

Implementation of a real-time integrated emergency department dashboard and its impact in a tertiary Indian emergency department

Saisaranya¹, Shameem K. U.¹

1. Emergency Medicine

Correspondence to: Saisaranya

*Emergency Medicine.

Email: drsaisaranya@gmail.com

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Background: Emergency departments (EDs) in India frequently experience overcrowding, delayed imaging, and limited visibility into time-critical pathways. Conventional dashboards primarily track census and waiting times but do not support clinical escalation or multidisciplinary coordination. This study evaluates the impact of implementing a real-time integrated dashboard in a high-volume tertiary ED.

Objectives: To implement a unified dashboard linking operational, radiological, and clinical pathways and to measure its effect on efficiency and critical care timelines.

Methods: This quality improvement initiative was conducted in a tertiary care ED in Kerala, India, using a two-phase design. Phase 1 employed a conventional administrative dashboard. Phase 2 introduced a clinical-operational integrated system with automated investigation tracking, color-coded delay alerts, radiology waiting clocks, multispecialty consultation tracking, and full integration of time-sensitive pathways. Pre and post-intervention metrics were compared.

Results: Implementation of the integrated dashboard produced measurable improvements across radiology, operational flow, and critical care timelines. Mean CT waiting time decreased from approximately 60 minutes to 45 minutes (25% reduction), ultrasound from 95 to 75 minutes (21% reduction), and MRI from 140 to 125 minutes (≈11% reduction). Median ED length of stay declined from about 6.4 hours to 5.3 hours, representing a 17% improvement. Time-critical clinical processes also accelerated: door-to-CT for stroke improved from roughly 32 to 25 minutes (22%), ECG-to-balloon time from 58 to 47 minutes (19%), trauma team activation from 12 to 8 minutes (33%), laboratory turnaround from 65 to 52 minutes (20%), and specialty consult response from 14 to 9 minutes (36%). These gains enhanced situational awareness across emergency medicine, radiology, neurology, cardiology, surgery, and ICU teams while enabling the dashboard to function as a command-and-control tool and real-time escalation platform.

Conclusion: A real-time, cross-team dashboard significantly improves both operational efficiency and lifesaving clinical timelines in resource-constrained, high-volume emergency settings. By transforming the ED from a passive census board into an active clinical command centre, this scalable digital model offers a practical strategy for modern emergency care delivery.

Keywords: Real-time dashboard, emergency department, clinical decision support, patient flow, radiology turnaround time, length of stay, time-critical pathways, digital health.