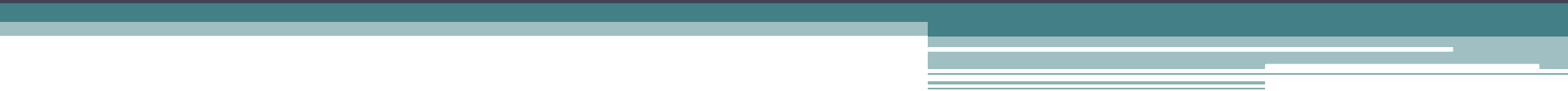


# Surgery for oesophageal cancer: How we can improve?

A series of horizontal lines in teal and light blue colors, with some lines having a 3D effect, spanning the width of the slide.

Christophe Mariette, MD, PhD  
Professor of surgery  
Head Dpt Digestive and Oncological Surgery  
University Hospital of Lille  
France

# Surgery: Ways to improve outcomes

- Appropriate patient selection
- Preconditioning
- Surgical technique
- Minimally invasive approach
- Enhanced recovery program after surgery (ERAS)
- Center volume

# Appropriate patient selection

## > Relative contra-indications to surgery

- Severe co-morbidities or multiple comorbidities
- Age is no more a limitation
- WHO PS 2
- Weight loss > 15%, not corrected after nutritional support
- Severe arteriopathy (grade  $\geq 3$ )
- Cirrhosis with no portal hypertension

# Appropriate patient selection

## > Absolute contra-indications to surgery

- Persistent weight loss >20% despite nutritional support
- WHO PS 3 or 4
- Respiratory insufficiency (FEV <1 000 ml/sec)
- Decompensated cirrhosis, portal hypertension
- Cardiac and Renal insufficiencies

# Preconditioning

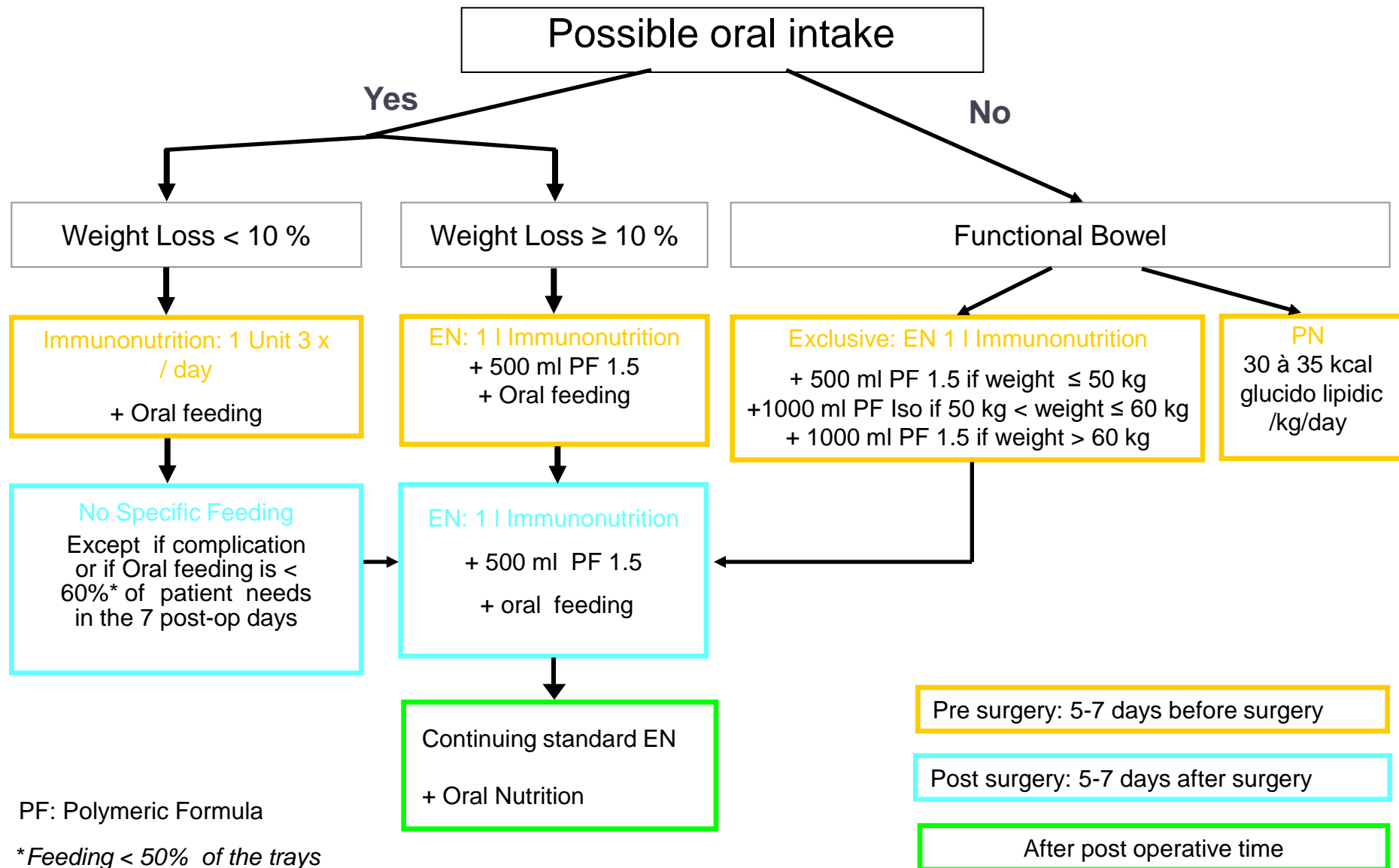
- Tobacco / alcohol cessation
  - > 4 weeks
  - ↘ pulmonary complications
- Buccodental hygiene
  - ↘ Mediastinal/pulmonary infections
- Respiratory conditioning
  - Preoperative physiotherapy for all patients
  - Intensive preop rehabilitation + bacteriological sputum analysis for high risk patients

# Preconditioning – Malnutrition

- To detect malnutrition
  - Prevalence 60 to 85%
  - ↗ neoadjuvant treatment toxicity, postop morbidity and mortality, tumoural recurrence
  - ↘ response to chemotherapy, survival and QOL
- To correct malnutrition
  - Guidelines
  - Weight loss <10% : oral supplements
  - Weight loss > 10% and/or neoadjuvant treatment: enteral feeding
  - Immuno-enhanced nutrition 5-7 days prior to surgery
  - Immuno-enhanced nutrition during neoadjuvant phase under investigation phase III trial (NCT 01423799)

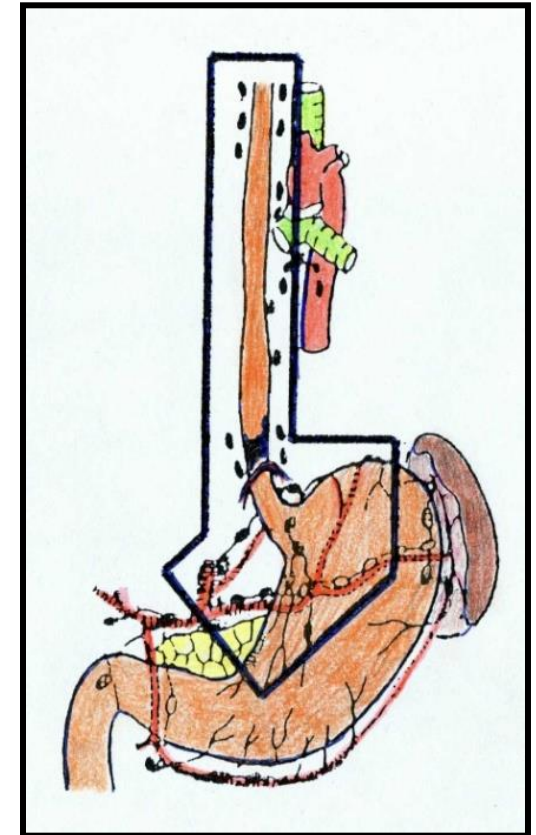
Mariette Ann Surg Oncol 2012

Cerantola BJS 2012



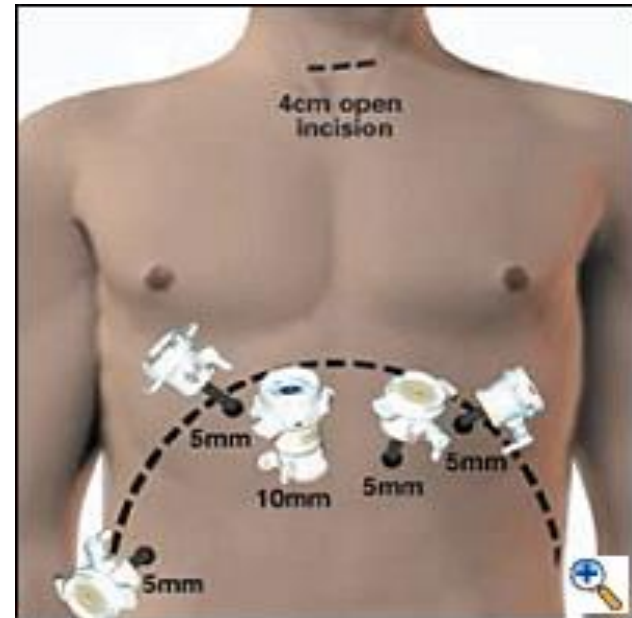
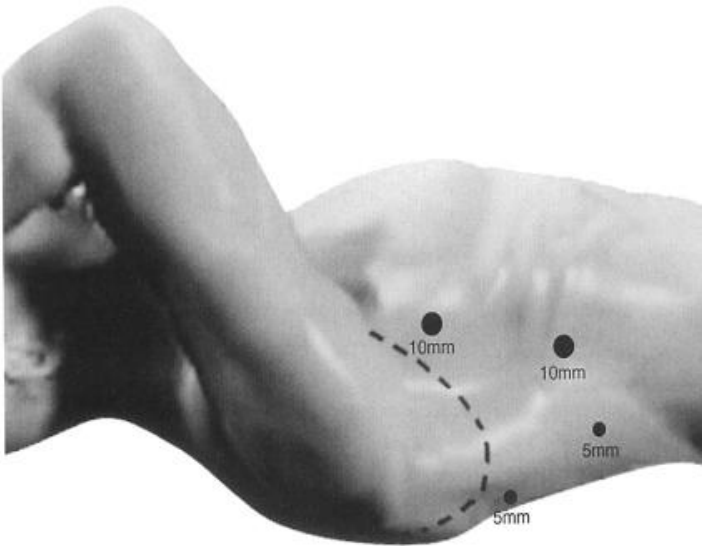
# Appropriate surgical technique

- R0 resection
- Transthoracic oesophagectomy
- Extended 2-field lymphadenectomy
- At least 23 LN examined





# Minimally invasive surgery



# Is minimally invasive surgery beneficial in the management of esophageal cancer? A meta-analysis

Kamal Nagpal • Kamran Ahmed • Amit Vats •  
Danny Yakoub • David James • Hutan Ashrafian •  
Ara Darzi • Krishna Moorthy • Thanos Athanasiou

## TOTALLY MIO vs. Open Oesophagectomy

**Table 2** Results of meta-analysis comparing MIE versus open and HMIE versus open esophagectomy

Outcome	No. of studies	No. of patients	OR/WMD	95% CI	P-value	HG $\chi^2$	HG P-value
MIE versus open							
Operative time	5	312	5.91	-39.53, 51.34	0.80	29.13	<0.001
Blood loss	5	312	-268.53	-369.91, -167.16	<0.001	12.14	0.02
ICU stay	3	216	-0.97	-1.31, -0.63	<0.001	1.16	0.56
Length of stay	4	267	-2.75	-4.65, -0.86	0.004	2.01	0.57
GI bleeding	2	171	0.32	0.04, 2.81	0.30	0.01	0.91
Anastomotic leak	5	447	0.58	0.28, 1.20	0.14	3.43	0.49
Anastomotic stricture	4	379	1.58	0.30, 8.40	0.59	15.07	0.002
Gastric conduit ischemia	3	236	1.80	0.34, 9.60	0.49	1.88	0.39
Respiratory complications	5	447	0.58	0.35, 0.98	0.04	2.91	0.57
Cardiac complications	3	368	1.11	0.51, 2.45	0.79	0.42	0.81
Chyle leak	5	447	1.37	0.35, 5.47	0.65	2.73	0.44
Vocal cord palsy	5	447	0.76	0.19, 3.10	0.71	0.12	0.94
Total morbidity	5	447	0.52	0.32, 0.84	0.007	4.36	0.36
30-day mortality	5	447	0.55	0.19, 1.57	0.26	0.04	0.98
Number of LN retrieved	4	240	1.02	-0.84, 2.88	0.28	2.76	0.43

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## HYBRID MIO vs. Open Oesophagectomy

HMIE versus open

Operative time	3	653	5.64	−31.77, 43.05	0.77	18.60	<0.001
Blood loss	3	653	−147.87	−297.40, 1.67	0.05	8.58	0.01
Anastomotic leak	4	806	0.51	0.28, 0.91	0.02	0.50	0.92
Respiratory complications	4	806	0.68	0.48, 0.96	0.03	1.12	0.77
Cardiac complications	4	806	0.67	0.42, 1.07	0.09	2.44	0.49
Chyle leak	2	562	1.48	0.23, 9.53	0.68	1.81	0.18
Vocal cord palsy	4	806	1.54	0.89, 2.67	0.13	1.45	0.69
Total morbidity	3	725	0.62	0.31, 1.25	0.18	5.17	0.08
30-day mortality	4	806	0.56	0.19, 1.60	0.28	0.92	0.34
Number of LN retrieved	3	632	−1.44	−6.61, 3.73	0.58	19.37	<0.001



# Minimally invasive versus open oesophagectomy for patients with oesophageal cancer: a multicentre, open-label, randomised controlled trial

*Surya S A Y Biere, Mark I van Berge Henegouwen, Kirsten W Maas, Luigi Bonavina, Camiel Rosman, Josep Roig Garcia, Suzanne S Gisbertz, Jean H G Klinkenbijn, Markus W Hollmann, Elly S M de Lange, H Jaap Bonjer, Donald L van der Peet, Miguel A Cuesta*

**Lancet 2012; 379: 1887-92**

- Comparison open vs. MIO
- Multi-centre RCT
- MIO 56 patients
- Open Resection 59pts
- Oesophageal Tumours including Siewert type I

## MIO Performed By

- Thoracoscopy / Laparoscopy and cervical incision

## Open Resection

- Right thoracotomy and intrathoracic anastomosis

## Primary Endpoints

- Respiratory complications in first 2 weeks

## Secondary Endpoints

- Operative / Postoperative / Oncological Data

	OO (N=56)	MIO (N=59)	p value
<b>Primary outcomes</b>			
Pulmonary infection within 2 weeks	16 (29%)	5 (9%)	0.005
Pulmonary infection in-hospital	19 (34%)	7 (12%)	0.005
<b>Secondary outcomes</b>			
Hospital stay (days)*	14 (1-120)	11 (7-80)	0.044
Short-term quality of life†			
SF 36‡			
Physical component summary	36 (6; 34-39)	42 (8; 39-46)	0.007
Mental component summary	45 (11; 40-50)	46 (10; 41-50)	0.806
EORTC C30‡			
Global health	51 (21; 44-58)	61 (18; 56-67)	0.020
OES 18‡			
Talking	37 (39; 25-49)	18 (26; 10-26)	0.008
Pain	19 (21; 13-26)	8 (11; 5-11)	0.002
Total lymph nodes retrieved*	21 (7-47)	20 (3-44)	0.852
Resection margin§			0.080
R0	47 (84%)	54 (92%)	..
R1	5 (9%)	1 (2%)	..
pStage¶			0.943
0	0 (0%)	1 (2%)	..
I	4 (7%)	4 (7%)	..
Ila	16 (29%)	17 (29%)	..
Ilb	6 (11%)	9 (15%)	..
III	14 (25%)	11 (19%)	..
IV	5 (9%)	4 (7%)	..
No residual tumour or lymph-node metastasis	7 (13%)	9 (15%)	..
Mortality			0.590
30-day mortality	0 (0%)	1 (2%)	..
In-hospital mortality	1 (2%)	2 (3%)	..

## Minimally invasive versus open oesophagectomy for patients with oesophageal cancer: a multicentre, open-label, randomised controlled trial

Surya S A Y Biere, Mark I van Berge Henegouwen, Kirsten W Maas, Luigi Bonavina, Camiel Rosman, Josep Roig Garcia, Suzanne S Gisbertz, Jean H G Klinkenbijl, Markus W Hollmann, Elly S M de Lange, H Jaap Bonjer, Donald L van der Peet, Miguel A Cuesta

*Lancet* 2012; 379: 1887-92

Pulmonary infection defined – clinical manifestation with confirmation on CXR or CT scan and positive culture

But some limitations ....  
Mariette Lancet 2012

# Open versus laparoscopically-assisted oesophagectomy for cancer: a multicentre randomised controlled phase III trial - the MIRO trial

Nicolas Briez<sup>1,2</sup>, Guillaume Piessen<sup>1,2</sup>, Franck Bonnetain<sup>3</sup>, Cécile Brigand<sup>4</sup>, Nicolas Carrere<sup>5</sup>, Denis Collet<sup>6</sup>, Christophe Doddoli<sup>7</sup>, Renaud Flamein<sup>8</sup>, Jean-Yves Mabrut<sup>9</sup>, Bernard Meunier<sup>10</sup>, Simon Msika<sup>11</sup>, Thierry Perniceni<sup>12</sup>, Frédérique Peschaud<sup>13</sup>, Michel Prudhomme<sup>14</sup>, Jean-Pierre Triboulet<sup>1,2</sup> and Christophe Mariette<sup>1,2\*</sup>

- Comparison open vs. MIO
- Multi-centre RCT
- Oesophageal Tumours
- Including Siewert I

## Surgical Procedure

- Thoracotomy plus Laparoscopy

## Primary Endpoints

- Major 30 day morbidity

## Secondary Endpoints

- 30 day morbidity, mortality, pulmonary morbidity
- DFS, OS, QOL, Medico-economic

# ERAS program

**Synonym:** Enhanced Recovery After Surgery = Fast track surgery

Khelet Lancet 2003

## **Definition:**

A concept for acceleration of postoperative  
convalescence by a multimodal rehabilitation program

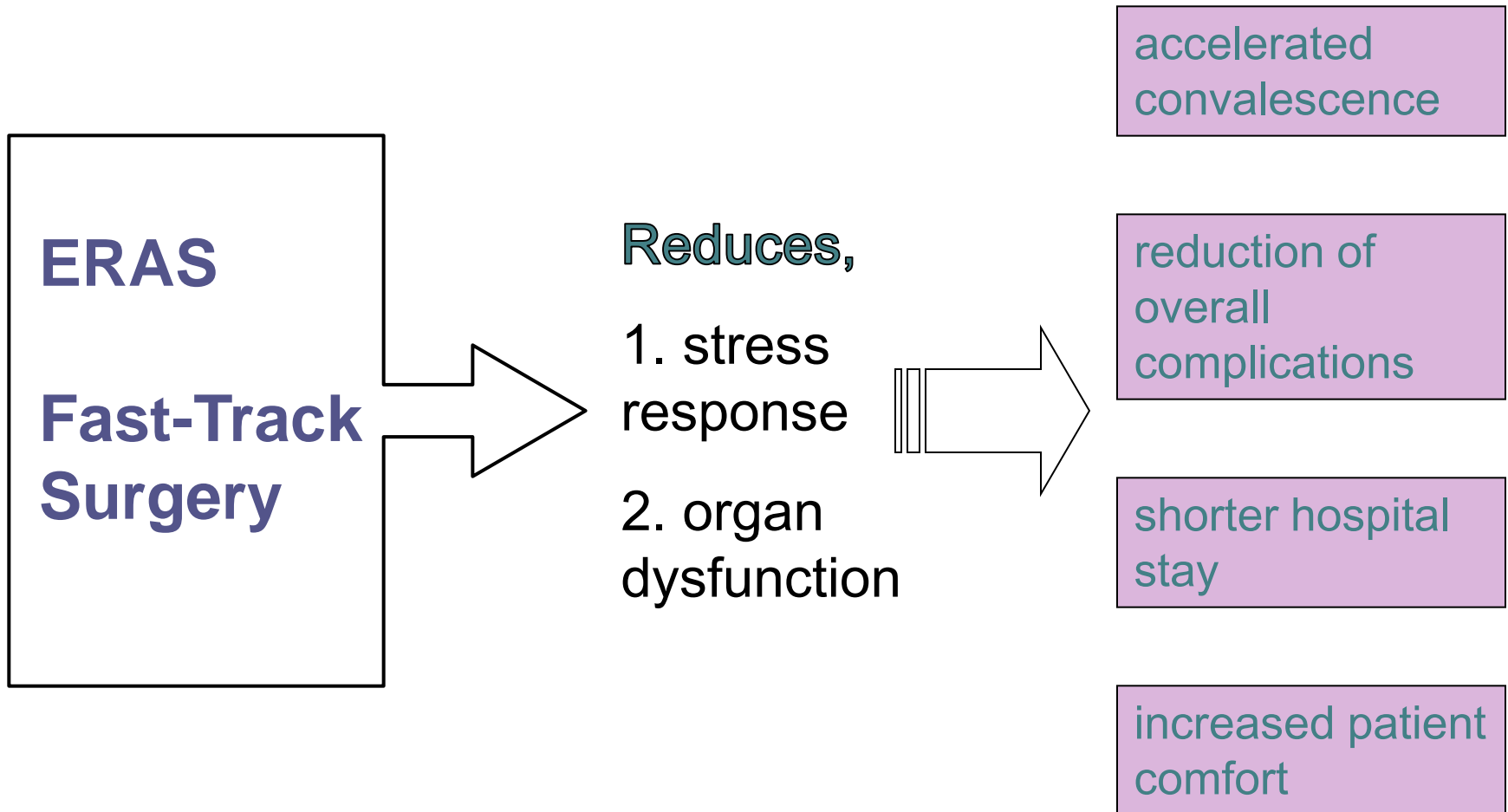
## **Multimodal strategy :**

Accelerate rehabilitation - shortened hospitalisation  
Improve outcomes

## **Aims :**

To attenuate the Stress Response After Surgery  
and To Enable Rapid Recovery

Finlay Ann Surg 2014





# The Process – Preoperative, Peri-operative and Post-Operative

Engage patient with process

Pre-admission counselling

Set goals/targets for post-operative care

Pre-operative discharge planning

Fluid and CHO **loading** until 1H – decrease Iresistance

No Premed

Epidural analgesia  
Short acting anaest agents

Goal directed fluid management –  
esophageal doppler (ODM)  
or pulse waveform analysis (PWA) – (LiDCO)

Short incisions/MIS

Normothermia

DVT prophylaxis

No NG tube when possible

Non-opiate analgesia

Prevention of nausea and vomiting

Stimulate gut motility

Early enteral nutrition

Early removal of catheters

Mobilisation regime



# Effectiveness of a written clinical pathway for enhanced recovery after transthoracic (Ivor Lewis) oesophagectomy

V. Munitiz, L. F. Martinez-de-Haro, A. Ortiz, D. Ruiz-de-Angulo, P. Pastor and P. Parrilla

Department of General Surgery, Virgen de la Arrixaca University Hospital, University of Murcia, Murcia, Spain

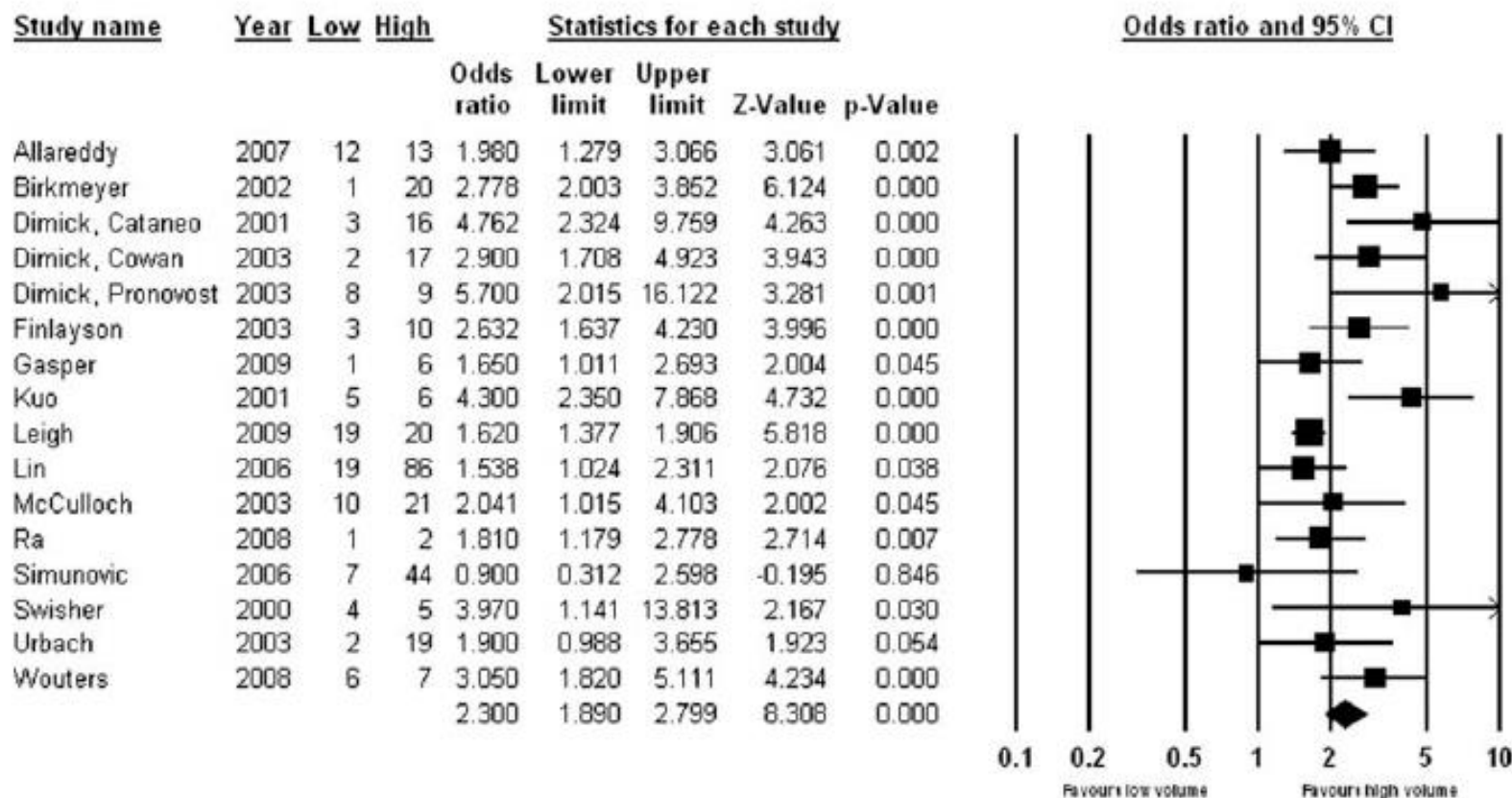
*Correspondence to:* Professor P. Parrilla, Servicio de Cirugía General, Hospital Universitario Virgen de la Arrixaca, Carretera Cartagena s/n, El Palmar, 30120, Murcia, Spain (e-mail: pascual.parrilla2@carm.es)

- Cohort comparison (74 control vs. 74 intervention)
- POM : 4% vs 1%
- Morbidity : 38% vs 31%
  - Less pulmonary complications\*
- 59% successfully completed the fast-track protocol
- No readmission
- Median LOS : 13 vs. 9\* days

\*  $P < 0.05$

# Center volume and hospital mortality

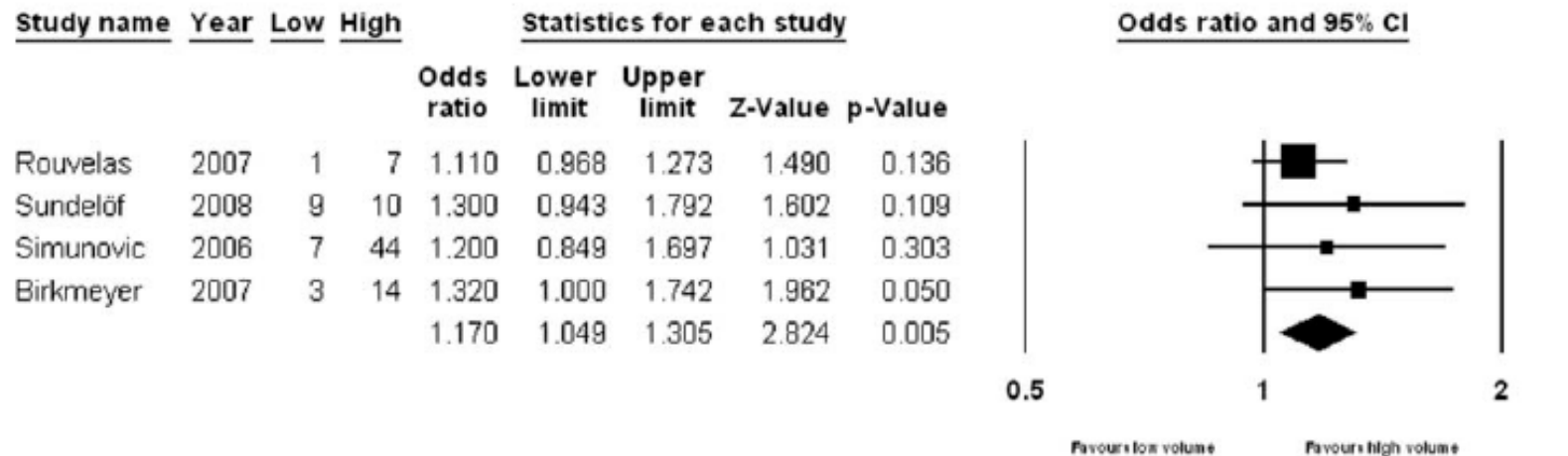
## Hospital Mortality



Postoperative mortality < 5% in high volume centers

# Center volume and long-term survival

## Hospital Survival



Probability for being alive at 5 years ↗ in high volume centers

# Take home messages

- Appropriate patient selection: age is no more a CI
- Preconditioning : correct malnutrition to  $\searrow$  morbi-mortality
- Surgery: extended resection to  $\nearrow$  radicality,  $\searrow$  recurrence
- Mini-invasive approach: to  $\searrow$  morbidity
- Enhanced recovery approach: to  $\searrow$  morbidity and LOS
- Experienced center to  $\searrow$  mortality,  $\nearrow$  survival



[www.11igcc.com](http://www.11igcc.com)