Introduction

A key recommendation of the 2019 Annual SHOT Report states that: Clinical and laboratory staff should be trained in fundamentals of transfusion, human factors, cognitive biases, investigating incidents and patient safety principles. Such a holistic approach will ensure safe, high-quality, patient-centred care and help embed an organisation-wide culture of learning from patient safety incidents. This builds on the 2018 SHOT recommendation that all clinical and laboratory staff should be encouraged to become familiar with human factors and ergonomics concepts. Through a series of human factors SHOT Bites, the key principles of human factors and their relevance and application within transfusion safety will be explored. This Bite focuses on a basic introduction to cognitive biases.

What are cognitive biases?

Essentially, cognitive biases are cognitive short-cuts used to aid our decision-making, and there is increasing recognition that they contribute significantly to errors in healthcare. Cognitive biases are flaws or distortions in judgment and decision-making. These are inconsistently reported and therefore challenging to quantify but cognitive biases are increasingly recognised as contributors to patient safety events.

Why do we need to be aware of cognitive bias?

It is important for everyone in healthcare to gain knowledge around cognitive biases and provide work systems that help recognise and compensate for limitations in cognition, as well as promote conditions that facilitate decision-making. This will ultimately help improve patient safety.

What are the types of cognitive biases?

The concept of cognitive bias was first introduced by researchers Amos Tversky and Daniel Kahneman in 1974. Several types of cognitive bias have been identified which may exist in different healthcare scenarios. If we were to do a deep dive into types of bias many classifications and terminologies would be revealed including bandwagon effect, attribution bias, anchoring bias, confirmation bias to name just a few. All these come under the umbrella term of 'cognitive biases'

What are some examples?

Cognitive biases can place limits on the mind's ability to process information, contribute to distorted thinking and introduce scope for making errors in judgement. Over 100 different types of cognitive biases have been described in literature, and there is considerable overlap in the definition of biases. The figure below provides a few examples with some scenarios related specifically to transfusion. Some of these are based on actual SHOT reports received and analysed.

Anchoring: Focusing on a single piece of information and not adjusting viewpoint when presented with new information

A patient with liver disease has a slight fever and increased bilirubin post transfusion – this is attributed to the underlying disease and a transfusion reaction is not investigated

Bandwagon Effect: Considering the opinion of the majority to be correct

A BMS reads multiple entries regarding non-specific reactions in a patient's antibody panel in LIMS. They fail to fully assess the serology, missing a combination of alloantibodies which has been present in the last 2 samples

Attribution error: A form of stereotyping: explaining a situation based on a single personal characteristic

An elderly patient is incorrectly booked under the details of another individual who has dementia. When the patient challenges the incorrect identity details on their wristband it is assumed that the patient is 'confused'

Confirmation bias: Tending to interpret the information gained to fit preconceived diagnosis, rather than the converse

A BMS doesn't acknowledge that a warning message on the LIMS is related to sample validity, assuming it is because of antibody status. Therefore 2 units of RBCs are serologically crossmatched on an invalid sample
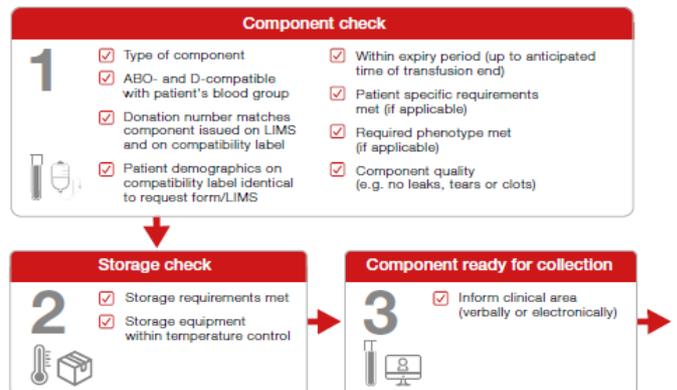
Blindspot bias: The ability to recognise the weakness or cognitive errors in others, and a tendency to overlook our own

An advanced specialist BMS writes the SOP for component checking stating only one unit should be checked at a time. When an urgent request is received for 4 units of RBC they label the units simultaneously to save time because they thought they were too senior to make an error. Labels on two of the units are transposed

Why are they important?

Staff need to be aware of the potential for such biases, and be trained to recognise, and if possible, prevent them through simple interventions. These might include formally 'slowing down', using checklists such as the laboratory component exit check from the 2019 Annual SHOT Report (shown parallel), use of flowcharts and 'metacognition' (considering alternatives). Such strategies may help mitigate the effect of cognitive bias in healthcare and help make systems safer (O'Sullivan 2018).

Component check

1
- ☑ Type of component
- ☑ ABO- and D-compatible with patient's blood group
- ☑ Donation number matches component issued on LIMS and on compatibility label
- ☑ Patient demographics on compatibility label identical to request form/LIMS
- ☑ Within expiry period (up to anticipated time of transfusion end)
- ☑ Patient specific requirements met (if applicable)
- ☑ Required phenotype met (if applicable)
- ☑ Component quality (e.g. no leaks, tears or clots)

Storage check

2
- ☑ Storage requirements met
- ☑ Storage equipment within temperature control

Component ready for collection

3
- ☑ Inform clinical area (verbally or electronically)

What is the importance of cognitive bias for incident reporting and investigation?

Investigating incidents using a human factors approach is vital to understanding what truly caused the incident, helping identify the appropriate corrective and preventative actions. It is also important to consider the human factors of incident investigations and how they can influence the quality and accuracy of investigations, and the ability for organisations to identify valid causal factors and remedial actions.
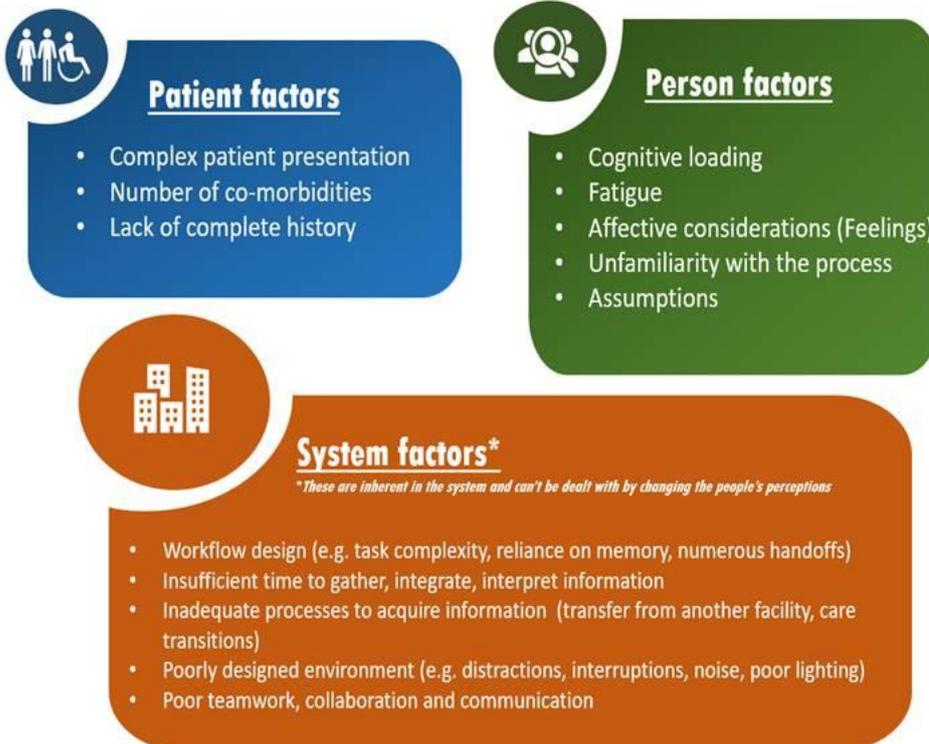
SHORT CUTS CUT LIVES SHORT!

IT IS SAFER AND BETTER TO HAVE SIMPLER POLICIES AND PROCESSES TO ENSURE COMPLIANCE AND AVOID DEVIATIONS

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The introduction of a human factors investigation tool (HFIT) within reports submitted to SHOT paved the way for incorporating human factors principles when reviewing transfusion incidents. However, reporters should be aware of cognitive biases and strive for impartiality when reporting and investigating incidents. SHOT strongly encourages reporters to use human factors and ergonomics principles to help assess all causes of an incident. Incident investigators may benefit from trying to put themselves "in the shoes" of the individual staff member(s) that they perceive to be most culpable in the incident and then from that stance review the external system factors again in more detail.

What are the common factors that can predispose or increase likelihood of cognitive biases?

Many biases can exist in healthcare settings. The factors that have potential to increase the likelihood of these occurring can be divided into person factors, patient factors and system factors. Some examples for each broader category are given here though these are not exhaustive.

Patient factors
- Complex patient presentation
- Number of co-morbidities
- Lack of complete history

Person factors
- Cognitive loading
- Fatigue
- Affective considerations (Feelings)
- Unfamiliarity with the process
- Assumptions

System factors*
*These are inherent in the system and can't be dealt with by changing the people's perceptions
- Workflow design (e.g. task complexity, reliance on memory, numerous handoffs)
- Insufficient time to gather, integrate, interpret information
- Inadequate processes to acquire information (transfer from another facility, care transitions)
- Poorly designed environment (e.g. distractions, interruptions, noise, poor lighting)
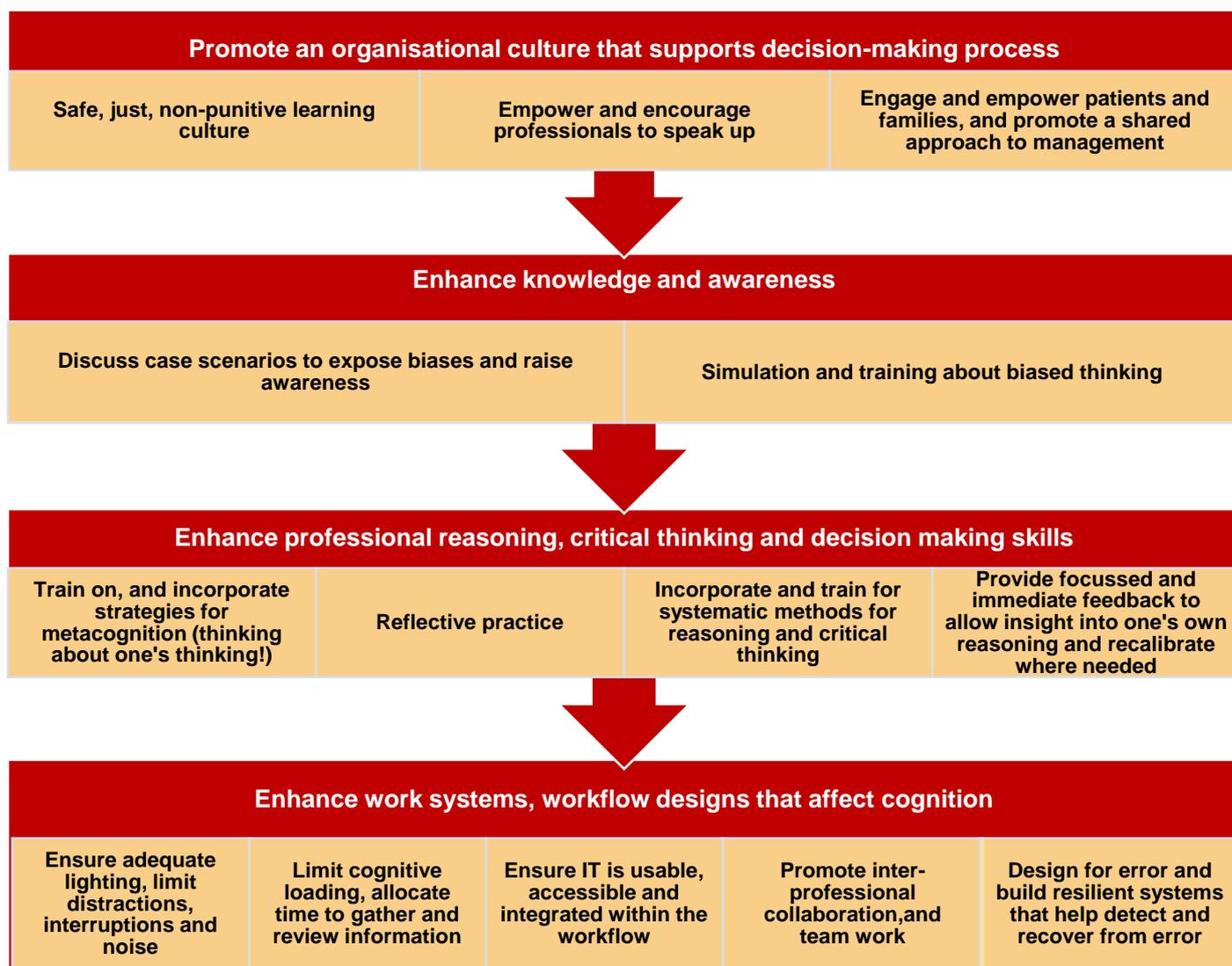- Poor teamwork, collaboration and communication

What are some potential solutions in the work environment?

An algorithmic approach to managing bias helps to:

- Become aware of the bias
- Ensure that you and your team are motivated to correct the bias
- Recognise the magnitude of the bias
- Apply an appropriate debiasing strategy

The following strategies help increase the awareness of cognitive biases and promote work system conditions that can detect, protect against and recover from cognitive biases and associated risk. These do not represent an all-inclusive list but offer some examples and potential practical ideas and solutions.

Potential solutions:

Promote an organisational culture that supports decision-making process

Safe, just, non-punitive learning culture	Empower and encourage professionals to speak up	Engage and empower patients and families, and promote a shared approach to management

Enhance knowledge and awareness

Discuss case scenarios to expose biases and raise awareness	Simulation and training about biased thinking

Enhance professional reasoning, critical thinking and decision making skills

Train on, and incorporate strategies for metacognition (thinking about one's thinking!)	Reflective practice	Incorporate and train for systematic methods for reasoning and critical thinking	Provide focussed and immediate feedback to allow insight into one's own reasoning and recalibrate where needed

Enhance work systems, workflow designs that affect cognition

Ensure adequate lighting, limit distractions, interruptions and noise	Limit cognitive loading, allocate time to gather and review information	Ensure IT is usable, accessible and integrated within the workflow	Promote inter-professional collaboration, and team work	Design for error and build resilient systems that help detect and recover from error

Useful Resources:

1. Tversky A & Kahneman D. Judgment under uncertainty: heuristics and biases. Science, New Series, 1974:185(4157), p. 1124-1131
2. O'Sullivan ED and Schofield SJ. (2018) Cognitive bias in clinical medicine. J R Coll Physicians Edinb 2018;48(3): 225-232.
3. Human Factors Video https://www.youtube.com/watch?v=aGZz3w5Hy8Y&feature=youtu.be&app=desktop

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