NHS
Cambridge
University Hospitals
NHS Foundation Trust

Together
Safe
Kind
Excellent

Changing everything …

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&

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Declaration of Interest

- I am a member of the:

  - EMEA HIMSS Advisory Council
  - KLAS International Advisory Board

- HIMSS have previously supported my registration & travel costs for attendance at two of their conferences

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The Trust in Numbers

1,200+
Beds

530,000+
Catchment population
as a District General Hospital

4 million+
Population for UK-
wide specialist care

126,000+
ED attendances

67,000+
Inpatient episodes

853,000+
Outpatient episodes

130,000+
Day case attendances

38,000+
Surgical operations

5,200+
Births

11,500+
Staff

£1bn (€1.15bn)
Turnover

Changing everything …. 2020-21 data

Our Digital Journey

- **2010**

  - Multitude of clinical IT systems & aging technology

  - Limited functionality, accessibility & poor integration

  - No / low levels of resilience

- **2011** - Procurement commenced

- **2013** - Contracts signed

- **2014** - Go-live across the hospitals (acute & maternity)

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Preparation

- **Workflow validation**

  - 1,000+ clinicians,   270+ sessions,   470+ pathways

- **Training**

  - > 95% of staff trained (12,000 people)
  - > 175,000 hours of training over 9 weeks

- **120, 90, 60 & 30-day pre-go-live**

  - technical / software readiness assessments
  - parallel divisional operational assessments

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26 October 2014 (go-live day 1)...

- PAS, bed management
- Enterprise scheduling
- All IP & OP care
- Emergency Department
- Intensive Care
- Maternity
- Cardiology
- Oncology
- Pathology
- Ophthalmology
- Pharmacy
- Radiology
- Transplant

- Theatres and anaesthetics
- Surgical pre-assessment
- Care plans & pathways
- Clinical documentation
- Orders and results
- Standard clinical terms & coding
- Prescribing & formulary management
- Workflow management
- Medical device integration
- Mobile & remote access
- Hydra (document import)
- Communicator (sending documents)

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Challenges …

NHS CUH

BBC NEWS

England | Local News | Regions | Cambridgeshire

Addenbrooke's Hospital consultants concerned over online records

31 July 2015

The Guardian

Internet
The networker

The NHS's chaotic IT systems show no sign of recovery

Paperless patient records are a necessity, but a new, US-made system at Addenbrooke's in Cambridge is a chronic misreading of patient needs

computing

Addenbrooke's Hospital £200m IT system proves an Epic fail

Cambridge University Hospitals NHS Foundation Trust is put into special measures, in part thanks to a new online patient records system

EPIC FAIL

Changing everything …

eHospital

The Way Forward

- Operational engagement

  - 'Support link', Epic specialty leads, 'Lunch and Learn'

  - Personalisation

- 'Recording of Care' / 'Variation in Care' programmes

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PRSB

Professional
Record
Standards
Body

Better records
for better care

HOME   STANDARDS ⌄   PROJECTS ⌄   USING OUR STANDARDS ⌄   NEWS ⌄   ABOUT US ⌄

CRISIS CARE SUMMARY

DIGITAL CARE AND SUPPORT PLAN

E-DISCHARGE SUMMARY

EMERGENCY CARE DISCHARGE

MENTAL HEALTH INPATIENT DISCHARGE

OUTPATIENT LETTERS

HEALTHY CHILD RECORD

STRUCTURE AND CONTENT OF PATIENT RECORDS

STRUCTURE AND CONTENT OF AMBULANCE RECORDS

STANDA

PRSB STA

The PRSB develops national standards for
the structure and content of health and
social care records. These cover, for
example, hospital referral letters, handover
communications, discharge summaries, and
inpatient and outpatient letters.

Our care record standards are widely accepted and endorsed across the
UK.

PRSB STANDARDS

- Digital care and support plan
- Healthy child record

https://theprsb.org/standards/

Digital environment

Fully integrated EPR
one patient, one record,
one system, one place
(integrated healthcare)

Same information viewed by the clinical team vital for patient care and safety

Latest IT equipment
8,500+ desktop PCs
1,500+ laptops
1,700+ mobile / handheld devices
Remote access - 2,500+ off-site daily

Integrated devices
All physiological monitors and ventilators in 40 theatres and 148 critical care beds integrated
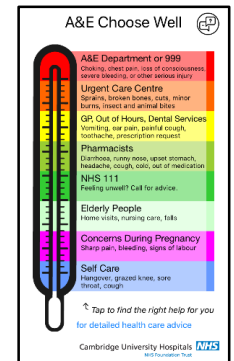
Use of mobile & handheld devices
Real-time information recorded
at the patient's bedside

Mobile apps factory
Clinical care &
clinical trials

Releasing time to care
saving 124 WTE nurses through documentation always to hand & eliminating data transcription

Changing everything …
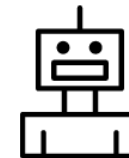
Better for our patients

Electronic prescribing
100% reduction in sedation related prescribing errors in paediatrics
= 50 intensive care beds &
100 regular beds saved / year

Faster preparation of discharge medications
50% reduction in the time taken to prepare discharge medications interfacing directly to our dispensing robot in pharmacy

Decision support
16% of allergy-related prescribing alerts have led to a change in prescription (preventing 850+ significant adverse reaction / year)

Rapid Response Team
Automated calculated warning scores drive workflows & alerts, >50% reduction in time to clinical review

MyChart patient portal
104,000+ active users, 158,000+ test results automatically released per month

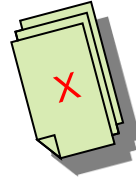**Routine review of best practice for intensive care ventilator tidal volumes**
saving 2-3 avoidable ventilator-related deaths per year

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Better for our hospitals

Paperless processes

£470,000 saved annually in medical records with a 99% reduction in paper notes (inpatient & outpatient areas)

Clinical coding improved

Information reviewed in one system Improved data quality & depth of coding cumulative additional income (5.5 years £87.3m – ROI >5,500%)

Pathway automation

75%+ automated opening & closing of pathways (cancer & RTT) based on clinical activities / decisions

Real-time bed occupancy information

electronic bed status available to all better management of high occupancy areas and discharge planning

Automated letter creation

80% of clinic letters in paediatric gastroenterology are given to the parents at the end of clinic – tools combining data from elsewhere in the patient's chart into a structured letter

Financial savings

£1.8million average annual reduction in the financial gap between high-cost drug expenditure and income

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Scanning for Safety

- Patient wristband scanning & close loop administration

- Barcode medication administration, transfusion & sample collection scanning

- Positive patient assignment throughout

- Saving 2,600+ lost bed days per year from avoidable adverse drug reactions

- National blueprint with NHS England

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MyChart Patient Portal

- First UK fully integrated patient portal

- Enabling / empowering patients in their own care

- Access to
  - Diagnoses
  - Medications
  - Allergies

  - Results
  - Demographics
  - Letters

  - Surveys
  - Appointments
  - Scheduling

- Activation data: Jul 2022 - 104,687
- Results release: ~158,000 automatically / month

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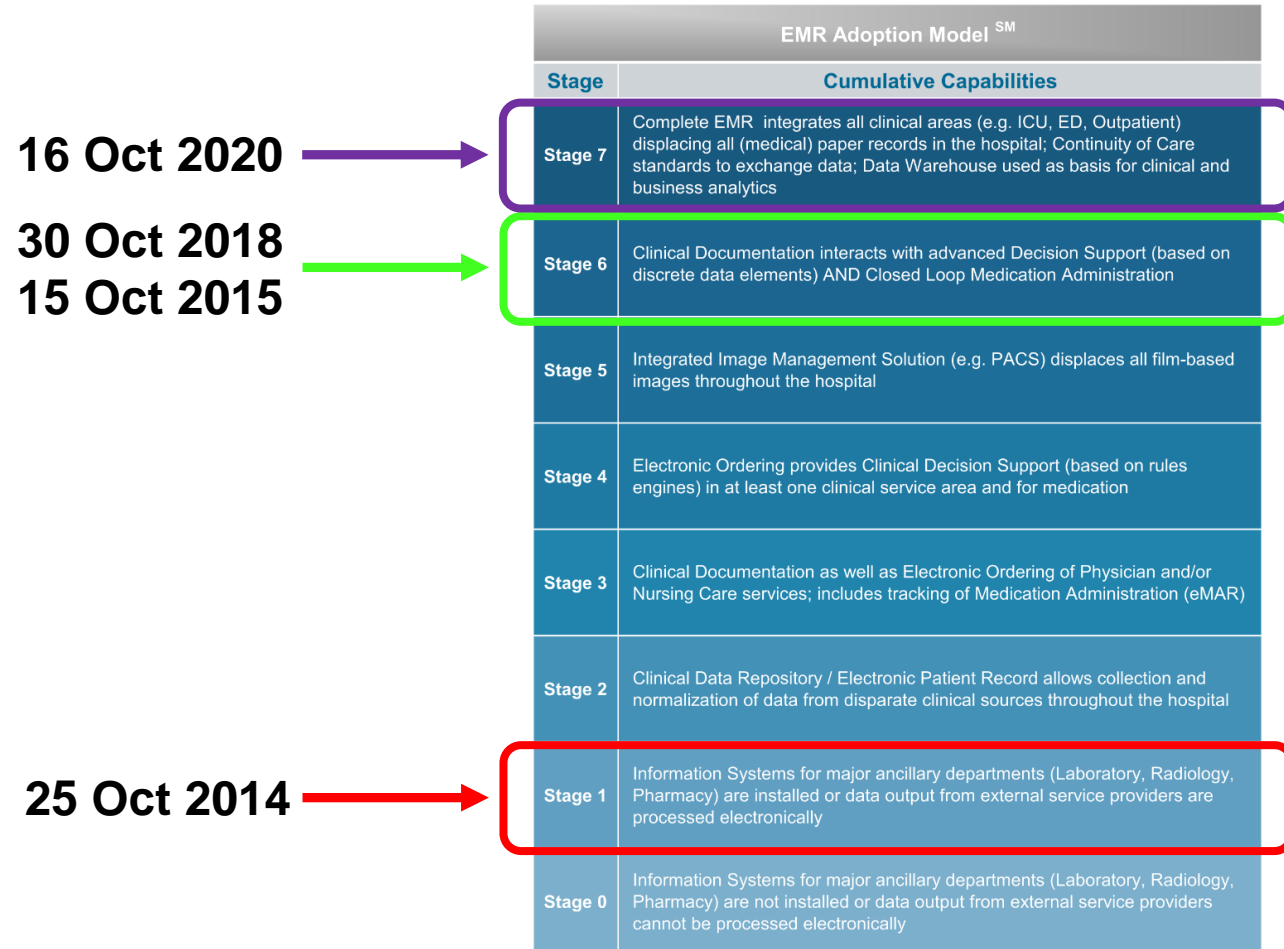
Sharing Beyond the Hospital

- **Care Everywhere** - sharing with hospitals
  - Integrating Healthcare Enterprise (IHE)
  - XCPD, XCA protocols
  - real-time sharing

- **Sharing with Primary Care**
  - Transfer of Care programme - interoperability toolkit 3.0
  - 'GP Connect' - https://digital.nhs.uk/services/gp-connect
  - FHIR based messages - https://digital.nhs.uk/services/fhir-apis

Digital Maturity

Healthcare Information & Management Systems Society (HIMSS)

Electronic Medical Records Adoption Model (EMRAM)

16 Oct 2020

30 Oct 2018
15 Oct 2015

25 Oct 2014

EMR Adoption Model ᔆᴹ

Stage	Cumulative Capabilities
Stage 7	Complete EMR integrates all clinical areas (e.g. ICU, ED, Outpatient) displacing all (medical) paper records in the hospital; Continuity of Care standards to exchange data; Data Warehouse used as basis for clinical and business analytics
Stage 6	Clinical Documentation interacts with advanced Decision Support (based on discrete data elements) AND Closed Loop Medication Administration
Stage 5	Integrated Image Management Solution (e.g. PACS) displaces all film-based images throughout the hospital
Stage 4	Electronic Ordering provides Clinical Decision Support (based on rules engines) in at least one clinical service area and for medication
Stage 3	Clinical Documentation as well as Electronic Ordering of Physician and/or Nursing Care services; includes tracking of Medication Administration (eMAR)
Stage 2	Clinical Data Repository / Electronic Patient Record allows collection and normalization of data from disparate clinical sources throughout the hospital
Stage 1	Information Systems for major ancillary departments (Laboratory, Radiology, Pharmacy) are installed or data output from external service providers are processed electronically
Stage 0	Information Systems for major ancillary departments (Laboratory, Radiology, Pharmacy) are not installed or data output from external service providers cannot be processed electronically

https://www.himssanalytics.org/europe/electronic-medical-record-adoption-model

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Staff Experience & Engagement

Item	April 2015	March 2016	May 2017	May 2018	June 2019	April 2022
Staff are able to find relevant patient info easily in Epic	+44	+60	+63	+69	+74	+76
Staff are satisfied with the support available/provided for Epic issues / Epic changes that arise	-8	+18	+25	+31	+39	+49
Staff who are confident, at the present time, that the Epic system supports them in caring for their patients	+25	+55	+61	+66	+71	+71
Staff who are confident that, in 6 months time, the system will support them in caring for their patients	+39	+54	+56	+60	+65	+62

Net promoter scores: +50 excellent, +70 exceptional

**Changing everything …**

Lessons (I)

- **Change of mindset**

  - digital underpins everything - it is not a 'bolt on'

- **Understand**

  - your clinical, administrative & operational workflows / policies
  - define / describe 'who', 'what', 'when' and 'why'
  - EPR is typically the 'how'

- **Become more educated in defining 'value' and measuring benefits**

Lessons (II)

- **Staff engagement & change management**

  - Make it 'real' - stories about ever-increasing high-quality care

  - Dress rehearsals for operational readiness (incl. infrastructure)

  - 'Too much' is not enough

**This is NOT about IT nor about medicine
it IS all about people**

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Further Information
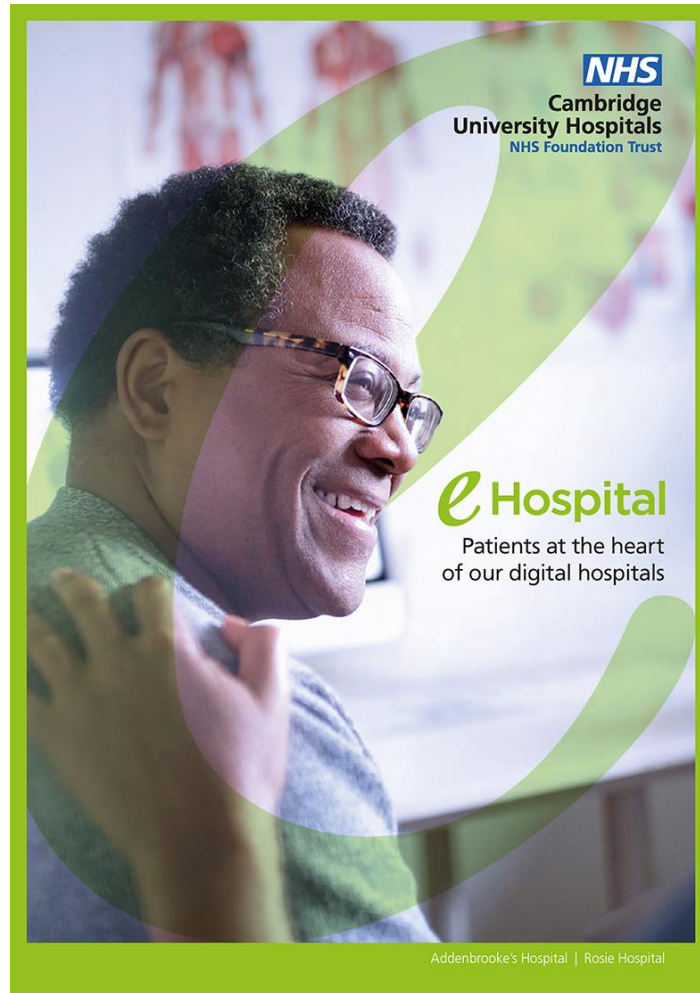
eHospital brochure (Sept 2019)

'Patients at the heart of our digital hospitals'

www.cuh.nhs.uk/ehospital

@CUH_NHS

@my_eHospital

Current Projects / Plans (I)

- *MyChart* **enhancements**
  - Expansion of self scheduling of appointments
  - Uploads of own data / wearables

- **More device integration**
  - Infusion pumps
  - Remote monitoring on-site and offsite – virtual wards

- **Registries & population health**
  - Expanding interoperability
  - Move towards broader cohorts and earlier intervention

Data & Information Technology

Current Projects / Plans (II)

- **Data stewardship & governance**
  - Automated pipelines of clean curated data for self-service tools
  - NLP / data mining of current / legacy records
  - Predictive modelling evolving to prescriptive care

  - Project Inner Eye - Dr Raj Jena

    https://www.microsoft.com/en-us/research/project/medical-image-analysis/

    https://www.cuh.nhs.uk/news/hancocks-high-tech-visit/

Data & Information Technology

Any questions?

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eHospital at Cambridge University Hospitals (LinkedIn)