

# Patient Safety and Human Factors

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Hospital Authority Convention 2013

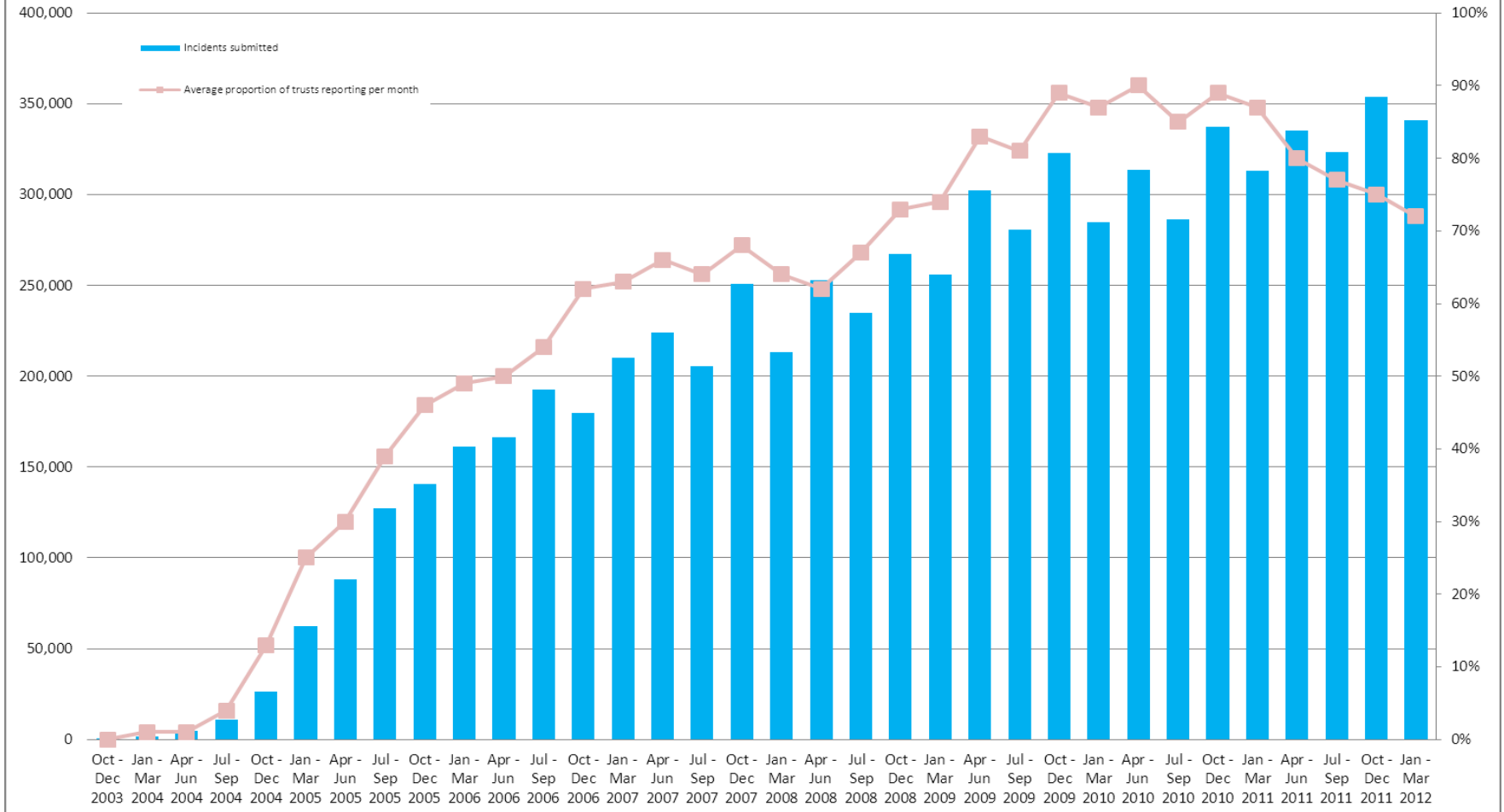
Hong Kong

# Healthcare

‘Medical care is extremely complex and this coupled with inherent human performance limitations even in skilled, highly motivated individuals ensures there will be mistakes’

# Incidents reported to NRLS

**Chart 1: Incidents reported from Oct 2003 - Mar 2012, and average proportion of Organisations submitting per month**



# Errors of diagnosis in Paediatric Practice

Singh et al Pediatrics 126(1);70-9 (2010)

- 1000 doctors
- 54% diagnostic error at least 1-2 times per month
- 45% diagnostic errors that harmed patient 1-2 times per year
- Failure to gather information from history , examination or chart review
- Inadequate care coordination or team work



# Human Factors

- What are they?
- Why are they important?
- What can we do about them ?



# Human Factors

The science of human performance

‘Enhancing clinical performance through an understanding of the effects of team work, tasks, equipment, workspace, culture and organisation on human behaviour and abilities and application of that knowledge in clinical settings’



# Hospitals reveal 750 'should never happen' blunders

**Preventable errors**

[Check your NHS trust](#)

By **Nicola Beckford**

BBC Radio 4, The World at One

**Total "never events" 2009-12: 762**

Top four types of "never events":

Retained foreign object  
post-operation



**322** / 762

Wrong site surgery



**214** / 762

Misplaced feeding tubes



**73** / 762

Wrong implants/prosthesis



**58** / 762

SPL

More than 750 patients have suffered after preventable mistakes in England's hospitals over the past four years, a BBC investigation has found.

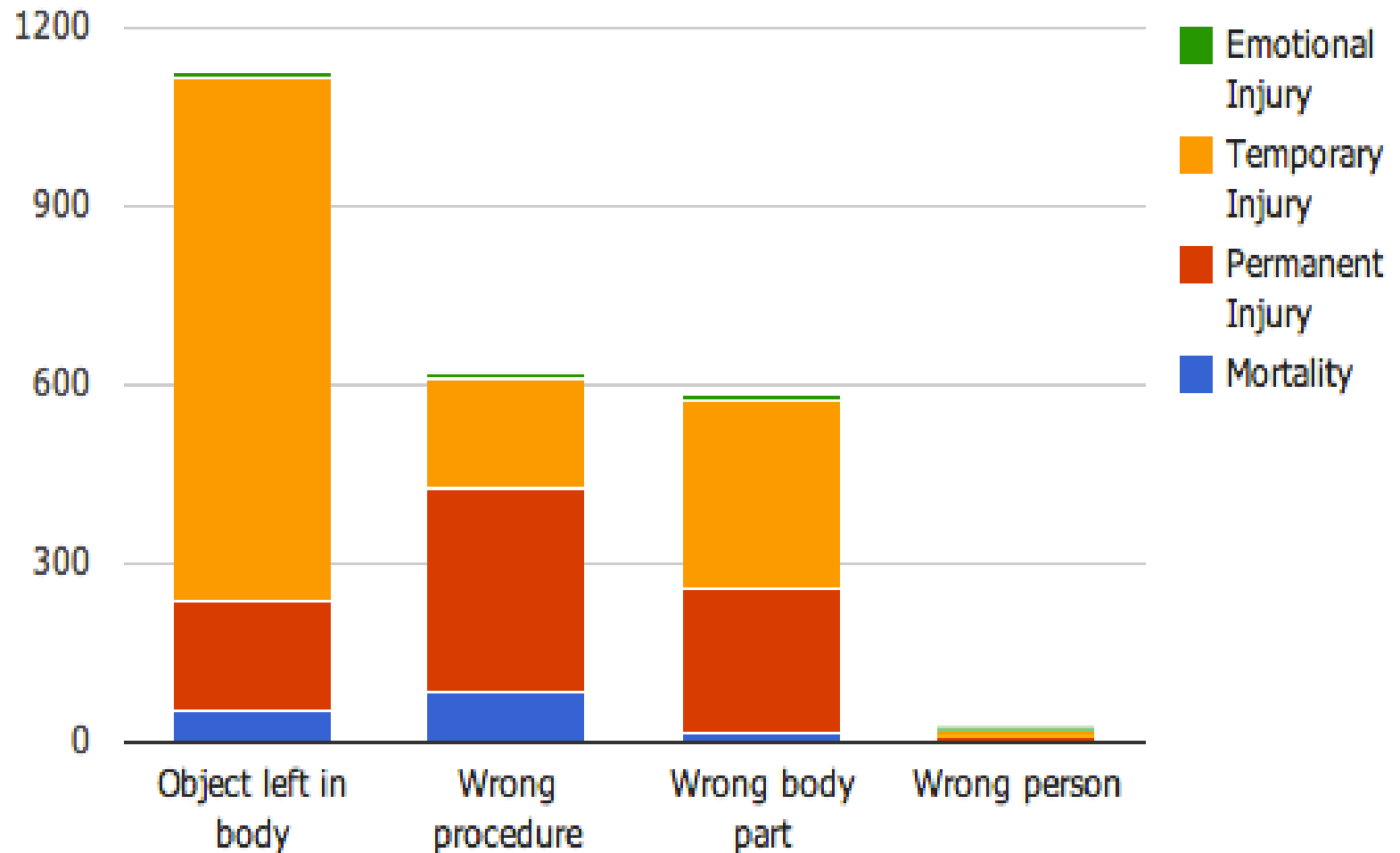
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# Never Events



## Patient outcome by type of 'never' event, 2004-2010



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\*

	Baseline	Checklist	P value
Cases	3733	3955	-
Death	1.5%	0.8%	0.003
Any Complication	11.0%	7.0%	<0.001
SSI	6.2%	3.4%	<0.001
Unplanned Reoperation	2.4%	1.8%	0.047



Alert

### Patient Safety Alert

15 January 2009

**NHS**  
National Patient  
Safety Agency  
National Reporting  
and Learning Service

## WHO Surgical Safety Checklist

In June 2008, the World Health Organization (WHO)<sup>1</sup> launched a second Global Patient Safety Challenge, 'Safe Surgery Saves Lives' to reduce the number of surgical deaths across the world.

The goal of the initiative is to strengthen the commitment of clinical staff to address safety issues within the surgical setting. This includes improving anaesthetic safety practices, ensuring correct site surgery, avoiding surgical site infections and improving communication within the team.

A core set of safety checks has been identified in the form of a WHO Surgical Safety Checklist for use in any operating theatre environment. The checklist is a tool for the relevant clinical teams to improve the safety of surgery by reducing deaths and complications.

A study of the checklist in nearly 8,000 surgical patients, published in the *New England Journal of Medicine*, showed a reduction in deaths and complications.<sup>2</sup>

The National Patient Safety Agency (NPSA), in collaboration with a multi-professional expert reference group, has adapted the checklist for use in England and Wales (see overleaf). This checklist contains the core content but can be adapted locally or for specific specialities through usual clinical governance procedures.

In industrialised countries, major complications are reported to occur in 3–16% of inpatient surgical procedures, with permanent disability or death rates of approximately 0.4–0.8%.<sup>3</sup> In England and Wales, 129,419 incidents relating to surgical specialities were reported to the NPSA's Reporting and Learning System in 2007 with the following degrees of harm:

Degree of harm	Number of reported incidents
No harm	90,368
Low harm	29,929
Moderate harm	7,746
Severe harm	1,105
Death	271

### Action for the NHS

For IMMEDIATE ACTION  
by Chief Executive Officers:

#### Deadlines

- Action underway: 2 February 2009
- Action plan to be agreed and actions started: 1 June 2009
- All actions to be completed: 1 February 2010

Organisations are required to:

- 1) Ensure an executive and a clinical lead are identified in order to implement the surgical safety checklist within the organisation.
- 2) Ensure the checklist is completed for every patient undergoing a surgical procedure (including local anaesthesia).
- 3) Ensure that the use of the checklist is entered in the clinical notes or electronic record by a registered member of the team, for example, Surgeon, Anaesthetist, Nurse, ODP.

**worth repeating**  
This Alert replaces the Correct Site Surgery Alert (2005)

1 [www.who.int/patientsafety/alerts/en/ks/](http://www.who.int/patientsafety/alerts/en/ks/)  
2 <http://dx.doi.org/10.1056/NEJM0806119> pdf/0806119  
3 [www.npsa.nhs.uk/patientsafety/alerts/en/ks/ks\\_20080119\\_churne\\_bakur0801.pdf](http://www.npsa.nhs.uk/patientsafety/alerts/en/ks/ks_20080119_churne_bakur0801.pdf)

# 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

## 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

## 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?

### 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.

This checklist contains the core content for England and Wales

# CHFG



## Never?

*This report, drawn up by the Clinical Human Factors Group, looks at nine wrong site surgery cases that were investigated last year, nine patients, nine families, nine clinicians and their teams all who thought it would never, could never happen to them.*

*It then examines how we can learn from these cases to ensure that next time it doesn't happen to you.*

# Never Events

## Contributory Factors

- Failure to mark site correctly
- Unfamiliar environment
- Time pressure
- Staff changes
- Interruptions
- Illegible writing
- Abbreviations

# Never Events

## Human Factors

- **Lack of situation awareness**
  - Operating table facing in opposite direction
  - Two patients with the same name
- **Poor decision making**
  - Pt anaesthetised before site marked
  - Proceeding with task when uncertain
- **Failure of teamwork**
  - Failure to speak up when checklist not followed
  - No support for less experienced members
- **Weak Leadership**
  - Arriving Late
  - Relying on memory
  - Not briefing the team

# Human Factors in Healthcare

- Universal
- Contribute to the majority of adverse events in healthcare
- Independent of knowledge and technical skill
- Rarely accounted for in the design of systems and facilities
- Current approach to safety is highly dependent on vigilance and hard work

## Hospitals reveal 750 'should never happen' blunders

Preventable errors [Check your NHS trust](#)

By Nicola Beckford  
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[Related Stories](#)



# Safety Critical Industries

- Organisational attention to Human Factors
- Investigation of accidents includes Human Factors analysis
- Staff are trained in Human Factors, Leadership and Teamwork
- Equipment, processes and systems are designed on Human Factors principles
- R&D activities are directed towards improving safety & include specialists in human factors
- Regulators and advisory bodies employ human factors specialists to inform on strategy and direction.

# Human Factors Training

## Healthcare

- Human factors experts?
- Cognitive psychologists?
- Educationalists?
- Sociologists?
- Non healthcare safety experts?
- Healthcare experts



# Technical skill acquisition



# Simulation



# STeLI mobile operating theatre



# Fit to fly?

or

## Safe to provide healthcare ?

- Basic qualification
  - Human performance
- Employment
  - 5 day CRM training
  - Simulator 12 x 4hrs
  - Safety equipment and procedures
- CPD
  - Twice yearly simulator testing
  - CRM 3yrly
  - SEP annually
  - Route check annually with human factors de-brief



# Non Healthcare Expertise



# Human Factors

## Design For Safety

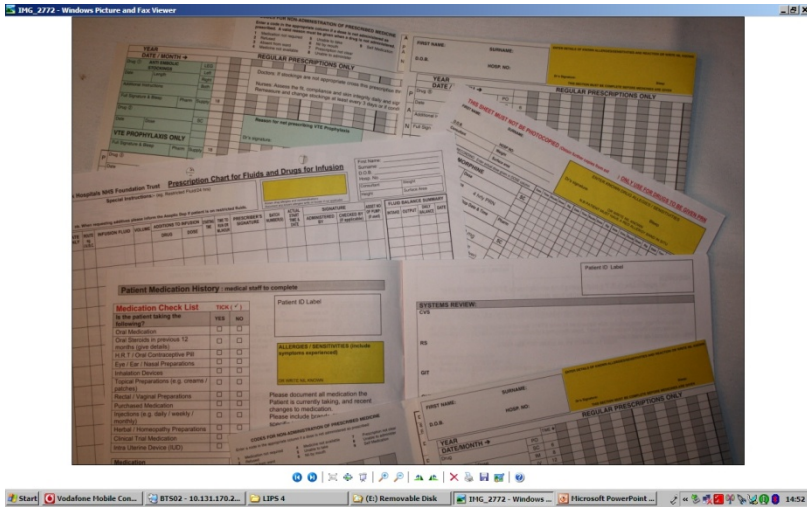


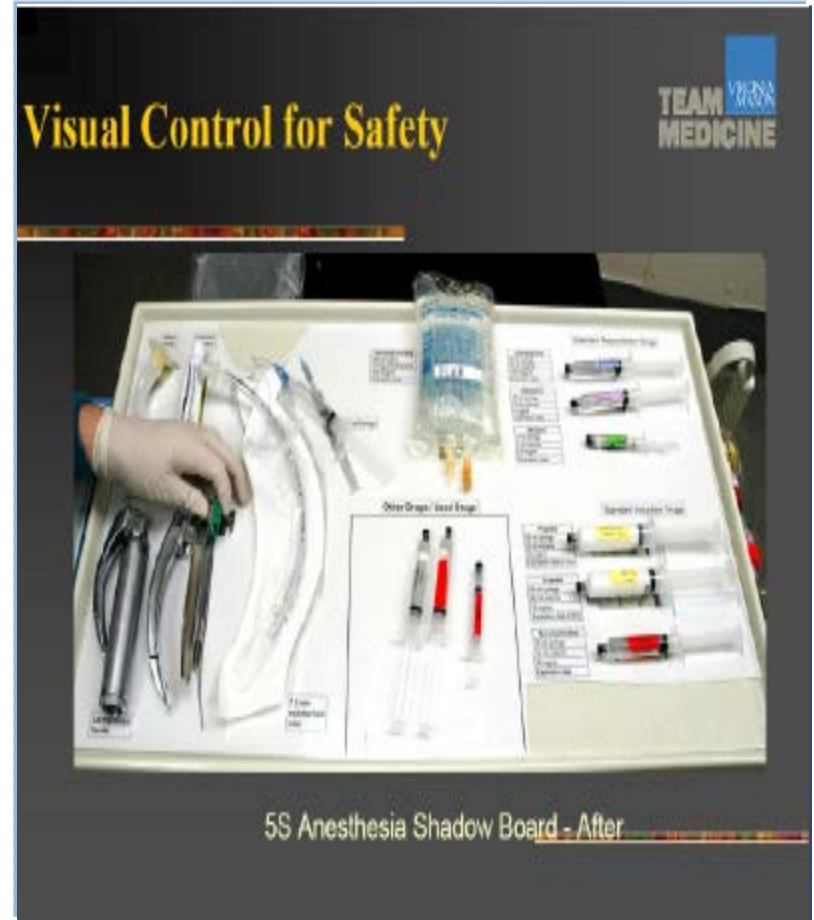
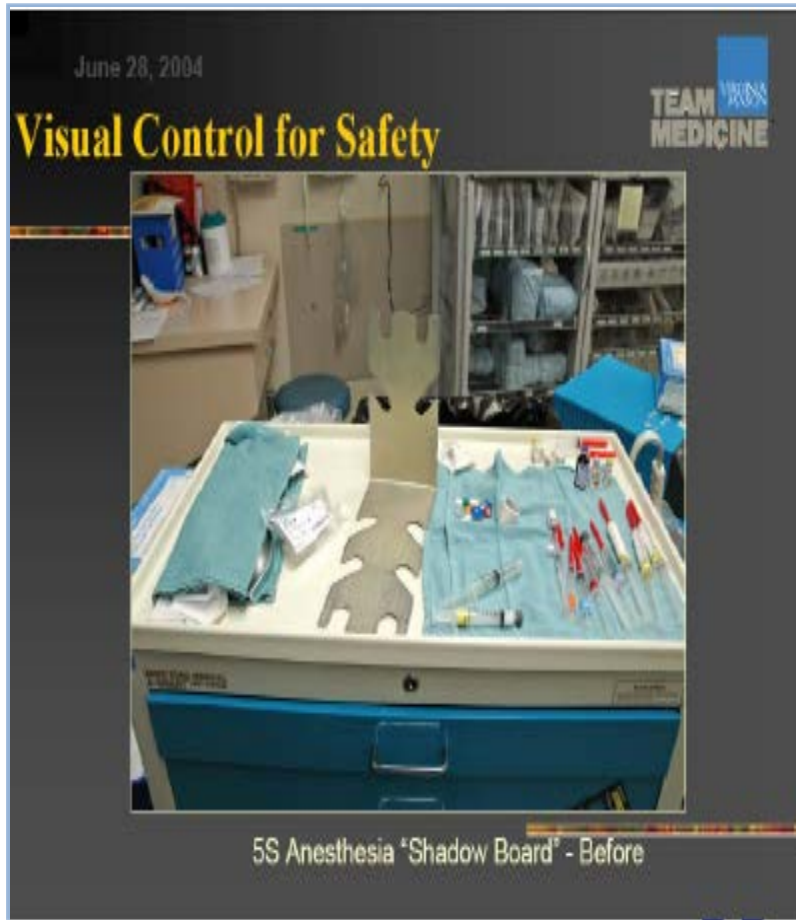
Figure 2. Package Labels WITH Tall Man Lettering. Image provided courtesy of ISMP.





# Human Factors

## Design for Safety



# Human Factors

Design for Safety -Operational Status at a Glance



# Human Factors

## Design for Safety - Standardisation



### PROVENCARE BY THE NUMBERS

#### ELECTIVE CORONARY ARTERY BYPASS GRAFT

Program went live: February 2006

Number of procedures in first year: 181

Percentage of patients eligible to participate: 34% (under Geisinger Health Plan)

Proven Care by the Numbers (18 months)	Before Proven Care	With Proven Care	% Improvement/ Reduction
Average total length of stay	6.2	5.7	-
30-day readmission rate	6.9%	3.8%	44%
Patients w/ any complication	38%	30%	21%
Patients w/less than 1 complication	7.6%	5.5%	28%
Incidence of atrial fibrillation	23%	19%	17%
Neurological complication	1.5%	0.6%	60%
Any pulmonary complication	7%	4%	43%
Blood products used	23%	18%	22%
Re-operation for bleeding	3.8%	1.7%	55%
Deep sternal wound infection	0.8%	0.6%	25%

# Human Factors

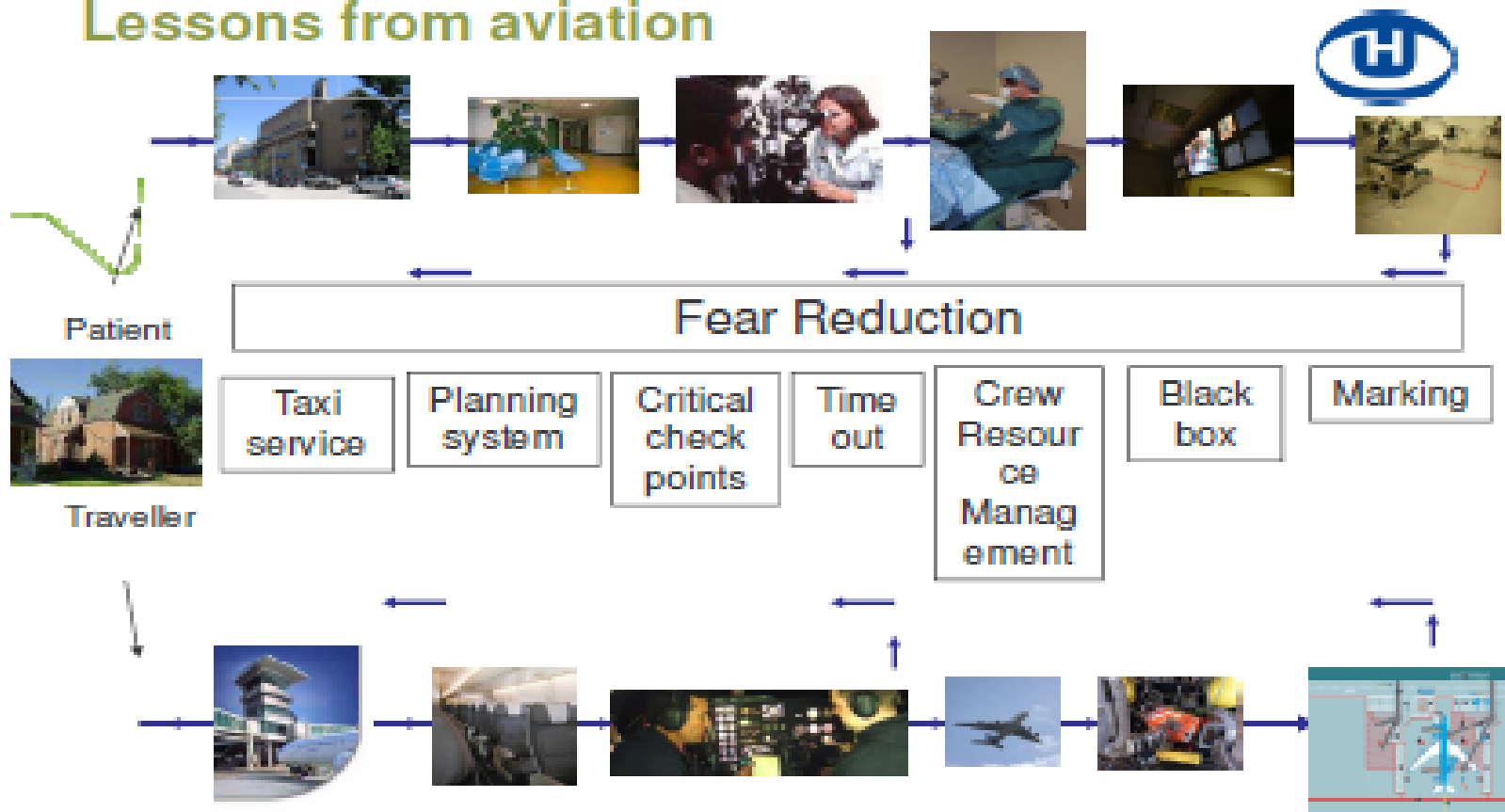
Not Designed for Safety



# Patient Safety and Human Factors

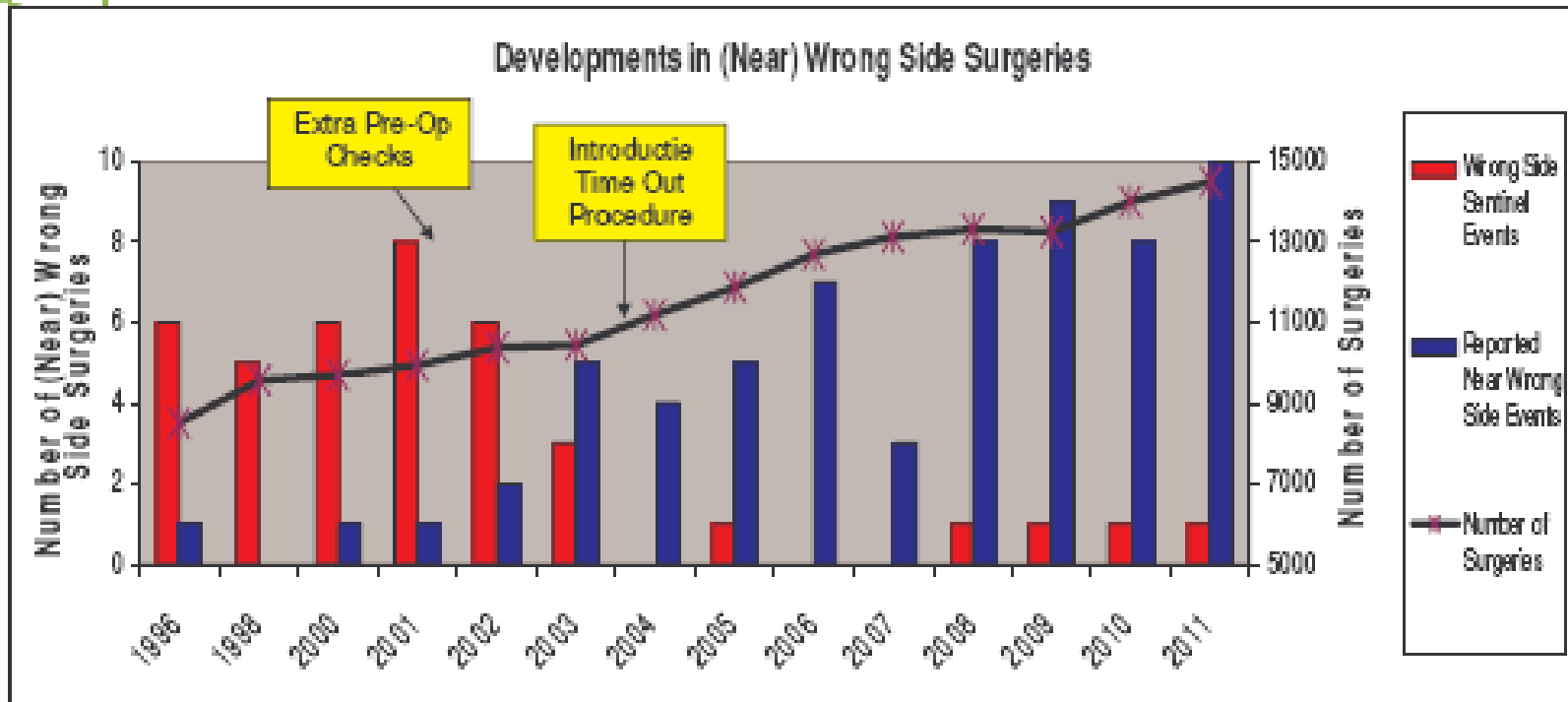
Het Oogziekenhuis Rotterdam

## Lessons from aviation



# Het Oogziekenhuis Rotterdam

## Wrong side surgery



# Rotterdam Eye Hospital

## Patient Checklist

### Patient empowerment



*Als patient heeft u een regio rol bij de behandeling aan uw ogen. Gebruik daarom deze checklist om bij vertrek vast te stellen of u voldoende informatie heeft ontvangen.*

De volgende informatie heb ik gekregen en begrepen (kruis aan):

- Houdingsadvies (en eventueel hulpmiddel)
- Bescherming van het oog
- Leefregels (wat mag ik wel/niet doen)
- Druppelen (zelf druppelen of met hulp)
- Instructie voor gebruik van medicijnen (ook pijnstilling en evt. andere oogmedicijnen die ik al gebruik)
- Informatie over mogelijke klachten
- Wat te doen bij spoedgevallen
- Het recept dat ik voor de operatie al ontvangen heb is gecontroleerd
- Ik heb een brief over het retinaforum ontvangen
- Visitekaartje van de retina telefonische helpdesk
- Vervolgafspraak (dag na de operatie groepsvoorlichting en afspraak retinachirurg)

Vragen die ik nog moet stellen voor ik het ziekenhuis verlaat:

.....

# Regulation & Commissioning for Safety

- Organisational & professional values and behaviours
- Support for safety culture
- Human Factors indicators and metrics for QI
- Measures of current evidence based human factors related 'safe practice'
- Requirements for human factors training – individual , team & organisational



# Patient Safety and Human Factors

- Organisational Issue
- Core element of training for all healthcare staff
- Fundamental to design of equipment, systems and processes
- Funding must be directed towards research and development
- Regulation must ensure Human Factors are central to high quality healthcare