Manchester Health & Care Commissioning

NHS Manchester University NHS Foundation Trust

NHS National Institute for Health Research

Exploring and Understanding the Management of Acute Kidney Injury in Primary Care

Dr Tom Blakeman
Dr Naveed Ghaffar
Prasanna Hanumapura
Deryn Waring

Collaboration for Leadership in Applied Health Research and Care (CLAHRC) Greater Manchester

Who	Suggested Content	Time
Dr Naveed Ghaffar	Introduction and brief background information on AKI (general stats). Case study of patient who's AKI was not detected by regular GP.	10 mins
Prasanna Hanumapura / Deryn Waring	Explain how patients are managed in hospital including at point of discharge	15 mins
Dr Tom Blakeman	Brief review of this work and links to national initiatives (RCGP toolkit) Explain how patients could be managed post discharge and provide example of a CCG project in Bury.	15 mins
Dr Naveed Ghaffar	How do we improve post discharge care in Manchester?	20 mins

Introduction to AKI

- Definition ?
- How Important is it ?
- Do primary care teams need to be aware? Why ?

- Hospital death /yr UK
  100,000
- Prevented
  30%
- Number admitted AKI
  1/5
- Kidneys make urine
  50%
- Community AKI
  2/3

(*https://www.thinkkidneys.nhs.uk*)

Case study

73 Yr M

AF, HTN CKD 3a

Bisoprolol, Ramipril

Had some routine bloods, but had been having diarrhoeal illness

Came to see me for review a week later - GP said “routine review “

Cr 145 GFR 40 otherwise ok

What's going on ? When should action have been taken? What should have been done?

(Nice Guideline CG169 AKI)

AKI Staging (Kidney Disease Improving Global Outcomes, KDIGO criteria[1])

AKI Stage	Serum Creatinine	Urine Output
Stage 1	Increase in serum creatinine by >26μmol/L **≤ 48 hrs** **OR** an increase in serum creatinine by **≥ 1.5** x baseline [2]	urine output <0.5mL/kg/hr for 6-12hrs
Stage 2	Increase in serum creatinine by **≥ 2** x baseline [2]	urine output <0.5mL/kg/h for ≥12hrs
Stage 3	Increase in serum creatinine by **≥ 3** x baseline [2] **OR** an increase in serum creatinine by ≥1.5 baseline **to > 354 μmol/L**	urine output <0.3mL/kg/h for ≥24hrs **OR** anuria for ≥12 h

[2] **When creatinine change** is known or presumed to have occurred **within previous 7 days**

[1] Kidney Disease Improving Global Outcomes (KDIGO) Acute Kidney Injury Work Group. KDIGO Clinical Practice Guideline for Acute Kidney Injury. Kidney International Supplement 2012;2(1):1–138.

'THINK KIDNEYS'


CKD
miss
function
bloods
Progressive
clinical
Kidney
GPs
results
labs
considered
patient
context
confidence
CKD
alerts
Diagnosis
response
alert
care
delays
diagnosis
OOH
management
failed
routine
actions
blood
patients
Difficultly
uncertainty
false
elderly
drugs
Significant
visible
comorbidities
Clinicians
actioning
frail
systems
inconsistency
reviewing
attention
improve
records
Frailty
high
Awareness
frailty
gap
action
enables
quickly
Clinical
calls
coded
respond
association
reporting
recognition
urgent
alarms
review
risk
recognise
lab
warning
enable
handover
awareness
need
timeliness
seeing
consecutive
reviewed
Reviewers
significance
observed
Information
enriched
proportion
weekend
timely

AKI Clinical Nurse Specialist:
A potential link between primary and secondary care ?

Tackling In-Hospital Acute Kidney Injury

The Manchester Acute Kidney Injury Team(MAKIT)

Dr Leonard Ebah, Prasanna Hanumapura & Deryn Waring

Acute Kidney Injury (AKI) at MFT

- **AKI occurs in 1 in 4 Acute Admissions at the MRI**
- **60% are Community acquired**
- **40% are Hospital acquired**

Challiner *et al. BMC Nephrology* 2014, **15**:84
http://www.biomedcentral.com/1471-2369/15/84

BMC Nephrology

RESEARCH ARTICLE Open Access

Incidence and consequence of acute kidney injury in unselected emergency admissions to a large acute UK hospital trust

Rachael Challiner[1*], James P Ritchie[2], Catherine Fullwood[3], Paul Loughnan[4] and Alastair J Hutchison[5]

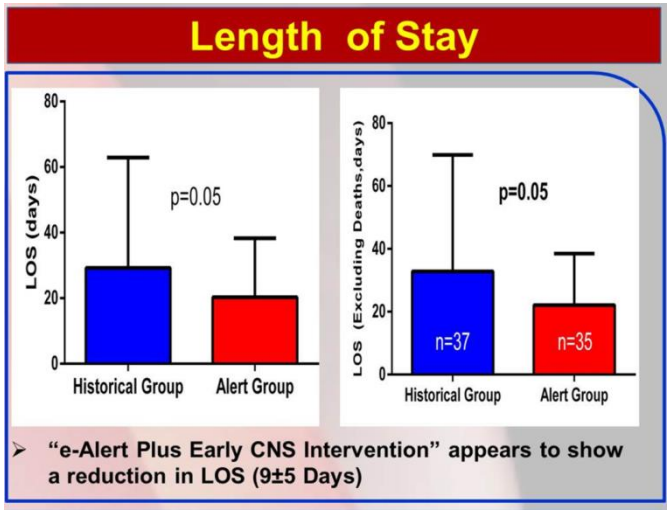
We were no better at MFT in 2013/14

Sub-standard AKI Care prior to 2014

KEY MANAGEMENT	MISSED/ NOT DONE
Urine Dipstick	78%
Recognition of AKI	50%
Fluid management	60%
Drug Review	52%
Investigations	11%
Renal Referrals	15%
Ultrasound Scan	11%
Catheterisation	16%

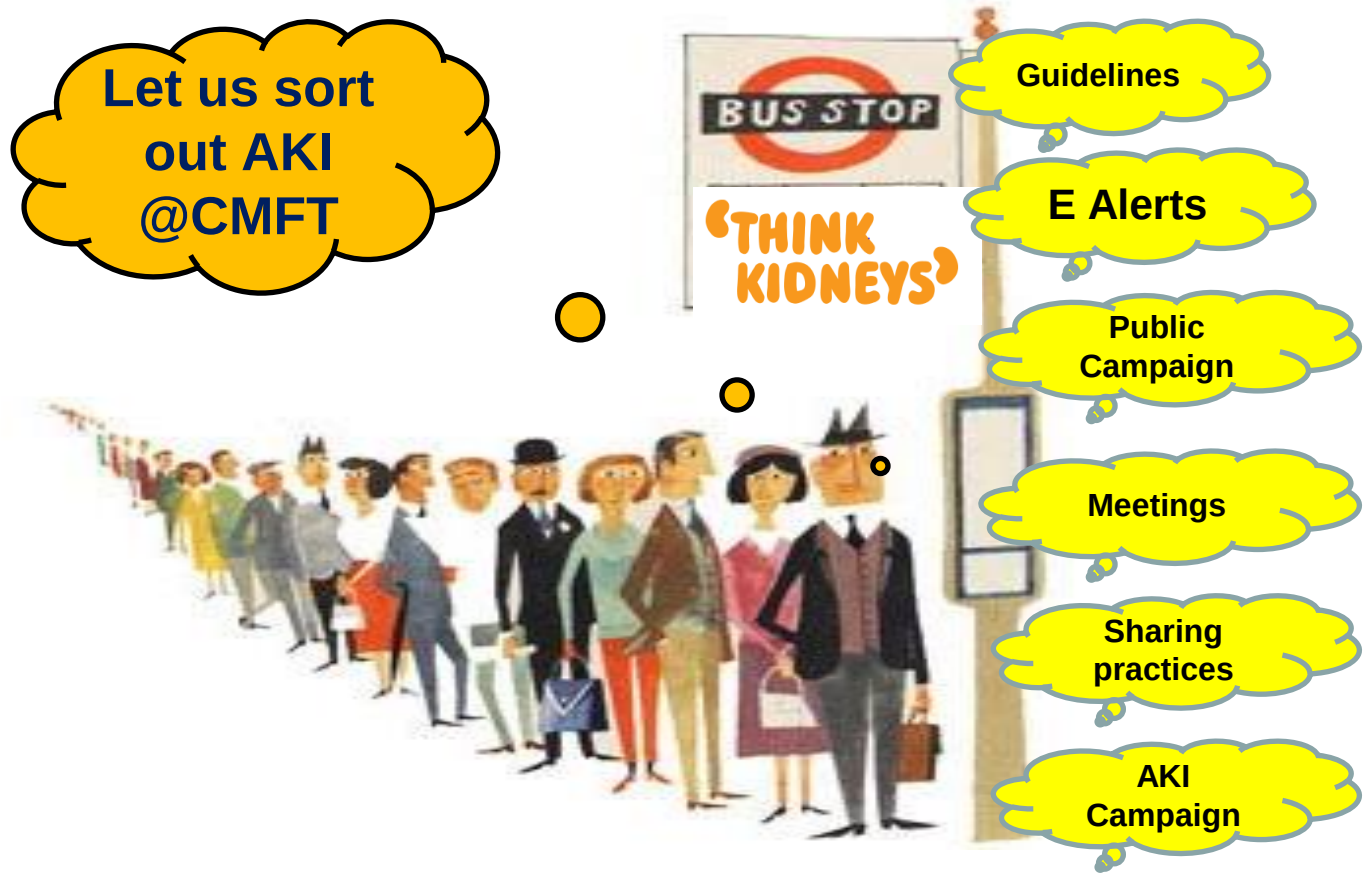
2014

- AKI Lead and Full Team
- Project was part of a Consultant Development Programme
- Quality Improvement supported by MAHSC
- Early impact on LOS:



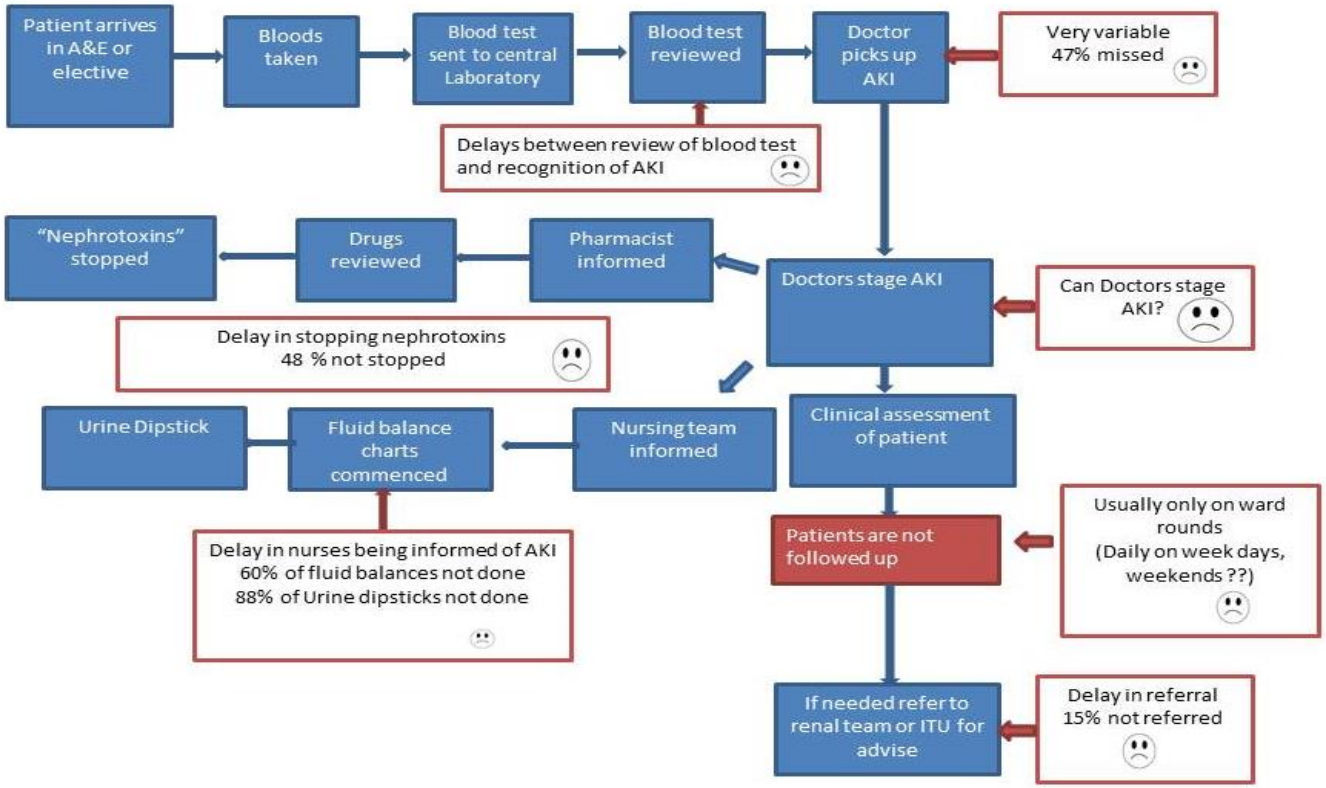
Help available:

Let us sort out AKI @CMFT

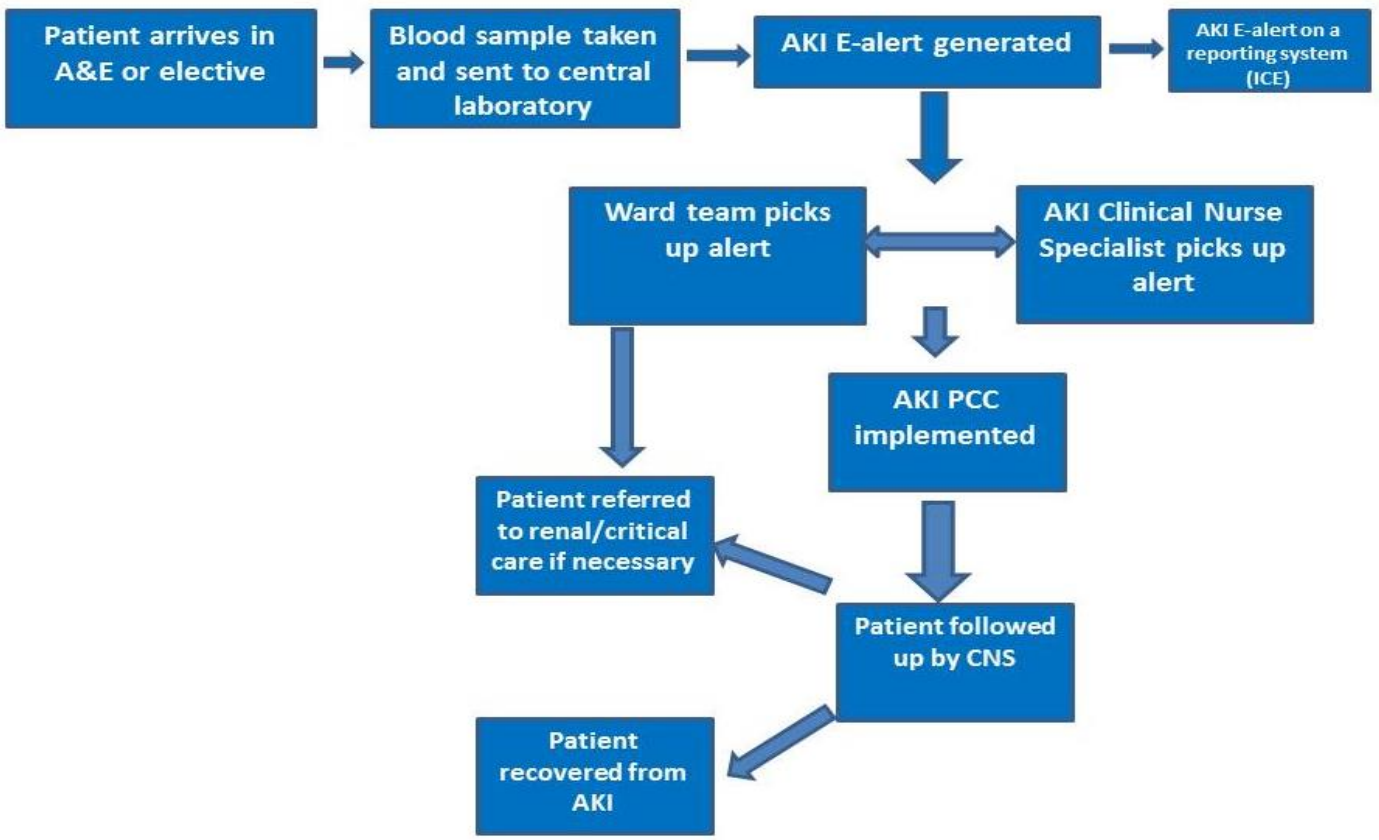


- Guidelines
- E Alerts
- Public Campaign
- Meetings
- Sharing practices
- AKI Campaign

Pre-2014 AKI Patient Journey



New streamlined process map for AKI Care



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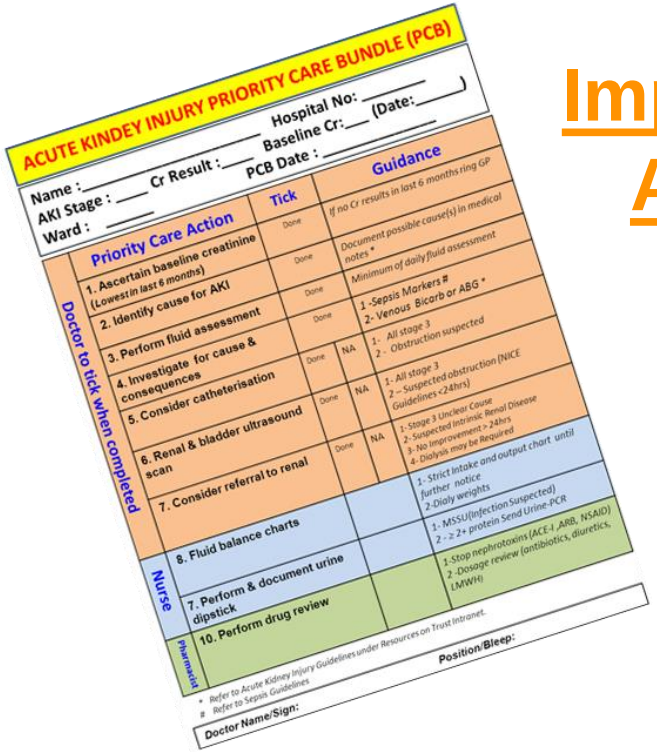
Improvement Activities



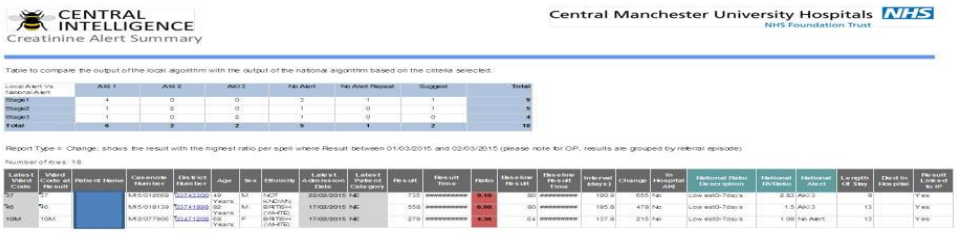
ACUTE KINDEY INJURY PRIORITY CARE BUNDLE (PCB)

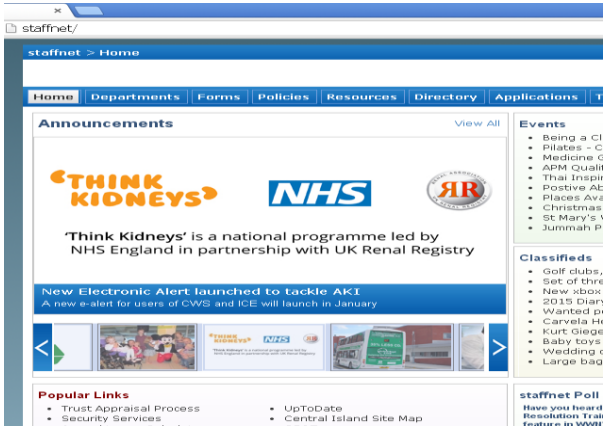
Name : _____ Hospital No: _____
AKI Stage : ____ Cr Result : ____ Baseline Cr: ____ (Date: _____)
Ward : _____ PCB Date : _____

	Priority Care Action	Tick		Guidance
Doctor to tick when completed	1. Ascertain baseline creatinine (Lowest in last 6 months)	Done		If no Cr results in last 6 months ring GP
	2. Identify cause for AKI	Done		Document possible cause(s) in medical notes *
	3. Perform fluid assessment	Done		Minimum of daily fluid assessment
	4. Investigate for cause & consequences	Done	NA	1.-Sepsis Markers # 2- Venous Bicarb or ABG *
	5. Consider catheterisation	Done	NA	1- All stage 3 2 - Obstruction suspected
	6. Renal & bladder ultrasound scan	Done	NA	1- All stage 3 2 – Suspected obstruction (NICE Guidelines <24hrs)
	7. Consider referral to renal	Done	NA	1- Stage 3 Unclear Cause 2- Suspected Intrinsic Renal Disease 3- No improvement > 24hrs 4- Dialysis may be Required
Nurse	8. Fluid balance charts			1- Strict Intake and output chart until further notice 2-Daily weights
	7. Perform & document urine dipstick			1- MSSU(Infection Suspected) 2 - ≥ 2+ protein Send Urine-PCR
Pharmacist	10. Perform drug review			1-Stop nephrotoxins (ACE-I, ARB, NSAID) 2 -Dosage review (antibiotics, diuretics, LMWH)

* Refer to Acute Kidney Injury Guidelines under Resources on Trust Intranet.
# Refer to Sepsis Guidelines

Doctor Name/Sign: Position/Bleep:

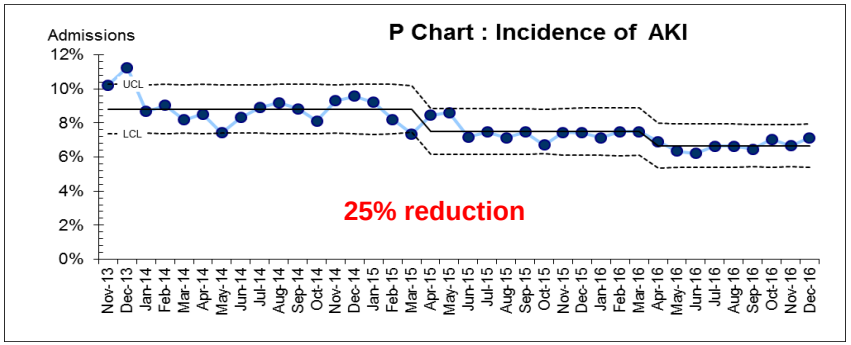




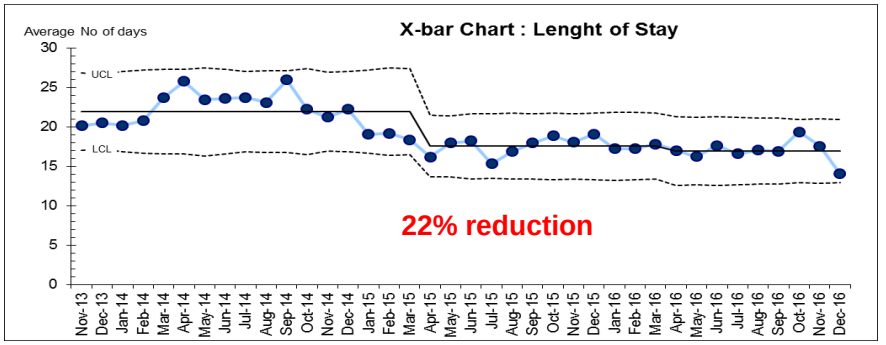
CLAHRC Greater Manchester

Results

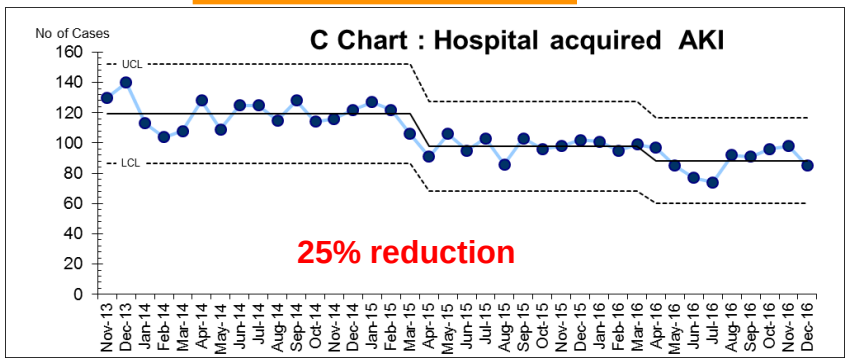
AKI Incidence



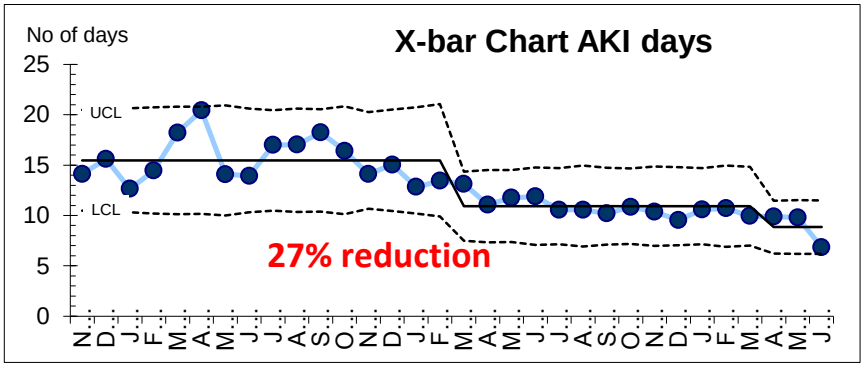
Length of stay



Hospital-acquired AKI



AKI days



Patient admitted for a elective total Knee replacement

Day 1 : Pre Op - Cr 134
Day 2 : Post Op- Developed Chest Sepsis and became anuric and Hypotensive with Cr 341 (AKI stage 3)

Patient was picked up by AKI Nurses on the rounds and reviewed by CNS and AKI PCC was implemented including USS

Patient was referred to renal and transferred to Ward 37 where they had 1 session of dialysis and patient renal function improved.

Day 4 : Cr 100 with no further need for dialysis.
LoS : 13 days
AKI days : 4 Days

Open Access BMJ Quality Improvement Programme

Submitted from BMJ Quality

A Multifaceted Quality Improvement Programme to Improve Acute Kidney Injury Care and Outcomes in a Large Teaching Hospital

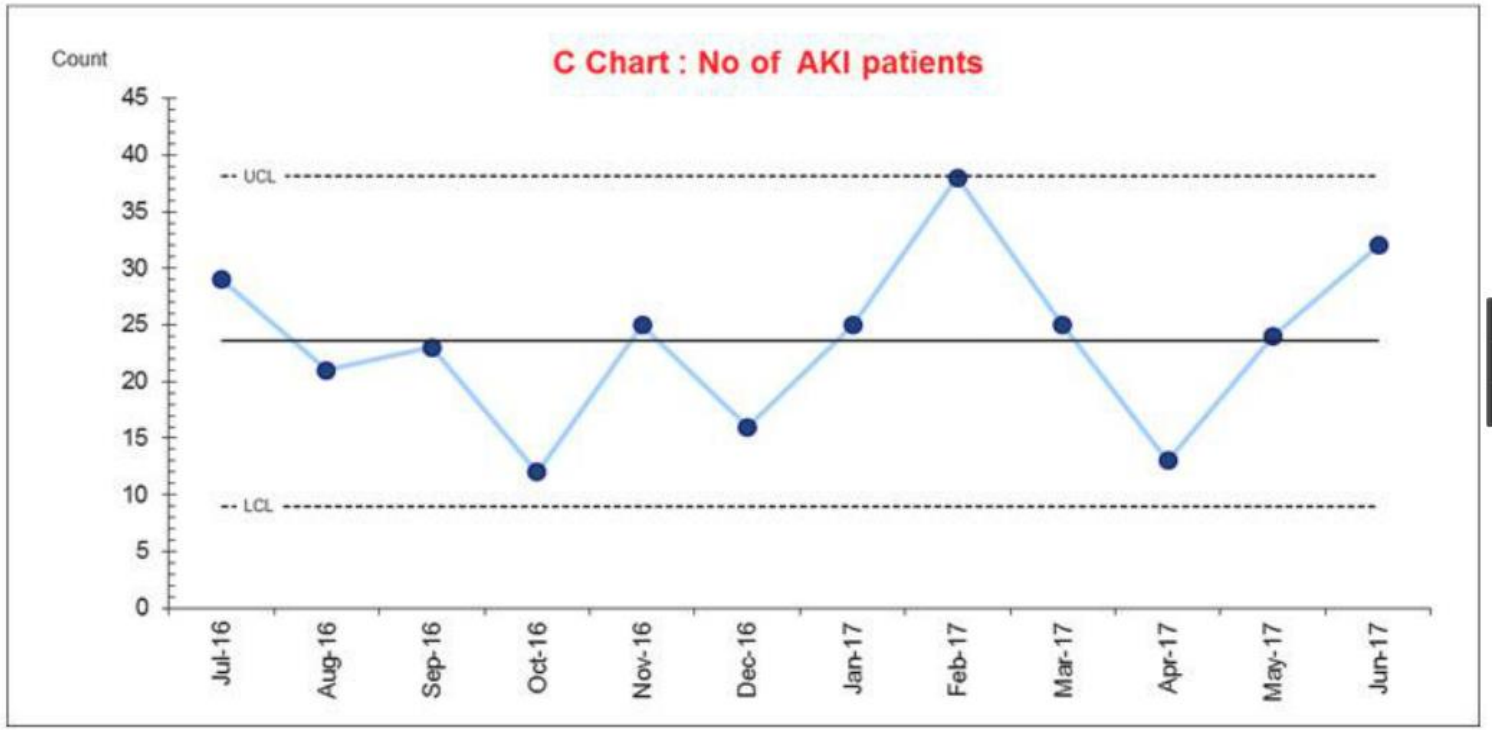
Leonard Ebah, Prasanna Hanumapura, Deryn Waring, Rachael Challiner, Katharine Hayden, Jill Alexander, Robert Henney, Rachel Royston, Cassian Butterworth, Marc Vincent, Susan Heatley, Ged Terriere, Robert Pearson, Alastair Hutchison

Improvement Science for Academics (IS4Ac)

Manchester AKI Project: a CLAHRC:MHCC CCG collaboration

- Generating list of AKI patients in 4 GP practices in the community
- Providing data on patients who had AKI during their hospital stay
- Involved in the discussion sessions at the GP practices
- Feedback to the trust from the learning sessions at the practices

AKI alerts for GP Practices Blood test




Change is the end result
of all true learning.
Leo Buscaglia

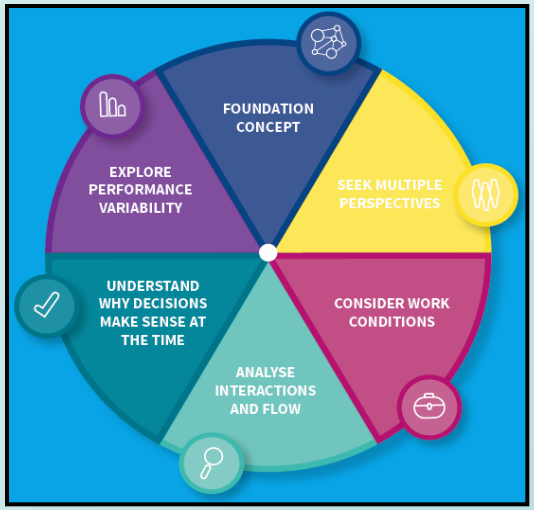
If you want to go fast, go alone; If you want to go far, go together


AKI
patients
discharge
awareness
kidney
confidence
Uncertainty
approach
medication
admission
CKD
risk
care
review
lack
restart
information
coding
discharged
follow
guidance
protocol
frailty
patient
Workload
Clarity
Pharmacist
timeliness
health
reviewed
sharing
scary opportunity
responsibilities
Importance
indicator
failure
involvement
coded
Link
Patients
opportunities
Coding
arrangements
existing
manage
stopped
Care
stage
extreme
communicate
Variable
including
takes
unaware
values
intermediate
Practice
medications
hit
clarity
complicating
med
driven
together
situation
language
meds
hospital
uncertainty
diagnosis
Caution
variable
Variation
time
Disconnect
restarting
medicine
management
Missed
digging
Culture
clear
age
ensure
cause
likely
specialities
status
practice
pressure
problem
realistic
communication
miss
Creatinine
variation
planning
Losing
piece
episodes
Shift
issues
acute
learning
Locums
content
confusion
Lack
credibility
implications
confusing
summary
factor
prescribing
Planning
presentation
important
reason
check
previous
diagnosed
process

Royal College of General Practitioners

RCGP
Acute Kidney Injury
Quality Improvement Project
Systems Thinking for Everyday Work

Dr Tom Blakeman
GP & Clinical Senior Lecturer



Royal College of General Practitioners

National Institute for Health Research

Collaboration for Leadership in Applied Health Research and Care - Greater Manchester (CLAHRC GM)

Kent Surrey Sussex Academic Health Science Network

ACADEMIC HEALTH SCIENCE NETWORK
NORTH EAST AND NORTH CUMBRIA

Healthcare Improvement Scotland

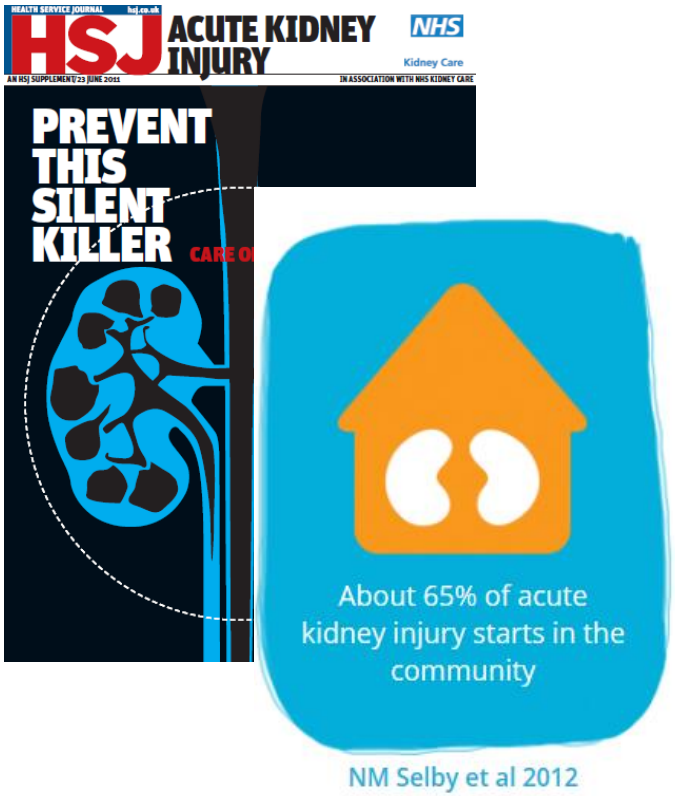
'THINK KIDNEYS'

NHS Education for Scotland

RCGP AKI Quality Improvement Project Partners

Acute Kidney Injury

- Common
- Harmful
- Costly
- Treatable
- Potentially Avoidable



Is AKI a marker of poor health outcomes?

Hospital Admission complicated by AKI

1020 patients admitted 2 x DGH in Wales


CJASN
Clinical Journal of American Society of Nephrology
Epidemiology and Outcomes in Community-Acquired Versus Hospital-Acquired AKI
Alexa Wonnacott, Soma Meran, Bethan Amphlett, Bnar Talabani and Aled Phillips
Abstract

- **Increased Mortality**
  - Within 14 months of the AKI episodes
  - 50% had died (287 in-hospital deaths)
- **Increased CKD Development/Progression**
  - > 33% had de novo CKD or progression of pre-existing CKD
- **Increased Rehospitalisation**
  - 492 Rehospitalisation events within 6 months after discharge

Wonnacott et al, 2014C lin J Am Soc Nephrol 9: 1007

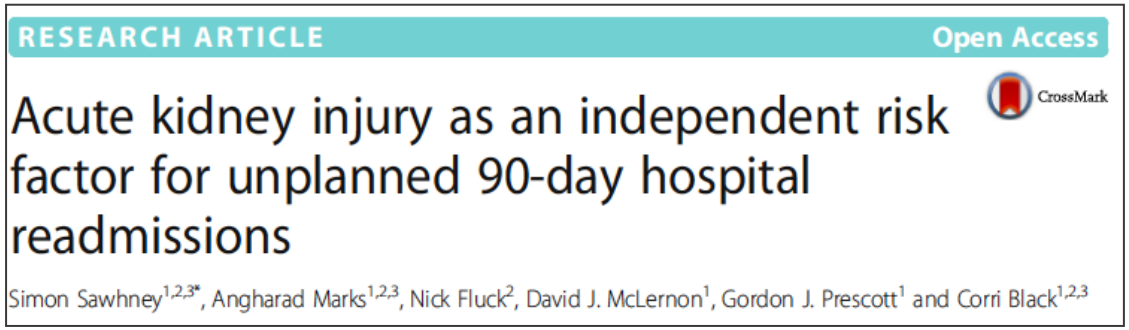
AKI

Context

Context

Ensure Safer Transitions of Care

Acute Kidney Injury: A need to improve transitions of care?



RESEARCH ARTICLE Open Access

Acute kidney injury as an independent risk factor for unplanned 90-day hospital readmissions

Simon Sawhney[1,2,3*], Angharad Marks[1,2,3], Nick Fluck[2], David J. McLernon[1], Gordon J. Prescott[1] and Corri Black[1,2,3]

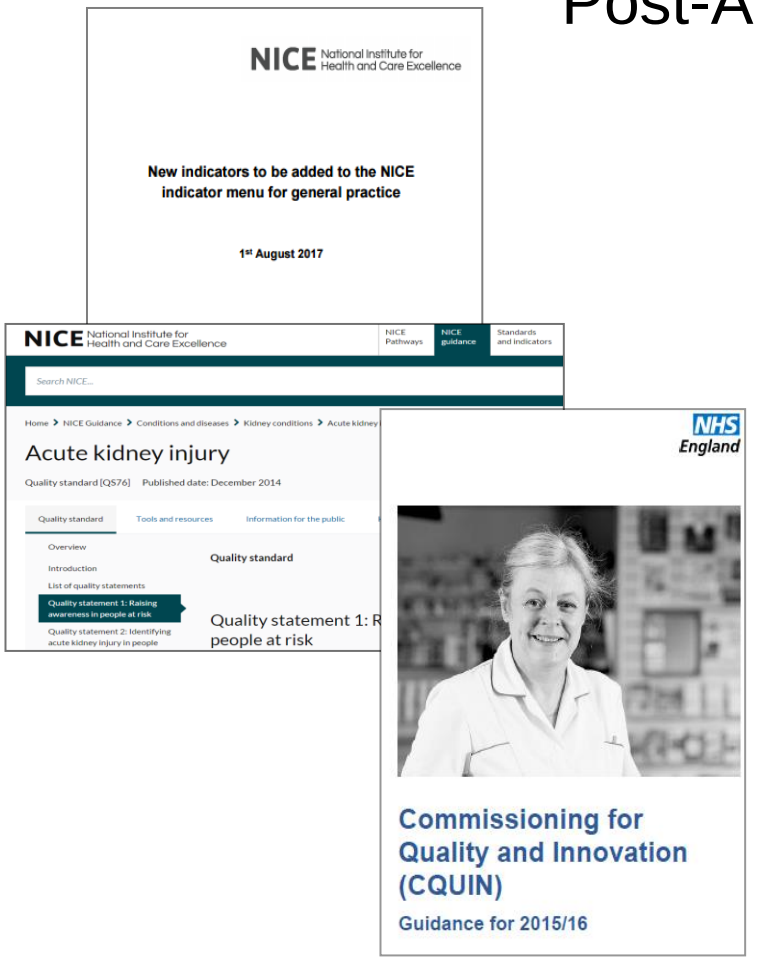
18.6% unplanned readmissions ≤ 90 days

'AKI is a strong, consistent and independent risk factor for unplanned readmissions – particularly readmissions with acute pulmonary oedema

Pre-emptive planning at discharge should be considered to minimise avoidable readmissions in this high risk group'

Sawnhey et al, BMC Nephrol 2017;18: 9

Post-AKI care: Recommended best practice



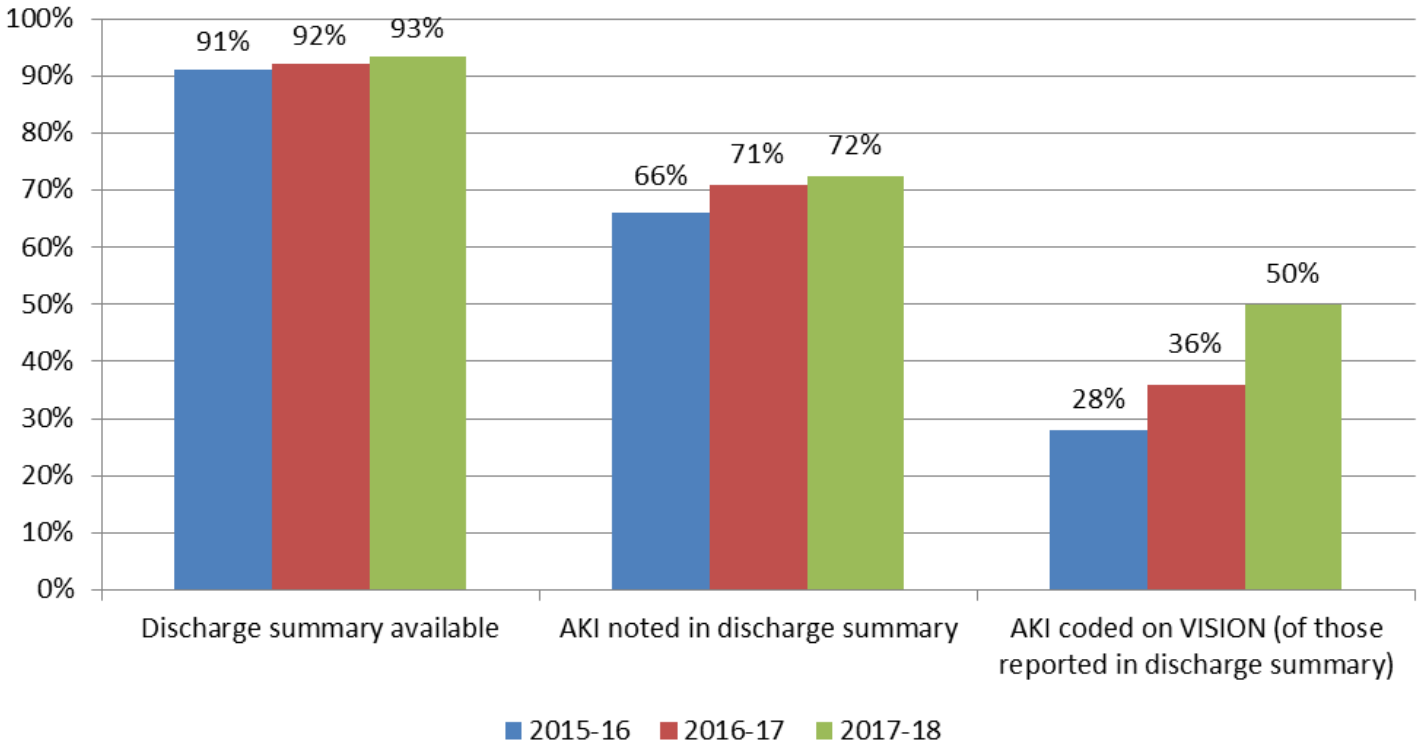
Structures

- Develop AKI Registers in primary care

Processes

- Stage of AKI
- Evidence of medicines review
- Type of blood tests required on discharge for monitoring
- Frequency of blood tests required on discharge for monitoring

Gaps in diagnostic coding: The Bury Post-AKI care project



Percentage of episodes of admissions complicated by AKI with discharge summary available, AKI noted in discharge summary and AKI Read coded, Bury CCG (2015/16, 2016/17 and 2017/18)

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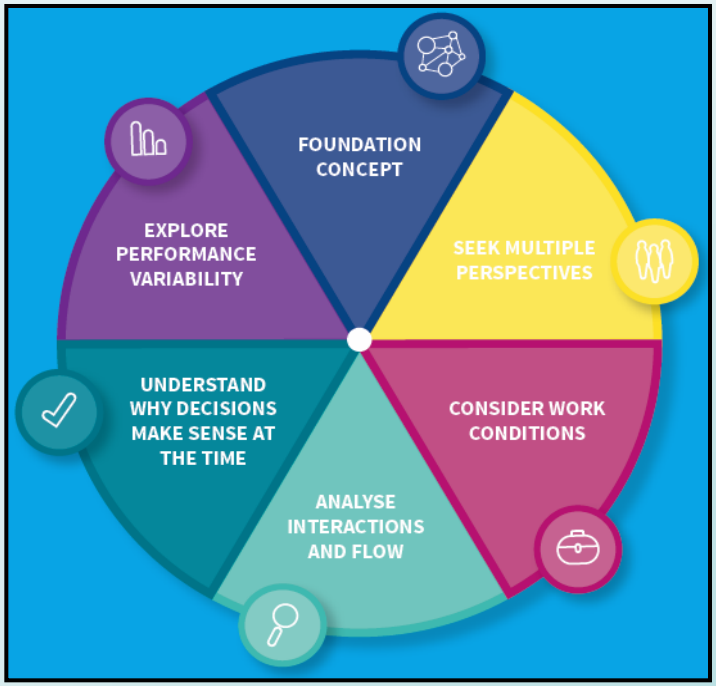
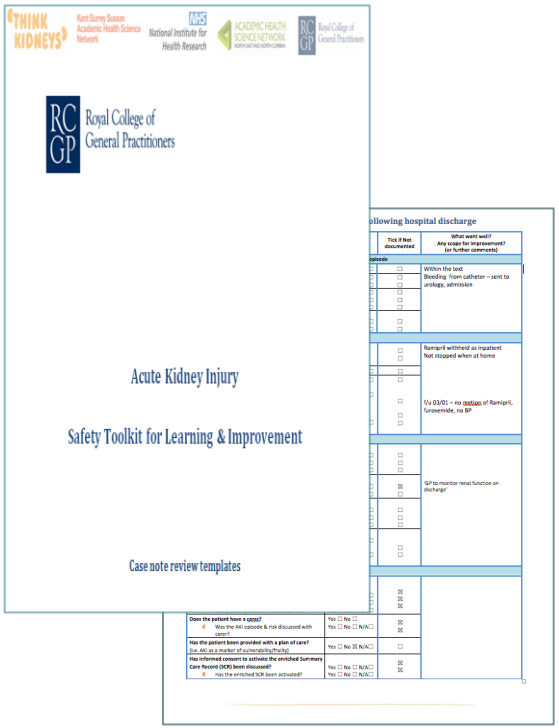
RCGP
Shared Learning
AKI Case Note reviews ↔ Systems Thinking



Key Principles: A Model for Learning & Improvement

- Develop evidence based interventions grounded in an in-depth understanding of routine clinical practice
- Maximise clinical utility of AKI as a driver of quality & safety whilst minimise treatment burden for patients unnecessary clinician workload
- Support system resilience through collaborative working across the interfaces of care

Step 1: AKI Case Note Reviews:



Aims

- Highlight patient safety learning opportunities across care interfaces
- To promote learning from real-life cases, rather than audit or criticise current practice
- Aid reflection to create plans for improvements in future care

Step 2: Systems Thinking for Everyday Work

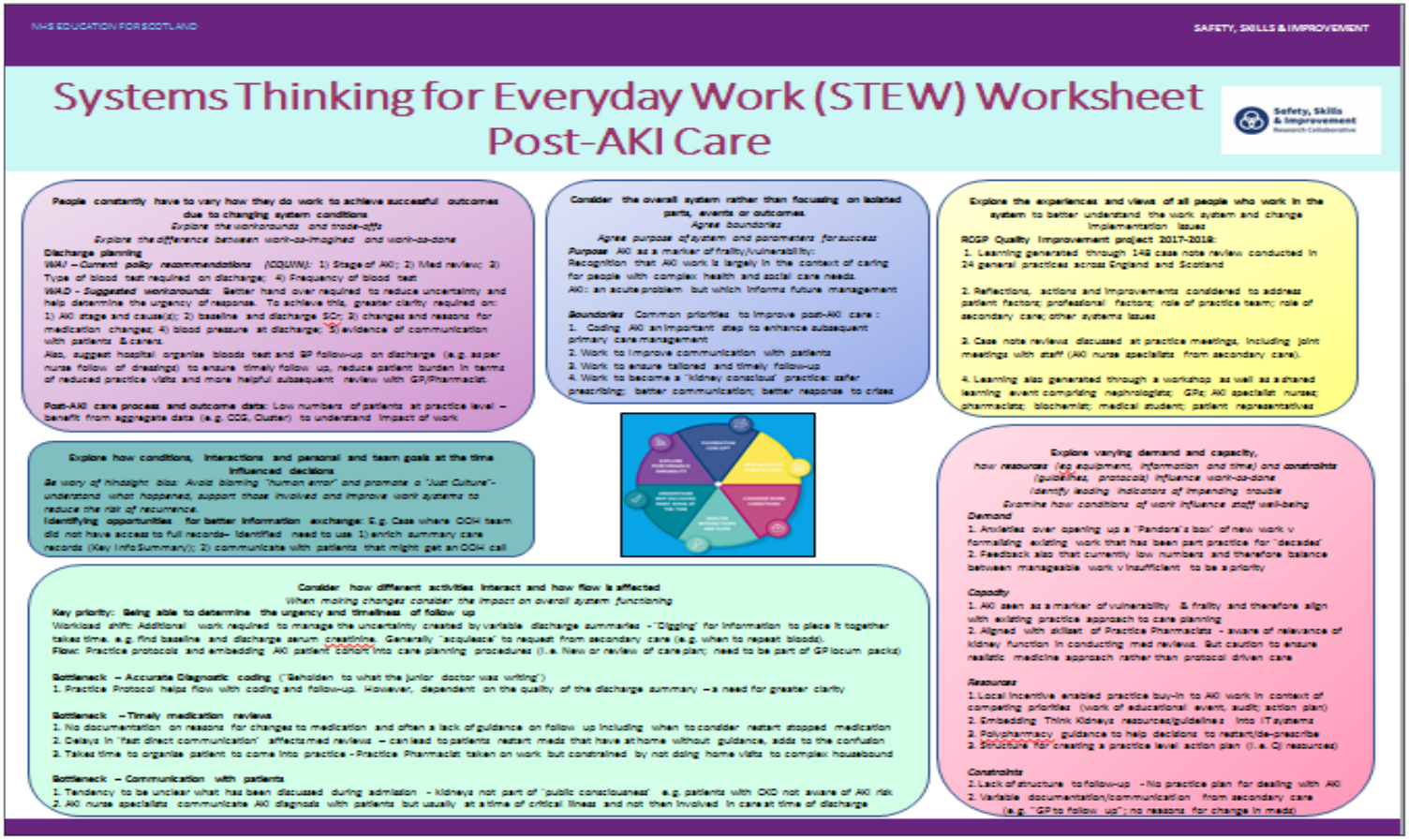
Aims:

- Generate learning through understanding everyday work

Applied STEW Framework within:

- Practice
- Regional
- National

Systems Thinking



NHS EDUCATION FOR SCOTLAND — SAFETY, SKILLS & IMPROVEMENT

Systems Thinking for Everyday Work (STEW) Worksheet Post-AKI Care

Safety, Skills & Improvement

People constantly have to vary how they do work to achieve successful outcomes due to changing system conditions
Explore the workarounds and trade-offs
Explore the difference between work-as-imagined and work-as-done

Discharge planning
WAI – Current policy recommendations (CQUIN): 1) Stage of AKI; 2) Med review; 3) Type of blood test required on discharge; 4) Frequency of blood test
WAD - Suggested workarounds: Better hand over required to reduce uncertainty and help determine the urgency of response. To achieve this, greater clarity required on: 1) AKI stage and cause(s); 2) baseline and discharge SCr; 3) changes and reasons for medication changes; 4) blood pressure at discharge; 5) evidence of communication with patients & carers.
Also, suggest hospital organise bloods test and GP follow-up on discharge (e.g. as per nurse follow of dressings) to ensure timely follow up, reduce patient burden in terms of reduced practice visits and more helpful subsequent review with GP/Pharmacist.

Post-AKI care process and outcome data: Low numbers of patients at practice level – benefit from aggregate data (e.g. CCG, Cluster) to understand impact of work

Consider the overall system rather than focusing on isolated parts, events or outcomes.
Agree boundaries
Agree purpose of system and parameters for success

Purpose AKI as a marker of frailty/vulnerability:
Recognition that AKI work is largely in the context of caring for people with complex health and social care needs.
AKI: an acute problem but which informs future management

Boundaries Common priorities to improve post-AKI care :
1. Coding AKI an important step to enhance subsequent primary care management
2. Work to improve communication with patients
3. Work to ensure tailored and timely follow-up
4. Work to become a 'kidney conscious' practice: safer prescribing; better communication; better response to crises

Explore the experiences and views of all people who work in the system to better understand the work system and change implementation issues

RCGP Quality Improvement project 2017-2018:
1. Learning generated through 148 case note review conducted in 24 general practices across England and Scotland

2. Reflections, actions and improvements considered to address patient factors; professional factors; role of practice team; role of secondary care; other systems issues

3. Case note reviews discussed at practice meetings, including joint meetings with staff (AKI nurse specialists from secondary care).

4. Learning also generated through a workshop as well as a shared learning event comprising nephrologists; GPs; AKI specialist nurses; pharmacists; biochemist; medical student; patient representatives

Explore how conditions, interactions and personal and team goals at the time influenced decisions
Be wary of hindsight bias: Avoid blaming "human error" and promote a "Just Culture"- understand what happened, support those involved and improve work systems to reduce the risk of recurrence.
Identifying opportunities for better information exchange: E.g. Case where OOH team did not have access to full records– identified need to use 1) enrich summary care records (Key Info Summary); 2) communicate with patients that might get an OOH call

Consider how different activities interact and how flow is affected
When making changes consider the impact on overall system functioning

Key priority: Being able to determine the urgency and timeliness of follow up
Workload shift: Additional work required to manage the uncertainty created by variable discharge summaries - 'Digging' for information to place it together takes time, e.g. find baseline and discharge serum creatinine. Generally 'acquiesce' to request from secondary care (e.g. when to repeat bloods).
Flow: Practice protocols and embedding AKI patient ESRDN into care planning procedures (i.e. New or review of care plan; need to be part of GP locum packs)

Bottleneck – Accurate Diagnostic coding ("Beholden to what the junior doctor was writing")
1. Practice Protocol helps flow with coding and follow-up. However, dependent on the quality of the discharge summary – a need for greater clarity

Bottleneck – Timely medication reviews
1. No documentation on reasons for changes to medication and often a lack of guidance on follow up including when to consider restart stopped medication
2. Delays in "fast direct communication" affects med reviews – can lead to patients restart meds that have at home without guidance, adds to the confusion
3. Takes time to organise patient to come into practice - Practice Pharmacist taken on work but constrained by not doing home visits to complex housebound

Bottleneck – Communication with patients
1. Tendency to be unclear what has been discussed during admission - kidneys not part of 'public consciousness' e.g. patients with CKD not aware of AKI risk
2. AKI nurse specialists communicate AKI diagnosis with patients but usually at a time of critical illness and not then involved in care at time of discharge

Explore varying demand and capacity,
how resources (eg equipment, information and time) and constraints (guidelines, protocols) influence work-as-done
Identify leading indicators of impending trouble
Examine how conditions of work influence staff well-being

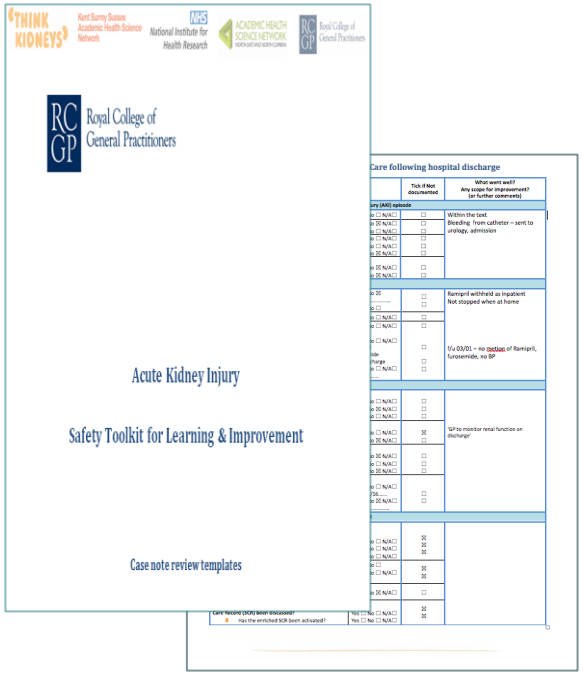
Demand
1. Anxieties over opening up a "Pandora's box" of new work v formalising existing work that has been part practice for "decades"
2. Feedback also that currently low numbers and therefore balance between manageable work v insufficient to be a priority

Capacity
1. AKI seen as a marker of vulnerability & frailty and therefore align with existing practice approach to care planning
2. Aligned with skillset of Practice Pharmacists – aware of relevance of kidney function in conducting med reviews. But caution to ensure realistic medicine approach rather than protocol driven care

Resources
1. Local incentive enabled practice buy-in to AKI work in context of competing priorities (work of educational event, audit; action plan)
2. Embedding 'Think Kidneys' resources/guidelines into IT systems
3. Polypharmacy guidance to help decisions to restart/de-prescribe
4. Structure "for" creating a practice level action plan (i.e. QI resources)

Constraints
1. Lack of structure to follow-up - No practice plan for dealing with AKI
2. Variable documentation/communication from secondary care (e.g. "GP to follow up"; no reasons for change in meds)

Multiple Perspectives



- 24 General Practices across England & Scotland
  - Responding to AKI Warning Stage Test Results
  - Post-AKI care
- 148 Case note reviews
  - Identify learning needs
  - Develop an action plan
- Joint meetings and interviews
- RCGP Shared Learning Event
- Applied STEW to learning identified

Foundation Concept: Purpose & Boundaries

Purpose

- A marker of vulnerability/frailty

Boundaries of work

- Work to improve diagnostic coding
- Work to determine urgency of follow-up
- Work to become a ‘kidney conscious’ practice
  - Safer prescribing
  - Better communication
  - Better response to episodes of acute illness

A 'Kidney Conscious' Practice

'I think probably as a practice we have become generally more kidney-conscious…. ….So I think the fact that we've perhaps, certainly, flagged notes and things…hopefully it's just that going through the back of people's minds, of thinking twice before you prescribe something. Or when you do prescribe it, you give that little bit of extra advice. If something like this happens, this is what you need to do'

Bury GP 04

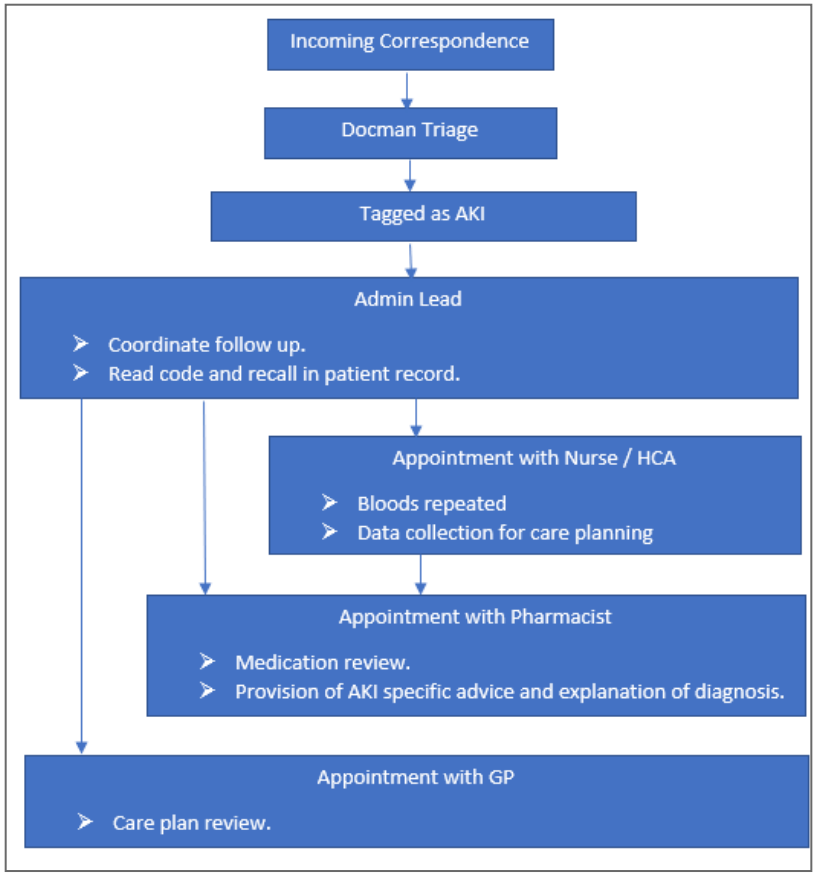
Consider Work Conditions

Demand

- Opening ‘Pandora’s Box’ v Formalising existing work
- Manageable numbers v Insufficient to be a priority

Capacity

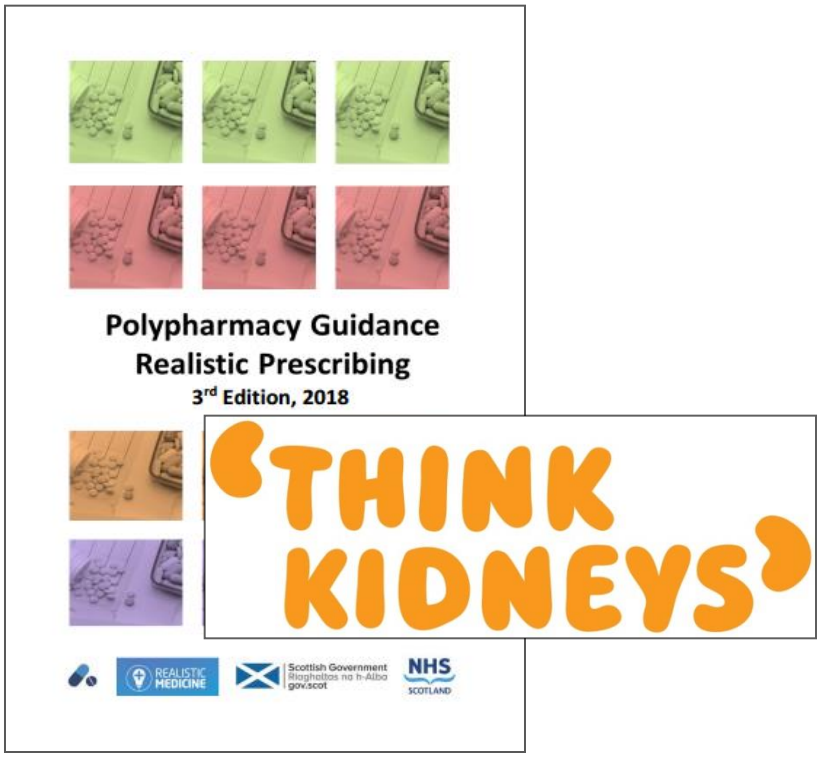
- Embed AKI work into existing approach to care planning
- Align with skill-set of Practice Pharmacists



Consider Work Conditions

Resources

- Local incentive enabled buy-in
- Embed Think Kidneys resources into IT systems
- Polypharmacy guidance to support decisions to restart or de-prescribe



Constraints

- Lack of practice protocol
- Variable information exchange
  - Discharge summaries
  - Within practice

Analyse Interactions and Flow

Hand Over

Better Information exchange required

- To reduce uncertainty
- To reduce workload
- To determine urgency of follow-up

Workload shift

- Additional work required to manage the uncertainty created by variable discharge summaries
- ‘Digging’ for information to piece it together takes time

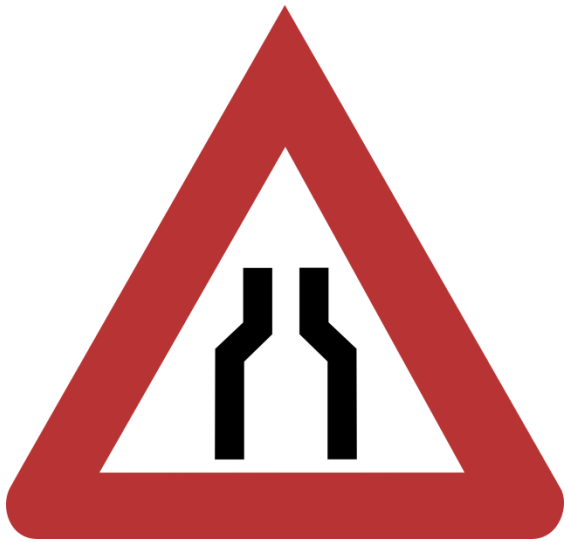
Analyse Interactions and Flow: Bottleneck #1

Diagnostic coding

- Coding AKI an important step to enhance subsequent primary care management
- Practice protocol helps with coding and follow-up

  BUT

- 'Beholden to what the junior doctor was writing'
  - e.g. needing to 'pull through' bloods from secondary care to confirm diagnosis and determine timing of follow-up



Analyse Interactions and Flow: Bottleneck #2

Medication reviews

- Delays in discharge information can lead to patients restarting medication at home – adds to the confusion
- Takes time to organise patient to come in for review
- Fits with role of Practice Pharmacist but not currently doing home visits

Analyse Interactions and Flow: Bottleneck #3

Communication with patients

- Lack of clarity whether and what was discussed during admission
- Kidneys not penetrated ‘public consciousness’
- AKI nurse specialists communicate at point of critical illness but not involved in planning discharge

Discharge planning: Explore Performance Variability

NHS England Guidance

Work-as-Imagined

1. Stage of AKI
2. Evidence of medicines review
3. Type of blood tests required on discharge for monitoring
4. Frequency of blood tests required on discharge for monitoring

Discharge planning: Explore Performance Variability

NHS England Guidance Work-as-Imagined

1. Stage of AKI
2. Evidence of medicines review
3. Type of blood tests required on discharge for monitoring
4. Frequency of blood tests required on discharge for monitoring

Shared Learning Work-as-Done

1. AKI stage and causes(s)
2. Baseline and Discharge SCr
3. Changes and Reasons for medication changes
4. Blood pressure at discharge
5. Evidence of communication with patients and carers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Acute Kidney Injury Toolkit
'THINK KIDNEYS'

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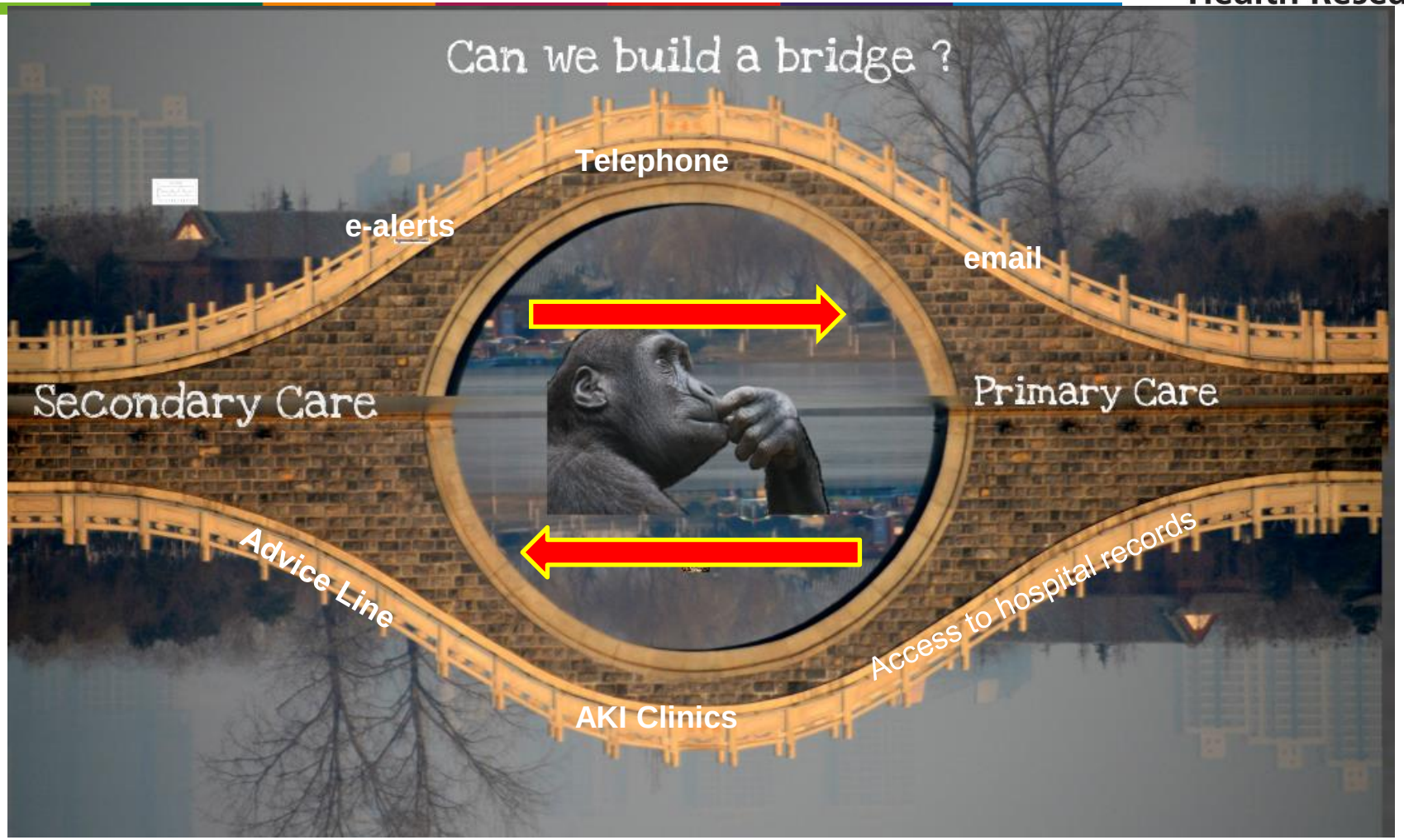
Can we build a bridge ?
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Secondary Care
Primary Care
Advice Line
Access to hospital records
AKI Clinics