NHS
Cambridge University Hospitals
NHS Foundation Trust

eHospital

Patients at the heart of our digital hospitals

Addenbrooke's Hospital | Rosie Hospital

Welcome to eHospital

eHospital is Cambridge University Hospitals' award winning digital transformation that is enabling our staff at Addenbrooke's and The Rosie hospitals to use the latest technology to deliver consistently high quality care to our patients.

Like many other NHS trusts, Cambridge University Hospitals previously relied on paper patient records and multiple aged IT systems with limited integration and capability.
With a clinical desire for data-driven care and improvements to safety using advanced digital technology, all clinical areas across both of our hospitals have been completely transformed with the introduction of eHospital.

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> **Cambridge University Hospitals' current digital maturity is the highest of any of the trusts visited.**
>
> National Advisory Group Report on Health Information Technology in England, chaired by Professor Robert Wachter (September 2016)

A digital revolution

Combining a 'built by hospital staff for hospital staff' fully integrated Electronic Patient Record (EPR) with a complete refresh of the computing estate, and the introduction of integrated mobile devices, we have successfully moved away from paper-based and manual clinical processes to fully digital ways of recording and accessing information to provide high quality patient care.

The first-of-its-kind transformation in an NHS Trust, eHospital has revolutionised the way our clinical teams now care for their patients. Having access to comprehensive electronic health records, at the touch of a button, enables our staff to view and record all clinical information in one place, in real-time, wherever and whenever they need it. All clinical teams across our hospitals see the same information about a patient in our EPR, which is vital to patient care and safety. Our patients can also access their information using their patient portal – MyChart – and we are able to digitally share data, in real-time, with other healthcare providers!

The winning formula

Within a year of its EPR going live Cambridge University Hospitals (CUH) was awarded Stage 6 of the Healthcare Information and Management Systems Society (HIMSS) international Electronic Medical Records Adoption Model (EMRAM) – recognition of its effective use of digital technology in providing high quality patient care.

On 30 October 2018 CUH became the first healthcare trust in the UK to successfully validate against the new, much more difficult, HIMSS Stage 6 criteria.

It is also one of 16 Global Digital Exemplars cited by NHS England to support other healthcare organisations in developing their digital maturity to drive the government's ambition of a digital NHS.

HIMSS Analytics STAGE 6

DIGITAL RECOGNITION

4x WINNER 2019
Digital Technology Leaders Awards
'Best public sector digital project', 'Best large enterprise digital project', 'Digital Ambassador' and 'Chief Digital Officer of the year' for Dr Afzal Chaudhry, CCIO

WINNER 2019
European HIMSS-Elsevier Award
'Outstanding ICT Innovation' for joined-up healthcare

WINNER 2018 & 2019
Top 40 Hospitals Award
CHKS Top Hospitals Awards

WINNER 2017 & 2018
Chime Most Wired
Top scoring international digital hospital

WINNER 2017 & 2018
Data Quality Award
CHKS Top Hospitals Awards

WINNER 2017
Digital Trust of the Year
ehi Awards

WINNER 2017
Best Place to Work in Digital, Large Organisation
Digital Technology Leaders Awards

Cambridge University Hospitals

Who we are and what we do

Cambridge University Hospitals (CUH) is one of the largest and best known healthcare trusts in the country, caring for patients through its two hospitals – Addenbrooke's and The Rosie. Located on the 142 acre Cambridge Biomedical Campus, it is also a leading national centre for specialist treatment, a government-designed comprehensive biomedical research centre, one of only six academic health science centres in the UK, and a university teaching hospital with a worldwide reputation for clinical excellence.

Our hospitals

Addenbrooke's is the 'local' hospital for our community and a centre of medical excellence. As an international university teaching hospital it is also a centre for specialist services dealing with rare or complex conditions needing the most modern facilities, up-to-date treatment and the best doctors. It provides emergency, surgical and medical services for patients living in the Cambridge area as well as being a centre of excellence for regional specialist services for organ transplantation, cancer, neurosciences, paediatrics and genetics.

The Rosie is a women's hospital providing gynaecology, maternity and neonatal services to our local population of Cambridgeshire and extending to parts of North Essex, East and North Hertfordshire, Suffolk and Bedfordshire. Specialist services in high risk obstetrics, fetal and maternity medicine and neonatal intensive care are provided for the whole of the eastern region. It has a new purpose-built birth centre and one of the largest neonatal units in the UK.

1,200+
beds

117,000+
A&E attendances

69,000+
inpatients

757,000+
outpatient attendances

5,300+
births

122,000+
day cases

40,000+
surgical operations

10,500+
staff

Catchment population:
530,000
as a district general hospital
4 million
across the country for specialist care

2017/18 annual Trust figures

eHospital
Our digital journey

Take a look at our timeline to see how far we have come over the years, how we have advanced our digitalisation to benefit our staff and patients, and recognitions of our success along the way.

eHospital

Our digital journey

2010 eHospital concept, vision, branding and business case created. Clinical engagement initiated

2011 eHospital business case approved by Trust Board. Procurement commenced for digital suppliers

APRIL 2013 Contracts signed with preferred digital suppliers (software and hardware suppliers)

MAY 2013 eHospital programme team established (100+ clinicians and hospital staff)

JUNE 2013 eHospital programme team training and certification in how to configure an Epic EPR – first NHS staff to ever do this

AUGUST 2013 Start of in-house configuration of our Epic EPR by our newly Epic qualified eHospital team

OCTOBER 2013 Commencement of Trust-wide network upgrade

NOVEMBER 2013 Managed print service introduced across the Trust - 3,000+ old printers reduced to 300 new ones. Staff given printer fobs to securely retrieve documents from printers to help protect patient confidentiality

JUNE 2014 New IT equipment and computers introduced across the Trust

AUGUST 2014 12,000+ staff began training in how to use our EPR to document care of their patients

SEPT/OCT 2014 Dress rehearsals, clinical and operational Trust preparations for go-live of our EPR

26 OCT 2014 **EPR go-live** Our EPR went live across the entire Trust in one go - both Addenbrooke's and The Rosie hospitals – and connected to the NHS Spine and e-Referral national systems

OCTOBER 2014 Introduction of mobile working Trust-wide – recording and accessing information whenever and wherever needed in real-time:

- Handheld and mobile devices connected to our EPR
- Epic apps (Haiku and Canto) on Trust and personal devices
- 'Bring your Own Device' service to securely access our EPR

OCTOBER 2015 Accredited with HIMSS EMRAM Stage 6 following an external inspection – first trust to achieve this within a year of an EPR going live

HIMSS Analytics Stage 6

APRIL 2016 Highest rated trust for capability in the NHS Digital Maturity Assessment

MAY 2016 Launch of MyChart patient portal pilot in endocrinology and oncology - the only patient portal truly integrated with an EPR

SEPTEMBER 2016 Highest rated trust for digital maturity in the national Advisory Group Report on Health Information Technology in England, chaired by Professor Robert Wachter

FEBRUARY 2017 Selected as a Global Digital Exemplar by NHS England

MAY 2017 Launch of digital kiosks for patients to self-check-in to clinic appointments

JUNE 2017 Commencement of MyChart patient portal Trust-wide rollout

AUGUST 2017 Contract signed with Microsoft – CUH becomes the largest healthcare organisation in England to purchase Microsoft Office 365

OCTOBER 2017 Commencement of Barcode Medication Administration (BCMA) rollout across inpatient and critical care areas

APRIL 2018 Launch of Care Everywhere – first of its kind digital innovation in the UK; linking our Epic EPR with West Suffolk Hospital's EPR, and with hospitals across the world that use an Epic EPR, for real-time digital patient record sharing

APRIL 2018 Barcode medication administration (BCMA) implemented across our emergency department – first UK Trust to implement BCMA in A&E

MAY 2018 Launch of EpicCare Link with Granta Medical Practices – secure portal into our EPR by GPs and community nurses

SEPTEMBER 2018 Barcode human milk administration implemented across neonatal, paediatric and maternity services

SEPTEMBER 2018 First digital patient records shared internationally between CUH and non-UK hospitals that use an Epic EPR

OCTOBER 2018 First UK trust to successfully validate against new 2018 HIMSS EMRAM Stage 6 criteria

HIMSS Analytics Stage 6

NOVEMBER 2018 Creation of EPR digital link with Royal Papworth Hospital (RPH) to automate real-time resulting of RPH tests from CUH laboratories

OUR JOURNEY CONTINUES...

Awards and media coverage

25 Apr 2017 (NEWS)
'How a digital NHS saves time and money, and transforms care' – eHospital at CUH featured nationally in *The Guardian*

10 May 2017
Winner of the national CHKS Top Hospitals 'Data Quality Award 2017'

4 Jul 2017
Highly commended for *'Best use of IT in improving patient safety'* at the national Patient Safety Awards 2017

6 Jul 2017
Winner of 'Best place to work in digital – large organisation' at the national Digital Technology Leaders Awards 2017, and finalist in two other categories

10 Jul 2017
'Most Wired 2017' first non-US healthcare organisation to rank among America's elite medical centres that use advanced digital technology to provide high quality patient care

31 Oct 2017
'Digital Trust of the Year' at ehi Awards 2017 - leading national digital healthcare awards. Dr Afzal Chaudhry wins *'CCIO of the Year'* award for digital leadership

3 May 2018
Winner at the British Society of Rheumatology Best Practice Awards 2018 for the Eastern Network for Rare Autoimmune Disease Video Case Conference, for our EPR use

15 May 2018
Winner of the national CHKS Top Hospitals *'Data Quality Award 2018'* for the second consecutive year

31 May 2018 (NEWS)
'Epic cultural revolution is saving lives as technology takes over healthcare' – national feature in The Telegraph to celebrate the NHS at 70

6 Aug 2018 (NEWS)
'Blueprint to end the sepsis scandal' – front page of The Mail – national coverage about how our sepsis alerts in our EPR are saving lives (see case study on pages 16-17)

2 Nov 2018
'Most Wired 2018' – top scoring international hospital for digital success, for a second consecutive year

12 Jun 2019
European award winner 2019 – HIMSS-Elsevier Outstanding ICT Innovation Award for joined-up healthcare with patients, other hospitals and primary care

Our digital story

Creation of our digital hospitals

Like many other public healthcare organisations in the United Kingdom, we relied heavily on the use of paper patient records coupled with old, unstable and slow technology with little or no integration between multiple aged IT systems.

Our clinical staff were becoming increasingly frustrated with the inability to see a unified view of a patient's health record, in its entirety, in a single place, which is vital to patient care and safety. Many of our aged IT systems, applications and manual ways of working needed to be replaced. Licensed support for numerous applications, including our main healthcare information management system (HISS), were due to expire in 2014, and handwritten information in paper patient records was sometimes difficult to read.

The case for change

We wanted to provide our clinical teams with better support through a comprehensive view of a patient's health record, available wherever and whenever needed, to support shared decision-making with patients – 'no decision about me, without me' – using fit-for-purpose computers and the latest mobile devices to enable the recording of vital information into a patient's electronic health record at their bedside.

The concept and creation of eHospital was thoroughly researched to ensure the right technological decision was made to benefit staff and patients and to help solve challenges including:

- Lack of visibility and accessibility to a patient's medical record in its entirety
- Improvements required to patient care and safety
- Improvements required to medication safety
- Staff needing to spend more quality time with patients
- Improvements required to service delivery and business efficiency.

As part of the eHospital business case in 2010, options were explored as to whether it would be best to simply replace out-dated technology as it became obsolete and essential, or to take the opportunity to invest in digital technology to transform the way we care for our patients by creating a sustainable data-driven future.

With both options requiring practically the same amount of investment – £200 million over a 10 year period – the latter was approved by the Trust's 'Board of Directors' in 2011 and supported by our senior clinicians, hospital staff and regulatory bodies.

Following a lengthy open, fair and competitive procurement process, contracts with software and hardware suppliers (Epic Systems Corporation and Hewlett Packard) were signed in 2013.

Ten-year £40 million contract signed with Epic Systems Corporation.

This kick-started our eHospital digital journey; turning our vision into reality and putting patients at the heart of our digital hospitals.

eHospital

Putting patients at the heart of our digital hospitals

Our future vision for eHospital

Back in 2010, our future vision for eHospital was one in which every member of staff would have access to the information they need, when they need it, without having to look for a piece of paper, wait to use a computer or ask the patient yet again.

DID YOU KNOW?

Over 50% of the USA population have their health records stored at an organisation that uses an Epic EPR.

Built by our staff for staff

The eHospital programme team was established shortly after contract signing in 2013.

Over 100 hospital clinicians, clinical support staff, administrators, operational and managerial staff - with a passion for improving healthcare by using data and digital technology - joined this team to configure the Epic Foundation System; creating the first fully integrated electronic patient record (EPR) in the UK.

During the summer of 2013 they spent several weeks being trained by Epic colleagues in how to configure the system to tailor it to both our needs, and that of secondary care in the NHS. They each completed difficult exams and projects in the various Epic application modules to become the first NHS staff to be certified and able to configure the Epic EPR system.

This newly established team of computer literate clinicians and staff held over 250 sessions with over 1,000 of their clinical colleagues to validate over 500 major clinical pathways. This helped to ensure that the team configured our EPR to incorporate our Trust's clinical workflows that supported local, professional and national guidelines; as well as being compatible with national systems such as the NHS Spine (personal demographic service for the NHS) and e-Referral (electronic referral service by GPs to hospitals).

Over an 18-month period the eHospital team created our custom 'built by staff for staff' EPR. At the same time they also completed an entire refresh of the Trust's IT estate – replacing 5,500 old computers with 8,000 new ones (including laptops), introduced over 800 mobile and handheld devices compatible with our EPR to enable the real-time documentation of care at a patient's bedside, and integrated all physiological monitors and ventilators in 40 theatres and 148 high dependency / critical care beds (including point of care testing devices) to our EPR to automate the manual transcription of physiological data.

With new technology comes new ways of working

Completely changing the way our staff provide care using innovative technology was no easy task. It required a huge training commitment to ensure that everyone was ready for the EPR going live and felt confident in using it to document the care of their patients, on new computers and mobile devices.

In the nine weeks leading up to go-live, 175,000 hours of training was delivered to 12,000+ staff.

A number of dress rehearsals and readiness sessions were held in various areas of our hospitals to test patient journeys and workflows within our EPR to help prepare staff for go-live.

What happened next went down in history as a national first…

8,000+	**new computers**
420+	**handheld devices**
400+	**mobile workstations**
1,300	**Wi-Fi access points**
800+	**laptops**
1,000+	**staff using mobile Epic apps**
3,700	**'Bring your own device' staff licences**

Caring for patients in our digital hospitals

On Sunday 26 October 2014, at 02:01, eHospital went live across the entire Trust – both Addenbrooke's and The Rosie hospitals – to become the first digital implementation of its kind (combining hardware and software) in the NHS and the first UK healthcare organisation to use Epic.

One patient, one record, one system, one place

Our EPR securely houses all information, past and present, relating to each and every one of our patients - one patient, one patient record, in one system, in one place. So when a patient arrives for an appointment, as an emergency, or is admitted, the team caring for that patient can see their health record in our EPR in its entirety, wherever and whenever they need to. They are all looking at the same information which is vital for the patient's care and safety.

Our EPR today is used concurrently by 3,400 staff at peak times and spans all clinical areas – inpatient and outpatient areas – including (but not limited to):

- Cardiology
- Emergency care (A&E)
- Critical / intensive care
- Maternity
- Ophthalmology
- Oncology
- Pathology (laboratories)
- Pharmacy
- Radiology
- Surgical pre-assessment
- Theatres and anaesthetics
- Transplant

Better for our patients and our organisation

Our EPR is proving vital to patient care at our hospitals…

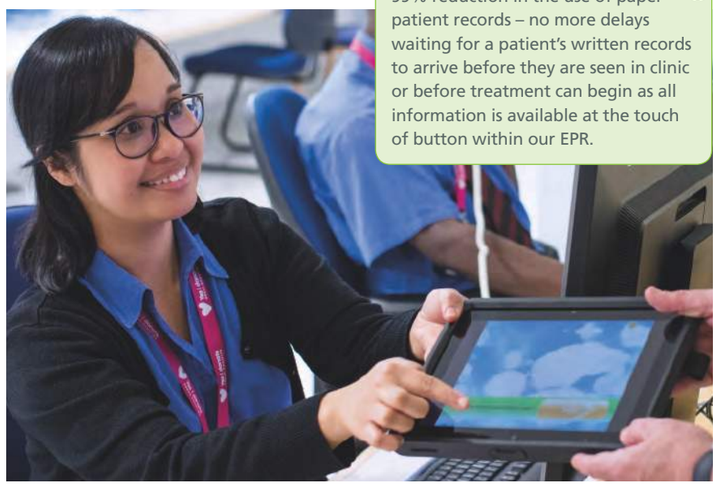
- improving quality and safety
- reducing duplication
- eliminating unnecessary delays to patient care
- improving patient experience
- improving efficiencies

Our EPR makes the right thing the easy thing to do.

99% of all clinical patient activity is documented in our EPR.

95% of requested changes to our EPR are made in-house by our Epic-qualified eHospital team.

99% reduction in the use of paper patient records – no more delays waiting for a patient's written records to arrive before they are seen in clinic or before treatment can begin as all information is available at the touch of button within our EPR.



Key benefits of eHospital

Before eHospital	**With** eHospital
Software	
1994 Patient Administration System (PAS) Reliant on paper patient records and multiple aged IT systems with no integration	**Fully integrated Epic electronic patient record (EPR) 99% of clinical information recorded in one place**
No clinical emergency department or critical care systems	**Emergency and critical care documentation & data recorded within our EPR**
Pathology system required an upgrade	**Laboratory Information Management System (LIMS) built within our EPR**
	Bedside device integration
	EPR connection to the NHS Spine and with national eReferral & child protection services
	Mobile 'apps' factory
Hardware	
No wireless network	**Upgraded networks & wireless**
Ageing computers	**Fit-for-purpose computers & laptops. Mobile & handheld devices integrated with our EPR**
Limited remote access to clinical systems	**Remote access & 'bring your own device' service for staff**
Digital team	
Small IT team	**eHospital digital division (clinical, technical, analytical expertise)**
Limited in-house IT skills	**Clinicians & staff qualified in configuring our EPR**
	95% of changes to our EPR are made in-house by our eHospital digital team

850
significant adverse reactions prevented each year with electronic allergy-related prescribing alerts in our EPR triggering a change in medication prescriptions - saving 2,450 bed days a year (equivalent to £0.98 million).

£1.1m saved
annually in nursing time as observations and medication administration are recorded directly into patient records at the bedside, using handheld devices connected to our EPR.

100% recording
of the indication for antibiotic prescribing leading to more meaningful antibiotic stewardship – antibiotics are only prescribed if they are truly needed.

£600k–£800k
annual reduction in financial gap between high-cost drug expenditure and income.

42% reduction
in sepsis mortality with electronic sepsis alerts built into our EPR by the eHospital team.

£2.6m saved
annually with physiological devices in our theatres and high-dependency areas connected to our EPR automating the recording of data.

£460,000 saved
annually in staff time as paper patient records no longer require retrieval from our medical records library.

> **"Our EPR enables our clinicians to view a patient's health record when and where they need to without having to wait for or write in paper records."**

Dr. Afzal Chaudhry, Renal Consultant
and Chief Clinical Information Officer, Cambridge University Hospitals

Our digital clinics

Using technology we have changed the way we work in outpatient areas to improve patient care, safety and experience; and to make the running of our busy clinics much more effective and efficient.

Prior to having our EPR, clinical patient-related data and information was collected in paper patient records and in spreadsheets or databases on individual computers, which made accessing and sharing information difficult and time-consuming.

With all patient data and information now in our EPR, records are complete and accessible by all members of a patient's clinical team at any time, in any place. There is no more 'pulling' of fragmented sets of paper notes from the Medical Records Library, which means no more delays waiting for records to arrive before our patients are seen in clinic.

Electronic referrals for outpatient appointments

By integrating our EPR with the NHS e-Referral Service, all patient first referrals made by GPs to our consultant-led clinics and services are received electronically within our EPR. This improves efficiency by streamlining our referral process and reducing the variation of referral routes so that appointments are booked for our patients as soon as the electronic referral is received.

Digital self-check-in

Patients now arrive at our hospitals and are presented with digital check-in kiosks, connected to our EPR, allowing them to self-check-in for their clinic appointment. They can also then utilise the on-screen maps and directions showing them how to get to their clinic; helping them to find their way around our sizeable hospital campus. These kiosks are helping to reduce queues and administrative check-in tasks at clinic reception desks, and prevents our patients' personal and confidential details from being overheard by other people in the clinic waiting area.

"Our EPR allows me to effectively manage every aspect of my clinical duties and care of my patients. I can access my patients' health records wherever I am in the Trust, and even when I'm working offsite in other clinics through secure Epic applications, to avoid any unnecessary delays to their care.

I no longer contend with missing information in paper notes, nor am I having to contact the labs for test results to print and stick into paper records ahead of clinic. I automatically get alerted in our EPR when my patients have test results available that have been processed at our Addenbrooke's laboratories – including blood tests that have been ordered by their GP – so I always have a complete set of test results to view, in my patients' records in our EPR, before I see them in clinic.

Also, if patients require procedures we order and schedule them within our EPR, which speeds up the booking process as we no longer have to search for, complete then submit paper procedure booking forms. Completing and submitting regular reports is also much easier and far less time-consuming as all the information needed is within our EPR, with reports set-up and automatically generated within the system.

With the technology that we now have, and access to the patient information that we need when we need it, we are able to provide our patients with knowledgeable safe care."

Dr Gareth Corbett, Consultant and Gastroenterologist.
Clinical Director for Digestive Diseases

Virtual Fracture Clinic

The fracture clinic at Addenbrooke's Hospital is one of our busiest clinics. Utilising our EPR, we have set up a 'Virtual Fracture Clinic' to help with service demand and improve patient care and experience.

Prior to having an EPR, patients would come to our emergency department (A&E) with a suspected fracture, and, if broken, be given a temporary plaster cast following an x-ray. They would then be sent home and an appointment made for them to attend the hospital's fracture clinic a few days later to discuss follow-up care and treatment.

With the Virtual Fracture Clinic, our trauma nurses and consultants study patients' case notes and x-rays within their records in our EPR, before contacting patients to discuss their follow-up care. Only those patients who need to come back into hospital to attend the fracture clinic for further treatment receive an appointment.

Automated coding of outpatient procedures

Instead of our clinicians having to document on paper the procedures that they have performed during an outpatient or emergency visit, then submitting this paper documentation to our clinical coding department for transcription to collect payment from our commissioners, this is all now automated within our EPR. As part of each clinic appointment our clinicians document in our EPR any procedures undertaken. This is then automatically sent, within our EPR, to our clinical coding department to ensure that we get paid the right amount by our commissioner for procedures undertaken for patient care.

100%
reduction in paper first referrals from GPs to our consultant-led clinics/services as our EPR is integrated with the NHS e-Referral service.

4,500
clinic appointments freed up in orthopaedics for patients who absolutely need to come to hospital for treatment, as clinicians are able to view notes and x-rays virtually in our EPR to assess whether a patient needs an appointment.

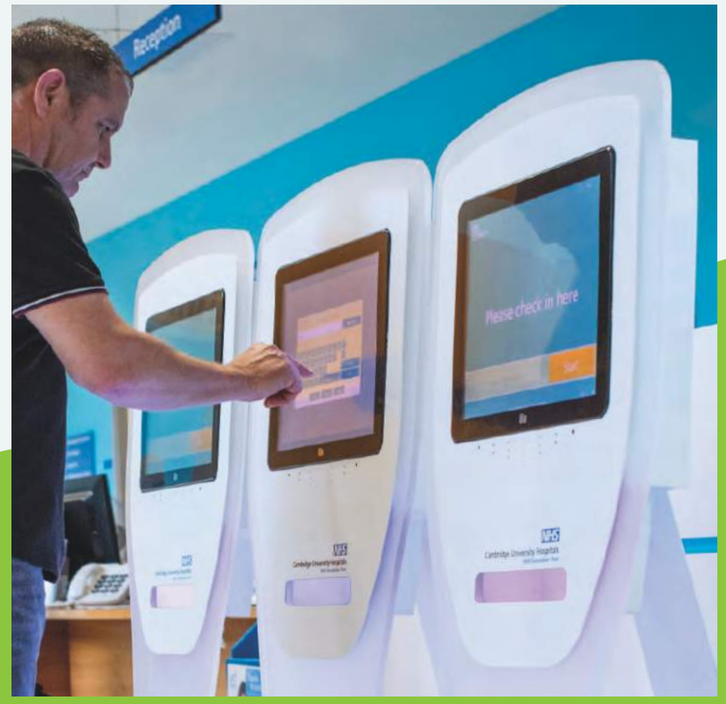
19
self-check-in digital kiosks for patients in outpatient areas across our hospitals.

80%
of clinic letters in paediatric gastroenterology are given to the parents at the end of clinic as data from various parts of the patient's health record in our EPR is automatically combined into a structured letter.

20%
more patients are being seen in our surgical pre-assessment clinic as patients are able to complete their own initial documentation on a digital tablet, with the information then saved automatically to their health record within our EPR.

Automated letter creation

Clinical documentation is now being recorded electronically in our EPR while the patient is in the clinic. Clinicians then utilise this data to quickly and easily formulate letters, rather than having to manually re-type information into a letter after the clinic. This means that in some areas, the majority of patients receive their clinic letter before they even walk out the door.



CASE STUDY

Pioneering portal gives patients access to their health information

In 2016 Cambridge University Hospitals launched MyChart, the UK's first patient portal to be truly integrated with a hospital's electronic patient record, giving patients secure access to their health information to engage and involve them more in their care.

Allowing our patients digital access to their health information

Living in a digital society, people are used to accessing services and personal information – finances/banking, shopping, social media - on computers, laptops, smartphones and tablets, so why should they not be able to access their health information in a digital way too?

Research shows that patients want to be more involved and more informed about their health, care and treatment, particularly those with long term health conditions. Through their MyChart patient portal, our patients can access their health information from directly within their health record held within our hospitals' electronic patient record system.

A patient's hospital information is available to them electronically via MyChart instead of being posted to them:

- Appointment letters / past appointment details
- Current health problems / conditions
- Clinic letters / clinical correspondence
- Vital signs (weight, height, blood pressure, temperature, pulse, respiratory rate)
- Test results
- Medications
- Known allergies

Our patients can also complete pre-appointment questionnaires electronically within MyChart, with the results then being discussed during their next clinic appointment. This makes appointments much more effective as our patients and clinicians spend more time discussing care and treatment plans together.

Empowering our patients to contribute to their health record

MyChart encourages our patients to contribute to their health information without having to make unnecessary visits to our hospitals. For example, if they have been prescribed new medication by their GP, they can add the medication name, dose and frequency to their record via MyChart for discussion with their clinical team during their next hospital appointment.

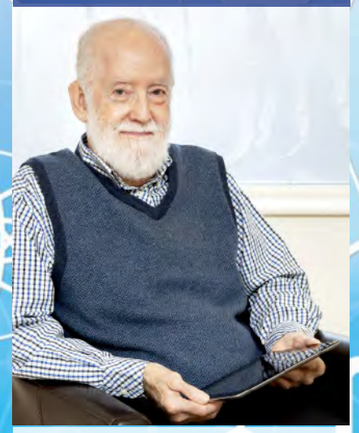
Anytime, anywhere

Our patients can access their information in MyChart anytime and anywhere. In the comfort of their own home they can access it through a secure website on a desktop computer or laptop, or when on the move, at our hospitals or abroad via the 'MyChart' app for Apple and Android tablet and Smartphone devices (provided they have an internet connection). MyChart is also compatible with screen readers for our visually impaired patients.

Future MyChart developments to benefit our patients

Over time more functionality of MyChart will be activated for our patients to use. This includes the ability for our patients to book and re-schedule appointments electronically; upload health trends e.g. their blood pressure, weight, blood glucose; arrange e-visits with their clinicians; proxy access for parents, relatives of elderly patients, power of attorney circumstances; and integration with wearable devices such as FitBit and Apple HealthKit.

Transplant patient and user of MyChart, *Alan Craig* talks about his experiences



"I have always played an active role in my own treatment and like to understand my conditions. I have a range of medical problems, which started in 1969 when I was diagnosed with polycystic kidney disease.

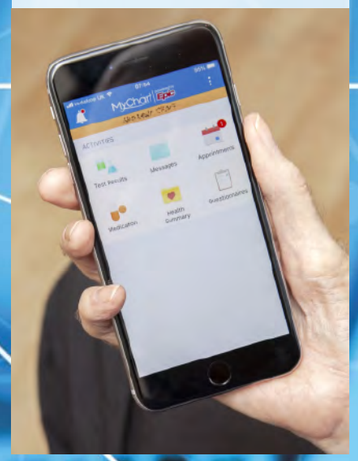
My blood pressure was controlled for a long time to help delay the need for dialysis treatment before I eventually had a successful kidney transplant in 1989. I was diagnosed with a serious heart condition and underwent a quadruple bypass and aortic valve replacement in 1999. As a result of the drugs I have to take following my transplant, I've also suffered with osteoporosis, abdominal hernias, basal cell carcinomas and several haematomas.

I like to work with my clinicians in the management of my health conditions, which was why the MyChart patient portal particularly appealed to me.

MyChart allows me to view my upcoming hospital appointments, details of past appointments and hospital visits, clinical letters from my doctors and my test results. I like how I can also access a health summary page, either on my computer at home or on my smartphone, which includes a full list of my medications, as well as links to further information to help me to manage my conditions and learn more about the medications that I have been prescribed.

More and more people are living with a range of complex health conditions. Having all the information available in one place, explained in plain English, is really useful for patients like me, especially when I am regularly in and out of hospital and using other healthcare services. I can access MyChart from anywhere in the world with an internet connection, which gives me peace of mind when I want to travel because if I were to need medical help in another part of the UK or abroad, I can log in using my smartphone and show my information to those clinicians caring for me.

Having my health information to hand has helped me to better manage my conditions and I believe that patient awareness and involvement contributes to a more joined-up health care system.



"I see a patient regularly in clinic who has difficulty communicating verbally, making the discussion during appointments somewhat challenging for us both. So I registered him with MyChart, which has proved a real game-changer. In addition to patients accessing their hospital health information, MyChart also allows them to send direct messages to their clinical teams. This patient is now able to write to us, clearly articulating changes in his condition or symptoms, or any concerns he has, prior to his appointments; allowing us to better prepare, plan and personalise his appointments with the information that he is now able to share with us. Using technology to create a more effective way of communicating is preventing his disability from hindering his care in any way.

Dr Martin Besser
Haematology Consultant

Our digital emergency department (A&E)

As one of the busiest emergency departments in the UK and the East of England's Major Trauma Centre, quick and easy access to information is essential for all staff working in A&E at Addenbrooke's Hospital due to the high volume of patients we treat, twenty-four hours a day.

Rapid access to information

If a patient has been treated by any of our services in the past - at either Addenbrooke's or The Rosie hospitals - their health record is immediately available to staff within our EPR upon their arrival. Their initial triage assessment, as they come through the door, is documented there and then in their electronic health record by a triage nurse using a mobile device - usually a workstation on wheels.

When they reach the reception desk their demographic, allergy, infection screening, disability and GP information contained in their electronic record is available to receptionists; making registration and checking of information much faster.

For patients who are being referred for urgent treatment, being transferred from another hospital, or on their way in an ambulance, clinicians automatically add the key details about their condition, accident or trauma into their health record in our EPR so that the entire clinical team has quick and easy access to the data when the patient arrives; avoiding potential life-threating delays to their care. This vital information was previously handwritten on paper, making it difficult to quickly share with an entire clinical team.

Electronic alerts

Alerts will trigger in our EPR to make appropriate staff aware if a patient is a frequent A&E attender with an emergency management plan – for example, a paediatric asthmatic patient – or if they need to be seen more urgently as a result of their early warning score which is automatically calculated in our EPR from their initial triage assessment.

Smartcards

Administrative staff in our emergency department, and staff across our other clinical areas, use Smartcards that are synced to the national Personal Demographic Service (known as 'the NHS Spine') to automatically pull nationally held information about a patient into our EPR system – name, address, date of birth, current GP and practice.

This is important for all of our patients, including those who have not been treated at our hospitals before as it allows administrative staff to quickly and easily create an electronic health record in our EPR, using nationally-held information, to document their treatment whilst in our care.

Single source of the truth

In whichever area of the emergency department a patient is being treated - high dependency, resuscitation, low dependency, minor injuries - their entire clinical team can simultaneously document in their electronic health record. If specialty-specific clinicians that work outside of the emergency department (for example surgeons, anaesthetists, neurologists) have been requested to assess a patient, they also document directly into the patient's record, which can then be viewed by the emergency department team. So everybody involved in a patient's care has access to the same information, which is vital to care and safety.

If a patient needs to be transferred for surgery, to intensive care or for specialist care on a ward, their entire health record - including all the care received and documented whilst in the emergency department – is immediately available for clinicians in the receiving areas. This allows them to plan the patient's care appropriately before they are actually transferred to their area of care.

Real-time information for effective management

At any point the current status of the emergency department can be viewed on a dashboard in our EPR, which updates in real-time. Staff can see, at a glance, colour coded information about each patient:

- waiting time
- which area and bed they are in
- acuity level
- early warning score
- status of their emergency care pathway
- when they were last reviewed by a clinician
- when assessments were completed

This snapshot helps with the effective and efficient management of the emergency department and ensures that our patients are receiving the appropriate and timely care that they need.

Administrative burden of urgently sourcing paper records for patients arriving in our emergency department has been eliminated.

Letters are automatically sent via our EPR to patients' GP when they are admitted to an inpatient area from the emergency department.

Discharge summary letters are sent electronically via our EPR to a patient's GP within 24 hours of discharge from the emergency department.

No more waiting for paper notes to be released from the emergency department before follow-up appointments can be booked.

CASE STUDY

Epic alert exposes 'silent killer' sepsis

Patients at risk of the 'silent killer' sepsis are being identified and treated quicker at our hospitals thanks to a new alert and action feature that we have built into our electronic patient record.

"In July 2018 I was diagnosed with sepsis within 15 minutes of arriving at Addenbrooke's Hospital A&E. The doctors and nurses caring for me started my treatment within an hour. Lifesavers.

Debs Keppey
Sepsis patient

The sepsis challenge

Sepsis is a life-threatening condition that arises when the body responds to an infection by attacking its own tissues and organs.

Every year approximately 250,000 people are affected by sepsis and it accounts for around 44,000 deaths, more than bowel, breast and prostate cancer combined.

Sepsis can affect anyone but those most at risk are people with a medical condition or receiving medical treatment that weakens the immune system, very young or very old people, and those who have recently had surgery or have wounds or injuries caused by an accident. If caught early sepsis can be treated with antibiotics.

However, sepsis can be difficult to spot and is often mistaken in the early stages for other more localised infections.

National guidance recommends that patients with sepsis are given antibiotics within an hour of diagnosis to reduce the risk of serious complications or even death.

Using digital technology to identify and treat sepsis quicker

In 2016 a Sepsis Action Group at Cambridge University Hospitals was created – consisting of clinicians from our emergency department, acute medicine, infectious diseases, rapid response and the eHospital digital team. They discussed how digital technology could be used to alert clinical colleagues to sepsis patients when they present at our emergency department (A&E).

They subsequently developed and built an electronic alert and action set within our electronic patient record (EPR).

Launched within our emergency department in August 2016, this electronic alert brings to the nurses' and doctors' attention that sepsis could be a possibility if a patient's clinical observations (temperature, blood pressure, pulse and respiratory rate) meet sepsis criteria.

If a sepsis alert is triggered for a particular patient, a series of electronic prompts guide clinicians to take a number of actions and tests, linked to national guidance, to effectively diagnose, care for and treat the patient with sepsis.

With 99 per cent of all clinical care at our hospitals documented, ordered and available in our EPR, accident and emergency nurses electronically order blood samples, blood cultures and oxygen for a potential sepsis patient; now typically completed within 30 minutes of receiving the electronic sepsis alert. When the doctor arrives to see the patient, blood results are available which enables appropriate treatment to be immediately determined.

Our doctors select and order in our EPR the most appropriate antibiotics to treat the source of the patient's infection, with the system supporting clinicians by recommending the correct medication dose and frequency.

The sepsis risk

Research shows that for every hour delay in receiving antibiotics the risk of sepsis mortality increases by 8%

Improved patient care and safety

Since its launch, there has been a 70 per cent increase in the proportion of patients diagnosed with sepsis receiving antibiotics within the recommended one hour national timeframe when presenting at A&E at Addenbrooke's Hospital.

Following this success, the electronic alerts and action prompts were tailored to national sepsis guidance for inpatients by our Sepsis Action Group. Since implementation across all adult inpatient areas at both of our hospitals (Addenbrooke's and The Rosie) in June 2017, we have seen a 50 per cent increase in inpatients receiving antibiotics for sepsis within 60 minutes of the sepsis alert being triggered in our electronic patient record. This means that deteriorating inpatients with suspected sepsis are now being more quickly and easily identified.

This alert feature has led to a 42 per cent reduction in sepsis mortality across the Trust.

National recognition for this lifesaving work

This lifesaving work has been shortlisted for numerous national awards – Patient Safety Awards, HSJ Awards and Digital Technology Leaders Awards – and has received national media publicity including a page feature in The Telegraph on 31 May 2018, and front page of the Daily Mail on 6 August 2018. We are working with NHS England to share our sepsis initiative and success to support other hospitals with their digital developments to improve patient safety and sepsis care.

"Improving prompt identification of sepsis patients and timely access to treatment is vital. The electronic alert and action set, devised with clinicians and built into our electronic patient record by our in-house eHospital digital team, better equips our doctors and nurses to be more aware of the possibility of sepsis and act quickly with appropriate treatment.

Dr Sian Coggle
Consultant in Acute Medicine and Infectious Diseases, and Sepsis Lead

"I had severe sepsis in November 2017 and the care I received from Addenbrooke's Hospital was honestly amazing. Resus started treatment immediately and everyone involved, from the rapid response nurses to the intensive care staff, were incredible. Thank you all so much for spotting it quickly and saving my life.

Robyne Toseland
Sepsis patient

42% reduction
in sepsis mortality across the Trust

100% sepsis screening
in our A&E department

80% increase
in patients receiving antibiotics for sepsis within 90 minutes of A&E arrival

70% increase
in patients receiving antibiotics for sepsis within 1 hour of arrival at A&E with electronic sepsis alerts in our EPR

50% increase
in adult inpatients receiving antibiotics for sepsis within both 60 and 90 minutes of the sepsis alert being triggered in our EPR

Our digital theatres and critical care

In our high dependency areas, like operating theatres and intensive care, a huge amount of data is produced about severely unwell patients who are hooked up to ventilators, monitors, and other medical devices. Prior to having our an EPR our teams had to manually assimilate data from multiple sources and devices, but with our EPR our theatres and high-dependency areas have been completely transformed.

Automation of vital patient data from medical devices

All of our physiological monitors and ventilators, in all 40 of our theatres and 148 high-dependency areas and critical care beds, are directly connected to our EPR. This means that the data generated from these devices, attached to our sickest patients, is being automatically and continuously recorded directly into their health record in our EPR; removing the need for manual transcription and associated errors.

Medical device integration improves safety allowing our clinicians to spend more quality time at the bedside caring for their patients, instead of having to spend time manually capturing and recording data, on paper, every 5-10 minutes, day and night, for each patient – a staff time saving equivalent to £2.6 million a year!

Since 2014 when our EPR was installed, there has been a 50% decrease in peri-arrest situations (those about to suffer a cardiac arrest) through the automated capture of physiological data.

With our EPR our intensive care teams are able to see, at a glance, the effects that medical intervention is having on a patient as it brings together various information (for example - temperature, antibiotics, inflammatory markers, bloods results) from different sources and presents it in an intuitive graphical way on screen. This enables our clinicians to easily see and monitor how a patient responds to certain treatments or medications in intensive care.

Effective transfers of care

When a patient is stable enough to be transferred from one phase of care to another – moving from theatre to intensive care, or from intensive care to a ward – all information about the patient is available to staff in that area before the patient arrives. From within the patient's record in our EPR the team are able to see, for example, which medications the surgeon/doctor has prescribed to be administered.
They can also easily see the information that has been recorded by previous teams treating the patient – from operation details, surgical notes and anaesthesia information, to procedures performed and medications prescribed.

> **"With all the information in one place in our EPR – test results, medical charts, theatre/operation details, and consultant and surgeon notes – the information is totally invaluable and is having a huge impact on our patients. In terms of patient safety and the care we give our patients, our electronic patient record has made an enormous difference, especially in intensive care which is such a data-rich environment.**

Dr Andrew Johnston
Consultant in Intensive Care Medicine and Specialty Lead for the John Farman Intensive Care Unit

> **"Having every bit of information at their fingertips in our electronic patient record means that relatively junior staff can, in the middle of the night when staff numbers are reduced, feel confident about making even the most significant decisions of all – for example when not to resuscitate a patient. The DNR (Do Not Resuscitate) order and all the other information is there to see in the patient's electronic record in our EPR.**

Dr Vilas Navapurkar
Consultant in Intensive Care

18%
increase in main theatre case volume through faster theatre turnaround and analytics in our EPR.

2-3
avoidable deaths prevented each year with electronic routine review of best practice for ventilator tidal volumes in our EPR.

30
minute reduction in our Rapid Response Team getting to patients across our hospitals that need them the most.

Rapid response

If any of our patients on any of our wards start to deteriorate or suddenly become acutely unwell, the Trust's Rapid Response Team - a dedicated team of 13 nurses, led by a consultant and registrar – can immediately respond with critical care expertise.

Our EPR alerts the team to any patients whose vital signs cause concern so that they can visit the patient's bedside within 30 minutes of the alert, a reduction of 30 minutes pre EPR, and, if necessary, move the patient straight to the intensive care unit for round-the-clock care and attention.

> **"We can access information about multiple patients across our hospitals at once, remotely, as all information is in their electronic health record in our electronic patient record. This means that the expertise of the intensive care staff can be spread throughout our hospitals; allowing us to quickly prioritise and get to the patients that need us the most.**

Dr Monica Trivedi
Consultant in Anaesthesia and Intensive Care, and Rapid Response Lead

> **"Having access to complete patient data and information at any place, at any time, allows staff at every level to make clinical decisions. It empowers us nurses – we can alert doctors and begin treatment while we wait for them to arrive to see the patient.**

Lisa Wood
Rapid Response Nurse

Our digital wards

Gone are the days of paper drug charts hanging at the end of patient beds, doctors documenting in paper notes during their ward rounds, nurses having to wait for a patient's set of notes to become available before they can write in them to record regular observations, multiple trips back and forth to pharmacy to submit paper medication prescriptions…and the list goes on!

As in our clinics, emergency department, and high dependency areas, the inpatient team caring for a patient can see their health record, in its entirety, within our EPR. A patient's notes are always available and accessible electronically, with multiple clinicians able to contribute to a record simultaneously, avoiding any unnecessary delays to care.

Our EPR has totally transformed the ward environment, from the start of a nurse's shift to the end. We no longer have lengthy one-to-one handovers. Following the main group discussion, nurses go straight onto a computer to read the handovers and view their patients' records simultaneously to quickly and easily see the care that was provided on the previous shift. This is a much more efficient use of our time – meaning that nurses can get quickly up to speed with their patients' care, and nurses tend to finish on time nearly every shift now.

Hannah Nunn
Senior Sister and Practice Development Nurse in Paediatrics

Recording care at the bedside using mobile devices

Our doctors and nursing staff use mobile and handheld devices on our wards to view and record information about their patients, in real-time, at the bedside.

Nurses use handheld devices called 'Rover' – an iPod Touch with in-built barcode scanner in a medical grade waterproof casing. When a nurse scans a wristband the patient's health record in our EPR appears on the screen, enabling the nurse to then record the patient's regular observations (temperature, blood pressure, pulse) directly into their record in our EPR, in real-time, at their bedside.

Workstations-on-wheels are used primarily by our doctors to record information during ward rounds – including updates to a patient's care, any medication changes or further tests/procedures required; all of which are documented and ordered in real-time, ready for nursing staff and other clinicians involved in the patient's care to action.

100%
of inpatients have barcode wristbands that link to their health record in our EPR

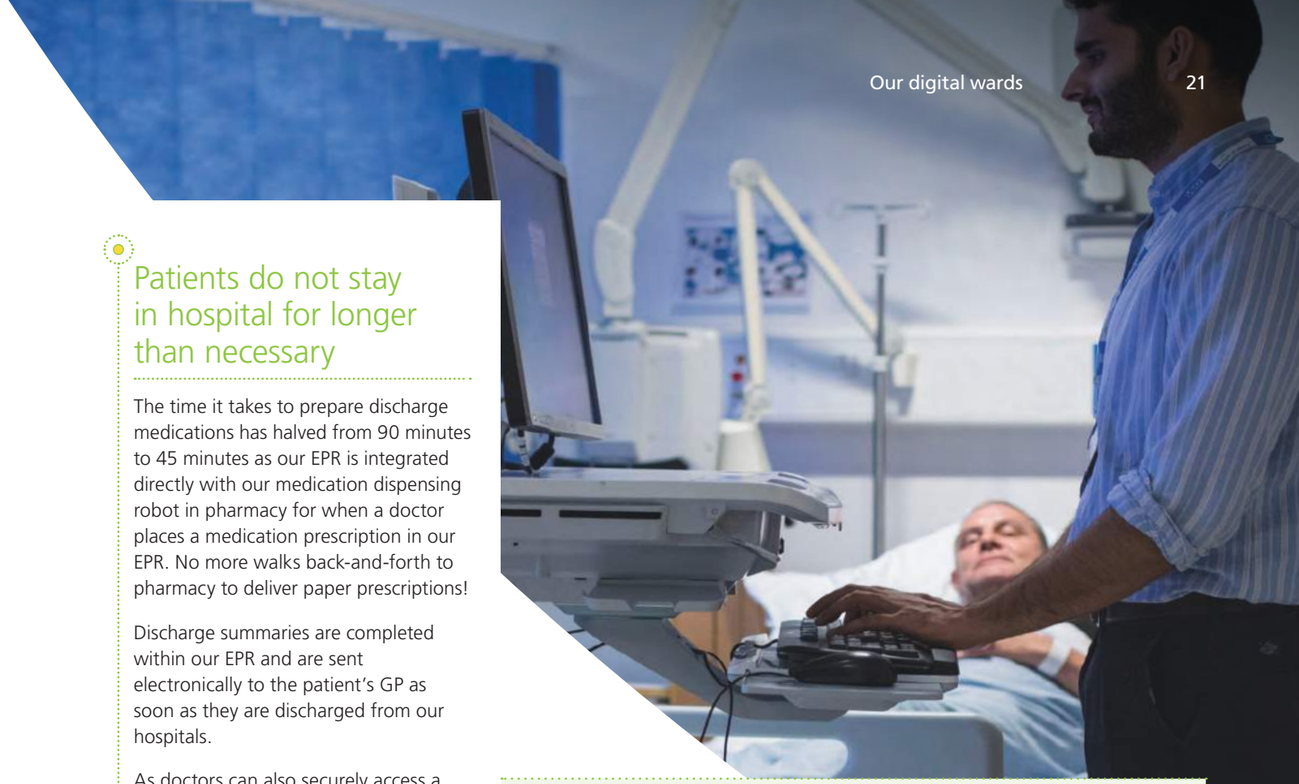
420+
handheld mobile 'Rover' devices with barcode scanner integrated with our EPR

400+
mobile workstations-on-wheels (WoWs) integrated with our EPR

50%
reduction in the time it takes to prepare discharge medications (90 minutes to 45 minutes) as our EPR 'talks' directly to our medication dispensing robot in pharmacy

Not having to share one set of hardcopy notes has been a huge help. Prior to having our EPR we were running around looking for notes then queuing up to wait for a colleague to finish with them before we were able to write in them. Information is now more easily kept track of as it's all in one place – in the patient's electronic record in Epic. Contending with illegible handwriting is also now a thing of the past. It has made us safer and more organised as we can make sure that absolutely everything is up-to-date in a patient's documentation with a few clicks of a few buttons.

Charlotte Foster
Senior Sister, Care of the Elderly Ward



Patients do not stay in hospital for longer than necessary

The time it takes to prepare discharge medications has halved from 90 minutes to 45 minutes as our EPR is integrated directly with our medication dispensing robot in pharmacy for when a doctor places a medication prescription in our EPR. No more walks back-and-forth to pharmacy to deliver paper prescriptions!

Discharge summaries are completed within our EPR and are sent electronically to the patient's GP as soon as they are discharged from our hospitals.

As doctors can also securely access a patient's record in our EPR wherever they happen to be, they can remotely provide care and prescribe medications without needing to be with a patient; avoiding any unnecessary delays to their care or discharge.

Improving flow and capacity

When a patient is discharged or transferred, our EPR automatically indicates to ward staff the type of bed clean that should be ordered based on the departing patient's clinical status. This is helping to reduce the unnecessary ordering of lengthy intensive cleans, which can take up to four hours - improving patient flow, bed capacity and efficiency across our wards.

Real-time bed status information is also available in our EPR, which is assisting with the management of high occupancy areas and the planning of upcoming patient discharges.

Historically when discharge letters were created they were done so at the discretion of doctors going through the patient's notes compiling what they deemed to be relevant and important for the patient's GP; focusing largely on medical aspects of their care. Within our EPR we have created a multidisciplinary-enhanced discharge summary for our elderly patients with complex conditions. It enables each discipline involved in a patient's care – physiotherapy, speech and language therapy, dietetics, psychiatry – to write a paragraph which gets automatically collated into the patient's discharge summary in our EPR so that the GP is informed of all aspects of care. This helps them better plan continuity of care through primary care services.

Dr Stephen Wallis
Consultant, Medicine for the Elderly

We have developed a capacity dashboard within our EPR that gives a complete view of the current bed state across all inpatient areas. It also shows potential discharges, actual discharges including the time that a patient left hospital, the red and green status and any delayed discharges. This is useful for the patient flow managers and other managers of the day to be able to focus on the patients that are more likely to be discharged. As our EPR is a live tool the dashboard is updated every few minutes to reflect the changes to bed statuses as they occur.

Claire Tolliday
Senior Clinical Nurse, eHospital Senior Team Leader and Head of eHospital Clinical Liaison Team

CASE STUDY

Scanning for Safety

At Cambridge University Hospitals we are improving safety and care through the use of digital technology, with one such example being our adoption of 'Scan for Safety'. 'Scan for Safety' is international best practice for the safe administration of medications, infusions and communally-stored expressed human milk, through the scanning of barcodes which we have integrated with our Epic electronic patient record.

Barcode medication administration

Barcode medication administration, known as BCMA, enables our nurses to safely administer medications and infusions by scanning both a patient's barcode on their identity wristband (linked to their health record in our electronic patient record system) and the barcode on their prescribed medications or infusions. This technology-enabled care supports our nurses in ensuring that the right medications and the right doses are given to the right patients, at the right time, and in the right way… each and every time.

Nurses in all 51 of our wards, critical and intensive care areas, across both of our hospitals (Addenbrooke's and The Rosie) are administering medications and infusions to our patients through BCMA. In May 2018 we became the first NHS trust to extend BCMA adoption to across all areas of our emergency department (A&E).

Barcode expressed human milk administration

In addition to barcode medication administration, our healthcare assistants, nursery nurses, midwives, midwifery support workers and nurses in neonatal, paediatric and maternity areas of Addenbrooke's and The Rosie hospitals also scan a baby's identity wristband, followed by the barcode on the baby's container of expressed breast or donor milk (if it is stored in a fridge with other expressed human milk containers from other mothers or donors). This is known as barcode breast milk administration or BCBM, and is international best practice for improving safety by ensuring the right milk is given to the right baby each and every time, and that the feed is recorded in the baby's health record in our electronic patient record system.

Enabled by our innovative digital barcode database

To enable scanning for safety across our hospitals, our eHospital digital team has built an electronic medication database within our electronic patient record, which is fully compliant with the NHS Dictionary of Medicines and Devices (dm+d) licensed within the UK. Our database contains over 80,000 drug codes and 55,000 medication barcodes. With the most complete coded medication database in an NHS trust, NHS England is considering how a new drug registry based on our methodology could provide a consistent medication database for use across the NHS.

"BCMA is helping to reduce the possibility of drug errors on our ward and it's really simple to do. Using a handheld Rover digital device I scan the patient's wristband which automatically brings their medication chart in our electronic patient record up on the screen. I then scan their medications and their wristband again to double-check that I am about to give the right medications to the right patient. This provides an added patient safety check and also makes me feel safer knowing that I've given my patients their correct medications and dose at the right time and in the right way, and that it's recorded accurately in their health record in our electronic patient record.

Claire O'Riordan
Nurse, Care of the Elderly Ward

NHS blueprint

We have created a national blueprint with NHS England to support other hospitals with Scanning for Safety

Epic steps in patient record sharing

At Cambridge University Hospitals we recognise the importance of accurate and timely access to clinical information – for patients themselves, for our hospital clinicians and clinical teams, for a patient's primary care providers and for other hospitals involved in a patient's care. Working with our healthcare partners, developing and utilising the extensive capabilities of our Epic electronic patient record, we are able to innovatively share electronic clinical data and information to enable joined-up healthcare to benefit our patients.

Putting patients at the heart of their care

With timely medical record sharing a challenge across the NHS, our ambition as a digital trust was to create integrated technology to:

- enable our hospital staff to see a single unified view of a patient's health record, electronically, in its entirety (Epic EPR);
- give our patients the ability to view their electronic health record held at our hospitals, to involve them more in their care and support them with the management of their health conditions (MyChart patient portal);
- enable the sharing of key clinical information with other hospitals also caring for our patients (Care Everywhere);
- advance patient care by sharing clinical information in a real-time digital way with our patients' GPs (EpicCare Link).

All of this is being achieved through the use of our EPR; with its extended capabilities of the MyChart patient portal, Care Everywhere and EpicCare Link functionality, which we have tailored to suit our needs and those of our patients and healthcare partners.

Care Everywhere – our digital connection with other hospitals

In April 2018 we delivered a UK technical breakthrough by linking our Epic EPR with a neighbouring hospital's EPR system. At the push of a button, our clinicians are able to easily and securely access clinical information about a patient that is held within West Suffolk Hospital's Cerner Millennium EPR, and vice-versa, enabling real-time information and data sharing to advance patient care.

This is the first digital link in the UK between hospitals' electronic patient record systems, provided by two different software suppliers.

Located 35 miles apart, approximately 30 per cent of patients attend our hospitals (Addenbrooke's and The Rosie) and West Suffolk Hospital for care and treatment.

From within each hospital's EPR system clinicians working in A&E, outpatient clinics, wards and other inpatient areas, can see a patient's past and present clinical information – from conditions and treatments to latest test results held at the opposite hospital – saving time and reducing delays to care and unnecessary repeats of tests and procedures.

Prior to this development there was no easy way for the two trusts to share vital clinical information with one another in a timely way.

This digital link also connects Cambridge University Hospitals with all hospitals across the world that use an Epic EPR and its Care Everywhere functionality.

EpicCare Link – our digital connection with primary care

In May 2018 we launched another technical innovation which enables general practitioners (GPs) and community nurses to securely access clinical information about their patients from directly within our EPR, via our digital primary care portal called EpicCare Link.

This portal is currently available at Granta Medical Practices in Cambridgeshire – a large practice group comprising of five GP surgeries.

At the touch of a button GPs, community nurses and administrative staff at the practices use this portal to securely view information in their patient's hospital record, within our EPR, to advance shared patient care in a timely and more effective way.

> **Being able to access patient records seamlessly and in real time for both hospital and community settings helps co-ordinate and improve the delivery of care. We are very much welcoming this active collaboration for the benefit of our shared patients.**

Dr James Morrow
Managing Partner of Granta Medical Practices

They are able to view the latest information about their patients – from conditions, tests and procedures to results, treatments, clinical letters and recommended follow-up care.

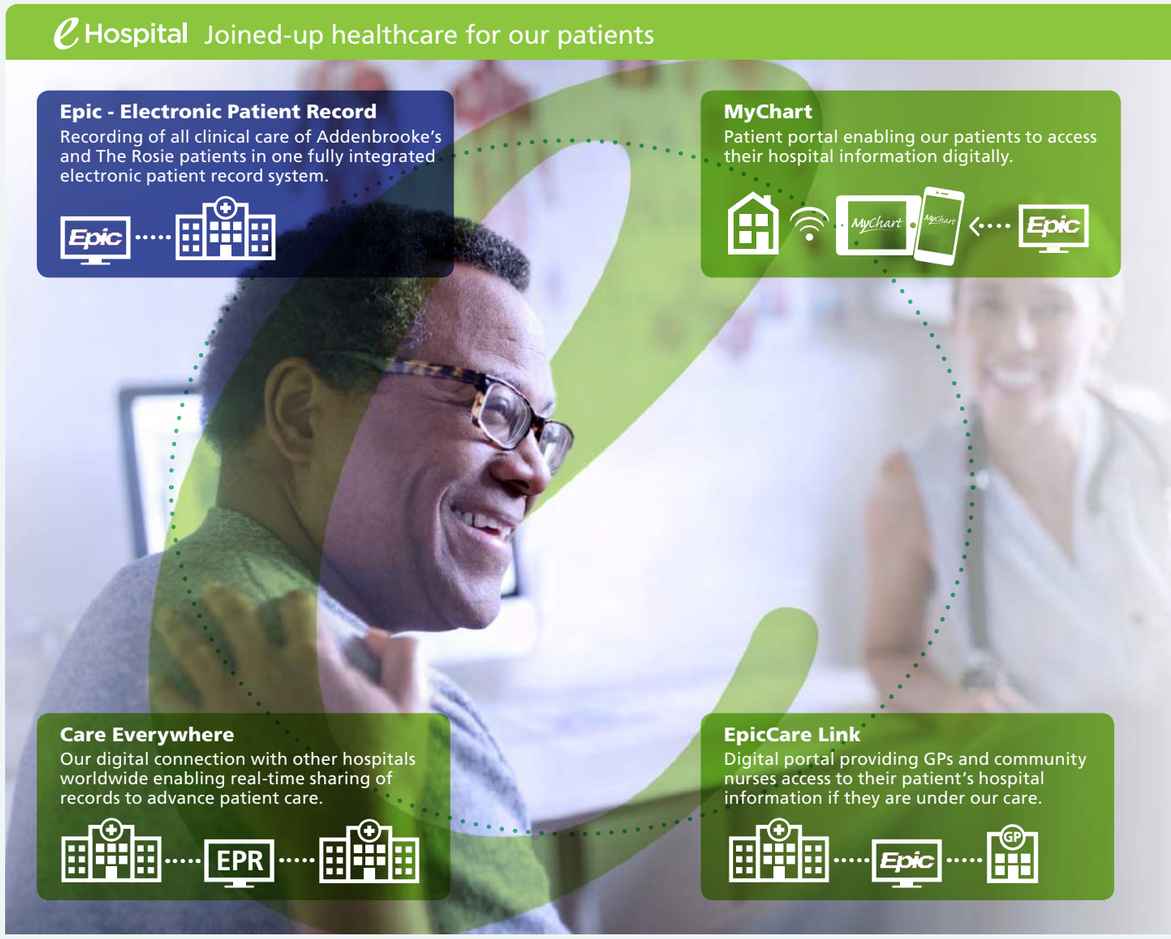
For example, if a patient visited our A&E department and then went to one of Granta's GP surgeries the following day or two, their GP would know everything about the care they received at our hospitals and any follow-up care or treatment that is required.

Better for our patients

Our electronic patient record, Care Everywhere and EpicCare Link functionality, combined with the use of the MyChart patient portal (allowing patients' access to their health information held at our hospitals), now means that our patients, their clinical teams and their GPs all have a more comprehensive view of their health and care status; enabling more informed decision-making and involving patients more in their care.

> **Empowering our patients to be more involved and informed about their care also helps us to ensure that the information we hold about them in our hospitals' electronic patient record is accurate and up-to-date.**

Helen Balsdon
Associate Director of Nursing Informatics
Cambridge University Hospitals



Our digital future

Over the years a great deal of progress in delivering digital change has been made across Cambridge University Hospitals (CUH), primarily through our eHospital programme, to enable us to lead the way in digitalisation of the NHS.
Through the use of digital technology, we are seeing huge improvements to patient care, safety and quality. However digital has the potential to go beyond this, offering solutions to some of the most complex challenges facing the NHS, which we want to fully embrace over the years to come.

A digital revolution in healthcare

As with many other sectors, healthcare is being taken over by the 'digital revolution', having recognised the potential that technology has to support and transform the delivery of care. To date, this has most notably been done through digitalised health records.

Building on our digital success, our digital strategy as a global digital exemplar enables us to further explore and develop the use of digital technology to fundamentally change the way we deliver healthcare.

Our digital vision for the future

To be an innovating, fully digital trust, that connects our patients, staff, and wider health systems. This will enable us to deliver sustainable leading healthcare outcomes, world-class research and teaching, and contribute to the national Life Sciences agenda.

The 'NHS Long Term Plan' sets out that we, as the NHS, need to continuously adapt to take advantage of the opportunities offered by technology, to continue to serve our patients and to meet future challenges and demand.

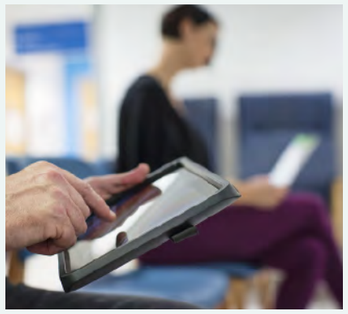
Our digital aims are to:

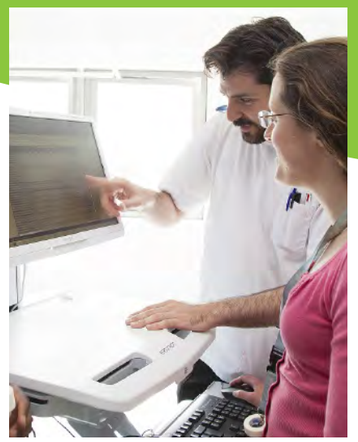
- **Further improve patient journeys:** Pathways will be more streamlined, outcomes improved, and patients will have greater involvement and engagement with their care; digitally supported transformation will be business as usual.
- **Work with our communities:** CUH will play a leading role in establishing the East of England as an exemplar region for sharing healthcare data in real-time.
- **Strengthen the organisation:** Digital will be embedded across our organisation as our default way of working, and we will be financially and operationally resilient in our delivery of this.
- **Contribute nationally and internationally:** CUH will be internationally recognised as a centre of excellence for digital innovation in healthcare and be a leading healthcare collaborator with industry, academia and other healthcare providers.
- **Supporting the NHS digitally:** We will continue to support other NHS trusts with their advancements in digital maturity by sharing our journey and successes through a series of digital 'blueprints' for others to adopt, and through Trust visits and collaborative activities.

Embracing advancements in technology

There are a number of well recognised opportunities in digital healthcare which we are keen to embrace further by advancing our digital technology and extending the capabilities of our electronic patient record (EPR) including:

- Co-produced healthcare – a cultural shift in the relationship between patients and healthcare professionals
- Patient self-management facilitated through access to their own records
- Increasing patient access to information via the internet
- Mobile and remote medicine
- Use of devices for care and management
- Wearable devices
- Artificial intelligence





"Epic's MyChart patient portal allows Bluetooth-enabled devices to be connected from either a wearable or a device at home via Apple's HealthKit on iPhones, or via Google Fit on Android phones. Data from these devices can then flow straight into the relevant patient's chart in our Epic EPR; enabling remote review by clinical teams, or providing data in advance of a forthcoming clinic appointment. This data can be graphed, tracked over time, and can drive clinical decision support processes - so in addition to engaging patients with their care, it enables more timely review and interventions leading to better quality care, as well as greater efficiency. As part of our future plans we will be activating this capability for our patients as it clearly carries great potential across a number of disciplines.

Dr. Afzal Chaudhry
Renal Consultant and Chief Clinical Information Officer, Cambridge University Hospitals

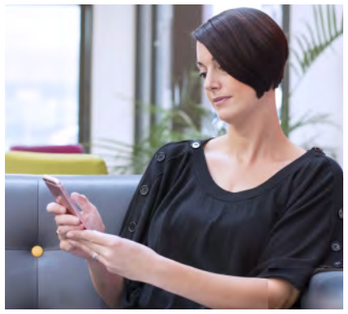
Understanding the true value of digital data

Within our EPR and legacy IT systems we hold data on 2.1 million patients. As a data-rich healthcare trust our aim is to move away from simply 'analysing' data - however detailed and rich in character - to instead understanding the true value of the information we hold on our patients, bringing profound benefits for them and their clinicians alike.

Combining clinical data with social and genomic data, for example, will generate comprehensive and actionable information that will help to support patients through the delivery of more personalised forms of care in the future; ideally moving from a principally reactive system to one where maintaining health is a proactive continuous programme.

Extending our cloud-based services with Microsoft Office 365

Microsoft Office 365 will work alongside our EPR to enhance the administrative side of our work, speeding up many processes from conferencing to communication, helping us to work even more efficiently and effectively across CUH to ultimately benefit our patients. It will also save us valuable time and money. Once the suite of services are made available to staff, CUH will become the largest healthcare organisation in England running Microsoft Office 365.



"The potential for technology to enable significant benefits for both patients and NHS staff is well known. Microsoft is delighted to be working with Cambridge University Hospitals to make that more of a reality. The Trust will be leading the way in enabling its staff to work flexibly, collaborate and share securely, leveraging our innovative cloud solutions. The benefits will be far reaching and we are very excited to see those emerge.

Suzy Foster
Director of Health and Life Sciences for Microsoft UK

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Published June 2019 | © 2019 Cambridge University Hospitals
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