



# **Management of complications after extended upper GI surgery**

**International workshop on**

**Management of  
Peritoneal Surface  
Malignancy**

**9-11 August 2017, Irkutsk, Sibiria**

**Verena Müller**

Charité - Universitätsmedizin Berlin

Chirurgische Klinik

Campus Charité Mitte | Campus Virchow-Klinikum

Head: Univ.-Prof. Dr. med. J. Pratschke



## First of all, try to prevent them

Select your patient carefully!

Work with SOPs!

Be aware of your learning curve

**What kind of problems can occur?**

# **Pulmonary problems**

**Pneumonia**  
**Acute respiratory failure**  
**Atelectasis**  
**Effusion**  
**Pulmonary embolism**

# Preoperative Pulmonary Risk Stratification for Noncardiothoracic Surgery: Systematic Review for the American College of Physicians

*Table 2. Procedure-Related Risk Factors for Postoperative Pulmonary Complications*

Risk Factor	Studies, n	Pooled Estimate Odds Ratio (95% CI)*	I <sup>2</sup> , %†	Trim-and-Fill Estimate Odds Ratio (95% CI)*
Surgical site				
Aortic	2	6.90 (2.74–17.36)	97.30	–
Thoracic	3	4.24 (2.89–6.23)	89.70	4.24 (2.89–6.23)
Any abdominal	6	3.09 (2.54–3.77)	59.50	3.01 (2.43–3.72)
Upper abdominal	4	2.96 (2.40–3.63)	66.40	2.91 (2.35–3.60)
Neurosurgery	2	2.53 (1.84–3.47)	71.00	–
Head and neck	2	2.21 (1.82–2.68)	0.00	–
Vascular	2	2.10 (0.81–5.42)	98.70	–
Emergency surgery	6	2.52 (1.69–3.75)	93.80	2.21 (1.57–3.11)
Prolonged surgery	5	2.26 (1.47–3.47)	67.80	2.26 (1.47–3.47)
General anesthesia	6	2.35 (1.77–3.12)	81.70	1.83 (1.35–2.46)
Transfusion (>4 units)	2	1.47 (1.26–1.71)	0.00	–

Gerald W. Smetana, MD; Valerie A. Lawrence, MD; and John E. Cornell, PhD  
Ann Intern Med. 2006;144:581-595.

# Perioperative Risk Factors for Postoperative Pulmonary Complications

## Patient risk factors

Age > 70  
Obesity  
Tabac  
Alcohol  
Steroids  
Malnutrition  
Anemia  
Respiratory disease

## Surgical factors

Thoraco-abdominal S  
Upper abdominal S  
Muscle disruption  
Muscle dysfunction  
Emergency procedure  
Duration > 2-3 hours  
Pneumoperitoneum

## Anesthetic factors

General anesthesia  
Pain  
Fluid excess  
Ventilatory settings

# Manage to reduce the pulmonary risk

Stop smoking in advance or at least reduce it  
Use your inhaler  
Exercise inhaling, Triflo prior to surgery

Restrictive fluid management  
Short operation times  
If possible laparoscopic approach  
Epidural analgesia

Postoperative exercise  
Fast track, early mobilization  
NIV (non invasive ventilation)



# Consensus guidelines for enhanced recovery after gastrectomy

## Enhanced Recovery After Surgery (ERAS®) Society recommendations

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N. Demartines<sup>4</sup>, S. M. Griffin<sup>8</sup> and K. Lassen<sup>1</sup> on behalf of the Enhanced Recovery After Surgery  
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**Table 1** Procedure-specific guidelines for perioperative care for gastrectomy: Enhanced Recovery After Surgery (ERAS®) Society recommendations

	Summary and recommendations	Evidence level	Recommendation grade
Preoperative nutrition	Routine use of preoperative artificial nutrition is not warranted, but significantly malnourished patients should be optimized with oral supplements or enteral nutrition before surgery	Very low	Strong
Preoperative oral pharmaconutrition	The benefit shown for major gastrointestinal cancer surgery in general has not been reproduced in dedicated trials on patients undergoing gastrectomy. Although a benefit cannot be excluded, there is presently insufficient evidence for this patient group	Moderate	Weak
Access	<i>Distal gastrectomy:</i> Evidence supports LADG in early gastric cancer as it results in fewer complications, faster recovery and may be performed to a standard that is oncologically equivalent to open access surgery.	High	Strong
	For advanced disease, T2–T4a gastric cancer, more data on long-term survival comparing LADG and ODG are needed	Moderate	Weak
	<i>Total gastrectomy:</i> There is some evidence supporting LATG owing to lower postoperative complications, shorter hospital stay and oncological safety. However, LATG is technically demanding	Moderate	Weak
Wound catheters and TAP block	Evidence is conflicting regarding wound catheters in abdominal surgery	Wound catheters: Low to moderate	Weak
	Evidence is strong in support of TAP block in abdominal surgery in general, although the effect is evident only during the first 48 h after surgery and none of the evidence is from gastrectomies	TAP blocks: Low	Weak
Nasogastric/nasojejunal decompression	Nasogastric tubes should not be used routinely in the setting of enhanced recovery protocols in gastric surgery	High	Strong
Perianastomotic drains	Avoiding the use of abdominal drains may reduce drain-related complications and shorten hospital stay after gastrectomy	High	Strong
Early postoperative diet and artificial nutrition	Patients undergoing total gastrectomy should be offered drink and food at will from POD 1. They should be advised to begin cautiously and increase intake according to tolerance	Moderate	Weak
	Patients clearly malnourished or those unable to meet 60% of daily requirements by POD 6 should be given individualized nutritional support	Moderate	Strong
Audit	Systematic audit improves compliance and clinical outcomes	Low	Strong

LADG, laparoscopically assisted distal gastrectomy; ODG, open distal gastrectomy; LATG, laparoscopically assisted total gastrectomy; TAP, transversus abdominis plane; POD, postoperative day.

# ERAS Guideline Gastrectomy

## Nutrition

- > Screen in advance (NRS)
- > Optimize if necessary (oral supplements, enteral nutrition)
- > Do not use nasogastric tubes routinely for decompression
- > Allow food at will from POD 1
- > Give nutritional support if the patient does not manage to meet his daily requirements

# ERAS Guideline

## Nutrition after Gastrectomy

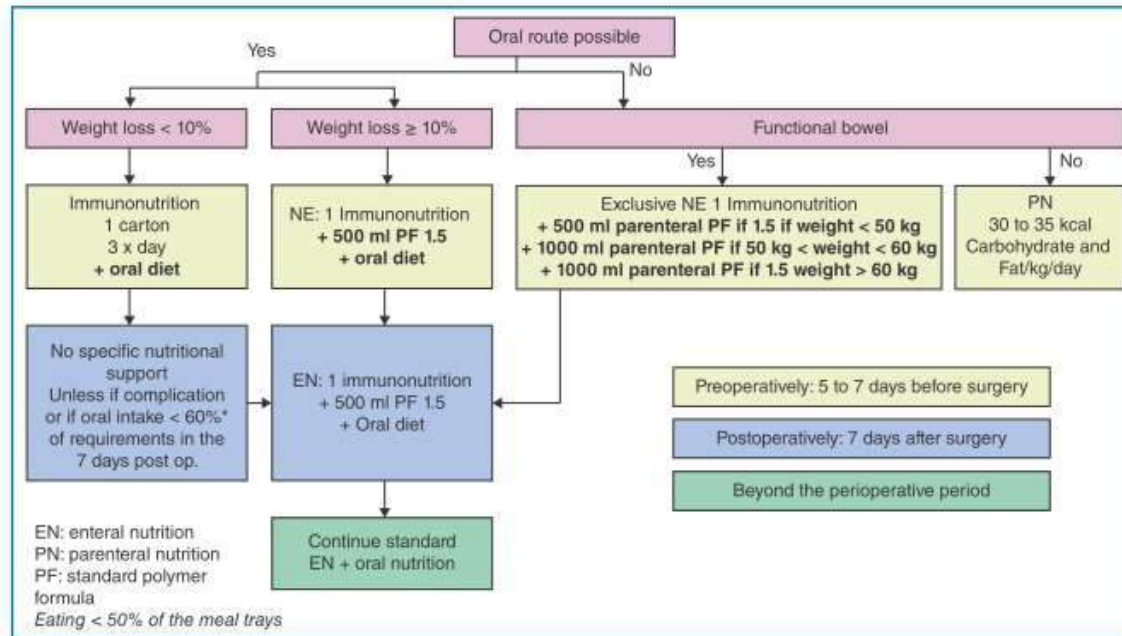


Figure 1. Decision algorithm for perioperative management of nutrition in patients undergoing surgery for gastrointestinal cancer.

# ERAS Guideline Gastrectomy

## General

- > Reduce Nicotin and alcohol
- > No bowel preparation
- > Antithrombotic prophylaxis
- > Antibiotic prophylaxis
- > Epidural analgesia, avoid hyperthermia, measure bloodsugar

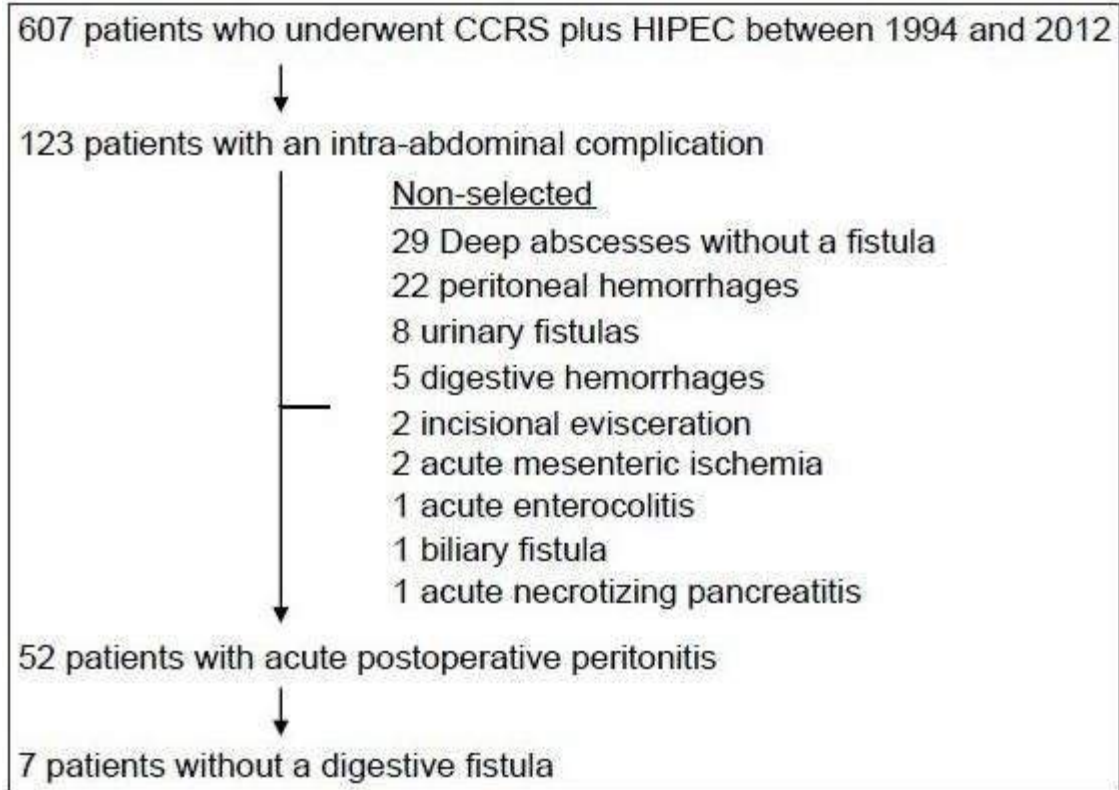
# If it happens, what to do...

## Anastomotic leakage

Anastomotic leak	1st treatment option	2nd treatment option
Esophago-jejunostomy	Conservatively; interventional therapy of subphrenic abscess	Resection of the anastomosis
Gastro-jejunostomy	Resection and new anastomosis	Oversewing
Duodenal stump	Oversewing, Rouy-en-Y anastomosis	Interventional therapy
Small bowel	Resection and new anastomosis	Fistula development
Colon anastomosis	Diversion operation	Resection and new anastomosis, eventually percutaneous drainage
Rectal anastomosis	Diversion operation	New anastomosis percutaneous/transabdominal drainage VAC therapy

Tailored approach

# Peritonitis after CRS / HIPEC



# Enterocutaneous Fistula

Outcome of patients with ECF vs. non-ECF following CRS/HIPEC.

	Fistula n = 53	No fistula n = 865	Univariate analysis
<b>Admission length</b> (median)	71 days	26 days	p < 0.0001**
<b>ICU</b> (median)	8.6 days	3.8 days	p < 0.0001**
<b>Morbidity (other grade III/IV) n (%)</b>	31 (58.5)	306 (35.4)	p = 0.0001** RR 1.65 95% CI 1.29–2.11
Sepsis	24 (45.3)	121 (14.0)	p < 0.001**
Drainage of intraabdominal collection	23 (43.4)	216 (25.0)	p = 0.001**
Pleural effusion	18 (34.0)	184 (21.3)	p = 0.004**
Bleeding	10 (18.9)	47 (5.4)	p < 0.001**
Small bowel obstruction	2 (3.8)	27 (3.1)	p = 0.429
<b>Mortality n (%)</b>	3 (5.8%)	11 (1.27)	p = 0.0371** OR 3.93 95% CI 1.09–14.25
<b>Operation post-CRS (not for ECF) n (%)</b>	11 (20.8)	93 (10.8)	p = 0.0213** RR 1.93 95% CI 1.32–80.87
<b>Overall survival</b>	33 months	62 months	p < 0.0001**
CRC	22 months	36 months	
Appendix	46 months	59 months	
PMP	61 months	NR	
Ovarian	29 months	37 months	
Mesothelioma	48 months	66 months	
<b>5-year survival</b>	38%	55%	p = 0.0160**
CRC	30%	28%	
Appendix	42%	45%	
PMP	43%	81%	
Ovarian	34%	26%	
Mesothelioma	42%	58%	

# Intraabdominal Infection



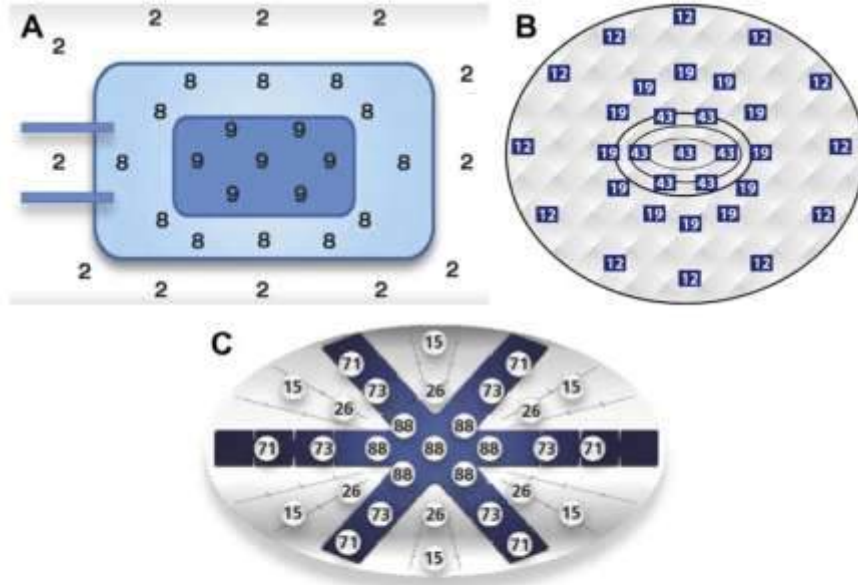
Interventional local treatment



Relaparotomy



# Negative Pressure Therapy

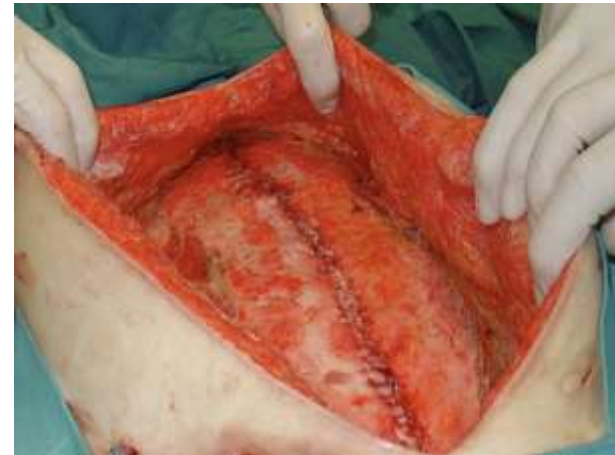


**Fig. 7.** Application of -125 mm Hg. Distribution of negative pressures in vacuum pack, VAC Abdominal Dressing and ABThera techniques. Note the even distribution of pressures in ABThera (C) and the uneven distribution in the vacuum pack (A) and VAC (B). (Data from Sammons A, Delgado A, Cheatham M. Clinical symposium on advances in skin and wound care. San Antonio (TX): 2009.)



**Suprasorb® CNP**

**Upper limit: 50mmHg!**



**So the bottom line is:**

**Manage your HIPEC-complications like you manage your complications in other cases.**

**Generally: the earlier, the more aggressive.**

**Whenever in doubt, you should do relaparatomy.**

**Do it that way you are most familiar with.**