SAFER ANESTHESIA FROM EDUCATION (SAFE)
SAFE Obstetric Anesthesia Course for Rwanda
December 2011

lifebox

Saving lives through safer surgery

The Angela Enright Lecture 2018

Enhancing Recovery Canada:

from siloed provider to team player

Franco Carli, MD, MPhil

McGill University

Montreal

Centre universitaire de santé McGill

McGill University Health Centre

Enhanced RECOVERY Canada

Putting patients first, improving patient safety.

- 60 patients (74 yo)
- Open colon resection + postop care program
- Epidural, early feeding (POD0) and early mobilization
- Median LOS 2 days (avg 3 days)

ANNALS OF SURGERY
Vol. 232, No. 1, 51–57

A Clinical F
Colonic Re

Linda Basse, MD, Dorthe Hj

From the Department of Su

Objective
To investigate the feasibility of a 48-hour postoperative stay program after colonic resection.

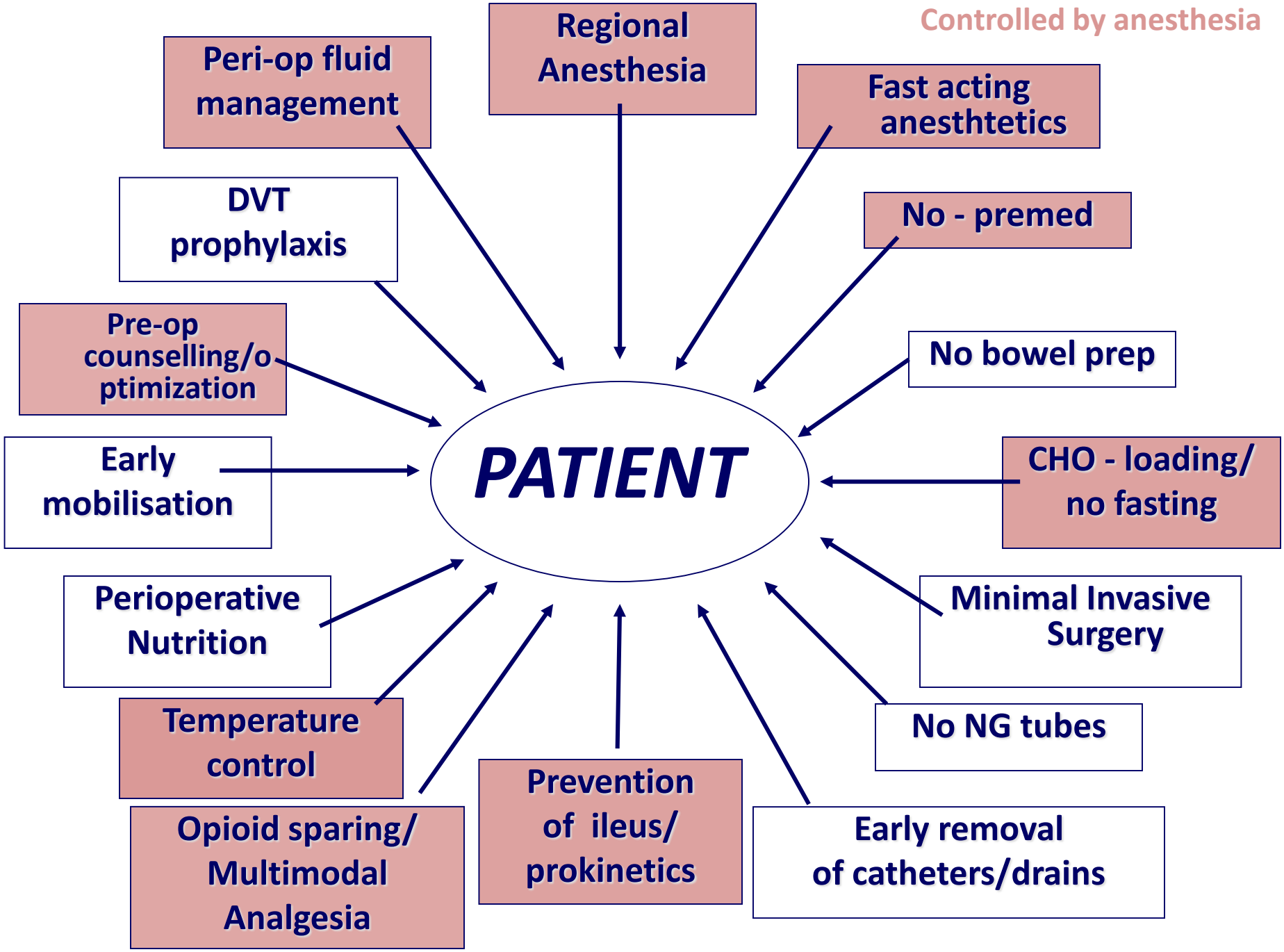
Summary Background Data
Postoperative hospital stay after colonic resection is usually 6 to 12 days, with a complication rate of 10% to 20%. Limiting factors for early recovery include stress-induced organ dysfunction, paralytic ileus, pain, and fatigue. It has been hypothesized that an accelerated multimodal rehabilitation program with optimal pain relief, stress reduction with regional anesthesia, early enteral nutrition, and early mobilization may enhance recovery and reduce the complication rate.

Methods
Sixty consecutive patients undergoing elective colonic resection were prospectively studied using a well-defined postoperative care program including continuous thoracic epidural analgesia and enforced early mobilization and enteral nutrition, and a planned 48-hour postoperative hospital stay. Postoperative follow-up was scheduled at 8 and 30 days.

Median age was 74 years, with 20 patients in ASA group III-IV. Normal gastrointestinal function (defecation) occurred within 48 hours in 57 patients, and the median hospital stay was 2 days, with 32 patients staying 2 days after surgery. There were no cardiopulmonary complications. The readmission rate was 15%, including two patients with anastomotic dehiscence (one treated conservatively, one with colostomy); other readmissions required only short-term observation.

Conclusion
A multimodal rehabilitation program may significantly reduce the postoperative hospital stay in high-risk patients undergoing colonic resection. Such a program may also reduce postoperative ileus and cardiopulmonary complications. These results may have important implications for the care of patients after colonic surgery and in the future assessment of open versus laparoscopic colonic resection.

The postoperative hospital stay after colonic resection is usually 6 to 12 days,[1–6] with a complication rate of 10% to 20%, because many patients are elderly and at high risk. The recent introduction of multimodal postoperative rehaapproximately 4 to 6 days.[6,10,11] However, in studies on the effect of laparoscopic-assisted colonic resection, there has rarely been a focus on revising perioperative care programs and on including optimal analgesia, early mobilization, and



Adapted from Fearon et a al 2005, Lassen et al Arch Surg 2009, ERAS Guidelines 2012

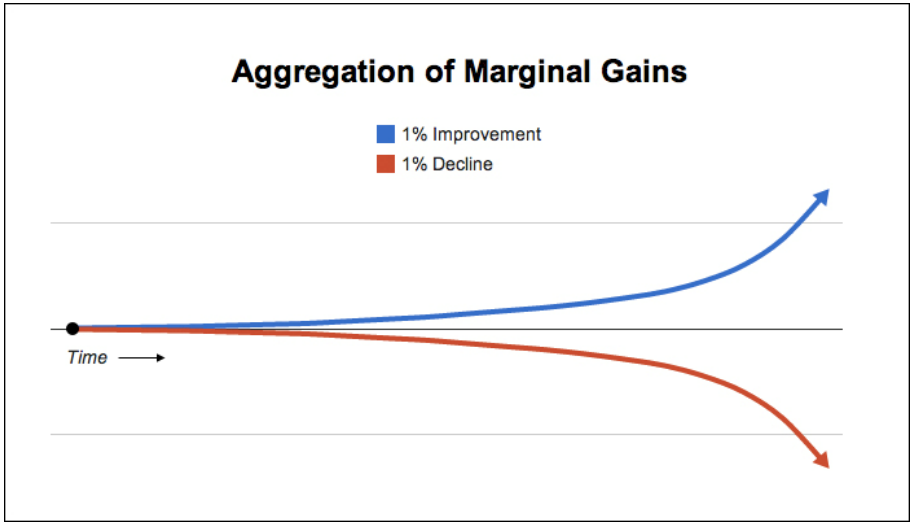
"Health care historically has been a very siloed field that's organized around medical specialties..."

"The patient is the ping-pong ball that moves from service to service.."

Michael Porter

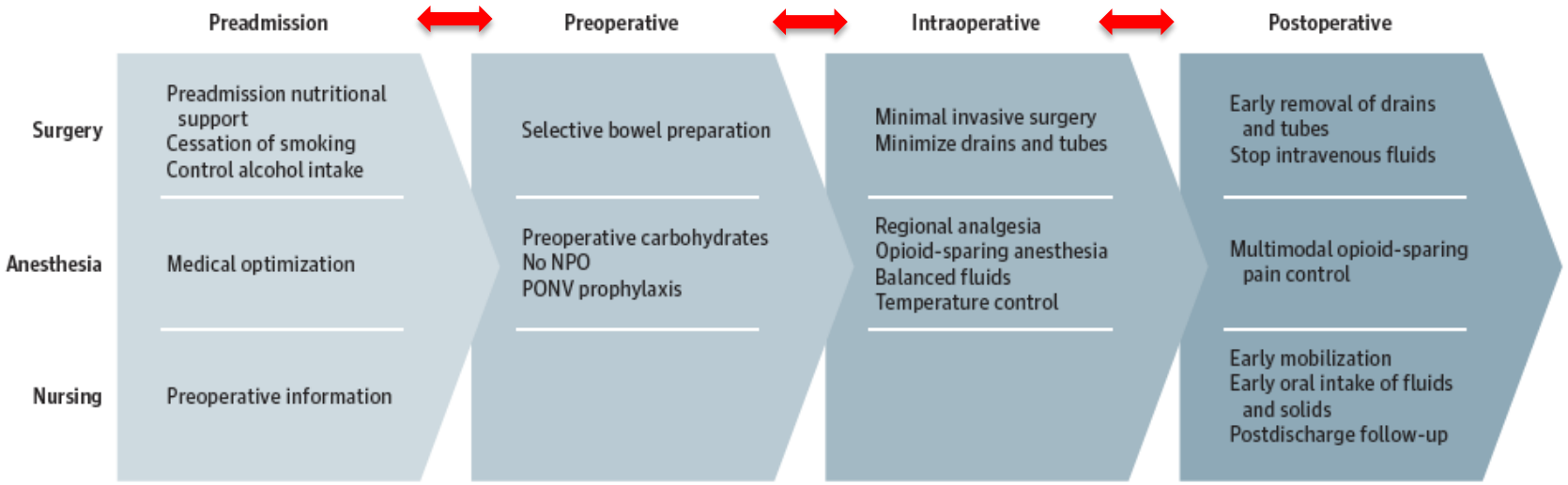
Theory of Marginal Gains

Sir Dave Brailsford



London Olympic 2012:

ERAS Programs



JAMA Surgery, 2017

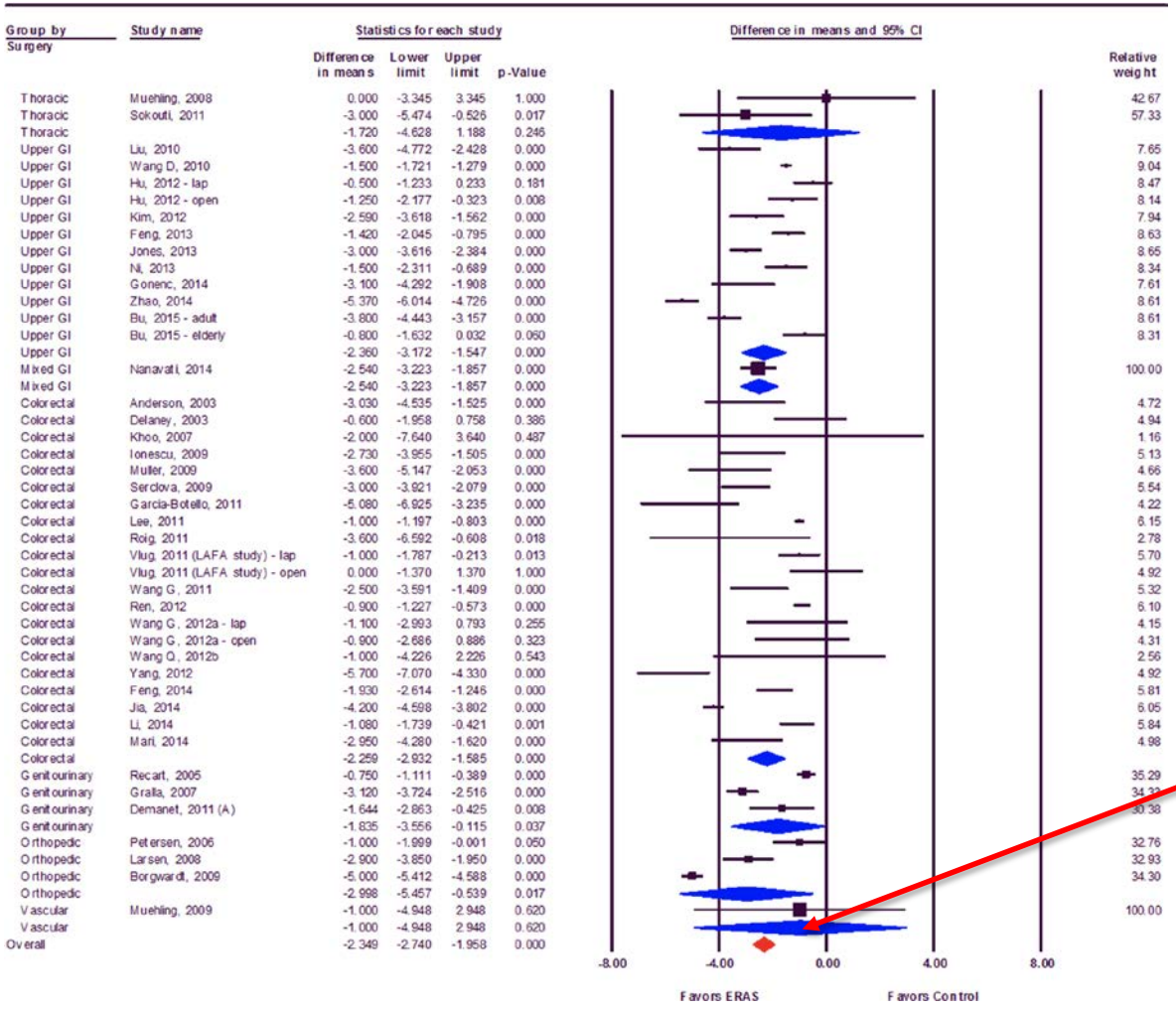
Procedure and Topic	Year of Publication
Colonic resection	2012
Rectal resection	2012
Pancreaticoduodenectomy	2012
Cystectomy	2013
Gastric resection	2014
Anesthesia protocols	2015
Anesthesia pathophysiology	2015
Major gynecology (parts 1 and 2)	2015
Bariatric surgery	2016
Liver resection	2016
Head and neck cancer surgery	2016
Breast reconstruction	2017
Hip and knee replacement	Under production
Thoracic noncardiac surgery	Under production
Esophageal resection	Under production

ERAS® Society Growth in Sept 2016

100+ units in 20+ countries

Slide shared courtesy of Dr. Olle Ljungqvist

ERAS & length of hospital stay



MD -2.34 days
95% CI
(-2.74 to -1.95)

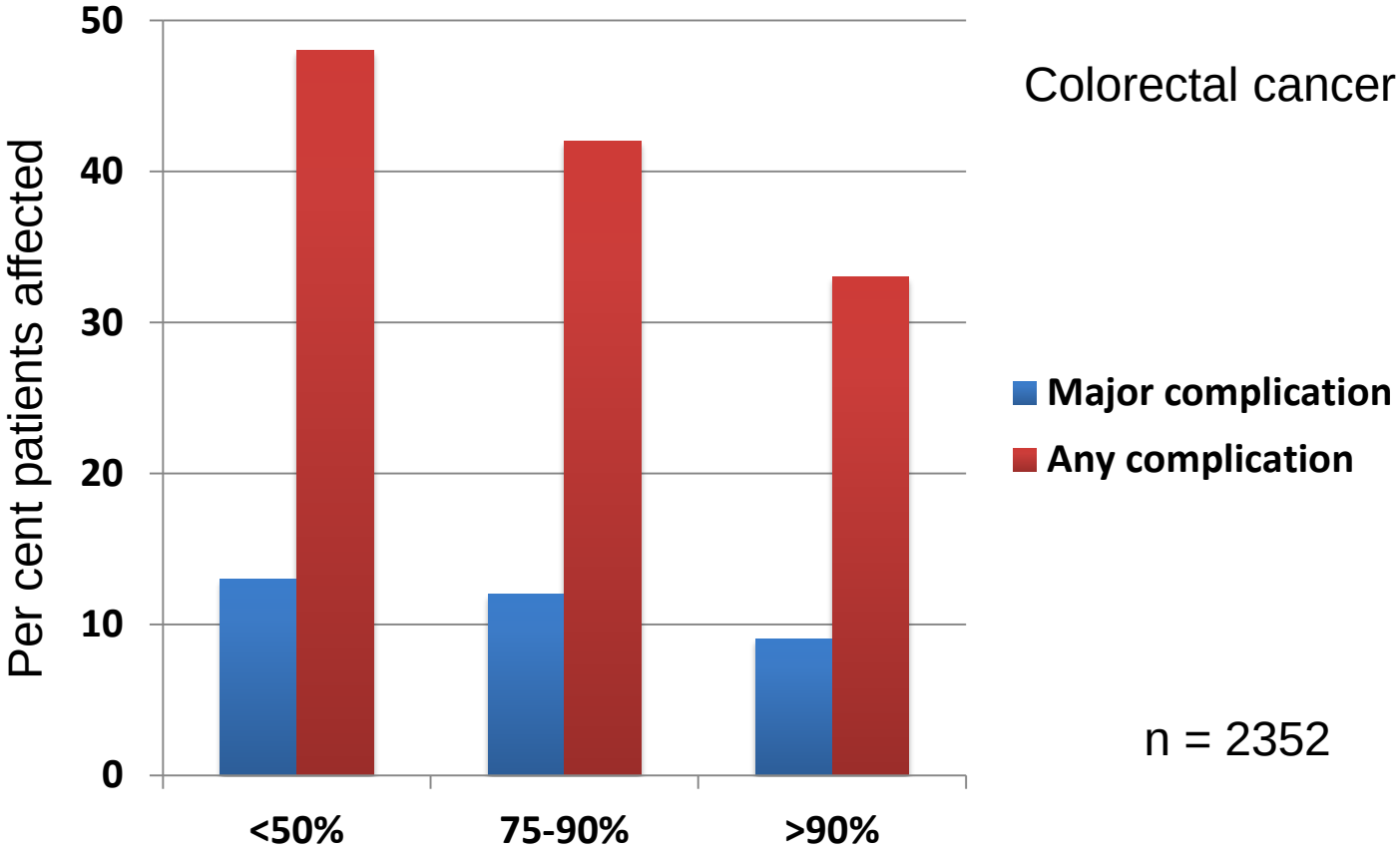
Lau C et al. World J Surg (2017) 41:899–913

ERAS & Postoperative medical complications

	RR	95% CI
Pulmonary complications	0.43	0.31 to 0.59
Cardiac complications	0.47	0.29 to 0.77
Surgical site infections	0.73	056 to 0.95

Lau C et al. World J Surg (2017) 41:899–913

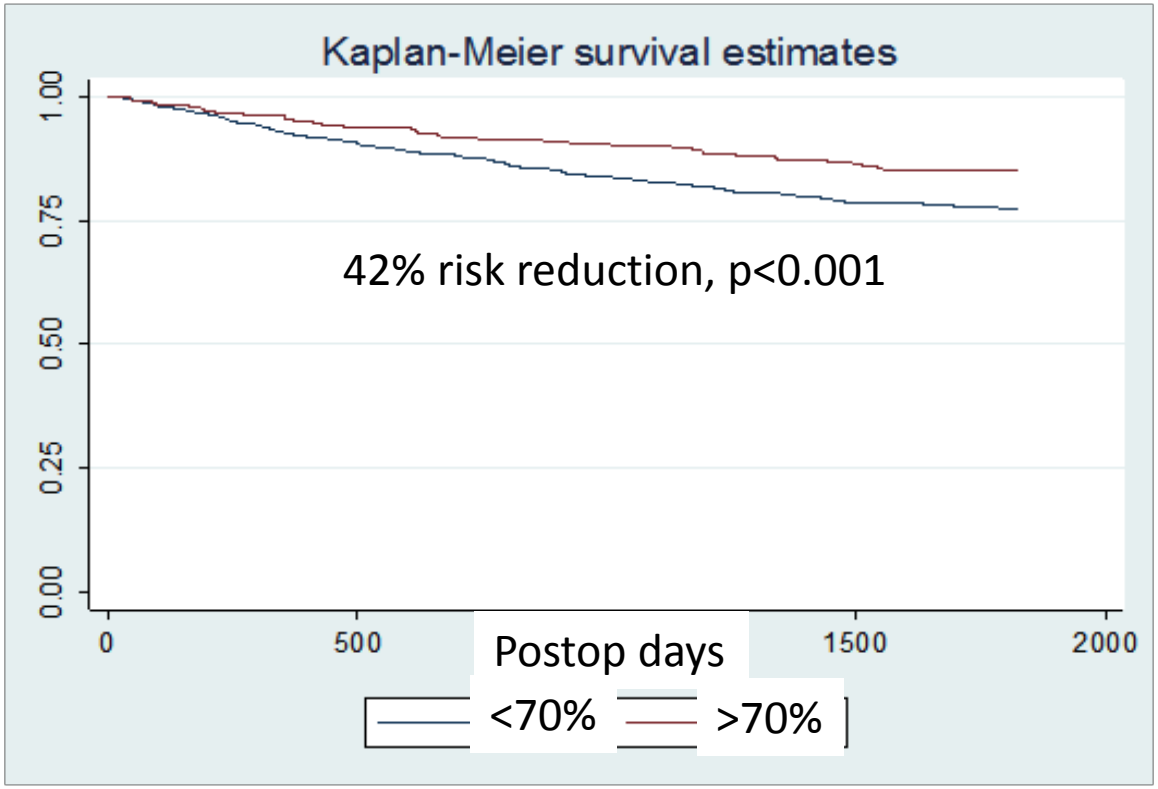
Complications
13 hospitals 7 countries



Compliance with ERAS protocol elements
Multi center study, consecutive patients

Ann Surg, 2015

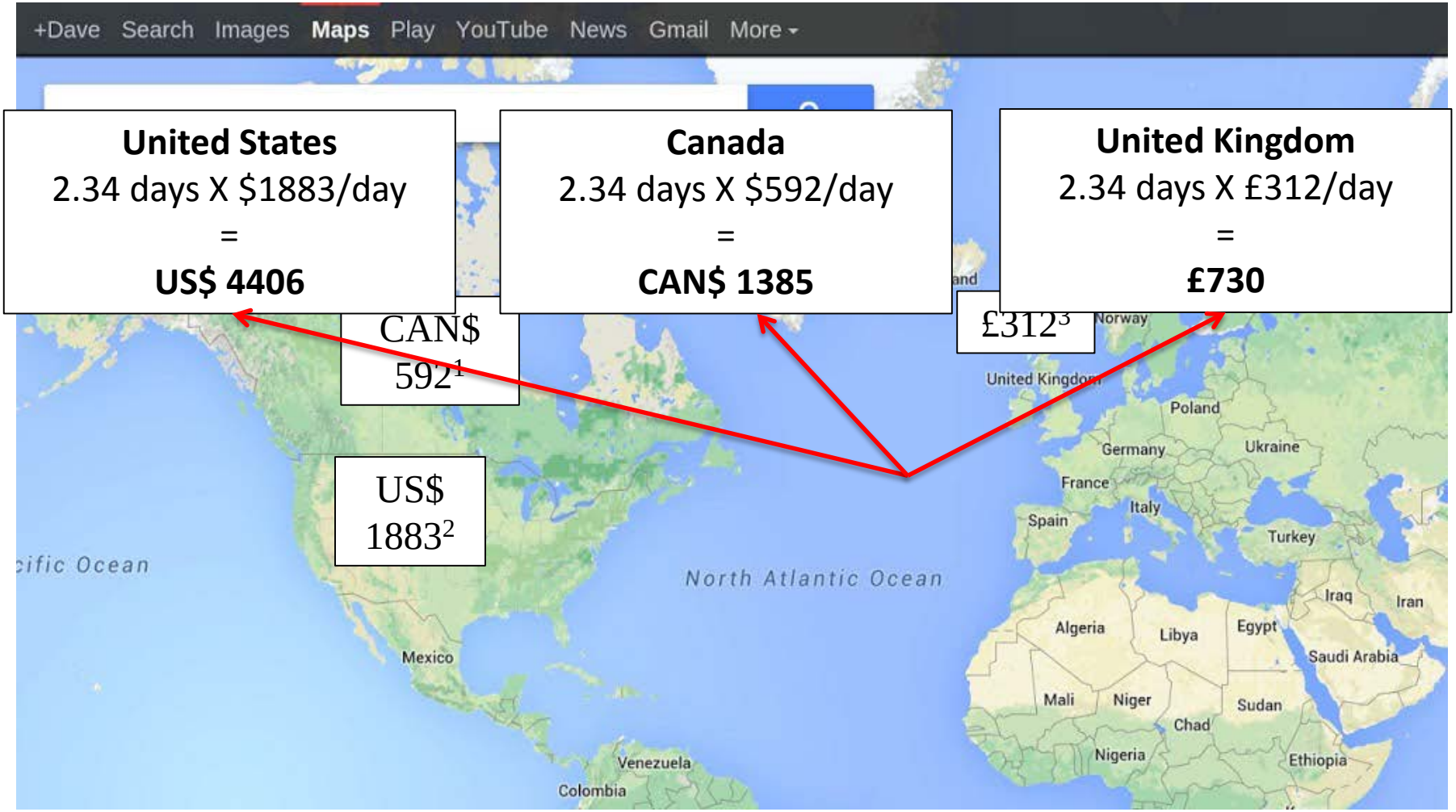
ERAS®: 5 year mortality outcomes



Compliance with ERAS protocol elements

Gustafsson et al, WJS 2016

Obviously ↓ LOS = ↓Costs

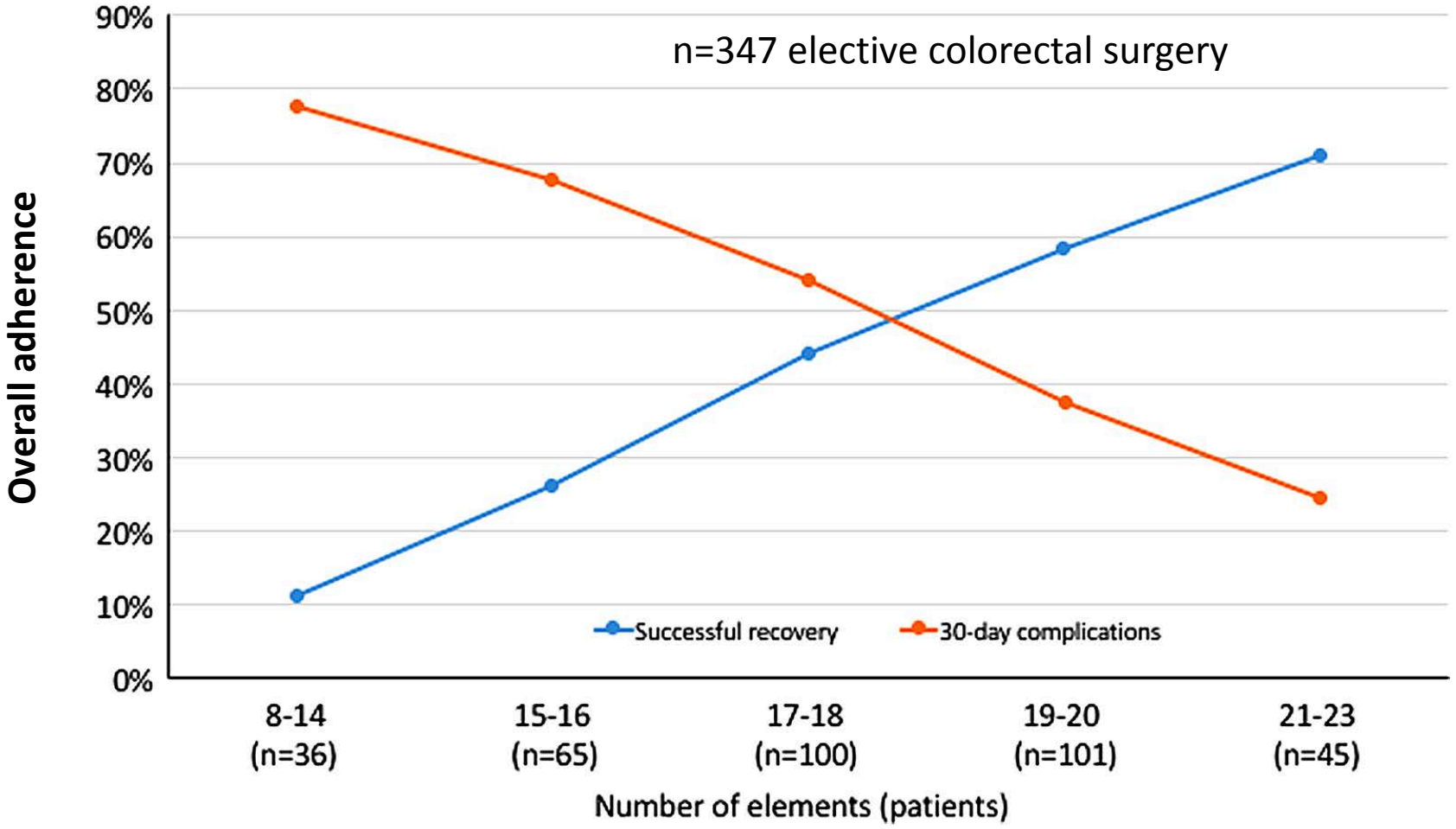


[1]MGH data; [2]Jensen DCR 2012; [3]NHS reference costs

Presence of ERAS® in Dec 2017

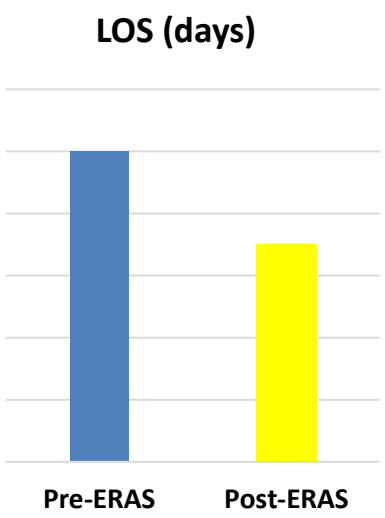
20+ sites in 5 provinces

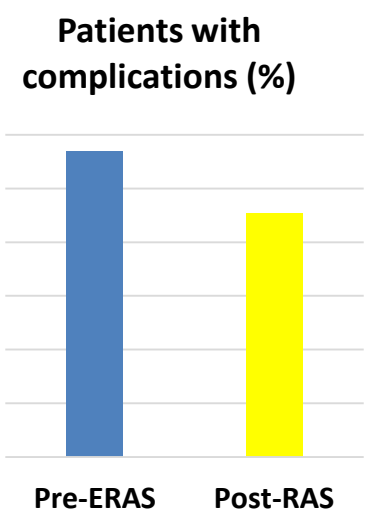
Relationship between overall adherence to enhanced recovery pathway elements, successful recovery and 30-day complications

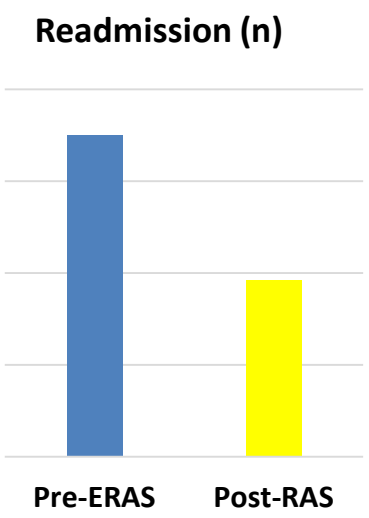


Pecorelli et al. Surg Endosc. 2016

Canada-Alberta Health Care experience







2.800 to 5.900 USD /per patient

$1 invested in ERAS gives $3.8 (range $2.4–$5.1) in return*

Gramlich et al. Implementation Science (2017) 12:67

Thanh N et al. CJS: 59(6) 2016*

Postoperative ERAS Interventions Have the Greatest Impact on Optimal Recovery

Experience With Implementation of ERAS Across Multiple Hospitals

- **2,876 patients**
- **15 academic hospitals Ontario**
- **40% compliance to postoperative ERAS elements**
- **Outcome increased with better compliance**

Aarts MA et al, Ann Surg 2018;267:992

Davies JM, Merchant R, O'Neil T, Carli F

on behalf of the CAS Standards Committee

ERAS in CANADA

Surveys 2014 & 2016

Cross-Canada snapshot

- **involvement in & attitudes to ERAS programs**
- **challenges for successful implementation of ERAS programmes**
- **attitudes to colleagues**
- **barriers to implementing CAS evidence-based fasting guidelines**

Results

	2014 - 2015	2015 - 2016
# Questionnaires sent out	2309	2590
# Questionnaires returned	224 (9.7%)	248 (9.6%)
Did not participate in an ERAS program	31.0%	20.0%
Comfortable giving colleagues responsibility for tasks & not wishing to oversee their work	Agreed & strongly agreed: 80.5%	Agreed & strongly agreed: 82.6%
Respected colleagues' decisions	Agreed & strongly agreed: 83.1% Not so supportive: 17.0%	Agreed & strongly agreed: 88.6% Not so supportive: 11.3%
• Strict NPO after 2400 hours • Fast patients 2-3 hours • Follow ERAS guidelines (carbohydrate drink then fast 2 hours)	• 49 (25.0%) • 133 (68.6%) • 29 (14.9%)	• 39 (18.5%) • 124 (60.2%) • 56 (27.2%)

Comments

- **Most surprising**
  - **# respondents reporting**
    - **their patients still forced to fast from midnight or at least 8 hours preoperatively**
- **> 3 decades ago (1987)**
  - **CAS fasting guidelines changed**
    - **from 'NPO after 2400 hours'**
    - **to the 5-hour rule**
- **2 decades ago (1999)**
  - **CAS fasting guidelines changed**
    - **adoption of the 2-hour rule**

Canadian Journal of Anesthesia 2015

Can J Anesth/J Can Anesth (2015) 62:99–104
DOI 10.1007/s12630-014-0261-3

EDITORIALS

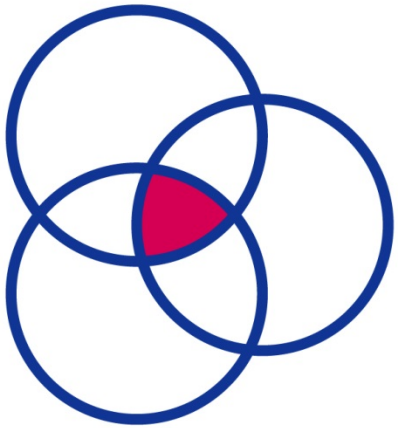
Enhanced Recovery After Surgery (ERAS): good for now, but what about the future?

Barriers and facilitators for the implementation and sustainability of ERAS program

Barriers	Facilitators
Resistance from health care professionals	Ongoing education about ERAS for clinicians and staff members
Resistance from patients	Champions and strong multidisciplinary team with good communication
Limited resources	Patient engagement and education
Rotating staff and residents	Continuous auditing and feedback of results to frontline clinicians
Belief that implementation would be too difficult	Hospital leadership and administration support
Perceived lack of evidence	Alignment of ERAS program design with current hospital practices
	Effective supporters
	Full time ERAS coordinators
	Regularly scheduled ERAS team meeting
	Standardization of protocol elements within a hospital

Stone AB et al. JAMA Surgery 2018

Enhanced
RECOVERY
Canada



Putting patients first, improving patient safety.

CPSI and *Enhanced Recovery Canada*

- Canadian Patient Safety Institute (CPSI) with 24 partner organizations founded *Enhanced Recovery Canada*

- *Enhanced Recovery Canada* will:
  - Collaborate with partner organizations to facilitate the creation of *Enhanced Recovery Canada* Guidelines
  - Facilitate the dissemination of *Enhanced Recovery Canada* Guidelines across the country


cpsi icsp
Canadian Patient Safety Institute
Institut canadien pour la sécurité des patients


CANADIAN ASSOCIATION
of GENERAL SURGEONS


CANADIAN ANESTHESIOLOGISTS' SOCIETY
SOCIÉTÉ CANADIENNE DES ANESTHÉSIOLOGISTES


ROYAL COLLEGE
OF PHYSICIANS AND SURGEONS OF CANADA
COLLÈGE ROYAL
DES MÉDECINS ET CHIRURGIENS DU CANADA


THE SOCIETY OF OBSTETRICIANS
AND GYNAECOLOGISTS OF CANADA
LA SOCIÉTÉ DES OBSTÉTRICIENS
ET GYNÉCOLOGUES DU CANADA


PATIENTS FOR PATIENT SAFETY CANADA
PATIENTS POUR LA SÉCURITÉ DES PATIENTS DU CANADA


THE CANADIAN ORTHOPAEDIC ASSOCIATION
ASSOCIATION CANADIENNE D'ORTHOPÉDIE


THE COLLEGE OF FAMILY PHYSICIANS OF CANADA
LE COLLÈGE DES MÉDECINS DE FAMILLE DU CANADA


doctors of bc
Better. Together.


Canadian Urological Association
Association des urologues du Canada

Operating Room Nurses Association of Canada

Association des infirmières et infirmiers de salles d'opération du Canada

CHNC

Community Health Nurses of Canada

IBCC

Infirmières et infirmiers en santé communautaire du Canada

CANADIAN NURSES ASSOCIATION

ASSOCIATION DES INFIRMIÈRES ET INFIRMIERS DU CANADA ®

Canadian Malnutrition Task Force™ | le Groupe de travail canadien sur la malnutrition™

Advancing Nutrition Care in Canada / Améliorer les soins nutritionnels au Canada

Canadian Physiotherapy Association | Association canadienne de physiothérapie

Canadian Society of Hospital Pharmacists

Société canadienne des pharmaciens d'hôpitaux


Alberta Health Services
Surgery Strategic Clinical Network™


Eastern Health


Sunnybrook
HEALTH SCIENCES CENTRE


Best Practice in Surgery


Surgery
UNIVERSITY OF TORONTO


Centre universitaire de santé McGill
McGill University Health Centre


HSO


ATLANTIC COLLABORATIVE
HEALTH QUALITY & PATIENT SAFETY
COLLABORATIVE DE L'ATLANTIQUE
QUALITÉ DES SOINS ET SÉCURITÉ DES PATIENTS


BC PATIENT SAFETY & QUALITY COUNCIL
Working Together. Accelerating Improvement.


MB HEALTHCARE PROVIDERS
NETWORK


Government of Saskatchewan


HQCA
Health Quality Council of Alberta

ERC SPONSORS

Gold

3M

MERCK
INVENTING FOR LIFE

Silver

Medtronic

FRESENIUS KABI
caring for life

Shire

Nestlé HealthScience

Edwards

Bronze

Abbott

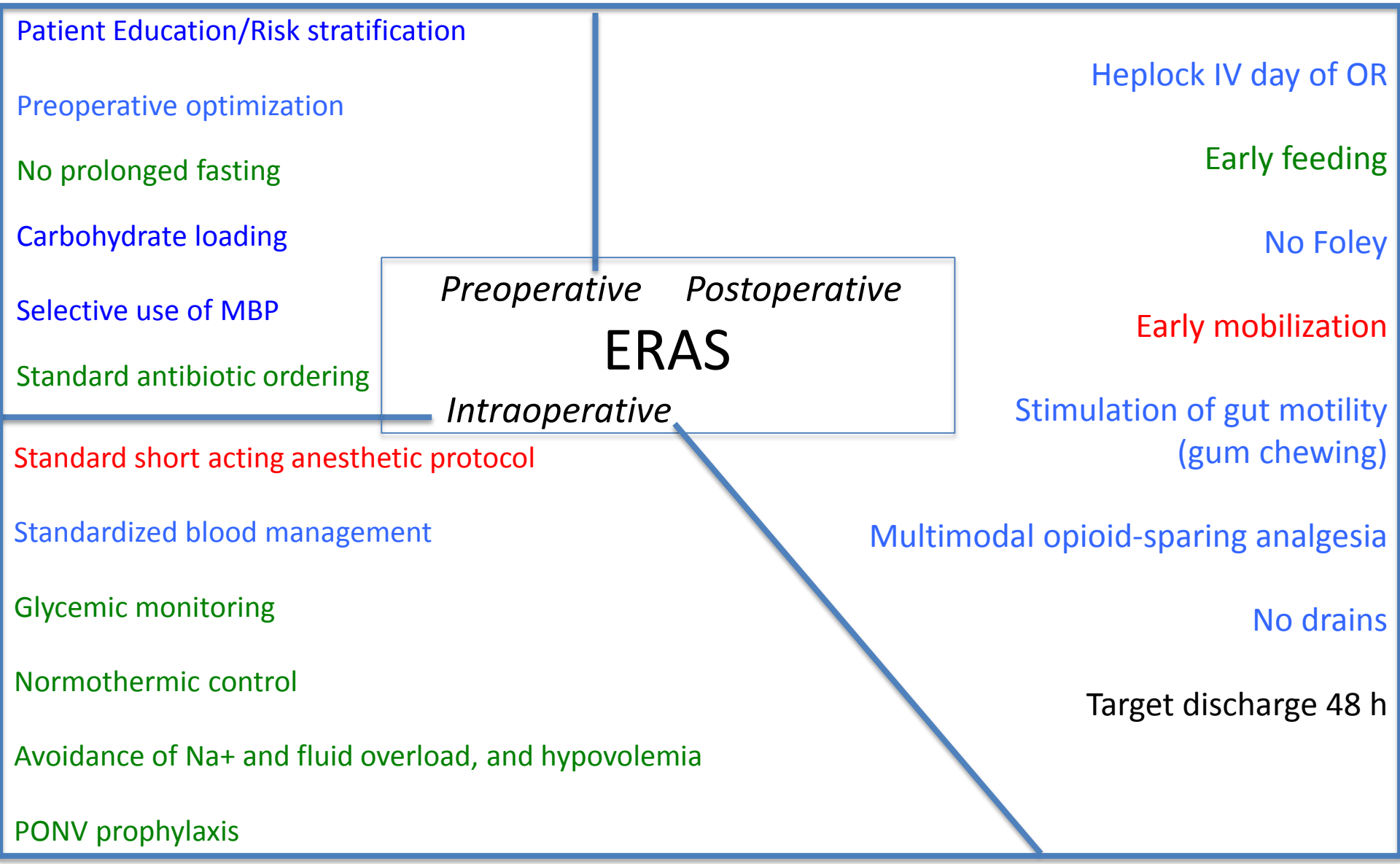
Baxter

HOW
HEALTH OUTCOMES WORLDWIDE

SeamlessMD

ConMed

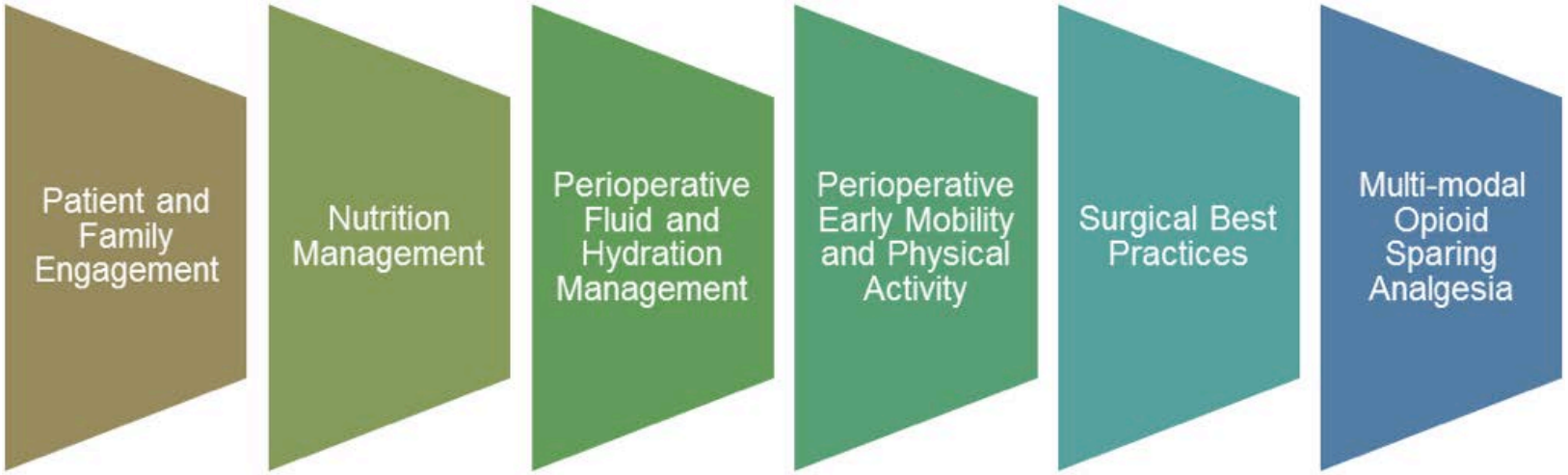
ERAS elements for gastrointestinal surgery



cpsi icsp Canadian Patient Safety Institute
Institut canadien pour la sécurité des patients

Implementing ERAS programs at the national level
Enhanced Recovery Canada

Six initial pillars



Enhanced RECOVERY Canada
Putting patients first, improving patient safety.

ROYAL COLLEGE OF PHYSICIANS AND SURGEONS OF CANADA
COLLÈGE ROYAL DES MÉDECINS ET CHIRURGIENS DU CANADA

CANADIAN ANESTHESIOLOGISTS' SOCIETY · SOCIÉTÉ CANADIENNE DES ANESTHÉSIOLOGISTES

ENHANCED RECOVERY CANADA

Perioperative early mobility and physical activity	Nutrition management	Surgical Best Practices	Perioperative hydration and volume optimization	Multi-modal opioid sparing analgesia	Patient Engagement Group
Dr. Francesco Carli Celena Scheede Bergdahl Julio Fiore Erin Ballah Dr. Jackie Farquhar Chiara Singh Dr. Sender Liberman Dr. Amal Bessissow	Dr. Leah Gramlich Heather Keller Manon Laporte Marlis Atkins Chelsia Gillis Loius-Francois Cote	Dr. Ahmer Karimuddin Maryanne Arts Dr. Biniam Kidane Dr. Liane Feldman Dr. Magda Recsky Dr. Tony MacLean Dr. Timothy Jackson Dr. Leah Gramlich Dr. Gregg Nelson Dr. Evan Minty	Dr. Gabriele Baldini Dr. Yannick Lemanach Dr. Stuart Mcclusskey Dr. Kelly Mayson Selena Fitzgerald Dr. Lucie Filteau	Dr. Philippe Richebe Dr. Hance Clark Dr. Naveen Eipe Erin Ballah Dr. Gabrielle Pagé Krista Brecht Dr. Véronique Brulotte	Dr. Leah Gramlich Melinda Baum Jennifer Rees Nancy Posel Valerie Philips Melissa Sheldrick Bevin LeDrew

Six Pillars of Enhanced Recovery Canada

Patient Engagement

Mobility

ERC – Patient Engagement

- Preoperative education has been shown to:
  - Decrease patients' anxiety and fears about surgery
  - Reduce postoperative complications
  - Lessen use of postoperative analgesia
  - Shorten hospital stay

- Patient engagement is integral to success of ERAS® programs
  - Many ERAS® guidelines are reliant on patient adherence

ERC - Nutrition

- Assess nutrition and sarcopenia
- Prolonged fast is inappropriate in preparing patients for the stress of surgery

- *Canadian Anesthesiologists' Society* Preoperative Fasting Guidelines:
  - Fast from intake of a light meal or nonhuman milk 6 hours before elective procedures
  - Patients should be encouraged to drink clear fluids up to 2 hours before anesthesia administration

ERC- Nutrition

- Carbohydrate loading before surgery:
  - Cochrane Review found that intake of a carbohydrate beverage prior to surgery may lead to small reduction in length of hospital admission in non-diabetic patients
  - Limited evidence to *recommend* carbohydrate loading in diabetic patients

ERC- Nutrition

- Postoperative feeding:
  - Introduction of fluids/solids on POD 0/1 results in small decrease in length of stay compared to traditional method of “nil per os” until bowel function resumes
  - May lead to increased chance of vomiting but otherwise appears to be no adverse effects
  - Does not increase the rate of wound infection, infectious complications or anastomosis dehiscence

ERC- Mobility

- Postsurgical immobility promotes:
  - Insulin resistance
  - Muscle atrophy
  - Poor functional capacity

- Stress of surgery can result in:
  - Loss of lean body mass muscle mass
  - Fatigue
  - Delayed recovery of functional capacity

ERC- Mobility

- Generalized mobility recommendations based on literature showing detrimental effects of bedrest after surgery
- Orthopedic literature found strong evidence to support mobilization within 24 hours of surgery
- First mobilization on POD 0/1 after orthopedic surgery led to:
  - Fewer complications (ie. DVT & PE)
  - Reduced hospital stay

ERC– Perioperative Fluid Management

- Hypovolemia must be avoided because it may lead to adverse events (minor organ dysfunction, multi-organ failure, death)

- Liberal administration of fluid may impair pulmonary, cardiac and gastrointestinal function and lead to postoperative complications and prolonged recovery

- Goal-directed fluid therapy (GDFT) should be utilized on selected patients to optimize cardiac performance or stroke volume
  - GDFT reduces postoperative morbidity for high risk patients

ERC– Multimodal Pain Management

- Multimodal pain management is recommended for the treatment of postoperative pain:
  - Use variety of analgesic medication to target different mechanisms of action in the peripheral and/or central nervous system
  - Avoid opioids when possible
  - Transition to oral medications as soon as possible

- Opioid sparing, multimodal pain management:
  - Reduces stress
  - Reduces insulin resistance
  - Facilitates mobility

ERC– Surgical Best Practices: Appropriate Use and Removal of Lines/Tubes

- Urinary Catheters:
  - UTIs are the most common type of hospital acquired infection
  - Biggest risk factor for developing a UTI is indwelling catheter
  - Urinary catheters should be avoided unless absolutely necessary
  - If used, urinary catheter should be removed within 24 hours (except if patient had rectal or urologic surgery)

ERC– Surgical Best Practices: Appropriate Use and Removal of Lines/Tubes

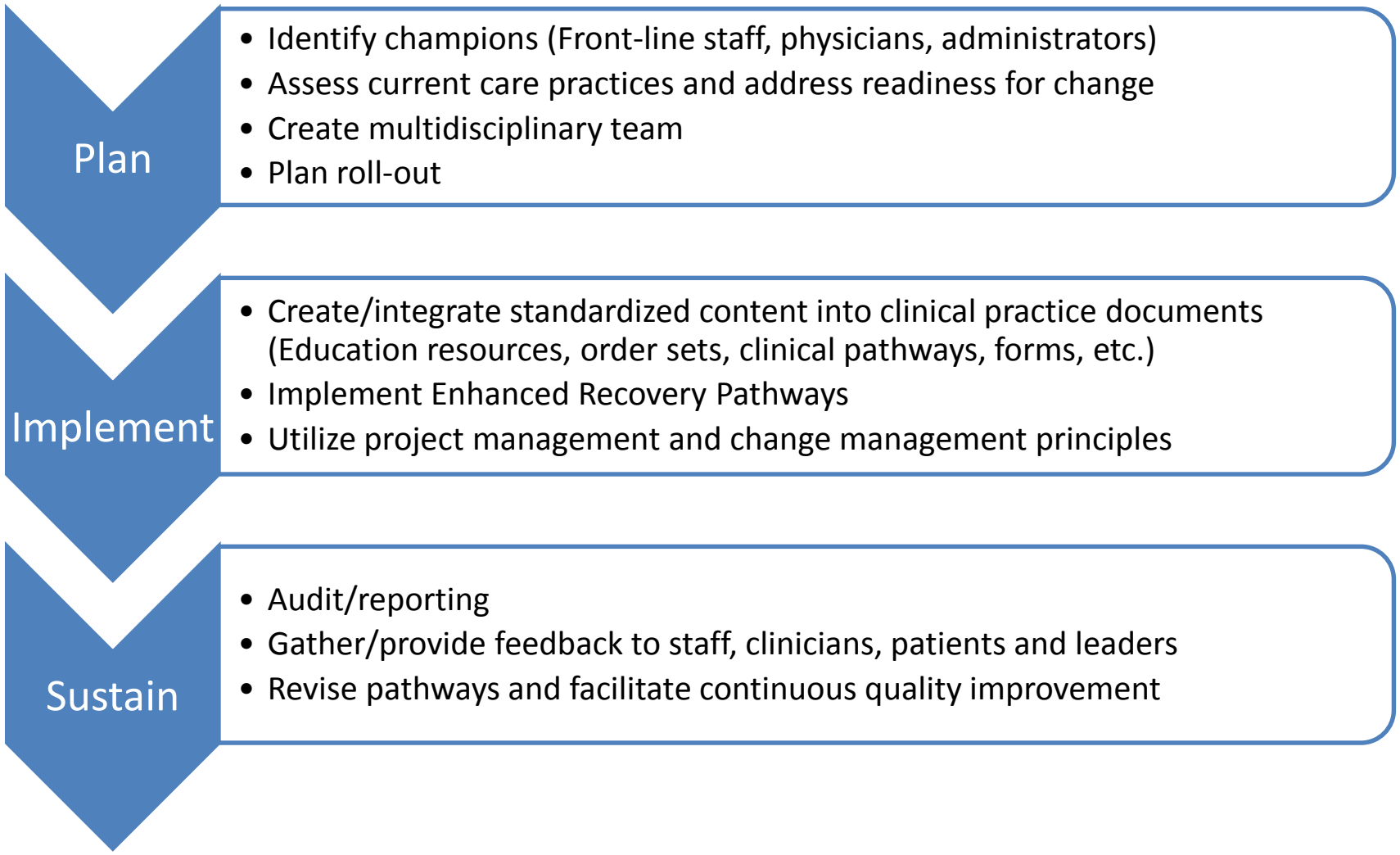
- NG Tubes:
  - Cochrane Review recommends to avoid prophylactic use of NG tubes for decompression after GI surgery
- IV Fluids:
  - Removal of IV lines encourages increased mobility and ambulation

ER Guidelines – Surgical Best Practices:
Surgical Site Infection Prevention & VTE Prophylaxis

- Surgical site infection prevention:
  - Perioperative antimicrobial coverage
  - Appropriate hair removal
  - Perioperative normothermia
  - Maintenance of perioperative glucose control, etc.

- VTE prevention:
  - Appropriate standardized screening for VTE prophylaxi
  - Implementation of standardized order sets for prophylaxis administration
  - Audit, etc.

Implement Enhanced Recovery



ERAS implementation: time to move forward

“The ERAS implementation process has been well described by starting to read the ERAS literature on the procedure in question, to know your own data, to compare with other data from fully implemented ERAS programs and to monitor the results.”

Kehlet H. Ann Surg 2018;267:998

'Enhanced Recovery After Surgery
A Review

Enhanced Recovery After Surgery programs represent a paradigm shift in how surgical care is delivered and how changes in practice are disseminated and implemented. These results rely on a new approach to teamwork, continuous audit, and support of data-driven change and improvement

Ljunqvist O et al JAMA Surgery 2017;152:292

ERC Requires an Interdisciplinary Approach to Succeed


© PA