

Electronic patient records - friend or foe?

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Making a transition to a new electronic system within the NHS can cause disruption to clinical practice and additional stress for users, especially for those who may not be as computer savvy as others. Electronic Patient Records (EPR) are computer-based software systems that store patients' interactions with health services over time. EPRs are used in many different healthcare settings, such as GP practices, community and secondary care. They are critical for modern healthcare, enabling digital management of patient data, streamlining clinical processes, and improving care coordination.

The UK previously tried to adopt the world's first national EPR system via the National Programme for Information Technology (NPIT)¹. This aimed to bring the use of IT by the National Health Service (NHS) into the 21st century, through the introduction of integrated EPR systems. Nevertheless, after spending large amount of money and long delays, it was dismantled in 2011 due to technical, financial, and privacy issues². Primary care services, however, rapidly adopted EPRs through platforms like EMIS Health, SystemOne, and Vision, while hospitals advanced more slowly. Digital initiatives like the NHS Long Term Plan set clear goals, leading to notable hospital EPR adoption by late 2023.

The Frontline Digitisation programme was launched in 2021 and supports healthcare organisations to transition from paper-based to digital systems for patient information, clinical notes and access to data. Its aim is to reach a core level of digitisation following minimum digital foundations with the aim of getting an EPR into every NHS trust by March 2025³. In May 2024, NHS England was targeting 98% coverage by March 2026⁴.

In the NHS, EPR systems must adhere to strict rules for data protection, confidentiality, and record-keeping. These rules are primarily

governed by the Data Protection Act 2018, the General Data Protection Regulation (GDPR), and the NHS Records Management Code of Practice⁵. These rules are highly complex with trusts having their own individual policies available online.

EPRs were originally designed with a primary focus on billing purposes. These systems were created to streamline the administrative side of healthcare, ensuring that patient visits, procedures and treatments could be efficiently billed and recorded. This means that the original EPR systems were not built with clinical or analytical functionalities as their main goal.

There are several EPRs in the UK, with the leading platforms in the acute trusts being Oracle Cerner, System C and EPIC. As of May 2024 in England, it is estimated that approximately 29% of acute trusts use Oracle Cerner, 18% System C, 12% EPIC, 9% Altera Sunrise and the remainder other systems⁶. In the USA, EPIC Systems leads the EPR market share with approximately 34-39%, while Cerner holds the second position with around 22-25%. EPIC is the most studied EPR system⁷. In September 2022, Manchester University NHS Foundation Trust (MFT), one of England's largest NHS Trusts, implemented EPIC's EPR system, known as Hive. This deployment is the largest single EPIC 'Go Live' in Europe⁸.

Advantages of EPRs

1. Accessibility

EPRs provide a centralised platform for comprehensive patient records, enabling healthcare providers to access a single patient chart across various care settings, such as hospitals, outpatient clinics, and pharmacies. In the UK, trusts using EPRs reported improved continuity of care for patients transitioning between primary and secondary care and among medical specialties⁹. The digitisation reduces time spent on searching for paper notes and helps minimise duplication of tests and investigations.



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In 2023/24, North West London Acute Provider Collaborative adopted the Oracle Cerner system, to become the first Integrated Care System in the UK with multiple acute trusts, to implement a single EPR system across all its acute trusts, allowing easy accessibility of medical records¹⁰. This is especially useful for patients getting cross-trust care, or those being repatriated to their local hospitals in the trauma setting. The ability to see future appointments across all these hospitals is especially useful to ensure that appropriate follow-up has been booked.

2. Improved patient safety

Real-time access to records reduces medication errors and improves clinical decision-making. Alerts and reminders (e.g., allergies, drug interactions) can enhance diagnostic and prescribing safety¹¹. Clinical decision support tools embedded in EPRs help to standardise evidence-based care. EPRs support multidisciplinary teams with shared access to up-to-date patient information. They can also facilitate early detection of deteriorating conditions through integrated monitoring and trend analysis.

For example, for those patients undergoing planned elective orthopaedic operations, EPR systems will not let you prescribe medications unless there is an allergy status. If a medication is attempted to be prescribed that the patient is allergic to, this will automatically trigger an alert to inform the clinician. For elective cases or acute inpatient admissions, there is a similar alert to complete a VTE prophylaxis assessment form.

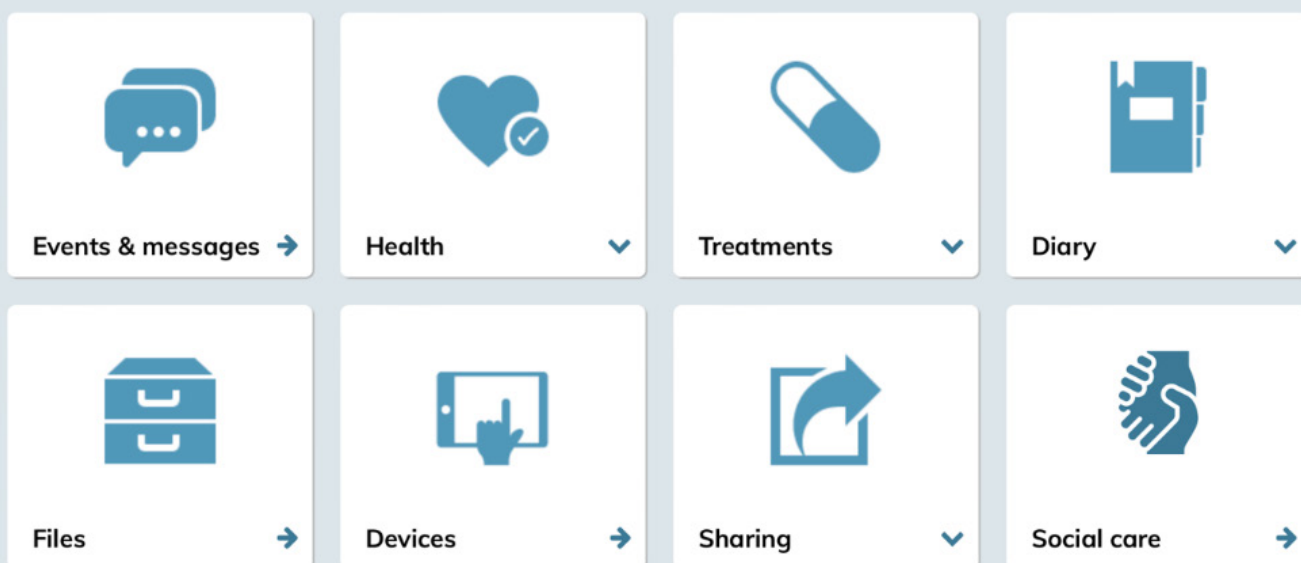
3. Patient Empowerment and Engagement

EPRs enable patient access to records via patient portals, encouraging active participation in their own care. It can also support digital communication such as appointment reminders and secure messaging, which can help reduce rates of DNA's in clinics. Patient portals such as 'Patient Knows Best' or 'MyChart' have demonstrated excellent adoption, engagement, clinical benefit and financial impact, especially in the setting of chronic disease¹².

The online 'Patient Knows Best' or 'MyChart' systems allow patients to get access to their clinic letters, future appointments and test results. They can also allow patients to share this information with friends/family members if they wish, which can be especially useful for decision-making. Every month, 'Patient Knows Best' releases 20 million test results, covering 25% of the UK¹³.

4. Data Quality and Standardisation

EPRs promote structured data entry using clinical coding systems. They can facilitate audit, research and population health analytics through consistent, high-quality data¹⁴. They enable detailed audit trails of access and actions, which improves accountability. Digitisation also helps to support integration with emerging technologies (AI, remote monitoring, predictive analytics). They can be particularly useful in a quality improvement setting, where you can set up operation note templates which are compliant with for example BOA guidelines helping improve and standardise documentation across a trust. >>



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Disadvantages of EPRs

1. High implementation and maintenance costs

EPRs have high implementation costs, e.g. the cost of EPIC for large hospitals such as Guys and St Thomas's NHS Foundation Trust and Kings College is estimated to be £450 million over 15 years¹⁵. Costs include licensing, hardware, and training. Maintenance and upgrades further strain budgets. In the NHS, where funding is constrained, these costs can divert resources from other priorities, such as staffing or equipment.

There may be limited support for clinicians after the immediate implementation, especially at weekends or out of hours. Out of date computer systems, can also lead to the slow running of EPR systems which can be frustrating and regular maintenance is paramount. A simple task such as printing a label for an intraoperative specimen, may be particularly challenging, if the label printers are not charged or connected. A quick intervention such as sticking the label printer code next to the computer in the operating theatre can be effective.

2. User learning curve

EPRs are complex and require significant staff training; often the training is 'generalised' and not that relevant to the day-to-day use for an orthopaedic surgeon¹⁶. There is a steep learning curve, which can lead to clinics needing to be reduced to accommodate this. It can be particularly frustrating for those staff members who have worked with a different system throughout their career. The additional administrative burden can contribute to burnout which has been demonstrated in studies in the USA¹⁷.

A study across the Emergency Departments in the UK looking at 25 EPRs found that no UK ED EPR system met the internationally validated standards of acceptable usability for information technology¹⁸. Usability of the EPRs is inconsistent. Benefits of easy user

access (cross platform) to records and results are acknowledged by most users. However, usability suffers due to alert fatigue as well as standardised interface often meaning system navigation is not straightforward. Wide variability in task duration, clicks, and accuracy when completing basic EPR functions exist among users. Clinical processes are not necessarily represented accurately in EPRs'

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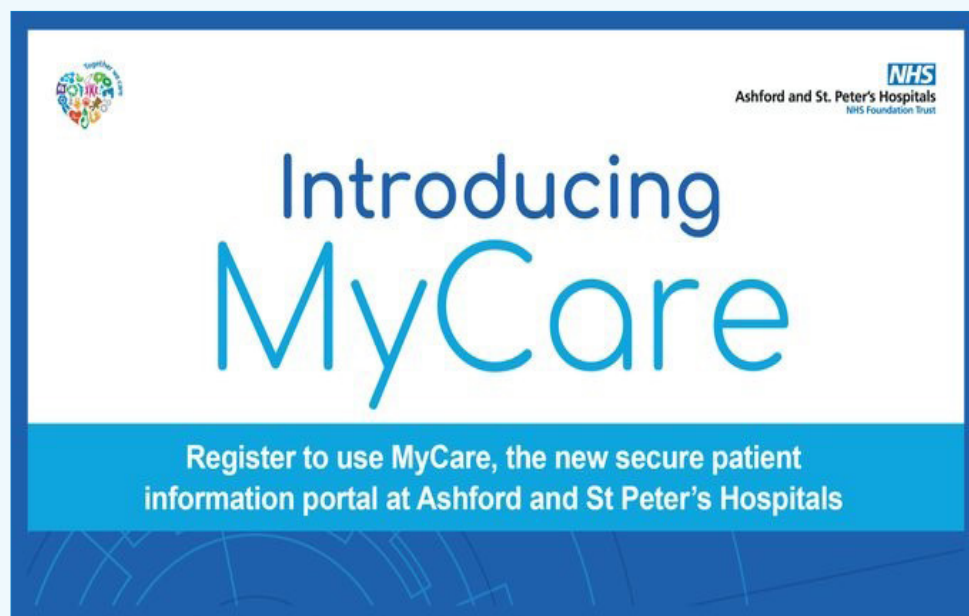
workflow. Attempts to reduce administrative support can mean increased clinical 'click count' for tasks. Substantial increase in documentation is perhaps an inevitable part of implementation of large scale EPRs, but repetition of content (through copy and paste and similar techniques) in entries risk propagating errors. Clinical processes become dependent on computer systems and efficiencies can therefore be affected due to errors. The increased administrative burden

due to EPR implementation needs to be supported by increased support for the clinical teams but often the reverse happens, resulting in productivity loss.

3. Privacy and cybersecurity risks

EPRs' extensive data storage makes it a prime target for cyberattacks. A 2023 breach at a US hospital using EPIC exposed 2.6 million patient records, highlighting vulnerabilities¹⁹. While EPRs offer robust encryption, human error and inadequate cybersecurity training increase risks. In the NHS, where cybersecurity funding is limited, trusts using EPRs face challenges meeting UK

Data Protection Act standards. In August 2022, sensitive information was stolen including medical records belonging to 82,946 people in an NHS Cyberattack. This led to the Information Commissioner's Office issuing a fine of over £6m to a major NHS IT provider²⁰. NHS England has a comprehensive online guide for Cyber and Data Security and there is a specialist Threat Operations team.



Tips for effective installation and use of EPRs

- Implementation should follow local clinical processes and configured according to the speciality requirements.
- Admin burden will increase – temptation to cut admin resource to justify the astronomical costs must be avoided.
- Initial training during implementation is only useful for basic system navigation, training videos are not often used by busy clinical teams and therefore speciality based 'super users' are possibly the best training resource who can be trained to a high level and in turn allowed to teach the rest.
- Asynchronous Learning – 'learning moments' with context sensitive help must be used.
- Features like 'Favourites' and 'Smart Phrases and Templates' should be used to stop repetitive typing of the same things. Large and detailed generated documents can aid clinical record keeping. The risk if patients cannot recall these discussions must also be considered.
- CME credits/statutory mandatory training for EPR learning should be considered.

For access to some Tips and Tricks for use of the common EPRs (Cerner and EPIC) in orthopaedics, please visit www.boa.ac.uk/Tips-and-tricks-for-EPRs. ■

References

References can be found online at www.boa.ac.uk/publications/JTO.