

Enhancing AKI Detection and Management in Critical Care

Real-Time Monitoring with the Accuryn System: Results from a Northwestern Quality Improvement Project

Executive Summary

Acute Kidney Injury (AKI) presents a major clinical and financial burden in critical care. Traditional detection methods, primarily serum creatinine-based, delay diagnosis and limit timely intervention. The Accuryn Monitoring System addresses this gap by providing real-time, automated monitoring of urine output, an early indicator of AKI.

A prospective quality improvement project led by Dr. Abbas Al-Qamari at Northwestern Memorial Hospital demonstrated Accuryn-enabled interventions decreased AKI progression in 27 high-risk cardiac surgery patients. These findings suggest significant opportunities to avoid the progression of AKI, improving patient outcomes and reducing healthcare costs—estimated at \$27,000–\$41,000 per patient.¹

Abstract

AKI is frequently under-recognized in its early stages due to reliance on delayed serum creatinine measurements. The Accuryn System enhances AKI care by continuously tracking urine output and intra-abdominal pressure, enabling earlier detection and the opportunity to prescribe timely interventions. Preliminary findings from Northwestern's QI project show a significant reduction in AKI progression with Accuryn use, underscoring its clinical and economic value.

Background: The AKI Challenge

AKI is common in critically ill patients and is linked to increased morbidity, mortality, and resource utilization. Serum creatinine, a lagging biomarker, typically rises only after significant kidney injury has occurred. By contrast, urine output—an early and sensitive AKI indicator—is difficult to monitor accurately with standard technology and manual workflows.²

KDIGO Guidelines define AKI:³

- Serum Creatinine (SCr) – Delayed marker of kidney distress.
- Urine Output (UO) – Early indicator of kidney distress, however, currently underutilized due to manual monitoring limitations

The Accuryn Monitoring System:⁴

- Continuous, automated urine output monitoring per the KDIGO guidelines
- Continuous intra-abdominal pressure readings
- Integrated temperature tracking

These metrics are seamlessly captured without added workload to nursing teams, without additional infection risk, and support early AKI detection and adherence to KDIGO guidelines.

Northwestern QI Project Overview

Objective: Evaluate the impact of real-time AKI monitoring using Accuryn in post-cardiac surgery (CSA-AKI), a high-risk ICU patient population for developing AKI.

Lead Investigator: Dr. Abbas Al-Qamari, Northwestern Memorial Hospital

Design: Prospective quality improvement project

Participants: 27 patients monitored continuously with Accuryn upon ICU admission

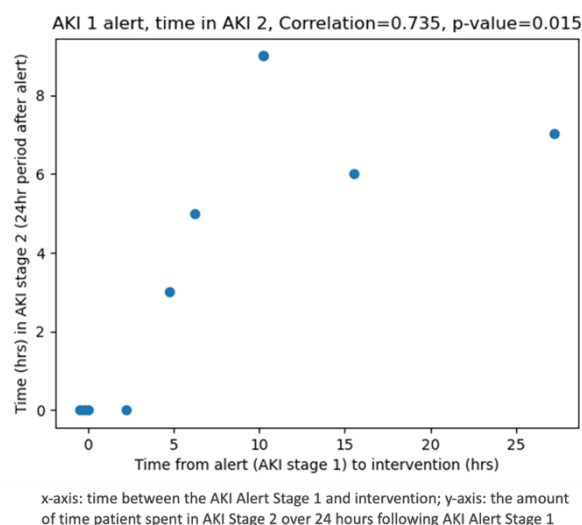
Protocol and Interventions

- Accuryn monitored urine output, temperature, and intra-abdominal pressure in real time
- Clinicians responded to AKI alerts within a critical **4-hour window**
- Interventions included fluid management, medication adjustment, and hemodynamic optimization

Key Results

- Time to Accuryn-driven intervention in AKI Stage 1 is inversely related to AKI Stage 2 duration.
- Statistical significance: $p = 0.015$
- Clinical takeaway: Early, Accuryn-driven interventions decreased AKI progression.

Visual Analysis: A scatter plot revealed clear correlation between time-to-intervention and AKI stage progression, reinforcing the impact of real-time data.



Implementation & Clinical Integration

The Accuryn System supports adoption of the KDIGO Kidney Bundle by:

- Enabling proactive avoidance of nephrotoxins
- Optimizing fluid and hemodynamic management
- Allowing timely consideration of renal replacement therapy

These interventions, guided by high-fidelity data, reduce ICU nurse workload, improve patient outcomes, and support value-based care goals.

Conclusion

The Accuryn Monitoring System represents a significant advancement in AKI management, offering clinicians real-time visibility into kidney function. Dr. Al-Qamari's project confirms Accuryn's utility in enabling providers to reduce AKI progression. Accuryn aligns with emerging healthcare priorities—early detection, timely intervention, and cost reduction.

As hospitals prepare for increased scrutiny on AKI-related outcomes and eCQM compliance, the integration of automated urine output and IAP monitoring offers a compelling case for operational and clinical leadership.

References

1. Kidney360 5(6):p 909-9262024. | DOI: 10.34067/KID.0000000000000466, June, 2024
2. U.S. Department of Health and Human Services. (2025). *Annual Mortality Rates Associated with Acute Kidney Injury*.
3. KDIGO AKI Work Group. (2012). *KDIGO Clinical Practice Guideline for Acute Kidney Injury*. Kidney Int Suppl, 2(1), 1–138.
4. Accuryn Monitoring System. (2025). *Transforming Acute Kidney Injury Management*.