

**Post-Acute Kidney Injury Care:
Results from an Audit on the Management of Patients
Who have had an Episode of Care Complicated by AKI**

CCG Preliminary Report

December 2017

Background

Over the last year, we (the National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care Greater Manchester; NIHR CLAHRC GM) have supported GP practices across Bury CCG to identify and improve the care received by patients who were discharged from Pennine Acute Hospitals NHS Trust (PAT) with a clinical diagnosis of Acute Kidney Injury (AKI). This work has aided practices to achieve standard 7 of Burys' Quality in Primary Care (QIPC) contract.

AKI is common, harmful and costly and is a major barometer of patient safety across the NHS¹⁻⁴. It is a clinical syndrome characterised by a sudden reduction in kidney function that complicates episodes of acute illness². As such, AKI is a marker of illness severity and is associated with up to around one in five unplanned hospital admissions, with more than 60% of these episodes arising in the community⁵⁻⁷ and the remaining acquired during a hospital stay. AKI is associated with significantly worse health outcomes including higher risk of a further episode of AKI, of development or progression of chronic kidney disease up to end stage renal disease, and mortality, both in the immediate and longer term^{2,6}. Hospital related care of patients with AKI is estimated to cost around 1% of the NHS budget⁴.

Support was organised around three types of activities. First, we delivered five multi-professional educational events, accommodating GPs/nurses/pharmacists/practice managers from all 31 of Bury CCGs GP practices. These events raised awareness of the syndrome, aided recognition of the signs of AKI, and shared best practice of the management of this patient population. Second, we supported the effective use of Vision electronic system for patient records' management used by practices in Bury, by highlighting the importance of appropriately Read coding patients who have had an admission complicated by AKI. Finally, through this, we have supported GP practices in developing their own action plans to enhance and sustain improved management of patients with AKI.

In July-August 2016 we conducted an audit covering patients registered with one of the GP practices in Bury CCG and discharged from PAT between April 2015 and March 2016 after an admission complicated by AKI. We audited all patients who were still active and had AKI noted on their discharge summary from the hospital. The list of patients was provided by PAT and included patients with a clinical diagnosis in the chapter N17 of the International Classification of Diseases version 10 (ICD – 10). During the summer of 2017, after the delivery of the training and the development of the GP practice AKI action plans, we conducted a re-audit covering the period between April 2016 and March 2017. We intend to conduct a further audit during summer 2018 for the following 12 month period.

Here, we report the results of the audit covering the period between April 2016 and March 2017 to document changes in key indicators of processes of care. Aligned with national guidance including pilot indicators proposed by NICE¹⁰ in consultation with Think Kidneys¹¹, we are reporting on four criteria:

1. Recording of AKI diagnosis in the electronic record of the patients used by GP practices in Bury (on Vision);
2. Medication review undertaken within 1 month of discharge from PAT;
3. Serum creatinine check undertaken within 3 months of discharge from PAT;
4. Written information (about AKI) given to patients.

This work aligns with a further NIHR CLAHRC GM project being delivered in collaboration with the **Royal College of GPs** <http://clahrc-gm.nihr.ac.uk/projects/acute-kidney-injury-rcgp-quality-improvement-toolkit/>. The learning from three Bury GP practices, along with approximately 20 others from around the UK, will inform the creation of a primary care focussed AKI toolkit to support GP practices nationwide.

NIHR CLAHRC GM have also been approached by The National Institute for Health and Care Excellence (**NICE**), who are very interested in drawing on the learning from the AKI work in Bury, in development of potential future AKI QOF indicators. We therefore seek permission to share this report with NICE to facilitate this.

For further information regarding this project, please see <http://clahrc-gm.nihr.ac.uk/projects/bury-post-aki/> or contact Dr Susan Howard, Programme Manager, susan.howard@srft.nhs.uk.

Audit of patients with an admission to hospital complicated by AKI

The list provided by PAT (April 2016 – March 2017) included a total of 1,593 episodes of admissions complicated by AKI for patients registered with a GP practice in Bury CCG, as illustrated in Table 1. Of these, 698 were patients who at the time of the audit were not active in the list of the GP practice, as they had left the practice or were deceased; these were therefore excluded from further analysis. Of the 959 episodes concerning patients still active, 67 had no discharge summary reported in Vision, and an additional 194 did not have AKI mentioned in their discharge summary. Therefore, out of the 1,593 episodes, we audited a total of 634 patient records, who concerned patients still active, and for whom a discharge summary was available and reported AKI.

Of the 634 episodes audited, only 229 (36%) had AKI Read coded. Due to the relatively high proportion of episodes of AKI not Read coded, we report the indicators on processes of care both as percentages of all the episodes of AKI and of the episodes Read coded, as illustrated in Table 2, and Appendix 1 in more detail.

We verified patients who had a medication review within one month (31 days) of discharge, blood test and serum creatinine checked within 3 months (93 days) of discharge, and were given written information since discharge.

A number of Read codes were used in primary care which were reviewed and identified as inappropriate for the described measure/criteria. Please see Appendix 2 for the list of codes included or excluded in the audit.

Table 1 - Episodes of admissions to PAT complicated by AKI for patients registered with GP practices in Bury CCG, April 2016 -March 2017

Episodes of admissions to PAT complicated by AKI	Episodes (percentage)
Total episodes of admission complicated by AKI (PAT list) :	1,593 (100%)
Total episodes excluded from audit	959 (60%)
- Patient no longer active / alive	698 (44%)
- No discharge summary reported in Vision	67 (4%)
- AKI not mentioned in the discharge summary	194 (12%)
Total episodes included in the audit	634 (40%)

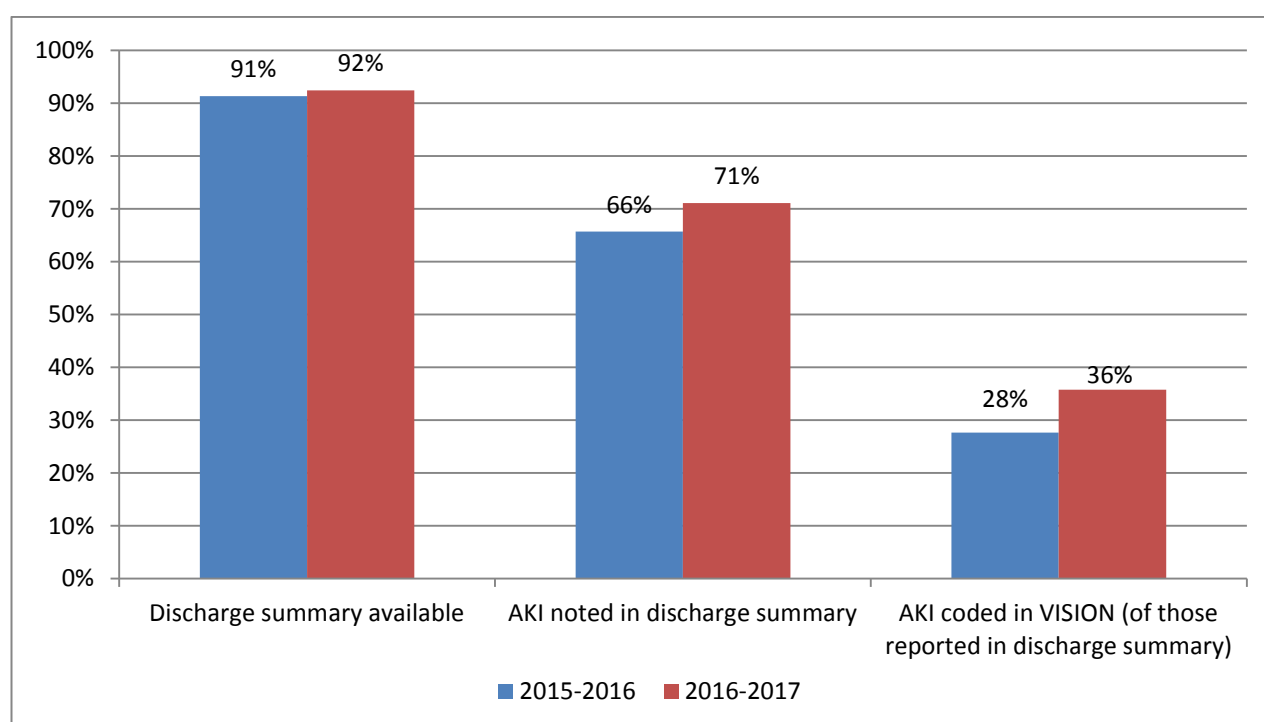
Table 2 – Indicators of post-discharge care for admissions complicated by AKI for patients registered with GP practices in Bury CCG (April 2016 -March 2017)

Indicator	Episodes	%
Episodes included in the audit	634	
Episodes with AKI coded in Vision	229	36%
<i>Out of 239 episodes coded in Vision:</i>		
Medication review within one month	52	23%
Serum creatinine checked within 3 months	181	79%
Written information on AKI given to patient	38	15%

AKI recording in secondary and primary care

Figure 1 shows the total number of active episodes with a discharge summary uploaded onto Vision, the number of active episodes with AKI noted on the discharge summary, and then those which had been Read coded on practice systems. A comparison between the two manual audits (2015-16 vs 2016-17) is included, which demonstrates an increase from 28% to 36% in the percentage of episodes Read coded of those with AKI reported on the discharge summary.

Figure 1 – 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 and 2016/17)

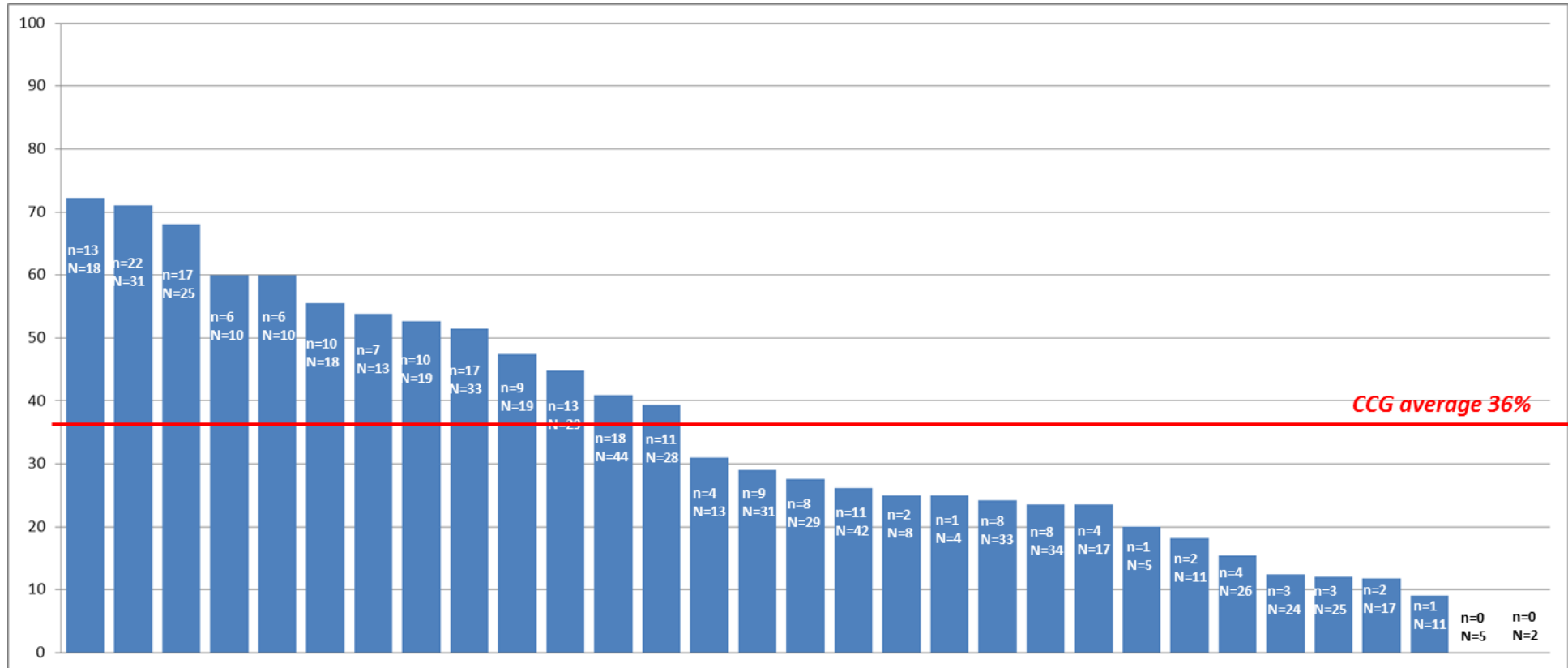


Note: Percentages calculated out of the total number of episodes of admission complicated by AKI for patients still active in the GP practice register at the time of the audit (N=656 in 2015-16 and N=941 in 2016-17)

AKI recording in primary care

Figure 2 shows the number of active episodes with AKI on discharge summary and then Read coded in general practice, ranking individual anonymised practices by proportion of patients coded. 36% of the episodes of AKI were Read coded overall in Bury CCG. However, there is variation across the 31 GP practices audited, from 0% of AKI episodes Read coded through to 72%. The coding achievement of each individual practice, as well as achievement of the other indicators, will be made available to GP practices through their individual practice reports.

Figure 2 - Percentage of episodes with AKI on discharge summary and Read coded by GP practice, Bury CCG (April 2016 – March 2017)

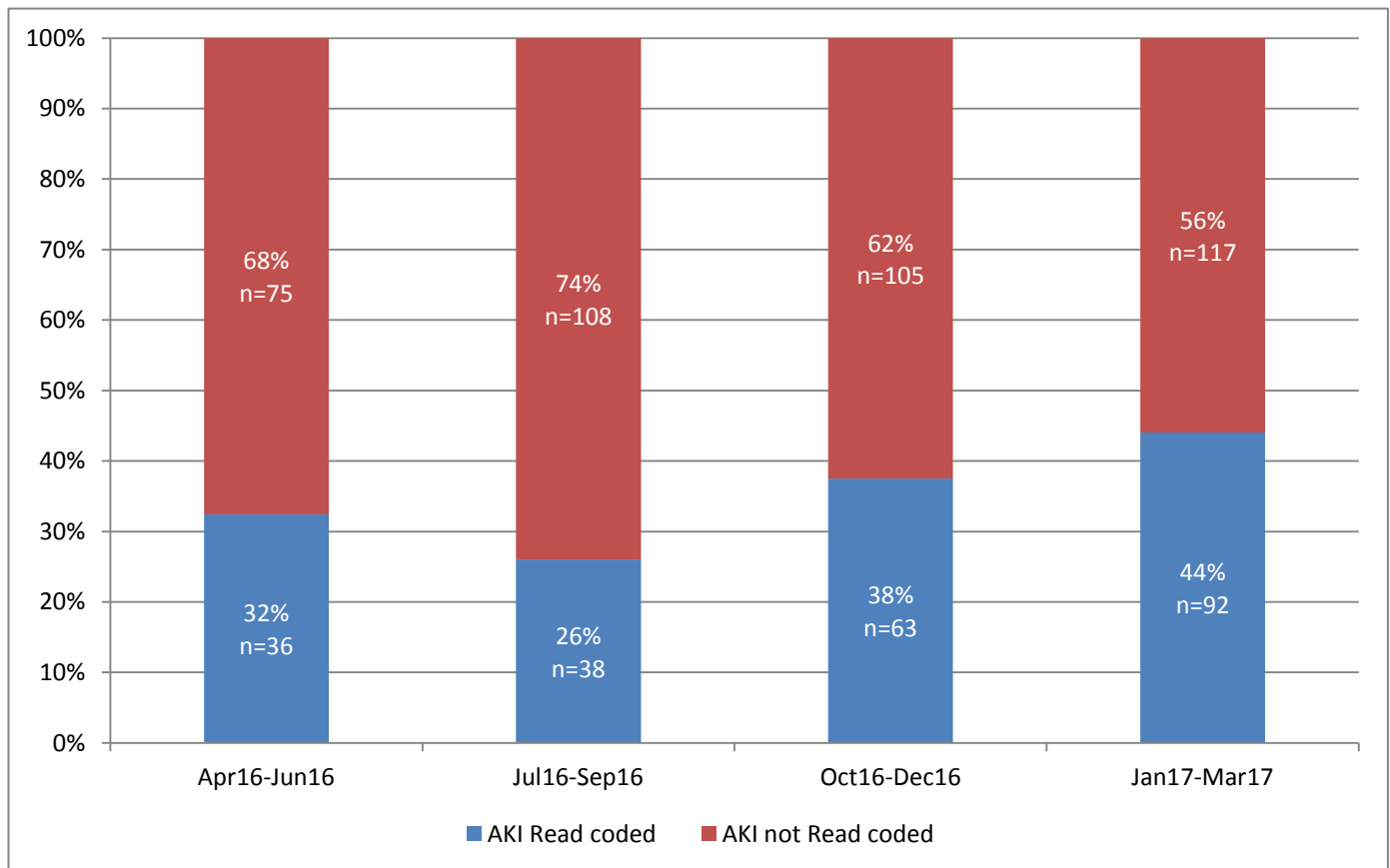


Note: n= number of episodes with AKI noted in discharge summary and Read coded, N= total number of episodes with AKI noted in discharge summary.

Post-AKI Care: Diagnostic Coding

The percentage of AKI episodes Read coded has increased since July - September 2016, up to 44% in January - March 2017. Figure 3 summarises data for all episodes in the 31 practices across Bury CCG and shows the number of active episodes with AKI noted on the discharge summary, comparing those Read coded versus not Read coded in general practice.

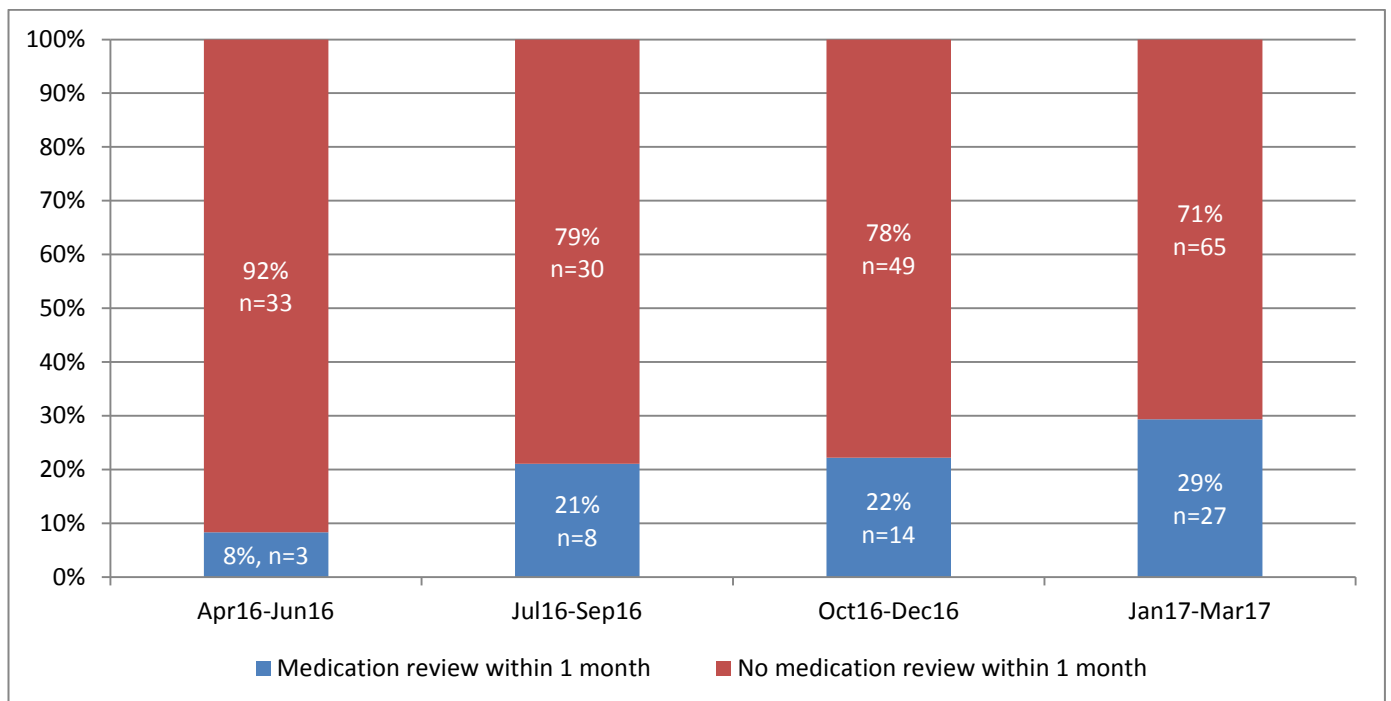
Figure 3 - Percentage of episodes with AKI on discharge summary and Read coded by quarter, Bury CCG (April 2016 – March 2017)



Post-AKI Care: Medication review

Figure 4 shows the number of active episodes with AKI noted on the discharge summary, and then Read coded with AKI in general practice, who had a medication review within 1 month of discharge. The percentage has increased from 8% at the beginning of the financial year to 29% at the end of the financial year. Appendix 1 provides 12 month comparative data showing 12% of episodes *not* Read coded had a medication review within 1 month of discharge compared with 23% of episodes Read coded with an AKI diagnosis.

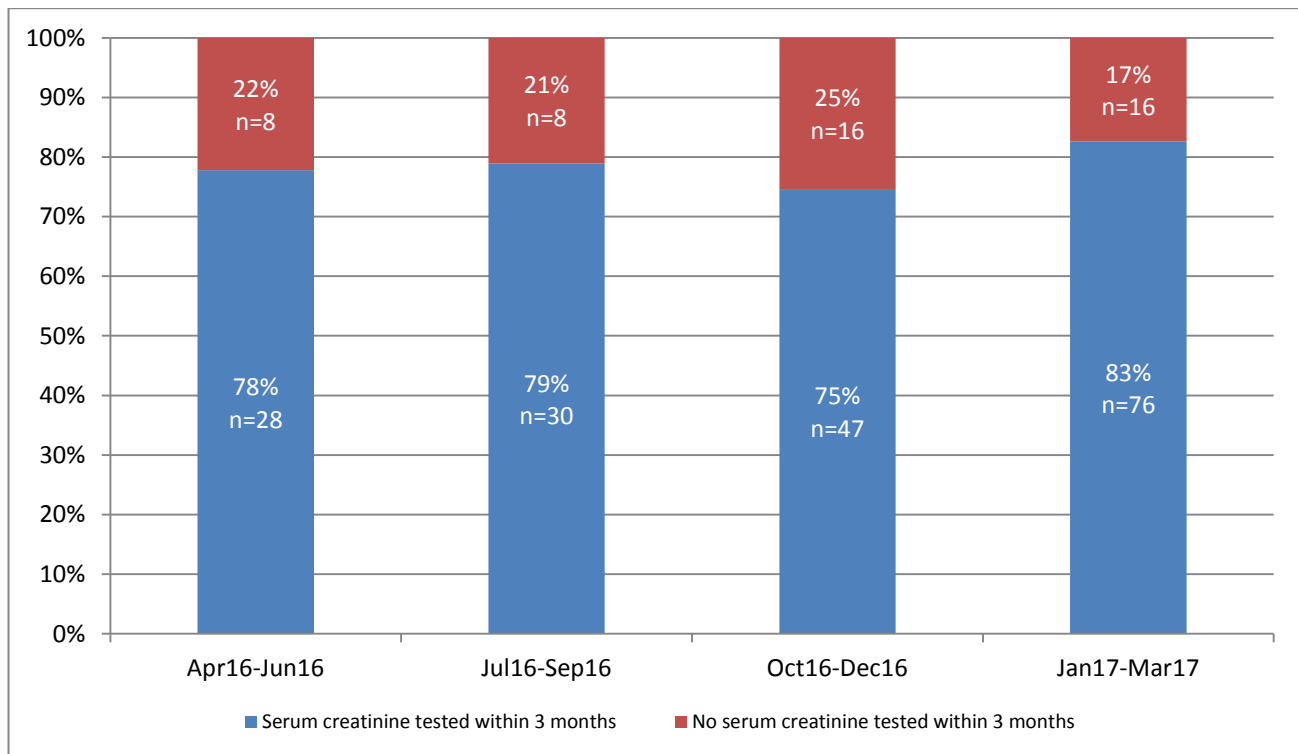
Figure 4 - Percentage of episodes with AKI Read coded who had a medication review within 1 month of discharge, Bury CCG (April 2016 – March 2017)



Post-AKI Care: Kidney function

The current guidelines^{1,2,10} recommend that a serum creatinine check is carried out within 3 months of discharge. Figure 5 shows the number of active episodes with AKI noted on the discharge summary, and then Read coded with AKI in general practice, who had serum creatinine check within 3 months of discharge. The percentage of episodes with serum creatinine checked within 3 months has not fluctuated notably over this financial year, perhaps suggesting that blood tests are conducted regardless of AKI diagnosis as part of the management of other / existing conditions. Appendix 1 shows that 58% of episodes *not* Read coded had a serum creatinine tested within 3 months of discharge compared with 79% of episodes Read coded with an AKI diagnosis.

Figure 5 - Percentage of episodes with AKI Read coded who had serum creatinine tested within 3 months of discharge by quarter, Bury CCG (April 2016 – March 2017)

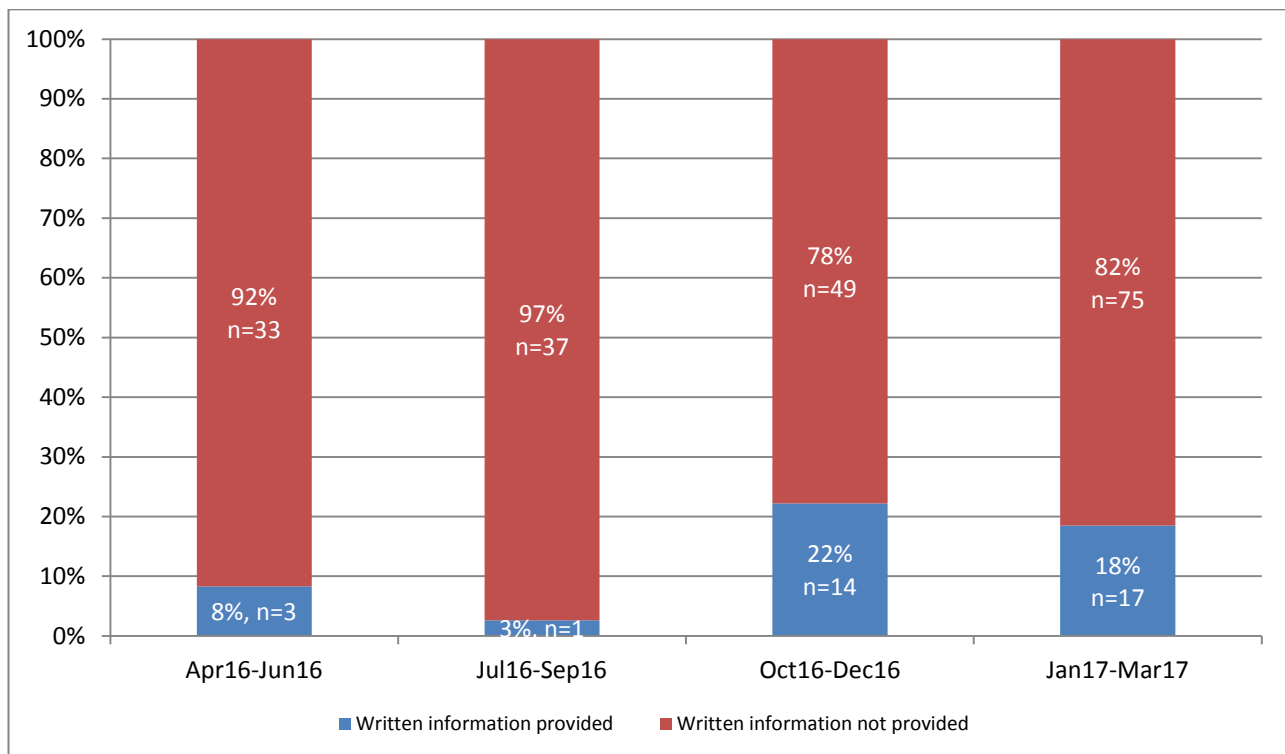


Post-AKI care: Patient Communication

Finally, best practice recommends that all patients with AKI receive written information about the condition. Information about AKI can be obtained via the Think Kidneys [website](#)⁸ and the Patient Info website⁹. We have also provided Bury practices with printed resources to facilitate this activity.

Figure 6 shows the number of active episodes with AKI noted on the discharge summary, and then Read coded with AKI in general practice, who received written information about AKI. There was a notable increase, from 3% to 22% in the percentage of patients Read coded as having been given written information following the education events in November/December 2016. Appendix 1 shows that 1% of episodes *not* Read coded had received written information compared with 15% of episodes Read coded with an AKI diagnosis.

Figure 6 - Percentage of episodes with AKI Read coded who had received written information about AKI by quarter, Bury CCG (April 2016 – March 2017)



Although NICE pilot recommendations suggest written information be given within one month of AKI diagnosis, due to small numbers in the data, our audit did not look at timing of delivery of information and instead allowed this to be given at any time.

Summary

The data enclosed demonstrates improvement in some of the key measures; there was a particularly notable increase in Read coding of AKI and provision of written information.

Coding of AKI on practice systems appears to positively impact on the improvement of management of this patient population. Appendix 1 provides comparison between those not Read coded versus those Read coded with an AKI diagnosis; 12% to 23% in medication reviews within 1 month of discharge, 58% to 79% in serum creatinine tested within 3 months of discharge, and 1% to 15% of patient provided with written information.

It remains unclear of the impact of seasonal changes on this data at present. Trends for the following financial year from next year's audit, and possibly qualitative data, may illuminate further understanding/interpretation of this data, and potentially indicate the sustainability of these changes.

There are still areas for improvement, and we will continue to work with Bury CCG practices to facilitate this.

It was also noted that the quality of information received by the GP practices from secondary care could be improved, as AKI is still not included in many discharge summaries, information on discharge summaries could be interpreted as conflicting, and lacking a clear plan of action for ongoing care.

Future planned activity includes:

- Continue to engage with practices to feedback audit data/discuss potential for further improvements to the care of this patient population
- A further re-audit to be undertaken during 2018, to assess changes in management over the entire intervention period
- Support the development of an AKI audit tool with INPS Ltd (i.e. Vision), which could potentially facilitate practices to self-audit beyond the lifetime of this project
- Qualitatively evaluate the process of implementation of this intervention in primary care, exploring barriers and enablers to change
- Assess the utility and cost effectiveness of this work through a health economics evaluation.

Beyond this study, we anticipate the findings to provide a platform for potential larger scale evaluation, by building on the currently limited evidence base. As such, there is interest in this project on a national level.

References

1. National Institute for Health and Clinical Excellence (NICE). Acute Kidney Injury: prevention, detection and management. Clinical guideline (CG169), NICE 2013.
2. 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.
3. Kerr, M., et al. The economic impact of acute kidney injury in England. *Nephrology Dialysis Transplantation*, 2014. 29(7):1362-1368.
4. NHS England. The Forward View into Action: Planning for 2015/16. 2014, NHS England Publications. NHS England Publications Gateway Number: 02768 NHS England 2014.
5. Wang, H.E., et al., Acute Kidney Injury and Mortality in Hospitalized Patients. *American Journal of Nephrology*, 2012;35(4): 349-355.
6. Selby, N.M., et al. Use of Electronic Results Reporting to Diagnose and Monitor AKI in Hospitalized Patients. *Clinical Journal of the American Society of Nephrology* 2012; 7(4): 533-540.
7. Selby, N.M., et al. Defining the Cause of Death in Hospitalised Patients with Acute Kidney Injury. *PLoS ONE*, 2012. 7(11): e48580.
8. British Kidney Patient Association Acute Kidney Injury Patient Leaflets. Accessed 26/10/17. https://www.thinkkidneys.nhs.uk/aki/wp-content/uploads/sites/2/2015/11/BKPA-RCGP-A4-Printout-Plain-Leaflet_v2.pdf ; https://www.thinkkidneys.nhs.uk/aki/wp-content/uploads/sites/2/2015/11/BKPA-RCGP-A4-Printout-Leaflet_v4.pdf
9. Acute Kidney Injury pages of 'Patient' website. Accessed 26/10/17. <https://patient.info/doctor/acute-kidney-injury-pro> ; <https://patient.info/health/acute-kidney-injury-leaflet>
10. NICE Indicator Programme. Consultation on potential new indicators. Consultation dates: 8 February 2017- 8 March 2017 <https://www.nice.org.uk/media/default/standards-and-indicators/nice-indicator-consultation-2017.pdf>
11. Linking NICE AKI Quality Standards with Think Kidneys Resources. Shared learning database - UK Renal Registry. Published date: April 2017 <https://www.nice.org.uk/sharedlearning/linking-nice-aki-quality-standards-with-think-kidneys-resources>

Appendix 1 – Episodes of AKI audited indicators by year and quarter, Bury CCG, 2016/17

	AKI Episodes			Total AKI episodes with:			AKI episodes coded in Vision with:			AKI episodes not coded in Vision with:		
	Total with AKI reported in discharge summary	With AKI in discharge summary and coded in Vision	With AKI in discharge summary but not coded in Vision	Medication Review within 1 month	Serum creatinine check within 3 months	Written information provided	Medication Review within 1 month	Serum creatinine check within 3 months	Written information provided	Medication Review within 1 month	Serum creatinine check within 3 months	Written information provided
Number of episodes	634	229	405	101	415	40	52	181	35	49	234	5
2016/17 (q1)	111	36	75	10	77	4	3	28	3	7	49	1
2016/17 (q2)	146	38	108	19	98	2	8	30	1	11	68	1
2016/17 (q3)	168	63	105	32	107	14	14	47	14	18	60	0
2016/17 (q4)	209	92	117	39	133	20	27	76	17	12	57	3
Percentages	100	36	64	16	65	6	23	79	15	12	58	1
2016/17 (q1)	100	32	68	9	69	4	8	78	8	9	65	1
2016/17 (q2)	100	26	74	13	67	1	21	79	3	10	63	1
2016/17 (q3)	100	38	63	19	64	8	22	75	22	17	57	0
2016/17 (q4)	100	44	56	19	64	10	29	83	18	10	49	3

Appendix 2: AKI Read Codes identified in Vision and screened for inclusion/exclusion in the audit

Diagnosis Read code	Description	Codes included / excluded
K04..12	Acute Kidney Injury	Yes
K04C.00	AKI Stage 1	Yes
K04E.00	AKI Stage 2	Yes
K04D.00	AKI Stage 3	Yes
14D8.00	H/O: AKI	No
451L.00	AKI warning stage	No
K04..00	Acute renal failure	No
S76..00	Injury to kidney	No
H2y..00	Other specified pneumonia or influenza b pneumonia with AKI	No
K06..00	Renal failure unspecified	No

Medication review Read code	Description	Codes included / excluded
8B3S.00	Medication review	Yes
8B31400	Medication review	Yes
8B3x.00	Medication review with patient	Yes
8B3V.00	Medication review done	Yes
8BMX.00	Medication review done by medicines management technician	Yes
8B3y.00	Medication review of medical notes	Yes
8BIC.00	Medication review done by pharmacist	Yes
8BI..00	Other medication review	Yes
8b3h.00	Medication review without patient	Yes
8B31B00	Polypharmacy medication review	Yes
8B31800	Medication reconciliation	Yes
6A...00	Patient reviewed	No
9b00.00	Initial post discharge review	No
8B31300	Medication commenced	No
8B3A.100	Medication increased	No
8B3U.00	Medication review due	No
9p...00	Medication monitoring administration	No