
Seven Levels of Safety

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Overview

- ◆ Case analysis
- ◆ Seven levels of safety
- ◆ Cases as a window on the system
- ◆ Seven levels of Intervention
- ◆ Contrasting visions of safety

Care management problems

- ◆ The significance of the decelerations on the CTG trace were not given sufficient weight
- ◆ The midwife did not reduce the syntocinon as soon as she saw the deteriorating trace
- ◆ The consultant overrode the decision of the team without considering their arguments
- ◆ The senior midwife was ‘forced’ to put the baby at risk

General features of the unit (Contributory factors)

- ◆ No clear demarcation of roles and responsibilities and no agreed line of communication in a crisis
- ◆ Inadequate training for CTG interpretation
- ◆ Staff assumed faults in machines rather than fetal distress
- ◆ General acceptance of faulty equipment
- ◆ No system to ensure lessons learnt from serious incidents

Person versus System explanations

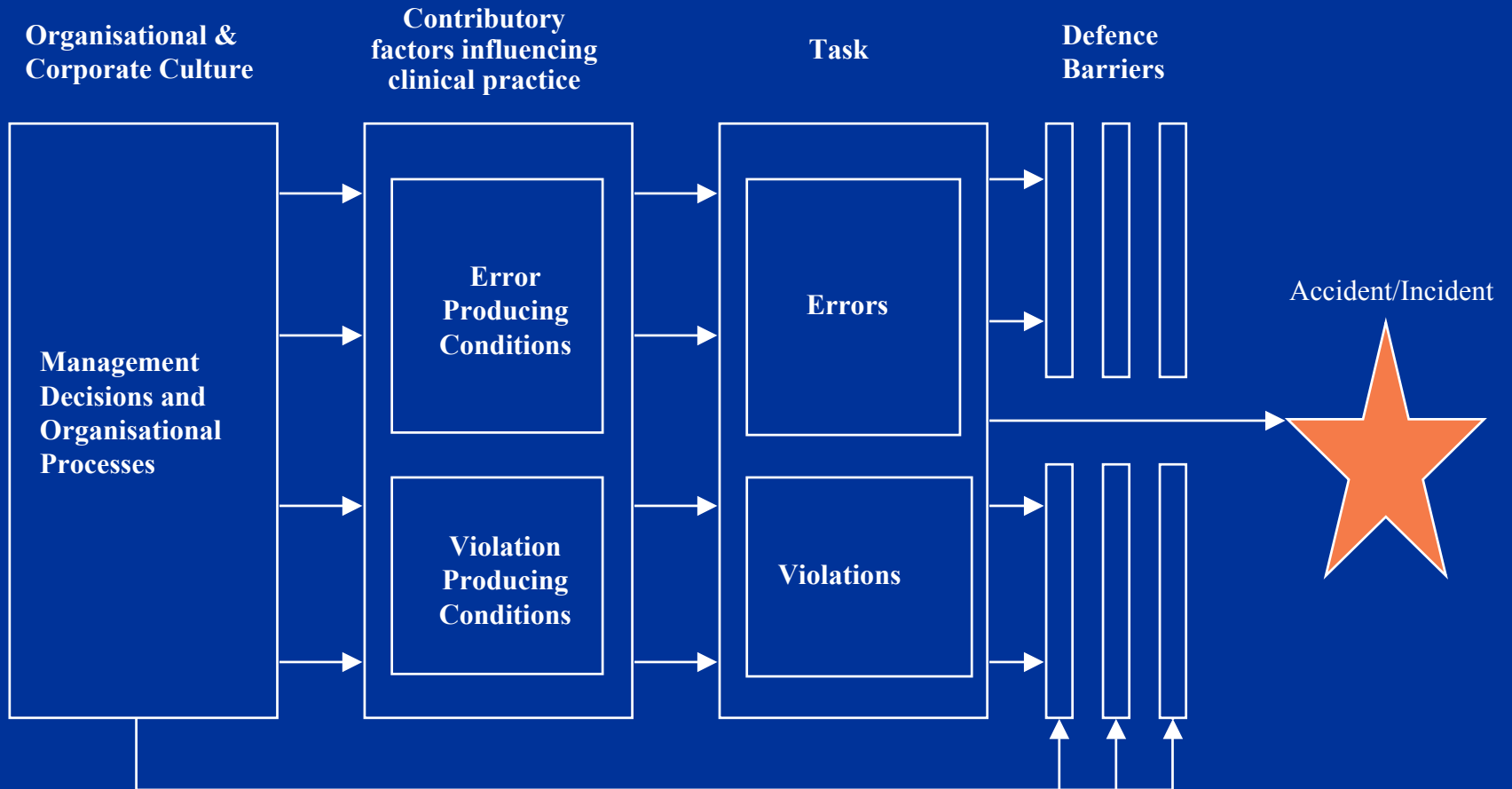
◆ Person Centred View

- Focuses on those at the 'sharp end'
- Individual responsibility and blame
- Countermeasures aimed at changing individuals' behaviour

◆ System View

- Human beings fallible, errors to be expected
- Focus on factors influencing errors
- Countermeasures aimed at conditions of work

Stages of development of an organisational accident



Framework for the analysis of risk and safety in medicine

- ◆ Patient factors
- ◆ Task factors
- ◆ Individual staff factors
- ◆ Team Factors
- ◆ Work environment
- ◆ Organisation and management
- ◆ Institutional context

Framework of factors influencing clinical practice and clinical outcomes

◆ Patient factors

- Condition (complexity and seriousness)
- Language and communication
- Personality and social factors

◆ Task factors

- Task design and clarity of process
- Availability & use of protocols,
- Availability & use of test results

◆ Individual staff factors

- Knowledge and skills
- Motivation, physical and mental health

◆ Team Factors

- Verbal and written communication
- Supervision and seeking help
- Leadership

◆ Work environment

- Staffing levels and skill mix
- Workload and shift patterns
- Design, availability and maintenance of equipment

◆ Organisation and management

- Financial resources & constraints
- Organisational structure
- Policy standards & goals
- Safety culture & priorities

◆ Institutional context

- Economic & regulatory context
- Social attitudes to risk
- National Health Service Executive
- Clinical negligence schemes

Uses of the seven levels framework

- ◆ A conceptual framework
- ◆ As basis of research strategy
- ◆ As basis of case analysis (root cause analysis)
- ◆ As guide to thinking about interventions

Analysis of adverse events

Management of attempted suicide

- ◆ When junior doctor saw patient the previous day, he recorded that she was not depressed and not suicidal
 - Individual: lack of knowledge and experience
 - Team factors: lack of supervision and support
 - Organisation: poor safety culture. Lack of supervision not taken seriously

A Window on the System

- ◆ Case analysis brings understanding of systems
 - Complexity of events and contributory factors
 - Moving away from blame
- ◆ Case analysis to identify common themes and systemic weaknesses
 - Looking to the future
 - Prioritising contributory factors - root causes
 - Generating plans for action

Choosing interventions to enhance safety

- ◆ The rush to intervention
- ◆ Should we give antibiotics or chemotherapy?
- ◆ How do we choose our interventions ?
 - Enthusiasm?
 - Trial and error?
- ◆ What principles could guide us?

Specific Clinical Interventions

(Agency for Healthcare Research and Quality)

- ◆ Prophylaxis to prevent venous thromboembolism
- ◆ Perioperative betablockers to prevent morbidity
- ◆ Sterile barriers while placing central intravenous catheters
- ◆ Antibiotic prophylaxis in surgical patients
- ◆ 7 more highly rated safety practices of 79 reviewed

How is safety achieved?

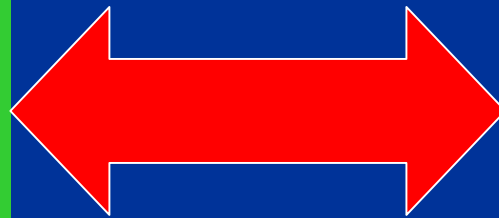
Contrasting visions

- ◆ Replace or support human beings
 - Design and standardisation
 - Protocols & guidelines
 - Information technology
 - Technical solutions

- ◆ Practitioners create safety
 - New & enhanced skills
 - High reliability organisations
 - Mindfulness & hazard awareness
 - Studying success and recovery

Conflicting Visions of Safety?

Replace or
support human
beings



Practitioners
create safety

Contrasting visions of human abilities

◆ Fallibility and irrationality

- Hindsight bias & memory failure
- Extreme over confidence
- Vulnerable to environmental influences
- Lack of control over thought and action

◆ Expertise and skill

- Flexibility and adaptability
- Experience and wisdom
- Teamwork and leadership
- Anticipation and recovery

Intuition in judgement and decision making?

- ◆ Expertise in judgement
 - From chess players to fire fighters
 - Recognising sepsis in the NICU
- ◆ ‘It’s intuition, it comes from experience’
- ◆ Recognising a pattern of cues and signs
- ◆ but may not be aware of how they do it

Clinical prediction and probabilities

◆ Assessment of suicide risk

- Past history
- Psychiatric diagnosis
- Current stressors
- Declared intent and preparation
- Pessimism & hopelessness

◆ Decision to operate in paediatric cardiac surgery

- Age
- Anatomy of heart
- Echocardiograph
- Pulmonary artery pressure

Probabilities and prediction

- ◆ Combining multiple sources of information
 - Prone to bias and inconsistency
 - Vulnerable to time pressure, stress, fatigue
- ◆ Computers or decision aids almost always outperform human beings
- ◆ Meehl's supermarket checkout

Can we improve clinical judgement and decision making?

- ◆ When time is short, dynamic environment
 - Experience and feedback
 - Training to reduce biases and errors
- ◆ When time allows and decisions can be framed
 - Decision support brings consistency and accuracy
 - Can now be patient specific
 - Should not be an embarrassment

NHS guidelines for urgent referral

Urgent Referral for a Chest X-ray

- Haemoptysis
- Unexplained or persistent (more than 3 weeks)
 - » dyspnoea
 - » weight loss
 - » chest signs
 - » ...
- features suggestive of metastasis from a lung cancer

Urgent referral to a Chest Physician

Any of the following:

- Chest x-ray suggestive/suspicious of lung cancer
- Persistent haemoptysis in smokers/ex-smokers over 40 years of age.
-

Patient Details:

Age: Gender: M F

Referral information (please tick boxes):

Chest X-ray?

- Not done Abnormal, other
 - Normal Specify
 - Abnormal, follow-up recommended
 - Abnormal, suspicious of cancer
- Date (dd/mm/yyyy)
- Reference
- Hospital site

History:

- Current or Ex-smoker? Yes No
- History of COPD? Yes No

Clinical examination:

- Chest signs Yes No
- Unexplained or >3wks Yes No
- Signs of SVCO Yes No
- Cervical / Supraclavicular LNS Persistent Yes No
- Stridor Yes No
- Signs of metastases Yes No

Symptoms:

- Haemoptysis?
 - None Once More than 1
- Unexplained or persistent (> 3 weeks):
 - cough Yes No
 - dyspnoea Yes No
 - wheeze Yes No
 - chest/shoulder pain Yes No
 - weight loss Yes No
 - hoarseness Yes No

ERA recommendations

These are made on the basis of the clinical features presented to the system; they are intended to aid, not replace, clinical judgement.

A 2-week referral may not be appropriate because none of the standard indications for a 2-week referral apply to this patient.

A referral for an urgent chest x-ray would be appropriate

The following indications for a CXR apply to this patient:

- persistent or unexplained cough
- persistent or unexplained weight loss

N.B. Each of these features would warrant a chest x-ray, even in isolation

Patient Details:

Age: Gender: M F

Referral information (please tick boxes):

Chest X-ray?

Diagnosing your workplace

How safe is it now?

- ◆ Chronically unsafe to reasonably safe
 - Morale & management
 - Protocols and procedures
 - Basic training
- ◆ Moving to high reliability
 - Deference to expertise
 - Flexibility of response
 - Departing from protocols

Which of the 7 levels should we target?

- ◆ Are the foundations in place?
 - Safety culture and awareness
 - Leadership and executive buy in
 - Regulatory pressure may assist
- ◆ What are the emerging themes?
 - Case analysis
 - Failure, modes and effects analyses

Intervention at 7 levels

- ◆ Institutional context
 - Regulator, government targets
- ◆ Organisation & Management
 - Safety briefings
 - Executive walk arounds
- ◆ Working conditions
 - Safety as a priority in planning and staffing
 - Equipment purchase and maintenance

Intervention at 7 levels

◆ Team

- Multi-professional training
- Crisis rehearsal and simulation
- Clear policies on calling for assistance

◆ Individual

- Expertise and hazard awareness
- Modelling of safety behaviours

Intervention at 7 levels

- ◆ Task and Technology

- Protocols and guidelines
- Computerised decision support

- ◆ Patient

- Recall and restatement during consent
- Monitoring adverse events
- Participation in treatment decisions
- Active checking of medication and treatment

Multi-level interventions: Compliance with hand hygiene in Geneva

- ◆ Senior management backing
 - Funding and safety culture
- ◆ Working conditions
 - Availability of cleaning solution
- ◆ Team based interventions
- ◆ Educational campaign for individual staff
- ◆ Task
 - Design of new containers

Multi-level interventions: Reducing medical errors at Wimmera Hospital

- ◆ Senior management backing
 - Executive champions and dedicated staff
- ◆ Working conditions
 - Reviewing working hours and workload
- ◆ Multidisciplinary action team
 - Addressing levels of supervision
- ◆ Training in risk management and patient safety
- ◆ Task
 - Simplifying systems
 - Standardising procedures
 - Reminders and checklists

An integrated vision

- ◆ Interventions at the 7 levels
- ◆ The two visions of safety depend on each other
- ◆ We need to standardise and support not to control and regulate but to free people for the human tasks
- ◆ The most important of which is talking to patients and their families

Sources & Information

- ◆ Research, books, papers and downloads of case analysis methods
 - www.patientsafety.ucl.ac.uk
- ◆ Agency for Healthcare Research & Quality
 - www.ahrq.gov/clinic/ptsafety
- ◆ Institute for Healthcare Improvement & BMJ
 - www.qualityhealthcare.org
- ◆ Decision support approaches
 - www.openclinical.org