Alert System for Early Diagnosis of Acute Kidney Injury
Kokilaben Dhirubhai Ambani Hospital & Medical Research Institute, Mumbai

About the Organization

- Type & size of hospital: A 750-bed, multi-specialty, tertiary-care hospital.
- Location, specialties: Four Bungalows, Andheri West, Mumbai – 400053. All Specialities.
- Type of Accreditation: NABH, JCI, NABL & CAP
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Key operational or clinical challenge

- Acute kidney injury (AKI) is hard to diagnose owing to its asymptomatic pathogenesis. Up to 15% of hospitalized patients experience AKI, often leading to complications and mortality.

Stakeholder(s) most affected:

- Patients, Clinicians, Nursing, Lab Team, Admin.

Key NABH quality indicators / aspects impacted

- Patient Safety, Clinical Care, Patient Outcomes, Information Management System, Waiting Time/ Turn Around Time, Critical Calls & Patient Satisfaction

Any awards, recognitions:

- Best Digital Technology award at 12th International Conference on Transforming Healthcare with IT 2025, Univants of Global Healthcare Achievement Award, NABH Best Practices Award 2023, Global Investigator Award, 3 original research papers in both international and national journals.

Digital Tool / Solution Implemented

- Implemented India's first automated AKI alert system, seamlessly integrated into its existing electronic health record.
- XGBoost and CatBoost models were trained to predict AKI using clinical parameters independently as well as with other vital and past features. Shapley Additive Explanations (SHAP) values were employed for clinically visualizing and interpreting results from the ML model.
- Development model: Solution developed in association with Koita Centre for Digital Health, IIT Bombay.

Key features:

- Data Inputs & Integration; Clinical Criteria & Risk Models; Real-Time Monitoring & Analysis; Alert Logic & Thresholding; Notification & Delivery Mechanisms; User Interface & Clinical Dashboard; Clinical Workflow Integration; Audit Logging & Reporting; Machine Learning & Predictive Analytics; Safety, Customization, Governance.

Digital Implementation Highlight

- Time taken for rollout: 2021 to 2025.
- Staff trained / departments covered: Laboratory Medicine, Nursing, Clinical Care, Admin.

Internal champions or teams that led the initiative

- PI: Dr. Barnali Das, Lead Consultant, Laboratory Medicine, KDAH&MRI
- Co-PI: Prof. Kshitij Jadhav, MD PhD,Assistant Professor, KDAH&MRI
- Core Team: Lipika Bhat, Roomani Srivastava, Sampada More, Suraj Prasad, Poonam M Pal.
- Mr. Srinivasan Raman. Assistant General Manager IT.
- Acknowledgement: Dr. Santosh Shetty CEO & ED, KDAH&MRI

Digital Impact

- An automated AKI alert system was deployed within the LIS framework using creatinine-based KDIGO criteria.
- This initiative has improved early diagnosis, reduced AKI-related ICU admissions, fulfilling NABH standards under COP, CQI, and HIM.

Key Enablers

- Standardized Clinical Protocols; Advanced Health IT Infrastructure; Interdisciplinary Collaboration; Training and Awareness; Patient Safety Culture.

Challenges:

- Data Quality and Timeliness; Technical Limitations; Alert Fatigue & Clinical Workflow Integration, Measuring Impact: Difficulty in demonstrating ROI.

Lessons Learned / Replicability

- Alignment with NABH Digital Health Standards
- Compliance with NABH's framework on patient safety, data security, and digital documentation improved credibility and acceptance.
- Leverage NABH Framework - Use NABH digital health certification as a guiding framework for governance, privacy, and quality assurance.

Plan for Scalability

- Design systems to scale from pilot units to hospital-wide deployment with adaptability to future updates.
- Supports Lab Management Stewardship
- Supports National Health Digital Mission (NDHM) Goals.