

A photograph in the top left corner showing several hands of different colors and sizes cupping a glowing heart. The background is a blue grid pattern.

# National Patient Safety Agency

## Root Cause Analysis (RCA) Investigation

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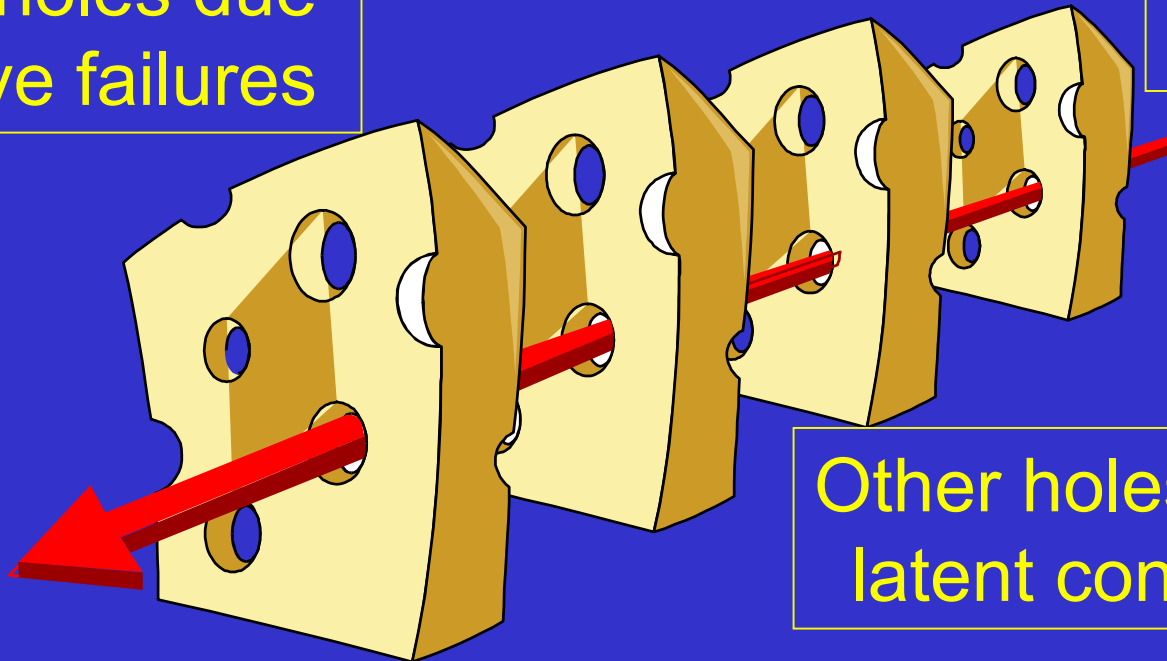
# Types of failure

- **Active failures**
  - **slips, lapses, fumbles, mistakes, procedural violations**
- **Latent Conditions**
  - **can translate into error provoking conditions eg time, pressure, poor equipment, staffing problems**
  - **provide longstanding weakness in defences eg unworkable procedures, construction deficiencies**



Some holes due to active failures

Hazards



Losses

Other holes due to latent conditions

DEFENCES, BARRIERS AND SAFEGUARDS

## Why RCA?

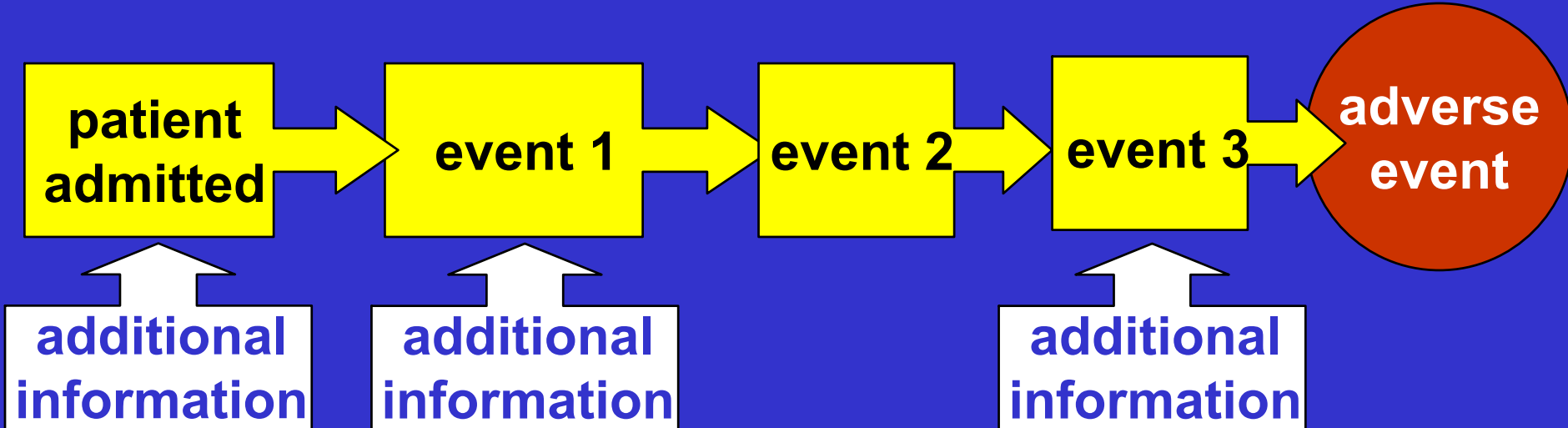
**‘In-depth analysis of a small number of incidents will bring greater dividends than a cursory examination of a large number’**

***Vincent and Adams, 1999***

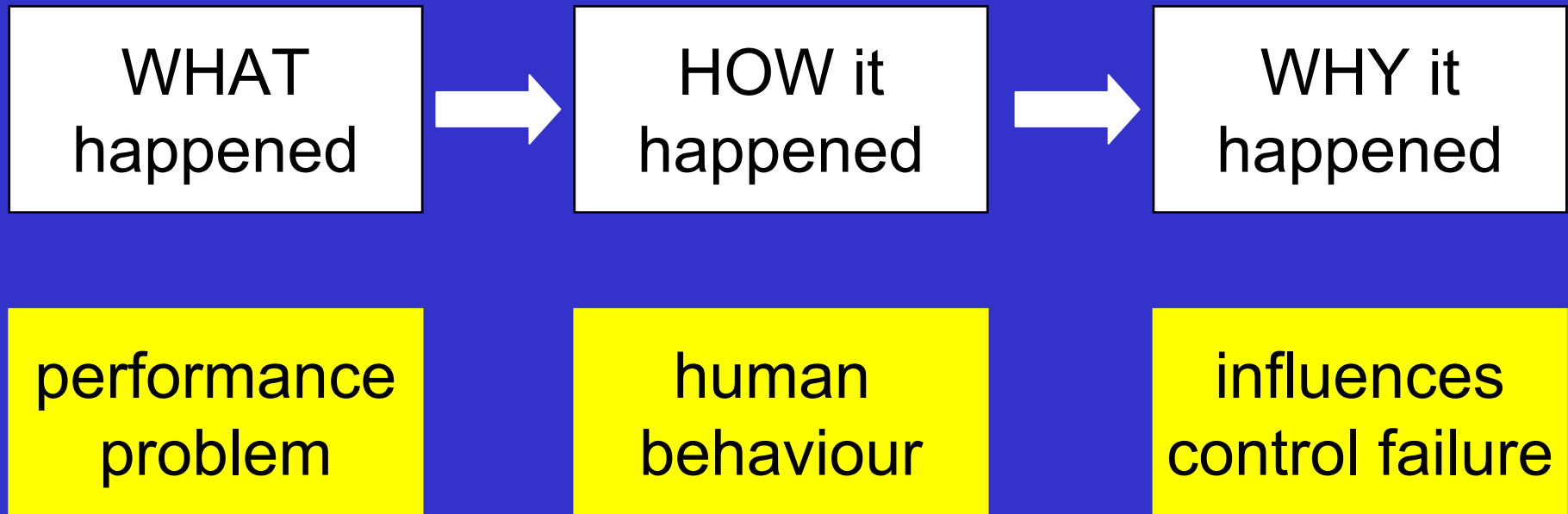
# When to use RCA

- **After a Patient Safety Incident has occurred**
- **Unpacks the 'whys'**
- **The contributory factors which set people up to fail including workload, design, lack of procedures, poor training and supervision, incompatible goals etc..**

# timeline



# basic elements of a good RCA investigation



## Exploring Incidents - Improving Safety

a guide to Root Cause Analysis from the NPSA



Introduction



Why things go wrong



Generating Solutions



Getting Started



Analysing Information



Gathering and mapping information



Exit



Resources



Help

# Basic RCA method

- **Identify and report Patient Safety Incident**
- **Select multi-disciplinary team**
- **Gather data**
- **Develop an incident chronology**
- **Identify the detail of what happened**
- **Explore the issues in depth**
- **Identify root causes and develop an action plan**
- **Test failsafe solutions**
- **Implementation and monitoring strategy**

A photograph showing several hands of different colors (white, brown, black) gently cupping a human heart. The background is a blue grid pattern.

# RCA Tools to identify and analyse Contributory Factors

**Brainstorming**

**Five Why's**

**CRU/ALARM Protocol**

**Cause and Effect Charting**

**Brain-writing**

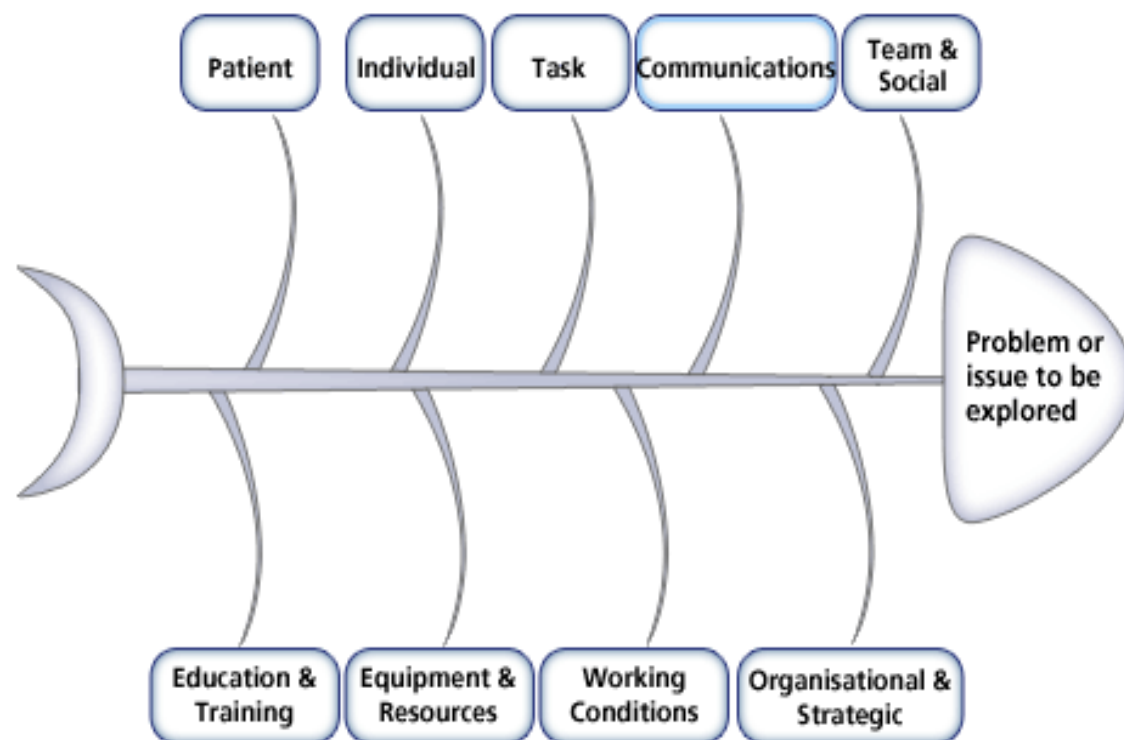
**Fault and Event Trees**

**Fishbone Diagrams**

**Nominal Group Technique**

## Contributory factors - NPSA framework

The key part of the analysis is to identify the [contributory factors](#) lying behind each problem. The NPSA's CFF has categories and components relating to exploring incidents. Click each category to find out more.



Communications factors are grouped into three types:

- **Verbal**
- Written
- Non-verbal.

Example: Relatives interpret GP's instructions to patient wrongly due to limited understanding of language.

Click **Next** to continue

# Identifying the Root Causes

- **Identify the contributory factors having the biggest impact on system failure = ROOT CAUSE**
- **A Root Cause is a fundamental cause which if resolved will eradicate, or significantly contribute to the resolution, of the identified problem to which it is attached both within the local department and more widely across the organisation**

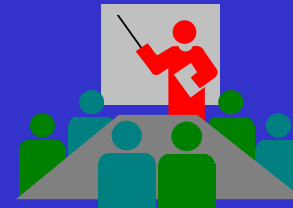
# Types of Barrier

## Human Action Barriers

- Checking the blood unit before administering

## Administrative Barriers

- Training
- Supervision
- Policies and procedures



## Physical Barriers

- insulation on pipes
- colour coding electrical flexes



## Natural Barriers

- place, time or distance

# Performing a barrier analysis

- **Choose an activity to be analysed (e.g. preparing a patient for theatre, giving blood)**
- **List, using Brainstorming techniques with relevant experts / others**


<b>TARGETS</b>	<b>HAZARDS</b>	<b>BARRIERS</b>
<b>Giving blood to patient</b>	<ul style="list-style-type: none"><li>• wrong pt</li><li>• wrong blood</li></ul>	<ul style="list-style-type: none"><li>• checks</li><li>• protocols</li></ul>

## Barrier Analysis Cont'd

- **Evaluate the list of barriers as strong, average or weak - any barrier involving human action is marked down**
- **Record the findings**
- **Remember barrier analysis can be used proactively or reactively!**

# Proposed Action Plan Summary Document

Root Cause	Actions to Address Root Cause	Level of Recommendation ( <u>I</u> ndividual, <u>T</u> eam, <u>D</u> irectorate, <u>O</u> rganisation)	By Whom	By When	Resource Requirements	Evidence of Completion	Sign-off

A photograph showing several hands of different skin tones cupping a glowing heart, symbolizing care and safety.

# Retrospective Study using root cause analysis (RCA) investigation into two incorrect blood component transfusion cases

- **Hypothesis**: RCA investigation would prove more useful in eliciting the latent conditions that lead to a patient safety incident

**Background**: Review of SHOT' s Annual Report 2000/01 stated that few cases were investigated thoroughly to get to the root cause that lead to incorrect blood transfusion

# Methodology

**Participants:** SHOT suggested 2 x Trusts who were deemed to be 'good reporters to SHOT' who used old cases from the latter part of last year

**Training:** Half day training to participants

**Follow up support:** Appointment of ECRI to evaluate participants' learning of RCA and to provide support with application of the process to past cases

# Case Scenarios

## Trust 1

### Background:

- **1991 and 1997:** Patient previously known to have had red cell antibodies (anit-K and ant-Fy(b)) by neighbouring **hospital A (hospital A&B since merged in 1998)**.
- **3/1/03** received cross matched blood at hospital B. The transfused units were not selected as antigen negative (K-, Fy(b-1)) as per national guidelines and good transfusion practice.
- **13/1/03** This discovery was made on and subsequently reported to SHOT

# Trust 1 - Methodology

- **Incident Grading** using 5 x 5 matrix risk scoring chart
- **Timeline** to track events occurring prior to, during and after the incident to discover all parts of the process where problems or errors occurred.
- **Gathering of relevant documents:**
  - Patient's healthcare records
  - Access to neighbouring hospital's Blood Bank computer and local hospital's computer, local Chemistry/Haematology computer
  - PAS
  - NBS reference laboratory report
  - IRI incident report

1. Apparent outcome of incident in terms of harm



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B: Potential future risk to patients and to the organisation	None	Minor	Moderate	Major	Catastrophic

3. Most likely consequences (if in doubt grade up, not down )

2. Likelihood of recurrence	None	Minor	Moderate	Major	Catastrophic
Almost certain					
Likely					
Possible					
Unlikely					
Rare					

RIS		Very low		Low		Moderate		High
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A: Impact on Patient:

- 1. Apparent harm to patient: none
- B: Potential future risk
- 2. Likelihood of recurrence of this type of incident: Likely
- 3. Most likely consequences of recurrence: Major

**Risk level: High**

## Results – Analysis & findings

- **Lack of single Blood Bank computer system between hospital A & B**
- **Failure to pass on relevant patient information during transfer between hospital A & B**
- **Potential for access to hospital B laboratory system for all patients' historical antibodies deemed impractical to look up for all patients due to time factors involved**
- **Failure of NBS reference lab staff to alert Trust 1 to the incorrect blood selection for transfusion**
- **The raise in bilirubin levels seems likely to have been caused by the biliary obstruction rather than red cell destruction as a probable result of this transfusion**

# Trust 1 - Key Learning Points

- **A single Blood Bank system is needed between hospital A and hospital B**
- **Staff awareness of importance of passing on red cell antibody information during transfer of patients between hospitals**
- **When incompatibilities are detected all available hospital transfusion systems should be checked for historical antibodies**
- **When issuing verbal reports, it is important to pass on all relevant historical information**

## Trust 2

- Background

A 62 year old female patient received a unit of platelets which were not her ABO group

- Methodology

**Gathering of relevant records:**

- Original telephone request form
- The blood bank register
- Relevant SOP
- Attempts were made to locate the Safecode IR form

## Staff Informally Interviewed

### Purpose of interview-

- To establish not only the witnesses to the event, but underlying working practices also
- **Staff interviewed:**
  - Blood Bank BMS
  - Senior BMS involved in the incident
  - Ward Manager involved in the incident and its reporting
  - Senior Nurse

# Findings & Analysis

- **The computer system that supports the work in the blood bank failed to alert when the wrong ABO group of platelets was issued to the patient**
- **1 member of staff operating in Blood Bank due to staff shortage**
- **Single person checking of products other than red cell transfusion appeared to be indicative of a task contributory factor**
- **A deficit related to education and training in the staff in HDU – did not question the ABO group at the time of collection**
- **Patient factors were also to play – very unwell , had been transferred as an emergency .**

## Other findings:

- **Deficit related to laboratory working conditions**
- **The platelet transfusion was prescribed on the treatment chart in use on the ward. No record of any signature on this, fluid prescription chart used in HDU**
- **No record of the adverse event, or the completion of the Safecode, in the nursing notes**

## Key Learning:

- **The computer system had a large part to play with highlighting both staffing issues and the shortcomings of the system. New system due to be installed this year**
- **Although difficulty in recruitment, now 2 members of staff are the norm in the laboratory**
- **Practice now changed - a second BMS should check and sign against the units for platelets**
- **Education deficits are currently being addressed by the Transfusion Nurse Specialist with the HDU staff re ABO compatibility and record keeping**

# Benefits of using RCA highlighted by Trust 1 & 2

- **Original investigation focussed on completing the questions raised by the SHOT reporting form- looked at immediate cause of the incident, e.g., in Trust 1, the incorrect verbal report by the NBS**
- **The true root causes were identified beyond the immediate obvious errors**
- **Use of the time line meant that a chronology of the patient's healthcare records was carried out, ensuring that questions were raised around any gaps in information**
- **A comprehensive process to follow when carrying out an RCA. Well structured report at the end of the RCA investigation**

## Other benefits

- Impressed by RCA investigation approach – setting up with Transfusion Nurse Specialist, a framework for investigating future blood transfusion errors
- Although the incident had been key in influencing the purchase of a single database, key learning re patient transfer between hospitals will be a main feature of the education programme
- Greater understanding of the how and why the incident occurred.
- Showed that there was more than one issue that needed addressing

# Further RCA Training

**The NPSA will be providing a RCA training in the following ways, commencing its programme in November:**

- **RCA 1 day foundation course – for any type/level of staff**
- **3 day RCA course for Trust RCA facilitators in 800 Trusts**
- **Master Classes in RCA**