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Brokering Innovation Through Evidence

September 2017

Evaluating a digitally-enabled care pathway for Acute Kidney Injury

CLAHRC researchers evaluate a new technological pathway to improve the detection, diagnosis and treatment of Acute Kidney Injury

Background

Acute Kidney Injury (AKI) is a sudden episode of kidney failure or kidney damage defined by changes in urine output or serum creatinine - a waste product filtered by our kidneys. AKI can affect other organs such as the brain, heart, and lungs. It is common in hospital inpatients, in intensive care units, and especially older adults.

What is AKI?

- **common (**affecting up to 20% of UK acute hospital admissions),
- associated with **significant morbidity and mortality**,
- **expensive -** excess costs to the NHS in England alone may exceed £1 billion per year.

NHS England has introduced an automated computer software algorithm to detect AKI from changes in creatinine levels in test results.

NHS laboratories are then expected to send an alert about the test result using existing IT connections to hospitals' patient management systems.

It is not clear if alerts to clinicians alone are enough to improve care so we designed a digitally-enabled care pathway.

Beyond alerts - designing a digitally-enabled care pathway

Researchers at the Royal Free Hospital (RFH), part of London's Royal Free London NHS Foundation Trust (RFLFT) developed a digitally-enabled care pathway as a clinical service to inpatients.

This pathway incorporates a mobile software application - the "Streams-AKI" app - that applies the NHS AKI algorithm to routinely collected serum creatinine data in hospital inpatients.

Streams was built by technology company DeepMind Health in collaboration with RFLFT clinicians and uses test result data to identify patients in danger of developing AKI.

A clinical response team of nephrologists and critical care nurses responds to these alerts by reviewing individual patients and administering interventions according to existing clinical practice guidelines.

We will compare the new pathway with

- **data from the RFH prior to deployment,**
- **pre-deployment and post-deployment data from a second hospital in the same trust**.

Measuring Success

We are undertaking a mixed methods service evaluation of the implementation of this care pathway. Our measures of success when evaluating this new pathway are as follows:

For Patients

- **clinical outcome** - recovery of renal function and return to normal creatine levels,
- **processes of care** - speed of recognition, investigation and treatment of AKI,
- **NHS costs** - length of inpatient stay in i) regular and ii) high acuity beds, treatment, and readmission.

For Health professionals

We will interview a selection of doctors and nurses, sampled to include a mixture of grades of clinicians (House Officers; Senior House Officers; Registrars; Consultants) and nurses (Staff Nurse; Charge Nurse).

We want to find out:

- strengths and weaknesses of the digitally-enabled care pathway;
- how these map to perceived deficiencies in AKI care;
- how the new pathway affected the quality and equity of patient care;
- how they feel the service could be improved.

Next steps

We will share results with RFH renal, acute medicine and critical care departments, and RFLFT leaders. Findings will inform development of the care pathway. Accessible study data will be presented on the Trust website and shared at; a learning event of the UCL Partners AKI Quality Improvement Collaborative (which has 9 participant Trusts); a London AKI Network event and as a case study to Think Kidneys (NHS England National AKI Programme).

Useful links

New app helping to improve patient care (RFH website): https://www.royalfree.nhs.uk/news-media/news/new-app-helping-to-improve-patient-care/
NHS England Acute Kidney Injury Algorithm; https://www.england.nhs.uk/akiprogramme/aki-algorithm/
Think Kidneys NHS England National AKI Programme: https://www.thinkkidneys.nhs.uk/aki/
STREAMS in NHS hospitals (DeepMind website): https://deepmind.com/applied/deepmind-health/working-nhs/how-were-helping-today/

Read the full paper

Connell A, Montgomery H, Morris S et al. *Service evaluation of the implementation of a digitally-enabled care pathway for the recognition and management of acute kidney injury*
F1000Research 2017, 6:1033 (doi: 10.12688/f1000research.11637.2)

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Keep up to date with this study

Service evaluation of the implementation of a digitally-enabled care pathway for the recognition and management of acute kidney injury

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