# Enhanced Recovery Pathways: 23 hour laparoscopic colectomy



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### **Operational Efficiency in Colon Surgery**

# **Disclosure Slide**

# **Conor Delaney MD PhD**

Ethicon Socrates Analytics Simbionix Covidien Surgisense Licensed patent - 2013 Founder / Ownership / IP Royalty – 2014 Consultant – 2014 Consultant - 2014

**Editorial Boards:** 

Dis Colon Rectum; World J Surg Colorectal Disease; Polish J Surgery World J Gastroenterol; Amer J Surgery





Enhanced Recovery Pathways and Resource Utilization

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### Page 2

# Operational Efficiency in Colon Surgery **Clinical and Financial Significance** • HCFA data (Medicare): 1999-2000 • 161,000 major intestinal / CR resections • mean post-op stay =11.3 days • 1.8 million hospital bed-days • \$1.75 billion per annum

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		(d)	of stay
Post-operative pathway :			
Traditional care Fast track care	273 106	7.7 4.7 †	<b>39%</b>

	Fast track (n=32)	Traditional (n=33)	р
LOS under 70's	4.7	5.8	0.01
LOS 'Fast track' surgeons	3.8	5.0	0.001
Pain score on D/C	3.1	3.1	0.79
Satisfaction with stay	8.1	8.2	0.81
Readmissions	3	6	0.45

	РСА	Epidural	p
LOS	5.0 (4.0-8.5)	5.0 (4.0-7.0)	0.94
Age	47	44	0.52
Pain score at 48h	3.3	2.5	0.0
Pain score on D/C	3.1 <u>+</u> 2.0	3.1 <u>+</u> 2.4	0.79
Pain score (all others)	identical		
Costs (\$)	4586	3808	0.14

	CREAD (n=97)	Trad (n=97)	р
Median stay	4	5	0.01
Mean stay	5.0	5.9	0.01
Readmission	24	20	0.49
Reoperation	9	10	0.80
Mean direct cost (\$)	5690	6670	0.001
Complications	similar		

# Accelerated rehabilitation vs conventional care for segmental colectomy

	Hospital 1	Hospital 2
Care path	Conventional	Multimodal
<ul> <li>Consecutive pts</li> </ul>	130	130
Accrual period	3 yr	3yr (approx)
<ul> <li>Defecation (d)</li> </ul>	4.5	2 *
Median LOS (d)	8	2 *
• Mean LOS (d)	10.0	3.3 *
Complications	45%	25% *
Anastomotic leak	4%	4%
Readmission (%)	12	20
* <i>P</i> <0.05		
Basse et al, DCR 2004		🚺 Cleveland Clinic



	ERAS Pro	rams	TPC	8	Risk Ratio	Risk Ratio	
Study or Subgroup	Events	Total	Events	Total	I, Random, 95% Cl	M-H, Random, 95% Cl	
Anderson 2003	0	14	0	11	Not estimable		
Delaney 2003	3	31	6	33	0.53 [0.15, 1.95]		
Gatt 2005	1	19	4	20	0.26 [0.03, 2.15]		
Khoo 2007	3	35	1	35	3.00 [0.33, 27.46]		
Total (95% CI)		99		99	0.67 [0.20, 2.19]	-	
Total events	7		11				
Heterogeneity: Tau <sup>2</sup> = Test for overall effect:	0.28; Chi <sup>2</sup> = Z = 0.67 (P =	2.64, df = 0.50)	2 (P = 0.	27); 🖻 :	0.0 Favou	1 0,1 1 10 s experimental Favours cont	0t Jot

### Surgery, 2011

Enhanced recovery pathways optimize health outcomes and resource utilization: A meta-analysis of randomized controlled trials in colorectal surgery

Michel Adamina, MD, PD, MSc.<sup>a,b</sup> Henrik Kehlet, MD, PhD,<sup>c</sup> George A. Tomlinson,<sup>d</sup> Anthony J. Senagore, MD, MS, MBA,<sup>e</sup> and Conor P. Delaney, MD, MCh, PhD,<sup>a</sup> Cleveland, Oh, St. Gallen, Switzerland, Copenhagen, Denmark, Toronto, Ontario, Canada, and Gravid Rapids, Mich

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### **Operational Efficiency in Colon Surgery**

# Adherence to Surgical Care Improvement Project Measures and the Association With Postoperative Infections

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Conor P. Delane	y, MD, PhD
Duncan V. Neuli	auser, PhD
David C. Aron, 3	ID, MS
Pingfu Fu, PhD	
Siran M. Koronk	ian, PhD
HE SCR	ICAL CARE IMPROVE

**Context** The Surgical Care Improvement Project (SCIP) aims to reduce su fectious complication rates through measurement and reporting of 6 in prevention process-of-care measures. However, an association between SCII mance and clinical outcomes has not been demonstrated.

Objective To examine the relationship between SCIP infection-prevention of-care measures and postoperative infection rates.

Design, Setting, Participants: A retrospective cohort study, using Pree Perspective Database for discharges between July 1, 2006 and March 31, . 405 720 patients (69% white and 11% black; 46% Medicare patients; and 6 the surgical cased from 398 housitals in the United States for whom SCB

## **JAMA** 2010;303:2479-2485

10/15/2010

# Fast-track protocol – PRE-op

General:

Pre-operative optimization Pre-operative information Frailty assessment Assessment of home support Pre-operative ostomy teaching and support

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# <section-header>Operational Efficiency in Colon Surgery Alpha and Lapacoscopic Colectomy 9. State and the appropriate patients 9. State and the appropriate patients



# **Intra-operative ERP**

- avoidance of epidurals
  - (except opioid dependent patients)
- oro-gastric tubes
- PONV and analgesia pre-treatment
- laparoscopy and counter-incision
- fluid restriction or GDFT??
- nerve blocks
- minimize drain use

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**Operational Efficiency in Colon Surgery** 

# **Post-operative ERP**

- oral tylenol
- PCA overnight
- oral analgesia day 1
- · liquids ad lib in PACU / floor
- diet next day, chewing gum
- ambulation, sitting out
- reduce iv fluids
- standardized discharge orders

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ost-operative pathway :			
Traditional care	273	7.7	
Fast track care	106	4.7 †	39%
Laparoscopic care	42	2.9 *	60%



	1999-2005‡	2005-2011
BMI	28.3	29.5
Cancer	28	41
Proctectomies	<10	18.9
Total and IPAA	7.5	10.7
OR time	121	151
Conversion	11	5.8
Mean hospital stay	3.7	4.1
Readmission	9.1	6.0

## **Operational Efficiency in Colon Surgery**

# SILS vs Laparoscopic colectomy

- 150 Laparoscopic, 150 SILS
- Case matched
- Four experienced centers



- Operative times:
- 135 vs 133 minutes 4.3 vs 4.6 days
- Hospital stay:Conversion to Lx:
- 11%
- · Complications and other endpoints similar

Champagne et al, Ann Surg, 2012

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	All	Day 1-2	Day 3	Day 4+
Op time	142+/-58	$134\pm53^{*}$	138 ± 58	161 ± 55
Mean LOS	3.7+/-3.7	1.8 ± 0.4 †	$\begin{array}{c} 3.0\pm 0\\ 3.0\end{array}$	7.2 ± 5.2
Median LOS	3.0	2.0		5.0
SNF	4	1	0	3
Home care	2	0	1	1

# 2006 - Next day colectomy discharge?

	All	Day 1-2	Day 3	Day 4+
Any complns	20	7 §	15	44
lleus / SBO Serious compls	11 2.5	4¶ 0‡	4 0	28 8.3
Readmissions	8.5	5.4	7.7	13.9
§ p<0.0001 vs D4+; ( ¶ p=0.001 vs D4+ ‡ p=0.06 vs D4+	0.028 vs All			
Delaney, Dis Colon Rec	tum, 2008			🚺 Cleveland Clinic



<b>Operational Efficiency in Colon Surgery</b>						
Acetaminophen and Block Optimize ERI for Laparoscopy	d TAP					
	ERP	ATAP + ERP				
Hospital stay						
- mean	3.2					
- median	3					
Day #1 discharge %	4					
Day #2 discharge %	19					
Day #3 discharge %	41					
Eavuzza et al DCR 2013		p=0.0003				
Favuzza et al, Surg Endosc 2013		🚺 Cleveland Clinic				

<b>Operational Efficie</b>	ency in Co	olon Surge	ery	
Acetaminophen and Block Optimize ERI for Laparoscopy	d TAP		11 M	
	ERP	ATA	P + ERP	
Hospital stay				
- mean	3.2		2.1	
- median	3		2	
Day #1 discharge %	4		33	
Day #2 discharge %	19		33	
Day #3 discharge %	41		26	
Favuzza et al, DCR 2013 Favuzza et al, Surg Endosc 2013	ł	<b>b=0.0003</b>	🚺 Clevelan	nd Clinio

# Randomized controlled trial: TAP vs no TAP

	TAP	No TAP	р
n	41	38	
PACU pain score	2.1	3.8	<0.00
PACU opioid use	1.8	0.8	<0.00
Total stay pain score	2.6	3.5	<0.05
Total stay opioid use	1.8	2.0	0.7
LOS	2.9	3.2	0.5
Readmission	5%	7%	0.9

**Operational Efficiency in Colon Surgery** Safe Early Discharge at 24-48 hours after Colorectal Resection 2736 consecutive cases 5 surgeons 360 cases (13.2%) discharged by POD #2 Mortality 0.3% POD<=2 POD >= 330 day readmission % 3.3 9.4 30 day complications % 4.4 25.9 Keller et al, JACS 2013 Cleveland Clinic





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PHARMACOGE	NETIC TESTING	BASED TREATMENT GUIDAN	CE						
Musculoskelet	al Pain Drug Ther	apy Selection & Dosing Guidanc	e						
Line of Directory		Use With Caution and/or Increased Montinging							
Drug	Ortin	Dusing							
codeine (Opiate)	duteration	Consider dose adjustment or alternate drug. Incre	ased dose may be						
hydrocodone (Oplate)	duidaenne								
tramadol (Opiate)	morphine	Consider dose increase or alternate drug. ABCB1 morphine analogsic response.	crease or atemate crug. ABUB1 C/C variant may redu sic response.						
tapentadol (Opiate)	Consider dose increase or alternate drug. ABCB1 C/C var								
hydromorphone (Opiate)	renuarry	tertiami analgesic response. Consider dose increase or alternate drug. ABCB1 C/C variant may redu methadone analgesic response.							
indomethacin (NSAID)	methadone								
diciofenac (NSAID)	axycodone	oxycodone Consider dose increase or afternate drug. ABCB1 C/C variant i oxycodone analogic response.							
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	flurbiprofen	Risk of metabolic interaction with metroniclazole							
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aberatory Director, Jean Amos Wison, PhD COMB	eport Approver: Jean A Wilson, PhD C	GMB Papert Approval Date: 09/25/2015	estronic Signature On Re						



