



Centre for Patient Safety & Service Quality

Imperial College  
London

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# Teams Create Safety

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[www.cpssq.org](http://www.cpssq.org)

# Overview

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- ◆ Safety meet surgery
- ◆ Teamwork as one critical element of safety
- ◆ Observation of surgical teams
  - Vulnerabilities in the system
- ◆ Teams create safety
  - Team interventions

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## Centre for Patient Safety and Service Quality

Research at the Imperial Centre for Patient Safety and Service Quality (CPSSQ) is focused on improving the **safety of patients and the quality of services** within the NHS.

The CPSSQ has facilities at St Mary's Hospital, Hammersmith Hospital and Imperial College London. It is a **partnership** between Imperial College Healthcare NHS Trust and Imperial College London. You can read more in our about us section.

We play a key role in establishing studies of safety and quality as a fundamental part of medical research in the UK. Our research has a strong focus on **psychology** and covers a variety of topics, including:

- Decision-making in healthcare workers
- Patient behaviour
- The design of medical technology
- Education and training
- Organisation and management

You can read more in our research topics section.

For more information about the CPSSQ, use the links on the left. You can also visit the main CPSSQ website, which is aimed at researchers and healthcare professionals as well as the general public.



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London

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## News

### Clinician manager programme shortlisted to success

• Cymbeline Moore

A PROJECT which recruits and trains clinicians in case management skills has been shortlisted for the prestigious Health Service Journal (HSJ) SWACS.

The 'The Value of Services (TVS)' project has been shortlisted in the Best Driven Service Improvement category.

The award by recognising a culture of data-driven service development and cost working relationships between clinicians and managers by training doctors in medical management skills. The award is also recognised by the under-16 qualification assignments using an amalgamation of medical and operational research methods which the project designed.



Project lead Reza Nooral

Business cases for heart and neck cancer, oncology, vascular and orthopaedic services were produced as part of the programme to investigate and address the impact gaps in resource availability based on clinical outcomes.

Clinical coding errors as so fall from 15 to less than 1.5 per cent as a result of the project.

Reducing this initial cost could increase total revenue by £50 per patient episode and the resulting increase in data accuracy could be a further service development.

The programme was developed by Reza Nooral, specialist registrar in academic ENT surgery with the support of Louise Tomkins, former director of service manager.

Mr Nooral said: "We are delighted to have been shortlisted for this prestigious award. It is a testament to the success of the project and to the hard work of everyone involved."

The TVS award has taken on December 1st in Park Lane, London. The trust will compete with four other organisations in this category.

**“We are delighted to have been shortlisted for this prestigious award. It is a testament to the success of the project and to the hard work of everyone involved.”**

### Patient Safety Centre celebrates first birthday

• Sandra Iskander

THE IMPERIAL Centre for Patient Safety and Service Quality (CPSSQ) is celebrating its first twelve months as a centre for research into providing safer healthcare.

One of only two such centres in the UK, the CPSSQ brings together a range of disciplines to carry out translational research into how to achieve safer and better quality healthcare.

Highlights from the first year of research include an evaluation of an automated, ward-based dispensing system to improve the management of controlled drugs and the

development and piloting of a surgical checklist designed to ensure that routine safety practices are reliably followed. Other streams of work are

looking at how to reduce hospital associated infections and how NHS organisations can better use information to improve quality.

Professor Bryony Dean-Fraikin, executive lead for research at the Trust, is acting director of the CPSSQ while Professor Charles Vincent is on sabbatical.

She said: "We are very proud of the work that the centre has achieved so far. Now that we

are established here, we are looking forward to developing some more long-term research projects, many of which will be based in the Trust.

In the coming months, we also hope to offer a support to frontline staff who are working hard to improve safety and quality in their areas.

### In your patch

#### Outpatients at St Mary's



A PHARMACY BOOTH which will also dispense medication much faster is just one of the most on at the newly refurbished St Mary's outpatients facility.

Both the first and ground floor of the unit, which is the main waiting area for patients, have been given a facelift to increase patient flow and efficiency.

The unit now has a new café and a pedestrianised area providing a new access entrance.

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A STATE-OF-THE-ART head and neck unit, which will provide an entirely new service to patients, is planned for Q3 at Charing Cross Hospital.

The project, which costs £2.4m, will provide 23 beds overall with six single en-suite rooms and a range of equipment such as ceiling mounted hoists.

The unit is due for completion in June 2009.



#### Lindo wing

THE GROUND FLOOR of the Lindo Wing at St Mary's has been completely refurbished. Patients and staff can look forward to answering, reception, administrative and rehabilitation consultation rooms.

Disability access has also been improved and a new minor operations room is due to open soon.

New 3T MRI

A NEW 3T MRI scanner is coming on line at Charing Cross, joining the other two MRI units already housed in the imaging department on the first floor.

Work has started to modify the structure of the primary care centre, which will be fully completed by the end of the financial year.

#### Research opportunities

If you or your team are working on research projects to improve patient safety, the centre would like to hear from you. The centre has a highly experienced team of researchers and clinicians who can offer advice on designing studies, collecting and analysing data and any other factors needed to create research projects which are academically robust. They can also put you in touch with other like-minded clinicians and managers who can offer a network of information and support. If you would like any help, please contact the centre manager, Sandra Iskander on s.iskander@imperial.ac.uk.



Professor Bryony Dean-Fraikin, acting director of the CPSSQ

## ◆ Cross cutting themes

Accident & Emergency

Care of Older People

Infection Prevention

Medication Safety

Cancer

Primary Care

Surgery

◆ Patients & Families

◆ Safety and Quality Information

◆ Design and Technology

◆ Team Work and Skills

◆ Organisation and Health Systems

Safety meets surgery

## Systems Approaches to Surgical Quality and Safety *From Concept to Measurement*

*Charles Vincent, PhD,\* Krishna Moorthy, FRCS,† Sudip K. Sarker, FRCS,† Avril Chang, FRACS,†  
and Ara W. Darzi, MD†*

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**Objective:** This approach provides the basis of our research program, which aims to expand operative assessment beyond patient factors and the technical skills of the surgeon; to extend assessment of surgical skills beyond bench models to the operating theater; to provide a basis for assessing interventions; and to provide a deeper understanding of surgical outcomes.

**Summary Background Data:** Research into surgical outcomes has primarily focused on the role of patient pathophysiological risk factors and on the skills of the individual surgeon. However, this approach neglects a wide range of factors that have been found to be of important in achieving safe, high-quality performance in other high-risk environments. The outcome of surgery is also dependent on the quality of care received throughout the patient's stay in hospital and the performance of a considerable number of health professionals, all of whom are influenced by the environment in

Research into surgical outcomes has primarily focused on the role of patient pathophysiological risk factors, and on the skills of the individual surgeon. The outcome of surgery is, however, also dependent on the quality of care received throughout the patient's stay in hospital and the performance of a considerable number of health professionals, all of whom are influenced by the environment in which they work. Drawing on the wider literature on safety and quality in healthcare, and recent papers on surgery, this article argues for a much wider assessment of factors that may be relevant to surgical outcome. In particular we suggest the development of an "operation profile" to capture all the salient features of a surgical operation. The aims of this initiative are: to expand operative assessment beyond patient factors

# Surgical Outcomes

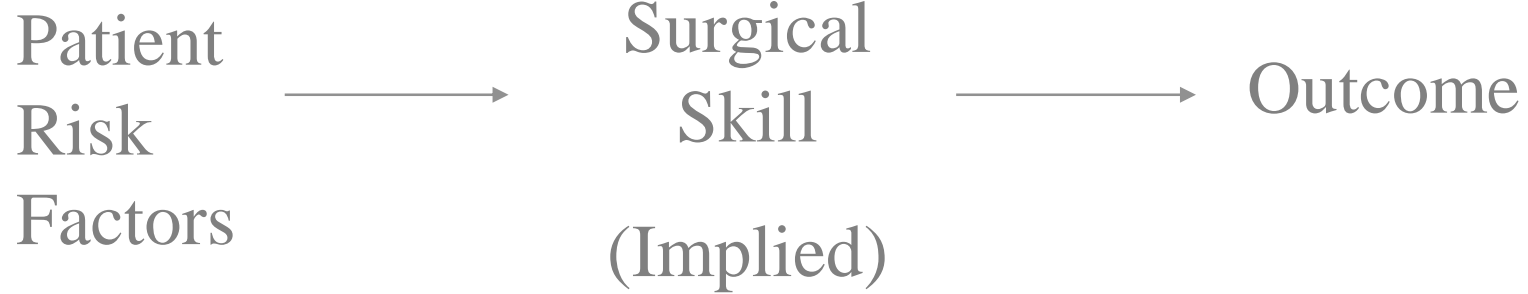
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Operation Profile

# Surgical Outcomes

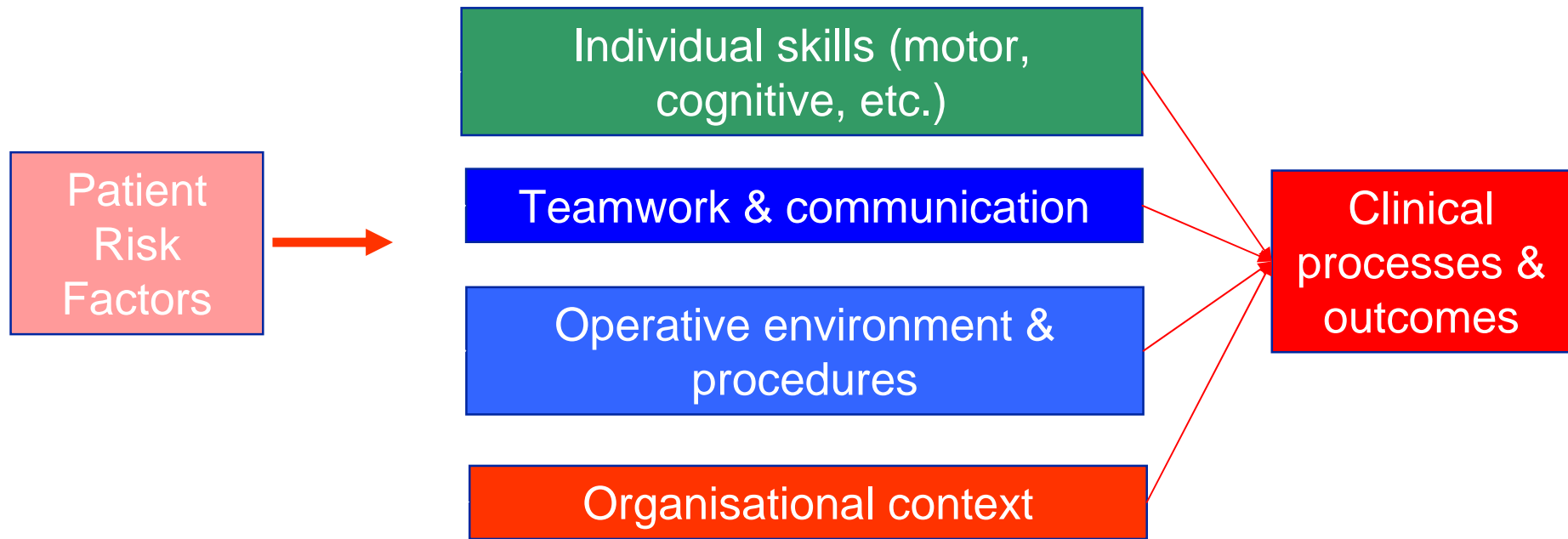
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# Systems approaches to surgery

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Vincent et al, 2004

## Patterns of Communication Breakdowns Resulting in Injury to Surgical Patients

Caprice C Greenberg, MD, MPH, Scott E Regenbogen, MD, David M Studdert, LLB, SCD, MPH, Stuart R Lipsitz, SCD, Selwyn O Rogers, MD, MPH, FACS, Michael J Zinner, MD, FACS, Atul A Gawande, MD, MPH, FACS

**BACKGROUND:** Communication breakdowns have led to the development of guide initiatives to improve surgical team communication.  
**STUDY DESIGN:** In surgeon-review of 60 cases involving communication breakdowns, reviewers analyzed the patterns of communication breakdowns on identified patterns of communication breakdowns that developed and their relationship to patient outcomes.  
**RESULTS:** The 60 cases involve communication breakdowns during intraoperative (30%) and preoperative (92%) involving 1 team member (73%) were common. Communication breakdowns occurred with handoffs and communication breakdowns.

The American Journal of Surgery (2009) 197, 678–685

Clinical Surgery-American

### Surgical team behaviors and patient outcomes

Karen Mazzocco, R.N., J.D.<sup>a,\*</sup>, Diana B. Petitti, M.D., M.P.H.<sup>b</sup>, Kenneth T. Fong, M.S.<sup>c</sup>, Doug Bonacum, M.B.A.<sup>c</sup>, John Brookey, M.D.<sup>d</sup>, Suzanne Graham, R.N., Ph.D.<sup>e</sup>, Robert E. Lasky, Ph.D.<sup>f</sup>, J. Bryan Sexton, Ph.D.<sup>g</sup>, Eric J. Thomas, M.D., M.P.H.<sup>f</sup>

The American Journal of Surgery

Joseph A. Dearani, MD, FACS, Joseph A. Dearani III, MD, FACS, Rochester, Minn

the potential to increase the occurrence of surgical errors and the nature of surgical flow disruptions and their relationship to surgical errors and their relationship to surgical flow disruptions to understand better the effect of these disruptions

errors and flow disruptions during 31 cardiac surgery cases by a classification system of human factors. Flow disruptions during 31 cardiac surgery cases by an interdisciplinary team of experts in operative and

communication failures, equipment and technology related distractions, and issues in resource accessibility. Cases in flow disruptions. Teamwork/communication errors.

data to develop evidenced-based error management and with implications to other related surgical programs.

vascular Surgery, Mayo Clinic, Rochester, Minn

British Journal of Anaesthesia 101 (3): 332–7 (2008)  
doi:10.1093/bja/aen168 Advance Access publication June 13, 2008

BJA

San Diego, CA and, CA, USA; <sup>d</sup>Kaiser Permanente, Oakland, CA, USA; <sup>e</sup>Baltimore, MD, USA

### CLINICAL PRACTICE

## Interprofessional handover and patient safety in anaesthesia: an observational study of handovers in the recovery room†

A. F. Smith<sup>1\*‡</sup>, C. Pope<sup>2</sup>, D. Goodwin<sup>3</sup> and M. van Beuzekom<sup>1\*</sup>

<sup>1</sup>Department of Anaesthesia, Royal Lancaster Infirmary, Ashton Road, Lancaster, UK; <sup>2</sup>Department of Nursing and Midwifery, University of Southampton, Southampton, UK; and <sup>4</sup>Institute for Health Research, Lancaster University, Lancaster, UK

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British Journal of Anaesthesia 105 (1): 52–9 (2010)  
doi:10.1093/bja/aeq135

### Patient safety: latent risk factors

M. van Beuzekom<sup>1\*</sup>, F. Boer<sup>1,2</sup>, S. Akerboom<sup>3</sup> and P. Hudson<sup>3,4</sup>

<sup>1</sup>OR Centre, I4-Q and <sup>2</sup>Department of Anaesthesiology, Leiden University Medical Centre, PO Box 9600, 2300 RC Leiden, The Netherlands

<sup>3</sup>Department of Psychology, Leiden University, The Netherlands

<sup>4</sup>Department of Safety Science, Delft University of Technology, The Netherlands

\* Corresponding author. E-mail: m.van\_beuzekom@lumc.nl

## Surgical outcome research

### Disruptions in surgical flow and their relationship to surgical errors: An exploratory investigation

Joseph A. Dearani, MD, FACS, Joseph A. Dearani III, MD, FACS, Rochester, Minn

the potential to increase the occurrence of surgical errors and the nature of surgical flow disruptions and their relationship to surgical errors and their relationship to surgical flow disruptions to understand better the effect of these disruptions

errors and flow disruptions during 31 cardiac surgery cases by a classification system of human factors. Flow disruptions during 31 cardiac surgery cases by an interdisciplinary team of experts in operative and

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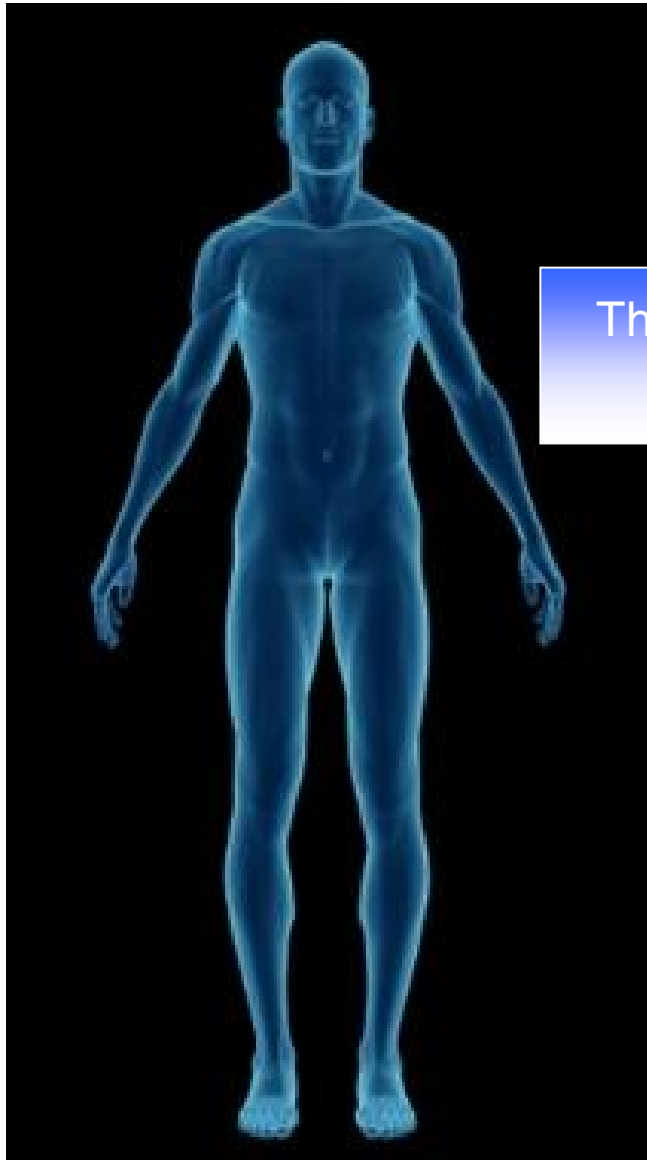
data to develop evidenced-based error management and with implications to other related surgical programs.

vascular Surgery, Mayo Clinic, Rochester, Minn

BJA

# Observing Surgical Teams

# Patient's Surgical Journey



Scheduling the case

Pre-assessment

Theatre Transfer & Preoperative checks

Induction of Anaesthesia

Operation

Postoperative Handover

Daily Ward Care



# Postop handover

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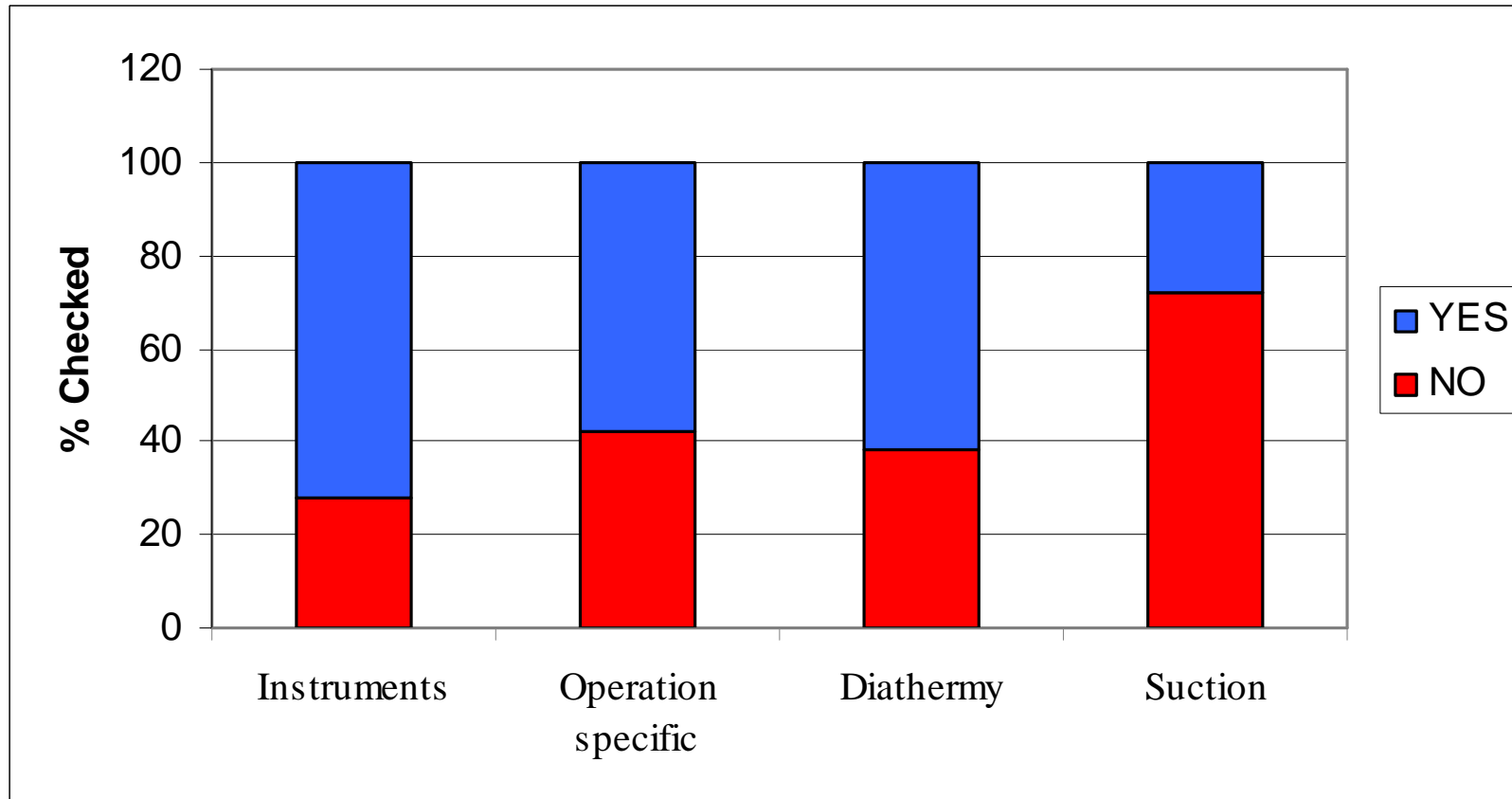
- ◆ Source failures
  - Failure to write postop instructions
  - Handover incomplete
  - Information at different places
- ◆ Transmission failures
  - Operation notes not transferred
  - Debriefing does not happen
- ◆ Receiver failures
  - Nurse multitasking, not gaining full info

# The evolution of communication

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- ◆ “A lack of an organised process of handing over information or recording information. People record information in different places, there's nursing notes, there's surgical notes and actually everybody's got their own, their own piece of territory but it's not all tied together. ”
- ◆ “What we've got is an organic system which has grown and developed over the years which includes multiple parallel hierarchies and people working independently”

# Surgical equipment checks



# Results: task completion

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	Pre-op		Intra-op		Post-op	
	Surg	Urol	Surg	Urol	Surg	Urol
Equip	56%	61%	82%	91%	89%	95%
Comm	61%	71%	55%	57%	90%	84%
Patient	90%	94%	93%	93%	97%	92%



# Lack of design in healthcare teams

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- Team haphazardly put together
- Assumption that they can “manage”
- Assumption that it is all down to one’s personality

Improving team performance

# I Reliability of ward care

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- ◆ (1) How well do you understand the goals of care for this patient today?
- ◆ (2) How well do you understand what work needs to be accomplished to get this patient to the next level of care?
- ◆ Less than 10% of nurses or doctors could answer these questions

**Table 1. Daily Goals Form**

Room Number ____	Date ____ / ____ / ____		
____ Attending initials:	–Initial as goals are reviewed–		
	0700-1500	1500-2300	2300-0700
What needs to be done for the patient to be discharged from the ICU?			
What is this patient's greatest safety risk? How can we reduce that risk			
Pain mgt/sedation			
Cardiac/volume status			
Pulmonary/ventilator (PP, elevate HOB)			
Mobilization			
ID, cultures, drug levels			
GI/Nutrition			
Medication changes (can any be discontinued?)			
Tests/procedures			
Review scheduled labs; morning labs and CXR			
Consultations			
Communication with primary service			
Family communication			
Can catheters/tubes be removed?			
Is this patient receiving DVT/PUD prophylaxis?			
<p>Mgt, management; PP, plateau pressure; HOB, head of bed; ID, infectious disease; GI, gastrointestinal; labs, laboratory tests; CXR, Chest radiograph; DVT, deep venous thrombosis; PUD, peptic ulcer disease.</p>			

# The Impact of Daily Goals

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- ◆ Structured and organised care for each patient
- ◆ Reliability – reducing the gap between what should be happening and what is actually happening
- ◆ Reduced length of stay from 2.5 to 1.3 days

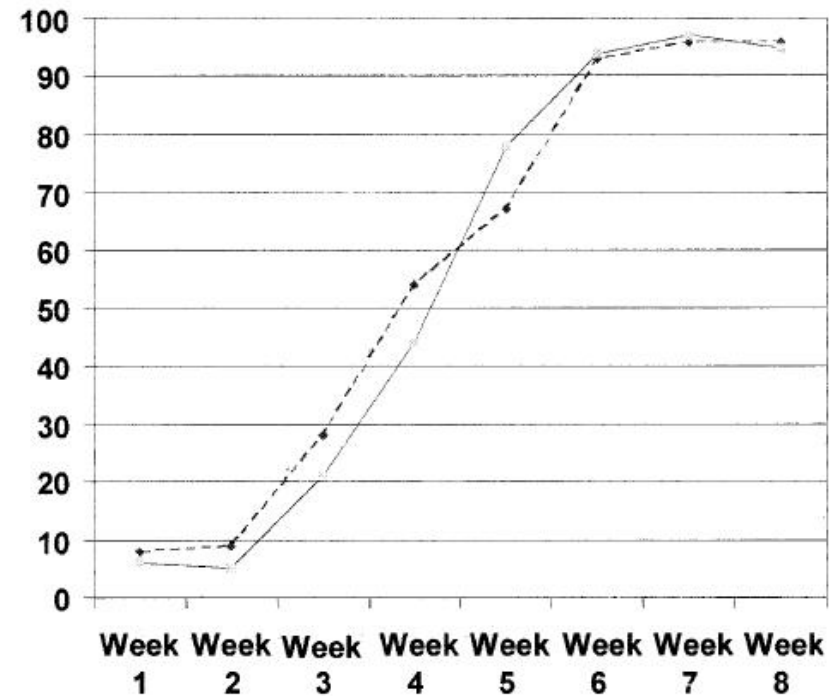


Fig 1. Percent of residents and nurses per week understanding goals.

SPECIAL ARTICLE

# A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

Alex B. Haynes, M.D., M.P.H., Thomas G. Weiser, M.D., M.P.H.,  
William R. Berry, M.D., M.P.H., Stuart R. Lipsitz, Sc.D.,  
Abdel-Hadi S. Breizat, M.D., Ph.D., E. Patchen Dellinger, M.D.,  
Teodoro Herbosa, M.D., Sudhir Joseph, M.S., Pascience L. Kibatata, M.D.,  
Marie Carmela M. Lapitan, M.D., Alan F. Merry, M.B., Ch.B., F.A.N.Z.C.A., F.R.C.A.,  
Krishna Moorthy, M.D., F.R.C.S., Richard K. Reznick, M.D., M.Ed., Bryce Taylor, M.D.,  
and Atul A. Gawande, M.D., M.P.H., for the Safe Surgery Saves Lives Study Group\*

# WHO Surgical Safety Checklist

(adapted for England and Wales)

## SIGN IN (To be read out loud)

Before induction of anaesthesia

Has the patient confirmed his/her identity, site, procedure and consent?

Yes

Is the surgical site marked?

Yes/not applicable

Is the anaesthesia machine and medication check complete?

Yes

Does the patient have a:

Known allergy?

No

Yes

Difficult airway/aspiration risk?

No

Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

No

Yes, and adequate IV access/fluids planned

Name:

Signature of

Registered Practitioner:

### PATIENT DETAILS

Last name:

First name:

Date of birth:

NHS Number:\*

Procedure:

\*If the NHS Number is not immediately available, a temporary number should be used until it is.

## TIME OUT (To be read out loud)

Before start of surgical intervention  
for example, skin incision

Have all team members introduced themselves by name and role?

Yes

Surgeon, Anaesthetist and Registered Practitioner verbally confirm:

What is the patient's name?

What procedure, site and position are planned?

Anticipated critical events

Surgeon:

How much blood loss is anticipated?

Are there any specific equipment requirements or special investigations?

Are there any critical or unexpected steps you want the team to know about?

Anaesthetist:

Are there any patient specific concerns?

What is the patient's ASA grade?

What monitoring equipment and other specific levels of support are required, for example blood?

Nurse/ODP:

Has the sterility of the instrumentation been confirmed (including indicator results)?

Are there any equipment issues or concerns?

Has the surgical site infection (SSI) bundle been undertaken?

Yes/not applicable

• Antibiotic prophylaxis within the last 60 minutes

• Patient warming

• Hair removal

• Glycaemic control

Has VTE prophylaxis been undertaken?

Yes/not applicable

Is essential imaging displayed?

Yes/not applicable

Name:

Signature of

Registered Practitioner:

## SIGN OUT (To be read out loud)

Before any member of the team leaves  
the operating room

Registered Practitioner verbally confirms with the team:

Has the name of the procedure been recorded?

Has it been confirmed that instruments, swabs and sharps counts are complete (or not applicable)?

Have the specimens been labelled (including patient name)?

Have any equipment problems been identified that need to be addressed?

Surgeon, Anaesthetist and Registered Practitioner:

What are the key concerns for recovery and management of this patient?

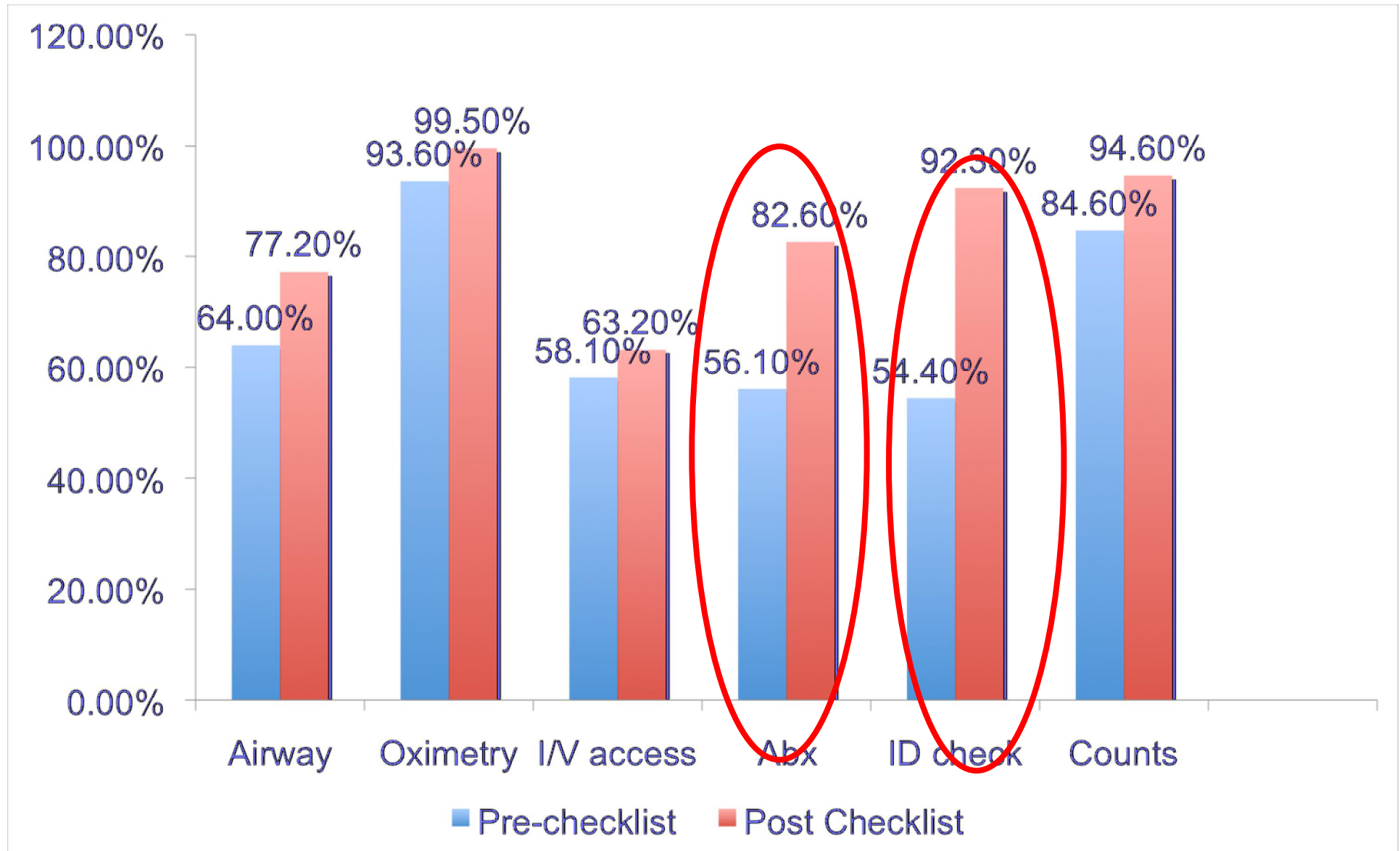
Name:

Signature of

Registered Practitioner:

This checklist contains the core content for England and Wales

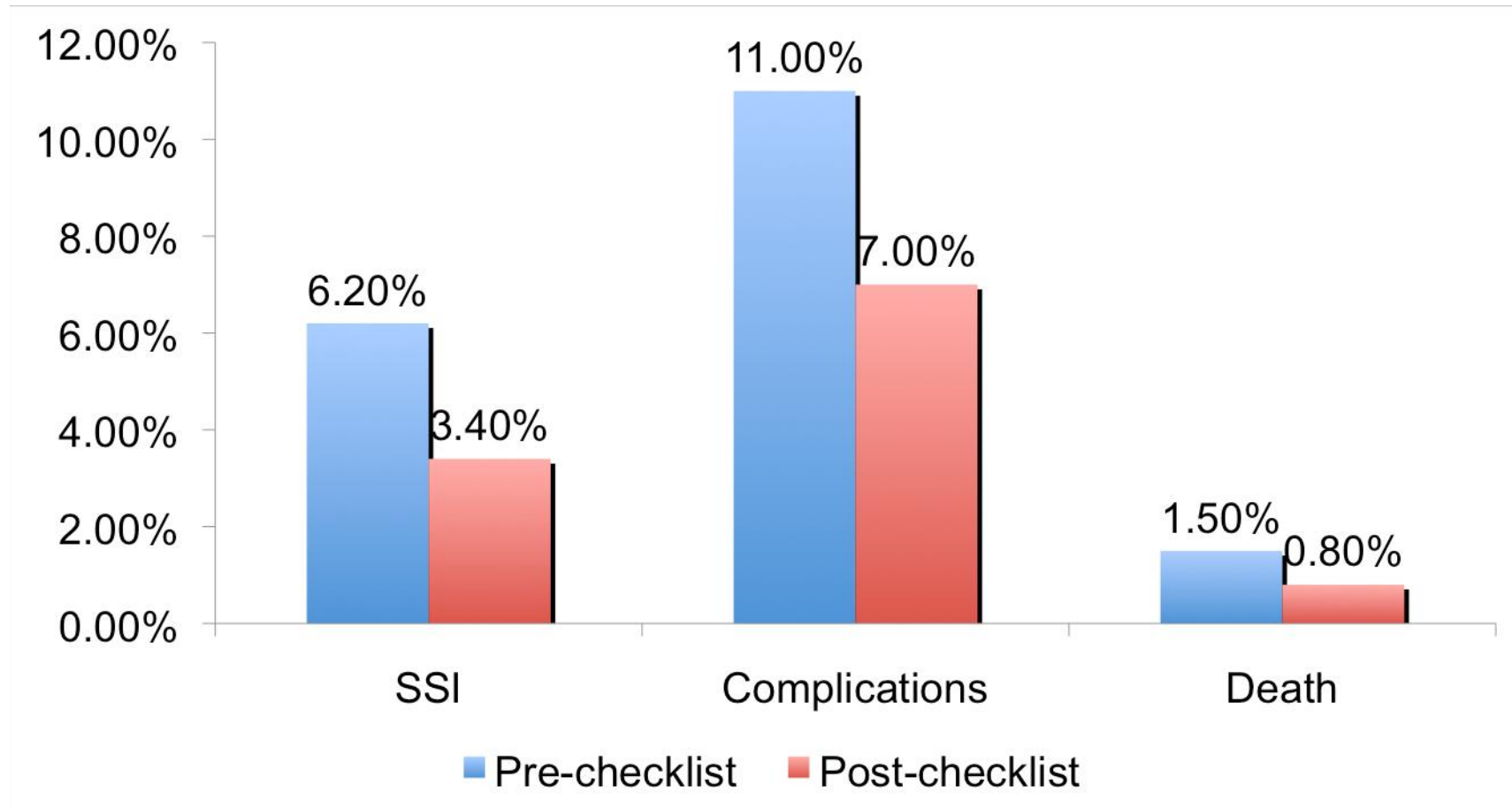
# Global results Process





# Global results Outcome

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SPECIAL ARTICLE

## Effect of a Comprehensive Surgical Safety System on Patient Outcomes

Eefje N. de Vries, M.D., Ph.D., Hubert A. Prins, M.D., Ph.D.,  
Rogier M.P.H. Crolla, M.D., Adriaan J. den Outer, M.D.,\*  
George van Andel, M.D., Ph.D., Sven H. van Helden, M.D., Ph.D.,  
Wolfgang S. Schlack, M.D., Ph.D., M. Agnès van Putten, B.Sc.,  
Dirk J. Gouma, M.D., Ph.D., Marcel G.W. Dijkgraaf, Ph.D.,  
Susanne M. Smorenburg, M.D., Ph.D., and Marja A. Boermeester, M.D., Ph.D.,  
for the SURPASS Collaborative Group†

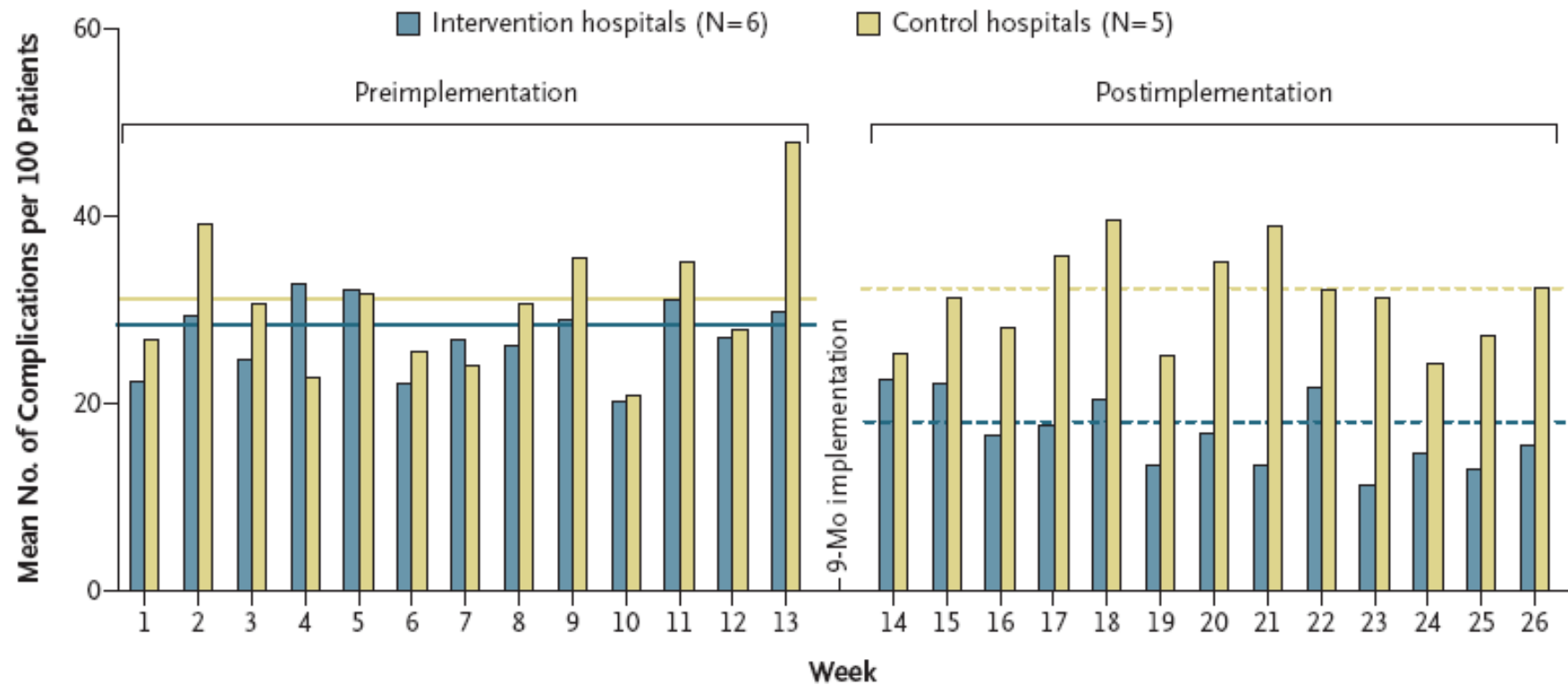
### ABSTRACT

#### BACKGROUND

Adverse events in patients who have undergone surgery constitute a large proportion of iatrogenic illnesses. Most surgical safety interventions have focused on the operating room. Since more than half of all surgical errors occur outside the operating room, it is likely that a more substantial improvement in outcomes can be achieved by targeting the entire surgical pathway.

#### METHODS

We examined the effects on patient outcomes of a comprehensive, multidisciplinary surgical safety checklist, including items such as medication, marking of the operative side, and use of postoperative instructions. The checklist was implemented in six hospitals with high standards of care. All complications occurring during admission were documented prospectively. We compared the rate of complications during a baseline period of 3 months with the rate during a 3-month period after implementation of the checklist, while accounting for potential confounders. Similar data were collected from a control group of five hospitals.



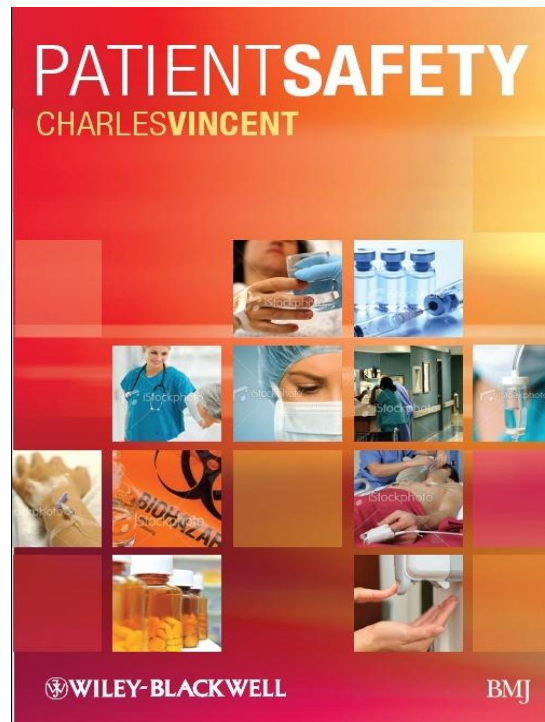
**Figure 1. Mean Number of Complications in Intervention Hospitals and Control Hospitals before and after Implementation of the Surgical Safety Checklist.**

The solid horizontal lines show the overall mean number of complications before implementation of the checklist, and the dashed horizontal lines show the mean number after implementation. The change in the mean number of complications from the preimplementation period to the postimplementation period was significant in the intervention hospitals ( $P < 0.001$ ) but not in the control hospitals ( $P = 0.81$ ).

# Checklist is not just a checklist

- ◆ Clarification of roles and responsibilities
  - Ward care
  - Handover
  - Operating theatre
- ◆ Softening the hierarchy
- ◆ Towards a shared mental model
- ◆ Anticipation of problems

## ◆ Further Information



Clinical Safety Research Unit  
[www.csru.org.uk](http://www.csru.org.uk)  
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