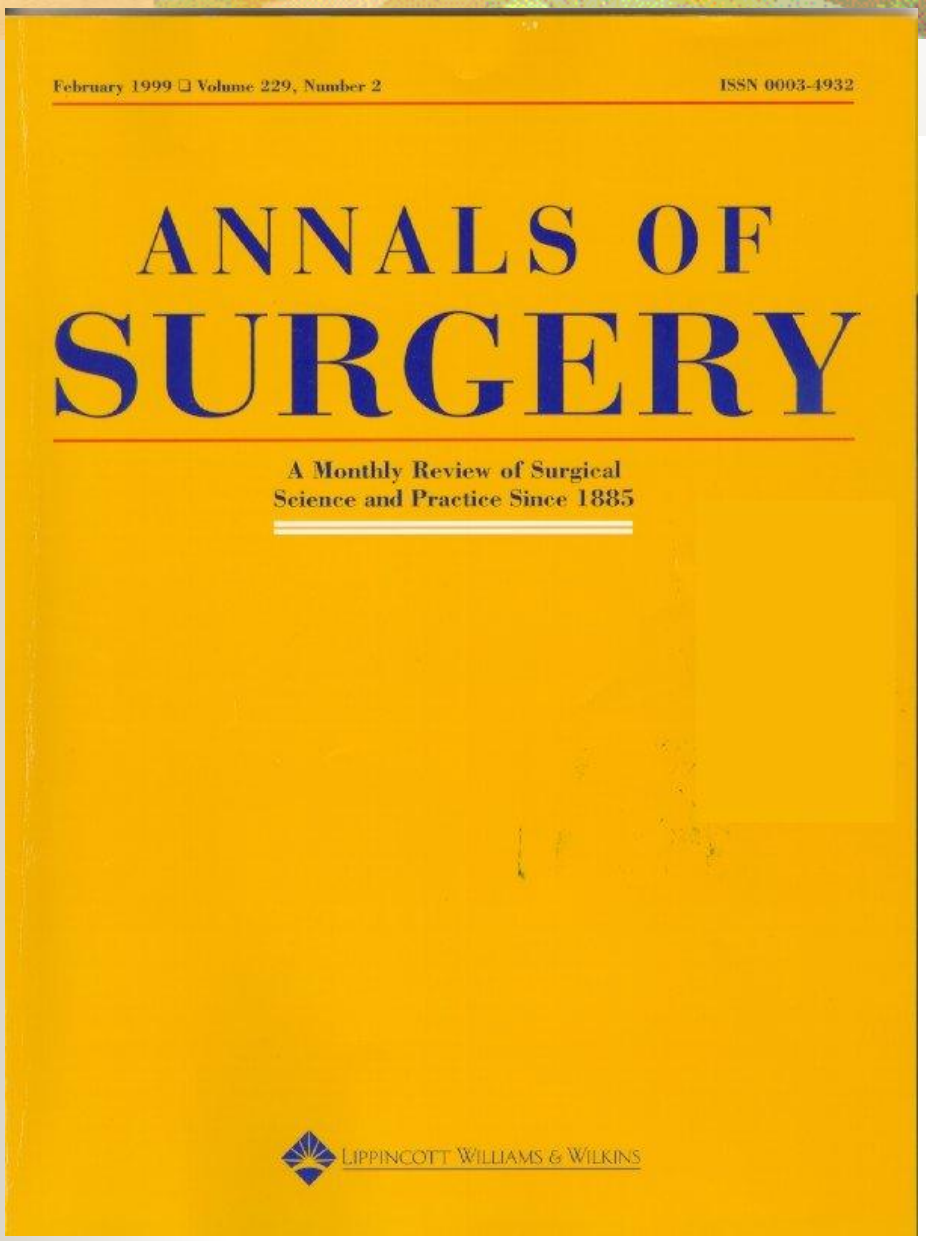
N=141 trials including 9559 patients

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.

Anesth-Analg. 1998 Feb; 86(2):235-9

I/v lidocaine speeds the return of bowel function, decreases postop pain and shortens hospital stay in patients undergoing radical retropubic prostatectomy



1998 Nov; 228(5):652-63

Surgical manipulation of the gut elicits an intestinal muscularis inflammatory response resulting in postsurgical ileus

Effect of prednisolone on the systemic response and wound healing after colonic surgery. Schulze et al. Arch Surg 1997;132(2):129-35

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.

The impact of prophylactic dexamethasone on nausea and vomiting after laparoscopic cholecystectomy: a systematic review and meta-analysis. Karanicolas et al. Ann Surg 2008; 248(5):751-62

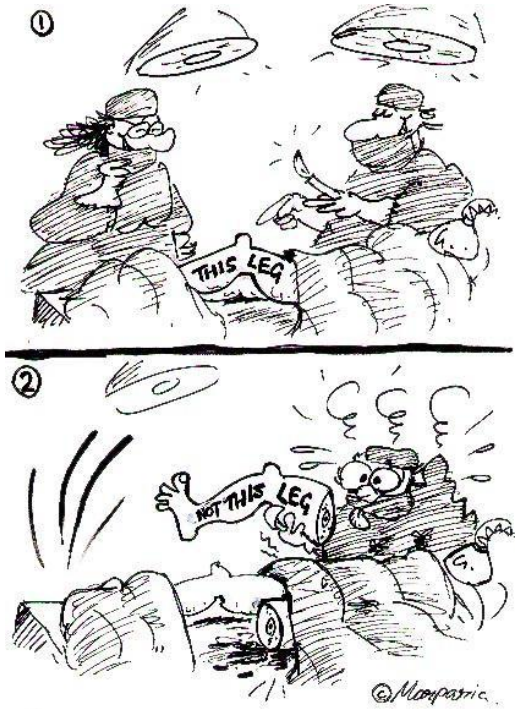
N=17 trials, >1200 patients

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



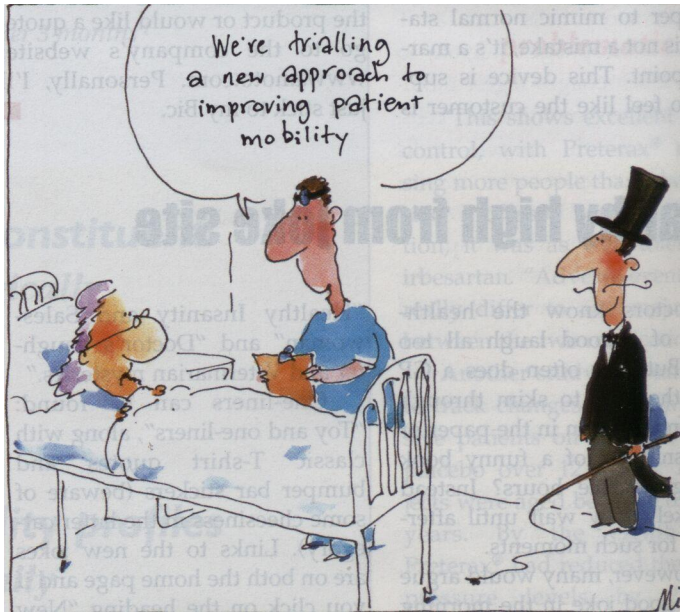
Early postoperative ambulation

All patients undergoing laparotomy

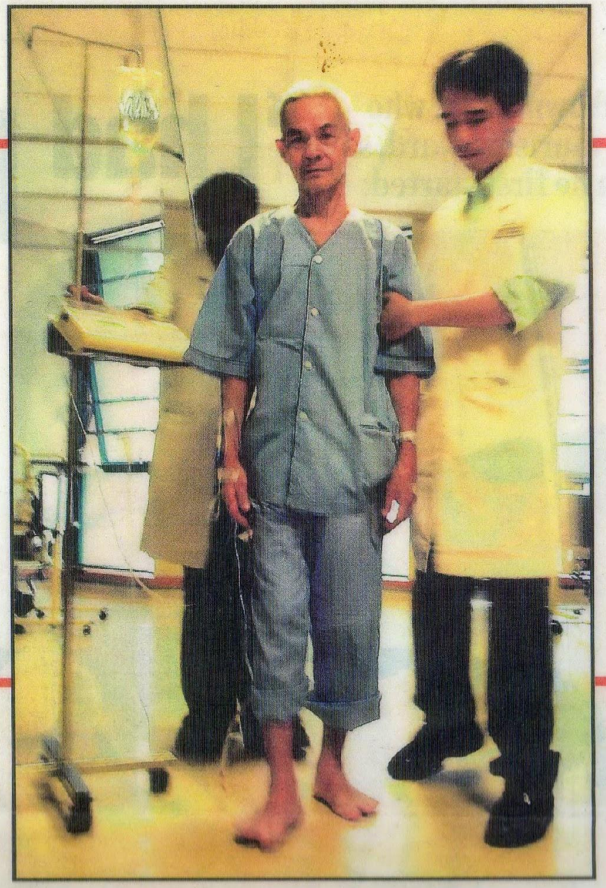
First postoperative day

Educate, encourage, enforce

Adequate pain relief



Walk 24 hours after op



Picture: DEURBON CHOW

By Ng Wan Ching
wanching@sph.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

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.

Gum chewing enhances early recovery from postoperative ileus after laparoscopic colectomy. Asao et al. J Am Coll Surg 2002;195:30-2

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

Postoperative ileus-related morbidity profile in patients treated with Alvimopan after bowel resection. Wolff, et al. JACS 2007; 204(4): 609-16

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.

COX-2 inhibitors

Original article doi:10.1111/j.1463-1318.2006.00998.x

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

R. Sim*, D. M. Cheong*, K. S. Wong†, B. M. K. Lee‡ and Q. Y. Liew‡

*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 admin-

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.

Effect of salt and water balance on recovery of gastrointestinal function after elective colonic resection: a randomised controlled trial. Lobo et al. Lancet 2002; 359: 1812–18

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.

Effects of Intravenous Fluid Restriction on Postoperative Complications: Comparison of Two Perioperative Fluid Regimens: A Randomized Assessor-Blinded Multicenter Trial. The Danish Study Group on Perioperative Fluid Therapy. Ann Surg 2003; 238(5):641-648

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.

National Healthcare Group
Adding years of healthy life
Tan Tock Seng Hospital

Affix Patient's sticky label here

PRE-OPERATION DAY

Date: _____

Clinical Pathway for Colorectal Surgery

DOCTOR'S CHECKLIST: To check	Action	NURSING INTERVENTIONS	ND	AM	PM	ND
PAT done & reviewed:	by SN	**CONSULTS**				
☐ Hb ☐ TW ☐ Platelets		Physiotherapist				
☐ UE abnormal Y/N specify_____		Stoma Nurse Clinician if indicated				
☐ ECG ☐ CXR		Acute Pain Service				
☐ CT scan/Ultrasound liver Y/N		**ACTIVITY / MOBILITY**				
☐ Histology: _____		Stoma Siting				
☐ PT/PTT		OT Chit to despatch @_____				
☐ Albumin > 3.5 g/dl ☐ CEA_____		**NUTRITION**				
☐ Consent for surgery		Oral PEG or Fleet Enema as ordered:				
☐ OT chit		▪				
☐ GXM 2 Units		Clear fluids /Low residue diet				
☐ Book bed in HD / ICU		**Pre-op: NBM after 12MN**				
☐ Anti-embolic stockings		**OBSERVATIONS**				
Bowel Preparation Required ☐ Yes ☐ No		Bowel Movement				
Specify:		Vital Signs BD				

National Healthcare Group
Adding years of healthy life
Tan Tock Seng Hospital

Affix Patient's sticky label here

OPERATION DAY

Date: _____

Clinical Pathway for Colorectal Surgery

DOCTOR'S ORDERS	Action by SN	NURSING INTERVENTIONS	AM	PM	ND
		ASSESSMENT			
POST-OP Review: (POT)		Pain Assessment			
☐ To Ward ☐ HD ☐ ICU		**INFORM:**			
☐ Hourly Parameters		Case Manager			
☐ NG Suction or ☐ Off NG tube		Physio if not done			
☐ NBM ☐ Sips of water / ice chips		Stoma Nurse Clinician if indicated			
☐ IV PCA		**ACTIVITY**			
☐ IV drip regime/transfusion:		Apply anti-embolic stockings			
		NUTRITION			
		Pre-op: NIL BY Mouth			
		Post –op: Sips of water / ice chips			
		: Continue NBM			
☐ Oxygen _____ L / min.		**OBSERVATIONS**			
☐ Check Abdominal wound / Stoma		Vital Signs hourly			
☐ Check Drains – patency and content		Check Stoma colour if present			
☐ Urinary catheter – Hourly urine output		SMD / NG output			
☐ STO date _____ POD		Incision site			
☐ Anti-embolic stockings		**EDUCATION**			

National Healthcare Group
Adding years of healthy life

Tan Tock Seng Hospital

Affix Patient's sticky label here

POST – OP DAY 1

Date: _____

Clinical Pathway for Colorectal Surgery

DOCTOR'S ORDERS	Action by SN	NURSING INTERVENTIONS	AM	PM	ND
Daily Post-op review:		**ASSESSMENT**			
Respiratory complication Y/N_____		Pain Assessment			
Urinary problem Y/N _____		**INFORM:**			
Thrombophlebitis / DVT Y/N		Case Manager if not done			
Cardiac problems Y/N_____		Physio if not done			
Ileus / Obstruction Y/N		Stoma Nurse Clinician if indicated			
Malnutrition Y/N		**ACTIVITY**			
Blood loss anaemia: Y/N		Apply anti-embolic stockings			
Electrolytes abnormal: Y/N		**NUTRITION**			
Specify_____		▪			
Others:_____		**OBSERVATIONS**			
Wound problems _____		Vital Sings 4 hourly			
Review:		Check stoma colour			
Oxygen: ☐ Continue ☐ Off		SMD / NG / Urinary output			
NG tube: ☐ Keep ☐ Off		Incision site / change dressing if indicated			
Intake/Output		**EDUCATION**			
☐ NBM		Use of PCA pump			
☐ Small feeds ☐ Soft diet ☐ DOC		Stoma Care			
		Wound Care			
Appointment to speak to relatives		**DISCHARGE PLANNING**			
Date:		Evaluate discharge needs			
Time:		Pt/family informed of caregiver training			
Doctor:		schedules and appointment to meet Dr			
ADDITIONAL ORDERS:		**Allied Healthcare Team/s Activity**	**Signature**		
		PT Regime: Post-op Assessment	**PT**		
		DESIRED OUTCOMES			
		Patient is haemodynamically stable			
		Pain score < 3			
		Stoma is healthy & pink			
		Nurse's Name	**Signature**		
		AM:			
Dr's Name:		PM:			
MCR No:		ND:			

National Healthcare Group
Adding years of healthy life

Tan Tock Seng Hospital

Affix Patient's sticky label here

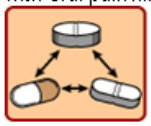
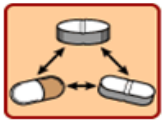
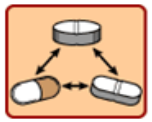
POST – OP DAY 4

Date: _____

Clinical Pathway for Colorectal Surgery

DOCTOR'S ORDERS	Action by SN	NURSING INTERVENTIONS	AM	PM	ND
Daily Post-op review:		**ASSESSMENT**			
Respiratory complication Y/N_____		Pain Assessment			
Urinary problem Y/N _____		**ACTIVITY**			
Thrombophlebitis / DVT Y/N		Apply anti-embolic stockings			
Cardiac problems Y/N_____		**NUTRITION**			
Ileus / Obstruction Y/N		DOC			
Malnutrition Y/N		**OBSERVATIONS**			
Blood loss anaemia: Y/N		Vital Signs BD			
Electrolytes abnormal: Y/N		Check stoma colour / function			
Specify_____		Incision site / change dressing if indicated			
Others:_____		**EDUCATION**			
		Stoma Care			
		Wound Care			
Wound Inspection ☐ Yes ☐ No		**DISCHARGE PLANNING**			
		Inform Pt/family tentative discharge date			
		Re- evaluate discharge plans/needs			
DISCHARGE PLANNING		Purchase stoma appliances			
☐ Tentative discharge date:		**Allied Healthcare Team/s Activity**	**Signature**		
		PT Regime: Ambulation	**PT**		
ADDITIONAL ORDERS:		**DESIRED OUTCOMES**			
		Wound is clean			
		Discharge Plan reviewed			
		Pt/family demonstrate correct colostomy			
		care			
		Stoma is healthy & pink			
		Normal bowel function			
		Nurse's Name	**Signature**		
		AM:			
Dr's Name:		PM:			
MCR No:		ND:			

Admission / Pre-Operation Day  Arrival at Emergency Department	 Check temperature, pulse, respiration and blood pressure	 Doctor will examine and explain your current condition , need for operation and nature of operation 	 Blood investigations to analyse your blood count	 Chest x-ray ordered to check your heart and lung if required	 Electrocardiography (ECG) ordered to check your heart activity if required	 Consent will be taken from you or next of kin once clinical & laboratory finding confirmed the diagnosis of appendicits (inflammation of the Appendix)	 You will be put on nil by mouth. Intravenous therapy will be administered prior to operation
Pre & Post Operation Day  You will be assessed and monitored closely for pain. Pain killer will be given to you either	 Prepare, change and send to operating theatre	 Duration of surgery depends on severity of the condition	 You will be transfered back to the general ward from operating theatre. Your condition will be monitored closely	 Intravenous therapy will be continued till reviewed by surgeon.	 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)	 Wound site will be monitored closely for sign of bleeding and infection	.  Doctor will review and update you and your family on your progress after surgery

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 and • 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 pain killer 	 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	 If you are fit for discharge, your discharge documents will be given to you at your bedside
Post Operative Day Two  Check temperature, pulse, respiration and blood pressure	 Medication will be served to you as ordered	 Doctor will examine and discharge you if: • no sign of wound infection • Diet tolerated • Pain bearable	 The nurses will inform your family of your discharge	 Discharge documents and medications will be given to you at your bedside	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 ($p = 0.105$).

CONCLUSION: The introduction of a colorectal clinical pathway significantly improved the outcome of patients undergoing major colorectal surgery. [*Asian J Surg* 2005;28(4):252-6]

Improving outcomes

'What cannot be measured, cannot be improved'

Patient's sticky label

Tan Tock Seng HOSPITAL

VARIANCE RECORD FORM
Clinical Pathway for Colorectal Procedures

Instructions:	**Key Indicators:**	Ward:
1. Document variance if patient is off pathway	☐ Complications during stay:	Bed:
2. Track & record key indicators	Yes / No	Class:
3. Record Co - morbid Conditions	☐ Discharge on the 8th POD	
4. Track factors that will prolong LOS & affect patient's outcomes.	Yes / No	☐ Elective ☐ Emergency
5. Upon discharge submit this form to Case Managers		

Date	V Code	Description	Action Taken	Signature

Variance Code (V Code):

A. Patient related:	**B. Health Care Provider**	**D. Community / Family**
• Wound Infection	• Dr's decision to postpone op	• No care giver/s
• Anastomotic leaks		• Awaiting for maid / care giver
• Burst Abdomen	**C. Hospital / System**	• Awaiting for Nursing Home
• Intra abdominal abscess	• OT delay / cancellation	• Awaiting for Community
• Chest Infection	• Diagnosis test / appointment:	Hospital
• Urinary Tract Infection	(To specify)	• Family request for extension of
• Thrombophlebitis		Stay
• Deep Vein Thrombosis (DVT)		
• Intestinal Obstruction		

Co morbid Conditions: Yes ☐ No ☐

☐ COPD / COLD	☐ IDDM (Type 1)	☐ Hypertension	☐ Stroke / CVA
☐ IHD	☐ NIDDM (Type 2)	☐ Hyperlipidemia	☐ Others (to specify)

Principal Specialist in charge: _____

Principal Diagnosis: _____

Principal Procedure: _____

Stoma: ☐ Yes ☐ No

Date: Time of Surgery: Surgeon/s:

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)

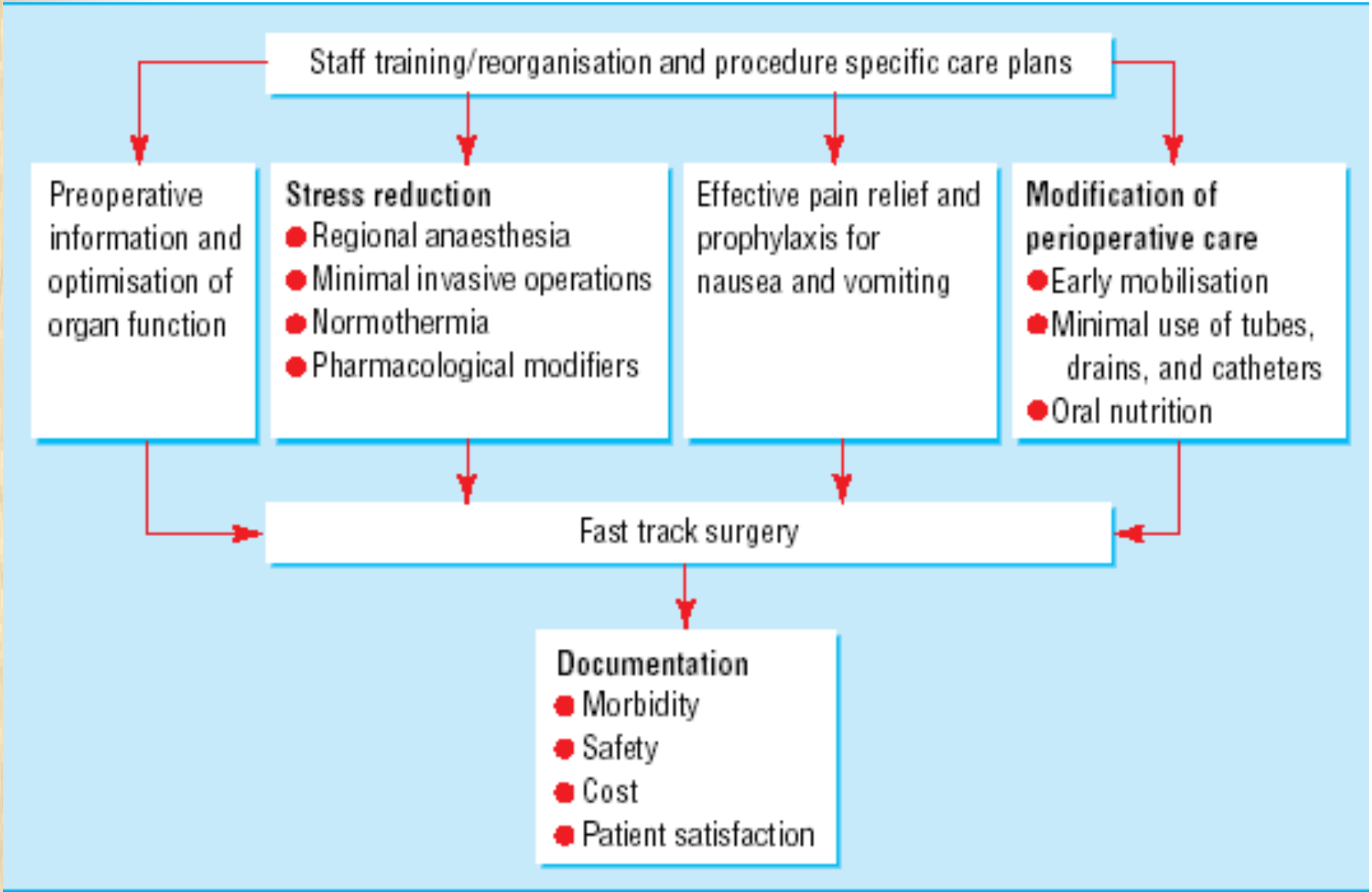
ADL status: Premorbid: ☐ Independent ☐ Assist ☐ Total
Upon discharge: ☐ Independent ☐ Assist ☐ Total

GENERALSURGERY COLORECTAL CLINICAL PATHWAY INDICATOR REPORT

	Tabulated by				
	Time Period	1st January to 31st December 2007			
		No	%		
1	**No of Patients on Colorectal Clincal Pathway**	324			
a	**No of Patients with colon surgery performed**	267	82%		
b.	**No of Patients with rectal surgery performed**	57	18%		
		Elective	**%**	**Emergenc**	**%**
2a	**Elective vs Emergency Admission rate**	68	21%	153	47%
b	SDA rates	103	32%		
3	LOS :				
a	Mean	9 days			
b	Median	7 days			
c	Range	2-81 days			
d	50th Percentile	7 days			
e	90th Percentile	16 days			

		Elective	**%**	**Emergenc**	**%**
4	**Pre-Operation vs Operation status**	195	60%	129	40%
5	LOS :				
a	Mean	8 days		12 days	
b	Median	6 days		10 days	
c	Range	2-81 days		3-37 days	
d	50th Percentile	6 days		10 days	
e	90th Percentile	12 days		21 days	
5	**Median ASA**	II			
6	**Stoma rates**	81	25%		
7	**No complication vs system variance rates**	252	78%	72	22%

Interventions for major improvement in surgical outcome



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.