

Root Cause Analysis of Transfusion Incidents The Leeds Experience

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LTH Transfusion

- Blood Transfusion Department
 - 2 Leeds laboratories supplying 2 teaching hospitals and 4 other hospitals
 - 1 Bradford based lab supplying Bradford Hospitals NHS Trust

LTH Transfusion

➤ The Leeds labs

- 87,000 samples per year
- Transfusing
 - 40,000 red cell units
 - 7,000 platelets
 - 16,000 FFP and cryoprecipitate

SHOT Reporting

- Reported to SHOT since 1996
- Involved in the Near-Miss Pilot Scheme
- Participated in the Root Cause Analysis project for SHOT and the National Patients Safety Agency in 2003

Leeds SHOT Reports 2003

- 64 Incidents reported to SHOT
 - 14 IBCT
 - 6 Acute reactions
 - 2 Delayed reactions
 - 2 TRALI
 - 40 Near-miss events



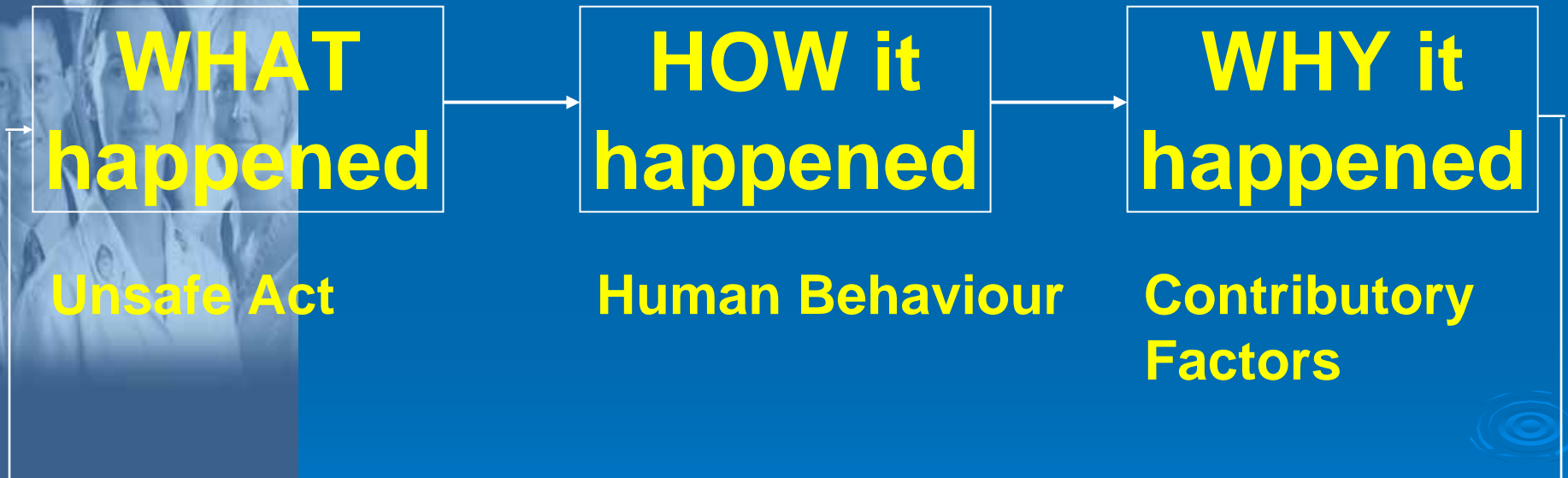
Root Cause Analysis

‘Root cause analysis is a structured investigation that aims to identify the true cause of a problem, and the actions necessary to eliminate it.’

Anderson and Fagerhaug, 2000

Root Cause Analysis

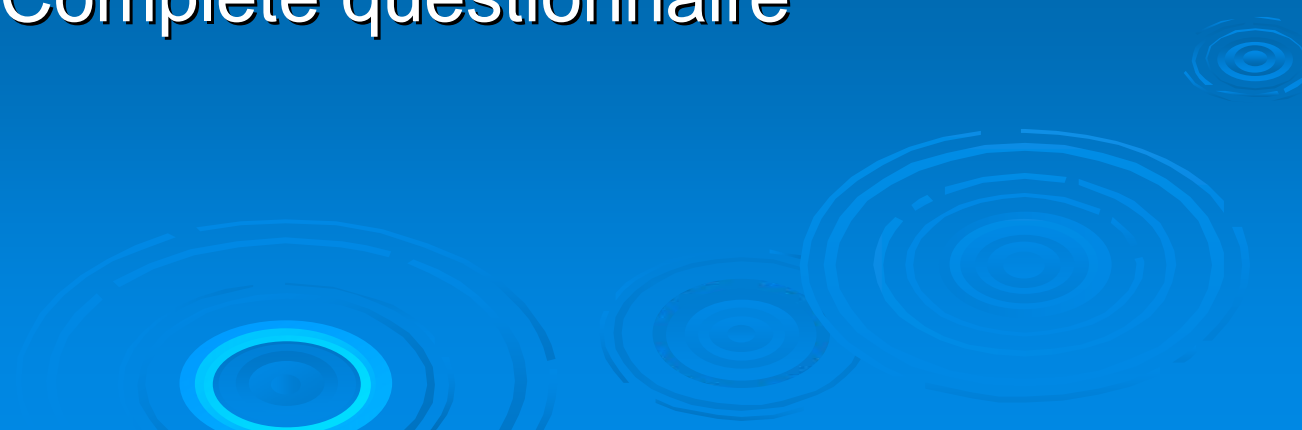
Basic Methodology



RCA & Feedback

Incident Investigation: The Leeds Approach

- Prior to using RCA
 - Report to SHOT
 - Gather information for SHOT questionnaire
 - Complete questionnaire



Incident Investigation: The Leeds Approach

➤ Now using RCA

- Gather full information for incident including
 - Witness statements (staff and patient)
 - Patient's notes
 - Nursing notes
 - ICU notes
 - Medical notes
 - Prescription charts
 - Observation charts

Incident Investigation: The Leeds Approach

- Procedures, policies and guidelines
 - Hospital
 - Laboratory
 - National
- Consult experts
 - Anaesthetists
 - Haematologists
 - NBS
 - Risk Management
- Produce a 'time-line' for the incident
- Produce a report
- Act on recommendations



The Report

➤ Constituent parts

- Introduction
- Summary of incident
- Method of investigation
- Grading of incident
 - Harm to patient
 - Potential of harm to future patients
- Discussion of errors / problems
- Key learning points / recommendations
- Acknowledgements
- References
- Appendices

Root Cause Analysis

A Case Study of an
Acute Transfusion Reaction / IBCT



Acute Transfusion Reaction Incident

- **Patient A, was an acute admission with LUQ abdominal pain, jaundice, query for surgery. Later the patient was diagnosed with a malignant mass around the head and neck of the pancreas**
- **The patient was currently taking warfarin for AF, INR on admission >10, Hb 8.2. No evidence of bleeding**
- **Four units of FFP and two units of red cells prescribed by the SpR**
- **The FFP was prepared by the Blood Bank and despatched to the ward**

Acute Transfusion Reaction Incident

- On commencement of the third unit of FFP the patient was observed to be having a reaction and the transfusion was discontinued

- **Symptoms**
 - Febrile
 - Hot and itchy
 - Tachycardia
 - Breathless
 - Wheezing

- **Treatment**
 - High flow O₂
 - IV Hydrocortisone / Chlorpheniramine
 - Nebulised Salbutamol / Ipratropium Bromide

Information Gathered

- Nursing staff interviewed
- Patient interviewed
- SpR interviewed
- The patient's clinical notes
- The patient's nursing notes
- Leeds General Infirmary Blood Bank Computer
- Leeds General Infirmary Chemistry / Haematology computer system
- The hospital PAS (Patient Administration System) computer
- Incident report form
- Guidelines for use of fresh frozen plasma. British Committee for Standards in Haematology. *Transfusion Medicine*, 1992, 2, 57-63

Errors / Problems

- **Error / Problem 1** – The patient has an acute reaction to transfusion of FFP. This appears from the patient's notes to be of the anaphylactic type
- **Error / Problem 2** – No tryptase tests were carried out following the reaction. The tryptase result would have helped confirm the diagnosis of anaphylaxis, although in this case the records of the patient's symptoms give a clear indication of the type of reaction

Errors / Problems

Error / Problem 3 (the root cause)

- FFP was prescribed for the patient for warfarin reversal. This does not follow national guidelines for reversal of warfarin effect
 - The recommended treatment for immediate reversal of warfarin is administration of vitamin K
 - In patients grossly overdosed with life threatening haemorrhage the recommended approach is to use concentrates of factors II, VII, IX and X (e.g. Beriplex)

Learning Points / Recommendations

- Adhering to the BCSH guidelines for reversal of warfarin would have avoided this incident from happening
- The laboratory system for requesting tests post transfusion reaction needs to be reviewed to ensure that all the relevant samples are taken

Follow Up

- 2 further similar incidents have been found since this one
- The Hospital Transfusion Team have issued copies of the BCSH guidelines to clinical areas and it is posted on the Trust intranet
- FFP usage is now included in PRHO and SHO induction
- The subsequent issue of the Transfusion Team Newsletter covered the use of FFP
- Currently conducting an audit of FFP usage including reason for transfusion

Have we benefited from RCA?

➤ Pros

- True cause of incident identified
- Learning points identified
- Recommendations made and implemented
- Better feedback to clinical teams
- Safer practice / reduced repeat incidents

➤ Cons

- Time consuming
- Requires training
- Obtaining all the patient's notes is not easy and transfusion episodes are sometimes poorly documented

In Summary

- We have found that RCA
 - Is not necessary and is impractical for all incidents

However: -

- Is very beneficial in incident investigation
- When used for small numbers of incidents can help improve transfusion practice