The 'three ages' of patient safety

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Morecambe Bay
Health Authority
Kendal
Millom
Ulverston
Grange-over-Sands
Carnforth
Morecambe
Bay
Barrow-in-Furness
Morecambe
Lancaster

Outline

- Describe the evolution of safety science and how it relates to patient safety
- Explain models and tools for each ‘age of safety’
- Understand the role of people in patient safety
- Outline some specific simple measures to improve perioperative safety

The healthcare quality dream.....

- Safe
- Effective
- Patient-centred
- Timely
- Efficient
- Equitable

US Institute of Medicine *Crossing the Quality Chasm* 2008

The reality

A&E crisis deepens with 65 hospital trusts issuing emergency alerts

The surgery where patients wait FOUR WEEKS to see a GP: Practice pushed to breaking point despite doctors seeing 100 people a day

Mental health

NHS mental health trust to be prosecuted amid claims it failed to offer safe care

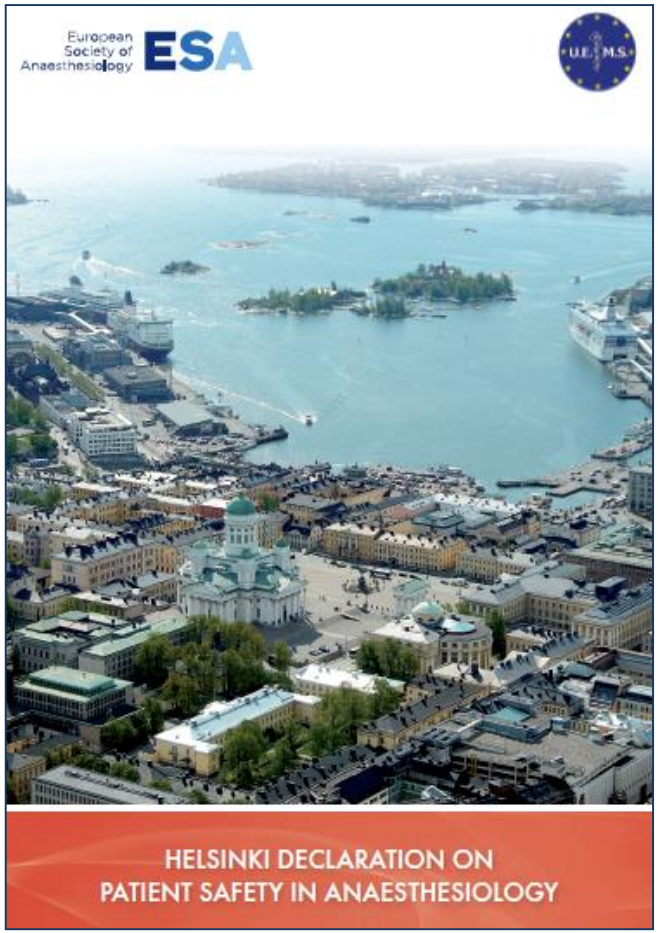
Why don’t things go wrong more often than they do?

What is ‘patient safety’?

- ‘The avoidance, prevention and amelioration of adverse outcomes or injuries stemming from the process of healthcare’

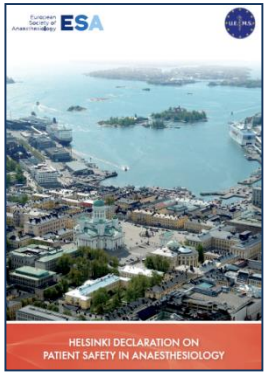
Charles Vincent 2010

Helsinki Declaration on Patient Safety 2010



Eur J Anaes 2010; 27: 592-7.

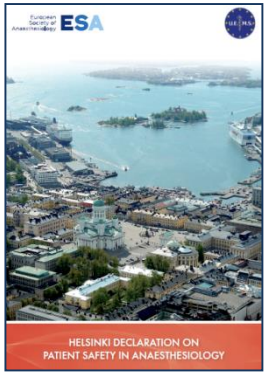
Helsinki Declaration on Patient Safety 2010



Heads of Agreement

- Endorsement of WFSA standards
- Patient involvement
- Funders provide appropriate resources
- Patient safety – training and education
- Importance of ‘human factors’ and team aspects (surgeons, nurses etc.)
- Co-operation with industry

Helsinki Declaration on Patient Safety 2010



Principal Requirements

- Compliance with minimum standards of monitoring
- Availability of clinical protocols
    - Difficult airway
    - Anaphylaxis
    - Massive haemorrhage
- Application of recognised sedation standards
- Support of WHO Safe Surgery Campaign
    - Contribution to incident reporting systems
        - Local
        - National

European Society of Anaesthesiology ESA

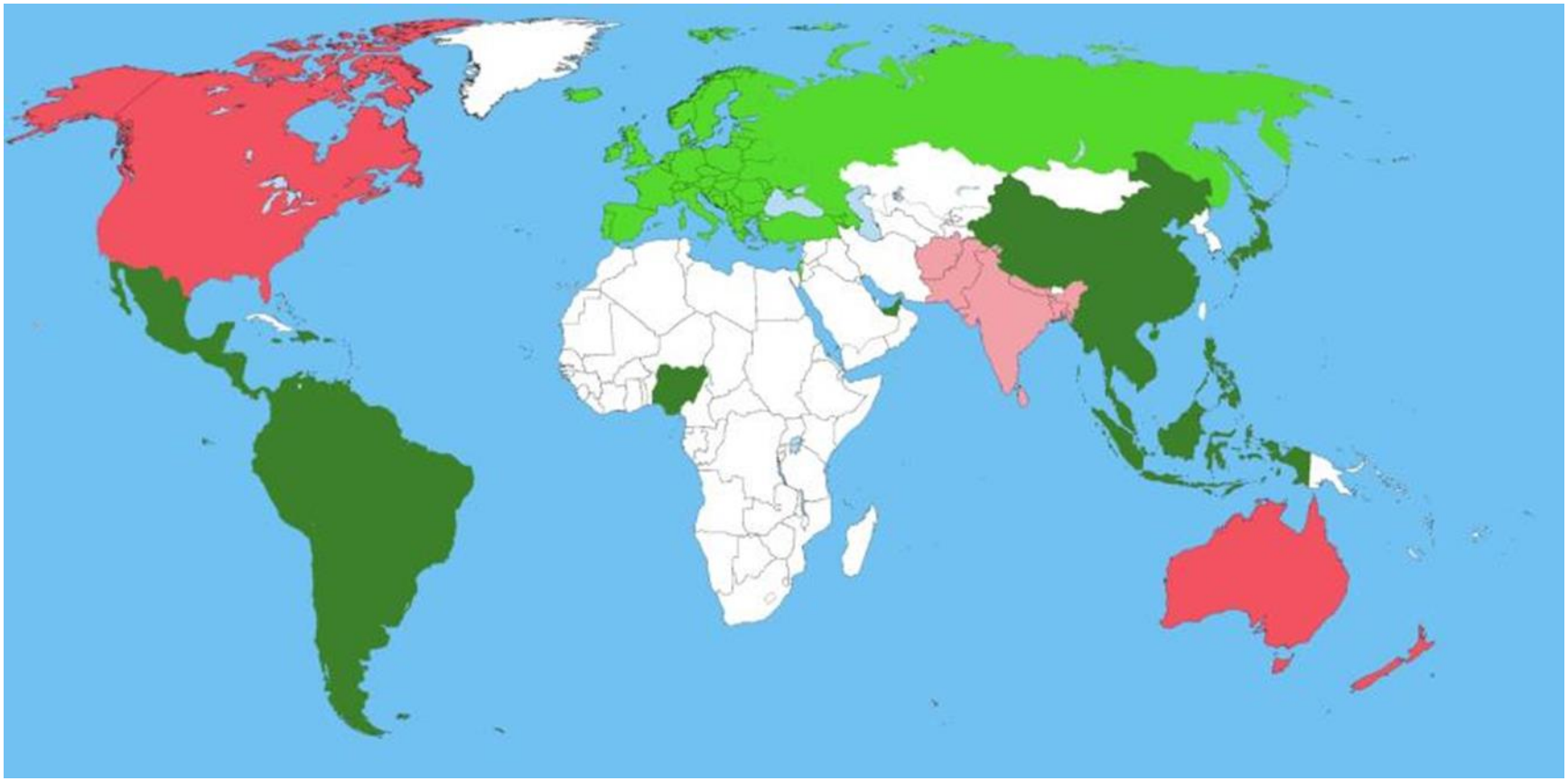
HOME | BASICS | PODCASTS | HAZARD WARNINGS | BASIC LECTURES | CHECKLISTS

PATIENT SAFETY IN ANAESTHESIOLOGY

A Starter Kit in Patient Safety in Anaesthesiology to raise safety standards across Europe.
Read, listen, learn and teach
Make anaesthesiology safer: save lives!

Developed and compiled by the ESA/EBA Task Force Patient safety (Sven Staender [chair] with Guttorm Brattebø, Andrew Smith and David Whitaker).

Uptake of the Helsinki Declaration in 2015



The ‘first age’: the age of technology

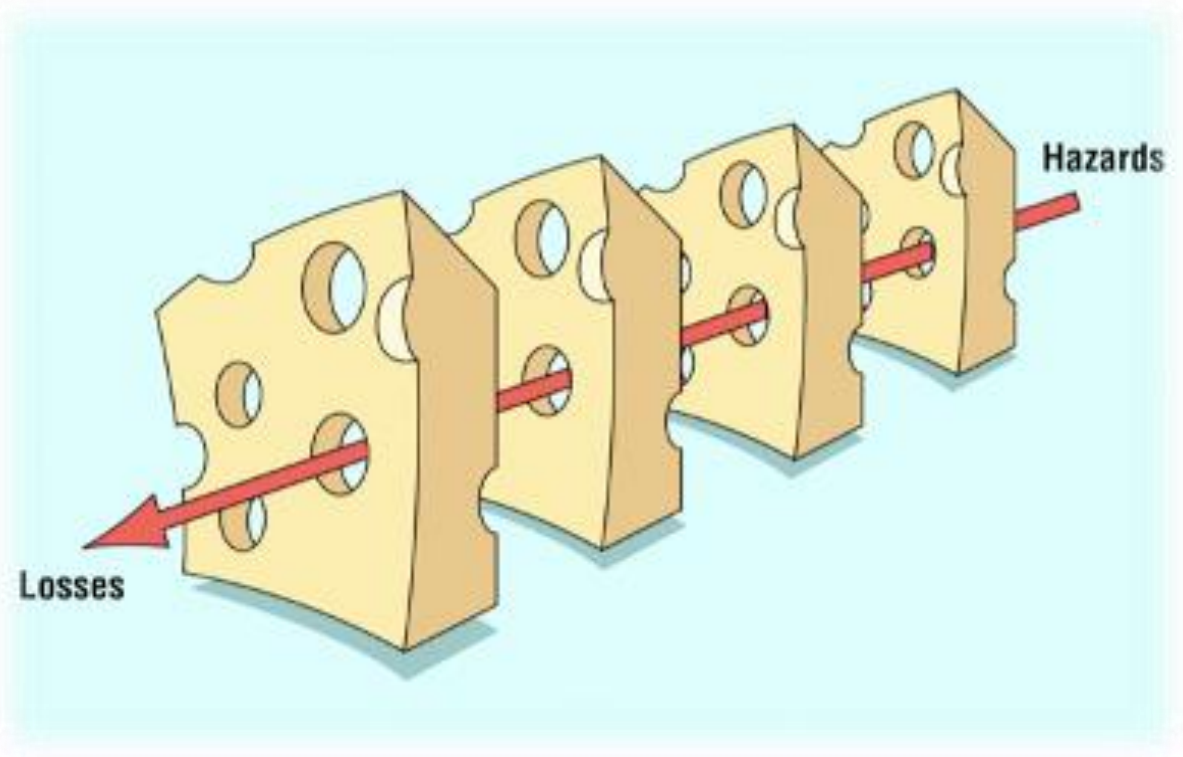
The ‘domino’ model

The role of people 1

- Designers, operators and victims of machines

The second age: the age of ‘human factors’

‘Swiss cheese’ accident model



The role of people 2

‘…’simplify, standardise and improve basic processes and reduce reliance on people by automating as much as possible…….ideally, the human contribution to the process of care is reduced to a minimum……’

Incident reporting

- Can show latent errors in systems of care
- Involve everyone in quality improvement
- Can guide management of critical situations (AIMS)
- Can provide data to buy new equipment or bring about changes
- Can help prevent repetition of incidents

IN THIS SECTION

Report a patient safety incident

Improving reporting

Serious Incident Reporting and Learning Framework (SIRL)

Reporting team

About reporting patient safety incidents

Healthcare staff reporting

Patient/public reporting

Report a patient safety incident

Reporting team	Healthcare staff	Patients and the public
Access NRLS Reporting here	Report a patient safety incident here	Report a patient safety incident here

Patient safety incidents are any unintended or unexpected incident which could have, or did, lead to harm for one or more patients receiving NHS-funded healthcare.

Please note:

- We do not investigate individual reports, but we do record public concerns and use this information to improve safety.

See also

Contact us

Patient safety data

Resources

» Harm from flushing of nasogastric tubes before confirmation of placement

» Minimising Risks of Mismatching Spinal, Epidural and Regional Devices with Incompatible Connectors

» Keeping newborn babies with a family history of MCADD safe in the first hours and days of life

» The adult patients passport to safer use of insulin

» Reducing the harm caused by misplaced nasogastric feeding tubes in adults, children and infants

RSS Feed

RSS feed: patient safety alerts

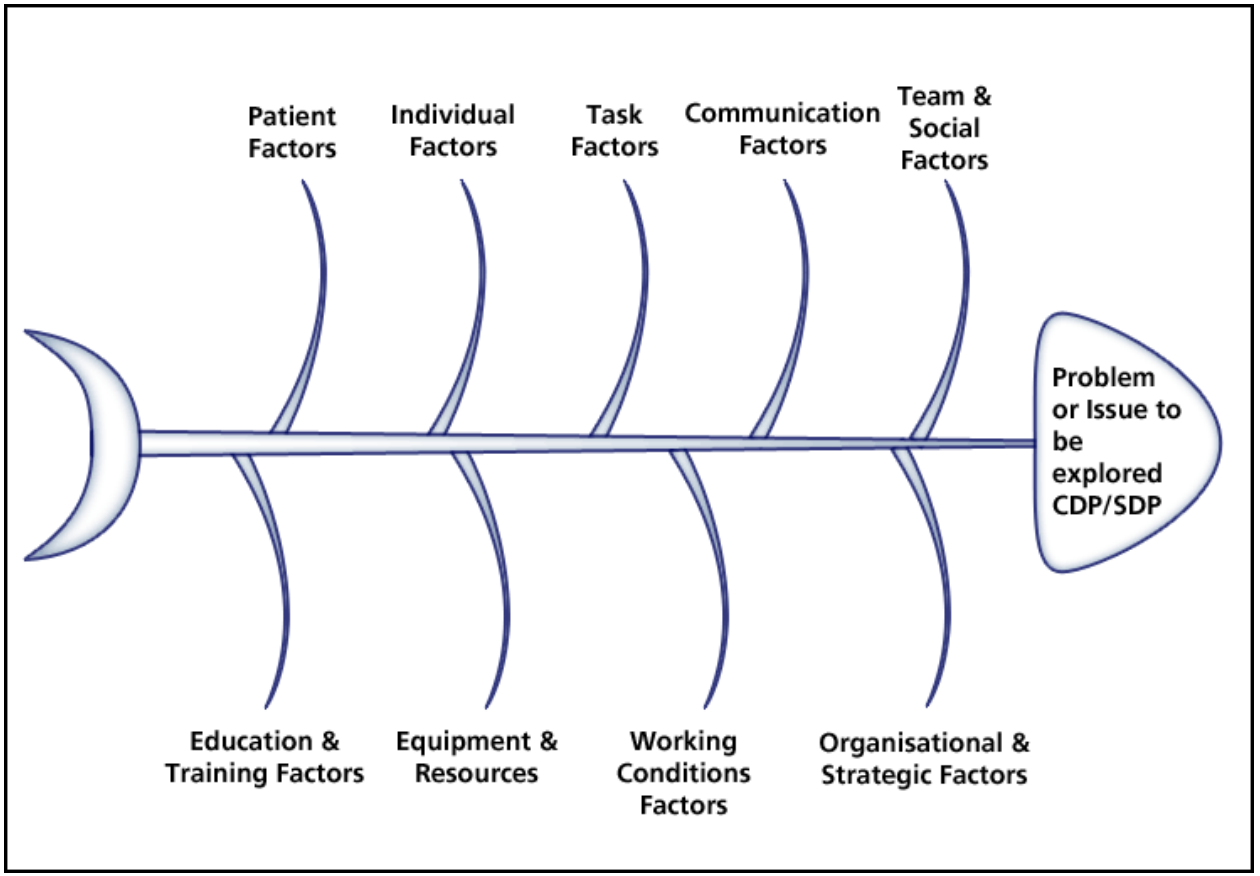
Root cause analysis (RCA)

- What happened?
- How did it happen?
- Why did it happen?

‘5 whys’

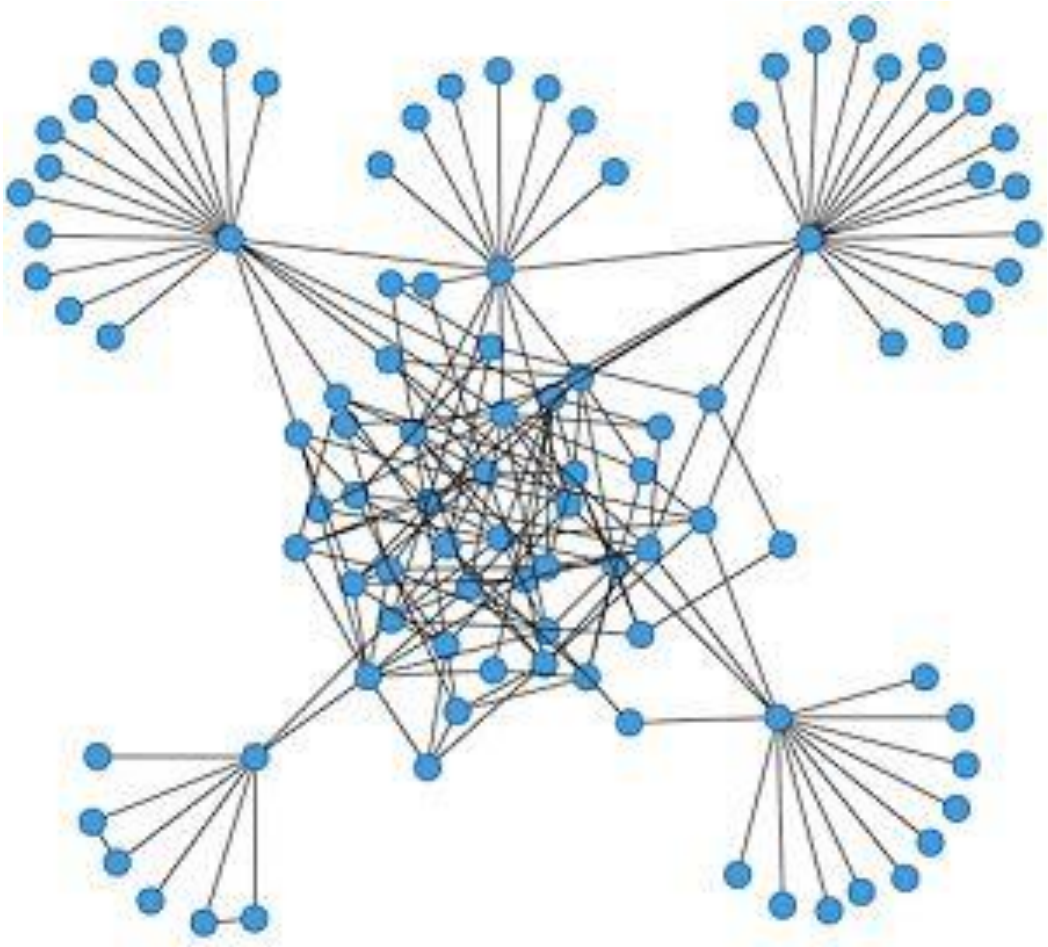
- Why?
- Why?
- Why?
- Why?
- Why?

Fishbone diagram



The ‘third age’: the age of safety management

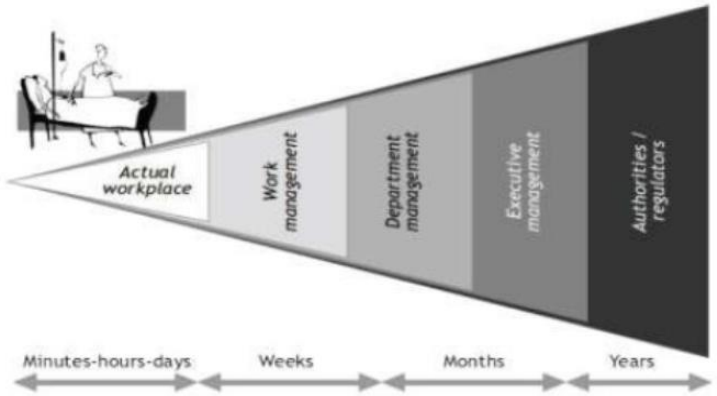
Complex (sociotechnical) systems model



Investigation model

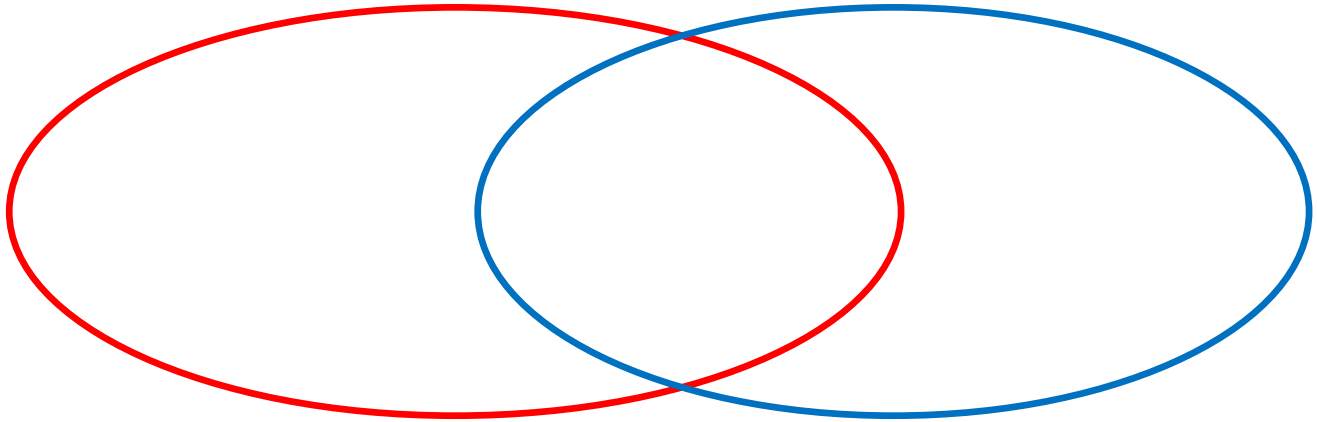
- Wait for something to go wrong
- Find out what happened
- Attribute actions to people
- Find out the root cause
- ‘Fix’ the systems so it doesn’t happen again (recommendations, training and protocols)

‘Work as imagined’ *vs.* ‘work as done’



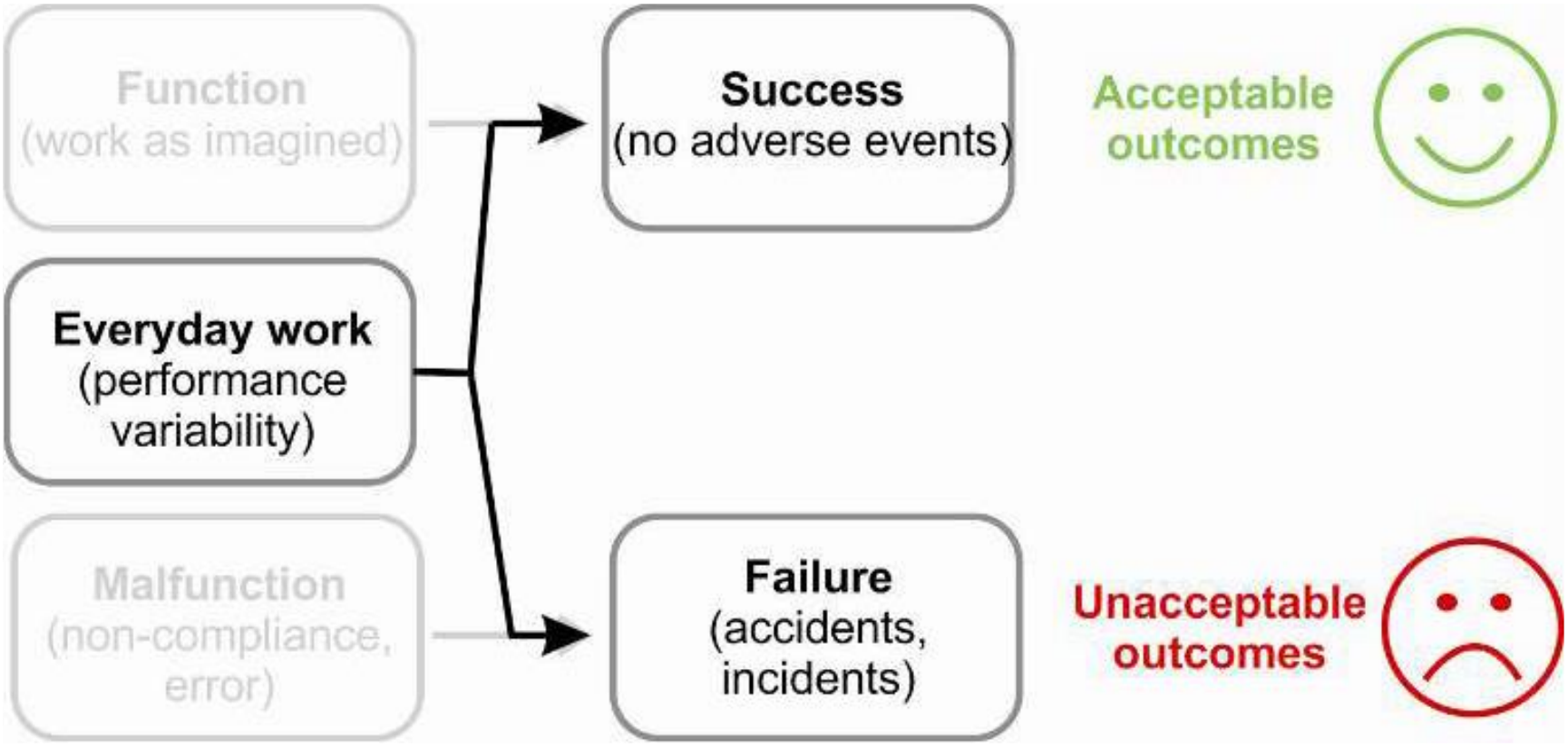
Work-as-imagined: The rules and standards outlining the way things *should* work—proposed by higher authorities and management at the blunt end.

Work-as-done: The work carried out by frontline employees at the sharp end e.g., clinicians, paramedics, nurses.



Work as done

Work as imagined


Function
(work as imagined)
Everyday work
(performance
variability)
Malfunction
(non-compliance,
error)
Success
(no adverse events)
Failure
(accidents,
incidents)
Acceptable
outcomes
Unacceptable
outcomes

The role of people 3

- ….'individuals, teams and organisations are aware of hazards and adapt their practices and tools to guard against or defuse threats to safety. It is these efforts that 'make safety'…..'

……..or create ***resilience***.

Individual and organisational resilience

- Human performance is poorer if you are tired, hungry, stressed, sad, disgruntled or the victim or witness of rudeness or coercion
- How you deal with the consequences of error
- Balance feeling safe with maintaining a culture of vigilance and ‘intelligent wariness’
- ‘Sixth sense’ and conscientiousness are vital

A structured ‘what if’ technique (SWIFT) to assess anaesthetic risks

- What can go wrong?
- How and how often?
- How bad?
- Is there any need for action?

Method

- Mapping of perioperative process
- Questions e.g. *'what if the GP doesn't consider the anaesthetic?'*
- Dominant causes, consequences and existing safeguards identified
- Ranked and prioritised
- Understand why people behave as they do
- Recommendations for safety improvement

How often? How bad?

Likelihood						
	5	More than once per thousand operations	**H**	**H**	**H**	**H**
	4	Between once per thousand operations and once per ten thousand operations	**M**	**H**	**H**	**H**
	3	Between once per ten thousand operations and once per hundred thousand operations	**L**	**M**	**H**	**H**
	2	Between once per hundred thousand operations and once per million operations	**L**	**M**	**M**	**H**
	1	Less than once per million operations	**L**	**L**	**M**	**M**
			Low	Moderate	Severe	Fatality
			A	B	C	D
			Consequence			

Risk	%	Cost	Time
Distraction of anaesthetist in theatre	7.2	v. low	1
Airway problems	6.8	med	3
Flexible working of theatre staff	6.2	v. low	1
Data set for preassessment	4.5	v. low	1
Peripheral nerve stimulator	4.1	v. low	2
Patient position and movement	4.1	v. low	1
Standardisation of equipment	4.1	med	1
Temperature monitoring and control	4.1	v. low	1
Devices and training thereon	3.7	low	1
Senior anaesthetist daytime cover	3.5	v. low	1

The ‘third age’ of patient safety

- Learn from failure but also have constant and active awareness of the potential for things to go wrong
- Through our actions, conscious and subconscious, we create resilient systems and ‘make safety’
- Accountable for unprofessional behaviour but culture is open and fair
- Understand that systems are complex and small changes can have big effects

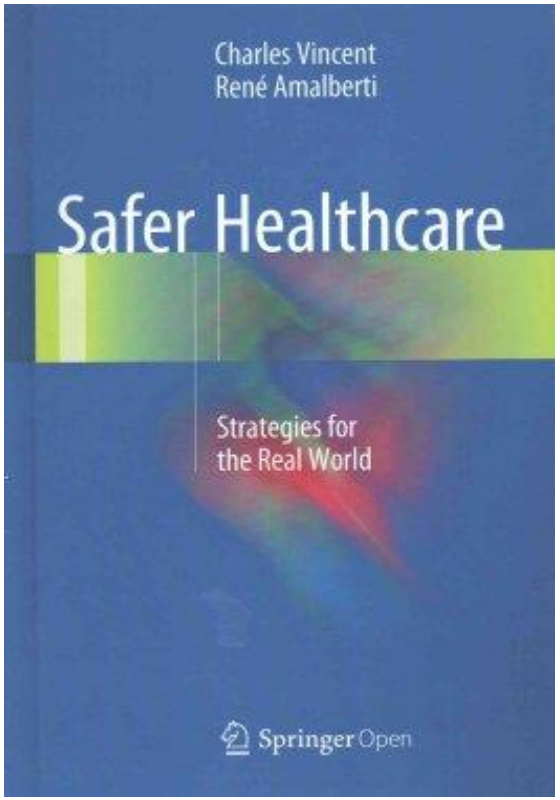
	Safety-I	Safety-II
Definition of safety	That as few things as possible go wrong.	That as many things as possible go right.
Safety management principle	Reactive, respond when something happens or is categorised as an unacceptable risk.	Proactive, continuously trying to anticipate developments and events.
View of the human factor in safety management	Humans are predominantly seen as a liability or hazard. They are a problem to be fixed.	Humans are seen as a resource necessary for system flexibility and resilience. They provide flexible solutions to many potential problems.
Explanation of accidents	Accidents are caused by failures and malfunctions. The purpose of an investigation is to identify the causes.	Things basically happen in the same way, regardless of the outcome. The purpose of an investigation is to understand how things usually go right as a basis for explaining how things occasionally go wrong.
Role of performance variability	Harmful; should be prevented as far as possible.	Inevitable but also useful. Should be monitored and managed.

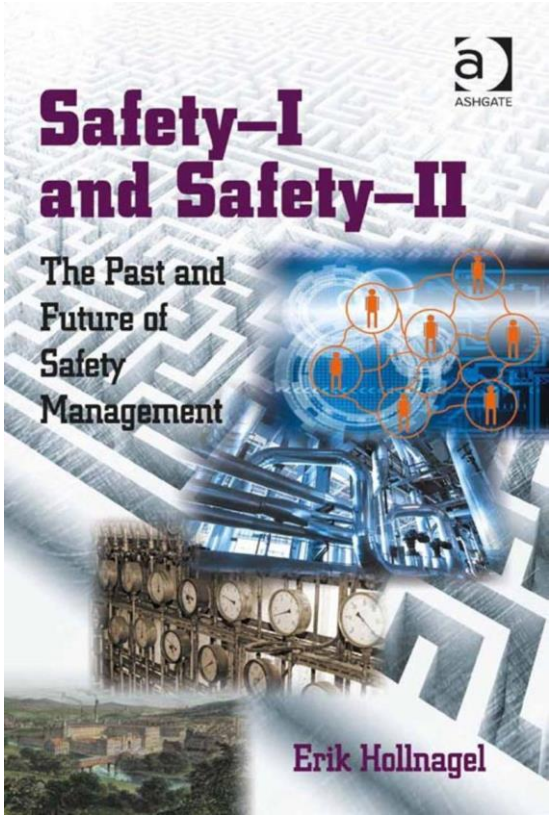
Investigation model revised

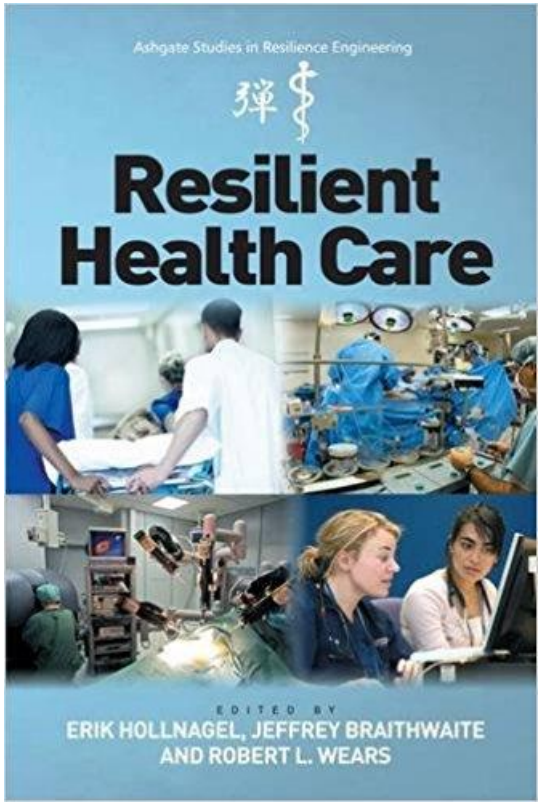
- More complex than the ‘first story’
- Not linear at all - multiple, interacting variables
- Find out why we did this many times previously and things went well – understand everyday activities/ rescue points
- Strengthen the system so we do more things well: experience, conscientiousness, variety, redundancy

Conclusions

- Safety science has moved on: ‘third age, third way’
- Formal, standardised approaches are useful, but other safety strategies are available
- Need to better understand why things go right most of the time
- Personal and organisational resilience are related
- Small changes can have big effects


Charles Vincent
René Amalberti
Safer Healthcare
Strategies for the Real World
Springer Open


ASHGATE
Safety–I and Safety–II
The Past and Future of Safety Management
Erik Hollnagel


Ashgate Studies in Resilience Engineering
Resilient Health Care
EDITED BY
ERIK HOLLNAGEL, JEFFREY BRAITHWAITE AND ROBERT L. WEARS

‘Simple’ measures for patient safety

- Medication errors
- Checklists
- Central venous catheters
- Wrong site regional blocks
- Handovers

Medication safety

- Drug packaging and storage
- Colour-coded syringe (and infusion line) labelling
- Single use of vials only
- Distractions
- Read label (drug/ampoule/syringe)before a drug is drawn up or injected. *Two people ideally.*
- Pre-filled syringes

EBA recommendations *Eur J Anaes* 2016; 33:1-4

Local Anaesthetic	Buprenorphine .....mg/ml
Metronidazole .....mg/ml	Calcium Chloride .....mg/ml
.....	Metoclopramide .....mg/ml
Atropine .....micrograms/ml	Diazemuls .....mg/ml
Adrenaline .....micrograms/ml	Propofol .....mg/ml


KCl
Water for Injections BP
10mL
Sodium Chloride
Injection BP 0.9%
POTASSIUM 10
Baxter
POTASSIUM 10 mmol
100 mL
INFUSE OVER AT LEAST 1 HOUR
L76R2
MAR 04

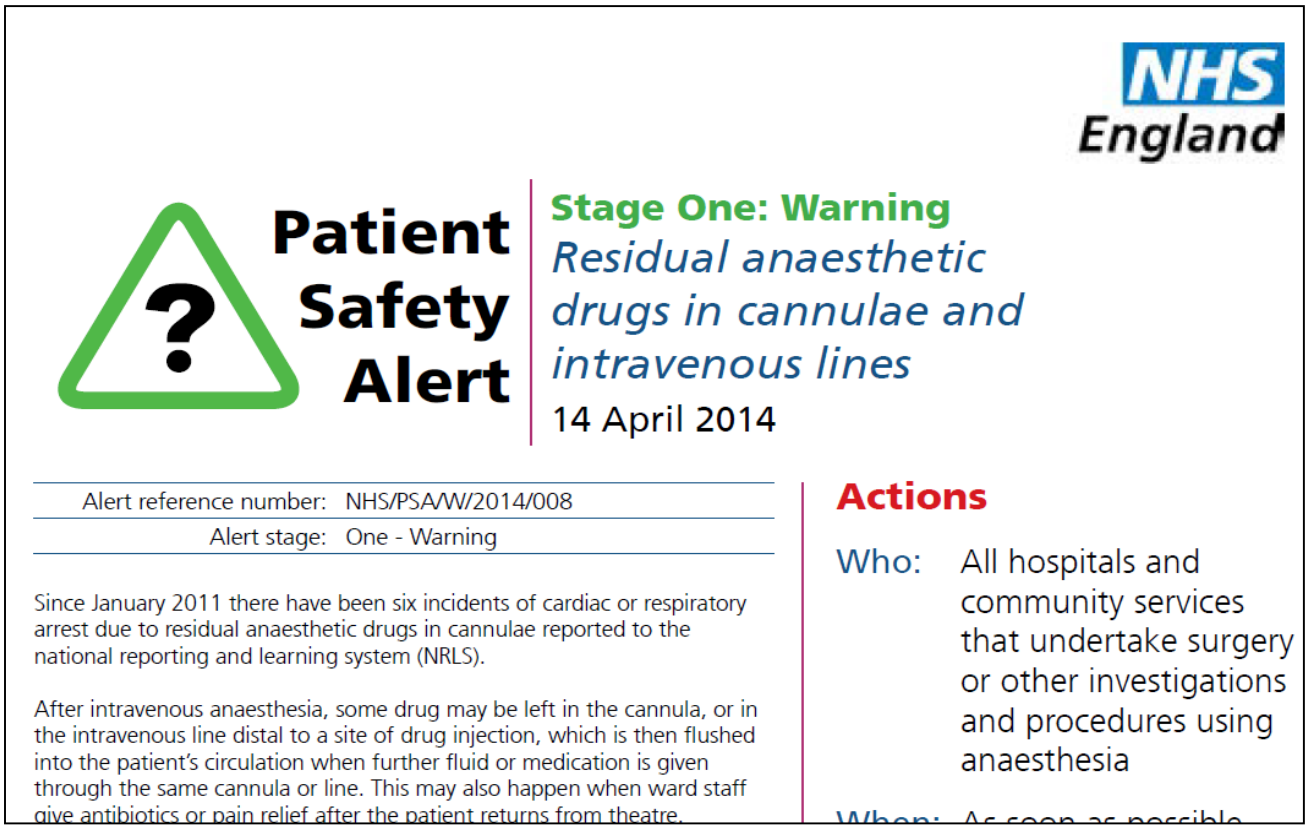
Concentrated electrolyte solutions

- Treat KCl as a controlled drug
- Remove from patient care areas
- Label ‘MUST BE DILIUTED’ and ‘HIGH RISK’
- Give by infusion, not bolus

Residual drugs in cannulae

- *Patient suffered an unexpected respiratory arrest on ward after surgery . He was intubated and ventilated by the ITU team , and transferred to CT scan for further investigation …. Upon extubation later in the day , the patient reported full awareness of the events leading up to his arrest , describing a ‘ heaviness’ which crept up his arm , into his jaw and led to him being unable to breathe, but with a full level of consciousness . This occurred immediately following a cannula being flushed in his hand.*

Residual drugs in cannulae



NHS England

Patient Safety Alert

Stage One: Warning

Residual anaesthetic drugs in cannulae and intravenous lines

14 April 2014

Alert reference number: NHS/PSA/W/2014/008

Alert stage: One - Warning

Since January 2011 there have been six incidents of cardiac or respiratory arrest due to residual anaesthetic drugs in cannulae reported to the national reporting and learning system (NRLS).

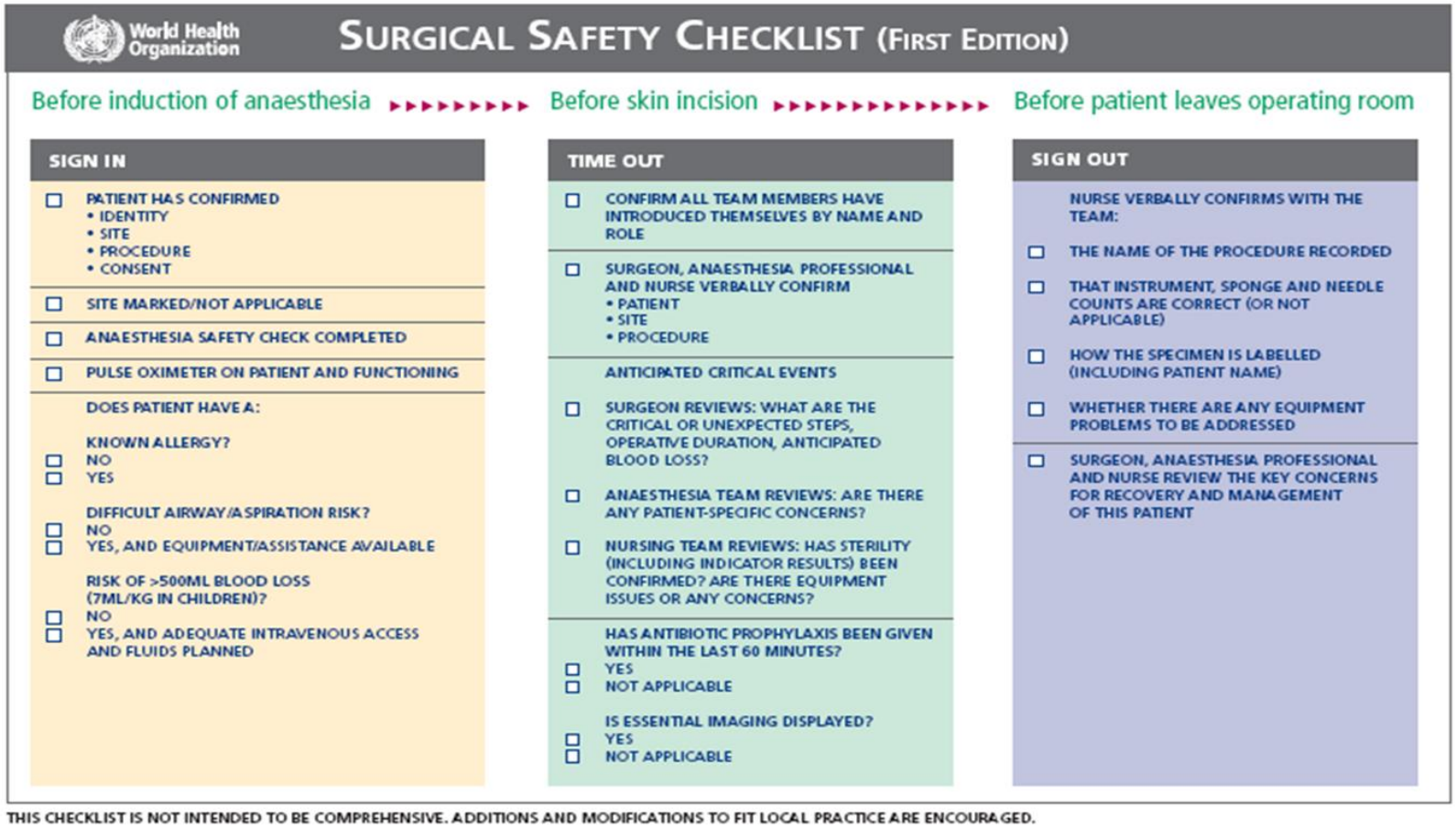
After intravenous anaesthesia, some drug may be left in the cannula, or in the intravenous line distal to a site of drug injection, which is then flushed into the patient's circulation when further fluid or medication is given through the same cannula or line. This may also happen when ward staff give antibiotics or pain relief after the patient returns from theatre.

Actions

Who: All hospitals and community services that undertake surgery or other investigations and procedures using anaesthesia

When: As soon as possible

Surgical safety checklist



World Health Organization

SURGICAL SAFETY CHECKLIST (FIRST EDITION)

Before induction of anaesthesia ▸▸▸▸▸▸▸▸▸ Before skin incision ▸▸▸▸▸▸▸▸▸▸▸▸▸ Before patient leaves operating room

SIGN IN

- ☐ PATIENT HAS CONFIRMED
  - IDENTITY
  - SITE
  - PROCEDURE
  - CONSENT
- ☐ SITE MARKED/NOT APPLICABLE
- ☐ ANAESTHESIA SAFETY CHECK COMPLETED
- ☐ PULSE OXIMETER ON PATIENT AND FUNCTIONING
- DOES 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 INTRAVENOUS ACCESS AND FLUIDS PLANNED

TIME OUT

- ☐ CONFIRM ALL TEAM MEMBERS HAVE INTRODUCED THEMSELVES BY NAME AND ROLE
- ☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE VERBALLY CONFIRM
  - PATIENT
  - SITE
  - PROCEDURE

ANTICIPATED CRITICAL EVENTS

- ☐ SURGEON REVIEWS: WHAT ARE THE CRITICAL OR UNEXPECTED STEPS, OPERATIVE DURATION, ANTICIPATED BLOOD LOSS?
- ☐ ANAESTHESIA TEAM REVIEWS: ARE THERE ANY PATIENT-SPECIFIC CONCERNS?
- ☐ NURSING TEAM REVIEWS: HAS STERILITY (INCLUDING INDICATOR RESULTS) BEEN CONFIRMED? ARE THERE EQUIPMENT ISSUES OR ANY CONCERNS?

HAS ANTIBIOTIC PROPHYLAXIS BEEN GIVEN WITHIN THE LAST 60 MINUTES?
- ☐ YES
- ☐ NOT APPLICABLE

IS ESSENTIAL IMAGING DISPLAYED?
- ☐ YES
- ☐ NOT APPLICABLE

SIGN OUT

NURSE VERBALLY CONFIRMS WITH THE TEAM:

- ☐ THE NAME OF THE PROCEDURE RECORDED
- ☐ THAT INSTRUMENT, SPONGE AND NEEDLE COUNTS ARE CORRECT (OR NOT APPLICABLE)
- ☐ HOW THE SPECIMEN IS LABELLED (INCLUDING PATIENT NAME)
- ☐ WHETHER THERE ARE ANY EQUIPMENT PROBLEMS TO BE ADDRESSED
- ☐ SURGEON, ANAESTHESIA PROFESSIONAL AND NURSE REVIEW THE KEY CONCERNS FOR RECOVERY AND MANAGEMENT OF THIS PATIENT

THIS CHECKLIST IS NOT INTENDED TO BE COMPREHENSIVE. ADDITIONS AND MODIFICATIONS TO FIT LOCAL PRACTICE ARE ENCOURAGED.

Barriers to checklist adoption

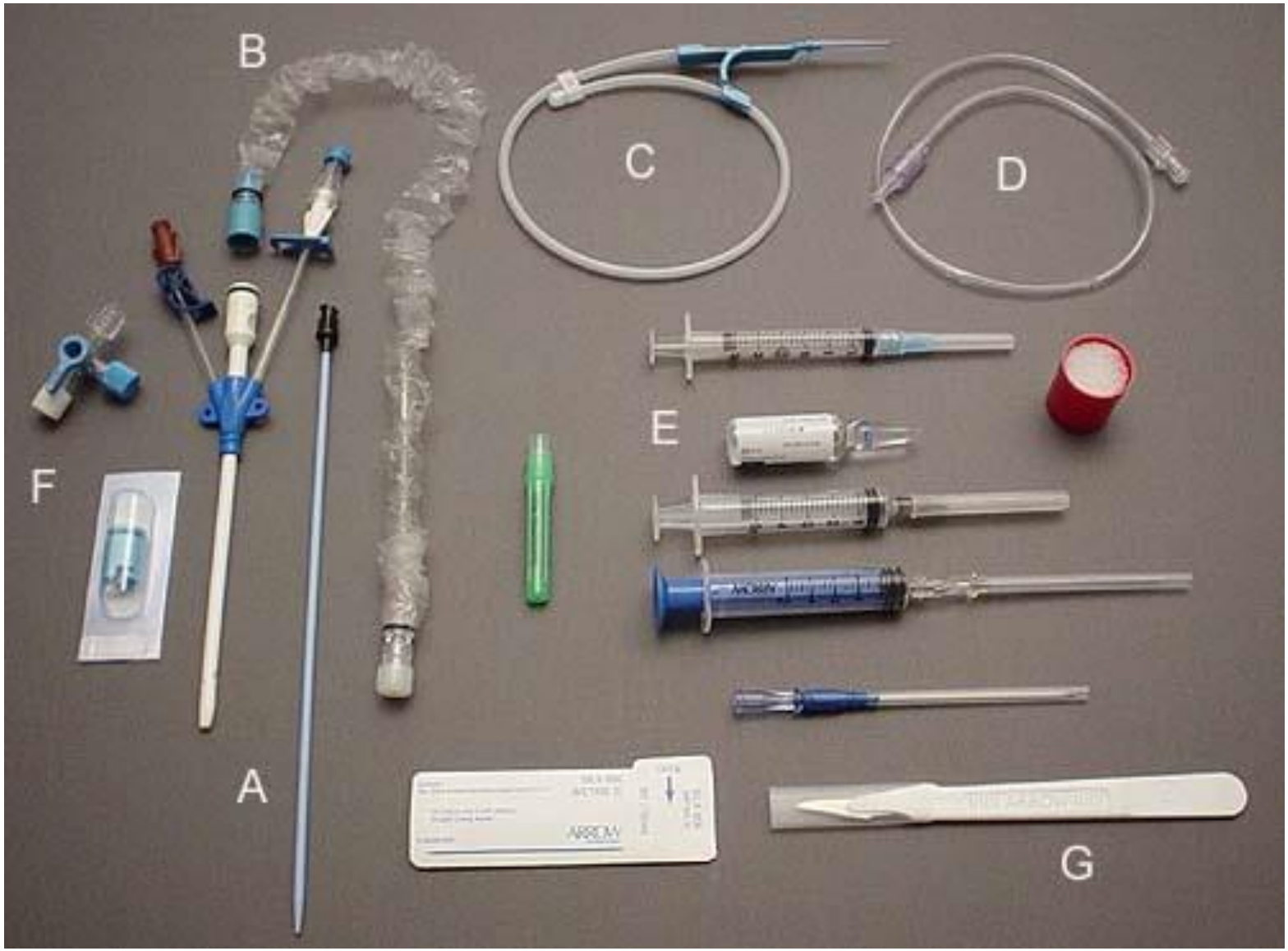
- Shyness about introductions
- Duplication with existing checks
- Poor communication between anaesthetist and surgeon
- Time-consuming
- Ambiguity
- Many risks not included
- Patients' attitude to questions

Fourcade A et al *BMJ Qual Saf* 2012; 21: 191-7

Making the checklist 'work'

- *Consistent* – all cases
- *Complete* – all items
- *Faithful* – only tick when item is truly addressed
- Team *united* in adapting checklist and planning its use

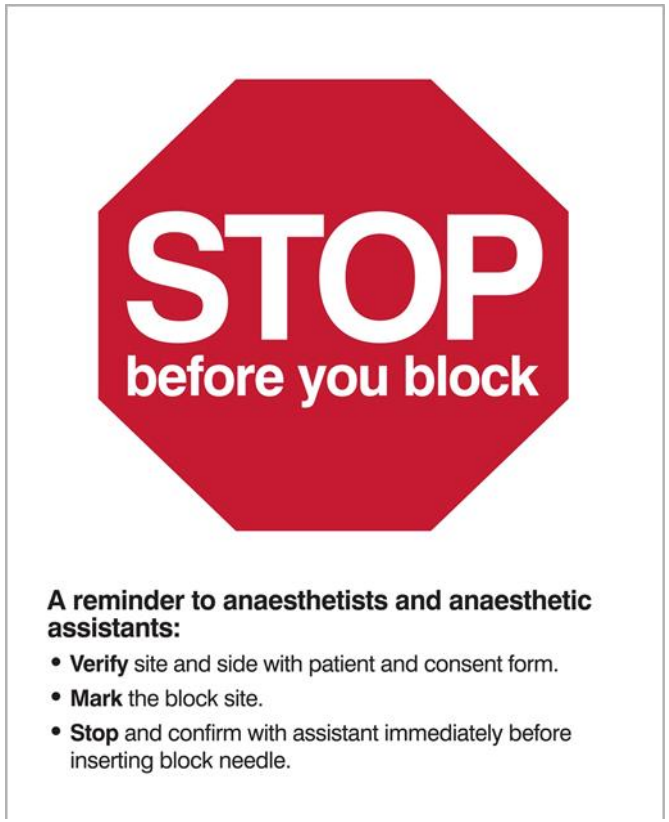
Aveling EL et al *BMJ Open* 2013 3:e003039.doi:10.1136/bmjopen-2013-003039


B
C
D
E
F
A
G

Central line bundle

- Hand hygiene
- Maximal barrier precautions during insertion
- Chlorhexidine skin antisepsis
- Optimal catheter site selection, (subclavian vein preferred site for non-tunnelled catheters)
- Daily review of need for line, with prompt removal of unnecessary lines

Wrong site regional block



What makes a good handover?

- Information
- Structure: situation, background, assessment, recommendation (SBAR)
- Shared understanding: *repeat-back*
- No interruptions!

Mid-case handover

- Previous health/current condition of patient
- Outline of anaesthetic technique
- Current surgical status
- Patient observations
- Check of monitoring and equipment
- Notification of surgeon
- Notification of responsible anaesthetist
- Documentation

PACU handover

- Patient's name
- Previous health
- Operation performed
- Analgaesics and antiemetics given
- Any problems
- Any special features
- Instructions for further management
- Where I will be and how I can be contacted

The ‘third age’ of patient safety

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- Through our actions, conscious and subconscious, we create resilient systems and ‘make safety’
- Accountable for unprofessional behaviour but culture is open and fair
- Understand that systems are complex and small changes can have big effects

Key resources

- ESA Patient Safety Starter Kit

https://www.esahq.org/patient-safety/patient-safety/patient-safety-starter-kit

- World Health Organisation

  www.who.int/patientsafety/solutions/en/

- US Agency for Healthcare Research and Quality
  www.ahrq.gov
- Vincent and Amalberti *Safer Healthcare* (free e-Book)

http://link.springer.com/book/10.1007/978-3-319-25559-0