

Human Factors & Infection Prevention and Control
Claire Kilpatrick, Jules Storr, Neil Wigglesworth
A Webber Training Teleclass

Human Factors & Infection Prevention and Control

Claire Kilpatrick
Jules Storr
Neil Wigglesworth

Hosted by Paul Webber
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Teleclass 2014

Infection Prevention and Control

A facet of patient safety

Human factors

A science at the intersection of psychology and engineering.....

Integrating human factors with infection prevention and control

Julie Storr, Dr Neil Wigglesworth, Claire Kilpatrick

In this thought paper, the authors discuss the application of human factors principles within infection prevention and control activities. They argue that the time has come to strengthen infection prevention and control efforts and capability by incorporating human factors principles, methods, expertise and tools. They suggest that a multi-disciplinary approach to infection prevention measures could help address challenges that exist within the complex socio-technical system that is healthcare.

At the Health Foundation, we are working to identify, test and demonstrate ways to manage risk in systems of care, and reduce the number of failures. We are conducting research and using engineering programmes to promote and evaluate and learning that can be shared across the health sector.

Health Foundation thought papers present the author's own views. We would like to thank Dr Storr, Dr Wigglesworth and Dr Kilpatrick for their work, which we hope will stimulate ideas, reflection and discussion.

Thought paper
May 2013



Why does infection prevention need to look outwards to other specialties/experts?

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The infection control paradox

Simple and complex at the same time

Using human factors engineering to improve the effectiveness of infection prevention and control

Judith Anderson, MD; Laura Lin Gosbee, MASC; Mary Bessesen, MD; Linda Williams, RN, MSI

Human factors engineering is a discipline that studies the capabilities and limitations of humans and the design of devices and systems for improved performance. The principles of human factors engineering can be applied to infection prevention and control to study the interaction between the healthcare worker and the system that he or she is working with, including the use of devices, the built environment, and the demands and complexities of patient care. Some key challenges in infection prevention, such as delayed feedback to healthcare workers, high cognitive workload, and poor ergonomic design, are explained, as is how human factors engineering can be used for improvement and increased compliance with practices to prevent hospital-acquired infections. (Crit Care Med 2010; 38(Suppl.):S269-S271)

Key Words: human factors engineering; infection prevention and control; delayed feedback; usability; hospital-acquired infections; simulation; hand hygiene; checklist; NSA; central catheter-associated bloodstream infection

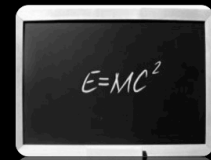
Human factors engineering (HFE) is a discipline which, when applied to healthcare settings, helps redesign the tools and workplace so that healthcare workers (HCWs) have the best possible chance of succeeding in their tasks. These interactions influence how humans behave and perform, and, as one might expect, these interactions are complex. There are specialties within the field of HFE that look at specific aspects of these interactions—for example, cognitive engineering, physical ergonomics, and human-computer interaction. These interactions can be designed to be either helpful or hindering. The delayed nature of feedback makes the cause-and-effect relationship unclear, often leading to a breach of technique and often in a physical setting different from where the incident occurred. The delayed nature of feedback makes the cause-and-effect relationship unclear, often leading to a breach of technique and often in a physical setting different from where the incident occurred. The delayed nature of feedback makes the cause-and-effect relationship unclear, often leading to a breach of technique and often in a physical setting different from where the incident occurred.

Crit Care Med 2010 Vol. 38, No. 8 (Suppl.) S269



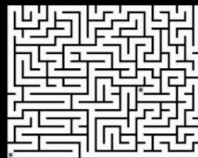
1. Delayed feedback

Cause and effect relationship unclear



2. Lack of connection with positive result

Cognitive disconnect between action & outcome



3. Complexity and inefficiency

Workarounds




4. Time pressure and high cognitive workload

And competing tasks

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5. Few infection control cues
Embedding habits that endure reliably



6. Inconsistent ergonomic design practice
Placement of the tools for the job



7. Need for additional problem solving tools
Multidisciplinary, multifaceted approach

Not part of the everyday flow of work
'I can either practice infection control or I can treat the patients, you choose' (Ward D, 2012)



Why is healthcare so complex?

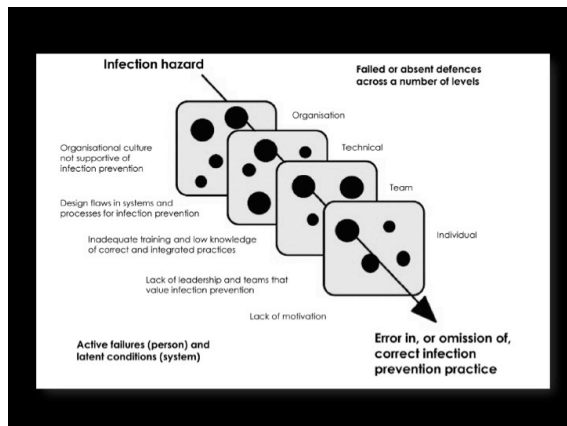
1. The number of actors involved
2. The explosion in processes, procedures, technologies
3. The throughput of patients
4. The ratio of nurses to patients
5. The dependency of patients
6. The layout of clinical care areas

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Is there no evidence that shows that human factors theory and practice has been used or has influenced interventions to reduce healthcare-associated infections?

On one level it could be argued that human factors have permeated a long way into the infection prevention mindset – if by human factors you simply think ‘checklists’

But there is little, if any, evidence of human factors expertise or input to the design of for example checklists



Why are human factors experts so important?

3

PubMed

Teamwork and learning together - one of the success factors in building cohesiveness, making sure key steps are taken during everyday workflow

Human factors expertise can reliably facilitate how we do this across teams and organisations

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Do we need to change everything, forget everything we have been doing till now in healthcare to now stop infections?

- Look back and look forwards together
- Analyse structural and process-related factors that contribute to unsafe care;
- (Re)design so that they improve, and the performance of healthcare workers and outcomes also improve

Refocusing on the prevention and control of infection through a human factors lens offers us a **new way of looking at an old problem**

The opportunity to assess if the problems we think exist are the real problems and to focus energy on the right approaches

A sense of urgency and importance

Increase efficiency and remove unhelpful redundancy, overuse, underuse and misuse of current interventions



Do you have a call to action to infection preventionists and others now?

One

Form a coalition

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Two

Recognize our strengths and limitations - reach out to identify areas most amenable to human factors approaches.

Three

The patient safety and infection prevention communities – ignite research

Four

More use of safety culture assessments prior to implementation

Five

Become evangelists – there is a burning imperative for action now



Who can help infection prevention take this leap forward in working with other specialists/ human factor experts for the future of patient safety?

Policy makers, national organizations with a remit for quality and patient safety, academics, as well as leaders within healthcare organizations, explore and facilitate the change alongside infection preventionists


Critical to translate evidence into practice

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Make the invisible visible

Integrate human factors and infection prevention

Recommended reading

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B

C

Teleclass 2014
Thank you



March 31 (FREE Teleclass - Broadcast Live from the German Hospital Hygiene Society Conference)
INFECTION PREVENTION IN HIGH AND MIDDLE INCOME COUNTRIES
Bruce Gamage of Canada, Dr. Pierre Parneix of France, and Prof. Dr. Li Han of China

April 3 HOW TO BRIDGE THE GAP BETWEEN KNOWLEDGE AND PRACTICE
Gerite van Knippenberg-Gordebeke, APIC International Section, Netherlands

April 8 (Free British Teleclass ... Denver Russell Memorial Teleclass Lecture)
ANTIBACTERIAL EFFICACY OF ATMOSPHERIC PRESSURE NON-THERMAL PLASMA
Dr. Brendan Gilmore, Queen's University Belfast

April 9 (FREE ... WHO Teleclass - North America)
HIGHLIGHTS ON SURGICAL SITE PREVENTION: THE NEW CDC GUIDELINES (AND MORE)
Dr. Joseph Solomkin, University of Cincinnati College of Medicine, USA

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Clean Care is Safer Care



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