Why Human Factors and systems thinking?

- We are all human
- Humans make errors and systems fail

Humans involved in event
Humans investigating

- You will see what you expect to see
- You will find what you expect to find
- Everything is easy with hindsight

Different lenses to look at same problem
**Human factors**

1. **“the human factor”**
2. The physical and cognitive capabilities and limitations of the human
3. Factors affecting human performance
   - Internal factors (physical and cognitive capabilities and limitations) and external factors (i.e. equipment, procedures)
4. Understanding humans as an element of and their interactions within a sociotechnical system

Apply theory, principles, data and methods
Understand interactions among humans and system
Design for human well-being and overall system performance
What is the health (sociotechnical) system
Health system: onion model

Institutional context factors

Organisational and management factors

Work environmental factors

Team factors

Individual staff factors

Patient factors

Task and technology factors
Myths

Errors are bad

It is easier to change people than situations

Bad people make bad errors

Errors cause accidents

Practice makes perfect

Hindsight bias
Just culture

Trust, learning and accountability

People are not punished for actions, omissions or decisions taken by them which are in line with their experience and training, but gross negligence, wilful violations and destructive acts are not tolerated.

Would a similar person in a similar situation with similar experience and training likely have done the same thing?

Was the person set up for success?

i.e. training, selection and experience, resources, supervision, conditions, demands and pressures?

Did they follow procedures?

Were procedures available, workable, intelligible, correct? Perceived benefit to organisation? Previously accepted?

Were actions & consequences intended?

History of unsafe acts? Unauthorised substance? Medical condition?
Being human
Limited attention resources
Perception: active processing
Situation awareness

1. Timely and accurate perception of elements
2. Integration of this information into existing mental model
3. Projection of the information to determine future status
Decision making

- Know what to look for
- Accuracy mental model

**System 1**
- Fast
- Unconscious
- Automatic
- Everyday Decisions
- Error prone

**System 2**
- Slow
- Conscious
- Effortful
- Complex Decisions
- Reliable

- Time to respond
- Cognitive demands
Cognitive biases

Primacy and recency effect

Confirmation bias

Groupthink
Technology

Landing gear

Flaps

Wing Flaps

Sound familiar?

Same buttons
Same alarm sounds
Fatigue

Impact on performance:

• Judgement
• Concentration
• Memory
• Vigilance
• Reaction time and/or physical coordination
• Work efficiency

We are bad in recognising that we are fatigued
Fatigue is everyone's responsibility

Organisational support
managing the risk of fatigue impairment

Sleep opportunity provided

Actual sleep obtained / Time awake / Time of day

Behavioural symptoms

Fatigue related errors

Fatigue-related incidents

based on Dawson & McCulloch, 2005
Working in a system

<table>
<thead>
<tr>
<th>FACTOR TYPES</th>
<th>CONTRIBUTORY INFLUENCING FACTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Factors</td>
<td>Condition (complexity &amp; seriousness)</td>
</tr>
<tr>
<td></td>
<td>Language and communication</td>
</tr>
<tr>
<td></td>
<td>Personality and social factors</td>
</tr>
<tr>
<td>Task and Technology Factors</td>
<td>Task design and clarity of structure</td>
</tr>
<tr>
<td></td>
<td>Availability and use of protocols</td>
</tr>
<tr>
<td></td>
<td>Availability and accuracy of test results</td>
</tr>
<tr>
<td></td>
<td>Decision-making aids</td>
</tr>
<tr>
<td>Individual (staff) Factors</td>
<td>Knowledge and skills</td>
</tr>
<tr>
<td></td>
<td>Competence</td>
</tr>
<tr>
<td></td>
<td>Physical and mental health</td>
</tr>
<tr>
<td>Team Factors</td>
<td>Verbal communication</td>
</tr>
<tr>
<td></td>
<td>Written communication</td>
</tr>
<tr>
<td></td>
<td>Supervision and seeking help</td>
</tr>
<tr>
<td></td>
<td>Team structure (congruence, consistency, leadership, etc)</td>
</tr>
<tr>
<td>Work Environmental Factors</td>
<td>Staffing levels and skills mix</td>
</tr>
<tr>
<td></td>
<td>Workload and shift patterns</td>
</tr>
<tr>
<td></td>
<td>Design, availability and maintenance of equipment</td>
</tr>
<tr>
<td></td>
<td>Administrative and managerial support</td>
</tr>
<tr>
<td></td>
<td>Environment</td>
</tr>
<tr>
<td></td>
<td>Physical</td>
</tr>
<tr>
<td>Organisational &amp; Management Factors</td>
<td>Financial resources &amp; constraints</td>
</tr>
<tr>
<td></td>
<td>Organisational structure</td>
</tr>
<tr>
<td></td>
<td>Policy, standards and goals</td>
</tr>
<tr>
<td></td>
<td>Safety culture and priorities</td>
</tr>
<tr>
<td>Institutional Context Factors</td>
<td>Economic and regulatory context</td>
</tr>
<tr>
<td></td>
<td>National health service executive</td>
</tr>
<tr>
<td></td>
<td>Links with external organisations</td>
</tr>
</tbody>
</table>

Taken from London Protocol
Humans make errors and systems fail

To err is human
To cover up is unforgivable
To fail to learn is inexcusable

(Sir Liam Donaldson)

Hope is not a strategy

miranda.cornelissen@safercare.vic.gov.au