Reducing door-to-analgesia and door-to-50% pain reduction time in the emergency room a prospective quality improvement study balancing urgency, empathy, and safety

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Background: Pain is one of the most common presenting complaints in the emergency department (ED), yet it is frequently under-treated, particularly among patients triaged to lower-acuity areas. Delays in analgesia contribute to unnecessary patient suffering, prolonged ED stay, and reduced satisfaction. Despite being recognized as the "fifth vital sign," pain assessment and timely management are often inconsistent due to workflow inefficiencies and a lack of standardized protocols. Quality Improvement (QI) methodologies offer a practical approach to address these gaps through low-cost, system-level interventions.

Objective: To reduce door-to-analgesia time by at least 25% from baseline and improve time to 50% reduction in initial pain score among adult ED patients with moderate to minor injuries.

Methods: A prospective QI study using Plan–Do–Study–Act (PDSA) cycles was conducted over 8 weeks in a tertiary care ED with a 3-tier triage system. Adults aged ≥18 years presenting with pain scores ≥1/10 were included. Baseline data were collected for 50 consecutive patients over 2 weeks. Interventions included staff education emphasizing pain as the "fifth vital sign," early pain scoring at triage, implementation of nurse-initiated analgesia protocols for selected non-critical conditions, visual reminders, and weekly audit and feedback. Primary outcomes were door-to-analgesia time and time to 50% reduction in pain score. Secondary outcomes included pain documentation rates and patient satisfaction.

Results: Median door-to-analgesia time decreased from 46 minutes (IQR, 19-114) at baseline to 12 minutes (IQR, 4-32) post-intervention, representing a 73% reduction ($p < 0.001$). The mean time to achieve 50% reduction in pain score improved by 30%. Pain documentation at triage increased from 38% to 92%. Utilization of nurse-initiated analgesia rose from 0% to 68%. Patient satisfaction scores improved from 2.9/5 to 4.6/5.

Conclusion: A structured, multidisciplinary QI initiative significantly improved the timeliness and effectiveness of pain management in the ED. Treating pain as a vital sign and empowering nurses through standardized protocols are feasible, low-cost strategies that enhance efficiency, patient-centered care, and overall satisfaction, even in resource-constrained settings.

Keywords: Door to analgesia, 50% reduction of pain, nurse initiated pain management.