# Human Rights – Factored In

Ratna Makker

Andy Buttery Virtual Spring Symposium 24 April 2024



# Call out your answers!

Plant an acorn to grow an ?...

Not "Ribbit"! – the noise a frog makes is a?...

To revive the fire give it a?...

Light a cigarette so you can?...

If they don't have Pepsi do they have?...

Make them laugh tell a?...

Need to mend it if it's ?...

Remove a stain give it a ?...

The white of an egg is called the?...

The white of an egg is called the?...



**Everyone join in!** 

# **Our Aims for this:**





# What comes to mind when you hear:

# "Human Factors"

# We get Human Factors wrong

EDUCATION FOR PRIMARY CARE, 2016 VOL. 27, NO. 2, 86–93 http://dx.doi.org/10.1080/14739879.2016.1152658



LEADING ARTICLE

#### Human factors and ergonomics for primary care

Paul Bowie<sup>a,b</sup> and Shelly Jeffcott<sup>c</sup>

<sup>a</sup>Medical Directorate, NHS Education for Scotland, Glasgow, UK; <sup>b</sup>Institute of Health and Well-Being, University of Glasgow, Glasgow, UK; <sup>c</sup>NHS Lothian, Edinburgh, UK

#### ABSTRACT

In the second paper of this series, we provide a brief overview of the scientific discipline of human factors and ergonomics (HFE). Traditionally the HFE focus in healthcare has been in acute hospital settings which are perceived to exhibit characteristics more similar to other high-risk industries already applying related principles and methods. This paper argues that primary care is an area which could benefit extensively from an HFE approach, specifically in improving the performance and well-being of people and organisations. To this end, we define the purpose of HFE, outline its three specialist sub-domains (physical, cognitive and organisational HFE) and provide examples of guiding HFE principles and practices. Additionally, we describe HFE issues of significance to primary care education, improvement and research and outline early plans for building capacity and capability in this setting.

#### **KEYWORDS**

Human factors; ergonomics; primary care; patient safety; quality improvement; education & training ... some published healthcare papers refer to 'human factors', yet point to the 'failures' of people as the underlying cause of adverse events ...

a stance that is contrary to HFE science and counterproductive for advancing patient safety



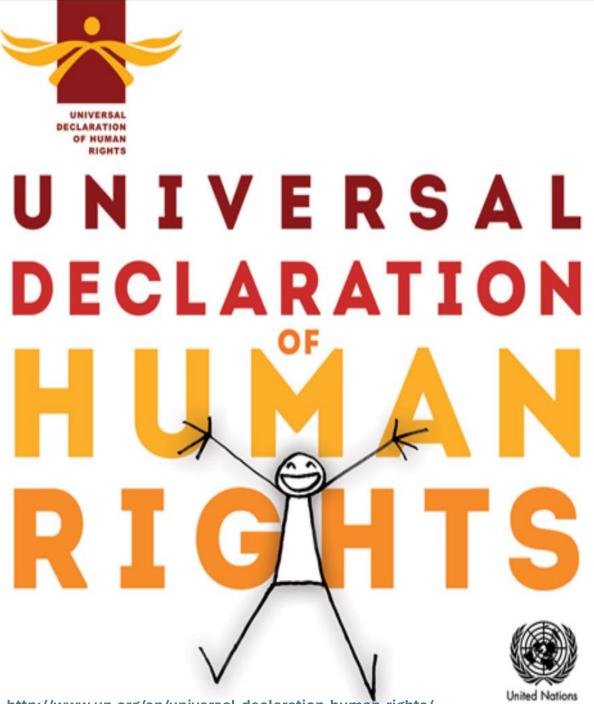
### **Article 5**

No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.

### **Article 6**

Everyone has the right to recognition everywhere as a person before the law.

People make mistakes.



# Human Factors, also called Ergonomics ...

... an evidence-based scientific discipline and profession that uses a design-driven systems approach to achieve two closely related outcomes of performance and wellbeing.



IIR HFALLH & SL

WHITE PAPER

# Beyond the fact that both may result in harm to another, *a crime and a mistake are not alike*.

In spite of the lack of *intent* to do any kind of harm, nurses and other health care workers were not only blamed for errors that occurred in the workplace but criminally charged.

### The Criminalization of Mistakes in Nursing Nayna C. Philipsen, JD

5<sup>6</sup> 5<sup>0</sup> 4<sup>6</sup>

No Mens rea – 'a guilty mind' No Actus reus – 'a guilty act' No concurrence between the 2



The Journal for Nurse Practitioners - JNP Volume 7, Issue 9, October 2011

# Identified 85 doctors charged with manslaughter since 1795.

Relatively high in the mid-19<sup>th</sup> century and interwar years, dramatic increase since 1990.

- 60 acquitted
- 22 convicted
- 3 pleaded guilty

Mistakes 37 Slips 17

Alleged violations 16

### Doctors charged with manslaughter in the course of medical practice, 1795–2005: a literature review

R E Ferner Sarah E McDowell

J R Soc Med 2006;99:309-314

#### SUMMARY

**Objectives:** To quantify the number of doctors charged with manslaughter in the course of legitimate medical practice and to classify cases, as mistakes, slips (or lapses), and violations, using a recognized classification of human error system.

**Design:** We searched newspaper databases, Medline, Embase, and the Wellcome library catalogue to identify relevant cases from 1795 to December 2005.

Setting: Medical practice in the United Kingdom.

Main outcome measure: Number of doctors charged with manslaughter in the course of medical practice.

**Results:** We identified 85 doctors charged with manslaughter since 1795. The number of doctors charged was relatively high in the mid-19th century and the inter-war years, and has dramatically increased since 1990. Sixty of the doctors were acquitted, 22 were convicted, and three pleaded guilty. Most doctors were charged as a consequence of mistakes (37) or slips (17), and a minority because of alleged violations (16). **Conclusions:** The number of doctors prosecuted for manslaughter has risen steeply since 1990, but the proportion of doctors convicted remains low. Prosecution for deliberately violating rules is understandable, but accounts for only a minority of these cases. Unconscious errors—mistakes and slips (or

charged with manslaughter in the course of medical practice from the early 19th century to the present day.

#### SEARCH STRATEGY

We searched The Times Digital Archive (1795-1985), The Scotsman Digital Archive (1817-1950), and the Lexis Nexis (1985-December 2005) databases using the text words doctor, anaesthetist, or surgeon and manslaughter, to identify relevant newspaper articles and case law reports. We also searched Medline (1955-December 2005) and Embase (1974-December 2005) using the text word manslaughter. In addition, we searched the titles and abstracts of the Lancet (1823-December 2005) electronically using the text words manslaughter, assizes, criminal court, or verdict. Finally, we carried out a search of the Wellcome library catalogue using the search term manslaughter. Where information on potentially relevant cases was incomplete, we also hand searched the indexes of the Lancet and the BMJ for the year during which a case was tried. A previous article<sup>5</sup> was limited to errors in administering anaesthetics or prescribing or giving medicines in the years 1970-1999. Here we extend the search to include all medical practitioners charged with manslaughter from 1795-2005. We divided the cases we identified, according to a recognized 67 ... 1

### Latent

A design error in a machine, misleading advice in a protocol etc. waits until someone is unlucky enough to discover it.

### Slip

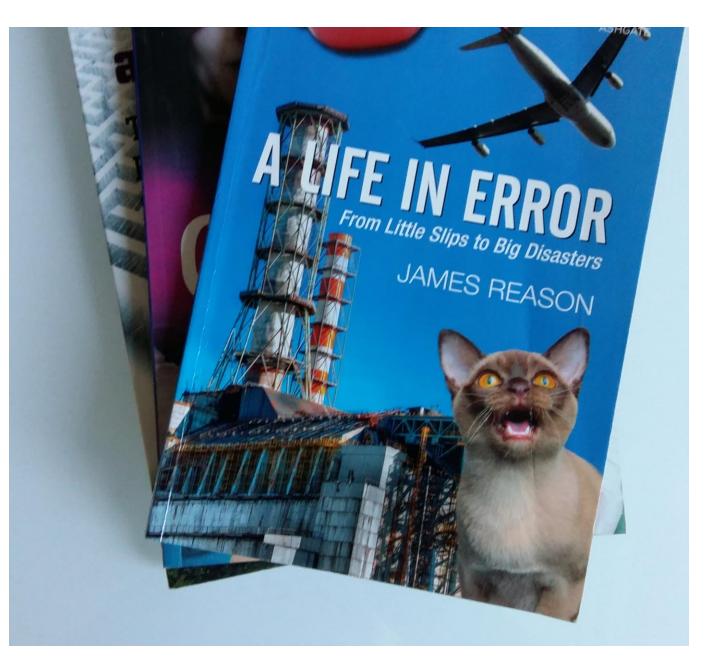
Imperfect performance – not doing precisely what you intended to do.

### Lapse

Mistake – not remembering correctly and doing it wrong.

### Violation

Deliberate rule-breaking for some perceived advantage.



# "Typoglycemia"

Aoccdrnig to a rseearch at Cmabrigde Uinervtisy, it deosn't mttaer in waht oredr the Itteers in a wrod are, the olny iprmoetnt tihng is taht the frist and lsat ltteer be at the rghit pclae. The rset can be a toatl mses and you can sitll raed it wouthit porbelm. Tihs is becaue the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.



# **Homo Sapiens Communicate**



#### NEW YORK TIMES BESTSELLER

"Stpiens tackles the biggest questions of history and of the modern world, and it is written in unforgettably vivid language." --JARED DIAMOND, Pulitzer Prize-winning author of Ganz, Germa, and Stee!

## Yuval Noah Harari

Sapiens A Brief History of Humankind

## "First & last letters matter most"

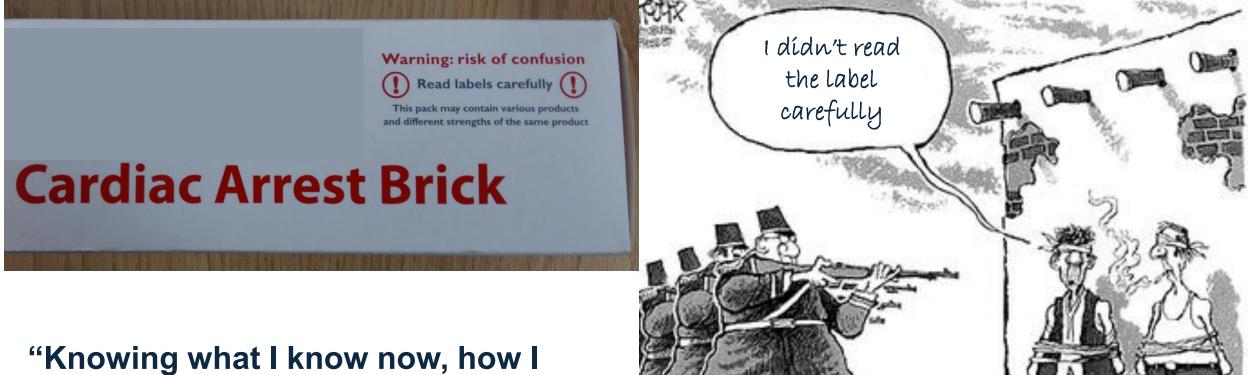
### **Cardiac Arrest**

Atropine Adrenaline Amioderone Adenosine





# "Please Be Vigilant"



"Knowing what I know now, how I wish I had been more vigilant then."



# Please can you share feelings, memories

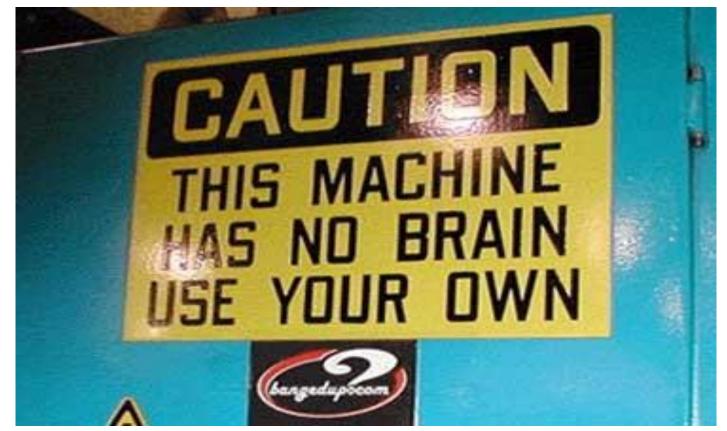
-associated with

personal experiences of error?

# Please summarise your memories of how serious errors have been managed?

i.e. Do people proactively get the support they need?In your opinion are the correct lessons learned?and acted upon?

# **Human Centred Design**



"The fool doth think he is wise, but the wise man knows himself to be a fool."

Wm. Shakespeare "AS YOU LIKE IT"



# **One Manufacturer**







#### MOST HEALTH® PROFESSIONALS SAY INFUSION PUMPS ARE NOT DIFFICULT TO USE

But because designers have not taken on-board the way in which medical staff actually use the equipment,

with a large variety of pumps.

several different sizes of syringes,

no standards for the design of user panels,

and scores of different interfaces,

the potential for inadvertent dosage errors is significant.

**Design for Patient Safety 2004** 



"The behaviour you are seeing is the behaviour you have designed for (whether intentional or not)." Joshua Porter 2009.

What a user can do with an object based on user's capabilities.

Affordance is not a "property" like a physical object or a User Interface - is defined in the relation between the user and the object.



https://www.interaction-design.org/literature/topics/affordances

# Human-Centred Design for interaction *?Does it:*

Suit the user's task & skill level

Make clear what is going on and what the user should do

Conform with expectations

Support learning

Enable the user to be in control of the interaction

Have error tolerance – forgiving of errors

Have customisable interaction and presentation to suit the user



ISO 9241-210 Ergonomics of human-system interaction

# **The Science of Human Factors: Separating Fact from Fiction**

"Human error in medicine, and the adverse events that may follow, are problems of psychology and engineering, not of medicine."

### JW Senders in:

"Human Error in Medicine" Bognor MS (Ed.) Hillsdale, NJ 1994

Russ AL. et al. BMJ Qual Saf 2013:22: 802-808.

#### The science of human factors: 6 separating fact from fiction **OPEN ACCESS**

Alissa L Russ,<sup>1,2,3,4</sup> Rollin J Fairbanks,<sup>5,6,7</sup> Ben-Tzion Karsh,\*<sup>8</sup> Laura G Militello,<sup>9</sup> Jason J Saleem,<sup>1,2,3,10</sup> Robert L Wears<sup>11,12</sup>

Additional material is ABSTRACT published on ine only. To view Background Interest in human factors has please visit the journal online

2012-001450)

end of article.

For numbered affiliations se

Center of Excellence, CIERP 1481 W 10th St 11-H

\*This article is in recognition

of Dr Rep-Tzion Karsh and

includes a tribute in the

Received 15 August 2012

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Accepted 14 February 2013

advnowledgements.

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Correspondence to

increased across healthcare communities and (http://dx.doi.org/10.1136/bmjqsinstitutions as the value of human centred design in healthcare becomes increasingly clear However, as human factors is becoming more prominent, there is arowing evidence of confusion about human factors science, both Dr Alissa L Russ, Roudebush anecdotally and in scientific literature. Some of VA Medical Center, VA HSR&D the misconceptions about human factors may inadvertently create missed opportunities for healthcare improvement.

> Methods The objective of this article is to describe the scientific discipline of human factors and provide common ground for partnerships between healthcare and human factors communities. Results The primary goal of human factors

science is to promote efficiency, safety and effectiveness by improving the design of technologies, processes and work systems. As described in this article, human factors also provides insight on when training is likely (or unlikely) to be effective for improving patient safety. Finally, we outline human factors specialty. areas that may be particularly relevant for improving healthcare delivery and provide examples to demonstrate their value. Conclusions The human factors concepts presented in this article may foster interdisciplinary collaborations to yield new, sustainable solutions for healthcare quality and patient safety.

#### INTRODUCTION



http://dx.doi.org/10.1136

Fairbanks RJ, Karsh B-T, et al

BMJ Qual Saf 2013;22: 802-808.

bmins-2012-002036

To cite: Russ AL,

blems of psychology and engineering, not of medicine.1" Medicine is devoted to human health and healing, but the science behind why

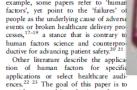
"Human error in medicine, and the

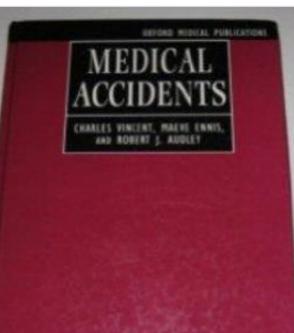
adverse events that may follow, are pro-

errors occur, and how to reduce the likelihood of preventable harm to individuals, are well described in human factors literature. Human factors-a provide a general introduction to human

science at the intersection of psychology and engineering-is dedicated to design ing all aspects of a work system t support human performance and safety Human factors, also known as ergonom ics, uses scientific methods to improv system performance and prevent acciden tal harm.2 The goals of human factors in healthcare are twofold: (1) support the cognitive and physical work of healthcar professionals3 and (2) promote high quality, safe care for patients.4 Human factors knowledge has been

suggested as a promising mechanism with which to improve healthcare delivery,5 yet this body of knowledge remain largely untapped. The reasons for this are not fully known. Gurses et al8 posit that safety efforts have been sluggish due to the inadequate integration of human factors principles and methods into healthcare. Their article provides valuable recommendations to accelerate the uptake of human factors. In addition, we believe that common misconceptions about human factors may slow the inte gration of human factors into healthcare and hinder healthcare improvement. The term 'human factors' itself can be misleading and may result in fundamental misunderstandings. It appears that several misconceptions about human factors science are beginning to take root in peer-reviewed medical literature.9-16 For example, some papers refer to 'human









# It is common for people who are particularly prone to cognitive biases to believe they are good decision makers\*



"The human understanding when it has once adopted an option...draws all things else to support and agree with it. And though there be a greater number and weight of instances to be found on the other side, yet these it either neglects and despises...In order that by this great and pernicious predetermination the authority of its former conclusions may remain inviolate."

Francis Bacon, Novum Organum 1620



# **Emotion or Logic?**

THINKING, FASTAND SLOW

### DANIEL

### KAHNEMAN

WINNER OF THE NOBEL PRIZE IN ECONOMICS

"fast" thinking, intuitive System 1, which **governs most decisions most of the time** 

"slow" thinking System 2, which comes into play for careful evaluation (e.g. to solve a complicated maths problem).

Kahneman discusses two "selves," which can be understood as an <u>experiencing self</u> that lives in the moment and a <u>remembering self</u> that is more evaluative and draws on the memory's storage of past experiences.



# Why Me?

### We need a lot more whys than that – WISE UP!

"The Human Completes The System"

Peter Buckle

"The pursuit of safety is not so much about preventing isolated failures, either human or technical, as about making the system as robust as is practicable in the face of its human and operational hazards"

Prof James Reason



### Achieving the culture we need—one of learning, trust, <u>curiosity, systems thinking</u>, and executive responsibility—will be immensely difficult.

#### Medical error: the second victim

The doctor who makes the mistake needs help too

When I was a house officer another resident failed to identify the electrocardiographic signs of the pericardial tamponade that would rush the patient to the operating room late that night. The news spread rapidly, the case tried repeatedly before an incredulous jury of peers, who returned a summary judgment of incompetence. I was dismayed by the lack of sympathy and wondered secretly if I could have made the same mistake—and, like the hapless resident, become the second victim of the error.

Strangely, there is no place for mistakes in modern medicine. Society has entrusted physicians with the burden of understanding and dealing with illness. Although it is often said that "doctors are only human," technological wonders, the apparent precision of laboratory tests, and innovations that present tangible images of illness have in fact created an expectation of perfection. Patients, who have an understandable need to consider their doctors infallible, have colluded with doctors to deny the existence of error. Hospitals react to every error as an anomaly, for which the solution is to ferret out and blame an individual, with a promise that "it will never happen again." Paradoxically, this approach has diverted attention from the kind of systematic improvements that could decrease errors. Many errors are built into existing routines and devices, setting up the unwitting physician and patient for disaster. And, although patients are the first and obvious victims of medical mistakes, doctors are wounded by the same errors: they are the second victims.

Virtually every practitioner knows the sickening realisation of making a bad mistake. You feel singled out and exposed—seized by the instinct to see if anyone has noticed. You agonise about what to do, whether to tell anyone, what to say. Later, the event replays itself over and over in your mind. You question your competence but fear being discovered. You know you should confess, but dread the prospect of potential punishment and of the patient's anger. You may become overly attentive to the patient or family, lamenting the failure to do so earlier and, if you haven't told them, wondering if they know.<sup>1-3</sup>

Sadly, the kind of unconditional sympathy and support that are really needed are rarely forthcoming. While there is a norm of not criticising,<sup>4</sup> reassurance from colleagues is often grudging or qualified. One reason may be that learning of the failings of others allows physicians to divest their own past errors among BMJ 20 Nurses, pharmacists, and other members of the healthcare team are also susceptible to error and vulnerable to its fallout. Given the hospital hierarchy, they have less latitude to deal with their mistakes: they often bear silent witness to mistakes and agonise over conflicting loyalties to patient, institution, and team. They too are victims

BMJ VOLUME 320 18 MARCH 2000

## Safety at the Sharp End (2008)

While organisational culture is a key determinant of workplace safety, it is also essential to focus on the non-technical skills of the system operators based at the 'sharp end'

The cognitive, social and personal resource skills that complement technical skills, and contribute to safe and efficient task performance.

### **Situation Awareness**

**Decision-making** 

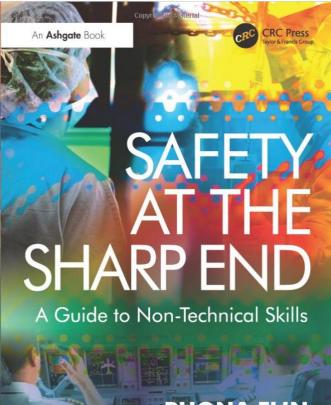
Communication

Teamwork

Leadership

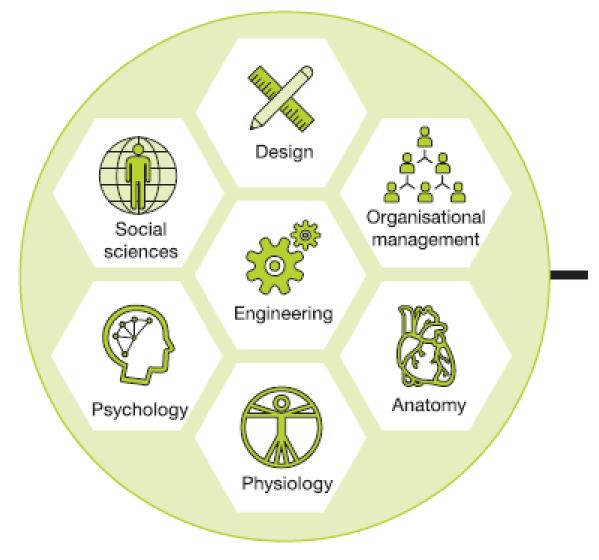
**Managing Stress** 

**Coping with fatigue** 



RHONA FLIN PAUL O'CONNOR MARGARET CRICHTON

### Vosper, H., Bowie, P., Hignett, S. (2017) 12 tips for embedding Human Factors and Ergonomics principles in healthcare educational curricula & programmes Medical Teacher https://www.tandfonline.com/doi/abs/10.1080/0142159X.2017.1387240



MEDICAL TEACHER, 2017 Taylor & Francis https://doi.org/10.1080/0142159X.2017.1387240 Check for update TWELVE TIPS Twelve tips for embedding human factors and ergonomics principles in healthcare education Helen Vosper<sup>a</sup> (), Sue Hignett<sup>b</sup> () and Paul Bowie<sup>c,d</sup> () <sup>a</sup>School of Pharmacy and Life Sciences, Robert Gordon University, Aberdeen, UK; <sup>b</sup>Design School, Loughborough University, Loughborough, UK; <sup>c</sup>Medical Directorate, NHS Education for Scotland, Glasgow, UK; <sup>d</sup>College of Medical and Veterinary Sciences, Institute of Health and Wellbeing, University of Glasgow, Glasgow, UK

#### ABSTRACT

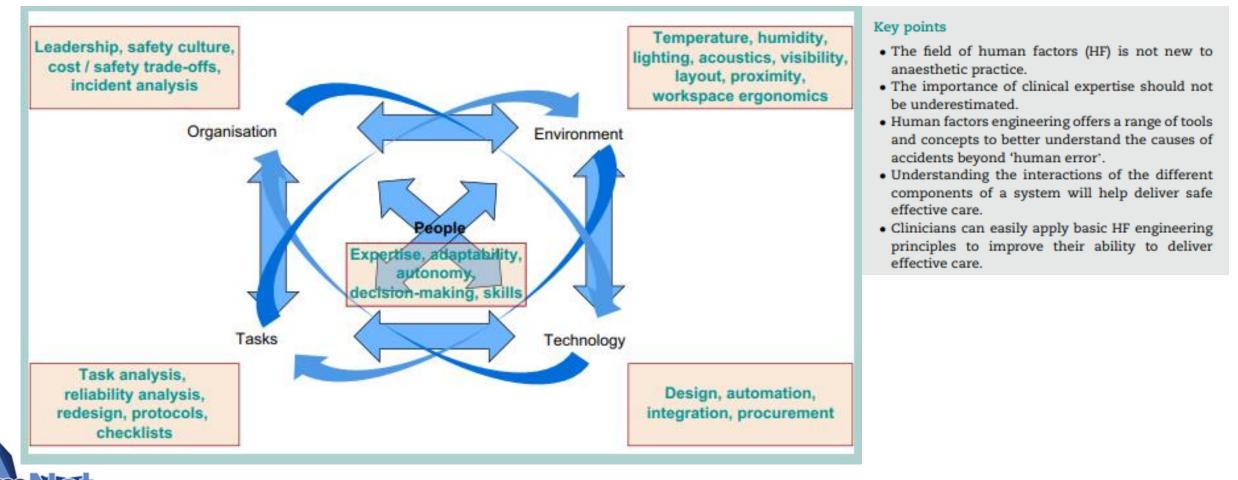
Safety and improvement efforts in healthcare education and practice are often limited by inadequate attention to human factors/ergonomics (HFE) principles and methods. Integration of HFE theory and approaches within undergraduate curricula, postgraduate training and healthcare improvement programs will enhance both the performance of care systems (productivity, safety, efficiency, guality) and the well-being (experiences, joy, satisfaction, health and safety) of all the people (patients, staff, visitors) interacting with these systems. Patient safety and quality improvement education/training are embedded to some extent in most curricula, providing a potential conduit to integrate HFE concepts. To support evolving curricula and professional development at all levels - and also challenge prevailing "human factors myths and misunderstandings" - we offer professional guidance as "tips" for educators on fundamental HFE systems and design approaches. The goal is to further enhance the effectiveness of safety and improvement work in frontline healthcare practice.

# Human factors in anaesthetic practice. Part 2: clinical implications

#### S. Lomax<sup>1</sup>, K. Catchpole<sup>2</sup> and J. Sutcliffe<sup>2,\*</sup>

<sup>1</sup>Royal Surrey Foundation Trust, Guildford, UK and <sup>2</sup>Medical University of South Carolina, Charleston, USA \*Corresponding author: j.sutcliffe1@nhs.net

Keywords: ergonomics



(ALSO: Human Factors in Anaesthetic Practice I: Facts & Fallacies BJAED 2023, etc)

### **Social Ostracism**

"The threat of social ejection probably acts as a powerful form of social control."

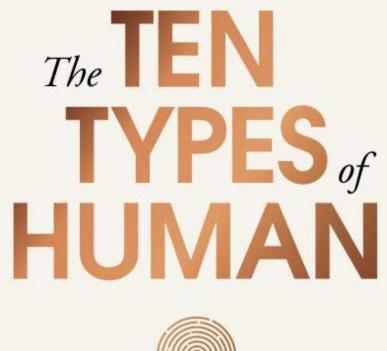
"For all our bluster and posturing ... social pain hurts us all about the same ...

initial effect doesn't appear to make much difference at first.

### The variance is in how we cope."

"...more than a metaphor. It actually hurts."

'Fantastic ... Inspiring and essential' CHARLES DUHIGG AUTHOR OF THE POWER OF HABIT





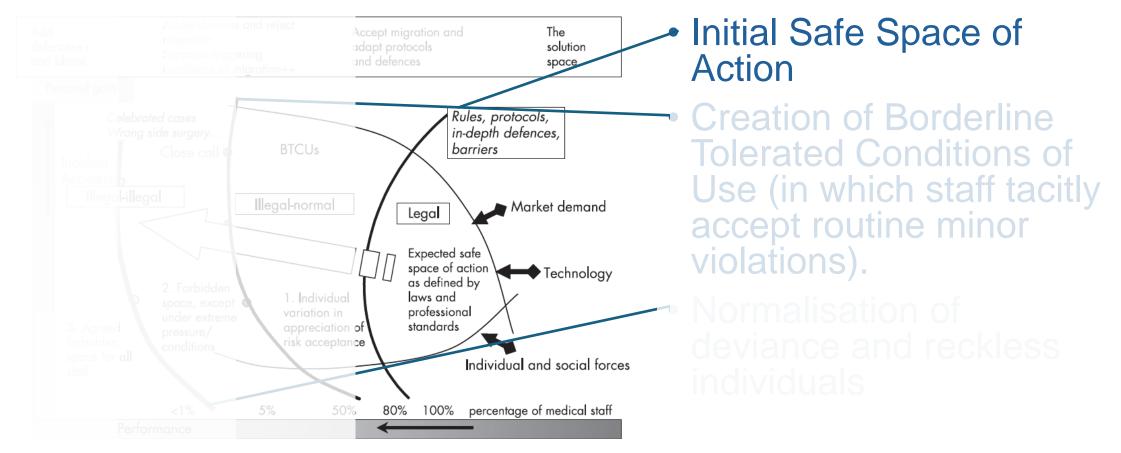
Who We Are and Who We Can Be

### DEXTER DIAS

'A game changer. Think *Sapiens* and triple it'



# **Borderline Tolerated Conditions of Use**



Violations and migrations in health care: a framework for understanding and management R Amalberti, C Vincent, Y Auroy, G de Saint Maurice Qual Saf Health Care 2006;15(Suppl I):i66–i71. doi: 10.1136/qshc.2005.015982









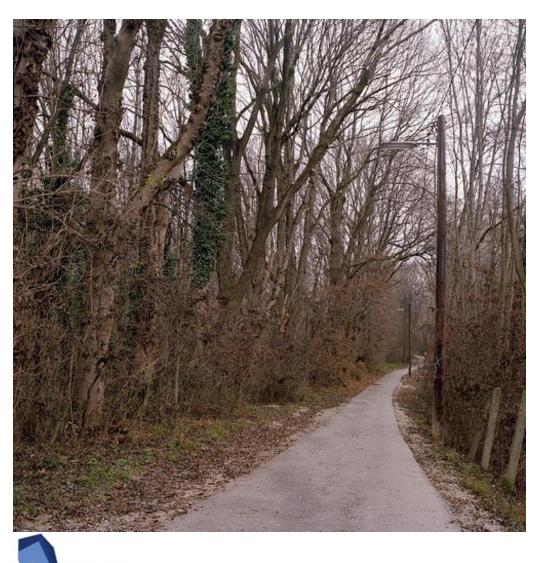




### "Homo Sapiens have evolved to do everything they can with their big brains to avoid having to use them."

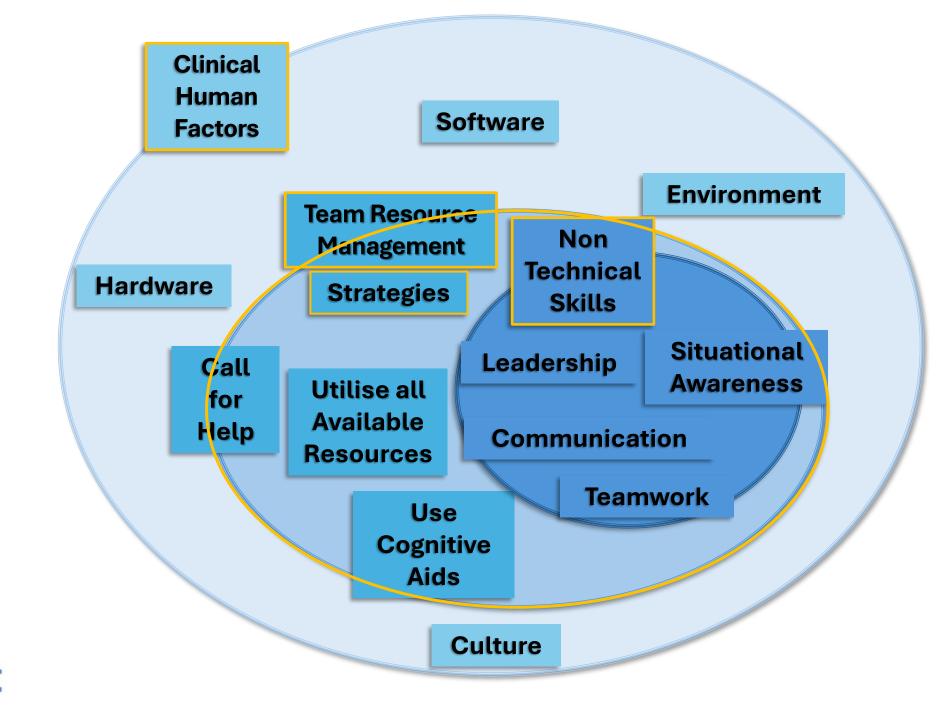






Just as medicine understands more about disease than health, so the safety sciences know more about what causes adverse events than about how they can best be avoided.

Reliability comes from many timely resilient human adjustments producing safety as a "dynamic non-event"





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When I was a house officer another resident failed to identify the electrocardiographic signs of the pericardial tamponade that would rush the patient to the operating room late that night. The news spread rapidly, the case tried repeatedly before an incredulous jury of peers, who returned a summary judgment of incompetence. I was dismayed by the lack of sympathy and wondered secretly if I could have made the same mistake—and, like the hapless resident, become the second victim of the error.

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# **Errors in medicine**

- 1. Errors are common
- 2. The causes of errors are known
- 3. Errors are by-products of useful cognitive functions
- 4. Many errors are caused by activities that rely on weak aspects of cognition
- 5. Errors can be prevented by designing tasks and processes that minimize dependence on weak cognitive functions
- 6. Systems failures are the "root causes" of most errors

Lucian Leape, "Error in Medicine" *JAMA* **1994** 



"It is though, highly probable that from the very beginning, apart from death, the only ironclad rule of human existence has been the Law of Unintended Consequences.

... we are notably bad at assessing risk, especially long-term risk ...."



### IAN TATTERSALL

CURATOR OF THE SPITZER HALL OF HUMAN ORIGINS, AMERICAN MUSEUM OF NATURAL HISTORY

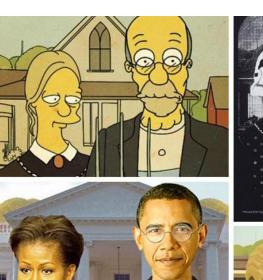
SimNet

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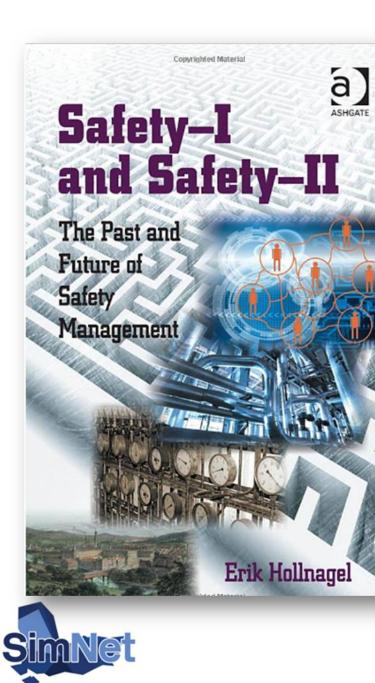
You wouldn't attempt to understand what makes a happy marriage by investigating divorce alone.



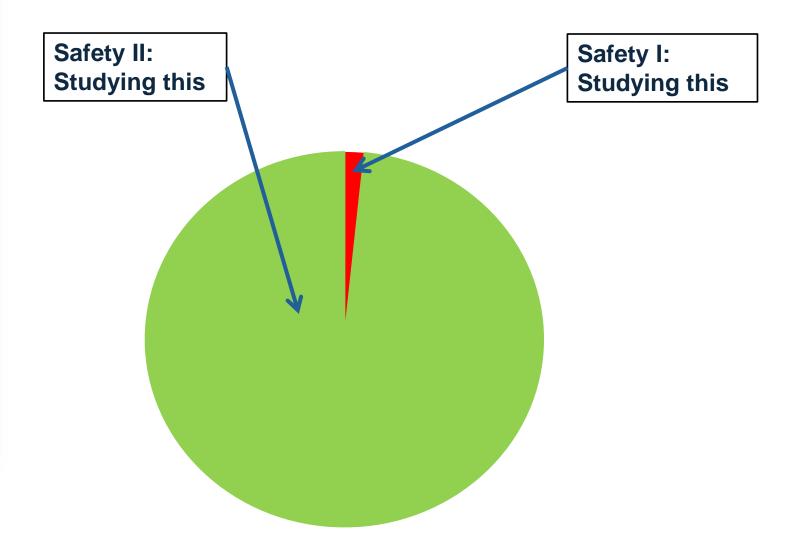








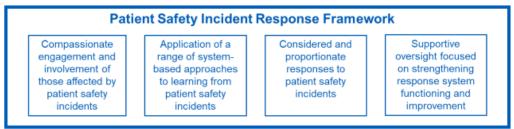
# Hollnagel & the Challenge of Safety I & II



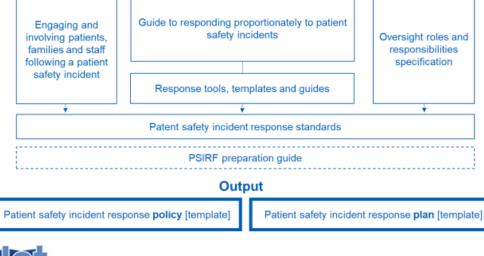
Organisations should use this guidance, together with relevant local information, to inform and maintain the corresponding sections of their local policy and plan as needed.

Figure 1 provides an overview of the framework and associated documents.

Figure 1: Overview of the Patient Safety Incident Response Framework documentation



#### Supporting documentation





Publication approval reference: PAR 1465

### SEIPS quick reference guide and work system explorer

Version 1, August 2022

#### Healthcare is a complex socio-technical system

Healthcare is complex because it is highly variable, uncertain, and dynamic.

Healthcare is a socio-technical system because it is characterised by multiple interactions between various components, both human and technological.:

#### What is SEIPS?

SEIPS is a framework for understanding outcomes within complex socio-technical systems.

Figure 1 provides an overview of the System Engineering Imitative for Patient Safety (SEIPS) framework, combining SEIPS 2.0<sup>1</sup> and SEIPS 101<sup>2</sup>. The figure It describes how a **work system** (or socio-technical system, left) can influence **processes** (work done, middle), which in turn shapes **outcomes** (right).

The SEIPS framework acknowledges that work systems and processes constantly adapt (see arrows in Figure 1).

https://www.england.nhs.uk/wp-content/uploads/2022/08/B1465-SEIPSquick-reference-and-work-system-explorer-v1-FINAL.pdf

https://www.england.nhs.uk/patient-safety/patient-safety-insight/incident-response-framework/

# **Clinical Human Factors Group: chfg.org**



"Human Factors are organisational, individual, environmental, and job characteristics that influence behaviour in ways that can impact safety..."

230

Avoidable hospital deaths per week

12,000

Avoidable hospital deaths per

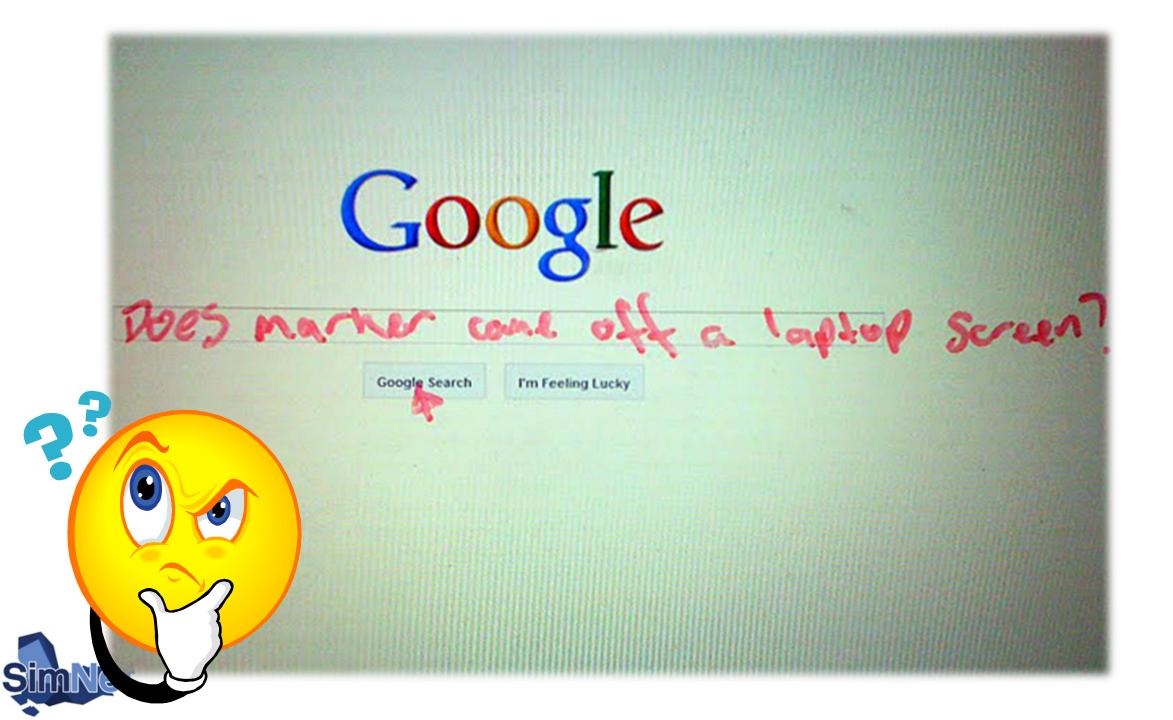
year



Serious incidents reported to NHS per year

# What words or phrases come to mind following this presentation?

Want more HF? Contact: Dr Ratna Makker; ratna.makker@nhs.net



There may be trouble ahead

All site visitors please note that while there is:

Moonlight

Love

Music

Romance

• Face the music • Dance

# Thank You!