



Enhanced Recovery After Surgery – moving EBM to practice

Olle Ljungqvist MD PhD

Chairman ERAS Society

Professor Surgery

Örebro University Hospital & Karolinska Institutet

Inspirerande Innovationer
i Vård och Omsorg

Stockholm 9 maj 2014



Hälsö- och sjukvårdsförvaltningen
STOCKHOLMS LÄNS LANDSTING



Where are we today?

- 5% of the population in the Western world operated every year
- 270 million operations world wide (WHO)
- Cost of health care rising
- Demand on quality of health care rising
- It takes ≈ 15 years to change practice....
- Best knowledge is not used



*A Non profit Multi-professional Multi-disciplinary
Medical Society*

Mission statement: Enhancing Recovery After Surgery

The mission of the Society is to **develop** perioperative care and to **improve** recovery through

- **Research,**
- **Education,**
- **Audit and**
- **Implementation of evidence based practice.**

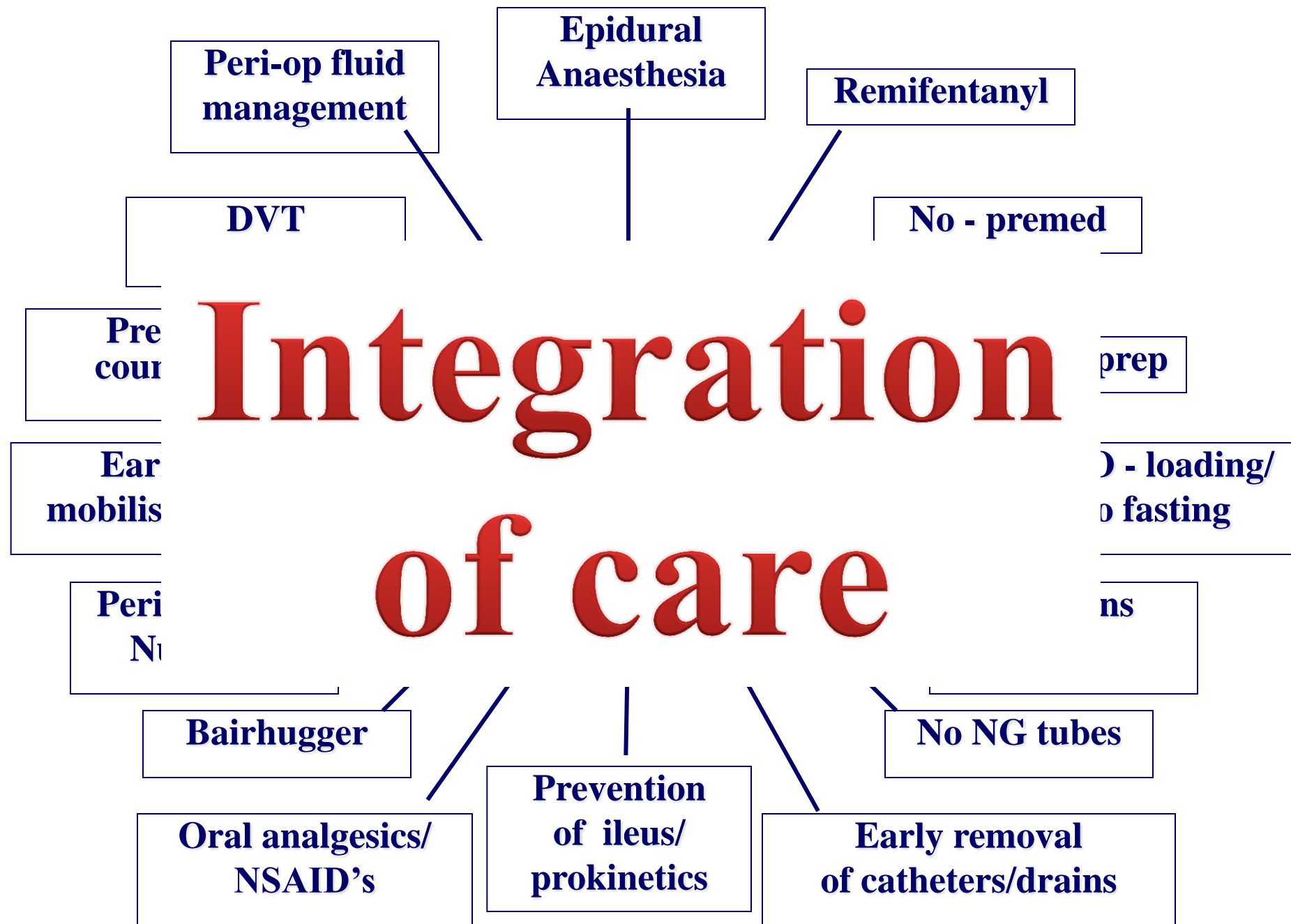
ERAS in Theory

Recovery After Surgery

What are we trying to achieve?

Patient back to preoperative function

- **Normal gastrointestinal function**
 - **Normal food intake**
 - **Bowel movement**
- **Pain control**
- **Mobility**
- **No complication**



3 new guidelines 2012

World J Surg
DOI 10.1007/s00268-012-1772-0



Guidelines for Perioperative Care in Elective Rectal/Pelvic Surgery: Enhanced Recovery After Surgery (ERAS®) Society Recommendations

U. O. Gustafsson • M. J. Scott •
N. Francis • C. E. McNaught •
A. Hill • R. H. Kennedy • D. N.

Multimodal

Reduce stress

Support function



duodenectomy:
ty

World J Surg
DOI 10.1007/s00268-012-1787-6

Guidelines for Perioperative Care in Elective Rectal/Pelvic Surgery: Enhanced Recovery After Surgery (ERAS®) Society Recommendations

J. Nygren • J. Thacker • F. Carli • K. C. H. Fearon •
S. Norderval • D. N. Lobo • O. Ljungqvist •
M. Soop • J. Ramirez

ERAS

Securing modern care: colo-rectal

Surgeon:

No bowel prep

Food after surgery

No drains

Early removal u-catheter

No iv fluids, no lines

Early discharge

All evidence based!

Anesthetist:

Carbohydrates no fasting

No premedication

Thoracic Epidural

Anesthesia (open)

Balanced fluids

Vasopressors

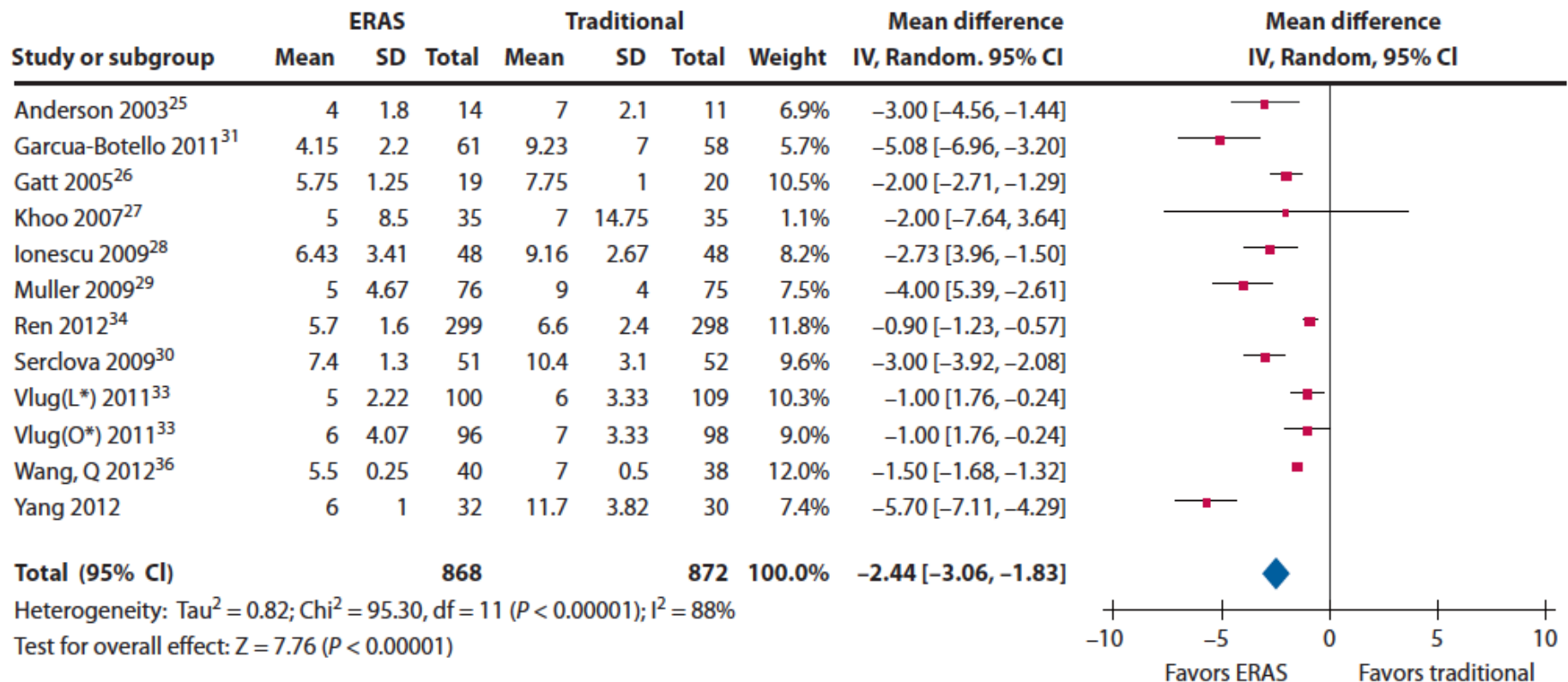
No or short acting
opioids

ERAS in Reality

Does ERAS work?

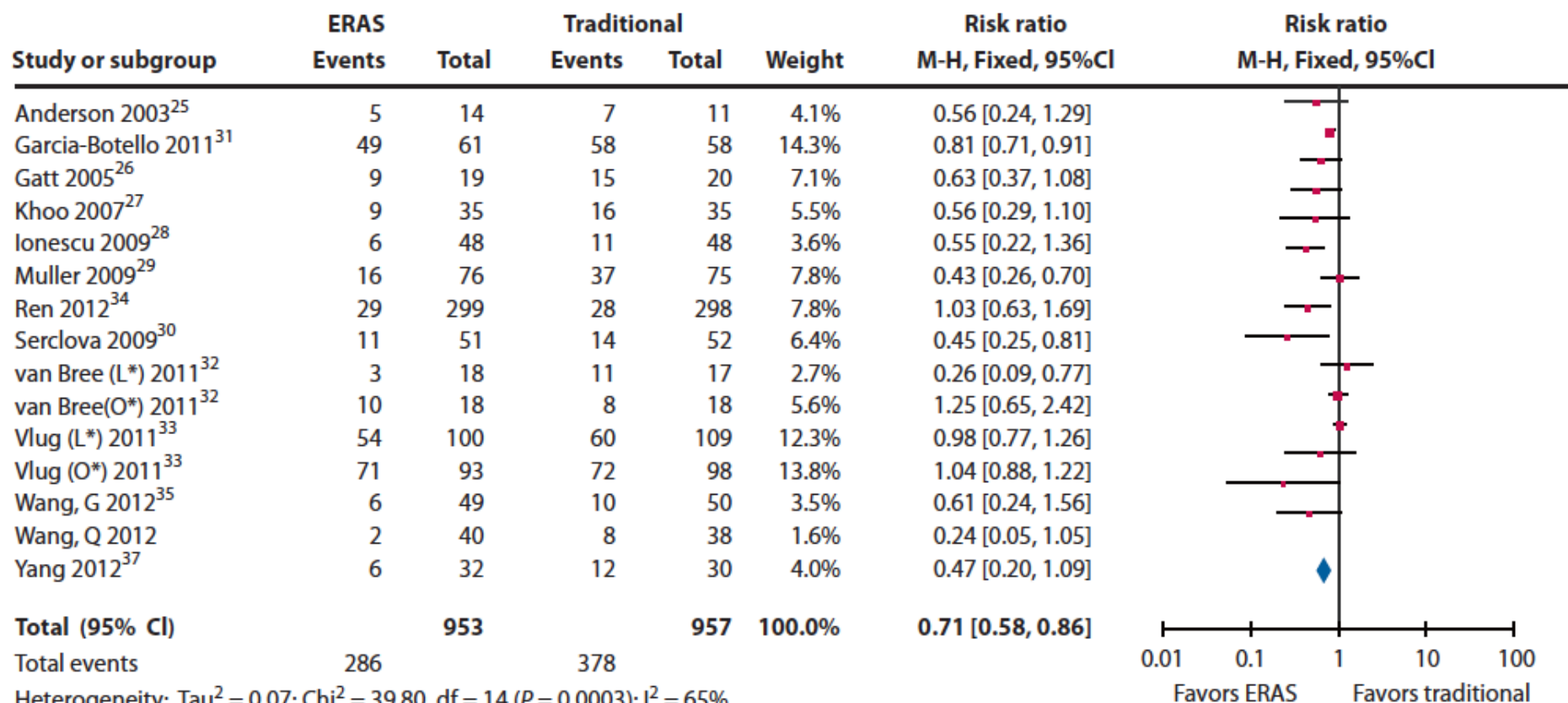
ERAS length of stay

ERAS: shorter length of stay by 2.4 days



ERAS colorectal complications

ERAS: Reduce complications by 30%



Reduced mortality?

Table 2. Comparison of mortality rates in the two groups

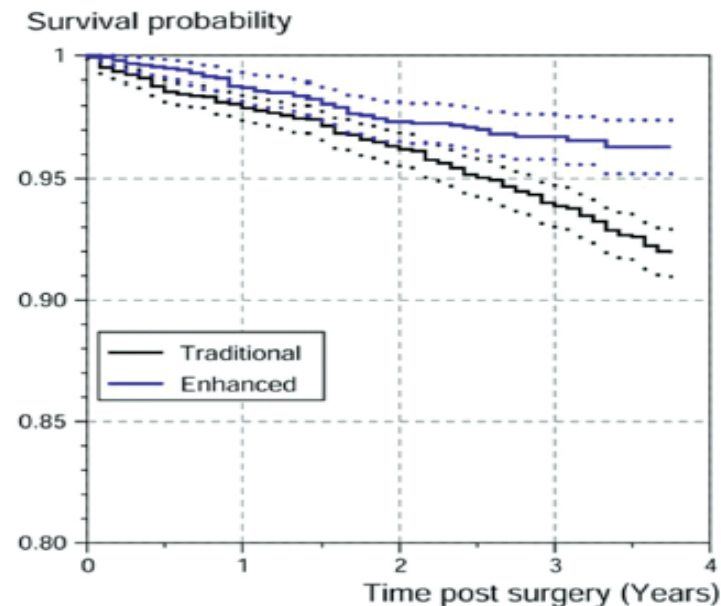
	TRAD (n = 3,000)	ER (n = 1,500)	p-value (chi-squared test)
Dead by 1 year	63 (2.1%)	19 (1.3%)	0.05
Dead by 2 years	114 (3.8%)	40 (2.7%)	0.05

Hip and Knee replacement

Traditional

After implementation of
ERAS

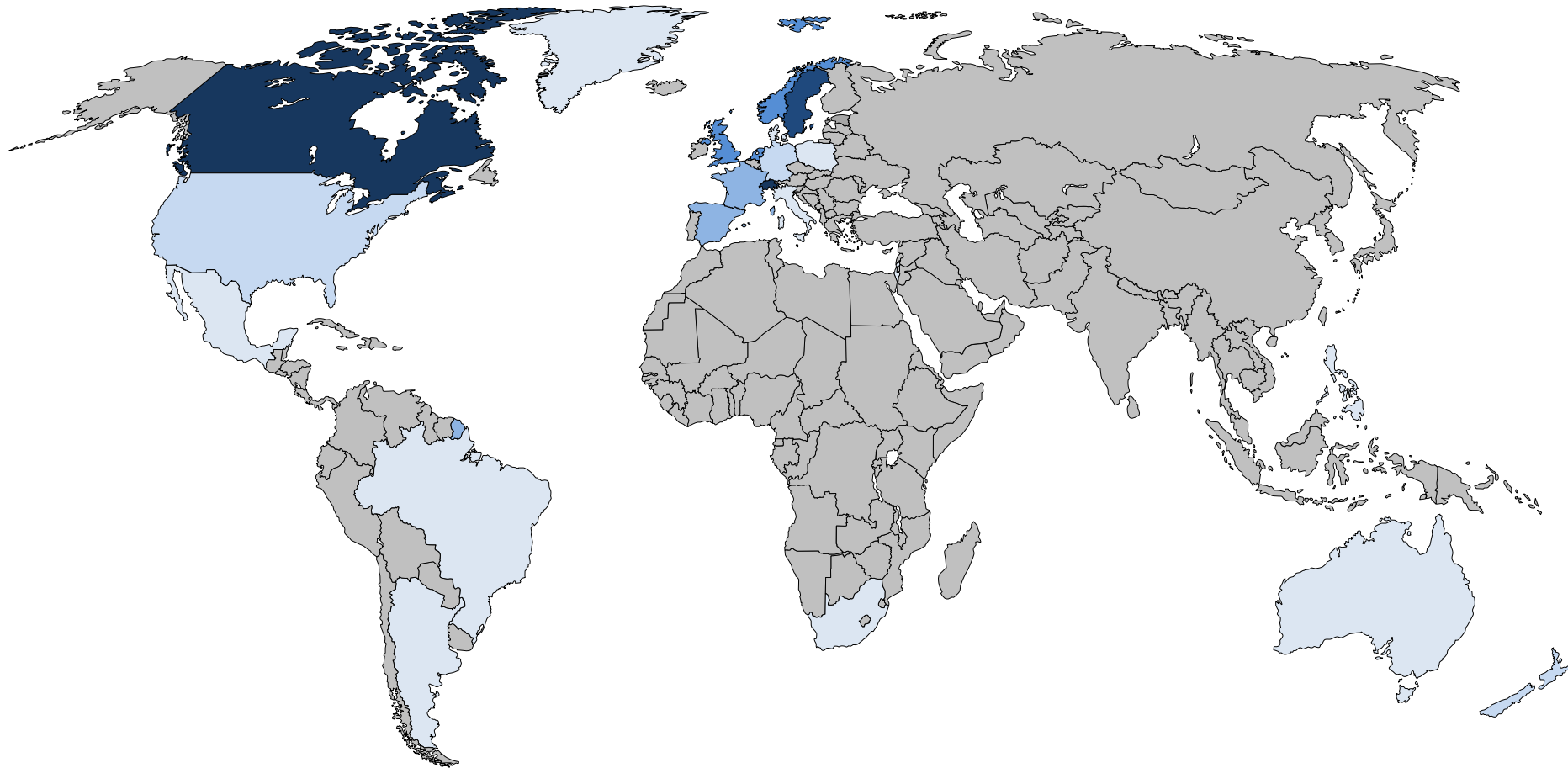
Causes of death
Higher for Trad:
Malignant disease



ERAS in the world today

ERAS[®] Society 2014

Growing fast...



- More than one Implementation program
- Implementation program running/announced
- ERAS Center in place
- ERAS center established in 2014
- ERAS center discussions

And in Sweden

- "We do ERAS already"
- Length of stay national average remain long
 - Colonic resections 8 days
 - Rectal resections 10 days

ERAS “innovations”

Structured implementation

IT support tools:

Interactive Audit

Implementation

ERAS Implementation Program

Building Blocks

- World Experts
 - Guidelines
 - Centers of Excellence (Informing & teaching)
- Structured Training
 - Breakthrough tailored for ERAS
- Special IT support
 - Encare & Partners
- Fast results – 3 winners:
 - Patients, Professionals, Payers

3 new guidelines 2012

World J Surg
DOI 10.1007/s00268-012-1772-0



Guidelines for Perioperative Care in Elective Colonic Surgery: Enhanced Recovery After Surgery (ERAS®) Society Recommendations

Colon

U. O. Gustafsson • M. J. Scott • W. Schwenk • N. Demartines • D. Roulin •
N. Francis • C. E. McNaught • J. MacFie • A. S. Liberman • M. Soop •
A. Hill • R. H. Kennedy • D. N. Lobo • K. Fearon • O. Ljungqvist

World J Surg
DOI 10.1007/s00268-012-1771-1



Pancreas

Guidelines for Perioperative Care for Pancreaticoduodenectomy: Enhanced Recovery After Surgery (ERAS®) Society Recommendations

World J Surg
DOI 10.1007/s00268-012-1787-6



arem Slim • Francesco Carli •
er • Rowan W. Parks •
as Demartines • Marco Braga •

Guidelines for Perioperative Care in Elective Rectal/Pelvic Surgery: Enhanced Recovery After Surgery (ERAS®) Society Recommendations

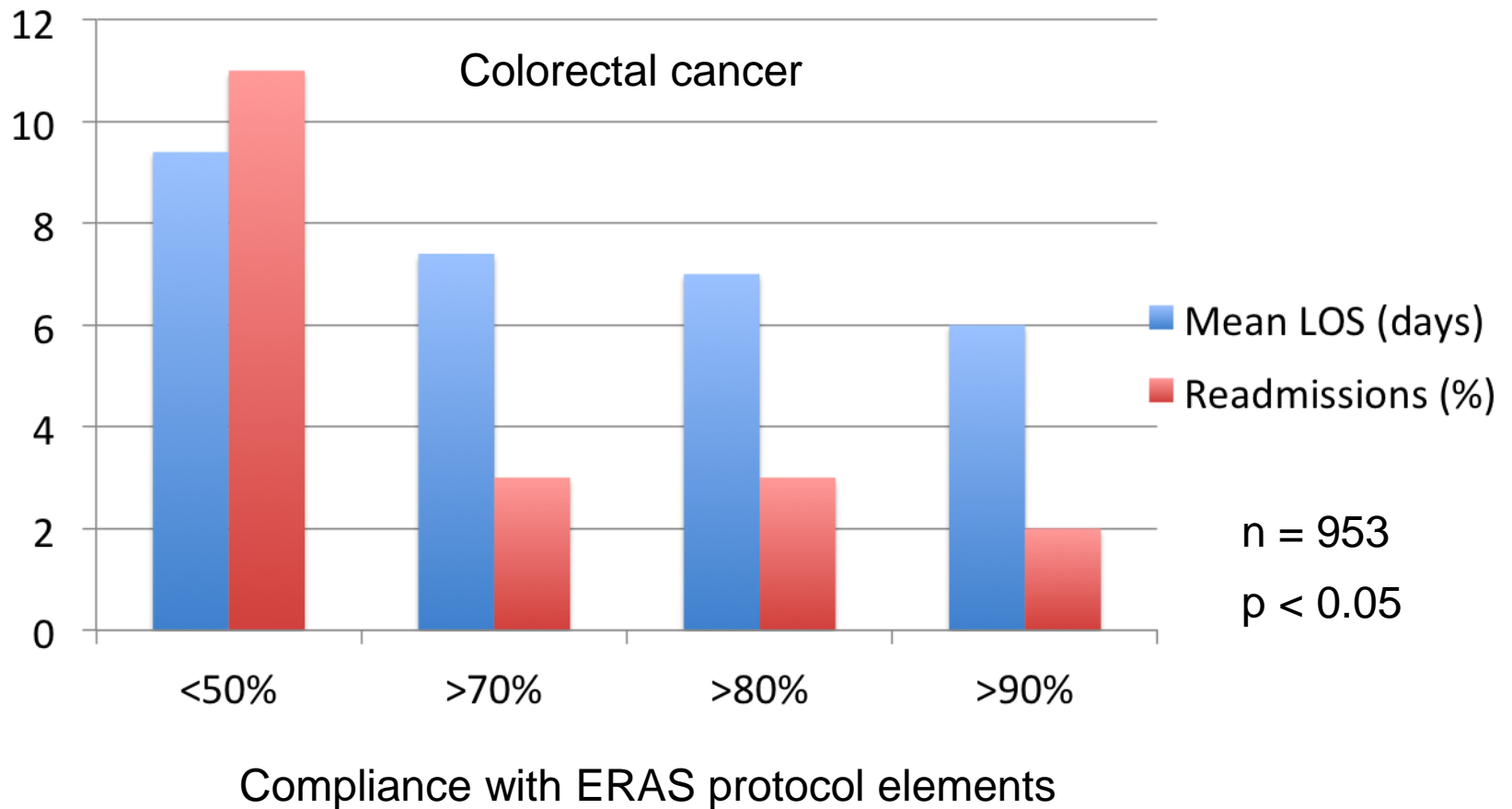
Rectal

J. Nygren • J. Thacker • F. Carli • K. C. H. Fearon •
S. Norderval • D. N. Lobo • O. Ljungqvist •
M. Soop • J. Ramirez

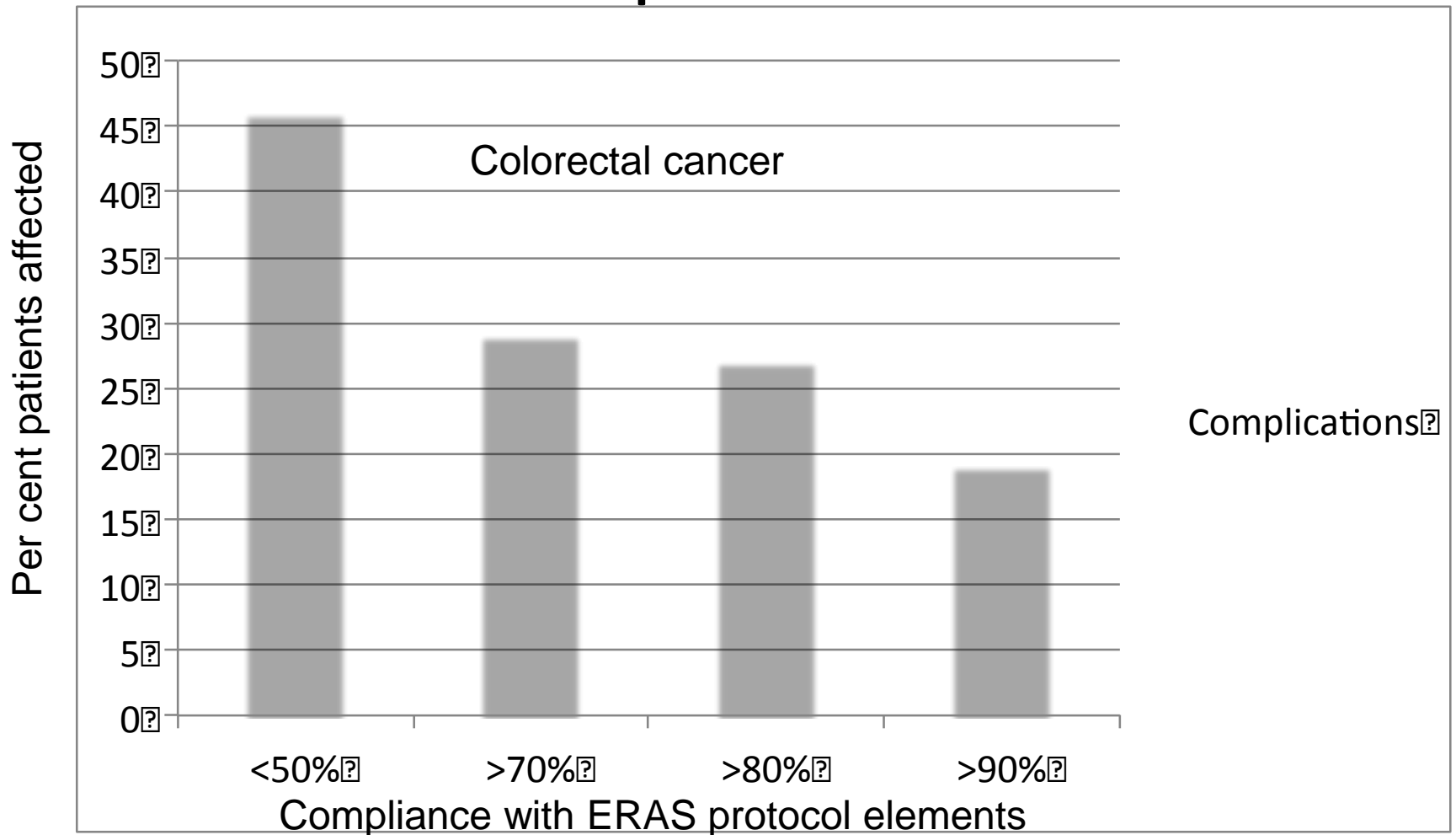
Do the guidelines work?

A test of Compliance

ERAS compliance: Length of stay & Readmissions



ERAS compliance: Complications



ERAS® Society

Guidelines

Colorectal

Pancreatic resection

Cystectomy

Gastrectomy

Anaesthesia

Bariatric

Nephrectomy

Gynecology

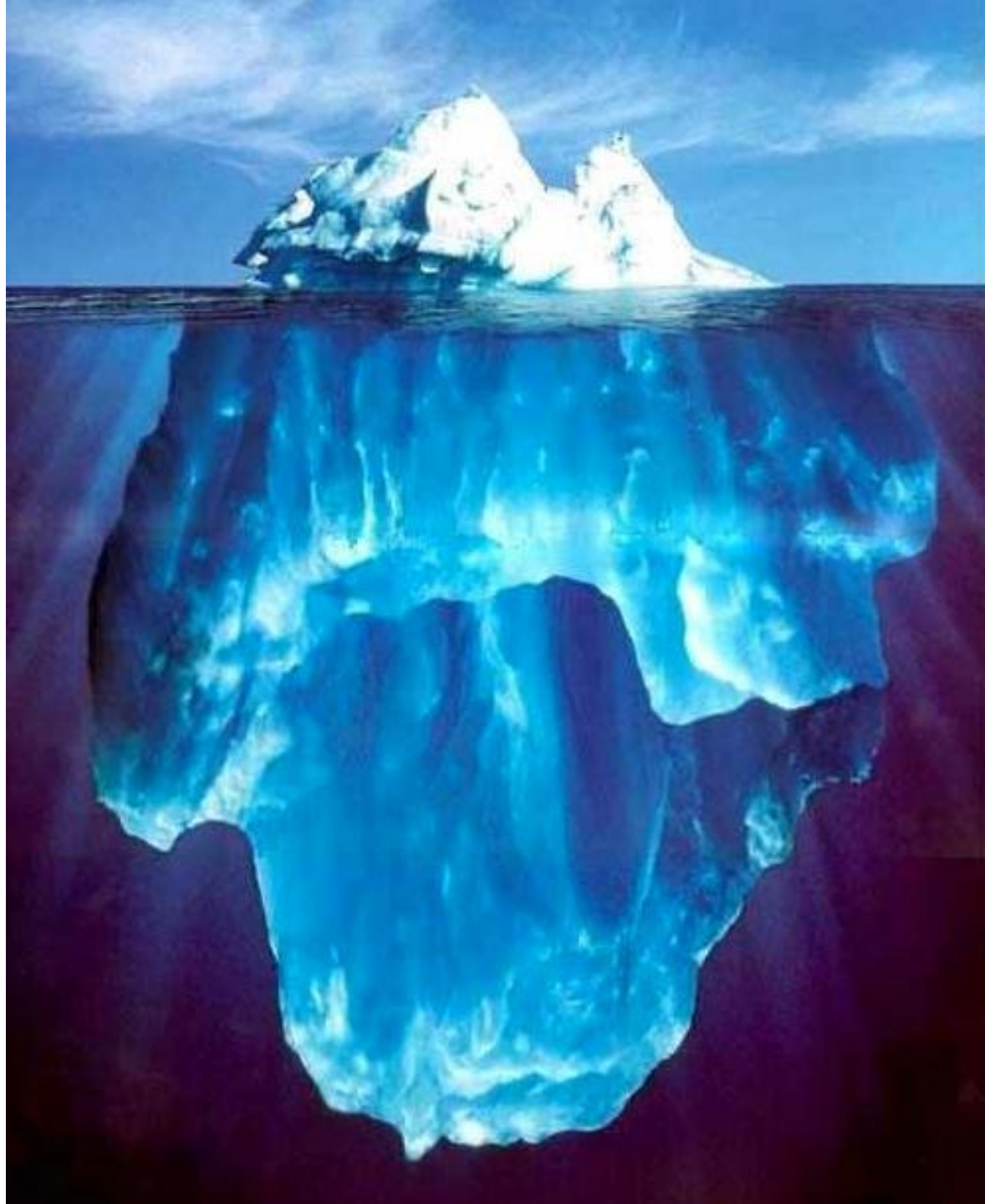
Hip replacement

Knee replacement

Thoracic

Liver resection

Esophageal resection



ERAS Society implementation

1. Center of Excellence

- Running ERAS, site visits, teachers

2. Structured implementation

- ERAS Implementation Program
- Team approach

3. Tools

- ERAS Guidelines – best practice
- ERAS Interactive Audit System

Implementation plan – does it work?

Results:

- Proof of concept in 5 countries (NL, S, CH, Can, F)
- All show improved outcomes (next slides)
- No dropouts after training – all run EIAS
- Major Health providers signing up

Length of stay

ERAS Implementation NL

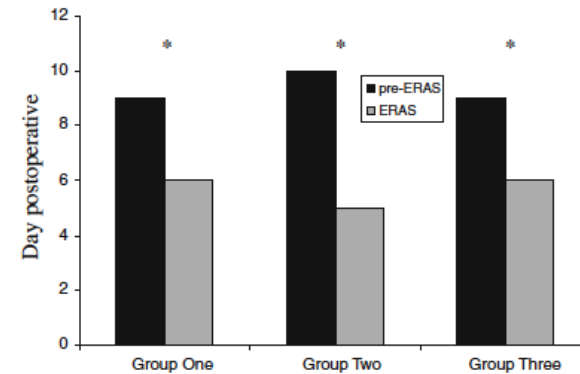
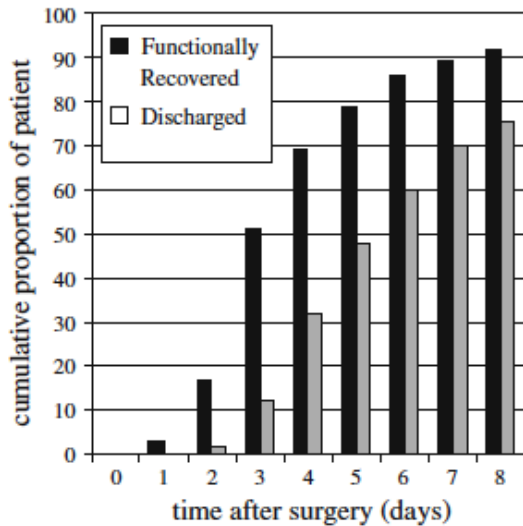
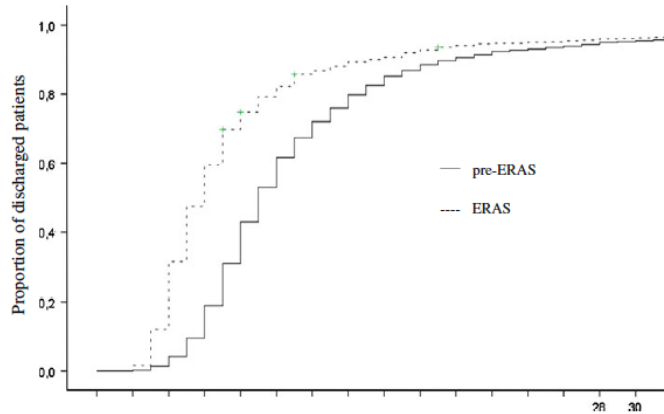


Fig. 3 Reduction in median LOS per hospitals group. * $p < 0.001$ (in all three groups)

Pre-ERAS ($n = 1,451$)

ERAS ($n = 1,034$)

No bowel preparation	582 (44) [0–100]	904 (96) [78–100] $p < 0.001$
Oral carbohydrate treatment	NA	839 (81) [17–100]
During surgery		
Active warming by upper body with an air-warming device	NA	987 (98) [93–100]
Epidural anesthesia	864 (62) [0–100]	920 (90) [50–100] $p < 0.001$
Nasogastric drainage removed at the end of surgery	224 (16) [2–85]	957 (94) [70–100] $p < 0.001$
Postoperative factors		
Day 0		
Mobilization of >15 min	NA	652 (65) [20–100]
Oral fluids intake >500 ml	NA	555 (56) [11–100]
Day 1 after surgery		
IV fluid infusion stopped	NA	343 (34) [3–87]
Mobilization of >3h	NA	779 (77) [56–100]
Solid food given	NA	676 (66) [16–100]
Oral nutritional supplements	NA	667 (69) [0–98]
Oral laxatives (Mofin)	NA	737 (71) [4–100]

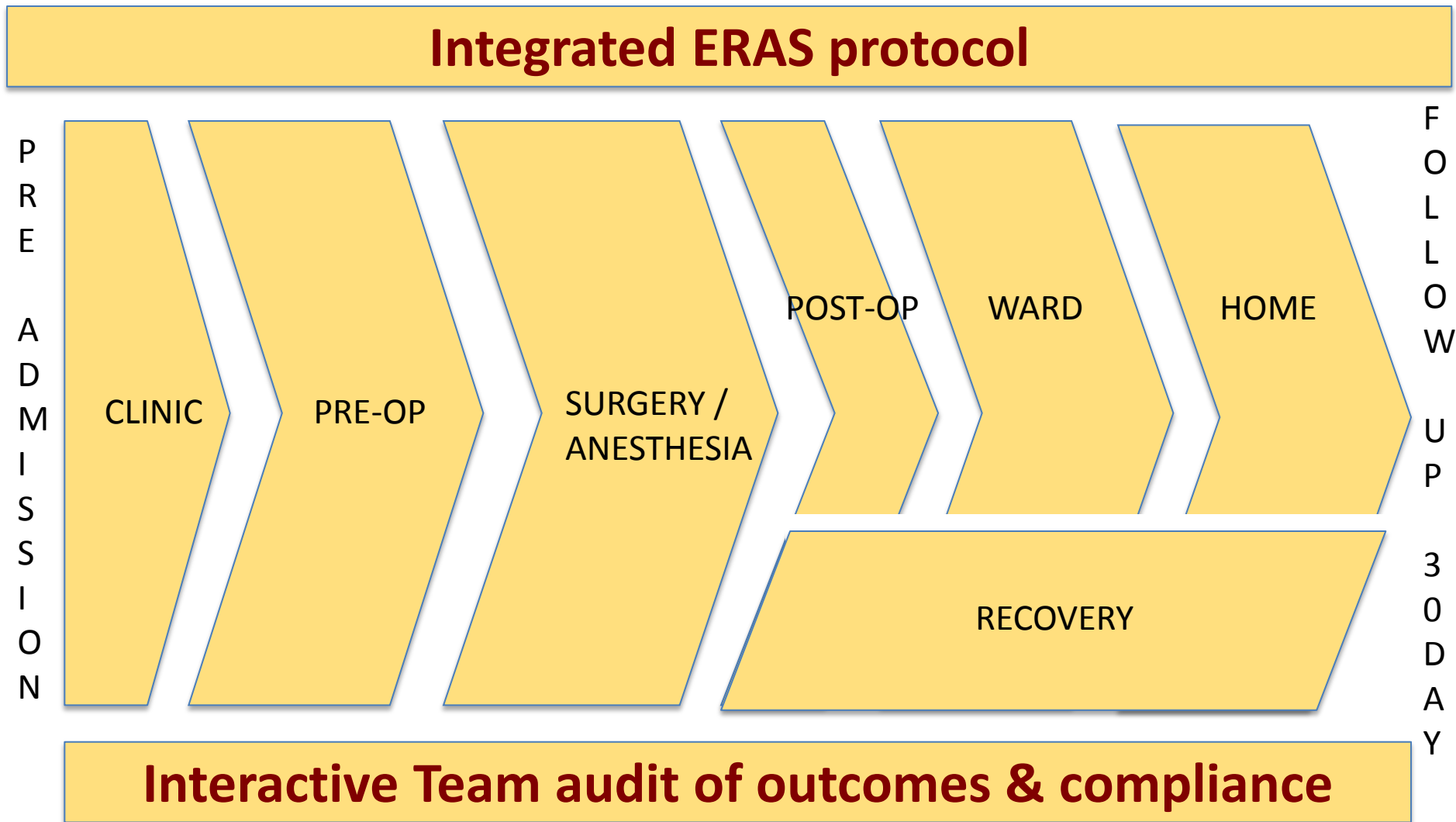
44 [2–84]

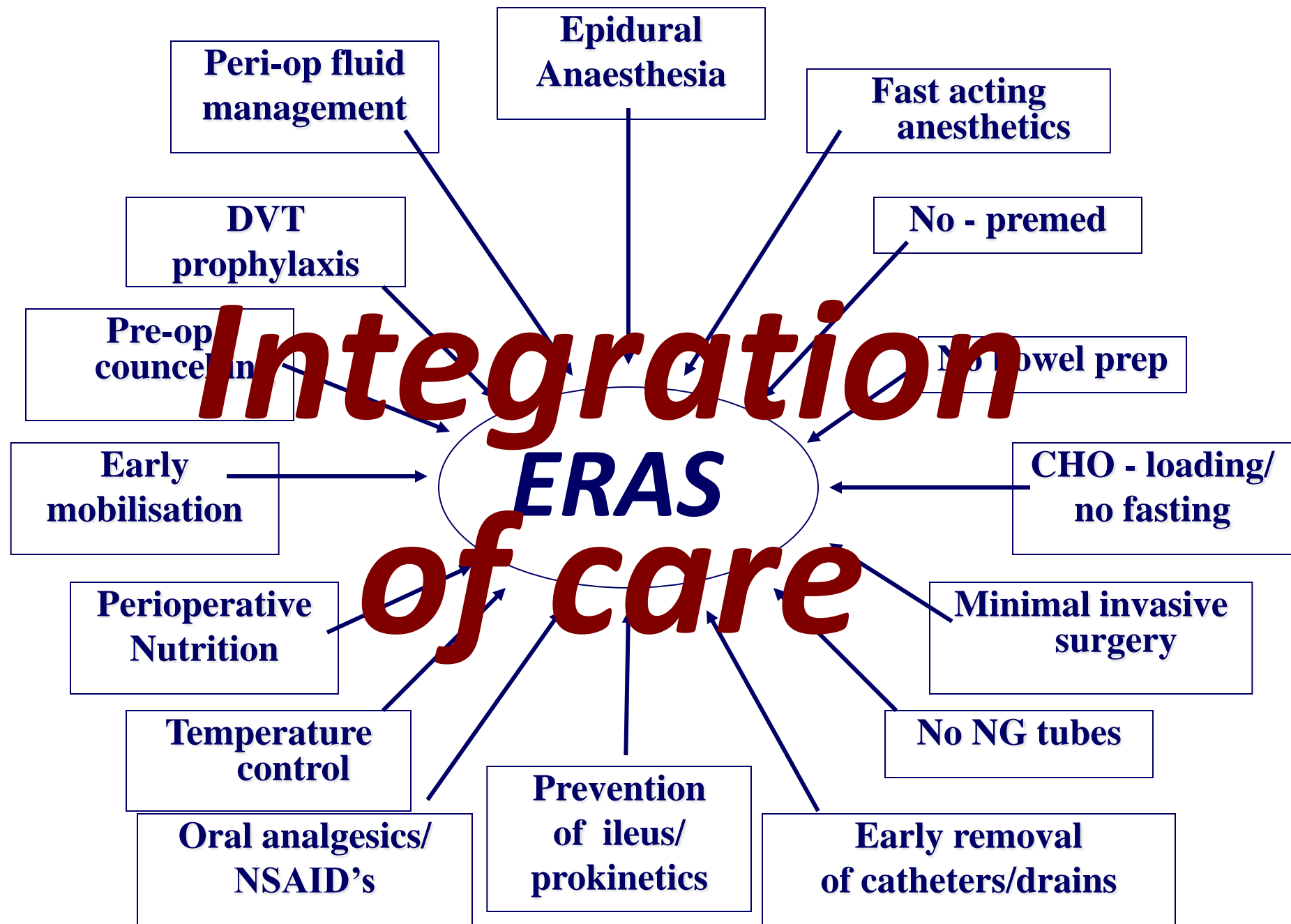
75 [64–93]

Implementation program

Philosophy

The patient's journey





ERAS team approach

- **Surgeon**
- **Anesthetist**
- **HDU specialist**
- **Ward nurses**
- **Anesthesia nurses**
- **Physiotherapist**
- **Dietitian**

- **Management**

Team work:

- **Training**
- **Implementing**
- **Planning**
- **Auditing**
- **Updating**
- **Reporting**
- **Research**

ERAS team approach

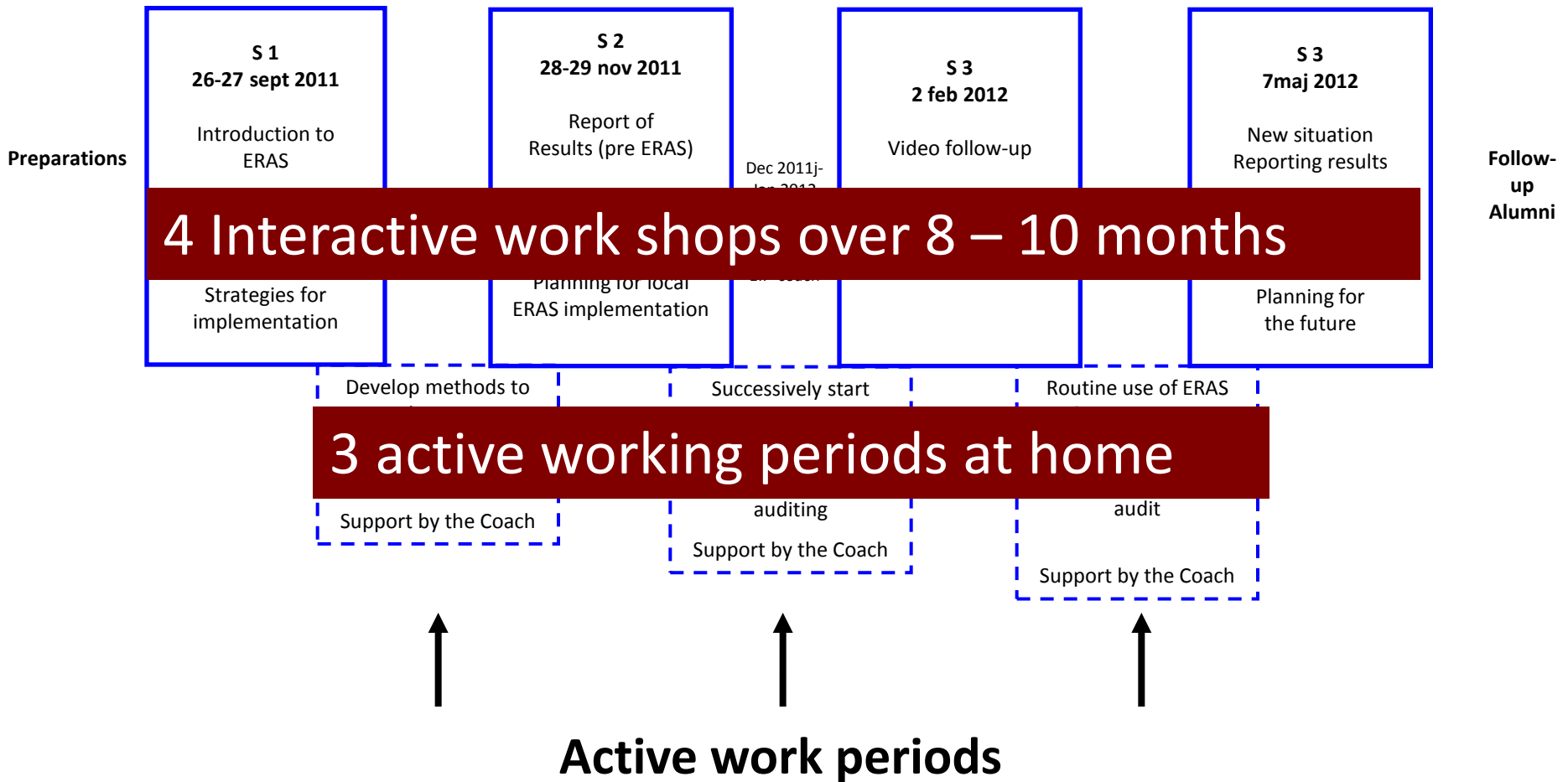
- Surgeon
- Anesthetist
- Warunna
- Anesthesia nurses
- Physiotherapist
- Dietitian
- Management

Team work:

- Training
- Implementing
- Updating
- Reporting
- Research

No escape – all around the table

ERAS Implementation plan



ERAS Implementation

ERAS Center of Excellence (KOL)

ERAS Symposia & other local events

ERAS Implementation Program

New surgical disciplines; Colorectal, Orthopedics, Gynecology, Urology etc.

ERAS & Cost savings

- **New Zealand**

- 4,000€ / patient in the first 50 patients. Study visits & full time included

- **Switzerland**

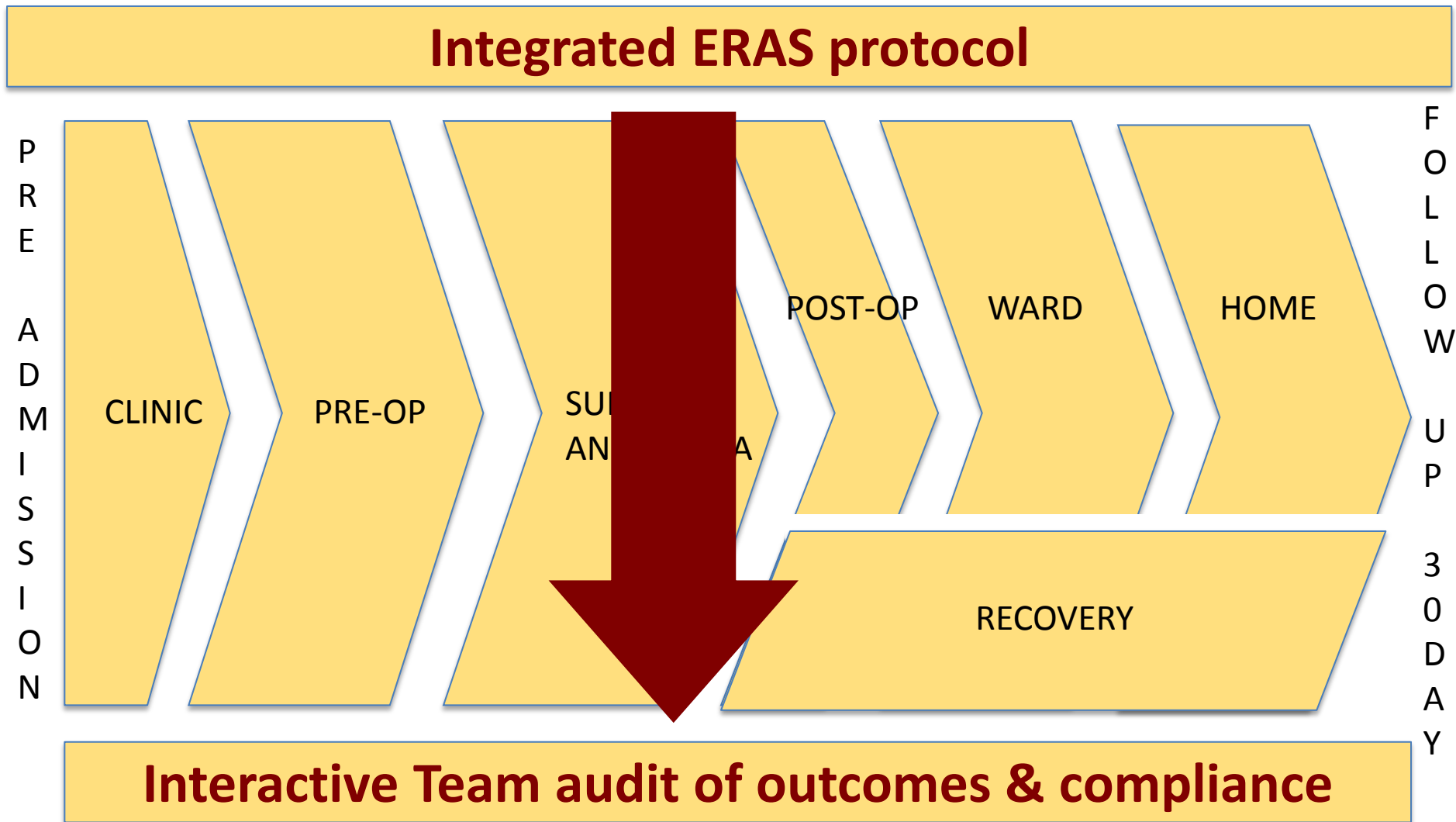
- 1,500€ / patient per first 50 patients. Training & full time nurse included

- **Canada**

- 2,200 € / patient (esophageal surgery).

Audit

The patient's journey



Interactive Audit System

Continuous control

- One international database
- Based on updated Best Practice ERAS Society developed protocols
- Internet access, bank security
- De-identified patient data
- Data ownership by entering unit
- National/regional control

ERAS Interactive Audit System

- Immediate & continuous control
- Team approach
- Compare – benchmark
- Check progress over time
- Basis for research

ERAS Interactive Audit System - Easy to use registration

ERAS - Start - Mozilla Firefox

Arkiv Redigera Visa Historik Bokmärken Verktyg Hjälp

Ukr uu.se https://www.reg.ucl.uu.se/eras/start.jsp

Senaste nytt Kom igång Fel vid sidhämtning firefox

stallmästaregården Search Page Status

SEB Hotell, erbjudande, hotellpaket, boka b... ERAS Society Official Website UCL ERAS - Start

ERAS®

Test Hospital - Complete

ERAS Complete Stafsing

Start Admin

Create a new patient

Area of surgery

Mode of surgery

Type of patient ID

Patient ID

Date of admission (YYYY-MM-DD)

P-POSSUM scoring

2 L...

0 No

Create

Area of surgery

Enter the relevant area of surgery for this patient:

6 = Gynaecology, rectal and small

6 = Gynaecology

7=Gynaecology

8=Urology

Incomplete patient records

Fetch

Number of registrations in the database

On Test Hospital - Complete: 16

In Sweden: 64

In ERAS: 82

* Mandatory variable New registration Data not complete Data complete Comment

Protocol variable

Number of registrations in the database

On Test Hospital - Complete: 16

In Sweden: 64

In ERAS: 82

Page lock in: 0

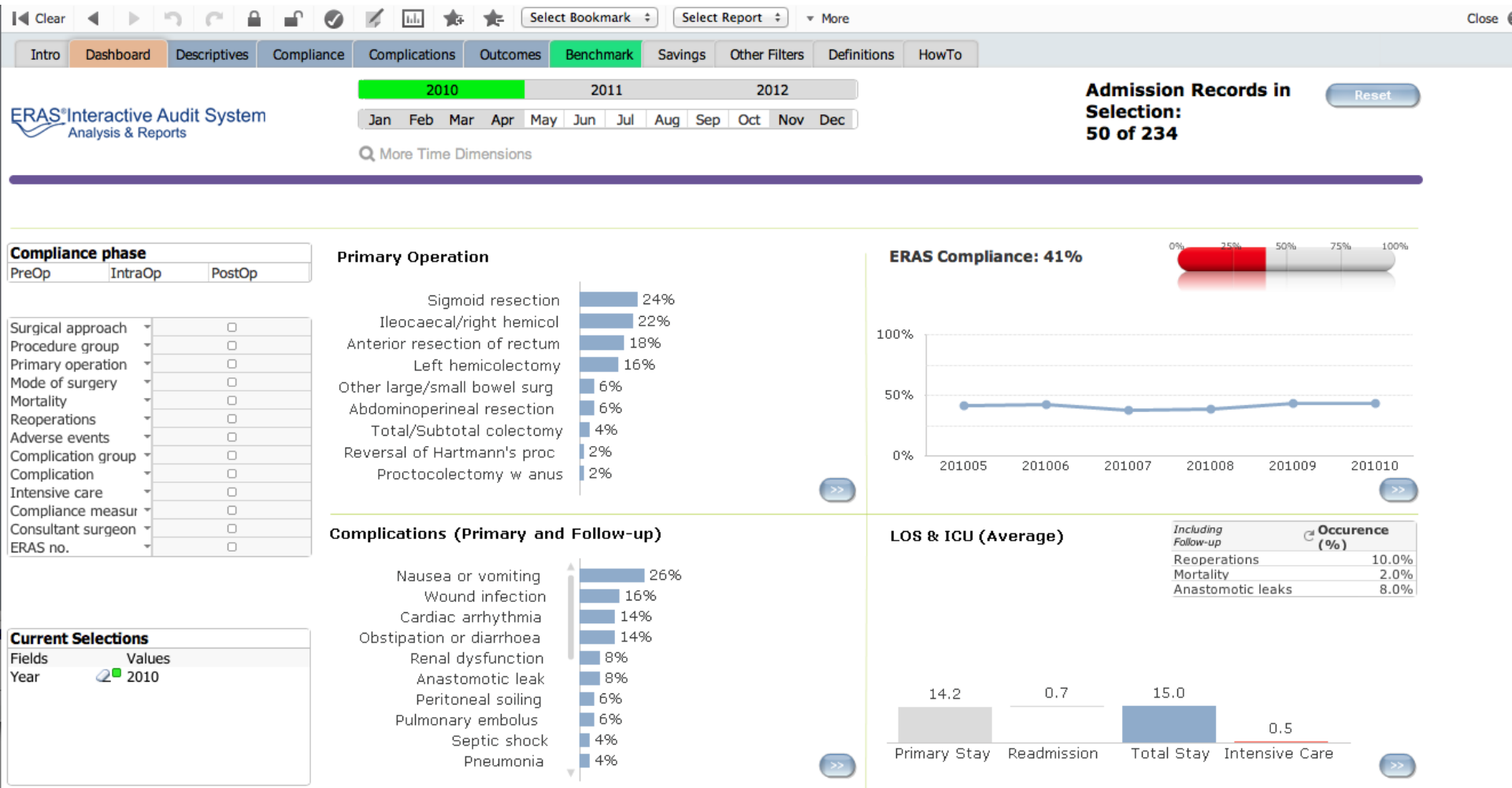
20-25 minutes / patient

Context driven helptexts

Symbol explanation

Interactive Team Audit

2010 – Before ERAS



2010 compliance

2010
2011
2012

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Admission Records in Selection:
50 of 234

Reset
 <<

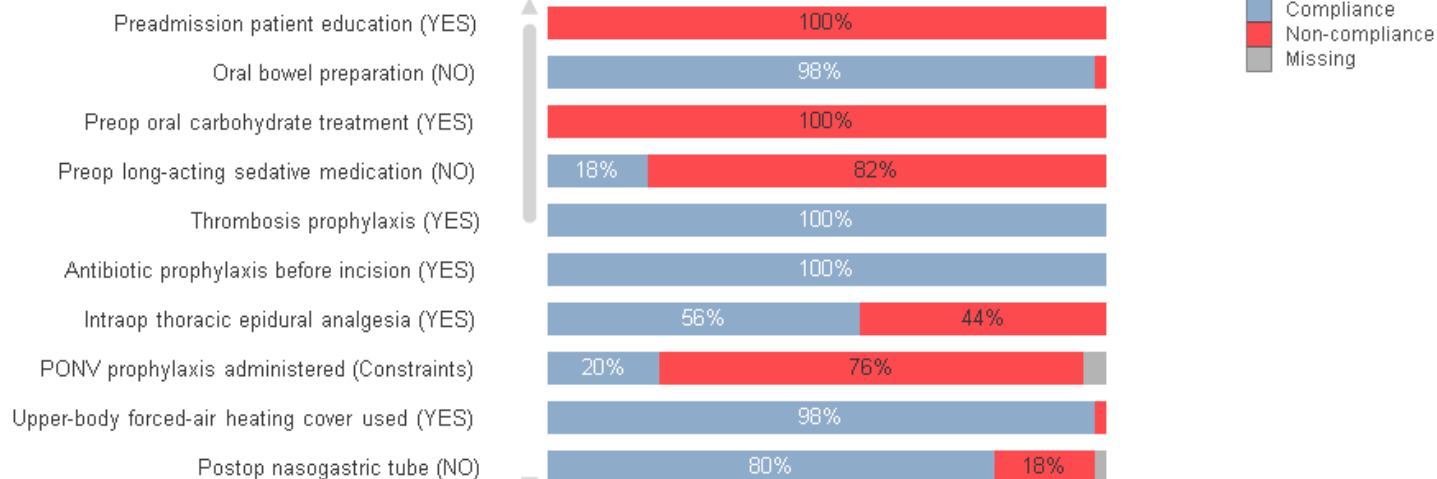
More Time Dimensions

By Care Element



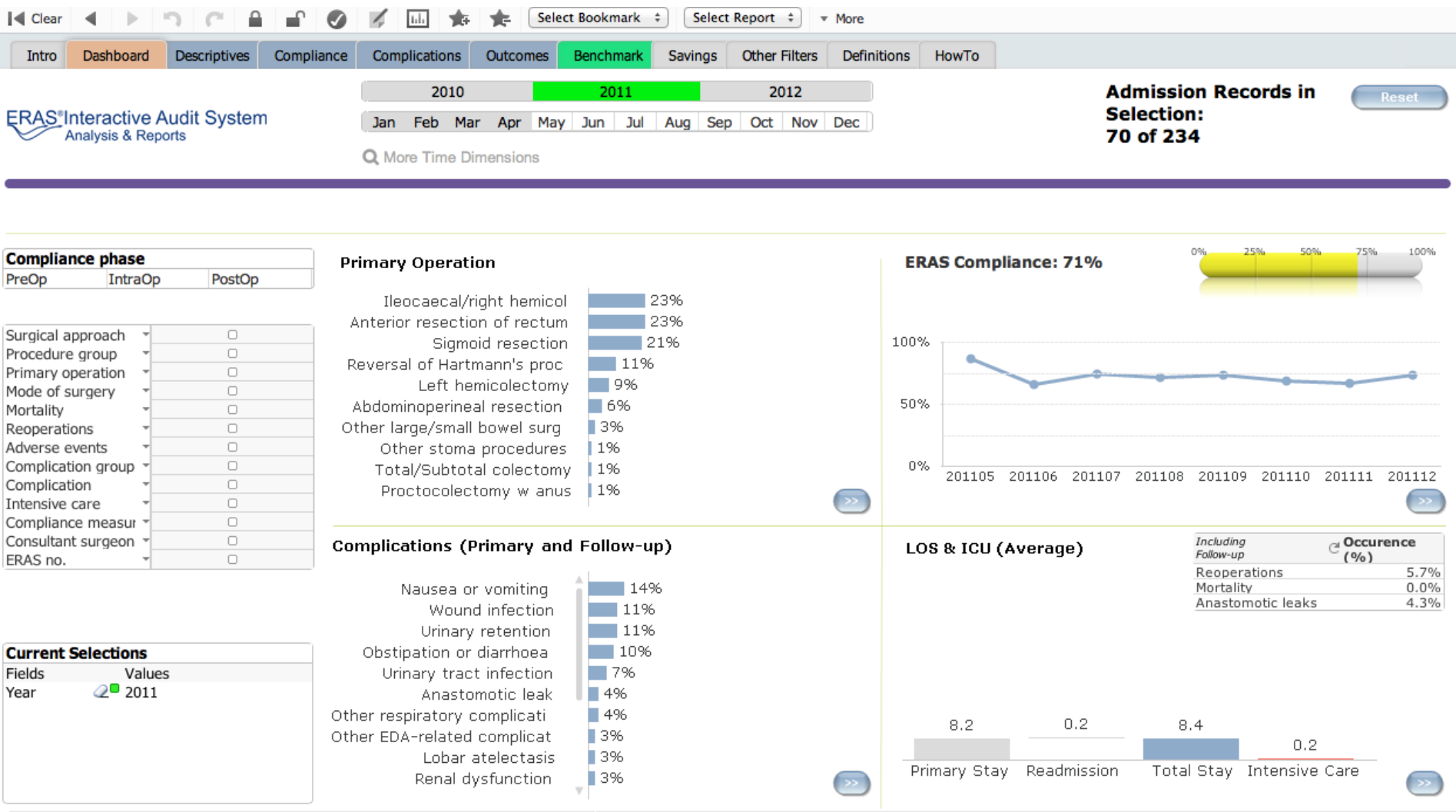
Percent Compliant

Compliance Measure

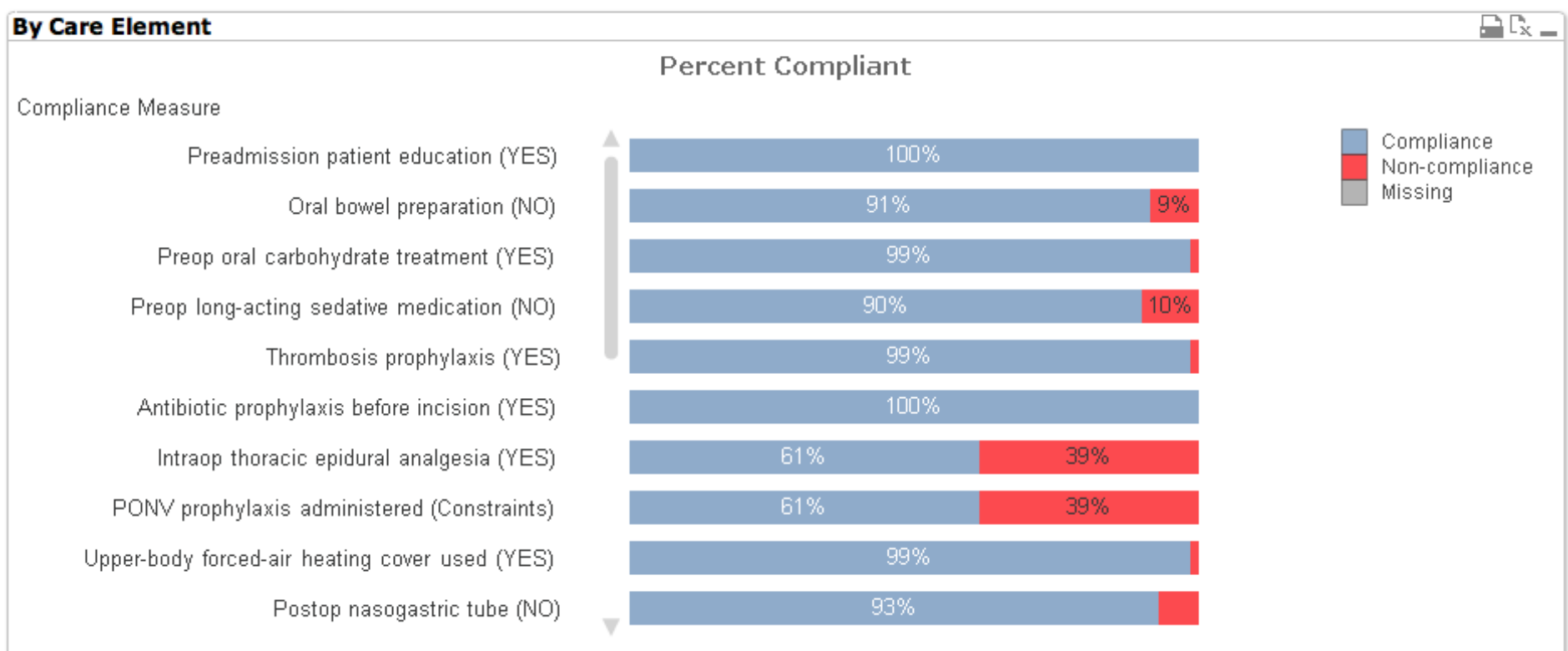


Compliance vs Total L... By Periop Phase Compliance & Total L... Mobilisation D0 and D1
 By Periop Phase Compliance Trend by...

2011- After ERAS training



2011 compliance



Navigation and Filter Options:

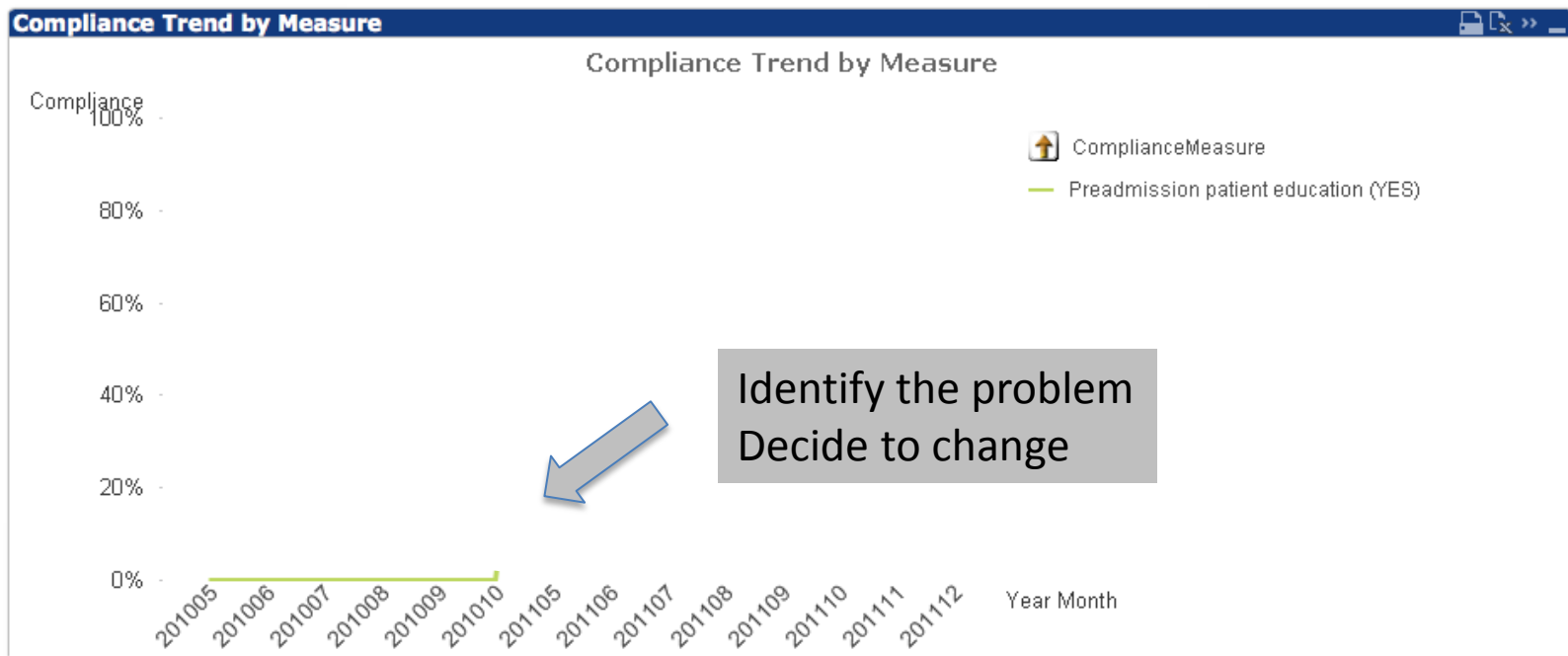
- Compliance vs Total L...
- By Periop Phase
- By Periop Phase
- Compliance & Total L...
- Compliance Trend by...
- Mobilisation D0 and D1

Latest update: 2012-09-23 11:55:04 PM (GMT+1) | Version 2.1.1

Acting to control outcomes

Clinic: Patient education

Q More Time Dimensions

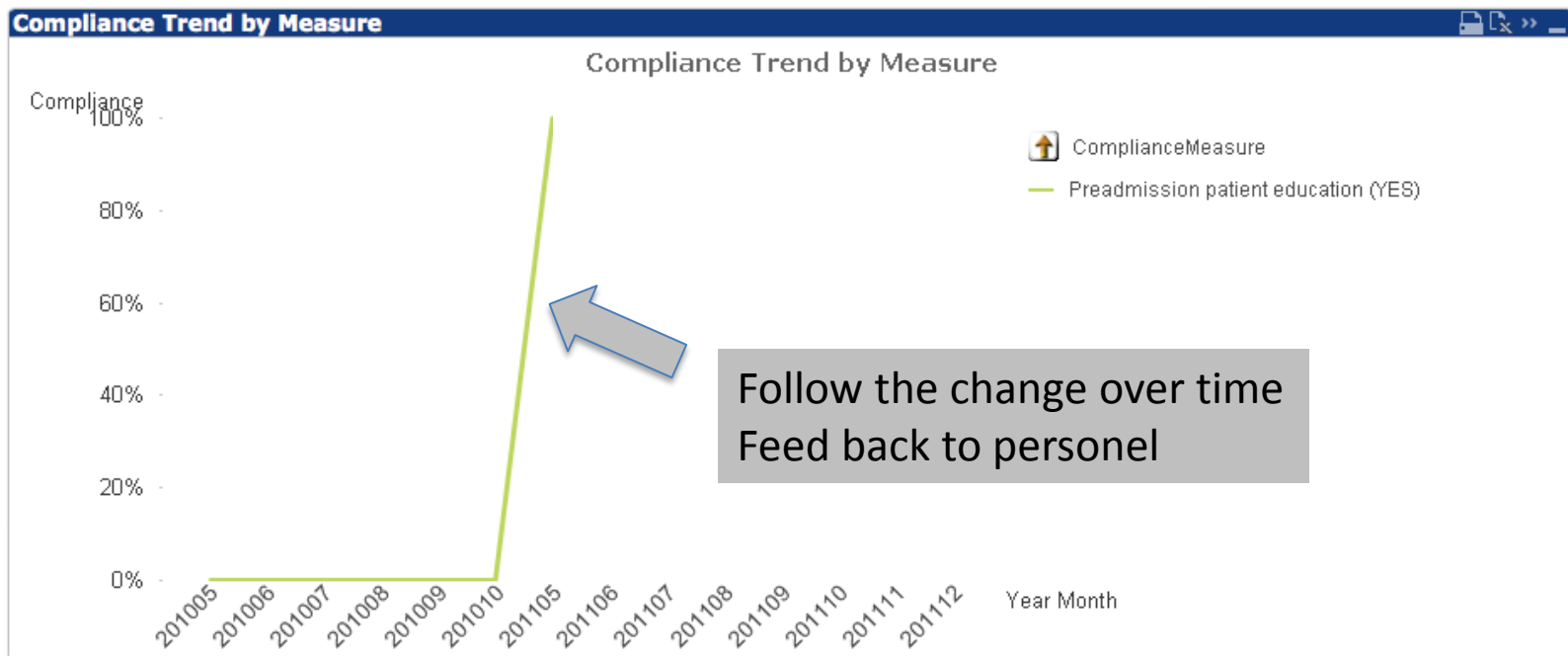


By Care Element By Periop Phase Compliance & Total L... Mobilisation D0 and D1

Compliance vs Total L... By Periop Phase

Clinic: Patient education

Q More Time Dimensions

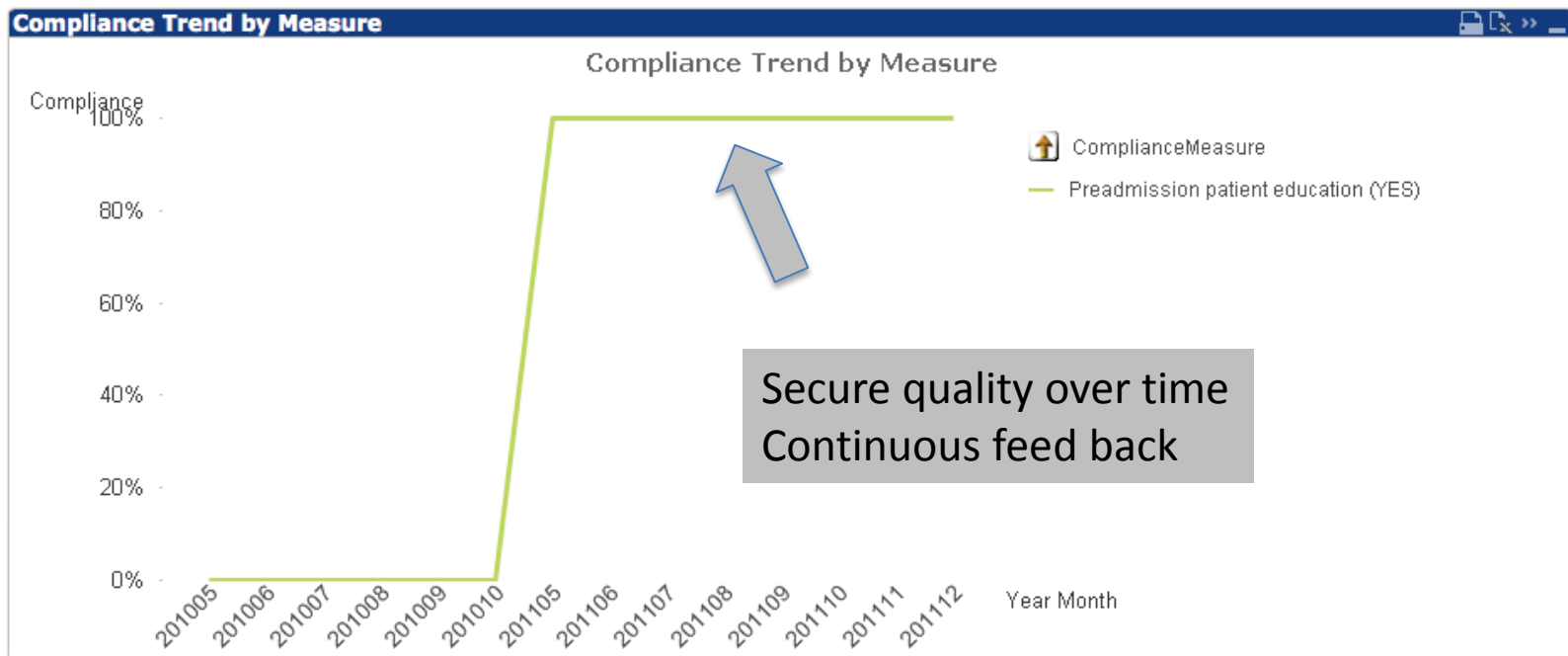


By Care Element By Periop Phase Compliance & Total L... Mobilisation D0 and D1

Compliance vs Total L... By Periop Phase

Clinic: Patient education

More Time Dimensions



By Care Element By Periop Phase Compliance & Total L... Mobilisation D0 and D1

Compliance vs Total L... By Periop Phase

Research

- Database – >11,000 patients
- Increase by almost 500/mo, up 10%/mo
- Control over all variables for outcomes
- Made for trials
- Committee – transparency
- Statistical support unit

2nd World ERAS Congress

- Valencia Spain
- April 23-26, 2014
- Patient, Practice & Outcomes

	Cannes 2012	Valencia 2014
Delegates	202	461
Countries	28	39
Abstracts	56	111

ERAS® Society

2nd World ERAS Congress

Enhanced Recovery After Surgery

23-26 April 2014 Valencia • Spain

www.erassociety.org

For more information, please contact
the Congress Secretariat
2nd World ERAS Congress
c/o MCI Suisse SA
Rue de Lyon 75
1211 Geneva 13
Switzerland
Phone +41 (0)22 33 99 7777
Fax +41 (0)22 33 99 601
E-mail eras2014@mci-group.com



Health Care Challenges

- Growing and ageing population
- Pressure for better results
- Diminishing funding

Health Care Challenges

- Growing and ageing population
- Pressure for better results
- Diminishing funding
- *Better care for less cost – Fast*

Health Care Challenges & ERAS

- Growing and ageing population
- Pressure for better results
- Diminishing funding
- *Better care for less cost – Fast*
- Better care
- Saves costs
- Implement in 8-10 mo

Summary

- ✓ Network of KOL large parts of the world
- ✓ ERAS Society support the use of best practice
 - Create and update guidelines
- ✓ Systematic implementation by Encare - ERAS
 - Guidelines basis for Interactive Audit system
- ✓ ERAS implementation program
 - Proof of concept in several countries
 - Fast accelerating growth

Vision:

Speed up change in practice

“Move from 15 years to 15 months for change”

- ✓ Global network of experts & users – collaboration!
- ✓ Develop care by organizing research using the database “Big Data”
- ✓ Leading systems for implementation & sustainability using IT

Challenges

- Best platform to work from?
- Spread the word
 - Large economic evaluations under way (Alberta HS)
- Speed up research
 - Database Audit & Prospective Randomized Trials
- Grow organization
 - CoE, Countries & regions for implementation – Partners?
 - Other domains in medicine (Interactive Audit System)