

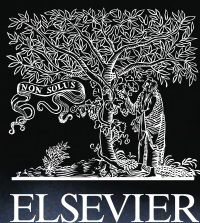
Journey towards zero harm – Sustaining the delivery of quality of care through system nudges

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The global health crisis, triggered by COVID-19, accelerated patient safety awareness and healthcare disruption.

While the mindset of zero harm would be a seismic shift from the current status quo that lives with high levels of avoidable harm, the question remains: how can we adapt and improve our current healthcare systems to deliver sustainable high-quality care and patient safety.

A part of the answer might be lying in the connection of knowledge and technology as integral part of systems.





Patient Safety and Systems Thinking

Despite significant advances, patient safety remains a global challenge for managers, health professionals and society in general, with millions of people suffering harm from unsafe healthcare worldwide. According to the [World Health Organization's Patient Safety Action Plan 2021-2030](#), in high-income countries, it is estimated that one in 10 people are harmed while receiving hospital care¹, and up to 15% of hospital spending is due to safety failures in care. In low and middle-income countries, estimates are one in four patients are harmed, with 154 million adverse events occurring annually due to unsafe hospital care, contributing to around 2.6 million deaths². The social cost of patient harm can be valued at between one to two trillion US\$ a year. A human capital approach suggests that eliminating harm could boost global economic growth by over 0.7% annually.³

The need to promote safe healthcare systems has been recommended for more than two decades, and was popularized through the report "[To err is human: building a safer healthcare system](#)", which stated that avoidable errors and the associated costs could be mitigated by the creation and implementation of "safe systems" capable of systematically recognizing and minimizing the sources of errors, since, as coined by Richard Cook, "safety is a characteristic of systems, not of their components. Safety is an emerging property of systems."⁴

Systems under crisis

The years of pandemic crisis surfaced the fallibility of the traditional definition of systems - a set of safe processes to prevent errors. When COVID-19 hit the wards, it became clear that safe processes alone do not guarantee safety at all stages of care, as processes are inherently intertwined with individual decision-making activities. The exponential growth of new scientific knowledge brought to light the importance of a second component of safe systems in healthcare: **an environment that fosters safe decision making.**

This renewed definition of safe systems enables an environment that emphasizes on the conditions under which professionals succeed rather than the conditions under which they fail.



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The clinical decision-making factor

The 'safe decisions' component of systems emphasizes the creation of an environment that fosters safe clinical decision-making. Individual decisions by healthcare professionals guide patient diagnosis and treatment activities. In this context, the use of clinical guidelines and evidence-based guidance are considered essential practice for improving quality and patient safety.⁵

To better understand the need for current, reliable, and evidence-based information to support clinical decision-making, it is important to look at how decisions are made in healthcare settings. Clinical decision making is based on dual process theory:

- 1) a fast, non-analytic, implicit and biased process, often based on heuristics; and
- 2) an explicit analytical process that relies on hypothetical and counterfactual reasoning, in which details are considered and questioned through the use of different information.

Although we tend to think that decisions are always analytic, the non-analytic and implicit system prevails in everyday decision-making processes, including decisions related to care.

With the time pressures and competing priorities that clinicians routinely face, most end up using intuitive, non-analytic, implicit, and biased processes to a greater degree than analytical reasoning. While this rapid decision-making strategy can save time and often result in correct diagnoses and favorable patient care outcomes, it is by nature more error-prone when patient cases are more complex and when professionals are more stressed and rushed.

Clinical Knowledge

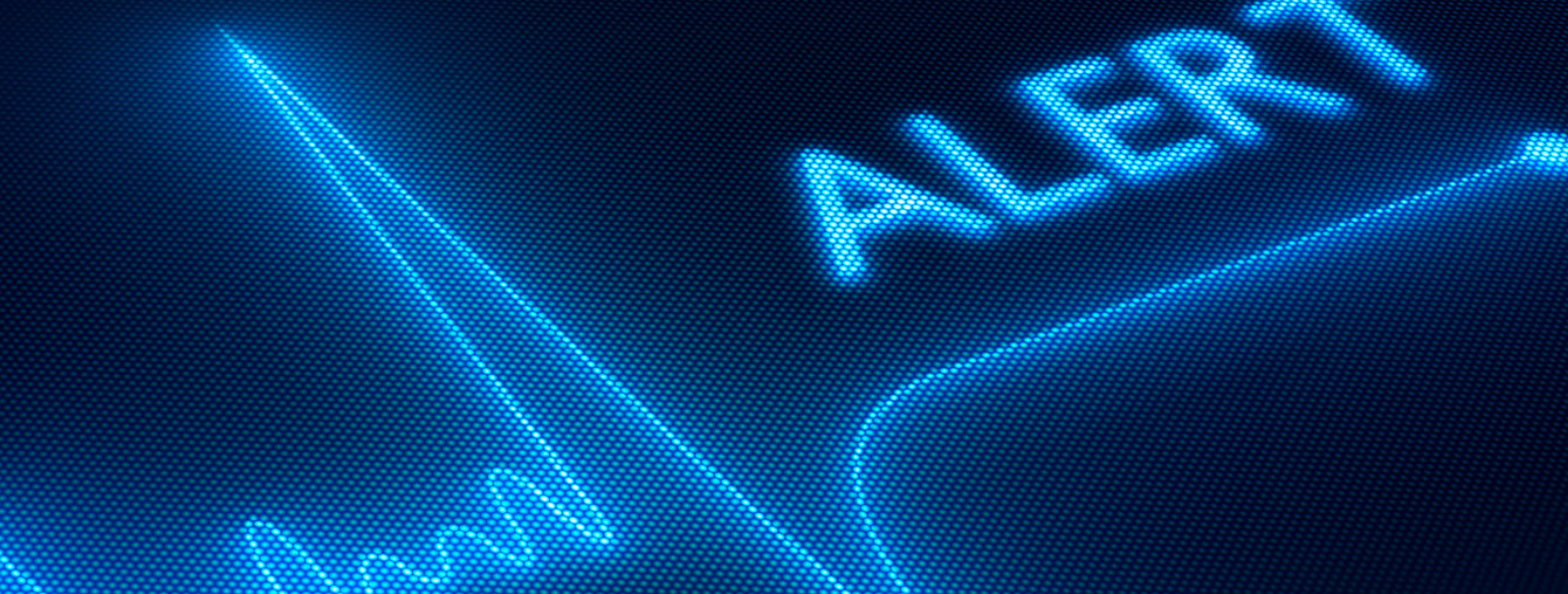
Being a key element of clinical decision making, clinical knowledge is never static. Updates and changes occur to fundamental principles and core knowledge, which are shaped and informed by bench research over time, and constant shifts occur in the practical application of knowledge, for example how clinicians assess, diagnose and care for patients.

The rate medical knowledge has been expanding in recent history is astounding. Take the WHO Covid-19 Database as an example: at the time of writing this piece (May 2022), a person would take around 64 years to read all full text articles available on the database, considering an inhumane rate of 20 articles per day.

Thus, accessing appropriate and relevant knowledge to support clinical reasoning and decision-making requires a clinician's knowledge base to be efficient, easy to use and relevant.



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Nudging towards safety

What if we could enable safer clinical decision-making by merging clinical knowledge and nudges in the workflow.

Behavioural theory suggests that rationality is limited by psychological factors, emotional associations, and mental assumptions that distort reality, hampering the rational decision-making process. It is in this context that the concept of nudge arises, popularized by the book “Nudge: Improving Decisions About Health, Wealth, and Happiness”. The book defines nudges as a tool capable of guiding behaviour, optimizing choices by encouraging safer and healthier behaviours, both from an individual and community perspective. The fundamental aspect of nudge is the maintenance of the individual's freedom of choice. This means that even though choice architecture can encourage you to make decisions based on nudges, the decision to follow through with the prompt is still yours to make.

The use of nudges to encourage healthier decisions has been continuously explored.⁶ An example of the use of nudge in health is the encouragement of organ donation. According to behavioural science, important psychological barriers prevent people from becoming organ donors, including the status quo bias - the tendency to maintain the status quo even when a change would be beneficial and is in line with our personal values and beliefs. In Ontario, Canada, a government experiment evaluated the use of nudges for donor registrations.⁷ Among the interventions, the researchers included the following phrases as nudges: 'If you needed a transplant, would you do it?' and “How would you feel if you or a loved one needed a transplant and didn't get it? Please help us save lives and register today.”

The experiment observed an increase of up to 143% in the number of new registrations. In the UK, the Behavioural Insights Team, also known as the Nudge Unit, concluded that nudges in the organ donation registry could result in 100,000 new registrations per year, a 40% increase.⁸

Safe nudges for HCPs can range from reminders of standard operating procedures to active support for clinical decision making.

Consider the scenario of a nurse starting a shift at the inpatient care unit (ICU) and being handed over a post-surgical case. The nurse logs into the EHR and checks the care plan for that patient, which suggests the parameters to be measured and actions to be performed based on patient assessment and best available guidance. For this patient, bleeding management is included, and subsequent actions are based on a clinical practice guideline. The nurse's clinical decision is nudged by both checklist and guidance, avoiding errors of omission, and nudging towards evidence-based practice.

As nudges are part of our day-to-day lives, they must be intentionally designed to promote safety by acting as reminders of safety measures or by fulfilling information gaps. In that context, nudges should ultimately be designed to increase navigability and support for clinicians and patients to make decisions that improve their well-being and the well-being of others.



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Fostering safe decision-making environment through knowledge-driven digital technology

As systems progress and evolve, the decision-making component increasingly gains ground, highlighting the importance of an environment that fosters safe decision-making. This approach of safe systems successfully connects safe processes and safe decision-making, creating an environment that fosters safe choices and actions. Nudges fundamentally guide users while respecting their freedom of choice, increasing sustainability of safety and improved quality of care.

Knowledge-driven digital technology tools can be a great ally for healthcare leaders to design sustainable choice architectures as it provides knowledge at the point of care in a format that nudges healthcare stakeholders into making safer decisions.

¹ Slawomirski L, Aaraaen A, Klazinga N. The economics of patient safety: strengthening a value-based approach to reducing patient harm at national level. Paris: Organisation for Economic Cooperation and Development; 2017

² Slawomirski L, Aaraaen A, Klazinga N. The Economics of Patient Safety in Primary and Ambulatory Care: Flying blind. Paris: Organisation for Economic Cooperation and Development; 2018.

³ Slawomirski L, Klazinga N. Economics of patient safety: from analysis to action. Paris: Organisation for Economic Cooperation and Development; 2020

⁴ Cook, Richard I. Two Years Before the Mast: Learning How to Learn About Patient Safety. Invited presentation. "Enhancing Patient Safety and Reducing Errors in Health Care," Rancho Mirage, CA, November 8–10, 1998

⁵ Clinical Practice Guidelines: Closing the Gap Between Theory and Practice – Joint Commission International. JCI-Whitepaper_CPGs-Closing-the-gap-between-theory-practice.pdf (clinicalkey.com)

⁶ Quigley M. Nudging for health: on public policy and designing choice architecture. *Medical Law Review*. 2013;21(4):588-621

⁷ Ontario.ca. 2021 [cited 3 August 2021]. Available from: <https://www.ontario.ca/page/behavioural-insights-pilot-project-organ-donor-registration>

⁸ United Kingdom. Cabinet office, Behavioral Insights Team. 2013 Applying Behavioural Insights to Organ Donation: preliminary results from a randomised controlled trial. *American Journal of Public Health* 97:634–641



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APPENDIX

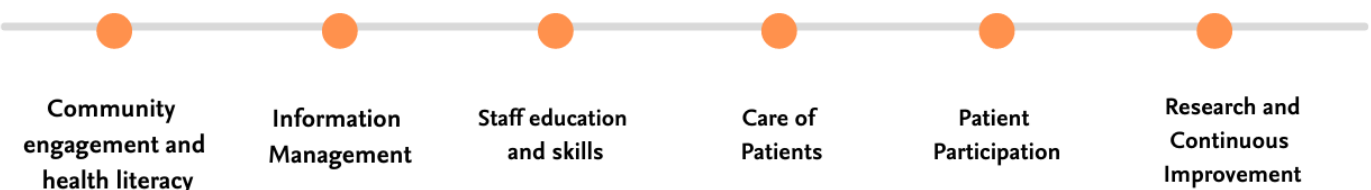
Navigating safely through the Quality and Patient Safety Journey

Nudges should ultimately be designed to increase navigability and support for clinicians and patients to make decisions that improve their well-being and the well-being of others.

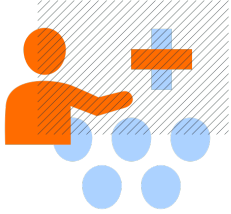
Nudges may exist in analogue or digital technology formats – the latter being more sustainable and easier to promote and implement. As clinical knowledge continues to rapidly evolve, digital technology enables live updates that reach stakeholders faster.

Nudges play a role in improving navigability, as highlighted in the recently updated Quality & Patient Safety (QPS) Journey, adopted and developed in partnership with the National Society of Quality of Care and Patient Safety in Brazil.

The journey describes the six key pillars of a system that promote patient safety:



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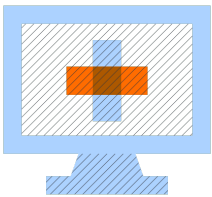


Community Engagement and Health Literacy

In 2020, we faced a global challenge of communicating information about a new virus to 7.83 billion people. It was the first pandemic in the era of digital networks, which enabled social distancing through remote working, remote communications, and telemedicine. However, it also exposed what the WHO described as an infodemic.

Research suggests that in the first three months of 2020, nearly 6,000 people globally were hospitalised because of coronavirus misinformation. During this period, researchers estimate that at least 800 people may have died due to misinformation related to the pandemic.⁷ Among the most viewed English videos relating to COVID-19 on a video streaming platform, 27.5% contained non-factual information, reaching 62 million views worldwide.⁸

Leveraging digital technologies to empower communities with accurate knowledge is paramount to nudge people towards safe behaviour. For example, an online game called [Go Viral!](#) was developed through a partnership between Cambridge University and the UK Cabinet Office, to improve the recognition of fake news. Previous research has shown that just one play can reduce perceived reliability of fake news by an average of 21%.⁹ Understanding the need to deliver evidence-based information, Elsevier launched the [Novel Corona Virus Information Center](#) in 2020, a hub providing expert, curated information for the research and health community on SARS-CoV-2 and COVID-19.



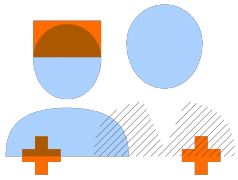
Information Management

Healthcare system leaders must work to ensure that the right information is provided at the right time and at the correct point of a patient's healthcare journey. The COVID-19 pandemic has accelerated the speed of change in processes and procedures from days to minutes. High patient admissions to acute units, infection prevention measures, staff redeployment and PPE scarcity were all contributing factors that facilitated process changes and encouraged adaptation that nudged staff in the safest direction possible. The use of digital technology is a key facilitator of this change as it integrates knowledge and embedding new policies and processes directly into the workflow.

For example, [the shortage of N95 Filtering Facepiece Respirator \(FFR\)](#) meant hospitals had to be agile and aware of the growing body of evidence shared by authorities, in order to adapt their policies for contingency capacity strategies. Looking forward post the pandemic, the speed of change in this process might reduce, however, the need to ensure that process changes are accurate, timely and adhered to by staff in a sustainable way remains.



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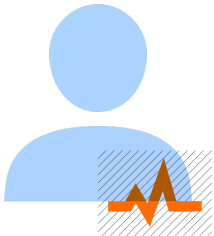
Staff Education and Skills

The growing body of clinical knowledge demands continuous dedication from HCPs to keep up-to-date and sustain the delivery of quality care. It is estimated that the doubling time of medical research was approximately 50 years in 1950, and by 1980, this is thought to have accelerated to an estimated seven years. In 2010, the estimates decreased to three and a half years, and by 2020, down to just 73 days.¹⁰ In this scenario, remaining aligned is an ever-growing challenge.

Over the past few months, high turnover rates have been increasing due to the unfortunate statistics on infection and death rates among HCPs working on the front line. More than [1.6 million healthcare workers have been infected in 34 countries](#) and the WHO estimates that [at least 115,000 healthcare workers](#) lost their lives to COVID-19.

To mitigate against staff shortages, the [Centers for Disease Control and Prevention \(CDC\)](#) suggested shifting HCPs who work in acute care to other patient care activities in the facility, the organizations also need to ensure these HCPs have received appropriate training to do so. Digital technology can be a sustainable education strategy. According to the WHO, in its [State of the World's Nursing Report - 2020](#), digital technology is playing an increasing role in both education and practice of the nursing workforce.¹¹

To complicate this equation, healthcare is recognised worldwide as a pressurised industry. HCPs are at risk for anxiety, depression and burnout. Severe burnout syndrome affects as many as 33% of critical care nurses and up to 45% of critical care physicians.^{12,13} Responding to this growing challenge, Elsevier has developed a [Mental and Behavioral Health Hub](#), with resources to support clinicians resilience as they care for patients in challenging environments.



Care of Patients

The gap between what clinicians know versus what they do in practice is traditionally described as the “know-do gap”. It is a new term used to describe an old problem that has been further highlighted during the pandemic crisis. A 2018 report from The Lancet Global Health Commission stated that “*Poor-quality care is now a bigger barrier to reducing mortality than insufficient access.*” *The annual cost of waste from overtreatment or low-value care is estimated between \$75.7 billion to \$101.2 billion, and healthcare costs are 75% higher for patients receiving uncoordinated care.*^{14,15}

Bridging the “know-do gap” starts with the transformation of read-only information into actionable content that can be integrated into the workflow of the healthcare worker. Creating these integrated pathways, protocols and guidance should be prioritised by a safe system architecture with the right nudges.



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Patient Participation

The shift in focus towards patient-centric care has brought an increased awareness of the need to engage and include patients as active partners. The continuum of care for patients with chronic diseases shines a light on their active role in disease management. While treating patients with chronic conditions was named one of the top challenges facing doctors in 2020 by [Medical Economics](#), the pandemic accelerated the adoption of digital technology to improve access to care and continuous monitoring.

Patient participation minimises the paternalistic model of healthcare, under which clinicians are solely responsible for the outcome. This leads to a gradual shift towards models of care that allow patients to take more active roles in their healthcare journey together with the clinician. Activating patients has proven benefits, with engaged patients having 12.5% fewer hospital admissions and 5.3% lower overall medical costs.¹⁶

Moving forward, system architects need to rethink how digital technologies can be effectively used to nudge patients to participate in their health, fostering safe behaviour in the care continuum.



Research and Continuous Improvement

The current healthcare crisis has unified and accelerated research efforts globally. There became an unprecedented need to discover, publish and promote findings that were clinically sound. Ground-breaking research such as the development of the first vaccines that doubled our efforts against Sars-Cov-2, sharing of best practice protocols, to advance the treatment of patients experiencing respiratory failure.¹⁷

Applying research into day-to-day practice as continuous improvement is a characteristic of a system that evolves as scientific, clinical and operational knowledge changes. Digital technology serves as way to democratise knowledge and ensure that the system is designed to nudge the environment into a [culture of evidence](#).



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