Human Factors Key Information

Student Course Booklet

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Contents

1. Introduction

Delivering safe and effective care is an essential part of our work. But when we look at why mistakes happen, it is rarely due to a lack of knowledge. More commonly it is due to poor thinking, poor communication, poor team working and poor systems of delivering care.

Human factors training is widely used in safety-critical industries, such as aviation or nuclear power, but healthcare is a relative late-comer to the field. The reasons for this are complex but at last we are seeing a realization of the importance of these skills.

We are all humans, and we experience emotion, stress, fatigue and many other factors that contribute to our behavior. Gaining awareness of oneself as an individual, as well as a team worker, and being able to recognize how we make decision is crucial to improving our care to our patients.

This course has two main aims:
1) **Show why errors happen and how they can be prevented**
2) **Look at how we look into errors and how we can use these skills to prevent future errors.**

No new facts will be taught; instead we will look at a different way of approaching the manner in which we deliver care

We hope that this course will make you think about what we do on the shop floor, in wards, theaters, ambulances or management offices and how it can be improved to provide the best possible care for our patients.

This course booklet contains the essential facts that you need to take away with you from this course - essentially very few. In addition we have provided you with a copy of all the slides as well as a copy of an example of prompt cards that we use in BSUH NHS Trust A&E departments. We have also provided a copy of the values and behaviors document from BSUH NHS Trust, as these values underpin good human factors.

Hopefully the course and resources will help you deliver the best possible care that you can. Thank you for showing an interest in the subject.

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2. Why errors happen

Error and threat management is a key concept when focusing on human factors in healthcare. It has relevance to leadership, systems development, stress and situational awareness, and of course team working.

The Swiss cheese model is one commonly used method to describe a process that can potentially end with error if all the holes (the barriers) are lined up. Most accidents occur as a result of a failure at one (and usually more than one) level.

In addition, the University of Texas Threat and Error Management model (TEM) classifies the causes of adverse outcomes – into threats and errors.

E.g.
- Ice on the road is a threat; driving too fast is an error
- Allergy to penicillin is a threat; giving penicillin to an allergic person is an error
- No mark on the side of surgery is a threat; operating on the wrong side is an error

Lines of defens:
- **Avoidance: This involves recognizing the threats, and managing them**

  For example:
  Ice is managed by gritting the road
  Allergies are prominently displayed in notes and on patient identity bracelet
  Mark is checked prior to patient coming to theatre

- **Trap: aiming to reduce the consequences of the error and lead to no adverse consequences**

  For example:
  Driver slowing down on the icy road
  Patient having a the correct site marked prior to commencement of anaesthetic

- **Mitigate: aiming to reduce the incidence of bad consequence, leading to a good outcome**

  For example:
  Mitigating the allergic reaction in a patient given penicillin by administering adrenaline, steroids and fluids

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3. Crew/ Crisis Resource Management (CRM)

- "Cognitive and teamwork skills that facilitate the management of medical events bearing a high risk to patients well being"

- CRM themes:

  - Maintain Situational Awareness
  - Cognitive skills and preventing fixation Errors
  - Know your environment and team
  - Call for help early
  - Effective Leadership
  - Distribute workload
  - Communicate Effectively
    - SBAR
    - PACE
    - Closed Loop
  - Allocate attention wisely
  - Anticipate and Plan
  - Use all sources of information
  - Cross check data
  - Use cognitive aids
  - Debrief and learn from cases

4. Situational Awareness

Situational Awareness (SA) is our mental picture of what is happening around us and of what is about to happen. It is important as situational awareness can become dangerously faulty – such as *fixation error* (e.g. fixation on intubation instead of ventilation or requirement for a surgical airway).

Situational Awareness can be affected by a multitude of factors such as fatigue, stress, inexperience etc.

Accurate SA is maintained using triggered checks:
- The SA check
- The things that trigger it

The three stages of the SA Check:
1. Identify the features of the current SA – and step back to consider other possibilities
2. Consider and verbalise all alternative hypotheses
3. Seek external evidence to decide between alternatives

The SA trigger list
- An action does not have the expected effect
- Confusion or uncertainty not resolved
- Disagreement between two sources of information
- Fixation on a single task
- Leading questions
- Displacement activities
- Failure to adhere to accepted practice
- Failure to react appropriately to warning signs
- Failure to communicate effectively
- When taking over
- The vague feeling of unease

The Sterile Cockpit

As healthcare professionals we can learn from the sterile cockpit. Often information is imparted to colleagues during a stressful incident and vital points lost due to inattention or stress. Maintaining a sterile cockpit, and a clear line of communication contributes to ensuring information is transferred safely.

5. Fixation errors

Fixation errors (also known as anchoring) occur when a practitioner concentrates solely upon a single aspect of a case to the detriment of other more relevant aspects. These are well recognised in practice and can contribute significantly to morbidity and mortality.

We therefore have to develop countermeasures to fixation errors to improve safety for patients.

Allocate Attention Wisely

Use all available information, prioritise tasks, delegate appropriately and stand back to re-review the situation. Be aware that fixation error leads to a reduction in situational awareness.

Errors of fixation can be classified into three main categories:

1. **This and only this** eg bronchospasm, without considering a blocked or kinked breathing circuit or tube

2. **Everything but this** eg unresponsiveness to drug therapy and not considering a drug error

3. **Everything is OK** eg assuming a low pulse oximetry reading is due to a recording error rather than hypoxaemia

6. Leadership

Different leadership styles tend to deliver different outcomes for staff and patients. Despite this, there are some key features of effective leaders wherever they sit within an organization.

Consistent teams will produce high quality care, but that is not feasible within a busy healthcare set up. We therefore need to focus on systems to enhance communication, leadership and followership that can be applied to any eventuality.

Tips for effective leadership:
1. Show, don't tell
   - As a group, health professionals tend to be skeptical about information given unless there is clear evidence to back it up. Therefore, demonstrating evidence and allowing a team to draw their own conclusions can be more effective.
2. Leading by example
   - Actions speak louder than words – and credible leaders tend to
3. Motivation
4. Positive reinforcement
5. Buy in
6. Delegation of tasks
7. Commonality of purpose
8. Team member development – utilize a flat hierarchy
9. Visibility
10. Humour
11. Diffusion of responsibility

Team-working
Team-working requires motivation and coordination of all members' efforts to maximize the team's effectiveness as a whole. The team is more effective than the sum of its members.

Team-working requires:
1. A vision
2. A leader who is able to develop that vision and continue to motivate the team, and distribute tasks efficiently and skill matching
3. Team-members who are able to align their personal objectives with this vision

In healthcare, effective team working contributes to improvement in patient outcomes, reduced hospital stays / costs <u>and</u> improved working lives of staff.

7.Communicatin

Communication failures are major contributors to medical mishaps – thought to be a feature in up to 80& of error cases.

Danger areas include:
1. Serial communication (the Chinese whispers effect)
2. Misleading sound bites – avoid jargon
3. Inadequate briefings and handovers.

People tend to act on impulse with simple reactions in a stressful situation – whereas consideration thought and training can aid a better outcome and team working. Closed loop communication, and systems such as PACE or SBAR can ensure information is transferred.

One mantra to never forget *Think before speaking*

PACE COMMUNICATION

PACE was introduced into aviation industry to assist management of subordinate crew members to help them speak out.

Establishes a progression of inquiries to reduce risks at each level of the intervention sequence

PROBING

ALERTING

CHALLENGING

EMERGENCY WARNING

An example of PACE in healthcare:

Scenario: An Emergency Medicine consultant needs to put in a chest drain urgently into a deteriorating patient. He has selected the wrong type of chest drain. The senior registrar notices this and uses PACE to stop him:

PROBE: '(states Consultant's name to focus question at him), why are you putting in that type of chest drain?'

ALERT: 'It's just usually in this situation I've used a different chest drain'

CHALLENGE: 'I don't think that's the correct chest drain to use here.'

EMERGENCY: 'Stop! Putting in that type of drain is compromising patient safety.'

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SBAR COMMUNICATION

An example of SBAR communication is shown below

S

Situation:
I am (name), a nurse on ward (X)
I am calling about (child X)
I am calling because I am concerned that…
(e.g. BP is low/high, pulse is XXX temperature is XX,
Early Warning Score is XX)

B

Background:
Child (X) was admitted on (XX date) with
(e.g. respiratory infection)
They have had (X operation/procedure/investigation)
Child (X)'s condition has changed in the last (XX mins)
Their last set of obs were (XXX)
The child's normal condition is…
(e.g. alert/drowsy/confused, pain free)

A

Assessment:
I think the problem is (XXX)
and I have…
(e.g. given O$_2$/analgesia, stopped the infusion)
OR
I am not sure what the problem is but child (X)
is deteriorating
OR
I don't know what's wrong but I am really worried

R

Recommendation:
I need you to…
Come to see the child in the next (XX mins)
AND
Is there anything I need to do in the meantime?
(e.g. stop the fluid/repeat the obs)

Ask receiver to repeat key information to ensure understanding

The SBAR tool originated from the US Navy and was adapted for use in healthcare by
Dr M Leonard and colleagues from Kaiser Permanente, Colorado, USA

If you require further copies quote SC043

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8. Checklists/prompt cards

Checklists and Standard operating procedures have been recommended by a number of reports in the management of critically ill patients. If introduced along with a cultural change in the acceptance of human fallibility and the importance of pre-planning for emergencies and planning for difficulty, they have been shown to improve outcome.

Checklists and Standard Operating Procedures for intubation, sedation, CVC insertion and transfer of critically ill patients by doctors have been developed for use in the resuscitation room. They should be used in all appropriate occasions by nurses and doctors of all grades and specialities.

Using checklists in the resuscitation room is obviously different to using them for planned procedures. In true time critical peri-arrest situations, then they should NOT be used. However, for the majority of cases in the resuscitation room, the procedures are urgent but not time critical and the safer care associated with the checklists outweighs the small extra time delay needed to run through them.

For each of the procedures, a 'sterile cock pit environment' should be adopted – where there is controlled order but all members of the team feel free to speak up. The team leader should ensure everyone knows each other's name and briefs the team on the plan for the procedure and plans for what to do in case of difficulty. Each checklist is a simple to follow tick box. Laminated versions should be placed in the ED and just a tick in the notes that a checklists was used. There is nothing in the checklists which shouldn't be done routinely anyway – they are just reminders to make sure each of the procedures is done as safely and optimally as possible.

It is not checklists per say which improve outcome - but the cultural shift that comes along with them; of acceptance that mistakes can happen and that care will be improved by ensuring that routine checks are complete and allowing any member of the team to speak up if they think something is astray.

Copies of the checklists/prompt cards are available for all candidates

9. Feedback

Feedback is something that should occur within our daily practice, and aimed to be relevant, specific, timely and constructive.

When giving constructive feedback in any setting, it should be:
1. Based on behavior, rather than focusing on personality
2. Given privately
3. Relevant to the needs of the individual and the team
4. Specific (avoid generalized statements)
5. Timely – as soon after the event as possible
6. Avoid being judgmental and assuming motives
7. Encourage reflections
8. Focus on the positive aspects
9. Negotiate a solution and ensure that opportunities to aid improvement are available

An After Action Review is a facilitated discussion and evaluation that is used when outcomes of an activity or event has been particularly successful or unsuccessful. It aims to capture learning from these tasks to avoid failure and promote success for the future. It looks at what happened, what should have happened, why there was a gap and what can be done to prevent the gap. It should be carried out in a no blame manner.