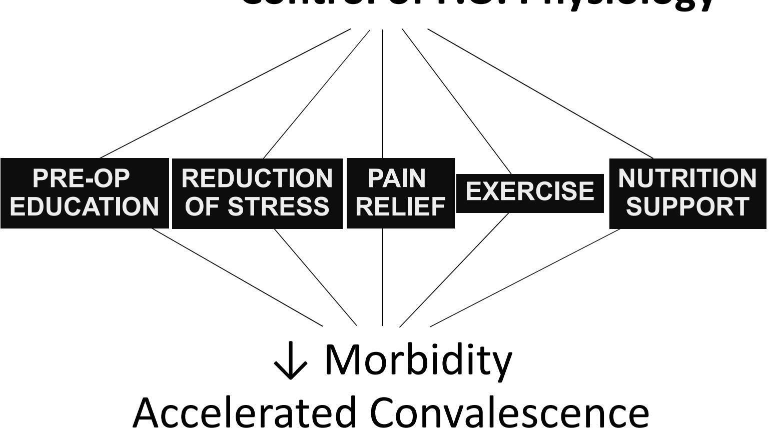
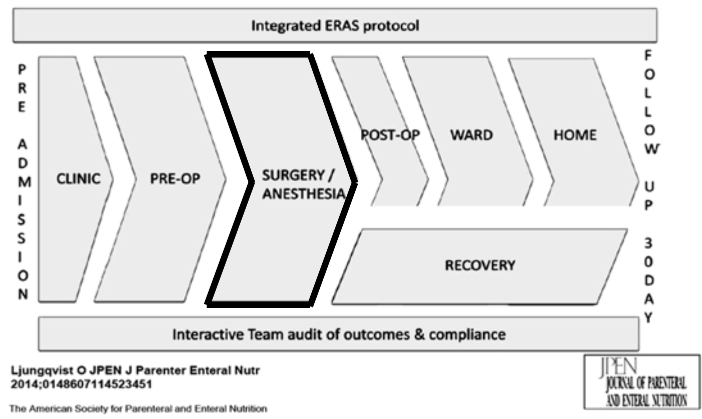
Control of P.O. Physiology



↓ Morbidity
Accelerated Convalescence

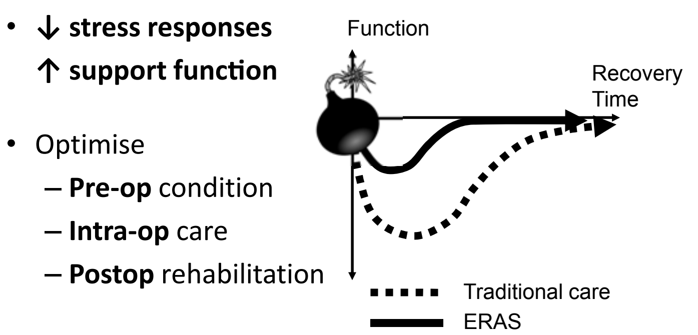
Kehlet. Br J Anesth 1997;78:606

Patient's Journey



Enhanced Recovery After Surgery

- ↓ **stress responses**
  ↑ **support function**
- Optimise
  - **Pre-op** condition
  - **Intra-op** care
  - **Postop** rehabilitation



"Helping patients to get better __sooner__ after surgery"

Guidelines

• Colon & Rectum	2005, 2012, 2018
• Pancreas	2012, 2019
• Bladder	2013
• Stomach	2014
• Gyne Oncol	2015, 2019
• Liver	2016
• Bariatric	2016, 2021
• H-N-B reconstruction	2017
• C/S	2018
• Esophagus	2019
• Lung	2019
• Hip-Knee replacement	2020
• Neonatal GI surgery	2020
• Vagina & Vulva	2020
• Lumbar spine fusion	2021
• Aortic surgery	2022

Siriraj
Dec 2010

22 Recommendations

(Preop 6, Intraop 10, Postop 6)

World J Surg (2022) 46:1826–1843
https://doi.org/10.1007/s00268-022-06587-w

SCIENTIFIC REVIEW

Guidelines for Perioperative Care in Elective Abdominal and Pelvic Surgery at Primary and Secondary Hospitals in Low–Middle-Income Countries (LMIC's): Enhanced Recovery After Surgery (ERAS) Society Recommendation

Ravi Oodit[1] · Bruce M. Biccard[2] · Eugenio Panieri[3] · Adrian O. Alvarez[4] · Marianna R. S. Sioson[5] · Salome Maswime[1] · Viju Thomas[6] · Hyla-Louise Kluyts[7] · Carol J. Peden[8,9] · Hans D. de Boer[10] · Mary Brindle[11,12,13,14] · Nader K. Francis[15] · Gregg Nelson[16] · Ulf O. Gustafsson[17] · Olle Ljungqvist[18]

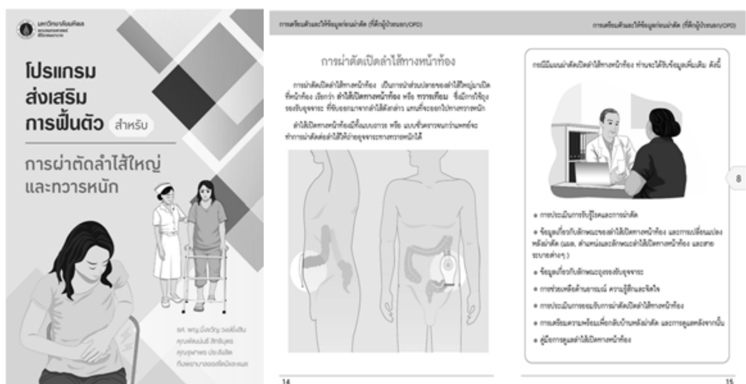
PRE-OP	INTRA-OP	POST-OP
A1. Preop education	B1. WHO safety checklist	C1. Multimodal analgesia
A2. Preop optimization	B2. ATB prophylaxis	C2. Early feeding
A3. Selective use of MBP	B3. PONV prophylaxis	C3. Early mobilization
A4. Preop fasting	B4. VTE prophylaxis	C4. Urinary catheter
A5. Preop CHO Drink	B5. Standard anesthesia	C5. Tailored monitoring,
A6. Pre-medication	B6. Normothermia	evaluation &
	B7. Fluid balance	escalation of care
	B8. MIS	C6. Audit
	B9. Avoid NGT & drain	
	B10. Multimodal analgesia	

Oodit et al. World J Surg 2022;46:1826-43

A1. Preoperative Education

- To: patient & care givers
- About: surgical journey + discharge plan
- How: oral, written, vdo
- Ideally by: ERAS nurse coordinator
- ↓ anxiety, pain, N&V
- ↑ satisfaction

Siriraj ERAS Booklet



Stoma Education

- RCT in Norway, n=122
- Control ward: CC + teach by nurse on admission date
- Ix ward: ERAS + teach by ET nurse from OPD, picture, equipment (onsite + take home), brochure + redo on admission date
- Reduce LOS from 9 → 6 days

(Benefits of ERAS + stoma education)

Forsmo et al. Int J Surg 2016;36:121-6

Stoma Education

- Cohort in UK, n=123
- Historic control: ERAS + non-structural educate
- Active program: ERAS + training package (1 wk prior to Sx, ET nurse both in hospital & community, dummy stoma + bag)
- Reduce LOS from 9 → 8 days

(Benefit of stoma education on ERAS)

Hughes et al. Ann R Coll Surg Engl 2020;102:180-4

Stoma Education *vs* Complication

- Cohort in China
- 288 End colostomy (APR)
  - Role of ET nurse in ERAS team
  - ↓ stoma CPT esp. infection & dermatitis
  - ↑ satisfaction + psychological status + QoL
- 491 Diverting ileostomy (LAR)
  - Role of 'follow-up' stoma education/clinic
  - ↓ stoma dermatitis by ½ (20% → 11%)

Shao et al. BMC Surg 2020;20:36
He et al. Transl Cancer Res 2021;10:581-8

Mini-conclusion: Stoma Education

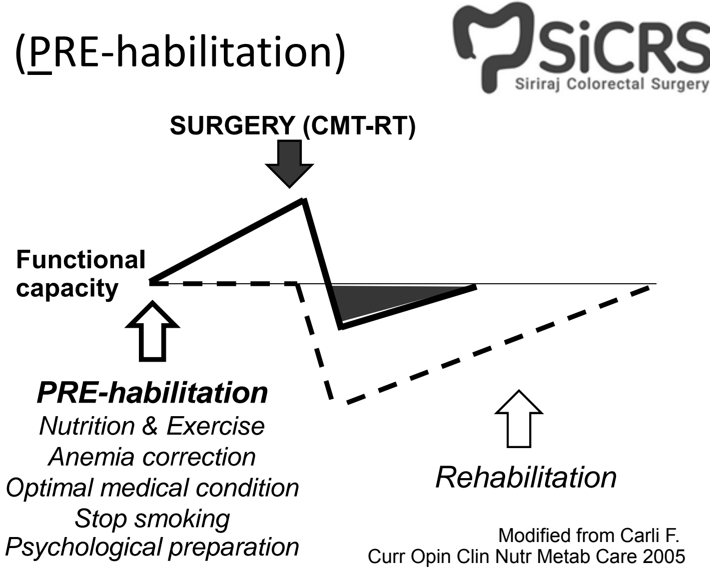
- Compliment to ERAS (further ↓ LOS & CPT)
- Be a crucial part of colorectal ERAS team
- Start from OPD with training package
- Continue after discharge

- Anyone who MIGHT or MUST have stoma should be educated by ET or well-trained nurse as early as possible

A2. Preoperative Optimization

- Stop smoking ≥ 4 wk
  - ↓ respiratory + wound complication
- Stop alcohol drinking ≥ 4 wk
  - ↓ overall complication
- Screen & treat anemia
  - IV better than Oral iron + restrictive blood tx
- Screen & treat malnutrition
- Optimal antiretroviral treatment in HIV

(PRE-habilitation)



C5. Tailored Postop Monitoring, Evaluation & Escalation of Care

- Index CPT → Further CPT (domino effect & potential lethal)
- Failure to rescue = The death of a patient following one or more CPT
- Recognize early warning symptoms & signs
- VS, U/O, O2 sat, consciousness, surgical site
- Siriraj CRS: add C-reactive Protein on POD3

Asian Journal of Surgery 43 (2020) 1012–1013

Contents lists available at ScienceDirect
Asian Journal of Surgery
journal homepage: www.e-asianjournalsurgery.com

Letter to Editor

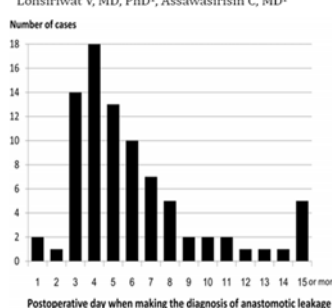
C-reactive protein for predicting infectious complications after colorectal surgery within enhanced recovery after surgery: Results from Thailand's largest university hospital

- POD 3
- CRP < 133 mg/L → NPV for infectious CPT 97%
  → *Early discharge if pt had good clinical recovery*
- CRP > 216 mg/L → PPV for AL or IA collection 33%
  → *Consider CT esp. fever, oliguria, delay GI recovery*

Lohsiriwat V, et al. *Asian J Surg* 2020;43:1012-3

Anastomotic Leakage following 4,357 Colorectal Cancer Surgery: Incidence, Presentation, Pathogens, Treatment and Outcome

Lohsiriwat V, MD, PhD[1], Assawasirisin C, MD[1]



Clinical presentation	Number
Postoperative ileus	67 (80)
Fever	64 (76)
Oliguria	62 (74)
Leukocytosis	38 (45)
Diarrhea	24 (29)
Localized peritonitis	24 (29)
Generalized peritonitis	11 (13)
Septic shock	11 (13)
Wound discharge with fecal or enteric content	10 (12)
Fecal or enteric content from intraabdominal drain	3 (4)

Lohsiriwat & Assawasirisin. *J Med Assoc Thai* 2020;103(suppl 5):6-11

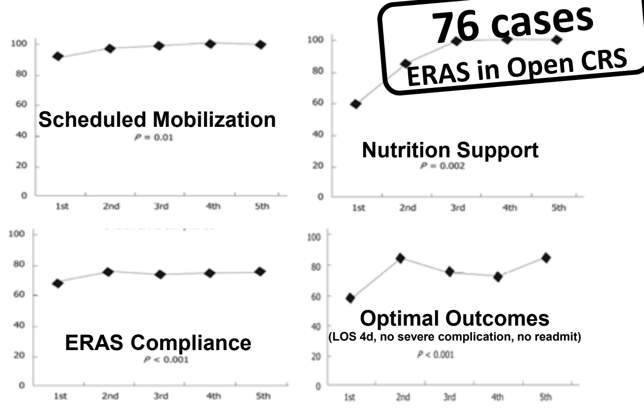
C6. Audit

… You can IMPROVE only the things you can and will MEASURE …

Clinical outcomes
- Complication
- Death
- LOS
- Readmission

Patient-reported outcomes (PROM)
- QoL
- Satisfaction
- Time to return full function

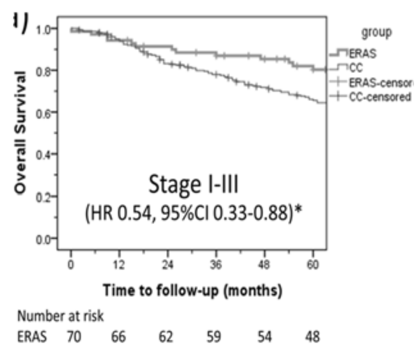
Learning Curve in ERAS



OPEN CRS 380 cases Lohsiriwat V. World J Gastrointest Surg 2019;11:169-78

ERAS *improved* CRC Survival

- Gustafsson et al. World J Surg 2016 (Sweden)
- Pisarska et al. World J Surg 2019 (Poland)
- Lohsiriwat et al. Update Surg 2021 (Thailand)



ERAS needs Teamwork

Together

Everyone

Achieves

More

Original research

The impact of an enhanced recovery pathway on nursing workload: retrospective cohort study

Martin Hübner [a,*], Valerie Addor [a], Juliette Slieker [a], Anne-Claude Griesser [b], Estelle Lécureux [b], Catherine Blanc [c], Nicolas Demartines [a]

[a] Department of Visceral Surgery, University Hospital of Lausanne (CHUV), Switzerland

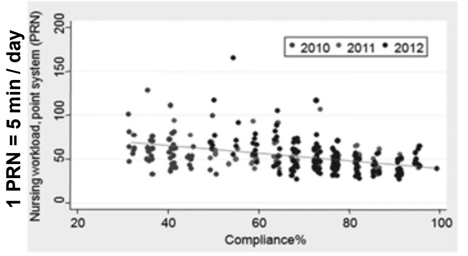
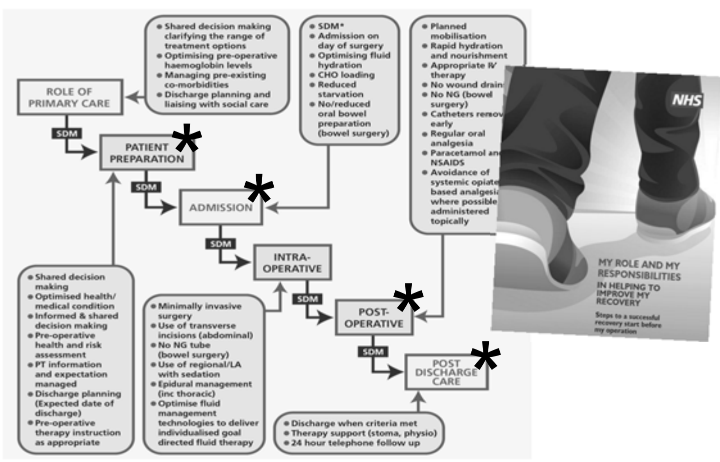


Fig. 3. Correlation of nursing workload with the compliance with the ERAS protocol. Inverse linear correlation between compliance with the ERAS protocol and nursing workload (PRN) ($\rho = -0.42$; $P < 0.001$). PRN – *Project de Recherche en Nursing* [10].

↓10 %
after
ERAS

Int J Surg 2015;24:45-50



ERA(S) of **ERAS** to **ERASe** complication & LOHS