



Human Factors/Ergonomics

Acknowledgements to Dr Sue Whalley-Lloyd & Dr Paul Bowie for some presentation content



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Session aims

- To be able to define and describe the concept of human factors according to professional bodies and a systems approach
- To develop an understanding of why human errors occur
- To reflect on witnessed practice and consider how these errors have occurred and how risk could be reduced
- To begin to develop a new attitude to errors



What do we already know?

What do you understand by Human Factors AND ergonomics?

Write down your first thoughts !

Within Your NMC Code

- Human factors refer to environmental, organisational and job factors, and human and individual characteristics, which influence behaviour at work in a way which can affect health and safety.

(HSE) Health and Safety Executive.

You can find more information at www.hse.gov.uk

World Health Organisation (WHO) Definition



We define human factors as:

The study of all the factors that make it easier to do the work in the right way.



Another definition of human factors is :

The study of the interrelationship between humans, the tools and equipment they use in the workplace, and the environment in which they work



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Human Factors: A Quick Guide

- [Human Factors: A Quick Guide - YouTube](#)

Human Factors in the UK

- Profession originated in 1949 in UK: 'Ergonomics Research Society'
- 1977 changed to: 'Ergonomics Society'
- 2009 became: Institute of Ergonomics and Human Factors
- 2014 granted Royal Charter becoming the '[Chartered Institute of Ergonomics and Human Factors](#)'



Chartered Institute
of Ergonomics
& Human Factors

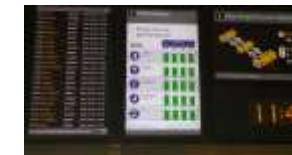
Human Factors &/or Ergonomics?

In the UK: Originally just Ergonomics BUT

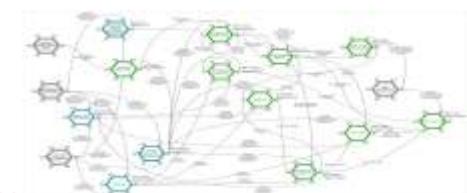
'Ergonomics' became linked in the publics' mind to physical work, such as design of office desks and position of controls and displays in cars.



'Human Factors' became associated with cognition, psychological aspects, human performance



Non-specialists didn't understand the wider role of Human Factors / Ergonomics to support Systems by applying human sciences with other science-based knowledge to achieve high performing, integrated systems



Using both terms

The Terms **Human Factors** and **Ergonomics** are now used Interchangeably;

Some countries use one term, some the other and some use both

International Ergonomics Association

Formed as a federation 1967



Ergonomics came from Greek roots (ergon and nomos).

Ergon = work

Nomos = law

Africa and Latin America = 12 federated societies; all use 'Ergonomics' title

Asia = 13 federated organisations; 5 use 'Human Factors and Ergonomics' 8 use 'Ergonomics'

Europe = 23 federated organisations; 20 use 'Ergonomics'

North America: USA uses 'Human Factors', Canada 'Ergonomics'

Oceania = Australia and New Zealand; both use 'Human Factors and Ergonomics'

IEA Definition of Ergonomics / Human Factors (2000 and still current 2020)



"Ergonomics (Human Factors) is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design in order to optimize human well-being and overall system performance.

The terms *ergonomics* and *human factors* are often used interchangeably or as a unit (e.g., human factors/ergonomics – HF/E or E/HF), a practice that is adopted by the IEA."

International Ergonomics Association



Core Competencies Document

https://learn-eu-central-1-prod-fleet01-xythos.learn.cloudflare.blackboardcdn.com/5d5fcf1f61b7d/3351911?X-Blackboard-Expiration=1621447200000&X-Blackboard-Signature=6F%2BZ3vIj%2Ffym4u%2BfL9luHVDNOV7V6U7pdS2P7ceuWBY%3D&X-Blackboard-Client-Id=172957&response-cache-control=private%2C%20max-age%3D21600&response-content-disposition=inline%3B%20filename%2A%3DUTF-8%27IEA%2520Summary%2520of%2520core%2520HF%2520competencies%25281%2529.pdf&response-content-type=application%2Fpdf&X-Amz-Algorithm=AWS4-HMAC-SHA256&X-Amz-Date=20210519T120000Z&X-Amz-SignedHeaders=host&X-Amz-Expires=21600&X-Amz-Credential=AKIAZH6WM4PL5M5HI5WH%2F20210519%2Feu-central-1%2Fs3%2Faws4_request&X-Amz-Signature=5220e534c51324e0bceb1b430d9c8760c815d28bf31fcb4fa0eeef02356ca0b1



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Why is it important to me professionally?



The Code

Professional standards of practice
and behaviour for nurses, midwives
and nursing associates

- 
- prioritise people
 - practise effectively
 - preserve safety
 - promote professionalism and trust

Preserve Safety (13-19)

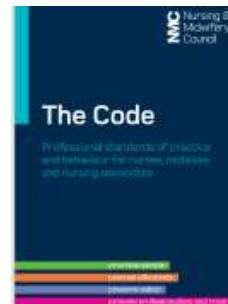
Particularly...



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Why is it important to me professionally?

- **14 Be open and candid with all service users about all aspects of care and treatment, including when any mistakes or harm have taken place**
- To achieve this, you must:
- **14.1** act immediately to put right the situation if someone has suffered actual harm for any reason or an incident has happened which had the potential for harm
- **14.2** explain fully and promptly what has happened, including the likely effects, and apologise to the person affected and, where appropriate, their advocate, family or carers
- **14.3** document all these events formally and take further action (escalate) if appropriate so they can be dealt with quickly
- *The professional duty of candour is about openness and honesty when things go wrong. “Every healthcare professional must be open and honest with patients when something goes wrong with their treatment or care which causes, or has the potential to cause, harm or distress.” Joint statement from the Chief Executives of statutory regulators of healthcare professionals.*



Why is it important to me professionally?

- **16 Act without delay if you believe that there is a risk to patient safety or public protection and...**
- **19 Be aware of, and reduce as far as possible, any potential for harm associated with your practice**
- To achieve this, you must:
- **19.1 take measures to reduce as far as possible, the likelihood of mistakes, near misses, harm and the effect of harm if it takes place**
- **19.2 take account of current evidence, knowledge and developments in reducing mistakes and the effect of them and the impact of human factors and system failures (see the note below)**
- **19.3 keep to and promote recommended practice in relation to controlling and preventing infection**
- **19.4 take all reasonable personal precautions necessary to avoid any potential health risks to colleagues, people receiving care and the public**



Why is it important to me professionally?

Awareness or denial of ‘Human Factors’ can have a huge impact on people, including:

- Yourself
- Your patients
- Their loved ones
- Your colleagues
- Society



An Introduction to the Discipline

1. Systems focused

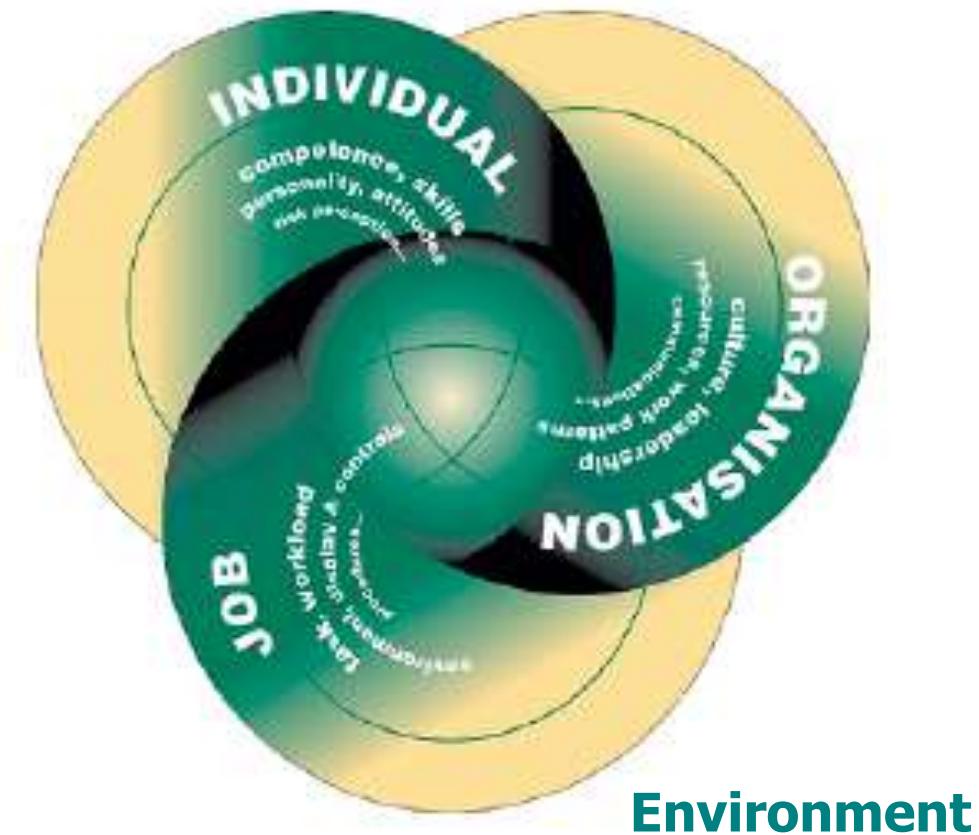
2. People are central

HF looks to achieve a fit between People & their tasks, equipment, information and environment (physical & organisational)

3. Human Science based

+

additional disciplines when needed



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Seven Human Factors Principles

- 1.A Systems Based Approach:** The functions of the System are defined, the roles of people within, interacting with or using the System are identified and the System supports everyone
- 2.Applies Human Sciences:** knowledge of people plus knowledge from **management, engineering and design** domains to review or develop supportive systems

Seven Human Factors Principles

3. Examines the Tasks: (for staff, patients, service users, carers) undertaken during normal, abnormal and emergency situations. Are these 'doable' eg the 'human performance envelope'.

4. Considers the Evidence: assesses whether a system is working well or not before issues occur - If things go wrong then HF is part of investigating why– not finding and blaming an individual

Seven Human Factors Principles

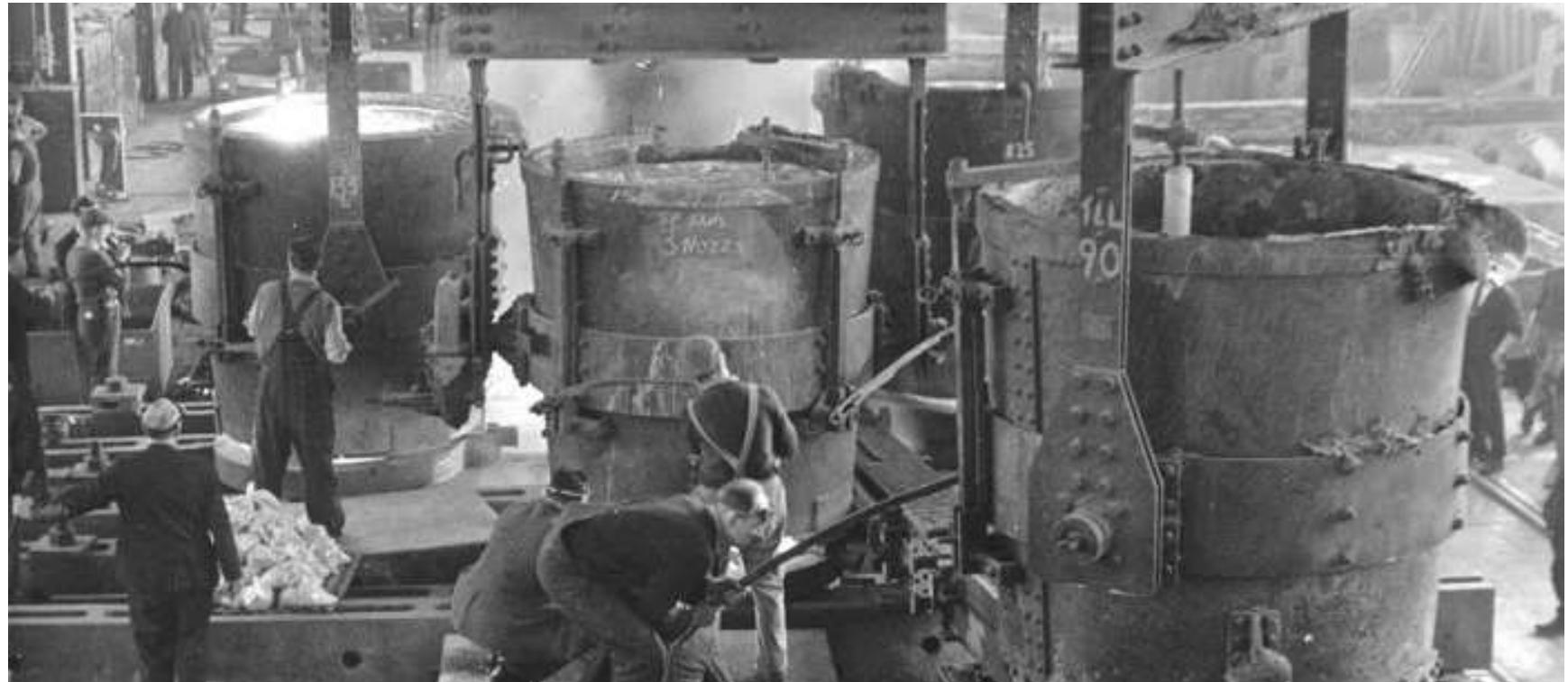
5. Reviews Equipment and Information: Does it make sense, is it easy to use, does it match user expectations, are there clear human/ equipment interfaces, does the design support tasks, does equipment fit the user.....

6. Assesses Physical Environment: Eg lighting, noise, heat, cold, access for movement, signage, vibration, radiation, micro-organisms, health and wellbeing facilities, need for PPE (Personal Protective Equipment)

7. Considers Organisational and Management Environment: Is the organisation supportive? What is the culture?

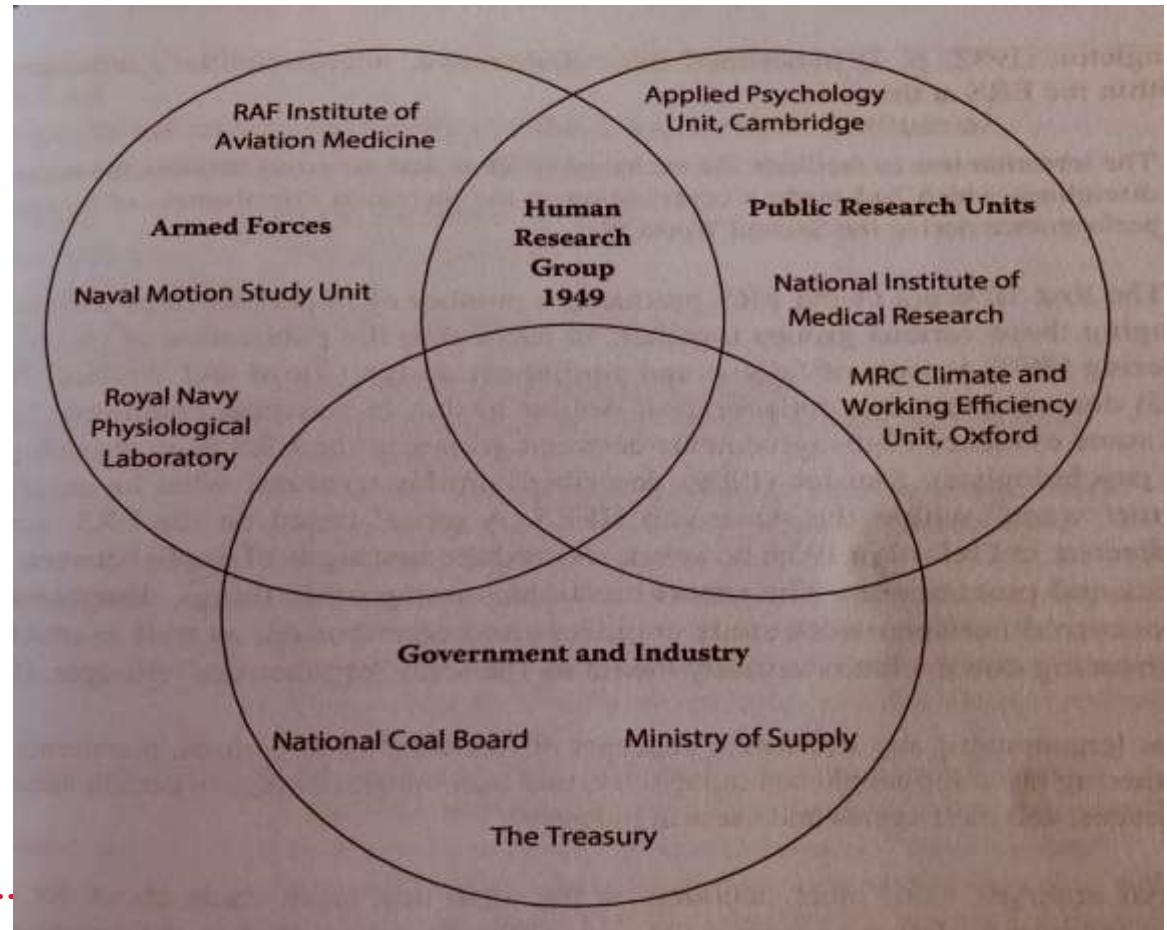
A New Concept, or is it ???

See timeline for more detail



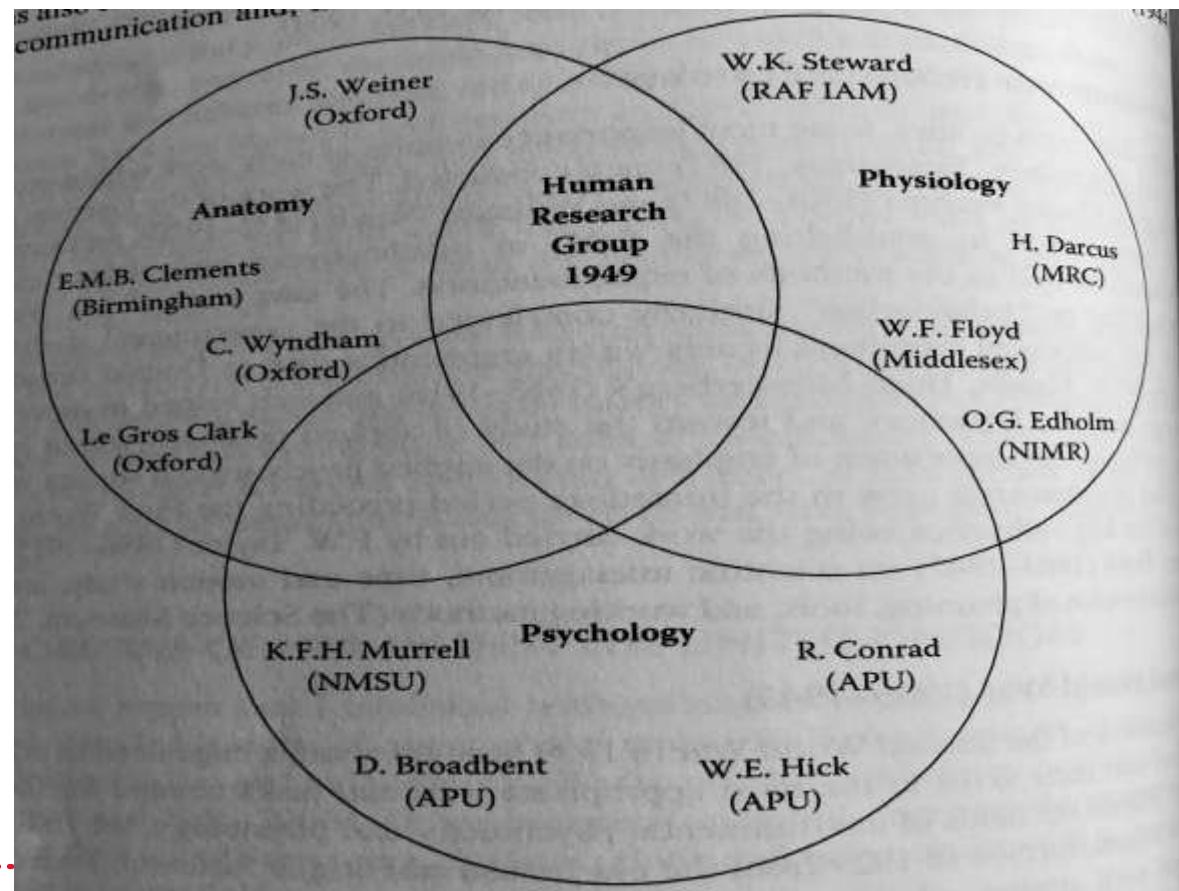
Human Research Group Meeting 1949

Organisational groups that attended the HRG meeting



Human Research Group Meeting 1949

Those attending
the Meeting by
Science
Discipline



Errors and when things go wrong



A moment of reflection

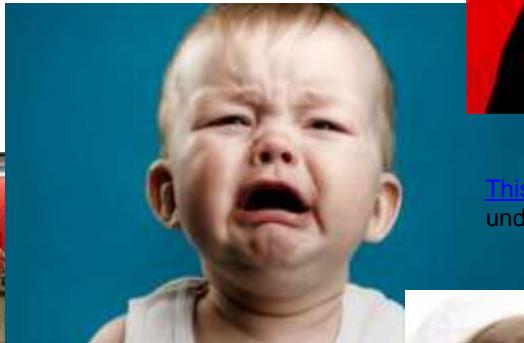
- What first drove you to want to be a nurse/apply for the course?
- Has this ideal/value been challenged since this started?
- Have you made an error/always acted according to these?

Influencers on Human Error

- Fatigue
- Stress
- Poor Communication
- Inadequate knowledge & Skill
- Distraction
- Environment

Source (WHO, 2021)

Other thoughts



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Self-care/Self Awareness – IMSAFE approach

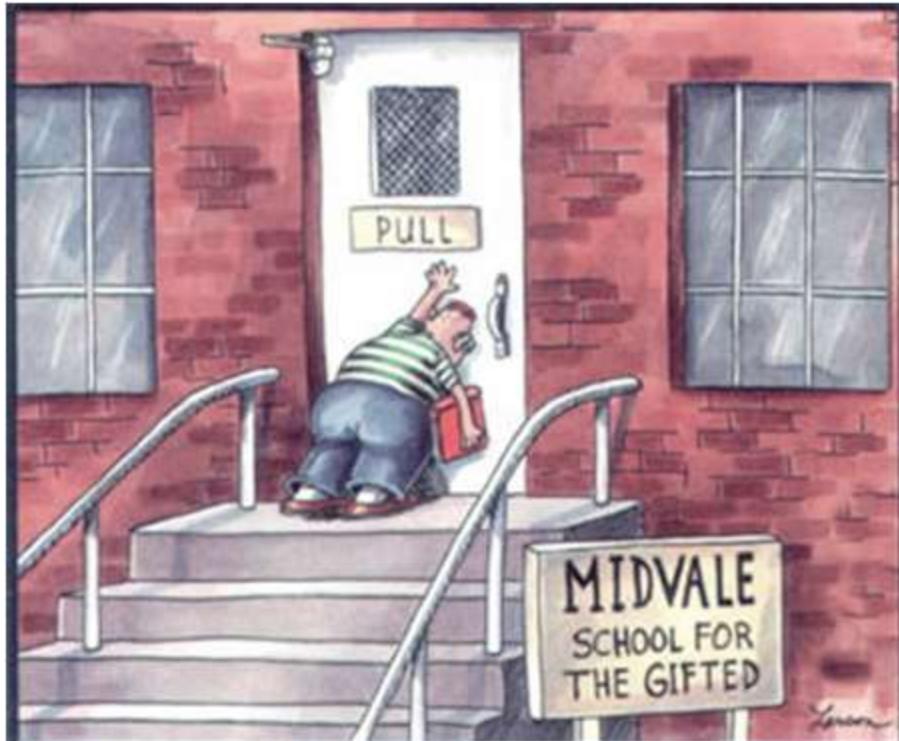
- ILLNESS
- MEDICATION
- STRESS
- ALCOHOL
- FATIGUE
- EMOTION

Human Performance Curve

Figure 1: The Yerkes-Dodson Human Performance and Stress Curve



FACT! – Humans make errors



Particularly when working
in complex demanding
environments

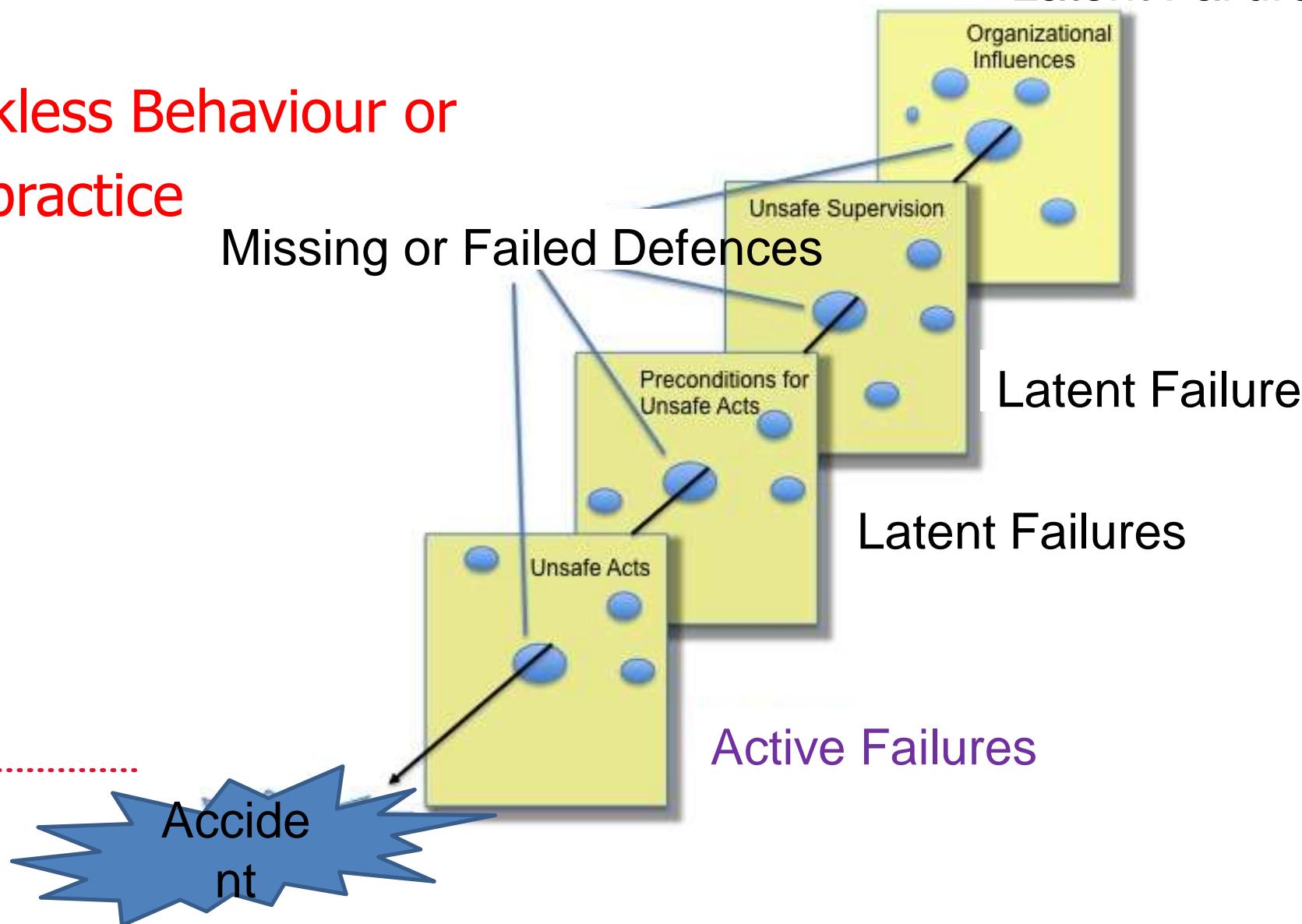
What errors have you
seen whilst in practice?

What factors contributed
to this?

Human Errors & Violations

Vs

Reckless Behaviour or
Malpractice



Let's revisit the Bromley's story...

- [Just a Routine Operation - YouTube](#)



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Discussion

Having discussed the interplay of systems and the role of humans in them and how errors occur, has your view of this story changed since we first viewed it this morning?

How do you feel about the people involved?

How do you feel about how Martin's response to it?

How would you handle it?



Hazards and Risk (H&SE)

- What could cause injury or illness in your business (hazards)
- How likely it is that someone could be harmed and how seriously (the risk)
- How do we try to minimise risk in healthcare?
- What approaches, tools and techniques are used?



Protocols

Policies

Guidelines

Pictoral guides

Standardisation

Checklists

Communication aids - SBAR

Your 5 moments for HAND HYGIENE



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How we aim to minimise risk in healthcare



Risk Assessments



Incident Reporting/Clinical Governance



Root cause analysis

Human Factors

FACT	FICTION
Human Factors is about designing systems that are resilient to unanticipated events	Human Factors is about eliminating Human Error
Human Factors addresses problems by modifying the system to support people better Click to add text	Human Factors addresses problems by teaching people to modify their behaviour
Human Factors ranges from working at the individual level to that of the whole organisation	Human Factors is only focused on individuals
Human Factors is a scientific discipline, it requires years of training to achieve a Human Factors degree	Human Factors is a limited set of principles that can be learnt during brief training
Human Factors professionals have a common goal of improving system design for human use but have many different specialities	Human Factors professionals - scientists and engineers all have the same expertise

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Suggested reading

- On Blackboard there is a selection of links and a recommended reading list that it would be useful to start investigating



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