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Patient Safety in the Digital NHS

**USER-CENTRIC APPROACHES TO
TECHNOLOGY AND TRANSFORMATION**

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OSKROCHI AND TOM MICKLEWRIGHT**

patient
safety
learning }

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Key Information

ABOUT PPP

Public Policy Projects (PPP) is an organisation operating at the heart of health and life sciences policy delivery. We bring together senior leaders and practitioners in the public and private health and life sciences sectors to find realistic solutions to the most pressing issues relating to health and care delivery.

We facilitate effective collaboration between public and private sector organisations. We help businesses to grow their profile within the NHS and wider public sector. In turn, we support public sector leaders and organisations with practical recommendations on implementing policy to improve health and wellbeing outcomes for local populations.

ABOUT PATIENT SAFETY LEARNING

Patient Safety Learning is a charity and independent voice for improving patient safety.

Patient Safety Learning harnesses the knowledge, enthusiasm and commitment of healthcare organisations, professionals and patients for system-wide change and the reduction of harm.

Patient Safety Learning support safety improvement through policy, influencing and campaigning, as well as the development of 'how to' resources such as *the hub*, an free award-winning platform to share learning, plus a comprehensive range of products, tools & consulting services that improve understanding and application of 'What Good Looks Like' in patient safety.

THE PATIENT SAFETY PROGRAMME

Patient safety is the cornerstone of high-quality, cost-effective care – yet it is not prioritised consistently across the health system. As documented by investigations, reviews and national media coverage, patient safety incidents continue to occur at an unacceptable frequency and scale in the NHS.

Responding to this, PPP alongside Patient Safety Learning have co-created a programme to facilitate continuous dialogue and engagement with a variety of stakeholders to develop patient safety public policy and improvement action. The 2024 programme, Harnessing technology to enable a system-wide approach to patient safety, is the first phase of the programme which will evolve as the policy context develops.

ACKNOWLEDGEMENTS

Between October to December 2024, Public Policy Projects, in partnership with Patient Safety Learning, hosted three roundtable discussions to discuss patient safety through the lens of technology, digital innovation and data-driven transformation.

By convening health sector and patient safety leaders, industry representatives, as well as patients and clinicians, the discussions aimed to provide open and constructive dialogue to challenge the health system to embed a culture of patient safety within UK healthcare technology innovation and implementation.

The roundtables were chaired by Helen Hughes, Chief Executive at Patient Safety Learning, Youssof Oskrochi, Consultant in Public Health Medicine, London Borough of Sutton, Honorary Lecturer in Digital Health, UCL Global Business School for Health and Honorary Clinical AI Lead, Health Innovation Kent Surrey Sussex and Tom Micklewright, Clinical Lead for Digital Transformation, Cheshire and Merseyside ICB and Medical Director at ORCHA. Attendees included:

- Digital health leaders
- Digital transformation leads
- Patient safety leaders, specialists and educators
- Clinical safety officers
- Heads of quality and clinical governance
- Human factors specialists

This report summarises the roundtable discussions and was authored by Samantha Semmeling, Policy Analyst, Public Policy Projects. We would like to thank everyone who attended the roundtable events and provided their expertise. We would also like to thank RLDatix, Oracle Health, and JLawry Healthcare Management for partnering with us on this report.

RLDatix, Oracle Health and JLawry Healthcare Management provided sponsorship funding for the roundtables and played a role in shaping the topics of this report, as well as contributing to the discussion. No speakers or contributors have received honoraria for their participation in the roundtables. PPP has supplemented the report with additional research and has retained complete editorial control.

NEXT STEPS

The roundtable discussions formed part of PPP's collaborative programme with Patient Safety Learning, Harnessing technology to enable a system-wide approach to patient safety, which culminates in the annual Patient Safety Forum. This is an evolving programme of work with further patient safety events throughout 2025 and a Patient Safety Forum in early 2026.

We invite all stakeholders with expertise or an interest in patient safety, including health system leaders, industry, clinicians and patient representatives who wish to contribute to this debate please write to Lee Davies, Managing Director, Public Policy Projects (lee.davies@publicpolicyprojects.com) or Helen Hughes, Chief Executive, Patient Safety Learning (helen@patientsafetylearning.org).

Foreword



The future of health and care delivery is increasingly being shaped by digital transformation, offering unparalleled opportunities to enhance patient safety, improve clinical outcomes, and optimise service delivery. Realising these benefits however requires a steadfast commitment to user-centred design, robust leadership, quality assurance process and a culture of continuous learning and improvement. This report underscores the critical role that digital innovation plays in healthcare and the collective responsibility we hold to ensure technology serves as a facilitator rather than risk to safer care.

As digital solutions are integrated into our health and care systems, we must acknowledge the challenges that come with them. Poorly designed, fragmented and unintegrated digital tools can introduce inefficiencies, communication gaps, and unintended risks to patient safety. It is imperative that digital leadership is strengthened at all levels, ensuring that healthcare organisations have the expertise to navigate the digital landscape and advocate for patient safety effectively. Interoperability must also be a priority to improve safety. The NHS's collective buying power should be leveraged to facilitate this, ensuring technology seamlessly integrates across systems and facilitates information sharing for improved decision-making and patient outcomes.

A key enabler of safety is data—how it is collected, analysed, and acted upon. Standardisation and co-designed safety metrics, reflecting how clinicians and patients regard safety, can drive meaningful improvements and foster a culture of transparency. When used effectively, safety data becomes a powerful tool, enabling system-wide learning and ensuring that interventions are targeted where they are needed most. However, this must be done in a way that is not burdensome to frontline staff, allowing them to focus on delivering safe, high-quality care.

The pace of technological change in healthcare is staggering, and as AI, data analytics, and mobile health are redefining the way services are delivered, the integration of technology and safety has never been more critical. Yet, economic pressures and workforce shortages threaten to widen the gap between innovation and implementation. As governance frameworks struggle to keep pace, and digital skills remain in short supply, it is essential that we invest in both the technological and human aspects of digital transformation. Patient-centred care and user-centric design must remain at the core of all innovation, ensuring that technology enhances rather than hinders healthcare.

This report is the culmination of extensive discussions with healthcare professionals, technology experts, policymakers, and those with lived experience. It provides a comprehensive roadmap for embedding digital transformation in a way that prioritises safety and ensures sustainable, long-term improvements in care delivery. The recommendations outlined here are not just theoretical—they are practical, actionable steps that can be implemented.

We extend our sincere gratitude to all contributors who shared their insights, experiences, and expertise to make this report possible. By working together to foster a culture of continuous learning, collaboration, and innovation, we can harness technology to build a safer, more effective, and resilient healthcare system.

Helen Hughes
Chief Executive,
Patient Safety Learning

Youssef Oskrochi
Consultant in Public Health Medicine,
London Borough of Sutton

Tom Micklewright
Clinical Lead for Digital Transformation,
Cheshire and Merseyside ICB, and Medical
Director, ORCHA.

Key Insights

System leadership and user needs

1. To enable scalable digital transformation while maintaining patient safety, technology must be designed and implemented with a user-centric approach. Although there are promising pockets of innovation, technology in the NHS often supports user-needs inadequately.
2. There is insufficient commitment and mechanisms to unite NHS staff, patients and citizens with industry to enable the co-design and co-production of technology. This limits opportunities for the development and implementation of truly user-centric, safe technology into the NHS.
3. NHS leaders, managers and board members require digital and data competencies to advocate for patient safety and enable effective digital transformation. Yet, a lack of understanding of digital technology and data is often tolerated, and although there is progress being made on elevating digital leaders and enhancing leaders' digital skills, this is not widespread across the NHS.
4. Efforts are underway to develop digital clinical safety within organisations, but there have been several reported incidences of direct patient harm related to IT issues across the NHS, underscoring the need for more consistent monitoring of digital systems. A lack of staff capacity and resource, as well as siloed working, means that safety standards are rarely assessed or repeated and there is a lack of holistic oversight of the impact of technology.
5. While there are examples of successful interoperability projects across the UK and legislation is being brought forward to support data sharing, overall there is a lack

of interoperability across digital systems in the NHS. This disrupts the co-ordination of care and places undue responsibility on patients or their carers to bridge gaps in information and care, risking patient safety and exacerbating inequalities.

Patient safety information

1. There is a significant disconnect between NICE guidance and PRSB information standards and the extent to which patient safety is included within them is insufficient. There is a need to unify standards and further embed patient safety within them.
2. Inconsistent patient safety metrics and data collection standards across health and care limit the opportunity to accurately measure patient safety. This in turn limits the ability to close gaps in the understanding of harm and assess the impact of improvement initiatives.
3. The Learning from Patient Safety Events (LFPSE) service generates a significant amount of incident reporting information and has been expanded to support capturing data about how digital systems impact upon patient safety. However, the data is not published transparently and there is a lack of analytical capacity to analyse it. This limits the ability to learn from avoidable harm and near misses, and learning for patient safety improvements is not achieved as planned.
4. A focus on identifying high levels of harm is critical, but lower risk incidents must not be ignored. A 'bi-modal' approach is needed where interventions are developed and implemented in areas of high levels of harm with simultaneous analysis of lower risk incidents including near misses. This could provide insights that if actioned, could significantly reduce instances of avoidable patient harm.

5. Making the NHS a health system capable of learning not only requires actioning insights from data but also requires a cultural shift. Leadership must be kind and empathetic, providing a just and open culture for learning. Obstacles to information and knowledge sharing between and within providers must be overcome. This means that knowledge sharing is first and foremost regarded as a learning opportunity rather than a means to impart blame.
3. The regulatory environment for digital health apps and devices is fragmented and many products fail to meet quality and safety standards, raising significant concerns for patient safety. Patients can gain support from organisations to navigate the digital health landscape, guiding them to credible digital health solutions and health information. However, this is not a substitute for robust standards and regulation.

Digitally enabled citizens

1. The increased usage of digital health technologies, such as wearables and apps, are greatly empowering patients to take control over and manage their own health and health data. This has the potential to reduce pressures on the NHS and enable the delivery of safer, more effective care. However, clinicians find that technologies which are poorly designed and implemented can increase workload burden and exacerbate inequalities in access to care.
2. A lack of interoperability between digital health solutions poses patient safety risks, especially for patients with multiple health conditions and co-morbidities. Solutions must be designed to be considerate of broader care pathways, provide clear informed guidance for users and be supported to address potential adverse interactions between different types of solutions.
4. To capitalise on digital health advancements, the NHS workforce must be better prepared to work with digital health technologies and support patients who are using them to manage and monitor their own health. This must be paired with a cultural shift wherein staff are supported with digital as a fundamental part of their role. Although existing digital education programmes are upskilling staff in pockets around the UK, they must be leveraged and scaled to develop digital education nationally and consistently.
5. Systems and services are increasingly designed to include digital technology solutions, making digital routes a more common access point for people to manage and access their healthcare. Digital poverty presents inherent risks to patient safety if non-digital routes of access are not maintained, and where patients are not supported in accessing digital health services. Access must be multi-modal to remain equitable, or else digital transformation initiatives may inadvertently widen inequalities.

Recommendations

System leadership and user needs

1. To support the adoption of user-centric technology into the NHS, NHS England should ensure that user-centred design, open application programming interfaces (APIs) and best practice interoperability guidelines are embedded within procurement specifications.
2. ICSs should leverage Patient Safety Partners (PSPs) to support and drive user-centricity in the NHS. This should include the involvement of PSPs in the stages of design, procurement and implementation of digital technology.
3. To ensure the design, development and implementation of technology is truly user-centric, a collaborative approach between the NHS and industry, supported by local Health Innovation Networks, is necessary. Developers should be supported to engage a diverse range of end-users across all stages of technology development, including those with lower digital literacy and with staff across a variety of levels, to ensure it meets the needs of all potential end-users.
4. NHS leadership must be held to higher digital and data literacy standards to drive patient safety improvements across the system. Any future legislation brought forward to regulate NHS managers should include standards for digital and data literacy and competency. Both clinical safety and patient safety should be integrated into job descriptions for all NHS leaders, especially those who work with technology and data.
5. Training for decision-makers must be improved to elevate safety standards across the system, with the same emphasis placed on technology literacy as well as the need for competence, training and accountability. The NHS Digital Academy should expand upon its leadership training programmes to develop those for aspirant managers, executive officers and non-executive directors, to improve digital literacy and competency across all levels of leadership.
6. The standards for clinical risk management in the manufacture, deployment and use of health IT systems, DCB0129 and DCB0160, should include patient safety criteria. Assessment against these standards should be regularly repeated after health IT systems are deployed.
7. Any new digital system should have a pre-determined post-implementation evaluation process to assess and monitor its residual risks and impact upon patient safety. Incident reporting should inform the development of learning loops which are monitored by clinical safety officers for them to regularly assess the risk of digital health technologies while they are in use.
8. NHS England should develop a centralised safety framework for NHS organisations to implement locally to guide technology lifecycle management. This should support organisations to track when support for their IT systems expires and include key patient safety considerations for assessing the viability of digital systems. This would help to shift away from inconsistent practices between organisations, helping them to maintain safe, effective and up-to-date systems throughout their lifecycle.
9. Clinical safety functions and patient safety leaders should be brought together alongside governance, data and digital professionals, who may traditionally operate in silos within organisations. This will facilitate shared learning and collaboration to enable a holistic view of the impact of digital systems and to support digital transformation.

10. Due to the patient safety implications of poor interoperability, regulatory oversight of interoperability between digital health technologies should be instated for the NHS.

Patient safety information

1. NICE and the PRSB should collaborate to embed patient safety into clinical guidelines and information standards. Standards and guidelines should be integrated to promote consistency and to make patient safety a core component of record keeping and care delivery.
2. A standardised approach to measuring patient safety is needed across all sectors of health and care to enable benchmarking and holistic analysis.
3. Patient safety indicators should be co-designed with patients and NHS staff to reflect what patients perceive as safe care and ensure streamlined data collection and reporting processes for clinicians and organisational leaders.
4. NHS England needs to dedicate further expertise, reporting and analytical capacity to ensure patient safety data from the LFPSE service is widely accessible. Access to LFPSE databases is needed to enable meaningful insights into incident data, identify risks of avoidable harm and inform improvement action.
5. ICBs should implement safety management system approaches to help identify patient safety risks across the patient journey throughout their healthcare systems, especially during transitions of care. The Patient Safety Collaboratives across the 15 Health Innovation Networks should be leveraged to facilitate a collaborative approach to patient safety at system-level, supporting knowledge sharing across systems and helping to develop a national culture of learning.

Digitally enabled citizens

1. To facilitate truly user-centric design of technology, developers must ensure digital health solutions are considerate of broader care pathways and provide clear, informed guidance to users. Consideration should be made for possible contraindications for those with co-morbidities during the design of technology.
2. The MHRA should enhance regulatory oversight over digital health technologies to more closely mirror regulation for software as a medical device. This would support patients and clinicians to navigate the growing market of digital solutions and ensure clinical guidance is produced for those technologies which require it.
3. The NHS should enable clinicians to prescribe digital health solutions to patients and enable authentication for them via the NHS App. The NHS App should in turn collect data from these apps to enhance the clinical insights available to clinicians to support the delivery of safe and effective patient care.
4. Programmes aimed at developing the digital skillset of NHS staff need to be made more accessible, with NHS staff being supported and encouraged with sponsorship and dedicated learning time from their organisations to attend training.
5. ICSs must ensure that they support digitally disempowered groups to better take advantage of digital opportunities. They must maintain clear and easy ways for members of society without digital access to continue to access health and care services through non-digital channels.
6. NHS organisations should conduct digital inclusion audits for all digital tools introduced into the NHS. This should be considered by NHS England as part of the consultation on the DCB0160 clinical safety standard.

Introduction

The rich and evolving ecosystem of new technologies offers potential to revolutionise the way patient care is delivered, supporting the NHS to become more efficient, productive, cost-effective and importantly, safer. From large scale digital systems such as electronic patient records (EPRs) and virtual wards, to smaller scale wearables and apps, digital technology has the potential to support clinicians and empower patients – and there are many examples of success across the UK.

As the NHS adopts new technologies at pace, and NHS England guidance reinforces the government's 'analogue to digital' shift, the health system is primed to realise the benefits of technology.¹ However, as the Darzi and State of Digital Government reviews point out, the NHS has not been reshaped by platform technologies and is failing to capitalise on their potential.^{2,3}

New technologies also have the potential to support improvements in patient safety, but where they are adopted without care they have the potential to do the opposite. This has been evidenced by rising incidents of harm related to technology as the NHS continues to digitise its services. Investigations have started to surface instances of serious harm related to poorly designed and implemented digital IT systems within the NHS.⁴



£5BN

Cost of harms from claims resulting from incidents in 2023/24

Source: NHS Resolution Annual report and accounts 2023/24



11,000

Lives the NHS fails to save every year due to safety breaches

Source: The NHS Patient Safety Strategy 2019

Further, analysis of patient safety incidents recorded over a decade in England and Wales identified 2,627 individual events identified as related to failures in health IT.⁵ However, as the National Digital Clinical Strategy points out, underreporting of patient safety incidents obscures what is known about the scale of



300

Deaths a week associated with long A&E waits in 2023

Source: Royal College of Emergency Medicine 2024

harm related to digital systems and health IT.⁶ Although progress has been made, incident reporting systems have not traditionally captured digital clinical safety information, nor do they indicate the influence digital systems have on patient safety in the NHS, meaning that estimates are likely to be significantly understated.⁷

The patient safety implications of inadequately designed and implemented digital technology are contributing to broader patient safety challenges and leading to avoidable harm in the NHS. Research informing the NHS Patient

Safety Strategy (2019) suggests the NHS fails to save at least 11,000 lives each year due to safety breaches.⁸ This is considered a significant underestimate, with the Royal College of Emergency Medicine estimating that the crisis in hospital care alone contributed an extra 300 avoidable deaths a week in England in 2023, totalling an associated 14,000 excess deaths over the year.⁹ The financial burden is also significant, with costs resulting from additional treatment following incidents, as well as litigation. The cost of harm for claims resulting from incidents reached £5.1 billion in 2023/24.¹⁰



1/10

1 in 10 patients in high income countries are harmed while receiving hospital care, 50% of which is preventable

Source: WHO Patient Safety 2019

Although guidance, such as the What Good Looks Like (WGLL) framework, exists to support the implementation of technology into the NHS safely and securely, it is not routinely being met across the NHS.¹¹ With the upcoming 10-Year Health Plan continuing to push the digital shift, patient safety must be placed firmly at the

DEFINITIONS



Patient safety: A framework of organised activities that creates cultures, processes, procedures, behaviours, technologies and environments in health care that consistently and sustainably lower risks, reduce the occurrence of avoidable harm, make error less likely and reduce impact of harm when it does occur.¹²

Digital clinical safety: refers to the avoidance of harm to patients and staff as a result of technologies manufactured, implemented and used in the health service.¹³

Clinical safety: Clinical safety is the concept of eliminating unacceptable clinical risk to patients.¹⁴

heart of design, implementation and ongoing use of technology.

This report collates the views of digital, patient safety, and health system leaders, as well as clinicians, patients and policymakers, to consider how patient safety can remain at the forefront of the NHS digital revolution, supporting the NHS to harness the potential of technology which is patient-centred and safe in practice.

System leadership and user needs

USER-CENTRIC DESIGN AND IMPLEMENTATION OF TECHNOLOGY

The NHS is increasingly seeking to digitise services to meet growing demand and create a future proof health system. As the government's own white paper asserts, technology in the NHS must be user-centric in its design and implementation.¹⁵ While there are promising pockets of innovation, a lack of user-centred approaches is creating unintended patient safety risks and preventing well-intentioned solutions from reaching their full potential.

The current technology landscape in the NHS does not adequately support user needs, and this issue starts with decision-making processes around the implementation of technology. Attendees argued that senior leaders often pursue solutions without fully understanding the problems they aim to address. For instance, decision-making around technology procurement and implementation into the NHS often overlooks the fundamental problems facing the health service.

Technology in the NHS is often deployed for cost savings or regulatory compliance without adequate assessment of the impact on end users. To ensure the right problems are targeted, decision-making must shift from top-down, vertical approaches to those which are inclusive, horizontal and engage all necessary stakeholders.

Although the only a small fraction of software procurement occurs via NHS Supply Chain, they are making progress towards more inclusive procurement by engaging with clinicians and patients. As part of its clinical and quality plan, NHS Supply Chain aims to partner with healthcare professionals, and has its own clinical leadership team to support a clinical approach to procurement.¹⁶ Similarly, the patient engagement focus area of its Business Plan will help to ensure technology purchased for the NHS meets the needs of patients and healthcare professionals.¹⁷

However, since framework agreements are the most common way of buying digital products in the NHS, their key technical data and digital standards - which vendors must meet at a minimum - should require products to be user-centric and safe for patients. Some standards, including the Web Content Accessibility Guidelines (WCAG), which exists to ensure web content is accessible to a wider range of people with disabilities, are listed within these frameworks.¹⁸ However, attendees describe current standards as insufficient to enable technology which is truly user-centric.

The Darzi Review identified the progression of platform technologies within the NHS as slow when compared with other industries.¹⁹ An attendee reflected that this is because the NHS designs technology around systems and processes rather than for staff and patients, resulting in technologies that fail to meet user-needs.

Technology must be rooted in reality and the 'so what' must be clear. It's the 'so what' for every member of staff, not just for data reporting for accountability, but how does it help people's lives and help them to do their jobs in the way that they want to. – Industry expert

For technology to be considered 'user-centric', it must be designed to meet the needs of all potential end-users, including NHS staff, patients and citizens more broadly. Both decision-making processes and the design and development of technology must be considerate of this. It is vital that healthcare technology is designed to account for a diverse range of users, including those of lower technological literacy such as the elderly or perhaps those with dyslexia. Healthcare technology must also be designed to anticipate error; otherwise, its implementation will exacerbate digital divides between those more or less digitally literate.

User needs are largely ignored, we know they should be examined for the citizen, patient and the clinician and the workforce. Largely other than talking about it, it doesn't get translated into the design. – **Digital health leader**

Engaging a diverse range of end-users during the design and testing of technology must also include a range of NHS staff levels. The increased involvement of a wider range of clinical staff, such as healthcare assistants (HCAs), who have been historically excluded from decision-making processes, can mitigate against risk by aligning the design of digital solutions more closely to the reality of delivering frontline care.²⁰

I hear that staff are involved in the process, but the HCAs are missed out, the frontline clinical staff are not involved, the staff involvement is often those that have not worked in a clinical area for many years and are senior managers, not the users. – **Patient safety expert**

Inadequate design and testing with end-users can have significant implications for the workforce, potentially reducing time for patient care. An attendee recounted a situation where a new digital system caused nurses to revert to paper-based risk assessments because the technology was poorly designed for their workflow. Further, retrofitting systems to address errors post-implementation is much more expensive for the NHS.

In 2021, NHS Digital (now NHS England) developed a user-centred design maturity model to support the NHS to enable user-centred design capabilities.²¹ The model is helping to advance user-centred design in NHSE but also supports the wider system to deliver on the recommendations of the Laura Wade-Gery report, which advocates for user, patient and citizen-centred approaches to decision-making and service design.²²

NHSE has also taken steps to bring developers and those who use NHS digital products, services and technology, together to collaborate on testing and refining user-centred technology as part of the NHS Accessibility Lab.²³ The Lab aims to support digital healthcare services to become more inclusive and promote best practice in accessible design. However, attendees stressed the importance of usability testing and engaging a range of end-users to simulate technology in a real-world environment to identify flaws and make necessary adjustments before deployment.

Patient Safety Partners (PSPs), who are patients or carers which work with NHS organisations to make it safer, could help to facilitate the implementation of user-centric technology into the NHS. However, they would require oversight from the point of procuring and commissioning technology, and they are often not placed at the right level within their respective trusts to make a significant difference. The remit of PSPs should be reviewed and include their involvement in stages of design, procuring and implementing digital technology.

Supporting the development of technology which is user-centric should be driven by innovation at a system level. The Health Innovation Networks (HINs), which support innovators with practical guidance on undertaking real-world evaluations with care providers to support determining the impact of innovation, provide the ideal vehicle to embed this.²⁴ England's HINs already host 15 Patient Safety Collaboratives across the country, which are designed to bring together networks of organisations to spread good patient safety practice.

Ultimately, although the onus is on vendors to ensure they develop technology which meets user-needs, a collaborative approach is required. Local systems must be able to

signal their needs clearly and developers must be enabled to develop technology which can address them.

An example of where this has been achieved successfully is the deployment of the 'Safe Steps' mobile app by Southwark Council, with support from Guy's and St Thomas' NHS Foundation Trust and Lambeth Council, to prevent and improve the management of falls in the community.²⁵ The project engaged end-users across all stages, from discovery to implementation, which included stakeholders from health, social care and the voluntary and community sectors as well as care residents. Involving a wide range of people in user research was identified as key to ensuring the product was scalable, demonstrating how engaging end-users in the design and implementation of technology is essential to the NHS achieving scalable digital transformation.

This project also engaged with the Manchester HIN to create an evaluation framework to measure staff and user experience. In the long-term, this evaluation framework will also enable providers to measure whether this app is continually fit for purpose in meeting its aims: a reduction in falls and in costs.

Every time tech is deployed, we should be straight away setting out to break it. The sooner we break it the sooner we can make the desired iterations that are required to make it safer by the time it lands with wider end users.
– Digital specialist

An NHS Confederation report found that funding, both revenue and capital, is one of the most significant barriers to healthcare organisations achieving their frontline digital priorities. Additionally, it found that bureaucracy, such as short-term funding

pots and the cost of procurement processes, has prevented systems from implementing frontline digital services at pace.²⁶ One attendee explained that even the most thoughtfully designed technology will fail without sufficient funding and resource. Budget cuts often lead to insufficient staffing and resource, limiting NHS staff capacity for co-design, leading to design flaws, which in turn create safety risks. Policymakers and programme leads must ensure that the implementation process is supported by the necessary funding, infrastructure, and staffing to maximise the potential for success.

As part of an injection of capital investment announced in the Autumn 2024 budget, the government has committed to invest more than £2 billion in 2025-26 for NHS technology and digital to run essential services and drive NHS productivity improvements to free up staff time, ensure all Trusts have electronic patient records (EPRs), improve cyber security and enhance patient access through the NHS App.²⁷

DIGITALLY AND DATA-COMPETENT LEADERSHIP

Ensuring NHS staff are involved in the design and implementation of technology is essential, but technology can only facilitate better outcomes when the workforce is trained and prepared to use it. If digital is to become a component of routine care delivery, its true value can only be unlocked when it is coupled with sufficient digital leadership at the right levels, as well as training, competency and accountability for all staff.

It is not acceptable to just give people loads of technological solutions and procure loads of stuff from vendors to sit it in organisations then pretend that does anything. It only does something if the people using it are trained, appraised and accountable.
– Industry leader

Leadership and boards must be digitally and data-literate to be effective digital transformation leaders, yet in the NHS a lack of understanding of digital technology and data at board-level is often tolerated. As indicated in the What Good Looks Like (WGLL) framework, there should be strong expertise and robust board-level accountability for digital transformation within health and care organisations.²⁸ However, as the State of Digital Government Review highlights, although 80 per cent of NHS trusts have a named Chief Digital Information Officer, only 50 percent of them have a seat on the trust board.²⁹

Attendees drew parallels to the nuclear and aviation industries, where similarly to healthcare, lives are at risk; however, leaders in these spaces are expected to possess the expertise to navigate digital systems and interpret data correctly. As the NHS becomes increasingly digitised, attendees argued that digital and data literacy is no longer optional, and leadership must be held to higher standards.



80%

of NHS Trusts have named Chief Digital Information Officer



50%

of these CDIOs had a seat on the Trust board

Source: State of Digital Government Review 2025

On a FTSE100/250 board you wouldn't have someone on there who is digitally incompetent, so why in the NHS do we still have people on boards who don't understand technology? It's disappointing and needs to change.

– Digital health leader

System leaders require digital and data competencies to advocate for patient safety. Drawing reference to the Thirlwall Inquiry, an attendee highlighted how a lack of digital and data competence among senior leaders can have catastrophic consequences for patient safety. They explained that in this case, clear safety risks were overlooked because decision-makers were unable to correctly interpret readily available data. Calls have since been made for the regulation of NHS managers, and the Department of Health and Social Care (DHSC) has opened a consultation seeking views on this.^{30, 31} Any future legislation brought forward to regulate NHS managers should include standards for digital and data literacy and competency.

Part of the problem is that system leaders often don't recognise their role in clinical and patient safety. These responsibilities should be integrated into job descriptions for all leaders – especially those dealing with technology and data. Further, attendees noted that the NHS typically lacks assertiveness in managing situations where data incompetence is demonstrated, further perpetuating the issue.

There are existing programmes which aim to support leaders to develop their digital skills, such as those offered by the NHS Digital Academy. The academy offers courses including the Digital Health Leadership Programme (DHLP), which addresses the need to develop and invest in the capability of digital change leaders. This programme is specifically aimed at those who hold leadership roles for digital and/or the digital workforce in their organisations. There are also programmes for ICB leaders

and trust boards.³² Further, as part of NHS England's Digital Clinical Safety Strategy, an intermediate training package specifically for senior leaders has been developed for specifically improving digital clinical safety.³³ However, for the NHS to see the benefits of these programmes, staff must be encouraged and sponsored by their organisations to attend.

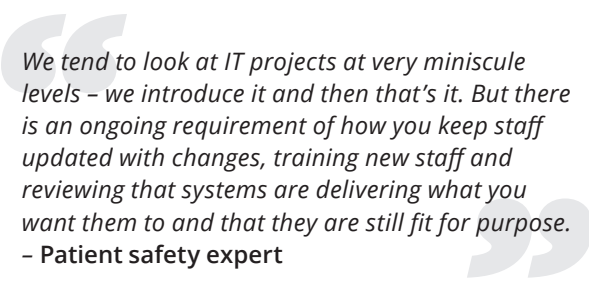
Although progress is being made with digital capability training programmes, offerings are clearly falling short of what is needed to sufficiently train leaders to improve digital and data competency across the system. Attendees argued for robust training packages for aspirant managers, executive officers, and non-executive directors, and an end to the NHS's tolerance of poor digital and data competence. Further, to clarify lines of accountability and responsibility, attendees called for comprehensive accountability frameworks for improving safety.

RESIDUAL RISK AND MONITORING

The introduction of technology into the NHS can enhance safety and reduce clinical risks, but it also introduces residual risks post-implementation. The more systems that are implemented and interconnected, the higher the risk of cybersecurity threats. The WGLL Framework illustrates that to maintain standards for safe care, organisations should be routinely reviewing digital and data systems to ensure they are safe, robust, secure, sustainable and resilient.³⁴ However, once technology is implemented within NHS organisations, residual risks are rarely assessed.

Organisations must ensure digital systems meet the clinical safety standards set out by DTAC, DCB0129 and DCB0160 (the Digital Technology Assessment Criteria, and standards for clinical risk management in the manufacture, deployment and use of

health IT systems, respectively).³⁵ However, tests against these standards are typically performed pre-implementation but are rarely repeated after systems are deployed. In situations where these are repeated, attendees added that staff are rarely given the time or resources required to do them effectively. These reassessments are necessary, as by the time large systems, such as those for EPRs, are implemented, they may have an altered risk profile.



We tend to look at IT projects at very miniscule levels – we introduce it and then that's it. But there is an ongoing requirement of how you keep staff updated with changes, training new staff and reviewing that systems are delivering what you want them to and that they are still fit for purpose.

– Patient safety expert

The need for more regular post-implementation reviews to assess the patient safety risks of IT systems was underscored by a 2024 BBC investigation which found 126 instances of serious harm linked to IT issues across 31 NHS trusts, including three deaths.³⁶ Similarly, in 2024 at least two patients suffered long-term or permanent damage to their health due to a cyber-attack on an NHS pathology provider.³⁷ This highlights the direct patient harm which can occur due to unsecured digital systems, and demonstrates the critical need for more consistent monitoring of said systems. A report by Patient Safety Learning, documenting how patient safety should be embedded in each stage of introducing an EPR system, recommends that once an EPR is in place, monitoring how it is operating in practice and learning and acting on any risk assessments, incidents, or near misses that take place, are critical for addressing patient safety risks.³⁸

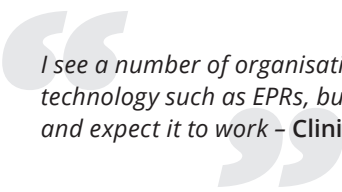
Patient safety is negatively impacted by siloed working in the NHS, as silos create barriers to the effective risk management of new

technologies. To more consistently monitor digital systems, some organisations are creating digital and safety committees which convene clinical governance, digital and data professionals to triangulate data and identify patterns where digital systems may be causing harm. The NHS Digital Clinical Safety Strategy has made progress on developing digital clinical safety within organisations. For example, by developing an innovative ‘train the trainer’ pilot to train digital clinical safety professionals as trainers, regions are able to increase their number of Clinical Safety Officers (CSOs).³⁹ This will in turn support systems to develop an adequately resourced clinical safety function. However, clinical safety professionals should be brought together with patient safety specialists and leaders within organisations, as well as clinical governance and other digital and data professionals. Bringing together members of staff who traditionally operate independently facilitates shared learning and collaboration to enable a holistic view of the impact of digital systems, reducing the residual risks of technology causing harm.

However, this is not widespread across NHS organisations; one attendee pointed out that some trusts are investing in these teams but for most it is optional, and so many trusts are still implementing systems in isolation, without a strategic and holistic view of their potential impact. To address this, an attendee reasoned that there must be a model for what digital teams should look like within organisations, as without this, the NHS will not be set up for successful digital transformation.

The need to invest equal time and effort into staff as the process of procuring and rolling out technology is echoed by a blog post by an ICB digital leader, who wrote that without engaging people in the project lifecycle of EPRs, providers will struggle to realise the benefits outlined in NHS England’s Frontline Digitisation Programme. They called for sufficient time and

investment into operational and clinical teams as well as patients to support a more positive user experience.⁴⁰



I see a number of organisations who purchase technology such as EPRs, but we can't just put it in and expect it to work – Clinical director

Similarly, where IT is introduced with minimal follow-up, this may also neglect ongoing requirements for staff training. For example, new staff joining organisations may not receive adequate training to utilise IT systems as part of their onboarding. Therefore, part of more regularly reviewing IT systems should also involve ensuring that staff are adequately trained and supported to use them. This is also supported by research highlighting that continuous training and support is necessary for the use of EPRs, as poor implementation may place additional cognitive load upon clinicians, contributing to burnout and risks to patient safety.⁴¹

The disposal and replacement of outdated technologies are also often overlooked, leading to equipment operating beyond its life expectancy, creating risks to patient safety. The consequences of outdated systems was demonstrated by the WannaCry ransomware attack in 2017, where failures to upgrade older computer systems contributed to the rapid spread of the attack.⁴² Contributing to this issue is the fact that the public sector has a narrower definition of ‘legacy’ systems than the private sector, according to the State of Digital Government review.⁴³ Based on survey responses conducted as part of the review, 10-50 per cent of technology estates are classified as legacy across NHS trusts (the private sector would consider this proportion to be even higher). To mitigate the patient safety risks of outdated systems, organisations should be tracking when support for their IT systems expires and include patient safety as a consideration when assessing the viability of legacy systems.

Attendees called for a centralised safety framework which organisations can implement locally to guide technology lifecycle management in health and care settings from NHS England. This should provide standard operating procedures to outline what is needed from the introduction, maintenance and disposal/decommissioning of technology systems to ensure risk mitigation is considered across all stages of its lifecycle. The framework should include key considerations, stakeholder involvement and timelines for system replacement. Such a framework would support a shift away from inconsistent practices between NHS organisations, as well as ensuring accountability for health and care providers. Doing so will help organisations to maintain safe, effective and up-to-date systems throughout their lifecycle.

INTEROPERABILITY AND INFRASTRUCTURE

Interoperability, in a health system context, is the ability for seamless data sharing between systems to support informed care decisions.⁴⁴ In the NHS however, the lack of interoperability between digital systems creates significant challenges for patient safety.

Attendees described NHS digital systems as “*fragmented*” and their inability to communicate often leading to inefficiencies, delays and risks to patient care. Issues can occur between sectors of healthcare but also between different departments within the same hospital if they are using different digital systems. As one attendee described, “*when someone comes into the emergency department and their casualty card notes don’t follow them to the intensive care unit (ICU), they end up being treated in the ICU without full information on the system*”. The inability of systems to ‘talk’ to one another therefore disrupts the co-ordination of care and can increase patient safety risks.

Different parts of digital systems work but are useless because they are not connected to something else. That for me is the biggest problem - interoperability - systems not talking to each other.
– Safety and learning lead

The lack of interoperability between NHS digital systems also places undue responsibility on patients, or their carers, to bridge gaps in care. For instance, patients treated at multiple hospitals with different EPRs may have more information than their providers, leading to the patient becoming the ‘integrator of their own care’. This is echoed by the State of Digital Government review, which explains that managing a long-term condition or disability can require interaction with more than 40 services across 9 different organisations.⁴⁵

Patient portals, such as the one developed by Patients Know Best (PKB), can support the interoperability challenges described above by supporting patients to keep health records in one place. Such portals can support patients to take control over their healthcare information and determine who can view it with privacy and consent settings. This would also support an objective of the WGLL framework to ensure ICSs have a system-wide approach for people to access and contribute to their health and care data.⁴⁶ However, although uptake is increasing, access to patient portals is not widespread across England.⁴⁷

We should empower patients to recognise what’s important and to show the right people. Even though I know ideologically that shouldn’t be what happens, I think recognising the interoperability problems we have means we should do that.
– Safety and learning lead

Empowering patients to take further control over their healthcare information must be accompanied by sufficient guidance, education and support. Attendees described a culture

where staff may not be receptive to a knowledgeable patient providing them with information and may be dismissive of that information even if it is pertinent. Attendees articulated the need for a culture shift toward more collaborative and person-centred approaches to care. For example, NHS England's person-centred care framework highlights that care which is co-produced by individuals and NHS staff working in partnership will in turn provide better patient outcomes.⁴⁸ However, empowering patients to understand key health information should not be a substitute for effective system-wide interoperability.

My mum has six different organisations for care and none of them are connected, the only conduit is me who lives 100 miles away.

– Patient safety expert

Poor data sharing between care providers can also lead to the misuse of information by patients. When patients receive results or discharge summaries ahead of their GP, they may self-diagnose using online resources. Further, relying on patients to navigate gaps in communication risks exacerbating inequalities, as patients with lower health and data literacy are less likely to understand the appropriate information to share with providers, or to advocate for the appropriate treatment for them.

Considering its potential impact upon patient safety, interoperability should be a key component of regulation. A 2020 study recommended that on this basis, since patient safety and quality of care falls within the remit of the CQC, it should provide regulatory oversight of interoperability.⁴⁹ However, while the Dash Review investigating the patient safety landscape remains to be published, the future of the regulatory environment surrounding health and social care remains to be determined.⁵⁰

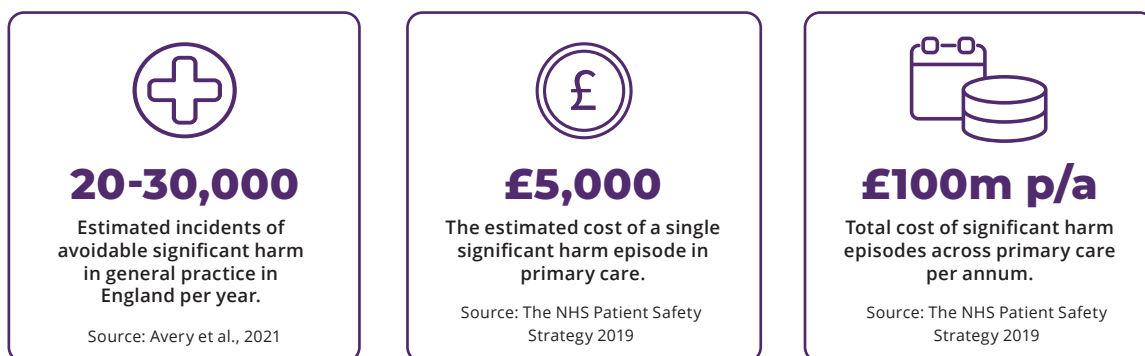
Since the NHS is composed of many autonomous organisations making independent procurement decisions, different technologies are implemented which may lack interoperability. However, there are existing standards which aim to support the NHS in achieving interoperability, such as the digital technology assessment criteria (DTAC).⁵¹ Attendees explained that interoperability should be considered when NHS organisations are procuring digital solutions as part of the DTAC, but many NHS organisations lack the resource to conduct a full DTAC assessment, prompting calls for centralised oversight of DTAC by NHS England.

Last year I did a review of social prescribing link workers and discovered that they used eight different systems in one day when managing patients and only one of those talked back to their GP system in some limited form.

– Digital specialist

England's ICSs are well placed to improve interoperability at local system level. They have taken on responsibility for system-wide digital transformation by delivering their own respective digital strategies, many of which include interoperability projects. For example, initiatives such as OneLondon, which spans the five London ICSs and connects health and care professionals to the London Care Record, is a type of shared care record providing up-to-date patient information aggregating data from different parts of the NHS and social care in London.⁵²

Additionally, the Data Use and Access Bill, announced by the Department for Science, Innovation and Technology at the end of 2024, will require IT suppliers to ensure their systems meet common standards to enable data sharing across platforms, supporting system interoperability. The legislation aims to make patient data accessible in real time across all NHS trusts, GP surgeries and ambulance services, regardless of the IT system in use.⁵³



While progress is ongoing, attendees called for oversight and effective governance to ensure that interoperability is a core component of procurement frameworks. An attendee explained that the NHS must leverage its buying power to ensure that vendors deliver interoperable solutions. For example, procurement should be better leveraged to encourage the purchasing of digital health technologies that embrace open application programming interfaces (APIs) and conform to best practice interoperability guidelines. However, there is a significant chance the upcoming NHS 10-year plan will make policy commitments regarding the interoperability of digital systems. This would support greater alignment between digital procurement strategies and NHS-wide interoperability.

NHS England has a role to play to ensure interoperability by saying that if vendors want to be on their framework, the system being procured should talk to other systems (current and planned). If it doesn't, they shouldn't get on. That's the buying power of the NHS and we need to use it.
– Patient safety expert

Inadequate hardware and outdated IT infrastructure also routinely hinder the delivery of modern, safe, and efficient healthcare across the NHS. Backlog maintenance currently totals near £14 billion which not only directly impacts patient safety but limits scope for digital transformation.^{54, 55}

Digital infrastructure challenges are particularly present in primary care, which handles 90 per cent of NHS patient contacts yet receives under 10 per cent of the budget.⁵⁶ An attendee described GPs as often working remotely from laptops which barely function, exacerbating risks to patient safety. Similarly, without sufficient core digital infrastructure, patient safety risks and incidents are more difficult to spot.

There are an estimated 20,000 - 30,000 incidents of avoidable significant harm identified in general practice in England per year.⁵⁷ A single significant harm episode in primary care is estimated to cost £5,000, resulting in a total cost across primary care of over £100 million a year.⁵⁸ However, the government have committed £100 million to upgrading GP estates, which should support addressing patient safety incidents associated with outdated digital hardware and infrastructure.⁵⁹ Supporting primary care with adequate digital infrastructure and IT will also be essential if the government are to realise their ambition to move care closer to home.

I think the digital risk is not so much about the software, interoperability, the digital divide, which are all important topics, but they are much less dangerous to patients than the digital hardware and the building we are working from and the working conditions 11-12-hour days.
– GP

Patient safety information

PATIENT SAFETY AS A FUNDAMENTAL COMPONENT OF HEALTHCARE

Patient safety should be considered a strategic priority by local systems. Currently, patient safety is not explicitly and consistently integrated into clinical guidelines or information standards. This represents a missed opportunity to embed patient safety within routine care and record-keeping.

An attendee explained that neither NICE, which provides clinical guidelines, nor the Professional Record Standards Body (PRSB), which provides health and care information standards, include 'what could go wrong' as a top-level section in their specifications. For example, information standards for maternity care lack explicit sections which indicate potential patient safety risks.

In contrast, attendees described the standards utilised for digital health technologies and noted that the use of hazard logs as part of DCB0129 and DCB0160 standards allow for risks to be qualified and quantified; providing both a clear oversight of 'what could go wrong' but also allowing mitigating actions to be designed and implemented to reduce the risks. Similar approaches should be considered for clinical practice and information standards more broadly to support embedding patient safety as a core component of routine care and record-keeping.

However, while this process exists for digital health technologies, attendees highlighted significant patient safety gaps in DCB0129 and DCB0160, the clinical risk management standards for health IT systems discussed previously. These standards do not make direct reference to 'patients' or 'patient safety'. There is a need to clearly define the distinction between clinical safety and patient safety, making sure that patient safety is also a fundamental component of these standards.

With an NHS England consultation currently underway on the DCB standards, attendees called for a stronger patient safety focus. Ultimately, patient safety should be at the core of both standards and risk assessments, to ensure safer health and care delivery.

We should be saying: this is what good care looks like, this is what you record when delivering that care, and this is what you look for in the records when you do that care. – Healthcare data expert

There is also a significant disconnect between existing standards, as NICE provides definitions of good care, and the PRSB defines what good records should look like, but these are not integrated. This highlights the need to bring standards and guidelines together to make record-keeping an integral part of safe care.

To address this gap, organisations must collaborate to deliver consistent and pragmatic definitions. This is critical to reduce the levels of conflicting advice present in different guidance employed by organisations. Embedding patient safety into unified standards and guidelines to promote consistency across organisations is necessary to make patient safety a core part of health and care delivery.

Patient safety is not just a fundamental component of healthcare but is a shared responsibility which transcends all disciplines. – Digital health leader

STANDARDISING PATIENT SAFETY DATA

To identify opportunities for improving patient safety, data collection and standardisation is essential. This helps to enable accurate measurement and holistic analysis. However, evaluating patient safety presents inherent

challenges. For instance, an attendee noted that determining the likelihood or severity of patient safety risks can be difficult, due to the following reasons:

1. Patient safety risks have not been measured
2. There is a lack of clarity about what should be measured
3. Data is collected but its meaning is not understood
4. Reluctance to measure patient safety

The ambiguity around what constitutes risk to patient safety hinders the ability to identify and mitigate against such safety risks effectively. Without data and metrics, the health and care sector will struggle to close gaps in the understanding of potential harms and be limited in their ability to improve patient safety.

One of the challenges to measuring patient safety is that there are inconsistent data collection standards across health and care. For example, a representative from the independent healthcare sector explained that it can be difficult for them to contribute to national datasets due to restrictive data submission requirements. Similarly, within the NHS, attendees described discrepancies in the levels of patient safety guidance between primary and secondary care, with fewer established safety metrics in primary care compared to secondary. This lack of standardisation can create barriers to developing a unified approach to patient safety. System leaders must develop a co-ordinated strategy across all sectors to establish consistency in how patient safety is measured.

In secondary care there is some guidance of what good care looks like from a safety perspective, there are a few established markers such as falls infections etc but in primary care there is a huge gap. – Digital health leader

The importance of reliable and consistent baseline data was highlighted in reference to a multi-professional training programme for maternity teams deployed across NHS Wales (PROMPT Wales). This initiative coordinates several harm reduction strategies and data has demonstrated that following its introduction and completion of other programmes, there was a 33.8 per cent reduction in severe postpartum haemorrhage and a 43.5 per cent reduction in term APGAR scores <7 at 5 minutes. While the safety improvements are linked to improvements across the service as well as directly attributable to the learning outcomes, this improvement was only measurable due to consistency of data collection and standardisation of these metrics. These statistics demonstrate improved patient outcomes, and should act as a catalyst for culture change, motivating further learning and patient safety improvements.

However, standardising how data is collected and reported across the health and care system is not without its challenges. Attendees noted a prevalent ‘culture of variation’ across the NHS, which they felt is re-enforced by optional guidelines, rather than mandatory standards.

“That standardised care pathway approach with data and analytics, the culture challenge of variation and its sustainability. If we are one NHS, why can’t we standardise for safety.”

– Patient safety leader

Attendees also stressed the importance of involving the patient perspective when developing patient safety indicators and metrics. One attendee explained, *“there is a need for us to develop patient centric, co-designed safety indicators, which not only match our perception of what safety is, but what our patients perceive as safe care.”*

Involving the patient's voice will also ensure safety indicators support better patient outcomes, while addressing risks which may otherwise be overlooked.

While data collection and reporting are essential for measuring patient safety, they must be seamless and integrated into clinical workflows; processes must be designed to balance the practicalities of delivering frontline care. New processes must first be piloted to support the integration of data collection into existing workflows, supporting patient safety improvement without adding unnecessary pressure to health and care professionals.

ESTABLISHING A PATIENT SAFETY LEARNING LOOP

Standardised data collection supports the development of a 'learning loop' for patient safety; where insights can be generated from data by identifying patterns and issues which need to be addressed. In turn, these insights inform plans for improvement and support the development of interventions which can be deployed and monitored, creating a feedback loop.

Achieving feedback loops to enable a culture of learning is currently supported by the Learning from Patient Safety Events (LFPSE) service, which is the national infrastructure for incident reporting in England. With regards to digital clinical safety, progress has been made to support capturing data about how digital systems impact upon patient safety.⁶⁰ The LFPSE system now captures digital clinical safety information and has three new digital clinical safety specific fields for certain types of incidents. Further, there is a national process in place to ensure routinely collected patient safety data is reviewed by digital clinical safety experts in the same way that all other safety incidents are reviewed.⁶¹

However, attendees described that the data from the service is often published too late, and

there is a lack of analytical capacity to extract valuable insights from LFPSE service data, which is creating challenges to instituting effective safety learning loops for digital clinical safety as well as patient safety more broadly. A report by the Health Services Safety Investigations Body (HSSIB) echoes this, finding that usability challenges with LFPSE service data mean that system-level risks may not be visible to ICBs and the wider and health and care system.⁶²

These challenges are also described by the Sudlow Review, which points out that the UK has rich and abundant health data due to the single-payer system in the NHS, yet there is a lack of accessibility for analysis and research which holds back progress that could improve lives.⁶³ The review recommends the establishment of a national health data service and a coordinated joint strategy to recognise England's health data as critical national infrastructure. However, without sufficient expertise and systematic processes for analysis, opportunities to learn and improve are missed. The recommendations of this review should be implemented alongside sufficient investment into NHS technical capabilities for data analysis, which will be vital for transforming patient safety data into meaningful action.

We collect and report 1.2 million incidents a year, the dataset has about 20 million incidents but there isn't any obvious analytical capacity to enable us to learn from that.

– Patient safety leader

An example of where a learning loop has been developed successfully is the Once for Wales Concerns Management System (OfWCMS), which is a centralised data system triangulating incidents, complaints and claims data across all health bodies in Wales. Since data collection across all three metrics has been made uniform within all health organisations, the data can be analysed holistically, and trends can be

identified, with no mapping of definitions needed. This has promoted shared learning and improvements, contributing to better service quality and reduced harm. The framework can also be replicated in other healthcare systems to unify and optimise incident management, feedback collection, and data analysis. Attendees discussed the feasibility of deploying such a framework at ICS/system level in England.

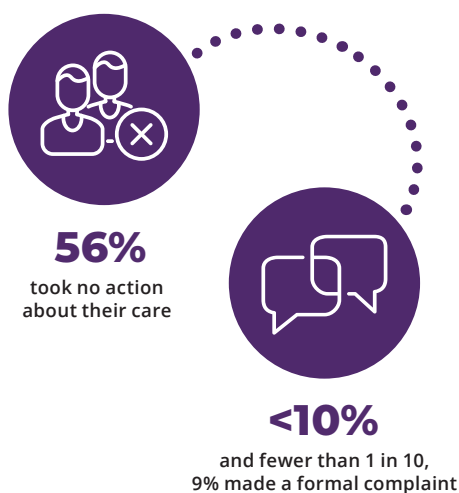
The importance of establishing cycles of learning and improvement from complaints is emphasised by research undertaken by Healthwatch England, which found that out of 2,650 adults living in England who had poor experiences of NHS healthcare, over half, took no action about their care, and fewer than one in 10, made a formal complaint.⁶⁴ One of the barriers to doing so was that around a third of respondents didn't believe the NHS would use their complaint to improve services. This

reinforces the importance of feedback loops, as they demonstrate to patients that their complaint data is being listened to, to ensure that people continue to come forward when things go wrong.

ICSs have a system-wide view which uniquely positions them to identify patient safety risks which occur across multiple providers and during transitions of care. The opportunity to introduce safety management system principles at ICB level has been highlighted by the HSSIB, in their Safety management: accountability across organisational boundaries report.⁶⁵ The report recommends that ICBs *"develop their patient safety capability and expertise to ensure they can effectively analyse safety data and intelligence about patient safety risks"*. However, the report points out that although ICBs should support coordination of incident responses across systems, some said they don't have the capacity to do this. Patient Safety Collaboratives (PSCs), which are established structures as part of each Health Innovation Network, could be further leveraged as the vehicle through which a collaborative approach to patient safety is developed at system-level, where knowledge from across ICBs can be shared. In turn, this would help to develop a national culture of knowledge sharing and learning from patient safety risks and incidents.

Despite opportunity there is a need for a realistic approach to introducing system wide patient safety improvements. Restricted budgets and ever-increasing service pressure will limit capacity for system wide transformation. Local systems must harness the data which indicates most medium and high-severity incidents, and deep-diving into these areas, creating improvement interventions and delivering these. PROMPT Wales is an example of this, where harm to women and babies, a high level of litigation costs and significant public interest were

Healthwatch England's poll conducted by YouGov found that out of 2,650 adults living in England who had a poor experience of NHS healthcare



Source: Healthwatch England, A pain to complain 2025

identified in the maternity sector and an effective intervention was delivered in a collaborative and coordinated manner.⁶⁶

However, while it is important to maintain focus where high levels of harm are being demonstrated through data, lower risk incidents must not be ignored. As one attendee referenced the 'Rose' or 'Prevention' paradox, where high risk activities happen to fewer people and low risk activities happen to a lot of people, which creates high levels of cumulative harm but is more difficult to identify. To address this, an attendee described the concept of a 'bi-modal' approach to addressing patient safety concerns, where interventions are developed and implemented in areas of high levels of harm, while simultaneous analysis of those lower risk incidents are considered equally and are addressed.

CULTURAL ENABLERS

Establishing 'learning loops' for patient safety fosters cultural and behavioural changes that drive continuous improvement. PROMPT Wales serves as a successful example, demonstrating measurable improvements in patient outcomes through data, with more possibilities if greater data streams are measured accurately. These results can inspire and motivate the workforce, encouraging further cycles of learning and improvement. As one attendee explained, *"it is evidence-informed decision-making for patient safety – using outcomes as a baseline, building on them, and leveraging each cycle to generate enthusiasm for further action."*

Creating a patient safety learning culture will require the NHS to overcome obstacles to information and knowledge sharing between and within providers, including removing blame culture and truly embracing freedom to speak up principles. However, a 2024 report by Patient Safety Learning identified persistent blame cultures and a fear of speaking up as significant issues.⁶⁷ This was highlighted

in reference to the 2023 NHS Staff Survey, which revealed that 40 per cent of staff lacked confidence that their organisation would treat them fairly if they were involved in an error, near miss, or incident.⁶⁸

Kind and empathetic leadership is required to support open communication and a health system capable of learning. One attendee summarised this vision: *"There needs to be a contract between patients, clinicians, and systems, ensuring that raising a patient safety issue is met with a caring approach focused on learning, rather than blame."*

Further, attendees stressed that accountability for patient safety incidents must extend beyond individual care providers to include workflows, systems, and organisational cultures. For instance, in the case of technology, failures in IT infrastructure must be analysed to ensure comprehensive learning from incidents. A culture of transparency will support a shift in the focus from individual blame to systemic issues, enabling actionable improvements.

Encouragingly, attendees noted progress in England, where changes are being implemented to improve the quality of investigations. These changes are aimed at identifying contributing factors, rather than assigning blame to individuals. This will help to further support transparent learning from incidents, rather than blaming those involved, to drive meaningful improvements in patient safety.

An attendee articulated their vision for what the health system could look like in five years' time:

"I want to work in a system that prioritises patient safety, is digitised with strong interoperability, and uses data to measure and improve outcomes. This system would integrate patient care and safety across all health and social care providers, fostering a culture of listening and acting on concerns." – Patient safety expert

Digitally enabled citizens

DIGITAL HEALTH TECHNOLOGIES: OPPORTUNITIES AND RISKS

Digital health technologies, such as wearables and apps, are revolutionising healthcare by empowering patients to self-monitor and manage their own health conditions. For example, continuous glucose monitoring (CGM) technology allows diabetes patients to monitor their blood glucose levels without needing to prick their fingers, making the process less painful and more manageable.⁶⁹ Similarly, epilepsy patients can use technology to alert others when they experience a seizure. These digital innovations are supporting patients to become more engaged, self-sufficient, and ultimately, safer.

Initiatives such as the Widening Digital Participation programme, delivered by the Good Things Foundation and NHS England, have demonstrated that supporting people with their digital health skills helps people to feel more informed and supported to manage their own health.⁷⁰ Patients who are empowered to take control over and manage their own health are also less likely to visit A&E or their GP. In turn, by empowering patients, digital health technologies support individuals

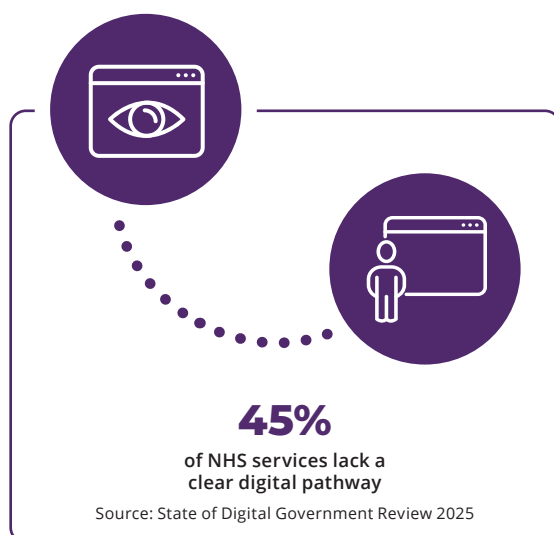
to live healthier lives while reducing the burden on the health and care workforce. When leveraged appropriately, they offer the opportunity to reduce pressure on the NHS, supporting its long-term sustainability.

Further, The Good Thinking service is a city-wide digital mental wellbeing service spanning across Greater London and provides 24/7 mental health support to all Londoners. This is a joint effort between all five London ICBs and has supported over 700,000 people to tackle their mental health concerns, demonstrating how digital health platforms can increase capacity within the system and empower patients to look after their own health.⁷¹

However, attendees described that the reality of the increasing usage of digital technologies such as wearables and apps is adding additional burden to health workforces, particularly in primary care. Attendees described cases of patients visiting the doctor because their wearable device suggests they are ill, but they otherwise feel healthy. A particularly common issue arises when smart watches detect irregular heart rhythms which are then often found to be irrelevant, especially in younger patients. Similarly, although the democratisation of medical knowledge through the internet can be positive and support individuals to take charge of their own health, 'Dr Google' can lead patients to believe that mild symptoms indicate severe conditions.

These situations can create additional work for healthcare professionals, as well as unnecessary anxiety for patients. These issues can also exacerbate healthcare inequalities, as the 'worried well', and individuals who better understand how to access health and care services, take up more appointments.

Research undertaken by the PRSB and the Patient Information Forum (PIF) investigating digital health portals (websites, apps and



online consultations), found that although user feedback is generally positive about portals and efficiency benefits are beginning to be seen, clinicians do not yet see their benefits and digital work is perceived as extra workload rather than a change in the model of care.⁷²

Further, the lack of interoperability of technology and digital health apps poses inherent risks. For instance, patients with multiple health conditions may use separate apps that do not communicate with each other, leading to contradictory advice. A diabetes app may recommend foods that have a high-salt content, while a hypertension app advises low-salt diets, putting the patient at risk. Unlike the British National Formulary (BNF) for drug interactions, there is no system exists to address adverse interactions between digital technologies.

With the population of individuals with co-morbidities growing, developers must ensure digital solutions are interoperable, considerate of broader care pathways and provide clear, informed guidance to users - perhaps by including alerts around contra-indications for those with co-morbidities.

The potential of digital health technologies needs to be balanced with their risk of harm. While empowering, these tools can create unintended consequences if not designed and delivered in combination with sufficient support and education.

REGULATION AND ASSURANCE OF DIGITAL HEALTH TECHNOLOGY

Many health apps and devices on the market fail to meet quality or safety standards, raising significant concerns for patient safety. An attendee quoted that there are over 350,000 health apps available, yet only 20 per cent pass quality thresholds. Further, it is often unclear to the public which technologies are classed as devices, and subject to stricter regulation, compared to those which aren't. Further, wearables that do not explicitly claim to be medical devices cannot be used to inform clinical decision making.

Regulatory frameworks that do exist are not sufficiently robust, which in some cases allow private enterprises to introduce products onto the market which fail to meet acceptable regulatory and safety standards. However, this issue has started to be addressed for digital mental health technologies, where the MHRA has produced guidance to support manufacturers to identify whether their product would be classed as a software as a medical device (SaMD), and therefore subject to regulation as such.⁷³

The regulators are failing, they are not tackling some of the people who are trying to sell goods and services for way below the safety level we would want – we are talking about devices for patients which could end or save their lives.
– Patient safety partner



>350,000

Available health apps

Source: IQVIA



>90,000

Apps released in 2020 alone

Source: IQVIA



No correlation between user ratings or app downloads and objective quality measures of user experience, data privacy and professional/clinical assurance

Source: Hyzy et al., 2024

Considering the fragmented nature of the regulatory landscape, attendees pointed to organisations which exist to plug gaps and support patients. Groups such as the Organisation for the Review of Care and Health Apps (ORCHA) and the PIF help to guide patients in identifying safe and credible digital health solutions and health information. For example, the PIF TICK certification scheme provides a trustworthy label to approved health information sources.⁷⁴ Although greater public awareness of this work is important and will help to keep patients safe and well-informed, it is not a substitute for a robust regulatory environment.

The NHS could also support patients by recommending certain digital health solutions and enabling clinicians to prescribe them. An attendee suggested that this could be enabled by authentication for them via the NHS App, and in return the NHS App could collect data from these apps. This would help to enhance the clinical insights available to clinicians, supporting them to deliver better patient care.

Some digital health technologies that are available direct to consumer would benefit from clinical guidance, advice or supervision. Attendees described how a tiered regulatory system for digital health technologies, similar to that for software as a medical device, could improve oversight and safety. A more structured approach to managing the diverse landscape of digital health technologies would also enhance patient safety and reduce confusion. This would help both patients and clinicians navigate the growing market solutions and ensure clinical guidance is produced for those technologies which require it.

Attendees also stressed the importance of international collaboration and co-ordination on regulatory standards. The International Medical Device Regulators Forum facilitates collaboration between authorities like the American Food and Drug Administration (FDA)



and the British Medicines and Healthcare products Regulatory Agency (MHRA) to harmonise regulatory standards. However, post-Brexit, the MHRA has faced significant resource and capacity challenges. An attendee highlighted the need for a well-resourced regulator and explained that rumoured plans to reduce the size of the UK civil service would potentially exacerbate this issue. The UK risks falling behind in safeguarding patient safety in the context of a rapidly evolving global market.

DEVELOPING DIGITAL SKILLS

As the digital transformation agenda develops and digital solutions increasingly become a central component of healthcare delivery, a digitally literate workforce, as well as leadership (discussed in chapter 1), able to work with data and technology, is essential to maintain the safe and effective delivery of care.

Attendees pointed out that medical training is currently not preparing health and care professionals for patients who are beginning to monitor their own conditions through wearables and devices. They highlighted the need for the workforce to be better prepared for understanding how to navigate healthcare delivery where highly activated patients

are utilising wearable data to support their health. However, as mentioned above – not all wearable devices produce data which can be utilised to support clinical decision-making, which must be made clear to both staff and patients.

Those who haven't had any contact at all with digital may suddenly have a digital device and don't really understand it because there isn't much training. If you go to most trusts and you walk up to any nurse and you ask when the last time they had IT training on anything they are using, they would say it's been a while.

– Healthcare consultant

A lack of digital skill among the NHS workforce puts the healthcare system on the back foot when it comes to procurement, as one attendee noted: *"we don't have dedicated people who understand the industry so when we purchase technology we don't know if we are talking the right language or if we are getting a good deal"*. In turn, this means the right questions aren't being asked of technology before its implemented. The attendee highlighted what can happen consequently: *"There was a maternity system which overwrote data instead of saving it, and we've lost loads of patients records on that potentially. We should have known about that before we put it onto the system. That to me seems a fundamental issue. Nobody noticed it or even asked about how the data is kept and saved"*. Further, a lack of digital capability can re-enforce blame cultures, as without having the right staff to investigate technology when an incident occurs, there is a higher likelihood that staff end up being blamed for errors.

There are examples of insulin pumps not being coded correctly and they give the wrong dose when people use them, it's not the device that gets blamed it's the nurse doing it because it's assumed the device works – Digital health leader

There are on-going efforts across England to digitally upskill the NHS workforce. An attendee pointed to the West Yorkshire Digital Ambassadors Programme as an example. This is a collaborative project between West Yorkshire Digital Primary Care Collaborative and Health Innovation Yorkshire and Humber, which aims to strengthen the digital innovation, transformation and improvement skills of the primary care workforce.⁷⁵ Similarly, DigitalHealth.London runs a Digital Pioneer Fellowship programme to empower individuals employed at any level within NHS, local authority and voluntary sector organisations.⁷⁶

Although these programmes are delivering crucial work in their respective regions, there is no national basis for digital training in the NHS. Attendees pointed out that these programmes can also be challenging for health and care staff to secure a place on, and when they do, they are not necessarily given the time and capacity to complete them. This issue was recognised by the Midlands Partnership University Foundation Trust (MPFT) Digital Training Team, which led them to launch their 'Digital Angels' programme. The initiative started with on-site training to digitally upskill NHS staff and has now also expanded to provide digital training to local communities.⁷⁷ Programmes such as these should be leveraged as best practice case studies to support informing the development and scale of digital education for the NHS and its service-users.

The government has recognised the need to expand the UK workforce's digital skillsets, not just in healthcare but across all sectors. The Digital Skills Council (DiSC), an advisory body focusing on current and future digital skill needs, has been established to shape the UK's digital skills landscape.⁷⁸ The council should seek to recruit those with an understanding of the digital skill requirements of the NHS and recognise the fundamental importance of

developing the workforce's digital knowledge, skills, and confidence to enable digital transformation and subsequently unlock promised productivity increases.

We transform when we transform ourselves.
– Chief Clinical Information Officer

Digitally upskilling the NHS workforce must be paired with a cultural shift. Staff must see digital as a fundamental part of their role, *“when you talk about digital transformation or digital access to health care, people don't think it's for everyone, they think it's for the digital team”*. This mindset could be a barrier to developing the NHS's digital skillset, making it imperative that clinical staff at all levels understand the importance of digital literacy.

Patients and citizens could also benefit from digital health training to support their safety. The third sector (including patient organisations, charities and local community groups) can play a key role in facilitating this. Integrated care partnerships (ICPs), which bring together NHS organisations, local authorities, social care providers and the voluntary, community and social enterprise (VCSE) sector, could act as the vehicle through which charities could be further engaged in facilitating digital awareness and skills for patients.

EQUITY OF ACCESS TO DIGITAL HEALTHCARE

While it is important to digitally upskill patients and healthcare professionals, local systems must ensure that those who don't have access to digital technology, and those who don't want it, remain able to access health and care services. As stated in the WGLL framework, *“ICSs should have a clear digital inclusion strategy, incorporating initiatives to ensure digitally disempowered communities are better able to access and take advantage of digital opportunities.”*⁷⁹

A 2023 report which investigated digital poverty in the UK by Deloitte and the Digital Poverty Alliance found that digital poverty impacts an estimated 13-19 million people aged 16+ (in at least one dimension of digital poverty out of the four measured).⁸⁰ While this level of digital poverty exists, systems must be designed to accommodate for those without access to digital.

Digital poverty: the inability to interact with the online world fully, when, where, and how an individual needs.⁸¹

We may want everyone to have access to their record and as a clinician I might want that, but if a citizen doesn't want it, we have to accept and make sure the system accommodates their needs, and we shouldn't try to force everyone down this route. – Digital health leader

An attendee described digital poverty as a patient safety issue, as: “we have designed systems with certain products, poor access to devices, tools, apps, and data means there is a patient safety dimension”. Further, a 2022 World Health Organisation (WHO) study found that digital health technologies are not accessible to all communities and areas in Europe equally, and critically that those struggling to access digital tools the most are those with poorer health outcomes.⁸²

Without acknowledging this, digital transformation could inadvertently widen health inequalities. This underscores the importance of ensuring access to care for those without, or who don't want, access to digital. This would help to ensure that all patients, especially those with poorer health outcomes, receive equitable access to care.

The younger generation may end up with better digital access, but I'd argue it depends on the type of digital literacy the group has. Unless we give people digital health literacy, which is different to digital literacy, which is different to literacy, we may not solve this issue. We need to think about it in the context of people using a system for their health needs. – Digital health leader

Digital poverty has a strong association with age, with one in two older adults found to be in digital poverty and one in five in severe digital poverty.⁸³ However, it is important to consider that digital poverty impacts people of all ages, despite assumptions that children and young people have better access. An attendee pointed out that digital poverty impacts one in five children and the most impacted group of adults after 'older people' are school leavers.

Attendees called for paediatricians to advocate for children having access to digital resources, signposting children and their families towards charities such as The Good Things Foundation, a national digital inclusion network providing free data and refurbished devices for disadvantaged children.⁸⁴

There is an assumption young people are fine and all savvy on this, but there are some really vulnerable young people with no devices, no parents to support them, no access to the internet. – Healthcare information expert

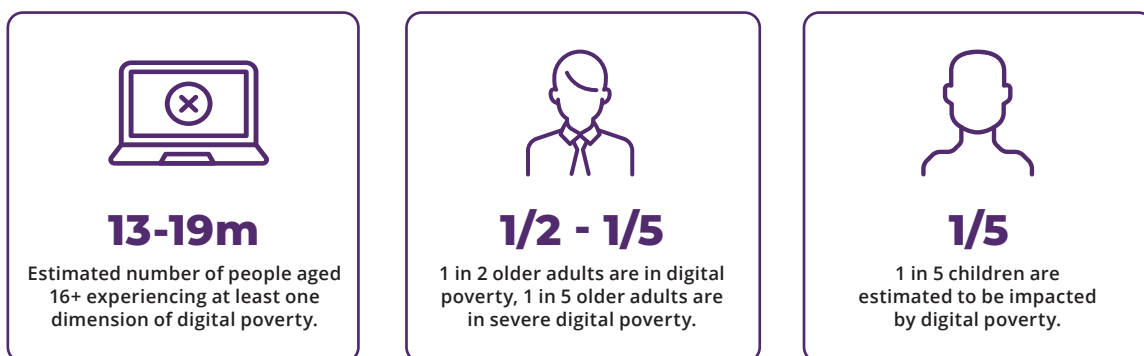
Research conducted by NHS Cheshire and Merseyside examining barriers to digital inclusion found subsets of society who are digitally excluded but also do not have an appetite to become digitally enabled.⁸⁵ After outlining the benefits of accessing NHS services online and the interventions available to their digitally excluded sample, two thirds (68 per cent) stated they were not likely to access NHS services online in future. 18 per

cent stated they were fairly likely, and only four per cent stated they were very likely.

Although there are subsets of digitally excluded individuals who do have appetite for learning and are willing to receive training and support, the report stressed the need for the NHS to maintain clear and easy to use ways for members of society to continue to access health care through non-digital channels. Access to services therefore must be multi-modal to remain equitable, where a variety of options remain in place, such as digital routes, letters, and telephony.

Digital inclusion is also a non-linear journey, as individuals can fall in and out of access to technology. Attendees described that this could happen when a patient's smartphone no longer supports security updates or newer versions of an app, which causes their wearable to cease from functioning. This means that people who once benefitted from technology are now excluded. Replacing devices often incurs a significant financial cost, which patients may not necessarily be able to afford, highlighting the need for developers to recognise digital inclusion as a continuous process in the design and development of technology.

To further support digital inclusion and access, developers should ensure to present information in accessible formats. Attendees highlighted a significant issue where many apps and digital tools fail to present information in an understandable way. They reasoned that this may be due to developers trying to bring technology to the market quickly, without leaving time for sufficient usability testing. Using CGMs as an example, attendees explained they collect a vast amount of data, but diabetic patients may struggle to interpret the way this data is presented. Without clear guidance, users are left to make sense of complex graphs and metrics without support. This underscores the importance of accompanying healthcare technologies with robust health and care information and advice.



Source: Deloitte and the Digital Poverty Alliance 2023

If we are really serious about moving the dial on inequalities and some of the issues that don't happen until someone becomes a patient, we need to start thinking about the citizen in the round and their needs. – Digital health leader

To promote digital inclusion, the NHS should consider introducing and conducting digital inclusion audits, where organisations review their digital services to assess how well they cater to diverse user-needs. Some trusts are already conducting audits, however attendees described significant gaps in areas such as maternity care. One attendee described an investigation which found that an online booking system and digital notes for a maternity unit unintentionally excluded

individuals. They described the issue as being partly due to the assumption that everyone has access to a personal device. Whereas, a family might share a single smartphone, which may be unavailable when needed. For instance, if the device accompanies a working partner. This lack of access can lead to missed appointments and even situations of coercive control, especially as domestic violence rates are known to increase during pregnancy. These findings underscore the need to consider the nuances of digital harm.

While digital tools can offer significant benefits, their implementation must carefully address potential barriers to inclusion, equity, and empowerment to avoid inadvertently disadvantaging vulnerable groups.

Conclusion

As the NHS is increasingly digitised, the need for a user-centred approach in technological innovation is critical. This report has explored the potential of technology and data to enhance patient safety, empower staff and patients, and improve health outcomes. However, it also highlights the challenges that arise when technology is not designed with end-users in mind. While progress has been made and there are examples of excellence across the UK, there remains a pressing need for more integrated, user-centric approaches to digital health technologies to prevent risks to patient safety.

Patient safety must be at the heart of all technological advancement within the NHS. This means risk mitigation must be prioritised across the entire lifecycle of technology, throughout design, development, implementation and disposal. From EPRs to wearable devices and apps, technology has the potential to improve record keeping, provide clinicians with enhanced clinical insights and improve the NHS' long-term sustainability, but only when designed and implemented safely. Through investigating patient safety through the lens of technology and digital innovation, this report demonstrates that to effectively transform service delivery, patient safety warrants strategic prioritisation across all health and care services.

Technology can empower patients by allowing them to support and manage their own health. This holds potential to support the government's mission to improve the nation's health, get people back to work and boost economic growth.⁸⁶ Yet, the potential of technology in health and care can only

be unlocked when balanced with its risk of harm, when it is seamlessly integrated into care delivery, designed to meet the diverse needs of end-users and supported by strong leadership, training, and governance frameworks.

To unlock the benefits of digital transformation, collaboration is critical. Health system leaders, frontline NHS staff, innovators and patients must be provided with structures through which to collaborate and co-design solutions that are not only innovative but also safe, effective, and equitable. This means engaging patients in decision-making, incorporating the experiences of frontline NHS staff, and fostering a culture of continuous learning and improvement.

Encouragingly, there is a growing commitment to embedding digital clinical safety within the NHS. Initiatives such as the WGLL framework and the NHS Digital Clinical Safety Strategy are offering blueprints for transformation, pointing to the importance of learning from examples of excellence as well as incidents.

Despite this, there is further work required to prevent the patient safety risks associated with digital technology. Digital transformation must not be seen as a standalone solution but as a continuous process requiring commitment, collaboration, and a relentless focus on patient safety. If the government and NHS England take the recommendations in this report seriously, with the right approach, the NHS can harness the power of technology to improve lives, enhance care, and build a safer healthcare system fit for the evolving needs of the population.

Attendees

Name	Position	Company
Elizabeth Anderson	Chief Executive	Digital Poverty Alliance
Gethin Bateman	Serious clinical incident investigation manager/clinical safety officer	Digital Health and Care Wales
Morgan Bedford	Quality Assurance Lead	National Unplanned Pregnancy Advisory Service (NUPAS)
Jonathan Benn	Associate Professor in Healthcare Quality and Safety	University of Leeds - NIHR Patient Safety Research Collaborative
Andrew Carey	Head of Risk	HCA Healthcare UK
Ian Colvin	Director of Islington GP Federation	NHS North Central London ICB
Claire Cox	Patient Safety Lead	Kings College Hospital London
Gangotri Darji	Senior Pharmacy Executive	Oracle Health UK
Amy Davies	Patient Safety and Investigation Lead	Cambridge University Hospitals NHS Foundation Trust
Caroline Donaldson	Patient Safety Improvement Coordinator	United Lincolnshire Teaching Hospitals NHS Trust
Chris Elston	Patient Safety Education Lead	University Hospital Southampton NHS Foundation Trust
Marion Endicott	Quality and Patient Safety Partner	South West London Integrated Care System
Jonathan Evans	Director of Communications	ABHI
Aimee Ferguson	Improvement Advisor	NHS Healthcare Improvement Scotland
Clive Flashman	Chief Digital Officer	Patient Safety Learning
Jim Forrer	Clinical product lead	Optum
Joanna Fox	Council & Faculty Member Digital Implementation and Transformation Specialist	National Association of Primary Care
Ruth Greenaway	Senior Human Factors Engineer	Rebus Medical Limited
Michaelene Holder-March	Managing Director	MHM Health Consultancy
Helen Hughes	Chief Executive	Patient Safety Learning
Stacey Humphries	Head of Clinical Governance	Chelsea and Westminster Hospital NHS Foundation Trust

Name	Position	Company
Marsha Jadoonanan	Head of Patient Safety and Learning	HCA Healthcare UK
Tim James	Clinical Director & Nursing Executive	Oracle Health UK
Liz Jones	Chief Customer Officer	RLDatix
Sarahjane Jones	Associate Dean for Research and Innovation	University of Staffordshire
Darren Kilroy	Medical Director	RLDatix
Jan Lawry	Director	J Lawry Healthcare Management
Eva Levin	NHS Senior Project Manager - Digital Transformation	Independent contractor to the NHS
Pedro Martins	Lead Pharmacist	Devon Integrated Urgent Care Service
Charlie McCay	Technical Advisor to the Board	Professional Record Standards Body
Scott Mcleod	Managing Director	StrydAR
Tom Micklewright	Medical Director	Organisation for the Review of Care and Health Apps (ORCHA)
Ana Luisa Neves	Director of the Global Digital Health Unit	Imperial College London
Helen Olaniyi	Patient safety officer	Great Ormond Street Hospital for Children NHS Foundation Trust
Youssof Oskrochi	Honorary Clinical Teaching Fellow	UCL Global Business School for Health
Laura Pickup	Head of Human Factors	University Hospitals Bristol and Weston NHS Foundation Trust
Jayne Pye	Patient Safety Partner	NHS Sussex
Rifat Qureshi	Head of Digital Transformation (East of England)	NHS England
Sophie Randall	Director	Patient Information Forum
Chris Reid	Chief Medical Officer	NHS Cornwall and the Isles of Scilly PCN
Kaye Reynolds	Lead Digital Clinical Safety Officer	The Queen Elizabeth Hospital King's Lynn NHS Foundation Trust
Helen Salisbury	Senior Medical Education Fellow and GP	University of Oxford
Sam Shah	Chief Medical Officer	The Ivory Clinic

Name	Position	Company
Justine Sharpe	Regional Patient Safety and Learning Lead	NHS Resolution
Sadia Siddique	Head of Quality & Governance	Renovo Care
Tom Skelland	Senior Pharmacy Executive	Oracle Health UK
Samantha Thomas	Safety and Learning Lead	NHS Resolution
Lea Tiernan	Patient Safety Engagement Manager	Imperial College Healthcare NHS Trust
Marcela Vizcaychipi	Chief Clinical Information Officer	Chelsea and Westminster Hospital NHS Foundation Trust
Clare Wade	Director	Patient Safety Learning
Jonathan Webb	Head of Safety and Learning	NHS Wales Shared Services Partnership
Yang Wei	Associate Professor in Wearable Technologies	Nottingham Trent University
Chris White	Director/Human Factors Specialist	Rebus Medical Limited
John Wright	Patient Safety Partner	North Tees University Trust

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