

Clinical Audit

Clinical Audit of In-Hospital Recognition, Management, Discharge Planning, and Post-Discharge Follow-Up of Acute Kidney Injury in Adult Medical Patients

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ABSTRACT

Background: Acute kidney injury (AKI) is a frequent and clinically important complication of acute illness and hospitalization. Delayed recognition, inadequate assessment of reversible causes, inappropriate medication management, incomplete discharge documentation, and poor continuity of care after discharge may contribute to adverse outcomes. Clinical audit provides a practical approach to measuring practice against explicit standards and implementing targeted quality-improvement measures. **Aim:** To assess the quality of in-hospital recognition and management, discharge planning, and post-discharge follow-up of AKI among adult medical inpatients in the Department of Medicine, Lady Reading Hospital, Peshawar, and to evaluate the effect of a structured AKI care bundle, staff education, medication-review prompts, and standardized discharge and follow-up processes on compliance with predefined audit standards. **Methods:** A two-cycle clinical audit and quality-improvement project was conducted among 200 adult medical inpatients with KDIGO-defined AKI. The baseline cycle included 100 eligible patients, followed by a separate re-audit sample of 100 patients. Patients with established end-stage kidney disease on maintenance dialysis and those managed exclusively in intensive care were excluded. Baseline performance was assessed across AKI recognition and staging, clinical assessment, inpatient management, medication safety, specialist referral, discharge documentation, and post-discharge follow-up. A targeted intervention comprising an AKI care bundle, staff education, medication-review prompts, and a structured discharge and follow-up checklist was implemented before re-audit. The same predefined standards were reassessed. **Results:** At baseline, AKI recognition was documented in 68% of patients and AKI staging in 54%. Volume or fluid status assessment was documented in 61%, serial serum creatinine monitoring in 74%, and nephrotoxin review in 63%. AKI was documented in the discharge summary in 52%, while a post-discharge follow-up plan was documented in 43% of patients discharged alive. Following implementation, corresponding compliance increased to 92%, 88%, 91%, 94%, 94%, and 90%, respectively. Among patients with available 30-day follow-up data, repeat serum creatinine assessment increased from 49% to 82%, medication review from 43% to 80%, and assessment for recurrent AKI or readmission from 54% to 86%. **Conclusion:** The baseline audit identified important gaps across the AKI care pathway, particularly in staging, medication safety, discharge documentation, and continuity of care. Implementation of a structured AKI care bundle with staff education and standardized discharge and follow-up processes was associated with substantial improvement in compliance with predefined standards. Continued periodic re-audit is required to determine whether these improvements are sustained. **Keywords:** Acute kidney injury; Clinical audit; Quality improvement; Medical inpatients; Care bundle; Discharge planning; Renal follow-up; Medication safety.

INTRODUCTION

Acute kidney injury (AKI) is a common and clinically important complication among hospitalized adults and is associated with increased morbidity, prolonged hospitalization, persistent impairment of kidney function, progression to chronic kidney disease, and mortality. AKI may develop in the context of hypovolaemia, sepsis, haemodynamic instability, exposure to nephrotoxic medications, cardiovascular disease, urinary tract obstruction, or intrinsic renal pathology, and its clinical course may vary from transient biochemical deterioration to severe renal dysfunction requiring specialist management or renal replacement therapy. Contemporary diagnostic frameworks therefore emphasize timely recognition using changes in serum creatinine and urine output, with severity classified according to standardized staging criteria to support risk stratification and clinical decision-making (1,2).

High-quality AKI care extends beyond recognition of an abnormal serum creatinine. Once AKI is identified, clinicians should determine the likely cause, assess volume and haemodynamic status, monitor urine output and serial renal function, investigate potentially reversible causes, and review medications that may contribute to kidney injury or require dose adjustment because of impaired renal clearance (1,2). Patients with severe, persistent, unexplained, or complicated AKI may additionally require nephrology assessment or specialist discussion. Failure to complete or document these components of care may delay correction of reversible causes, increase medication-related risk, and compromise the consistency of inpatient management.

The transition from hospital care to post-discharge follow-up represents another important component of the AKI pathway. Clinical recovery from the acute illness does not necessarily indicate complete recovery of kidney function, and some patients remain at risk of persistent renal dysfunction, recurrent AKI, and subsequent chronic kidney disease. Accordingly, discharge communication should document the occurrence of AKI, renal function at discharge, the degree of renal recovery, relevant medication changes, and arrangements for repeat renal function testing and clinical review. NICE quality standards recommend post-discharge clinical review after an episode of AKI, with earlier assessment for patients at greater risk or with incomplete renal recovery (3). Despite these recommendations, continuity of care after AKI may remain inconsistent when discharge documentation and follow-up planning are not incorporated systematically into routine clinical workflows.

Previous audit and quality-improvement initiatives have demonstrated that structured AKI care bundles and educational interventions can improve selected aspects of recognition, clinical assessment, and medication safety (4). However, improvement in isolated inpatient processes does not necessarily ensure that deficiencies across the entire AKI pathway—including staging, renal monitoring, medication review, discharge communication, and post-discharge follow-up—are addressed simultaneously. Evaluating the full pathway is particularly relevant in tertiary teaching hospitals, where patients with AKI are frequently managed by multiple clinical teams and where failures in documentation or transitions of care may contribute to variation in practice.

Against this background, the present two-cycle clinical audit was undertaken in the Department of Medicine, Lady Reading Hospital, Peshawar, Pakistan, to measure current AKI care against predefined standards derived from KDIGO and NICE guidance, identify areas of suboptimal compliance, implement a structured quality-improvement intervention, and reassess performance using the same standards. The audit specifically aimed to determine whether a coordinated strategy incorporating an AKI care bundle, staff education, medication-review prompts, and standardized discharge and follow-up processes could improve compliance across recognition, inpatient management, medication safety, discharge planning, and post-discharge continuity of care.

AUDIT STANDARDS

The audit standards were derived from established AKI guidance, particularly KDIGO diagnostic and staging criteria and NICE recommendations for AKI detection, investigation, management, monitoring, specialist referral, discharge planning, and follow-up. Targets were defined before analysis. Standards dependent on clinical indication were assessed only among eligible patients.

No.	Audit standard	Target
1	AKI recognized using accepted diagnostic criteria	≥90%
2	AKI diagnosis documented in clinical record	≥90%
3	AKI stage documented	≥90%
4	Baseline/recent renal function identified	≥90%
5	Likely cause of AKI documented	≥90%

No.	Audit standard	Target
6	Volume/fluid status assessed	≥90%
7	Urine output monitored/documented where appropriate	≥90%
8	Serial serum creatinine monitored appropriately	≥90%
9	Urinalysis performed when indicated	≥85%
10	Obstruction assessed when clinically indicated	≥90%
11	Underlying cause appropriately treated	≥90%
12	Nephrotoxic medicines reviewed	≥95%
13	Renally cleared medicines appropriately dose-adjusted	≥95%
14	Nephrology referral/discussion when indicated	≥90%
15	AKI documented in discharge summary	≥95%
16	Creatinine/renal function at discharge documented	≥95%
17	Degree of renal recovery documented	≥90%
18	Medication reconciliation completed at discharge	≥95%
19	Repeat renal function planned after discharge when indicated	≥90%
20	Post-discharge follow-up plan documented	≥90%
21	Post-discharge renal function reassessed when indicated	≥80%
22	Post-discharge medication review completed when indicated	≥80%
23	Persistent renal dysfunction identified and acted upon	≥90%
24	Readmission/recurrent AKI assessed during follow-up	≥80%

Compliance for each standard was calculated as the number of eligible patients receiving the required component of care divided by the number of eligible patients for that standard, multiplied by 100. For indication-dependent standards, the denominator excluded patients for whom the intervention was not clinically appropriate.

MATERIALS AND METHODS

This was a two-cycle clinical audit and quality-improvement project designed to measure current practice against predefined standards, identify areas of deficiency, implement targeted quality-improvement interventions, and repeat measurement to assess subsequent changes in performance. The audit was conducted in the Department of Medicine, Lady Reading Hospital, Peshawar, Pakistan. The baseline audit cycle was undertaken from June to August 2025, after which the quality-improvement intervention was implemented. The re-audit cycle was conducted from September 2025 to January 2026. Lady Reading Hospital is a tertiary teaching hospital serving a large adult medical population with a broad spectrum of acute and chronic medical conditions, and the audit focused specifically on patients managed through adult medical services.

A total of 200 adult medical patients with acute kidney injury (AKI) were included in the audit. The baseline cycle comprised 100 eligible patients, while the re-audit cycle included a separate sample of 100 eligible patients. Patients were considered eligible if they were aged 18 years or older, were admitted under adult medical services, developed AKI meeting kidney disease: Improving Global Outcomes (KDIGO) criteria during hospitalization, and had sufficient clinical and laboratory documentation to permit assessment of the relevant audit standards. Patients were excluded if they had established end-stage kidney disease requiring maintenance dialysis, were admitted exclusively to intensive care or non-medical specialties outside the defined audit pathway, or had medical records with insufficient information to determine the presence of AKI or assess the principal audit measures.

AKI was defined according to KDIGO criteria as an increase in serum creatinine of ≥ 0.3 mg/dL within 48 hours, an increase in serum creatinine to ≥ 1.5 times the baseline value within the preceding 7 days, or urine output of < 0.5 mL/kg/hour for 6 hours. AKI severity was staged according to KDIGO serum creatinine and urine-output criteria. When urine-output data were unavailable or considered unreliable, staging was based on the available serum creatinine criteria.

Data were collected using a standardized audit proforma covering demographic characteristics, comorbidities, admission diagnosis, baseline and peak renal function, AKI stage, suspected etiology, clinical assessment, relevant investigations, fluid management, medication and nephrotoxin review, specialist referral, discharge documentation, and post-discharge follow-up. The audit team reviewed relevant medical records, nursing documentation, laboratory results, medication charts, discharge summaries, and available post-discharge clinical or laboratory follow-up records.

The baseline audit cycle assessed routine clinical practice before implementation of the quality-improvement intervention. For each eligible patient, compliance was evaluated against the predefined audit standards using the standardized audit proforma. Each standard was assessed only among patients for whom the corresponding component of care was applicable. For indication-dependent standards, including urinalysis, assessment for

urinary tract obstruction, and nephrology referral or discussion, only clinically eligible patients were included in the relevant denominator.

Following completion of the baseline audit, a targeted quality-improvement intervention was implemented to address deficiencies identified in AKI recognition, staging, inpatient management, medication safety, discharge documentation, and post-discharge continuity of care. The intervention comprised four linked components: introduction of a one-page AKI care bundle; brief educational sessions for medical and nursing staff addressing AKI recognition, staging, assessment, management, and medication safety; a medication-review prompt to encourage identification of potentially nephrotoxic medicines and appropriate renal dose adjustment; and a structured discharge and follow-up checklist requiring documentation of AKI diagnosis, renal function at discharge, recovery status, medication changes, repeat renal function testing, and follow-up arrangements. Nephrology referral or discussion was emphasized according to clinical indication, particularly in patients with stage 3 AKI, unexplained or persistent AKI, inadequate response to initial management, significant complications, suspected intrinsic renal disease, or clinical situations in which renal replacement therapy might be required.

Following implementation of the quality-improvement intervention, a second sample of 100 eligible adult medical patients with AKI was assessed using the same eligibility criteria, definitions, audit standards, and data-collection process used during the baseline cycle. The re-audit assessed changes in compliance with individual standards and identified domains that remained below the predefined audit targets.

Post-discharge follow-up was evaluated as part of the continuity-of-care component of the audit. The audit framework incorporated clinical review within three months after discharge, with earlier review for patients considered at higher risk or those with incomplete renal recovery. A 30-day follow-up assessment was specifically evaluated as an early measure of post-discharge continuity of care. Available clinical and laboratory records were reviewed for repeat serum creatinine measurement, renal function assessment, medication review, recurrent AKI, hospital readmission, and identification and management of persistent renal dysfunction.

The primary audit outcomes were compliance with predefined standards relating to AKI recognition, diagnosis and staging, inpatient assessment and management, medication safety, discharge documentation, and post-discharge follow-up. Secondary outcomes included AKI stage, renal recovery at discharge, partial recovery or persistent renal dysfunction, requirement for renal replacement therapy, 30-day readmission, recurrent AKI, length of hospital stay, and in-hospital mortality.

Categorical variables were summarized as frequencies and percentages, while continuous variables were summarized using mean and standard deviation or median and interquartile range, according to the distribution of the data. Compliance with each audit standard was calculated as the proportion of eligible patients in whom the required component of care was documented or completed.

Baseline and re-audit proportions were compared using the chi-square test or Fisher's exact test, as appropriate. Absolute improvement was expressed as the difference in compliance between the re-audit and baseline cycles in percentage points. A two-sided p-value of <0.05 was considered statistically significant, and statistical analyses were performed for comparisons between the baseline and re-audit cycles.

Patient confidentiality was maintained throughout the audit. Direct patient identifiers were excluded from the analytic dataset and replaced with audit identification numbers. Data were used exclusively for clinical audit and quality-improvement purposes and were reported in aggregate form without disclosure of individual patient identities. The audit was conducted in accordance with institutional requirements for clinical audit and quality-improvement activities, and any required departmental, institutional, ethics, or quality-improvement governance approval was obtained as applicable.

RESULTS

The baseline audit included 100 adult medical inpatients with AKI. The mean age was 58.4 ± 16.7 years, and 61 (61%) patients were male. Diabetes mellitus was present in 39 (39%) patients, hypertension in 47 (47%), chronic kidney disease in 22 (22%), and heart failure in 12 (12%). Sepsis or infection-related admission was documented in 44 (44%) patients, suspected of hypovolemia or dehydration in 31 (31%), and nephrotoxic medication exposure in 36 (36%).

Table 1. Baseline Patient Characteristics

Characteristic	Baseline (n=100)
Age, years, mean $\pm$ SD	58.4 $\pm$ 16.7
Male sex	61 (61%)
Female sex	39 (39%)
Diabetes mellitus	39 (39%)
Hypertension	47 (47%)
Chronic kidney disease	22 (22%)
Heart failure	12 (12%)
Sepsis/infection-related admission	44 (44%)
Hypovolaemia/dehydration suspected	31 (31%)
Nephrotoxic medication exposure	36 (36%)

AKI was classified as stage 1 in 49 (49%) patients, stage 2 in 32 (32%), and stage 3 in 19 (19%). The documented or clinically attributed causes were prerenal/hypovolemic in 38 (38%), sepsis-associated in 29 (29%), drug-associated in 12 (12%), obstructive in 7 (7%), intrinsic renal disease in 6 (6%), and multifactorial/uncertain in 8 (8%).

Table 2. Baseline AKI Severity and Etiology

Variable	n (%)
AKI severity	
Stage 1	49 (49%)
Stage 2	32 (32%)
Stage 3	19 (19%)
Etiology	
Prerenal/hypovolemic	38 (38%)
Sepsis-associated	29 (29%)
Drug-associated	12 (12%)
Obstructive	7 (7%)
Intrinsic renal disease	6 (6%)
Multifactorial/uncertain	8 (8%)

4.2 Compliance with Audit Standards at Baseline

Baseline compliance demonstrated deficiencies across several components of AKI care. AKI recognition and diagnostic documentation were each recorded in 68% of cases, while AKI staging was documented in 54%. Baseline renal function was identified in 72%, and the likely cause of AKI was documented in 66%. Assessment of volume/fluid status and urine output monitoring were documented in 61% and 58%, respectively. Serial creatinine monitoring was documented in 74% of cases.

Table 3. Compliance with Audit Standards at Baseline

Standard	Baseline	Target	Gap (pp)
AKI recognized	68%	90%	-22
AKI diagnosis documented	68%	90%	-22
AKI stage documented	54%	90%	-36
Baseline renal function identified	72%	90%	-18
Cause documented	66%	90%	-24
Volume/fluid status assessed	61%	90%	-29
Urine output monitored	58%	90%	-32
Serial creatinine monitored	74%	90%	-16
Urinalysis when indicated	63%	85%	-22
Obstruction assessed when indicated	71%	90%	-19
Underlying cause treated	79%	90%	-11
Nephrotoxin review	63%	95%	-32
Renal dose adjustment	69%	95%	-26
Nephrology referral when indicated	67%	90%	-23
AKI in discharge summary	52%	95%	-43
Discharge creatinine documented	64%	95%	-31
Recovery status documented	46%	90%	-44
Medication reconciliation	71%	95%	-24
Repeat renal test planned	55%	90%	-35
Follow-up plan documented	43%	90%	-47

4.3 Baseline Post-Discharge Follow-Up

Of the 100 patients included in the baseline audit, 86 were discharged alive. A documented post-discharge follow-up plan was present in 37 (43%) patients. Among the 72 patients with available 30-day clinical or laboratory follow-up data, repeat serum creatinine was documented in 35 (49%), medication review in 31 (43%), and assessment for

recurrent AKI or readmission in 39 (54%). Persistent renal dysfunction was identified in 18 patients with available renal function results, of whom 11 had a documented management plan.

Table 4. Baseline Post-Discharge Follow-Up

Follow-up measure	Baseline
Patients discharged alive	86/100 (86%)
Documented post-discharge follow-up plan	37/86 (43%)
Patients with available 30-day follow-up data	72/86 (84%)
Repeat serum creatinine documented	35/72 (49%)
Medication review documented	31/72 (43%)
Recurrent AKI/readmission assessed	39/72 (54%)
Persistent renal dysfunction identified	18
Documented management plan for persistent dysfunction	11/18 (61%)

4.4 Baseline Clinical Outcomes

Among the 86 patients discharged alive, 57 (66.3%) achieved renal recovery by discharge, while 29 (33.7%) had partial recovery or persistent renal dysfunction. Renal replacement therapy was required in 8 (8%) patients, and in-hospital mortality was 12 (12%). Among the 72 survivors with available 30-day follow-up data, 9 (12.5%) were readmitted and 6 (8.3%) experienced recurrent AKI.

Table 5. Baseline Clinical Outcomes

Outcome	Baseline
Renal recovery among patients discharged alive	57/86 (66.3%)
Partial recovery/persistent dysfunction among patients discharged alive	29/86 (33.7%)
Renal replacement therapy	8/100 (8.0%)
In-hospital mortality	12/100 (12.0%)
30-day readmission among followed survivors	9/72 (12.5%)
Recurrent AKI among followed survivors	6/72 (8.3%)

5. QUALITY-IMPROVEMENT INTERVENTION AND RE-AUDIT

Following completion of the baseline audit, a targeted quality-improvement intervention was implemented to address deficiencies in AKI recognition, inpatient management, medication safety, discharge documentation, and post-discharge continuity of care. A one-page AKI care bundle was introduced to prompt documentation of AKI stage, baseline and current serum creatinine, likely etiology, volume status, urine output, medication and nephrotoxin review, repeat renal function testing, and criteria for escalation or specialist discussion.

Brief educational sessions were conducted for medical and nursing staff. A structured discharge checklist was incorporated into the clinical workflow to improve documentation of AKI in the discharge summary, renal function at discharge, degree of renal recovery, medication changes, repeat renal function testing, and post-discharge follow-up arrangements. Nephrology referral was emphasized according to clinical indication, particularly for stage 3 AKI, unexplained or persistent AKI, inadequate response to initial management, significant complications, suspected intrinsic renal disease, or situations in which renal replacement therapy might be required.

5.1 Re-Audit Patient Characteristics

The re-audit included 100 patients. The mean age was 57.6 ± 17.1 years and 59 (59%) patients were male. Diabetes mellitus was present in 41 (41%), hypertension in 49 (49%), and chronic kidney disease in 24 (24%). Sepsis or infection-related admission was documented in 46 (46%) patients. AKI was classified as stage 1 in 47 (47%), stage 2 in 34 (34%), and stage 3 in 19 (19%).

Table 6. Re-Audit Patient Characteristics

Characteristic	Re-audit (n=100)
Age, years, mean $\pm$ SD	57.6 ± 17.1
Male sex	59 (59%)
Diabetes mellitus	41 (41%)
Hypertension	49 (49%)
Chronic kidney disease	24 (24%)
Sepsis/infection-related admission	46 (46%)
Stage 1 AKI	47 (47%)
Stage 2 AKI	34 (34%)
Stage 3 AKI	19 (19%)

5.2 Comparison of Audit Performance

Following implementation of the quality-improvement intervention, compliance improved across all audited process measures.

Table 7. Comparison of Audit Performance Between Baseline and Re-Audit

Standard	Baseline	Re-audit	Improvement (pp)	P
AKI recognized	68%	92%	+24	<0.001
AKI diagnosis documented	68%	92%	+24	<0.001
AKI stage documented	54%	88%	+34	<0.001
Baseline renal function identified	72%	94%	+22	<0.001
Cause documented	66%	91%	+25	<0.001
Volume/fluid status assessed	61%	91%	+30	<0.001
Urine output monitored	58%	87%	+29	<0.001
Serial creatinine monitored	74%	94%	+20	<0.001
Urinalysis when indicated	63%	86%	+23	0.001
Obstruction assessed when indicated	71%	90%	+19	0.002
Underlying cause treated	79%	91%	+12	0.018
Nephrotoxin review	63%	94%	+31	<0.001
Renal dose adjustment	69%	93%	+24	<0.001
Nephrology referral when indicated	67%	91%	+24	0.006
AKI in discharge summary	52%	93%	+41	<0.001
Discharge creatinine documented	64%	95%	+31	<0.001
Recovery status documented	46%	89%	+43	<0.001
Medication reconciliation	71%	94%	+23	<0.001
Repeat renal test planned	55%	91%	+36	<0.001
Follow-up plan documented	43%	90%	+47	<0.001

The largest improvements were observed in documentation of the post-admission and discharge components of care. Recovery status documentation increased by 43 percentage points, AKI documentation in the discharge summary by 41 percentage points, follow-up planning by 47 percentage points, and repeat renal testing planning by 36 percentage points. Medication safety measures also improved substantially, particularly nephrotoxin review, which increased from 63% to 94%.

5.3 Post-Discharge Re-Audit

In the re-audit cycle, 88 patients were discharged alive. A documented post-discharge follow-up plan was present in 79 (90%) patients. Among these 79 patients with available 30-day clinical or laboratory follow-up data, repeat serum creatinine was documented in 65 (82%), medication review in 63 (80%), and assessment for recurrent AKI or readmission in 68 (86%). Persistent renal dysfunction was identified in 17 patients with available renal function results, of whom 15 had a documented management plan.

Table 8. Post-Discharge Follow-Up in the Re-Audit

Follow-up measure	Re-audit
Patients discharged alive	88/100 (88%)
Documented post-discharge follow-up plan	79/88 (90%)
Patients with available 30-day follow-up data	79/88 (90%)
Repeat serum creatinine documented	65/79 (82%)
Medication review documented	63/79 (80%)
Recurrent AKI/readmission assessed	68/79 (86%)
Persistent renal dysfunction identified	17
Documented management plan for persistent dysfunction	15/17 (88%)

5.4 Re-Audit Clinical Outcomes

Among the 88 patients discharged alive, 63 (71.6%) achieved renal recovery by discharge, while 25 (28.4%) had partial recovery or persistent renal dysfunction. Renal replacement therapy was required in 7 (7%) patients, while in-hospital mortality was 10 (10%). Among the 79 survivors with available 30-day follow-up data, 7 (8.9%) were readmitted and 4 (5.1%) experienced recurrent AKI.

Table 9. Re-Audit Clinical Outcomes

Outcome	Re-audit
Renal recovery among patients discharged alive	63/88 (71.6%)
Partial recovery/persistent dysfunction among patients discharged alive	25/88 (28.4%)
Renal replacement therapy	7/100 (7.0%)
In-hospital mortality	10/100 (10.0%)
30-day readmission among followed survivors	7/79 (8.9%)
Recurrent AKI among followed survivors	4/79 (5.1%)

DISCUSSION

Principal Findings

The baseline audit demonstrated substantial gaps across several components of AKI care, particularly in AKI staging, urine-output monitoring, medication and nephrotoxin review, documentation of renal recovery, discharge communication, and post-discharge follow-up planning. Recognition of AKI and treatment of the underlying cause were more frequently documented than several of the subsequent monitoring and continuity-of-care measures. Following implementation of a structured AKI care bundle, staff education, medication-review prompts, and standardized discharge and follow-up processes, substantial improvements were observed across all audited process measures.

The greatest improvements were observed in follow-up planning, documentation of renal recovery, inclusion of AKI in discharge summaries, repeat renal testing plans, and medication safety measures. These findings suggest that standardized prompts and structured documentation can address important process gaps in AKI care. The findings are broadly consistent with previous audit-based quality-improvement work demonstrating that structured AKI care bundles and education can improve recognition, assessment, and medication safety.⁴ However, the magnitude of improvement observed in the present audit should be interpreted in the context of its single-centre, two-cycle before-and-after design.⁵

Recognition of AKI

Recognition is fundamental because subsequent management depends on timely identification of renal deterioration and consideration of AKI as a clinical diagnosis. In the baseline audit, AKI recognition was documented in 68% of patients and AKI staging in 54%. This indicates that although AKI was recognized in a substantial proportion of patients, documentation of disease severity was less consistent.⁶

Following implementation of the intervention, recognition increased to 92% and staging documentation increased to 88%. The improvement suggests that incorporating AKI diagnostic and staging prompts into routine clinical documentation may support more consistent identification and characterization of AKI. Accurate staging is particularly important because the severity of AKI influences monitoring intensity, investigation, treatment, specialist involvement, and discharge planning.

In-Hospital Management

Assessment of volume status, urine output, serial serum creatinine, urinalysis when indicated, and urinary tract obstruction are important components of AKI evaluation and management. Baseline compliance was suboptimal across these domains, indicating that recognition of AKI did not consistently translate into a complete diagnostic and monitoring response.

Following the intervention, documentation of volume or fluid status increased from 61% to 91%, urine-output monitoring from 58% to 87%, serial creatinine monitoring from 74% to 94%, urinalysis when indicated from 63% to 86%, and assessment for obstruction when indicated from 71% to 90%. These improvements support the usefulness of a structured care pathway in reducing omissions in routine AKI assessment. Nevertheless, care bundles should support rather than replace individualized clinical judgment, particularly because the appropriate investigations and interventions vary according to the suspected cause and clinical severity of AKI.⁷

Medication Safety

Medication safety represents an important and potentially modifiable component of AKI management. Acute reduction in renal function can alter drug clearance and increase the risk of toxicity, while some medications may contribute to or exacerbate kidney injury in susceptible patients.

In the baseline audit, nephrotoxin review was documented in 63% of patients and appropriate renal dose adjustment in 69%. Following implementation of the intervention, these measures increased to 94% and 93%, respectively. The improvement suggests that a visible medication-review prompt incorporated into an AKI care bundle may improve recognition of medication-related risks and promote appropriate dose adjustment.⁸

Medication review should remain individualized. The clinical decision to withhold, discontinue, substitute, or continue a medication should consider the indication for treatment, severity and reversibility of AKI, haemodynamic status, and the anticipated benefits and risks of therapy.

Nephrology Referral

Nephrology referral or discussion should be based on clinical indication rather than applied universally to all patients with AKI. Patients with severe AKI, particularly stage 3 disease, unexplained or persistent renal dysfunction, inadequate response to initial management, significant complications, suspected intrinsic renal disease, or possible need for renal replacement therapy may require specialist input.

In the present audit, nephrology referral or discussion when indicated increased from 67% at baseline to 91% during the re-audit. This improvement suggests better adherence to the predefined specialist-review pathway while maintaining an indication-based approach rather than requiring referral for uncomplicated AKI that responds appropriately to initial management.

Discharge Planning

Discharge planning represented one of the most important areas of deficiency in the baseline audit. AKI was documented in the discharge summary in 52% of cases, while documentation of renal recovery was present in only 46%. These omissions are clinically important because an episode of AKI may have implications for future renal risk, medication management, and follow-up.

Following implementation of the structured discharge pathway, documentation of AKI in the discharge summary increased to 93% and documentation of recovery status increased to 89%. Documentation of discharge renal function increased from 64% to 95%, while medication reconciliation increased from 71% to 94%.

These findings indicate that discharge checklists can improve communication of clinically important renal information at the transition from hospital to community care. Documentation should include the AKI diagnosis and stage where appropriate, renal function at discharge, degree of recovery, medication changes, repeat renal function requirements, and follow-up arrangements.

Post-Discharge Follow-Up

Post-discharge follow-up represents an important component of comprehensive AKI care because recovery of the acute illness does not necessarily indicate complete recovery of kidney function. Patients may remain at risk of persistent renal dysfunction, recurrent AKI, and subsequent chronic kidney disease.

In the baseline cycle, only 43% of patients discharged alive had a documented follow-up plan. Among patients with available 30-day follow-up data, repeat serum creatinine was documented in 49%, medication review in 43%, and assessment for recurrent AKI or readmission in 54%. Following the intervention, documented follow-up planning increased to 90% of patients discharged alive. Among those with available 30-day follow-up data, repeat serum creatinine assessment increased to 82%, medication review to 80%, and assessment for recurrent AKI or readmission to 86%.

These findings demonstrate a marked improvement in continuity-of-care processes after follow-up was incorporated explicitly into the AKI discharge pathway. However, documented follow-up and actual patient attendance are distinct outcomes. The availability of follow-up information may also be affected when patients receive subsequent care outside the hospital.

Comparison with Previous Audit Work

Previous hospital-based audit and quality-improvement work has demonstrated that structured AKI care bundles combined with staff education can improve selected aspects of AKI recognition, fluid-status assessment, and medication management. The present audit is consistent with this general approach and demonstrates improvement across a broader pathway extending from AKI recognition and inpatient management to discharge documentation and post-discharge follow-up.

The inclusion of discharge and post-discharge measures is particularly relevant because the clinical consequences of AKI may persist beyond the index hospitalization. A quality-improvement approach that addresses only inpatient recognition may therefore leave important gaps in continuity of care.

STRENGTHS

The audit assessed the AKI pathway from recognition through inpatient management, discharge, and post-discharge follow-up.

Explicit and measurable standards were defined before assessment.

Indication-based standards were used for specialist referral and selected investigations.

A two-cycle audit design allowed assessment of practice before and after a targeted quality-improvement intervention.

Discharge documentation and post-discharge follow-up were assessed separately, allowing identification of gaps in continuity of care.

The intervention was practical and incorporated care bundles, staff education, medication prompts, and structured discharge processes.

LIMITATIONS

Several limitations should be considered when interpreting these findings. First, this was a single-centre two-cycle clinical audit using separate patient samples rather than a randomized controlled study. Therefore, improvements in process measures cannot be attributed exclusively to the intervention.

Second, clinical documentation may underestimate care that was performed but not recorded. Third, post-discharge follow-up data were dependent on the availability of clinical and laboratory records and may not have captured care received outside the hospital.

Fourth, patient characteristics, disease severity, and case mix may have differed between the baseline and re-audit cycles. Fifth, some audit standards were dependent on clinical indication and therefore required specific denominator definitions. Finally, changes in clinical outcomes such as renal recovery, readmission, recurrent AKI, renal replacement therapy, and mortality should be interpreted cautiously because the audit was not designed or powered to establish causal effects on these outcomes.

RECOMMENDATIONS

Introduce and maintain a standardized AKI recognition and management bundle in adult medical wards.

Require documentation of AKI stage, baseline renal function, and likely cause when AKI is identified.

Use a structured medication-review prompt to identify potentially nephrotoxic medicines and medicines requiring renal dose adjustment.

Standardize criteria for nephrology discussion, particularly for stage 3 AKI, unexplained or persistent AKI, inadequate response to initial management, significant complications, and suspected intrinsic renal disease.

Incorporate a dedicated AKI component into discharge documentation, including renal function at discharge, degree of recovery, medication changes, repeat renal testing, and follow-up requirements.

Arrange post-discharge renal function testing and clinical review according to AKI severity, recovery status, comorbidities, and underlying cause, with earlier review for higher-risk patients.

Provide patients with clear information regarding AKI, hydration, medication changes, potentially nephrotoxic over-the-counter medicines, and circumstances requiring medical attention.

Repeat the audit periodically to assess sustainability and identify regression in compliance.

Use departmental audit feedback, performance dashboards, or regular audit meetings to communicate results and reinforce adherence among medical and nursing teams.

Sustainability Plan

Sustainability should be assessed after the initial re-audit. The AKI care bundle should be incorporated into routine ward practice rather than remaining a temporary quality-improvement intervention. New doctors and nurses should receive AKI education during induction, while the discharge checklist should be integrated into the routine clinical documentation workflow.

A subsequent audit cycle approximately six to twelve months after the re-audit would help determine whether the observed improvements have been sustained and identify areas requiring further intervention.

CONCLUSION

AKI is a common and clinically important contributor to morbidity among adult medical inpatients. High-quality AKI care requires more than recognition of a raised serum creatinine. It requires timely assessment of severity and cause, appropriate monitoring and treatment, medication safety, specialist involvement when indicated, and clear communication at discharge.

The present clinical audit demonstrated substantial baseline deficiencies across several components of AKI care, particularly staging, medication safety, recovery documentation, discharge communication, and follow-up planning. Implementation of a structured AKI care bundle, staff education, medication-review prompts, and standardized discharge and follow-up processes was associated with marked improvement in compliance across all audited process measures.

These findings support the integration of structured AKI pathways into routine adult medical practice. Continued monitoring through periodic re-audit is required to determine whether the improvements are sustained and whether further quality-improvement measures are needed. Changes in clinical outcomes should be interpreted cautiously and should not be considered evidence of a causal intervention effect within this two-cycle audit design.

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