

Exploring and Understanding the Management of Acute Kidney Injury (AKI) in Primary Care – Final Report

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NIHR CLAHRC Greater Manchester

*(The views expressed are those of the authors and not necessarily those of the NHS,
the NIHR, or the Department of Health and Social Care)*

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1. Introduction and background

The National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care Greater Manchester (NIHR CLAHRC GM) has partnered with the Manchester Health and Care Commissioning (MHCC) to undertake this project to explore the management of patients who have had care complicated by Acute Kidney Injury (AKI). The AKI specialist team from Manchester University NHS Foundation Trust (MFT) are also collaborating with this work to examine how the processes of care and communication between primary and secondary care settings could be improved. AKI is common, harmful and costly and is a major barometer of patient safety. AKI is associated with significantly worse health outcomes, approximately 1 in 5 unplanned hospital admissions, and an estimated 100,000 deaths per annum. To date, AKI initiatives have largely focused on improving management in secondary care and recognising that approximately two-thirds of episodes of AKI start in the community setting, efforts are needed in primary care, as well as across the interface.

This final report outlines the work carried out in the field by the NIHR CLAHRC GM between September 2017 and March 2018 to support improvements in Post-AKI, updated to include feedback from the Citywide educational event. This work aligns with NIHR CLAHRC GMs Royal College of General Practitioners (RCGP) AKI Quality Improvement Project, which is now a partnership between: NIHR CLAHRC GM; Think Kidneys; Kent Surrey Sussex Academic Health Science Network (AHSN); North East and North Cumbria AHSN; NIHR Greater Manchester Patient Safety Translational Research Centre; NHS Education for Scotland; and Healthcare Improvement Scotland.

Key principles underpinning the AKI Improvement project

1. Develop evidence based interventions grounded in an in-depth understanding of routine clinical practice.
2. Navigate the challenge of over diagnosis: Maximise clinical utility of AKI as a driver of quality and safety whilst minimise treatment burden for patients and unnecessary clinician workload.
3. Support system resilience through person centred collaborative working across the interfaces of care.

2. Objectives

Using a quality improvement approach of testing a reflective audit template and sharing learning, we aim to develop and adopt:

1. Processes to improve communication of AKI between secondary and primary care.
2. Processes to improve diagnosis and coding of AKI.
3. Timely care and surveillance (e.g. serum creatinine checks; medication reviews and information given to patients as per national guidelines).

This initiative supported reflective practice through the use of QI improvement tools (including casenote review and reflective learning templates) in a small number of practices, and joint meetings between primary and secondary care teams. The purpose of the meetings was to explore how AKI is managed and how joint working between the two sectors could be improved.

3. Methodology

The method we used to deliver this work was as follows:

1. Medical practices that were willing to participate were identified.
2. Each practice was provided with the RCGP AKI Safety Templates to support: a) review of patients who generated an AKI Warning Stage Test Result in primary care; and b) review of patients who had a hospital admission complicated by AKI.
3. MFT provided practices with a list of patients for casenote review.
4. Practice visits were conducted to discuss learning generated through their reviews.
5. A rapid (anonymised) thematic analysis of the findings was undertaken from these reviews, which also fed back at the RCGP national event in Birmingham on 27th February 2018.

Step 1: Recruitment

A number of GP Practices were approached to take part in this project and our aim was to recruit 4 to 6 practices, across the central, North and South locality of the Manchester Health and Care Commissioning group; three practices in Central agreed to participate. Once the practices were recruited, the AKI specialist team at MFT provided them with a list of patients who a complication of AKI.

The practices that participated were:

Practice name	Lead GP	Visit date
Manchester Medical Centre	Dr Maria Ahmed	09/11/17
Chorlton Medical Practice	Dr Duncan Hill	15/11/17
The Alexandra Practice	Dr Anthony Larkin	21/11/17

(NB: Limitations - We had intended to include a practice from North Manchester, however, we have been unable to identify a suitable practice in this sector, and the practice from South did not respond to our invitations)

Step 2: Casenote reviews

GPs in each practice were then asked to review the patients' medical notes (up to 5 patients) using an AKI casenote review template (see Appendices 1 and 2) designed to capture the process of AKI care from secondary to primary care.

Step 3: Practice visits

Following the casenote reviews, each practice was visited to feedback on their findings with the NIHR CLAHRC GM team and an AKI specialist nurse from MFT to capture the learning from this process and add to the learning from the RCGP (see section 5 for details of this linkage). Each practice was encouraged to invite their multidisciplinary team to attend the visit (e.g. GP, Pharmacist, Practice Nurse, District Nurse, Administrative staff).

Step 4: Undertake a thematic analysis of the findings

Following the casenote reviews and feedback visits, the NIHR CLAHRC GM team gathered the information shared by the practice teams on many facets of the management of AKI in primary care and the interaction between primary and secondary sectors.

4. Learning from the visits

Following the casenote reviews, we visited each practice to discuss the experience of the practice staff with managing patients with AKI, specifically focusing on: 1) post discharge care and 2) the response to AKI warning stage test results (as these have been in operation locally since 2015).

The learning from MHCC was then pooled with a further 21 general practices (24 in total) across England and Scotland, 148 casenote reviews were conducted and reflected on in total, as part of a collaborative project with the RCGP. The table below displays themes extracted from reviews undertaken by GP practices across the country, the points highlighted in yellow originated from reviews undertaken by the practices in MHCC specifically.

Response to AKI Warning Stage Test Results

	Learning identified	Suggested actions
Key themes	<ul style="list-style-type: none"> ➤ AKI and its association with frailty: Awareness that frail elderly patients and those with comorbidities/drugs at high risk of AKI ➤ Kidney function not necessarily considered as part of care ➤ Inconsistency of response with delays observed: Diagnosis of AKI v Progressive CKD not obvious ➤ Information that enables results to be placed in clinical context reduces uncertainty of diagnosis and improves confidence in making a diagnosis and supports subsequent management ➤ Reflection that high proportion of false positive AKI Warning Stage Results ➤ Need hand over to Out of Hours (OOH) to enable the result to be placed in a clinical context: enriched summary care records, preparing the patient may get call ➤ Easy to miss the AKI alert: need systems to made more visible 	<ul style="list-style-type: none"> ➤ Actively code including cause would help others in subsequent management ➤ Need for clarity on responsibility for acting on the result – need for a protocol ➤ Need protocol and systems for reviewing bloods: involvement of team in learning to ensure agreed clarity, clear hand over within team and OOH, clarity on accountability and responsibility – clarity on Friday bloods required ➤ Protocol and resources clear to Locums working in the practice ➤ Labs to link alerts to Think Kidneys guidance, and make more visible (Pink). Ensure clarity on how alerts/stages will be communicated

	Learning identified	Suggested actions
Professional Level	<ul style="list-style-type: none"> ➤ AKI and Frailty: Awareness that frail elderly patients and those with comorbidities/drugs are at high risk of AKI ➤ Diagnosis AKI v Progressive CKD not obvious: Unlike secondary care, don't have consecutive bloods but rather a set of routine bloods 	<ul style="list-style-type: none"> ➤ Actively looking for and recording the cause(s) would be useful for other clinicians, as would a plan of action and subsequent reviews ➤ Need for clarity on responsibility for acting on the result ➤ Ensure up to date with guidance

- Clinical context helps recognition from colleague/info helps making diagnosis
- AKI not necessarily coded: “Renal function going off” or similar stated, rather than “AKI” or “CKD”
- Clinicians lack of confidence in making diagnosis and how to respond - GPs usually failed to recognise the significance of the AKI Warning Stage Test Result – leading to delays
- Kidney function not necessarily considered as part of care
- Ensure Locum pack includes info about AKI
- Protocol to improve response to AKI alerts – and ensure robust methods for reviewing results

	Learning identified	Suggested actions
Practice team	<ul style="list-style-type: none"> ➤ Reviewers surprised at inconsistency of response/management e.g. timeliness ➤ Majority of GPs on board with awareness and actions required ➤ Practice system for reviewing bloods every morning and action if urgent – though not necessarily reviewed quickly if not picked up as urgent 	<ul style="list-style-type: none"> ➤ Need to view results in a timely manner ➤ Develop a system of how to look out for and respond to AKI alerts ➤ Need to include practice admin in protocol for responding to alerts ➤ Need clarity on hand over: to ensure timely review of results and response ➤ Aim for all relevant staff to have training around AKI ➤ Review how system working as evidence that missing cases

	Learning identified	Suggested actions
System Level	<ul style="list-style-type: none"> ➤ Alarms leading to less attention being paid to them ➤ AKI alert needs clinical correlation ➤ Difficulty seeing all blood results – different labs reporting for same patient ➤ Bloods sent on Friday afternoon not routinely seen until Monday morning. No way of “actioning” alert – unless bloods so bad that labs calls (an unprepared) Out of Hours Service ➤ Reflections on significant gap in timely review of lab results and response to alerts ➤ Easy to miss AKI alerts 	<ul style="list-style-type: none"> ➤ Make AKI Warning Stage Result more visible (PINK) ➤ Lab could also link the result to the Think Kidneys guidance - if not phoned, might prompt GPs to take result more seriously ➤ Need clear system to inform OOH and also inform patients to be prepared for a call from OOH. Help OOH put result in clinical context: learned the importance of ensuring relevant info is shared - enhanced / enriched VISION record ➤ Need clear system for triage once AKI triggered – role OOH, practice tram, labs, patients. Clear guidance on when labs phone –how to communicate results ➤ Need to ensure locum staff aware of protocol and relevance of AKI

- Need to address Friday bloods: Clear guidelines on when results are telephoned to practice (and will be brought to the attention of the on-call GP)

Post discharge care

	Learning identified	Suggested actions
Key themes	<ul style="list-style-type: none"> ➤ Workload Shift – additional work generated in general practice to manage the uncertainty created by a variable discharge process ➤ Lack of evidence that patients are aware of the relevance of kidney health and AKI risk ➤ Uncertainty constructed from point of admission onwards ➤ Coding AKI an important step to enhance subsequent primary care management 	<ul style="list-style-type: none"> ➤ Better Hand Over needed – To reduce uncertainty and help determine the urgency of response. To achieve this, greater clarity is required on the AKI stage and cause(s); baseline and discharge serum creatinine (SCr); changes and reasons for medication changes; blood pressure at discharge, communication with patients/carers ➤ Discharge planning to start earlier during the course of an admission ➤ Establish a protocol for post-discharge care including patient communication ➤ A need to anticipate impact of action on others ➤ A need for better professional understanding as to whether AKI or progressive CKD ➤ Consider primary care workload and treatment burden for patients: Secondary care organising follow-up bloods might allow more timely and helpful GP/Pharmacist review ➤ Consider how AKI fits with concept of frailty: evidence of some practices aligning with existing care planning practices including enrichment of summary care records

	Learning identified	Suggested actions
Patient	<ul style="list-style-type: none"> ➤ Lack of clarity on patient awareness of AKI and kidney health ➤ Patients with CKD unlikely to be aware of AKI risk ➤ Missed opportunities to communicate AKI risk/kidney health with patients including confusion over medicines management ➤ The language of AKI and kidney failure is felt to be scary to patients 	<ul style="list-style-type: none"> ➤ Need to communicate AKI diagnosis with patients, provide written information and opportunity to discuss with a health professional. Need to check patient understanding ➤ Ensure information sheets are embedded in IT software so easy to share and print off ➤ Consider how to frame conversations about AKI and kidney health: e.g. “Due to your illness your kidneys have been under a lot of stress lately. We need to protect them, keep an eye on you and check everything is OK.”

	Learning identified	Suggested actions
Professional	<ul style="list-style-type: none"> ➤ Culture of variation in coding ➤ Variation in awareness of AKI including awareness of GP Locums ➤ AKI an acute problem but seen to inform future management including prescribing ➤ Uncertainty on when or if to restart medication 	<ul style="list-style-type: none"> ➤ Address educational gaps/needs of GP knowledge in terms of definition of AKI, mortality, morbidity, aware association with increasing age ➤ Illness complicated by AKI potential moments/prompt for a conversation about care/realistic medicine ➤ Existing documents such as Scottish Government on Polypharmacy might help conversations – medication management including consider de-prescribing

	Learning identified	Suggested actions
Practice team	<ul style="list-style-type: none"> ➤ Importance of coding diagnosis: If AKI not coded – then clinician unaware of previous episodes ➤ Care Planning: Link AKI into existing approach to care planning. Patients are reviewed and a care plan is initiated or updated with AKI information ➤ Practice protocol: helps to ensure coding and then a review ➤ Benefit of pharmacist involvement in process of care including invite/BP check/med review 	<ul style="list-style-type: none"> ➤ Signpost team to resources (RCGP Toolkit) ➤ Need for team involvement and training: Read coders to be clear on protocol; locum training and included in resource pack ➤ Need for a timely post discharge review: a) AKI is clearly flagged on timely discharge summary, allowing Practice team to initiate appointments for repeat bloods, BP, urine etc, without a delay for appointment with GP, and allow GP to review the results before seeing patient. b) A workflow would need to be set up in a practice ➤ Post-discharge plan could be implemented – adapt ‘key information summary’ and anticipatory care plans (ACPs) could fit here too which ticks other areas regarding prevention of hospital readmission

	Learning identified	Suggested actions
Secondary care	<ul style="list-style-type: none"> ➤ Variable ‘hit and miss’ discharge information in terms of timeliness and variable content: reason/cause for AKI, stage, sharing of blood pressure, lack of SCr values, often lack of guidance on follow up including when to consider restarting stopped medication, lack of information about what patient knew about AKI ➤ Disconnect: Those completing the discharge summary seemed to be unaware of the implications of the AKI ➤ Some specialities better than others: renal > medicine > surgery ➤ Needed to go ‘digging’ for information to piece it all together - takes time in 	<ul style="list-style-type: none"> ➤ Timely and clear discharge summaries- addressing points above ➤ Discharge records to consider including what information has been provide to the patient about the AKI diagnosis – patient communication to happen during admission ➤ Good to be provided with serum creatinine (SCr) value at admission and at point of discharge - would create confidence in the diagnosis ➤ GP actions to be place at top of discharge summary ➤ Ensure AKI listed in diagnoses list so effectively coded. Clear plan for monitoring

<p>practice</p> <ul style="list-style-type: none"> ➤ Risk of losing confidence/credibility: Examples of no confidence in AKI status e.g. CKD rather than AKI ➤ Often when patients are discharged and they have medicines at home they restart medications without guidance, further confusing the situation ➤ AKI likely to get coded in hospital if part of presentation at admission but may not be diagnosed/coded if a complicating factor during an admission 	<ul style="list-style-type: none"> ➤ A need for better communication following admission with AKI
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	Learning identified	Suggested actions
System	<ul style="list-style-type: none"> ➤ Clarity on responsibilities: Need clear communication on follow arrangements for patients discharged to intermediate care ➤ AKI and issues of extreme age: learning opportunity and need to consider how AKI relates to the concept of frailty: is it associated with frailty or an indicator of frailty? Is AKI a 'Yellow Card'? 	<ul style="list-style-type: none"> ➤ Suggest Association of Sessional GPs (NASGP) to be updated about AKI management ➤ Primary care systems to accurately Read code an AKI diagnosis ➤ Patients often frail: If needed, secondary care to initiate blood tests on discharge & blood pressure (i.e. as per nurse follow for removal of sutures/dressing) to ensure timely follow-up, reduce patient burden as reduce visit, and ensure more a timely and helpful review by GP/ pharmacist ➤ If AKI is apparent to coding team then potential for more streamline follow-up review ➤ Introduce a protocol/template for Post-AKI care on practice (e.g. EMIS) system ➤ Add an AKI section on the new community website with patient information ➤ AKI: Potential manageable focus of work to support establishment of GP Clusters in Scotland ➤ Consider AKI risk as part of routine annual reviews

5. Link to the RCGP national work and NICE guidance development

The learning from this project was shared at a full day national RCGP workshop in Birmingham on 27th February 2018. Dr Duncan Hill presented learning generated through the MHCC.

Dr Duncan Hill, from Chorlton Medical Practice, presented on his learning from undertaking this review of AKI patients: *Key learning and action from Dr Hill's reviews: Coding was poor from their team and there was a lack of structure for follow up. Now they have in place workflow, sick day rules and patient information sheet. Asked about how useful the reviews were to do, he said they were invaluable as they had assumed that all the problems would be with the discharge summaries but this was false. (Dr Hill also pointed out that there isn't any fast direct communication from the hospital (e.g. no electronic discharge summaries).*

Siobhan Halligan, from the AKI specialist team at MFT, also contributed with an overview of previous improvement work, and looking at trialling follow-ups via a Nurse led AKI clinic. *A discussion emerged from the audience about giving patient education and the problems when AKI occurs during critical illness, and lack of AKI specialist on discharge. Learning from casenote reviews – they are now looking to see if the AKI specialists can start discharge summaries.*

This event was also attended by a representative from the National Institute for Health and Care Excellence (NICE) who have piloted measures and have been developing guidelines around the management of AKI. NICE are working in collaboration with NIHR CLAHRC GM to develop clinical and process indicators to support these guidelines.

Key outputs to date:

This MHCC project has contributed to:

- The development of RCGP AKI Casenote Review Templates (see Appendix)
- A national RCGP Shared Learning Event, which has informed the development of the [RCGP Acute Kidney Injury Toolkit](#)
- Shared learning across the interface between primary and secondary care: AKI nurse specialists contributing to joint practice meetings as well as providing lists of patients to practices for casenote review.

6. Citywide event October 2018

NIHR CLAHRC GM, along with colleagues from MFT and MHCC, delivered a citywide educational event Wednesday 3rd October 2018. The event provided the opportunity to bring the audience up to speed on current AKI guidance, plus sharing the learning from this piece of work, as well as other aligned projects. For further information about the event content, and a copy of the slides, see <https://www.clahrc-gm.nihr.ac.uk/news/news/aki-mhcc-news>.

Feedback following the event was very positive, some comments from attendee's are as follows.

Take-home message from today's event:

'Read code AKI, as per discharge summary'

'To be kidney conscious'

'Increased awareness of AKI → share with other practice clinicians'

From your learning during this session, what (if anything) will you do differently in practice:

'Will maintain an AKI register'

'Review soon patients with a diagnosis of AKI (1-3)'

'Look at Manchester AKI pathway and develop practice protocol'

7. Potential next steps and recommendations

1. Review the learning and suggested actions in the tables above in line with the MHCC action plan.
2. Consider sharing the casenote review forms to facilitate other practices in MHCC to identify further learning points and potential improve their own processes of care for this patient population.
3. Explore a possible educational event linked in to the existing MHCC educational programme: a shared learning event with key stakeholders across primary and secondary care – delivered October 2018.
4. Refer to the developments from the RCGP toolkit, and the resources developed by Think Kidneys, to inform practices about the best steps to take to manage patients with AKI.
5. Consider using the following criteria (developed from NICE initial proposals and with NIHR CLAHRC GM/Bury CCG practices) to undertake regular audits:
 - a. Appropriate Read coding of AKI in patients' notes
 - b. Medication review to be undertaken within 1 month of discharge from hospital
 - c. Serum creatinine check to be undertaken within 3 months of discharge from hospital
 - d. Written information about AKI given to patients
6. Consider embedding AKI Business Rules into routine practice to measure and understand the variation in post-AKI care across Manchester CCG.

Appendix: AKI safety template - Post AKI Care following hospital discharge



Royal College of
General Practitioners

Acute Kidney Injury

Safety Toolkit for Learning & Improvement

Case note review templates

Aims of the AKI Safety templates

- The templates are structured to identify patient safety issues and gaps in management processes, highlighting learning opportunities across care interfaces (Primary/Secondary; In/Out of Hours)
- Questions aim to promote learning from real-life AKI cases, rather than audit or criticise current practice
- AKI Safety Template 1 is designed to support case note review of patients who have generated an AKI Warning Stage Test Result in primary care
- AKI Safety Template 2 is designed to support case note review of patients who have had a hospital admission complicated by AKI
- The AKI Safety Template 3 is designed to aid reflection and learning through a summary of cases in order to create action plans for improvements in future care

AKI safety template 1: Recognition and Response to AKI occurring within Primary Care	Tick if Not documented	What went well? Any scope for improvement? (or further comments)	
1. Ordering kidney function tests			
Why was the blood test taken? <ul style="list-style-type: none"> <input type="checkbox"/> Routine Chronic Disease monitoring <input type="checkbox"/> Drug monitoring <input type="checkbox"/> Assessment of acute illness <input type="checkbox"/> Other (please specify) 	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Were there relevant co-morbidities? <ul style="list-style-type: none"> <input type="checkbox"/> Any stage of CKD <input type="checkbox"/> Diabetes <input type="checkbox"/> Heart failure <input type="checkbox"/> Other (please specify) 	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Any recent changes in medication or dosage? <ul style="list-style-type: none"> <input type="checkbox"/> Any increase in ACEi, ARB or diuretic 	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Did the test request need communicating to: <ul style="list-style-type: none"> <input type="checkbox"/> The practice team / Out of hours 	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/>	
2. Obtaining a sample			
When was the blood test done? <ul style="list-style-type: none"> <input type="checkbox"/> Date & time 	<input type="checkbox"/>	
Were there any problems with the sample? <ul style="list-style-type: none"> <input type="checkbox"/> e.g. lost, left too long or left overnight 	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/>	
3. Recognition & response to AKI Warning Stage Test Results			
When & how was alert issued (Time point A)? <ul style="list-style-type: none"> <input type="checkbox"/> Date & time <input type="checkbox"/> Via telephone <input type="checkbox"/> Via routine lab results <input type="checkbox"/> Other Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
When did the clinician respond to the alert (Time point B)? <ul style="list-style-type: none"> <input type="checkbox"/> Date & time 	<input type="checkbox"/>	
What was the timeliness in response? (Time point B minus Time point A) <ul style="list-style-type: none"> <input type="checkbox"/> Did it fit with Think Kidneys guidance? <input type="checkbox"/> If not, what were the reasons? Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Was AKI confirmed? (If NOT AKI - finish here)	Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/>	
If 'true' AKI, did it get coded in GP records? <ul style="list-style-type: none"> <input type="checkbox"/> If yes, was the AKI Read coded? <input type="checkbox"/> If yes, was the AKI stage Read coded? 	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
What was nature of response? <ul style="list-style-type: none"> <input type="checkbox"/> No action required (recorded in notes) <input type="checkbox"/> Blood tests repeated <input type="checkbox"/> Telephone call <input type="checkbox"/> GP Consultation <input type="checkbox"/> Home visit <input type="checkbox"/> Other 	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Did response include: <ul style="list-style-type: none"> <input type="checkbox"/> Assessment of likely cause(s) <input type="checkbox"/> Urinalysis <input type="checkbox"/> Repeat blood tests <input type="checkbox"/> Review of medication <input type="checkbox"/> Review of fluid status <input type="checkbox"/> Review of carer requirements <input type="checkbox"/> Communication of AKI with patient/carers <input type="checkbox"/> Plan for follow up <input type="checkbox"/> Admission 	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

What was the outcome 3 months post alert?  E.g. death or reduced performance status New CKD or Renal function at baseline	<input type="checkbox"/>	
If 'True AKI' and patient admitted to hospital consider using case note review template 2			

AKI safety template 2: Post AKI Care following hospital discharge		Tick if Not documented	What went well? Any scope for improvement? (or further comments)
1. Documentation and coding of inpatient Acute Kidney Injury (AKI) episode			
Was AKI on the discharge summary?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/>	
Was the patient given an AKI Read Code? If yes, was the AKI stage coded?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Was the cause(s) of the AKI documented? On the discharge summary? In the patient's GP records?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Did the patient require: An admission to ITU? Renal replacement therapy?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
2. Optimising medicines management post AKI			
Have medications been reviewed post-discharge? If yes, how long after the AKI episode? If yes, was this a face to face review?	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Was the blood pressure (BP) checked?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/>	
Were any drugs stopped during admission? (e.g. antihypertensives or drugs that accumulate during AKI) Were any medications restarted? If yes – please specify: Was this pre/post discharge? Were reason(s) for restarting/withholding drugs post-discharge documented?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
3. Monitoring Kidney Function post AKI			
Is the discharge serum creatinine: Recorded in discharge summary? Recorded in the GP patient's records? Recorded as improving, stable or unstable?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Is there a plan for further blood monitoring: In the discharge summary? In the patient's GP records?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
If yes, do these plans stipulate: Frequency of blood testing? Which blood tests are required? Duration of monitoring?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Has the patient had repeat: Blood tests? (If yes – what was the date?) Urinary ACR if appropriate? (If yes – what was the date?)	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
4. Reducing AKI Risk and Promoting Kidney Health Post AKI			
Was patient informed of AKI episode & onward AKI risk? Was this discussed prior to discharge? Was this discussed post-discharge? Was patient provided with written info?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Does the patient have a carer? Was the AKI episode & risk discussed with carer?	Yes <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	
Has the patient been provided with a plan of care? (I.e. AKI as a marker of vulnerability/frailty)	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/>	
Has informed consent to activate the enriched Summary Care Record (SCR) been discussed? Has the enriched SCR been activated?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	

AKI safety template3: Reflection from AKI case reviews

1. Review details

Name of Reviewer:		
Profession:		
Name of practice:		
Date of review:		
Was this completed individually or as a team	Individually <input type="checkbox"/>	As a team <input type="checkbox"/>

2. Review of records

Total number of records reviewed:		
What template was used (Both templates, AKI safety template 1 only or template 2 only):	Both templates	
	AKI Safety Template 2 only	
	AKI Safety Template 1 only	
Review period (e.g. 6 months):		
Approximately what length of time (in minutes) did it take to review all records:		

3. Reflection, action and improvement

Please describe identified learning needs for the following factors: <ul style="list-style-type: none"> ● Patient ● Professional ● Practice Team ● Secondary Care ● System 	Patient	
	Professional	
	Practice Team	
	Secondary Care	
	System	
Develop an Action plan: <ul style="list-style-type: none"> ● Specific ● Measureable ● Achievable ● Relevant ● Time-bounded 		
What is the time frame for review of the Action plan?		