'Human Factors in Transfusion': A Focus on WBITs

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Talk overview

- What is human factors (HF)?
- HF behind transfusion errors
- High risk situations
- The WBIT problem
- How can HF research help?
- Common methods
- Broader issues to address

What is human factors?

- Human factors is a broad science that deals with many factors influencing human performance
  - e.g. physical environment, task characteristics, individual characteristics and organizational or management systems
  - i.e. factors that affect how people perform, think, communicate, and interact with technology in complex socio-technical systems

What is HF research?

- Human factors research is used to demonstrate how the rigorous study of these factors can provide the basis of re-design to reduce failure and promote “safe” systems
  - Proven in other high-risk industries which can provide lessons with potential to reduce effort required to solve patient safety issues

Human factors in transfusion

- There are a number of human factors linked with transfusion errors, such as:

  - (1) poor communication between staff;
  - (2) complexity of care and urgency of tasks;
  - (3) confusing product labelling or packaging;
  - (4) incomplete or inadequate education;
  - (5) insufficient staffing or patient monitoring, and;
  - (6) lack of automation or technologies mismatched to work processes

High risk settings for error

Repetitive tasks, complacency, distraction and fatigue universal

Issues that predispose certain areas to transfusion error include:

- The unknown or new patient to the hospital (e.g. ED)
- The non-responsive patient (e.g. ICU)
- High familiarity with patients
- 5am specimen collection to coincide with morning ward round
- High urgency (e.g. massive transfusion)
- Greater demand, greater patient volumes

What are WBITs?

- '**Wrong Blood in Tube**' or WBITs are the most common error involving patient identification that occurs in the process of transfusion

- Occurs when samples in which a properly labelled tube identifying blood from Patient A actually contains blood from Patient B.

- *They start a complex chain of events that compromise patient safety:*

(1) WBITs are a precursor to 'Incorrect Blood Component Transfused';
(2) WBITs lead to inappropriate therapy due to incorrectly matched results

- *WBITs are, thus, an indicator of deeper system problems...*

Scale of WBIT problem

- They are wide scale; 1 in every 165 samples mislabelled and 1 in every 1986 samples miscollected and contained WBIT

- *But we have*:

(1) Limited understanding of complexity of events behind WBITs

(2) Poorly documented risk mitigation strategies with limited success

- *We need*:

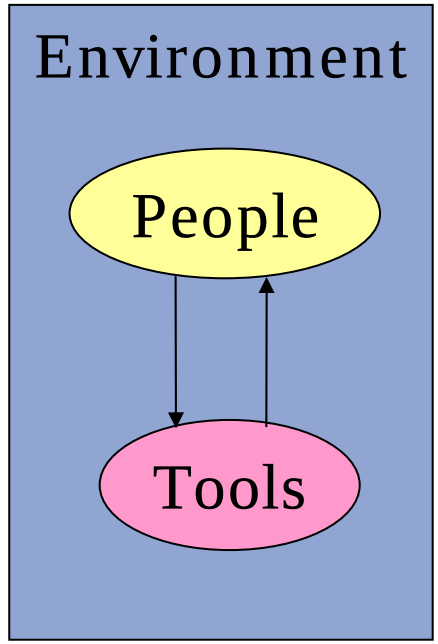
(1) Greater insight surrounding the development of WBITs

(2) Interventions that are designed to lower incidence of WBITs

(3) Interventions that have staff engagement and context-specific

How can HF research help?

- Moves away from blaming frontline staff to systems understanding
- Acknowledges the need to work forwards not backwards
- Moves beyond counting errors toward building resilience
- Sees technology as only appropriate when it truly supports humans
- Proactive not merely reactive risk approach
- Stakeholder engagement processes to inform design
- Provides us with systematic methods to observe the world ‘as is’



Common Methods (1)

1. Failure Modes and Effects Analysis (FMEA)

- Begins with observations and interviews to build process maps and then requires engagement with key stakeholders (supplemented by further observation of work in practice)
- Identifies the key “failure modes” and their “effects” which, in this case, are in terms of impacts on patient safety.
- Failures are prioritized according to how serious their consequences are, how frequently they occur and how easily they can be detected
- The one key drawback of the FMEA process is that it is very time-consuming and may suffer from lack of engagement

REF: DeRosier et al. (2002)

Common Methods (2)

2. Systems Analysis: e.g. building a "Work System Map"

- (1) What technology is used?;
- (2) What policies and rules (both internal and external) are involved in determining how, when, why, or where step executed?;
- (3) What supervision is involved in the step?;
- (4) What environmental factors (e.g. lighting, noise) might affect the step or how it is executed?;
- (5) What other people might influence the execution of this step or determine whether the step takes place?; and,
- (6) What information is needed for the execution of this step?

REF: Karsh et. al (2005)

Broader issues to address

- How blood banks provide resilience for hospital transfusion practice
- The nature inter-professional interactions around operating table
- Influence of cultural & hierarchy factors on the way people prescribe
- Issues surrounding justifying one's clinical judgment
  - (often visible at handovers)
- Focus on a particular domain where transfusion problems known
  - (e.g. obstetrics or massive transfusion)
- Focus on national guideline adherence and / or barriers to this
- Focus on decision making and existing / potential decision support tools

Thank you ☺

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