



Emergency department flow —
patterns, predictors and patient outcomes

av

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Abstract

Background: Emergency departments (EDs) must balance timely care, safety, and resource utilization. Emergency department length of stay (EDLOS) is widely used as a proxy for ED performance, yet it primarily reflects elapsed time whose clinical meaningfulness depends on patient case-mix and context. **Aim:** The overall aim was to develop a deeper understanding of patient flow in Swedish EDs, with particular focus on process determinants of EDLOS and on patient groups at greatest risk of poor outcomes. **Methods:** Four studies were undertaken. Study I was a concept analysis of “long EDLOS”. Study II was a retrospective observational study of 222,047 ED visits from two hospitals, estimating the impact of input-, throughput and output factors on EDLOS. Study III examined high-frequency ED users (HEDU) at a university hospital (121,403 visits), assessing prevalence, costs, and process outcomes. Study IV linked national registries across 5,049,641 ED visits from 15 sites (2015–2023) to analyse associations between EDLOS and adverse outcomes. **Results:** Long EDLOS is often used as a proxy for other phenomena. Throughput processes were the dominant factors impacting EDLOS. HEDU comprised 6.1% of patients but accounted for 22.4% of visits and a disproportionate share of costs. In Study IV, absolute EDLOS displayed a non-linear association with mortality, with elevated risk at very short stays. Patients with non-specific complaints were vulnerable to extended EDLOS. **Conclusions:** EDLOS is a useful metric, but when dichotomized, blunt and imprecise. Patient flow in the ED is not necessarily a reflection of levels of crowding and access block. Deviations from the expected EDLOS — whether longer or shorter — better predict adverse outcomes than absolute duration, highlighting the need for contextualised patient-centred performance metrics.

Keywords: emergency department; patient flow; ED length of stay (EDLOS); frequent users; mortality; unplanned revisits; registry linkage