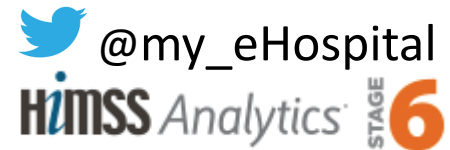


Cambridge  
University Hospitals  
NHS Foundation Trust

# Blueprinting Closed Loop Barcode Medication Administration



# **Carolyn Crooks**

## Head of Information Management

# The Trust



- Two hospitals – Addenbrooke's & the Rosie
- 5 clinical divisions – women's healthcare fully integrated

# The Trust (II)



**1,000**  
beds approx.



**110,000+**  
ED attendances



**65,000+**  
inpatient episodes



**127,000+**  
day case  
attendances



East Anglia

**Catchment pop.**  
530,000 GDH  
4m specialist



**40,000+**  
surgical operations



**740,000+**  
Outpatient  
episodes



**5,500+**  
births



**£850m**  
turnover

**9,000+**  
staff



2016/17 activity

# Achievements (I)

- **First** UK Trust to achieve Stage 6 of the HIMSS international Electronic Medical Record Adoption Model within a year of go live
- **Winner** of CHKS Top Hospitals Programme - Data quality award (May 2017)
- **Highly Commended** for 'best use of IT in improving patient safety' – National Patient Safety Awards (July 2017)



# Achievements (II)

- **Winner** of ‘best place to work in digital – large organisation’ – national Digital Technology Leaders Awards (July 2017)
- **First ever non-US health centre to rank among America’s elite**, that use advanced digital technology to provide high quality patient care, in USA’s prestigious ‘Most Wired’ survey and benchmarking study (July 2017)
- **Winner** of ‘Trust / Board of the Year’ – ehi Awards (October 2017)



# Blueprinting BCMA

- December 2017: CUH agreed to be part of the GDE blueprinting pilot project.
- Aim: to define the framework, methodology and publication strategy for GDE blueprints.
- Scope: provide insights to shape a proposed design and subsequent process for developing blueprints.
- Requirement: to provide dedicated resource involving project management, collating/authoring and subject matter expert input.
- Vendor neutral, process based and not discussing the technical elements of the implementation

# e-Prescribing including clinical decision support & medication administration chart

## Computerised Physician Order Entry

96% of all medication and instruction orders now completed electronically in our Epic EPR



## Improved antibiotic stewardship

100% recording of the indication for antibiotic prescribing within our Epic EPR



## Electronic prescribing

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



Patients don't stay in hospital for longer than necessary

50% reduction in the time taken to prepare discharge medications as the EPR now integrates directly with the pharmacy robot



## Financial savings

£1.2 million average annual reduction in the financial gap between high-cost drug expenditure and income.




## Clinical decision support

16% of allergy-related prescribing alerts lead to a change in prescription = 850+ significant adverse medication reactions prevented (2,450 bed days saved)



# Safer Medication Processes

1. Fully integrated electronic patient record system including prescribing, clinical decision support & medication administration chart



2. Coded electronic medication database



3. Barcode Medication Administration (BCMA) & blueprinting to support other healthcare organisations

# BCMA - scanning for safety

- International best practice for improving safety of medication administration
  - Simultaneous scanning of a patient's barcode wristband and medication barcode
  - Connected to mobile / handheld devices and electronic medication administration chart in Epic EPR
  - Protecting patients from prescribing, dispensing and administration errors
  - Supports nurses in confirming five 'rights' of medication administration in real time
- 
- Implemented on 18 wards
  - All inpatient areas by June 2018
  - Working towards HIMSS Stage 7 validation



**Improved safety**  
50% reduction in  
medication errors

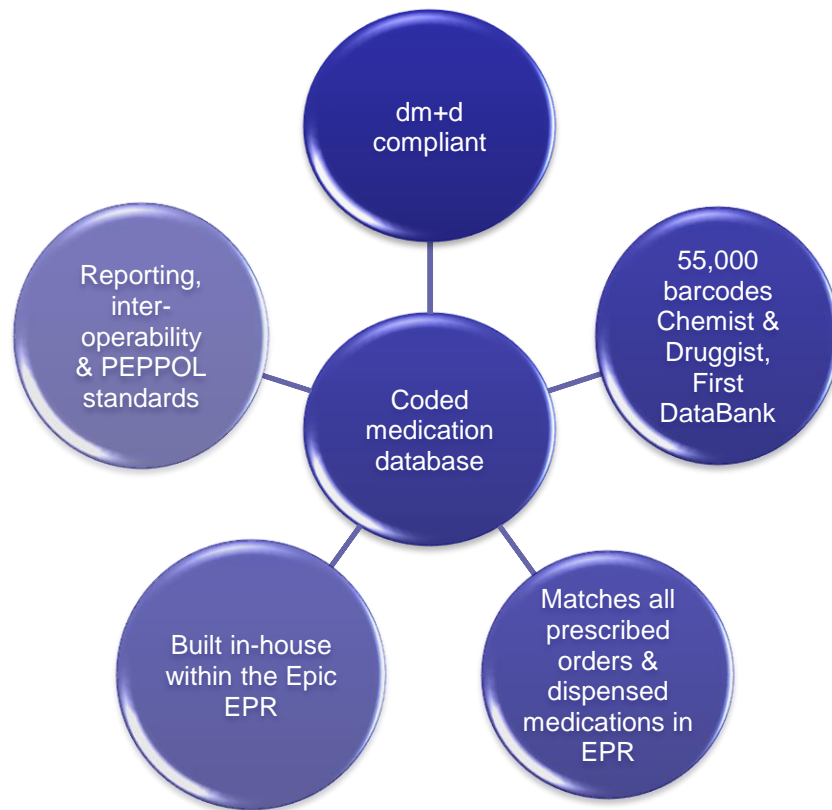
# Planning and timing of BCMA implementation

- Not implemented as part of EPR “big bang”
  - Managing the rate of staff process change
  - Requirement for dedicated resources
- We learnt from others
  - Visits to Sunderland Royal Hospital and Radboud UMC (Netherlands)
- Assess the workflows and resources
  - Map the ward layouts and the workflows
  - Carry out hardware assessment

# Developing a medication barcode database

- Within the UK there is no national registry of barcodes for medications at this time.
- For the pilot phase CUH created our own database using the First Databank (FDB) Multilex drug database
- Manual EPR codes were created and matched to medication profiles for any medications not represented.
- Work with the FDB was expanded post pilot to include “Chemist and Druggist” to give greater coverage

# Most complete drug barcode database in any NHS trust



NHS England are forming a new national drug registry for all NHS trusts based on our methodology

# Training – for the pilot and beyond

We created training which reinforced the CUH patient safety vision.

- For Ward Staff – scan the patient, scan the medication
- For Pharmacy – verify labels and medication

Our training policy developed as the programme progressed.

- Train medical staff about the importance of BCMA
- Utilise respected medical peers to support training
- Medication inclusion and exclusion criteria became enhanced

# Pilot phase on a single ward

Chose to pilot the programme on a paediatrics ward;

- Engagement and leadership
  - The ward had a Senior Sister who was motivated to drive the project forward
- Staffing
  - Consistent staffing, low staff turnover and low reliance on bank staff
- Prescribing patterns
  - Complex ward with range of prescribers
- Medications and volumes
  - Medications used were consistent with low volumes of drug administration

# Implementing the pilot phase

- Go live was scheduled to cause minimum disruption on the ward
- “Average” Monday morning, at 11am
- Dedicated trainers on the ward to answer questions
- Pharmacy support available to troubleshoot medications
- Support, communications and monitoring
  - Individual support
  - Ward team huddles
  - eHospital technical huddle
  - Compliance monitoring



# Roll out across the organisation

- Roll out planned according to workflow and technical capability.
- Remaining areas went live in three “big bangs”
- Pilot process was repeated
  - Mapping of ward layout and workflows
  - Support using huddles
- Nurse training was adapted based on staffing factors.
- Feedback mechanism developed between nursing and pharmacy staff

# Benefits and outcomes

- Clinical Outcomes
  - When BCMA compliance reached 80% there was a 50% drop in medication related incidents
- Operational Benefits
  - BCMA is cost-neutral in terms of staff time and medication costs
  - Nurses satisfaction – nurses feel “safer”
  - BCMA has given increased visibility into medication compliance

# Lessons learnt from BCMA Implementation

- Start with a steering group
- Keep a clinical focus
- Communicate your vision for patient safety
- Document learning from the huddles
- Group your wards by workflow
- Share your data
- Understand that each roll out gets easier
- Recognise the limitations

# Lessons learnt from Blueprinting

- Enables reflection.
  - Did we make the right decisions?
  - How were those decisions made?
- Encourages good project management methods.
  - Document the process
  - Peer review
- Requires commitment to the programme.
  - Dedicated resource

# What our nurses say...

*“BCMA is helping to reduce the possibility of drug errors on our ward and it’s really simple to do. Using a handheld digital device I scan the patient’s wristband which automatically brings their medication chart in Epic up on the screen. I then scan their medication and their wristband again to double-check that I am about to give the right medication 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.”*

**Clare O’Riordan, Staff Nurse, Care of the Elderly Ward**

*“Scanning of a patient’s medication and wristband together is really helping with patient safety on our ward. Nobody likes the feeling of unintentionally making a drug error and barcode medication administration significantly reduces the risk of this occurring. If you scan the wrong medications for a patient the device will sound an alert and if you take the scanned medications to the wrong patient it will again sound a warning to alert you that you have got the wrong patient.”*

**Hannah Nunn, Senior Sister, Paediatric Ward D2**

