# Human Factors in incident investigation

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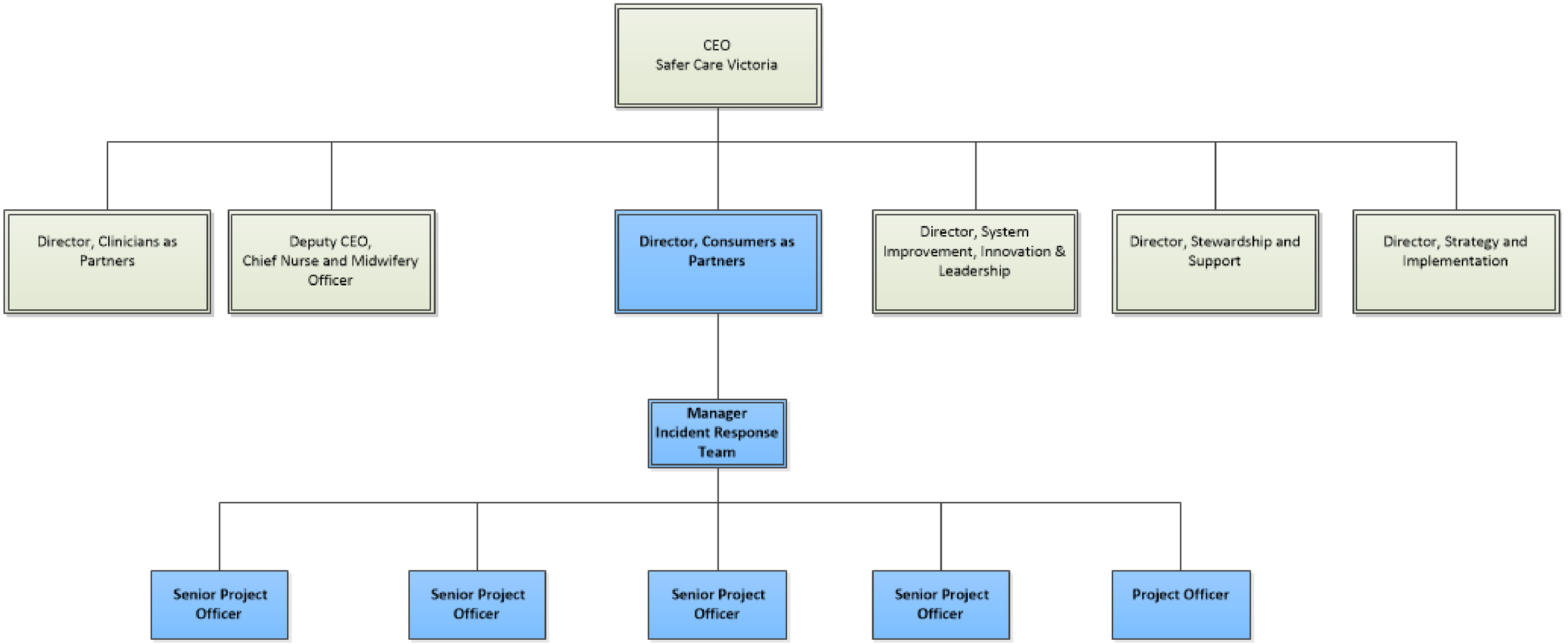
# Why are we here?


- Threshold for investigation and review
- Lack of systematic processes
- Right clinical experts, right time
- Right skills for investigations and recommending effective improvements
- Missing opportunities to learn and improve

# SCV - Incident Response Team

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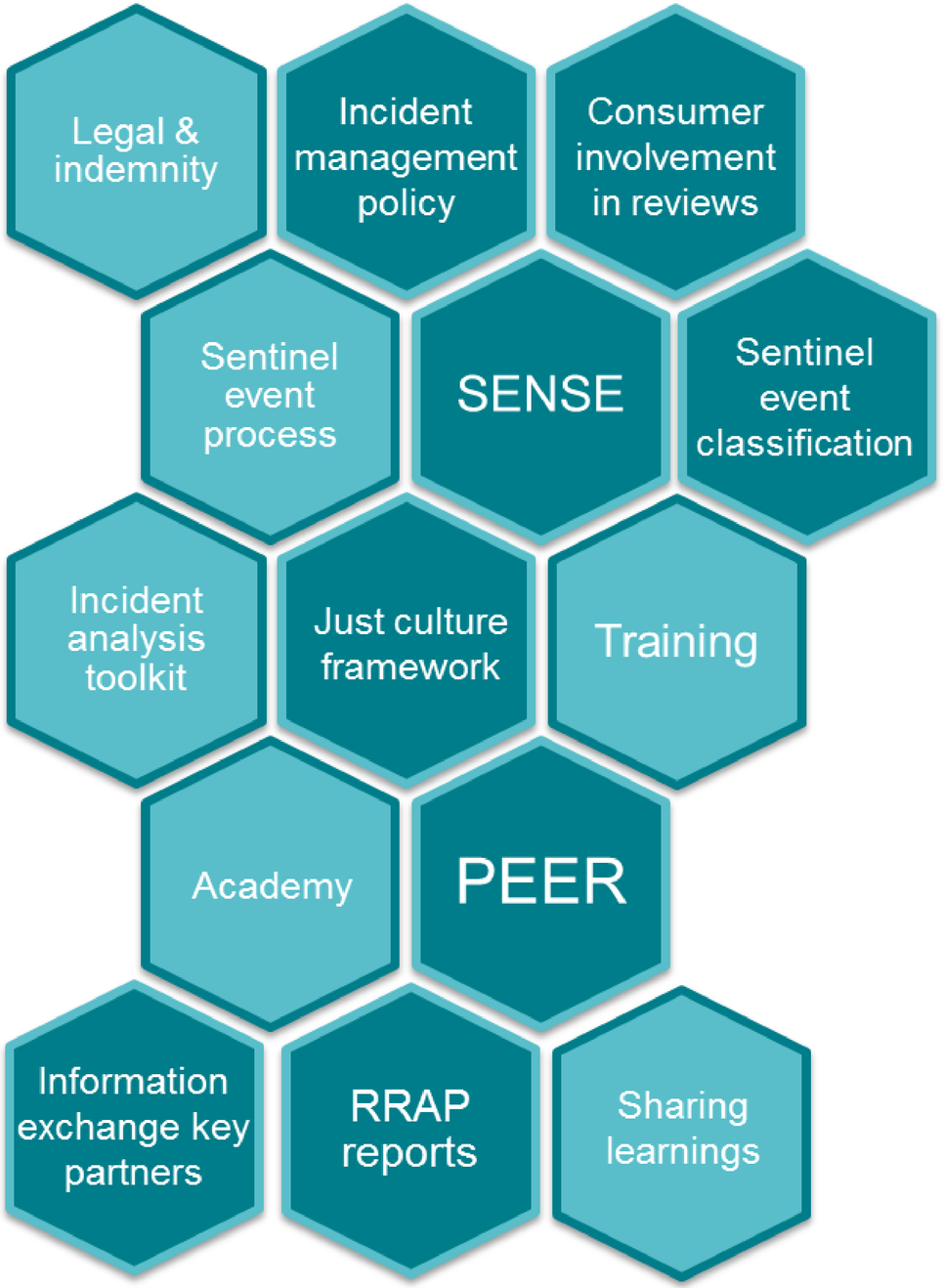
Incident Response Team

Overview of work plan
(October 2017)

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# Why Human Factors?

Being Human

Humans involved in event
&
Humans investigating

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

Different lenses to look at same problem

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

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# Overview

- Human Factors and system concepts
- Human error myths
- What makes us human and how does it affect work

# Human Factors

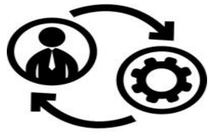
Apply theory, principles, data and methods

Understand interactions among humans and other system elements

↕

Design for human well-being and overall system performance

4 Understanding humans as an element of and their interactions within a sociotechnical system



3 Factors affecting human performance
Internal factors (physical and cognitive capabilities and limitations) and external factors (i.e. equipment, procedures, supervision, training, culture etc)

2 The physical and cognitive capabilities and limitations of the human

1 “the human factor”

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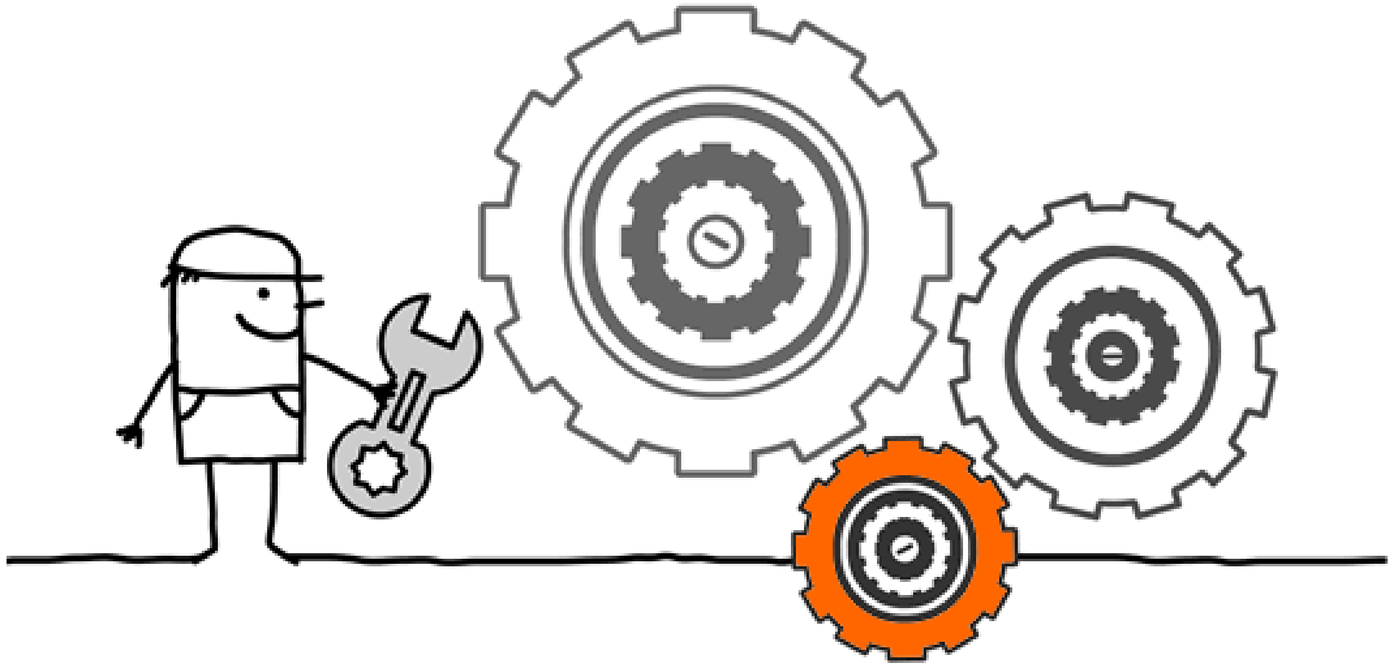
# What is the health (sociotechnical) system



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# 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

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# Part 2

## Human error myths

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# Errors are intrinsically bad?

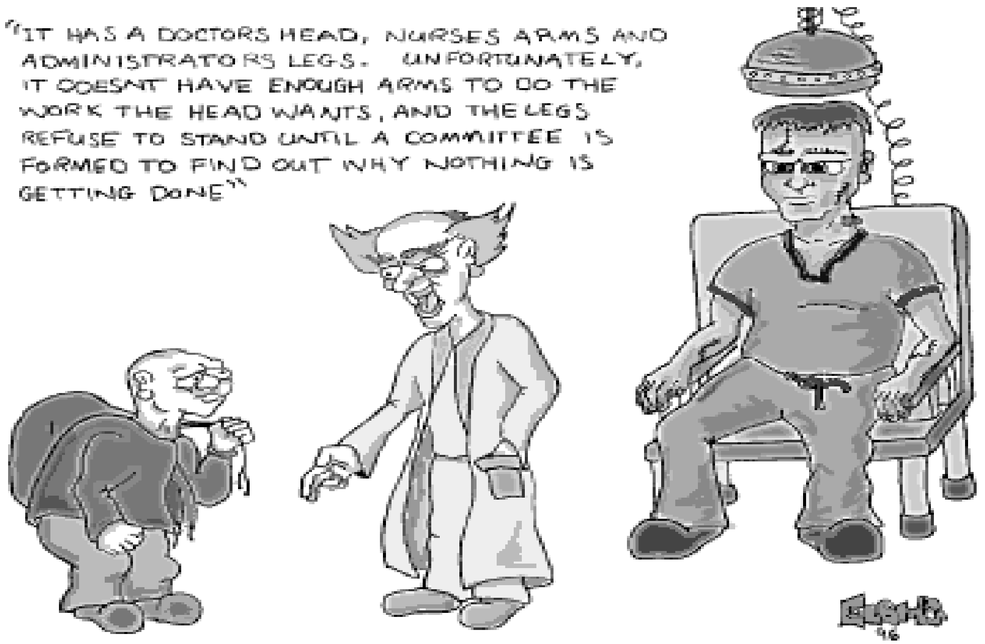
**Facts:**

- Errors are not bad per se
- Man made contexts and systems are unforgiving of error
- Contexts and systems shape outcomes
- Errors - an opportunity to learn and improve

# Bad people make bad errors?

**Facts:**

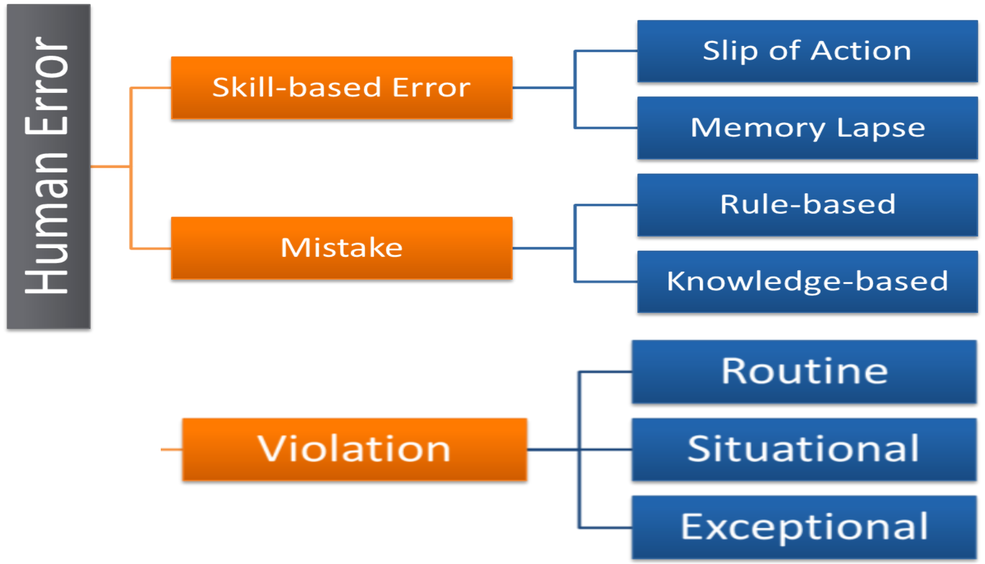
- Tendency to attribute errors to personality
- The best people can sometimes make the worst mistakes
- The best people often perform the most difficult tasks and therefore are more likely to make an error



# Errors are random and highly variable?

## Facts

Most errors can be categorised as:





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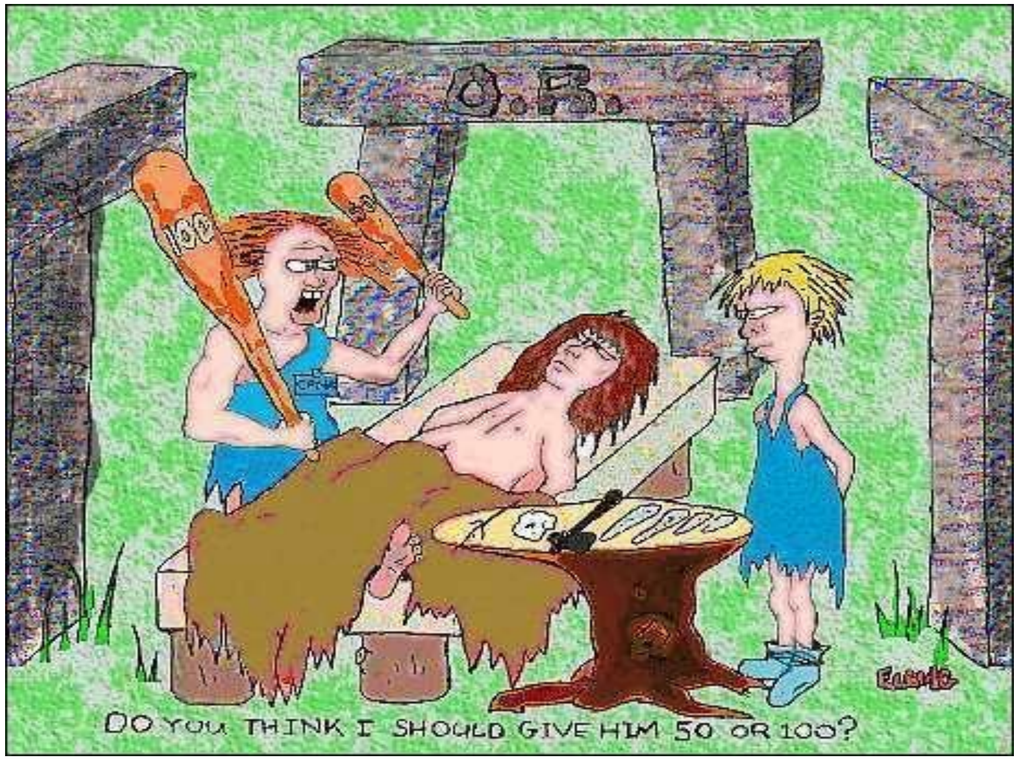
# Practice makes perfect?

## Facts

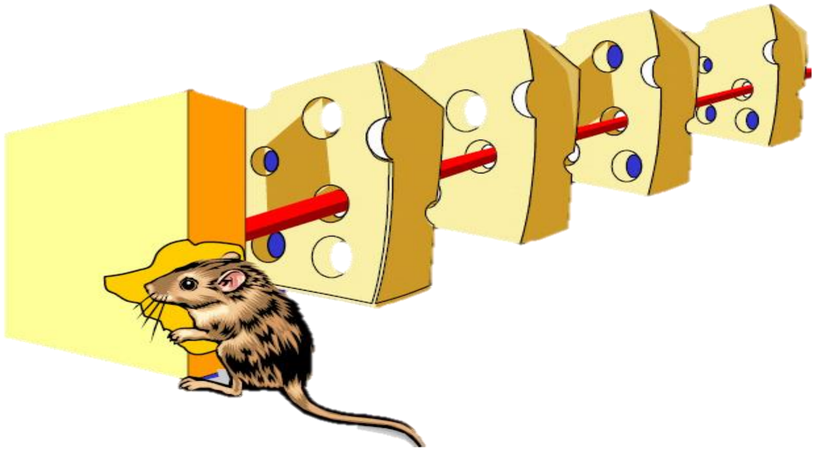
- Experienced practitioners are more likely to make absent-minded slips and lapses
- Intermediate practitioners are more likely to make rule based mistakes



# The errors of highly trained professionals are very rare?

**Facts**

- Errors amongst highly trained professionals are common
- Experts anticipate the likelihood of errors and employ effective error recovery strategies
- Compensatory strategies are limited and cognitive resources are brittle



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# The errors of highly trained professionals are usually sufficient to cause bad outcomes?

## Facts

- Experts make numerous errors but rarely have bad outcomes
- Role of barriers and safeguards to protect patients from harm
- Adverse events are usually a result of multiple, coinciding system weaknesses that fail to protect the patient


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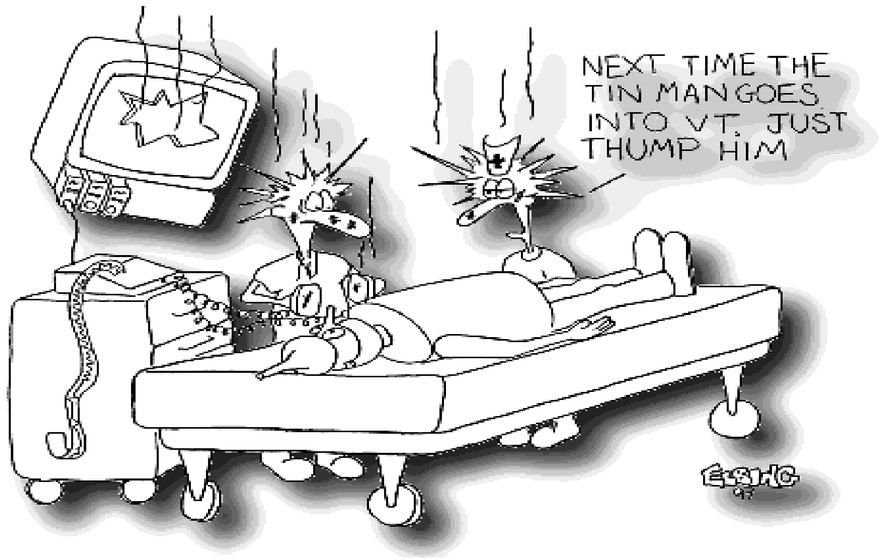
# It is easier to change people than situations

## Facts

- Human error can never be entirely eliminated
- We cannot change the human condition but we can change the conditions under which people work

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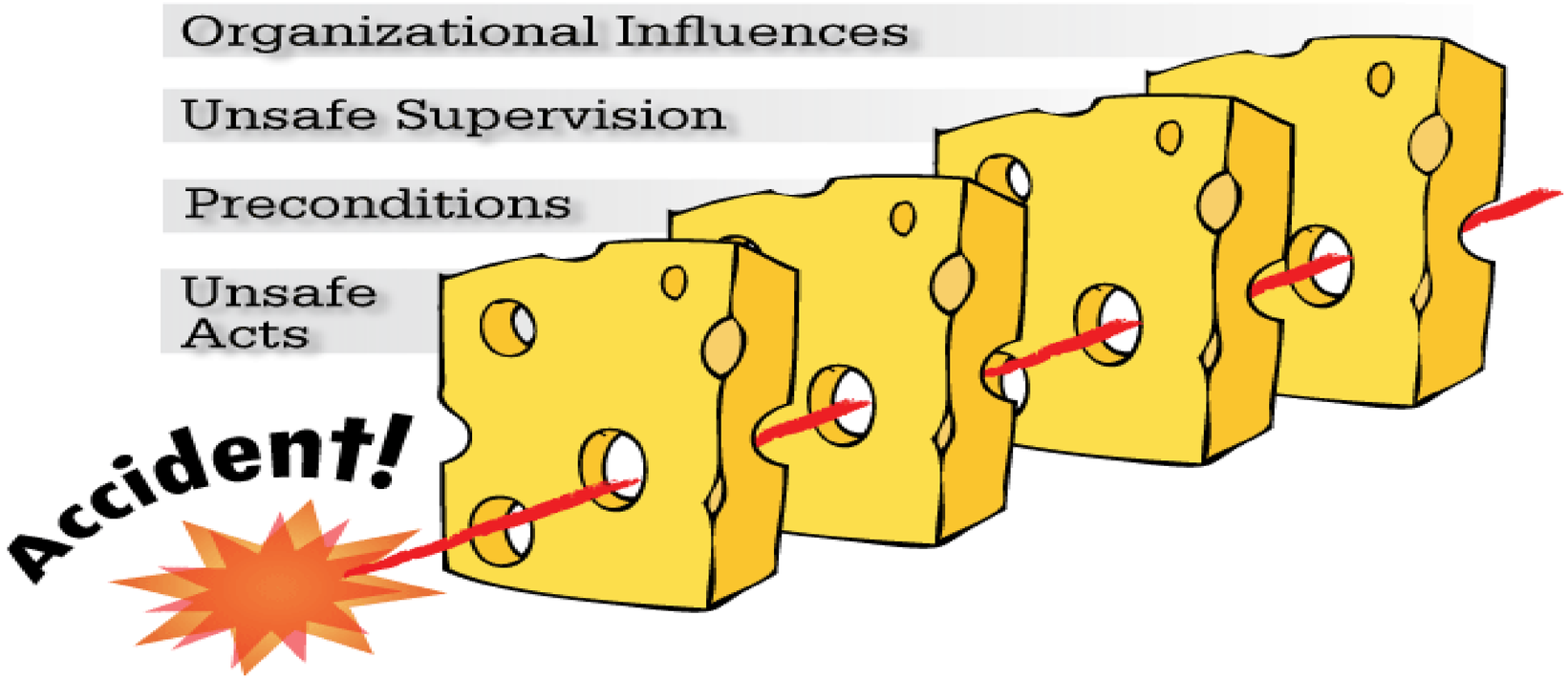
# The error is clear…how could they?

# The error is clear…how could they?

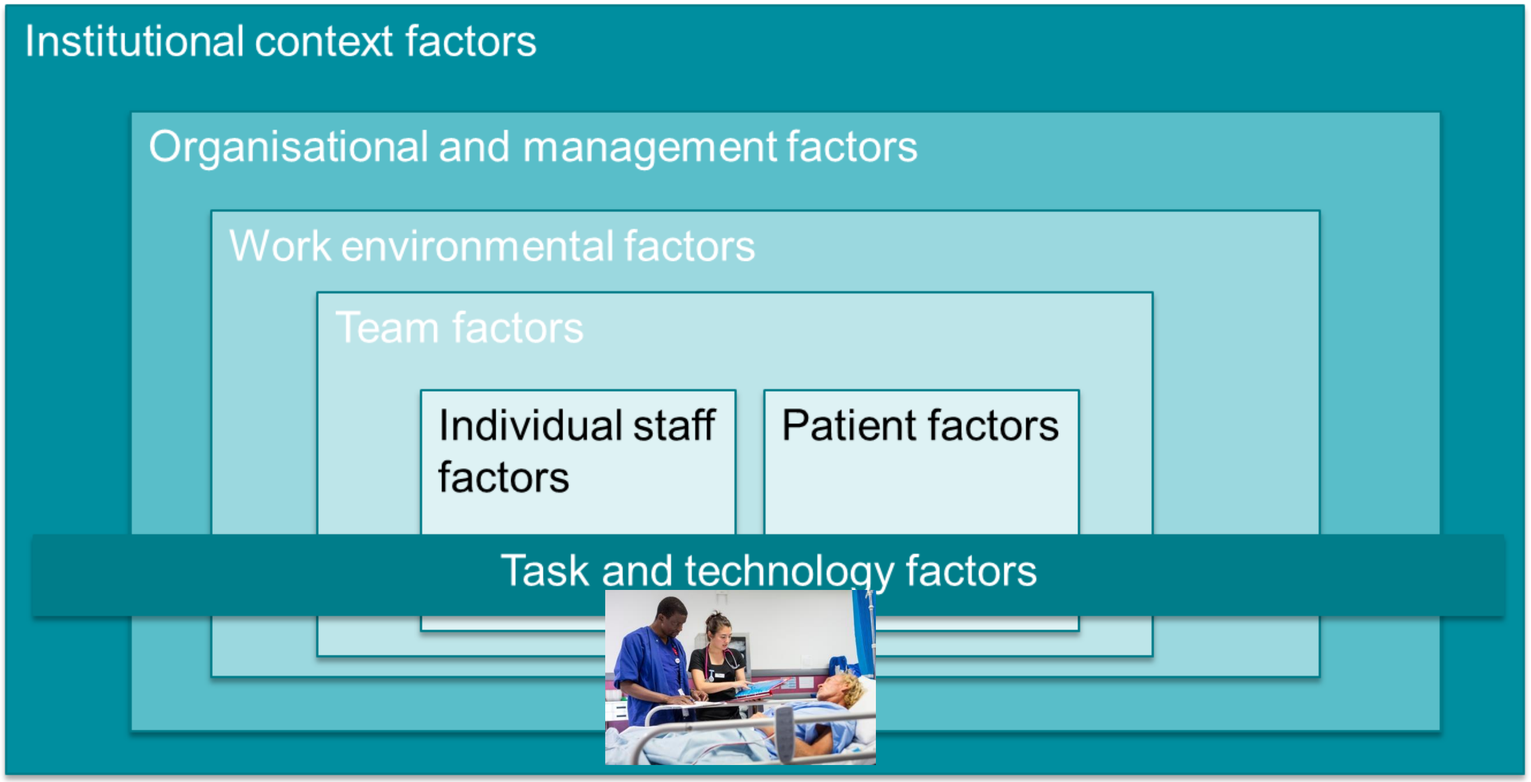
**Facts**

- Hindsight bias
- Made sense to them at the time
- Don’t assume you know why (Ask!)
- Systems and process focus not individuals

# Accident causation



# Human error in systems context




We don’t redesign humans

We redesign the system within which humans work

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# Part 3

## What makes us human and how does it work?

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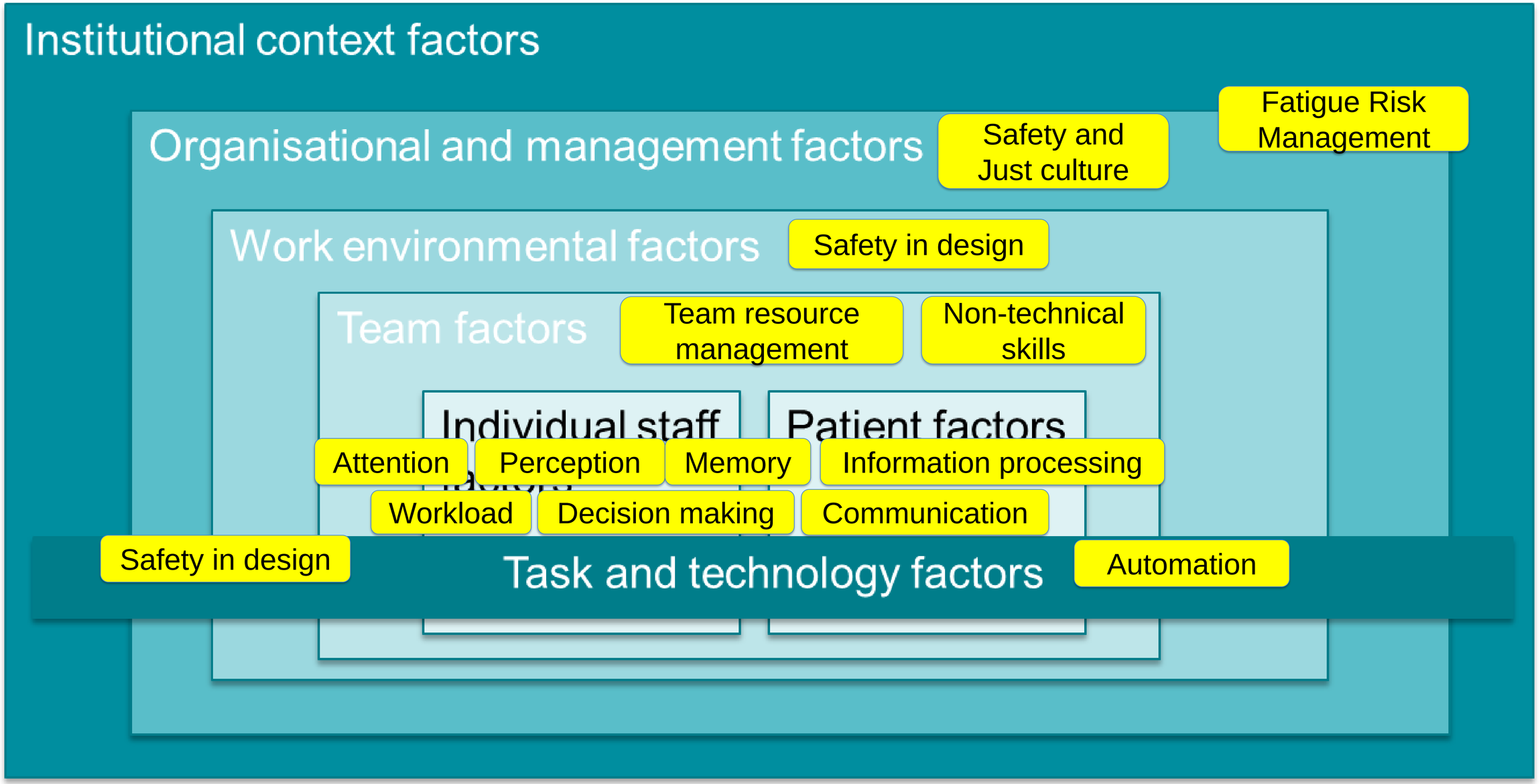
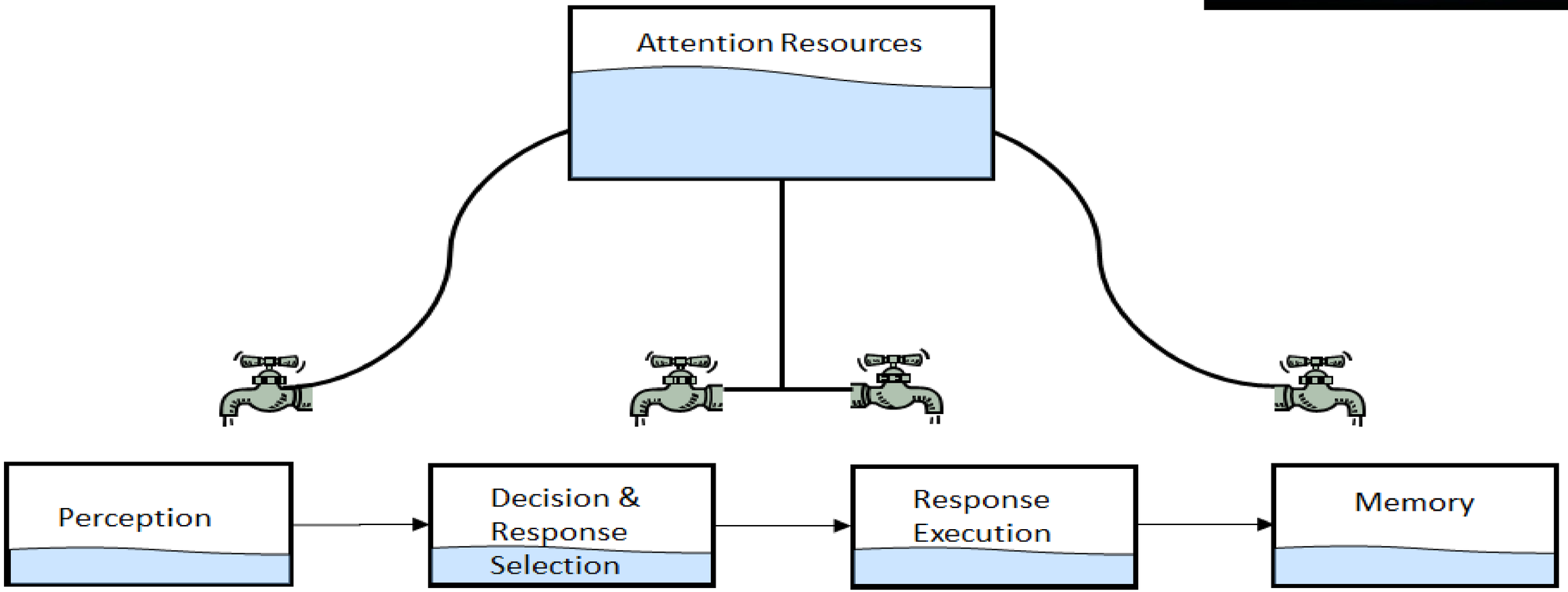
# Human Factors (selection of topics)

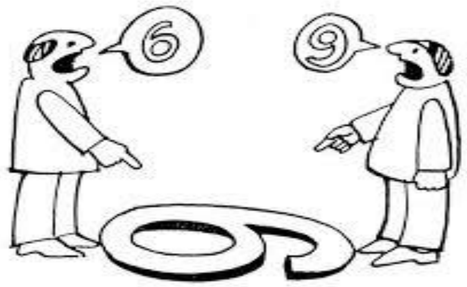


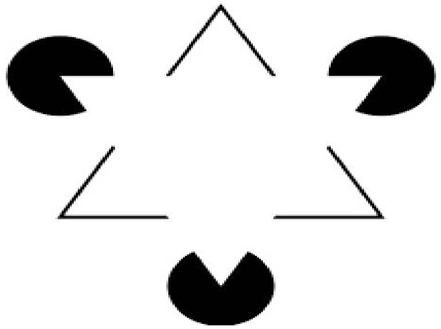
# Limited attention resources

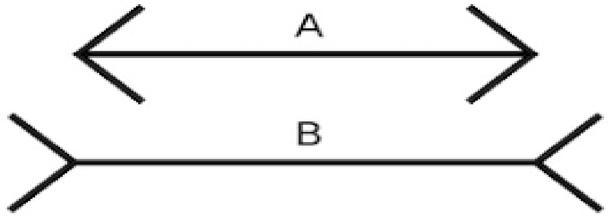



# Perception

Humans actively process information, they don’t just passively receive, store, and retrieve information





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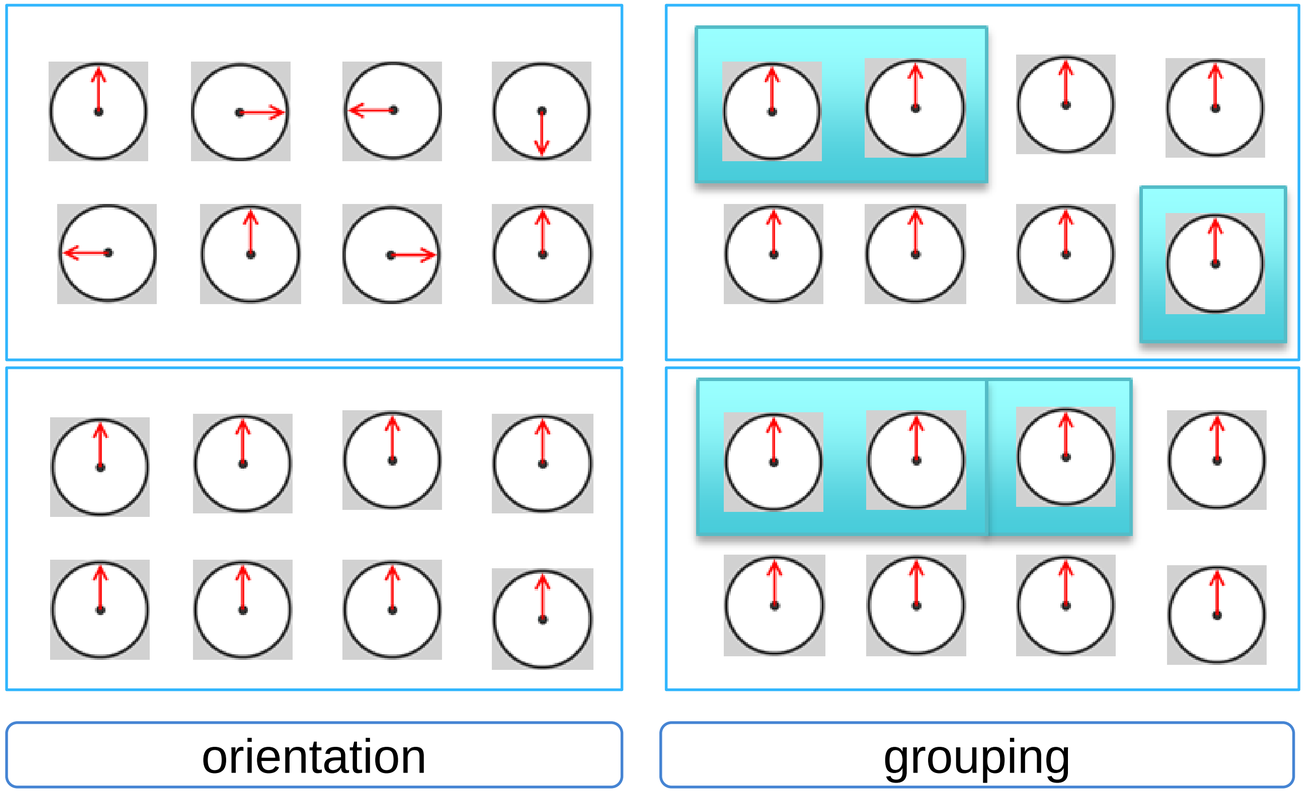
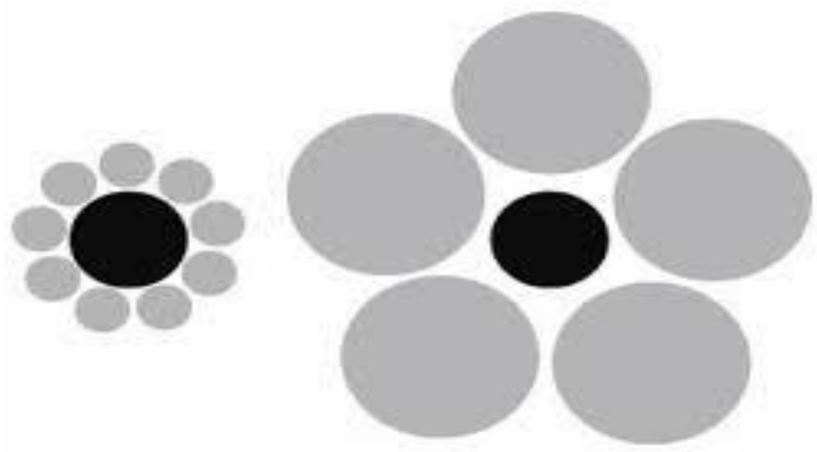


# Perception

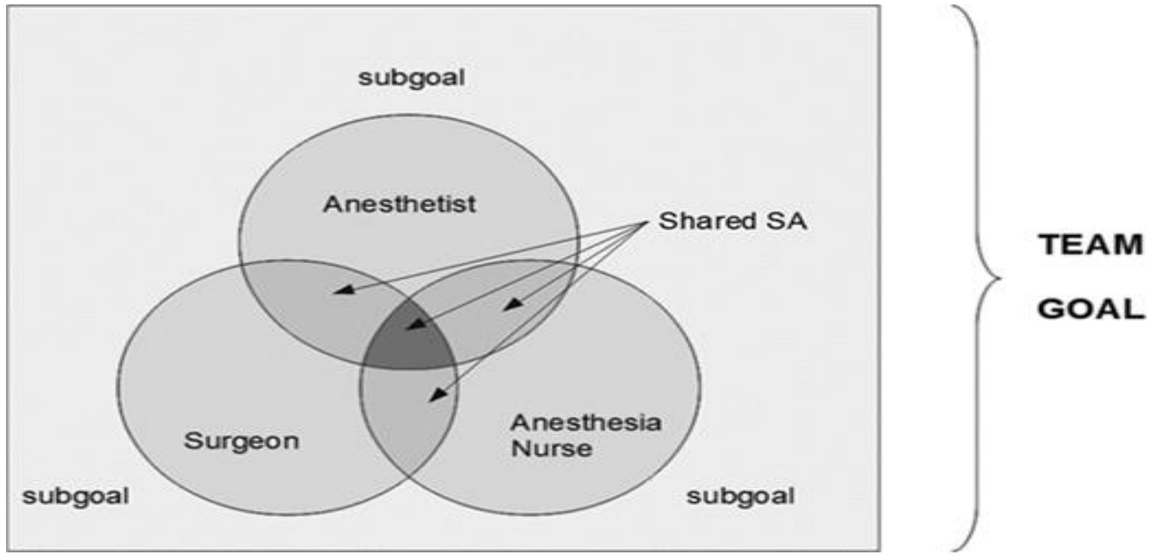


Relative size

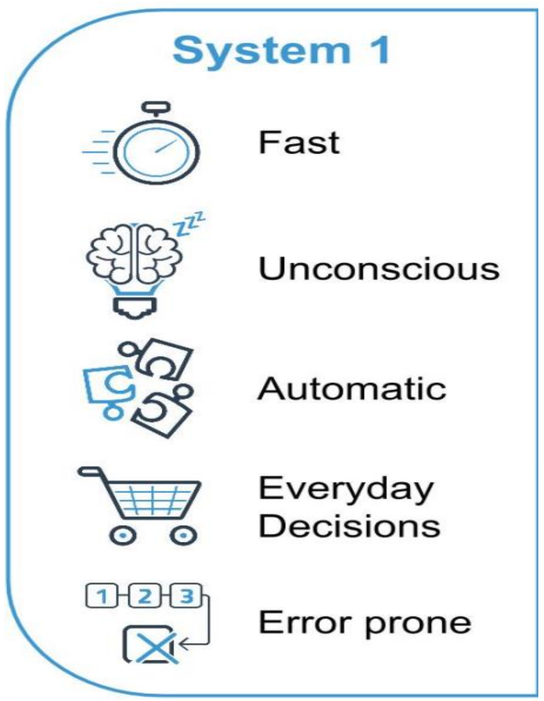

Depth perception

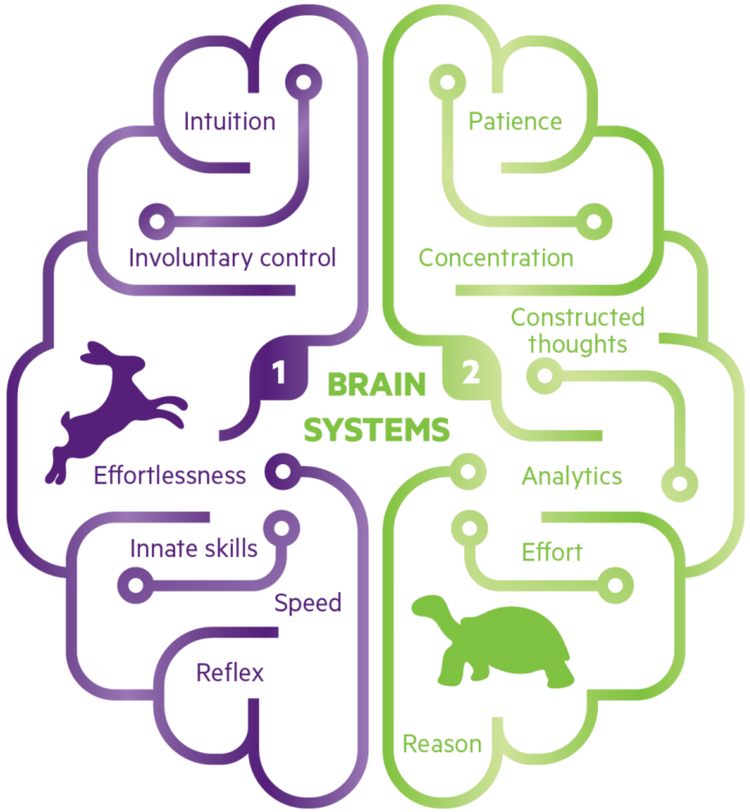
# Situation awareness

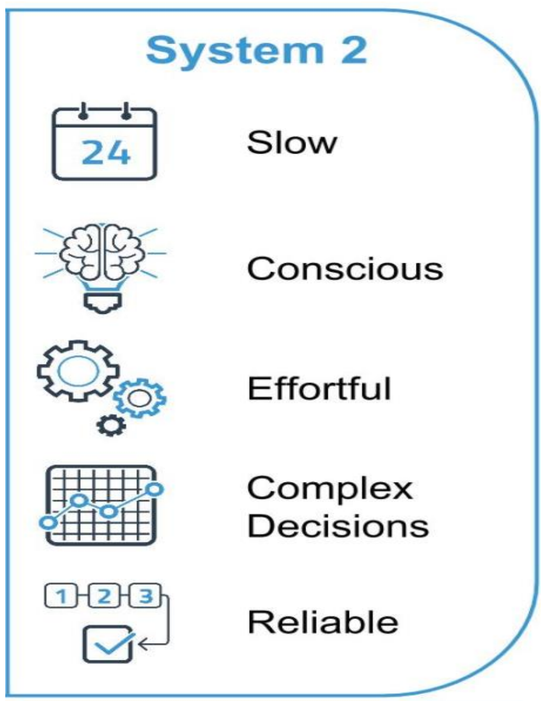
1. Timely and accurate perception of elements
2. Integration of this information into existing mental model
3. Projection of the information to determine future status



# Decision making

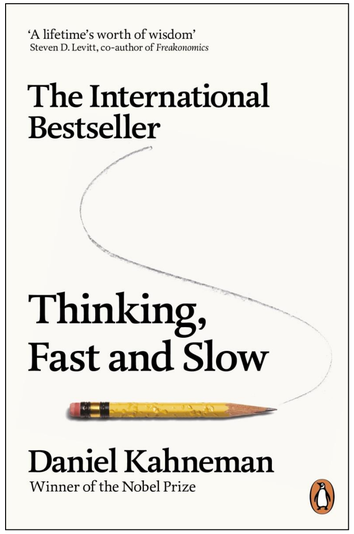



- **Know what to look for**
- **Accuracy mental model**

- **Time to respond**
- **Cognitive demands**

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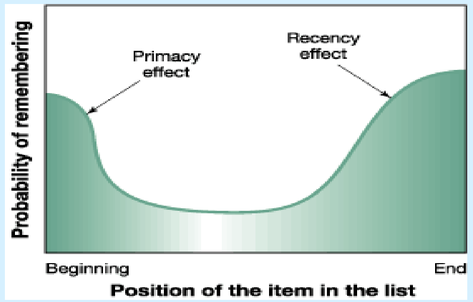
# Cognitive biases

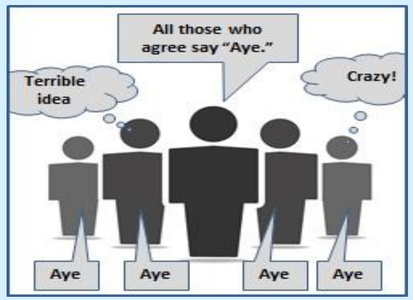
## Primacy and recency effect




## Confirmation bias


## Hindsight bias


## Groupthink

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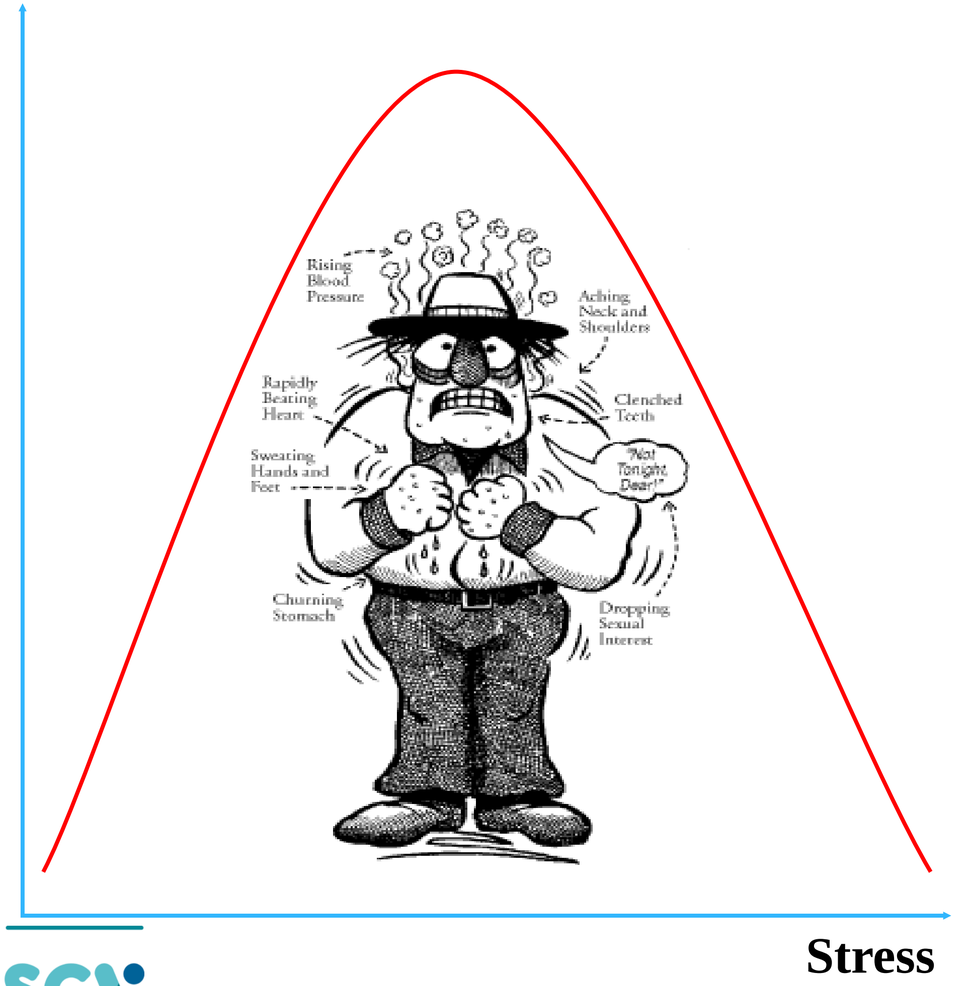
# Stress




- Improves performance (up to a point)
- Fixate
- Previous responses or habits
- Communication declines
- ‘Freeze’ or panic

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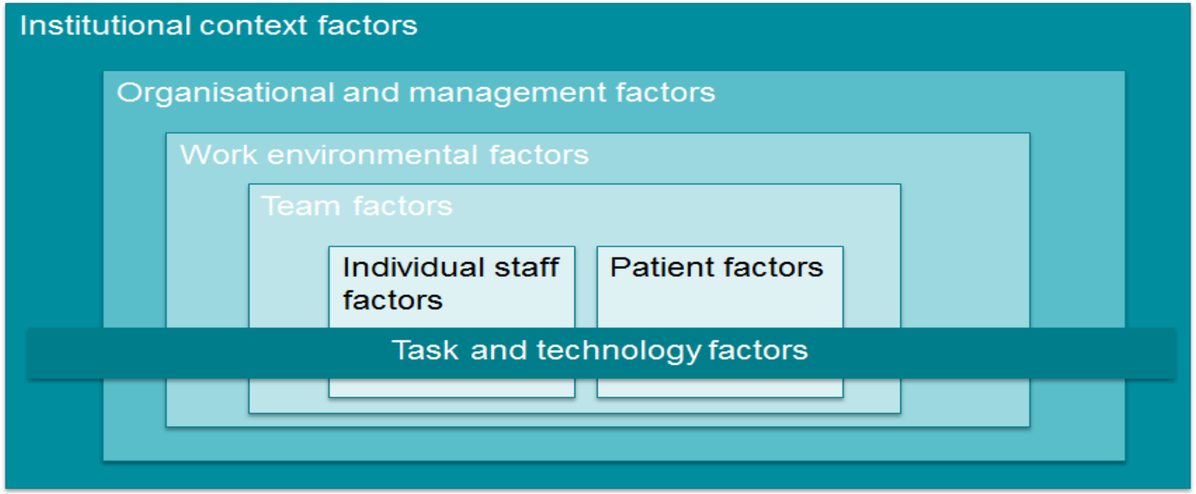
# Fatigue

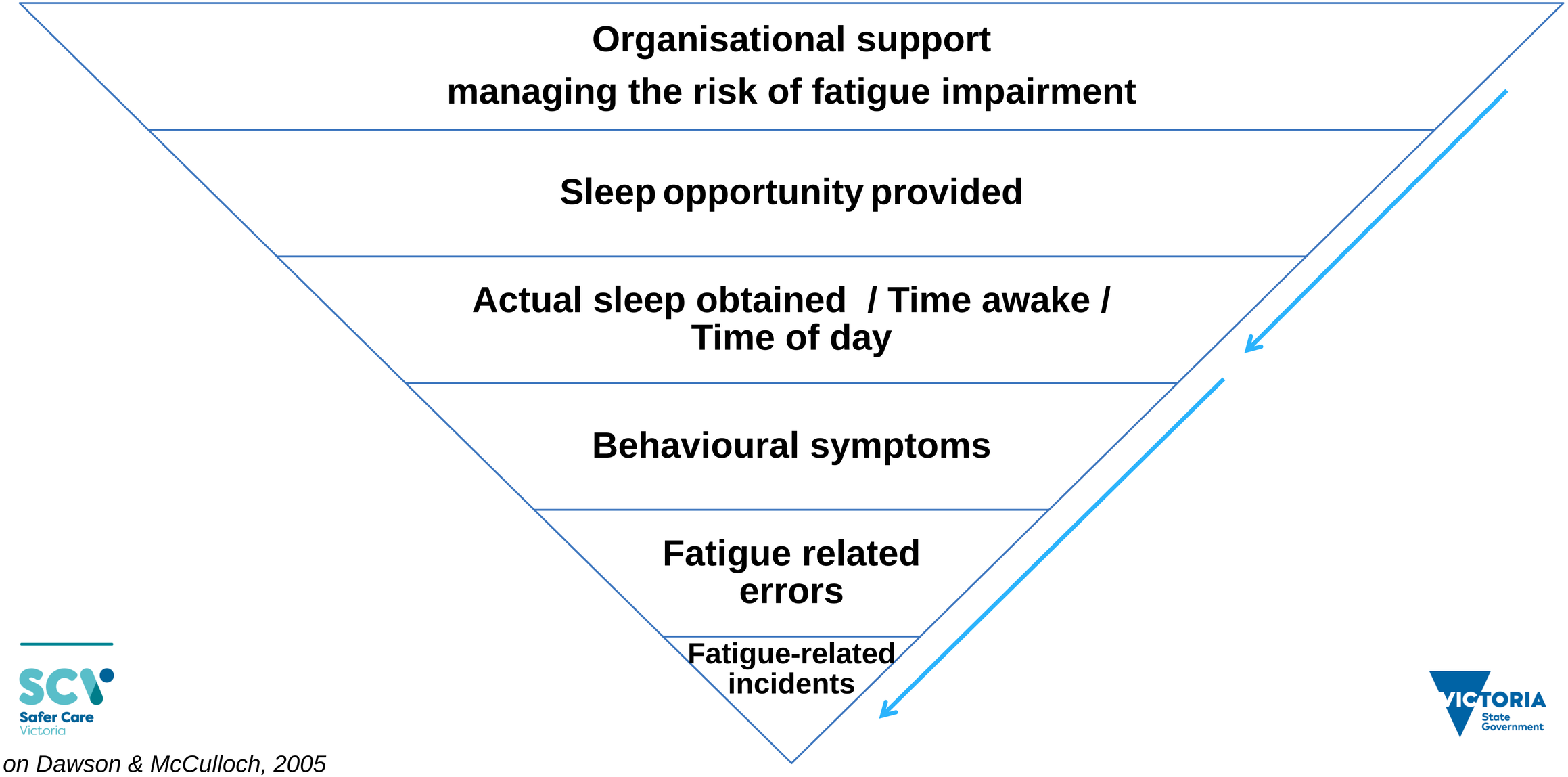
Impact on performance:

- Judgement
- Concentration
- Memory
- Vigilance
- Reaction time and/or physical coordination
- Work efficiency
- Recognising that we are fatigued

# Working in a system



# Fatigue is everyone's responsibility




*based on Dawson & McCulloch, 2005*

# Automation

Landing gear

Flaps



Sound familiar?

Same buttons
Same alarm sounds

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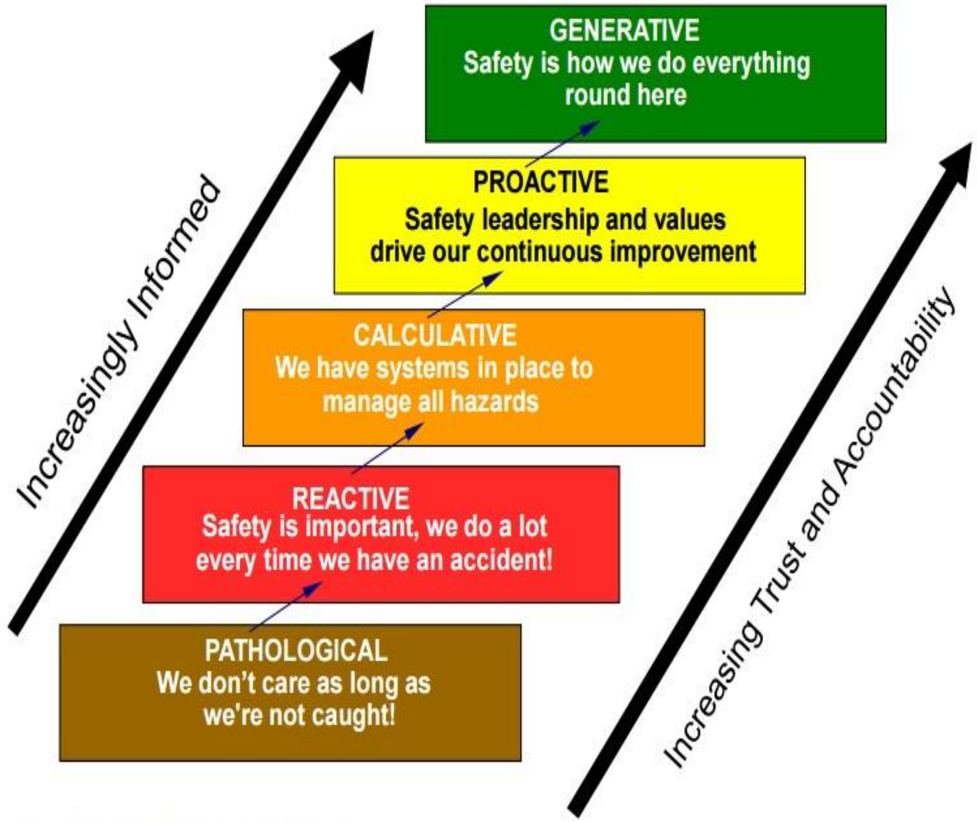
# Safety culture

- Value everything they say and do
- Time and resources for safety
- Feel safe to speak up and report
- Human error is a symptom
- Learn when things go wrong
- Proactive risk management
- Not just compliance focused

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# Just culture

*"Humans make errors and systems fail"*


**Would similar person in similar situation likely have done the same?**

N →

- **Training, selection experience**
- **Resources**
- **Supervision**
- **Conditions**
- **Demands or pressures**

→ Review and action systemic factors

- **Not follow procedures?**
- **Available, workable, intelligible, correct**
- **Perceived benefit to organisation**
- **Previously allowed**

→ Procedures and implementation

- Actions intended?
- Were consequences intended?
- Deliberate harm?

Y

- History of unsafe acts?
- Unauthorised substance?
- Medical condition?

→ Individual performance

System safety review

Involve HR/ criminal/ AHPRA

Good clinician?

Making the most of the hand you are dealt with?

Continuously improve the system

Provide a better hand in the first place!

*Leaving the hand and rely on people to make the most of it is practically and ethically irresponsible*

(Dekker and Leveson, 2015)


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