Enhanced recovery after surgery (ERAS) in gynecologic oncology: Everybody knows it but few have adopt it: Why?

DR. OMAR ALELWAN

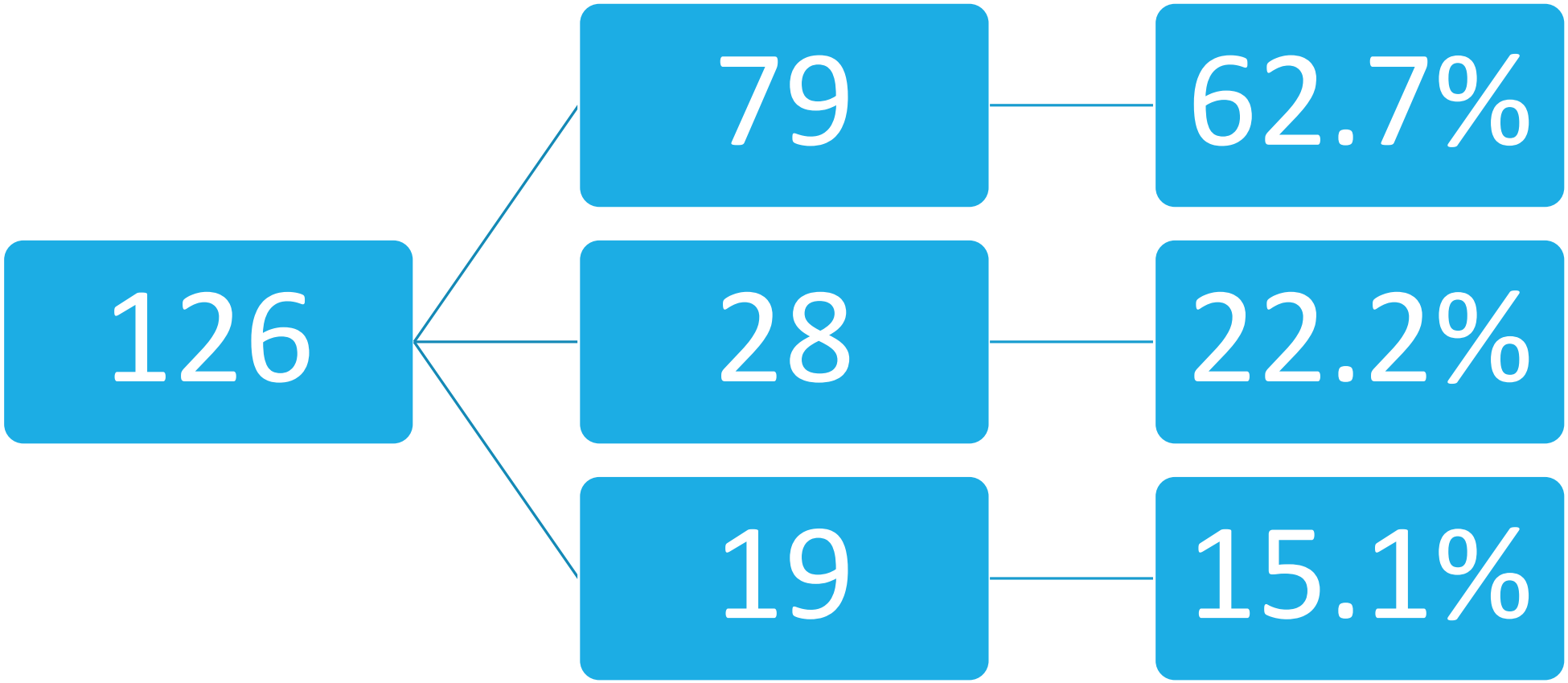
SPECIALIST IN GYNECOLOGY & OBSTETRICS

SPECIALIST IN GYNECOLOGIC ONCOLOGY

(JORDANIAN ROYAL MEDICAL SERVICES)

I have no disclosures

Survey result



Introduction

It is first developed by a colorectal surgeon called Henrik Kehlet from Denmark in the late 1990s.

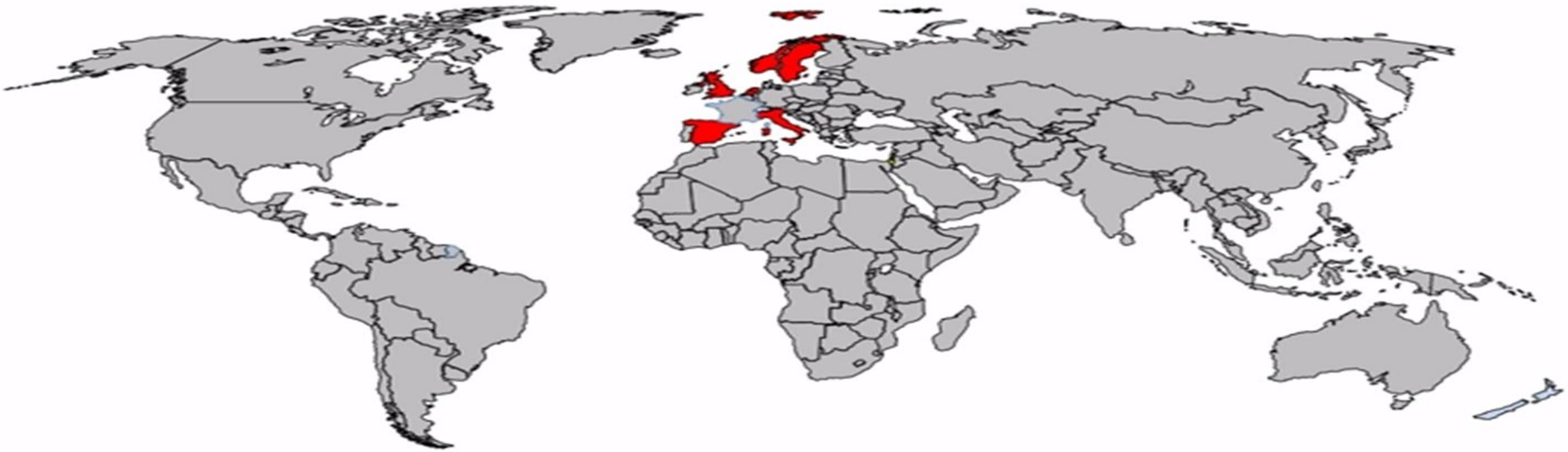
Enhanced Recovery After Surgery is a multidisciplinary, multimodal approach to the patients undergoing surgery.

The main principle is to decrease the main effect of the surgery on the endocrine and metabolic response which leads to early recovery.

Kehlet H. Multimodal approach to control postoperative pathophysiology and rehabilitation. *Br J Anaesth*1997;78:606-17

ERAS®Society 2010

A few centers forms the Society



ERAS®Society 2016

100+ units in 20+ countries

ERAS®

Opportunities: Does ERAS work?

Shorter LOS -2.28 days [95 % CI –3.1 to –1.5]

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Anderson 2003 (30)	3.9	1.8	14	7	2	11	6.9%	-3.10 [-4.61, -1.59]
Delaney 2003 (31)	5.2	2.5	31	5.8	3	33	7.2%	-0.60 [-1.95, 0.75]
Garcia-Botello 2011 (32)	4.15	2.2	61	9.23	7	58	6.1%	-5.08 [-6.96, -3.20]
Gatt 2005 (33)	6.6	4.4	19	9	4.6	20	4.3%	-2.40 [-5.22, 0.42]
Ionescu 2009 (34)	6.43	3.41	48	9.16	2.67	48	7.5%	-2.73 [-3.96, -1.50]
Khoo 2007 (35)	5	8.5	35	7	14.7	35	1.7%	-2.00 [-7.63, 3.63]
Muller 2009 (37)	6.7	4.8	76	10.3	4.9	75	6.8%	-3.60 [-5.15, -2.05]
Ren 2012 (13)	5.7	1.6	299	6.6	2.4	298	8.9%	-0.90 [-1.23, -0.57]
Serclova 2009 (38)	7.4	1.3	51	10.4	3.1	52	8.1%	-3.00 [-3.92, -2.08]
Vlug 2011 LPS (12)	5	2.9	100	6	2.9	109	8.3%	-1.00 [-1.79, -0.21]
Vlug 2011 LPT (12)	7	4.4	93	7	5.2	98	7.2%	0.00 [-1.36, 1.36]
WANG 2012 LPS (41)	5.2	3.9	40	6.3	4.7	40	6.0%	-1.10 [-2.99, 0.79]
WANG 2012 LPT (41)	6.5	4.1	41	7.4	4.2	42	6.3%	-0.90 [-2.69, 0.89]
Wang G 2011 (14)	5.1	3.1	106	7.6	4.8	104	7.7%	-2.50 [-3.60, -1.40]
Yang 2012 (40)	6	1	32	11.7	3.8	30	7.1%	-5.70 [-7.10, -4.30]
Total (95% CI)			1046			1053	100.0%	-2.28 [-3.09, -1.47]

Heterogeneity: Tau² = 1.90; Chi² = 98.88, df = 14 (P < 0.00001); I² = 86%
Test for overall effect: Z = 5.50 (P < 0.00001)

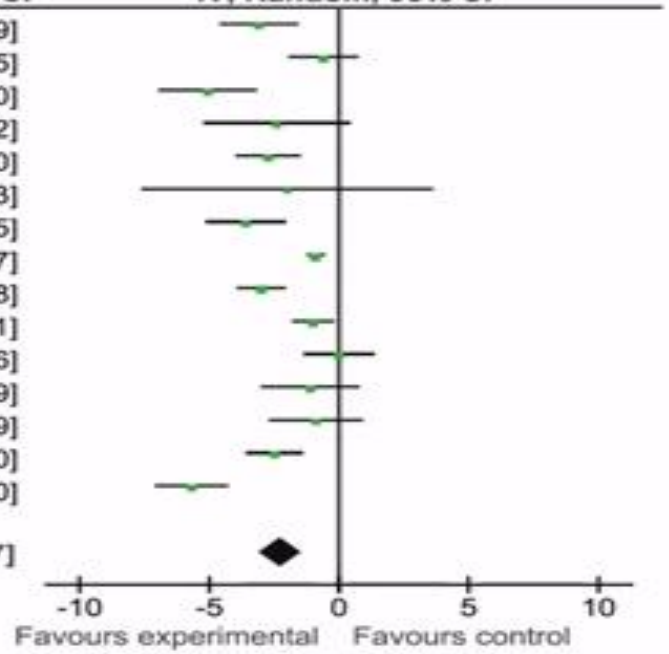


Fig. 6 Pooled estimates of length of hospital stay comparing enhanced recovery after surgery versus standard care. *CI* confidence interval, *df* degrees of freedom, *RR* risk ratio

Greco et al W J Surg 2014

Opportunities: Does ERAS work?

Reduction of complications in total 40%

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
Anderson 2003 (30)	4	14	6	11	4.9%	0.52 [0.19, 1.41]
Delaney 2003 (31)	7	31	10	33	6.2%	0.75 [0.32, 1.71]
Gatt 2005 (33)	9	19	15	20	10.5%	0.63 [0.37, 1.08]
Lee 2011 (36)	6	46	14	54	5.8%	0.50 [0.21, 1.20]
Muller 2009 (37)	16	76	47	75	11.9%	0.34 [0.21, 0.54]
Ren 2012 (13)	28	299	29	298	11.4%	0.96 [0.59, 1.58]
Serclova 2009 (38)	11	51	25	52	9.5%	0.45 [0.25, 0.81]
Vlug 2011 (12)	33	193	33	207	12.5%	1.07 [0.69, 1.67]
Wang G 2011 (14)	20	106	39	104	12.0%	0.50 [0.32, 0.80]
Wang G 2012 (39)	10	81	16	82	7.5%	0.63 [0.31, 1.31]
Wang G 2012 (41)	6	49	10	50	5.3%	0.61 [0.24, 1.56]
Wang Q 2012 (29)	2	40	8	38	2.5%	0.24 [0.05, 1.05]
Total (95% CI)		**1005**		**1024**	**100.0%**	**0.60 [0.46, 0.76]**
Total events	152		252			

Heterogeneity: $Tau^2 = 0.08$; $Chi^2 = 19.54$, df = 11 (P = 0.05); $I^2 = 44\%$

Test for overall effect: Z = 4.07 (P < 0.0001)

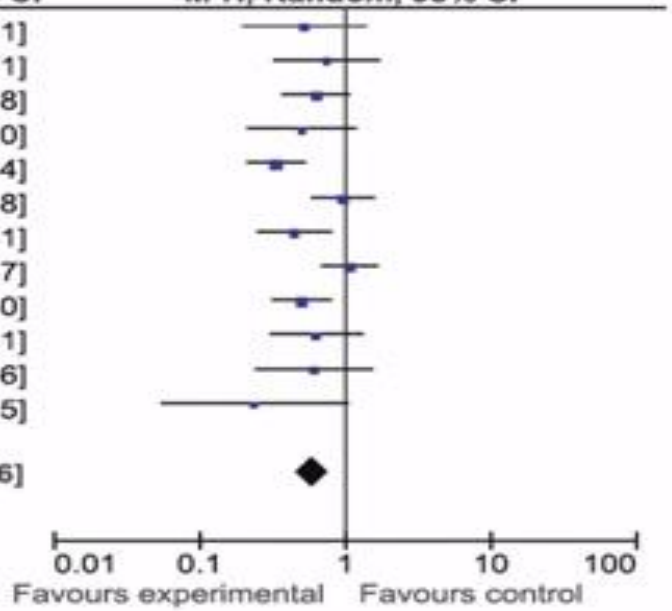


Fig. 1 Pooled estimates of overall morbidity comparing enhanced recovery after surgery versus standard care. *CI* confidence interval, *df* degrees of freedom, *RR* risk ratio

Greco et al W J Surg 2014

phases

Preoperative Phase.

Intraoperative Phase.

Postoperative Phase.

Preoperative Phase

- **Stop smoking at least one month before surgery.**
- **Do not drink alcohol for 24 hours prior to surgery.**
- **Vitamins and herbal supplements should be stopped two weeks before procedure.**
- **Stop all NSAIDs (ibuprofen, aspirin) one week prior to surgery.**

Preoperative Phase

- **Shower with the antibacterial soap (chlorhexidine) before bed and again in the morning to decrease the risk for infection.**

- **Thromboembolism prophylaxis should be given preoperatively, combined with mechanical methods, and continued post-operatively.**

- **Prophylactic antibiotics within 1h before skin incision (usually at the time of anesthesia induction) broad spectrum such as Cefazolin and must be repeated in prolonged operations and in case of blood loss >1500 ml .**

NICE, Clinical Guideline 92. Reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital,www.nice.org.uk/cg92 2010.

Bulletins–Gynecology, A.C.o.P., ACOG Practice Bulletin No. 104: antibiotic proplaxis for gynecologic procedures, Obstet. Gynecol. 113 (5) (2009) 1180–1189.

Preoperative Phase

- **Routine oral mechanical bowel preparation should not be used .**
- **Preoperative fasting time to be kept to a minimum.**
- **Patients should be permitted to drink clear fluids until 2 h before anesthesia and surgery and abstain from solids 6 h prior to induction of anesthesia.**
- **Oral carbohydrate loading beverages for example:**

The day before surgery drink one bottle by 8 p.m. and another at bedtime.

final bottle at the morning of surgery 2 hours before .

I. Smith, P. Kranke, I. Murat, A. Smith, G. O'Sullivan, E. Soreide, et al., Perioperative fasting in adults and children: guidelines from the European Society of Anaesthesiology,Eur. J. Anaesthesiol. 28 (8) (2011) 556–569.

Beverage	Mfg/Available In	Total Carb (g)	Maltodextrin (g)	% Carb	Calories	Volume (ml)	Osm
Carbohydrate-Rich Beverages Of Enhanced Recovery Programs Around The World*							
Clearfast®	BevMD/USA	50	44	14	200	355	270
Arginaid® H2O	Nestle/Japan	52	52	18	200	250	200
Fortijuice®	Nutricia/UK	67	40.8	24-34	300	200	750-955
Maxijul®	Nutricia/UK/EUR	47.5	43.25	32	190	150	420
Nidex®	Nestle/Brazil	50	50	12.5	200	400	200
ONS400®	Fresenius Kabi/ Germany	50	50	12.5	200	400	200
ONS300®	Fresenius Kabi/ Germany	50	50	16.6	200	300	266
Polycal® Liquid	Nutricia/UK	122	98.4	61	494	200	845-1400
PreOp®	Nutricia/EUR/ Canada	50.4	40	12.5	200	400	260
Preload®	Vitaflo/Nestle/UK	52	47.5	13	200	400	135
Beverages Also Used							
Impact AR®	Nestle	45	0	18.5	340	237	930
Ensure Clear®	Pepsico	43	0	21.5	200	200	700
Pedialyte®	Pepsico	6	0	2.5	25	237	270
Gatorade® Thirst Quencher	Pepsico	21	0	n/a	80	355mL	n/a
G2 Gatorade®	Pepsico	7	0	n/a	30	355mL	n/a
Lemonade	Country Time	35	0	12%	140	355mL	n/a

*www.bevmd.com/compare-pre-op-beverages

Intraoperative Phase

- **Short acting anesthetic agents should be used to allow rapid awakening. The addition of regional anesthesia to general anesthesia is opioid sparing, helps reduce PONV, and allows more rapid awakening.**

- **A ventilation strategy using tidal volumes of 5–7 ml/kg with a PEEP of 4–6 cmH2O reduces postoperative pulmonary complications.**

E. Futier, J.M. Constantin, C. Paugam-Burtz, J. Pascal, M. Eurin, A. Neuschwander,et al., A trial of intraoperative low-tidal-volume ventilation in abdominal surgery,N. Engl. J. Med. 369 (2013) 428–437.

Intraoperative Phase

- ***Prevention of postoperative nausea and vomiting:***
  - **Use regional anesthesia (rather than general anesthesia).**
  - **Use of propofol for induction and maintenance of anesthesia**
  - **Avoid nitrous oxide.**
  - **Avoid volatile anesthetics.**
  - **Minimize opioids.**
  - **Adequate hydration, while avoiding excessive fluid.**
  - **Using more than two antiemetic agents.**

Gan TJ, Diemunsch P, Habib AS, et al. Consensus guidelines for the management of postoperative nausea and vomiting. Anesth Analg. Jan 2014;118(1):85-113.

Intraoperative Phase

- **Minimally invasive surgery (MIS), including vaginal surgery is preferred for appropriate patients when feasible.**
- **Nasogastric tubes inserted during surgery should be removed before reversal of anesthesia.**
- **Maintenance of normothermia with suitable active warming devices should be used routinely.**

.F. Wong, S. Kumar, A. Bohra, D. Whetter, D.J. Leaper, Randomized clinical trial of perioperative systemic warming in major elective abdominal surgery, Br. J. Surg. 94 (4) (2007 Apr 1) 421–426 (John Wiley & sons, Ltd.).

Postoperative Phase

- **Postoperative thromboembolism prophylaxis.**
- **Balanced crystalloid solutions are preferred to 0.9% normal saline due to the cumulative risk of hyper-chloremic acidosis.**
- **Oral intake of fluid and food should be started the day of surgery whenever possible.**
- **Encourage to chew gum for 30 minutes every four hours for the first two days.**

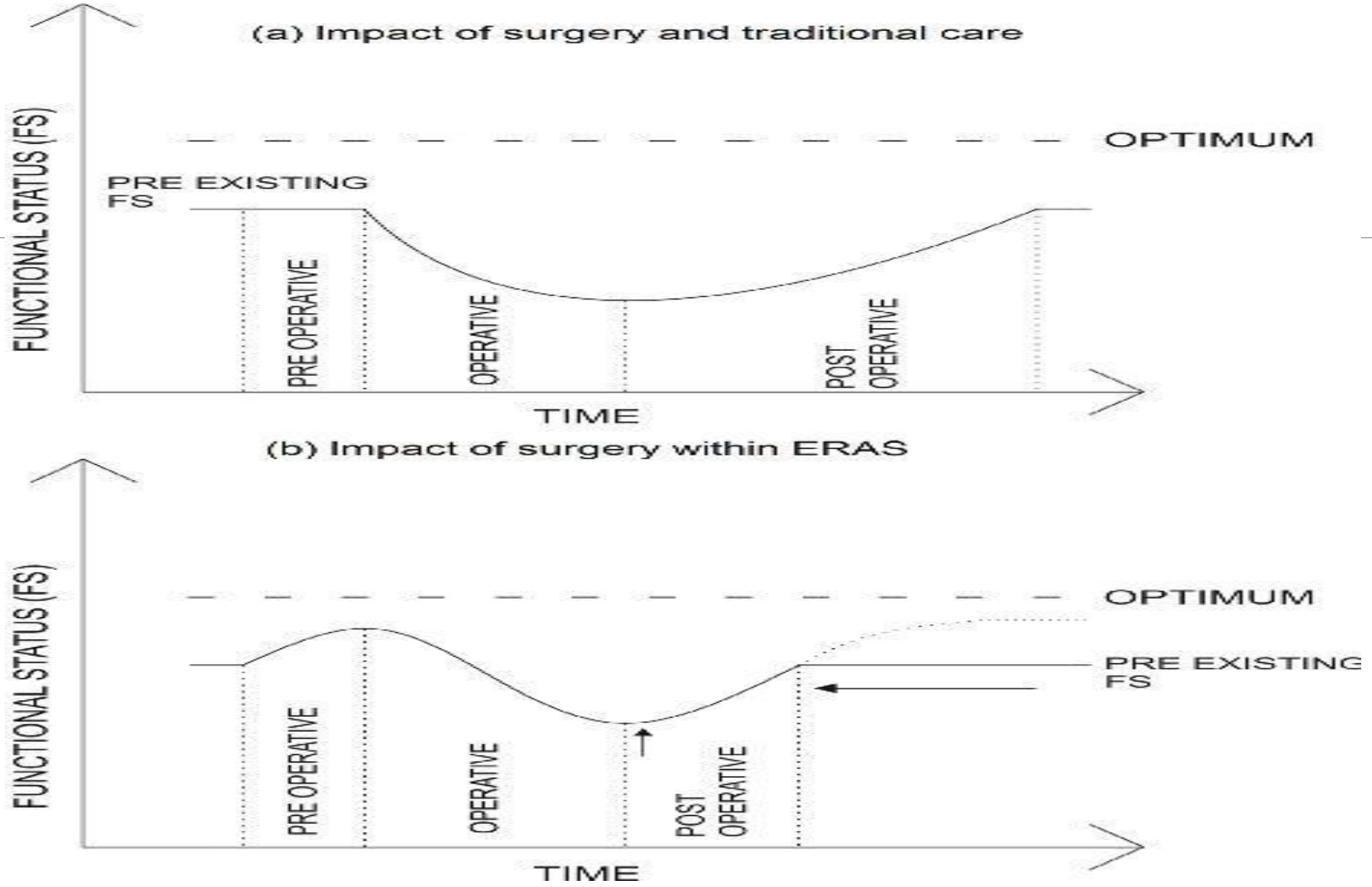
Guidelines for postoperative care in gynecologic/oncology surgery:Enhanced Recovery After Surgery (ERAS®) Society recommendations — Part IIa,G. Nelson et al.

Postoperative Phase

- **A multimodal analgesia strategy should be employed with the aim of reducing post-operative opioid requirement.**
- **Peritoneal drainage is not recommended routinely.**
- **Urinary catheters should be used for postoperative bladder drainage for a short period preferably <24 h postoperatively.**
- **Early mobilization.**

Guidelines for postoperative care in gynecologic/oncology surgery:Enhanced Recovery After Surgery (ERAS®) Society recommendations — Part IIa,G. Nelson et al.

Conclusion


(a) Impact of surgery and traditional care
FUNCTIONAL STATUS (FS)
OPTIMUM
PRE EXISTING FS
PRE OPERATIVE
OPERATIVE
POST OPERATIVE
TIME
(b) Impact of surgery within ERAS
FUNCTIONAL STATUS (FS)
OPTIMUM
PRE EXISTING FS
PRE OPERATIVE
OPERATIVE
POST OPERATIVE
TIME

It is a team work between the surgeons, anesthetists, nurses, and the patient. So there is many factors effect a successful ERAS protocol.