

Conclusion: This study identified the increased demand placed on a tertiary referral public hospital emergency department during extreme heat events and the potential for overcrowding.

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Impact of Evaluating Patients in Chairs on Emergency Department Length of Stay

Sudhir Baliga¹, Randy Bitrus¹, Seth Krupp¹, Michael Nauss¹, Michelle Slezak¹, Suzanne Schlacht¹, Sherry Bloodworth¹, Howard A. Klausner²

1. Emergency Medicine, Henry Ford Hospital, Detroit/MI/United States of America
2. Emergency Medicine, Henry Ford Hospital, Detroit/MI/United States of America

Study/Objective: Determine if evaluating low acuity Emergency Department (ED) patients in chairs can decrease Patient Length of Stay (LOS) and if it impacts other low acuity patients' LOS.

Background: EDs can utilize an urgent care area to create space for sicker patients. Despite this, overcrowding still results and leads to increased patient LOS. One potential solution is to evaluate patients in chairs as opposed to stretchers.

Methods: This prospective case-control study took place in an inner-city ED with an annual census of 95,000. From January 6 to February 9, 2016, patients with low acuity complaints with anticipated short LOS were placed in chairs for their entire stay. Over 15 complaints were included. A specific nurse and care provider were assigned to these patients. Each study patient was matched with a case control with the same complaint from one year prior. Independent-samples Welch's t-test was used to analyze the data.

Results: Overall, 258 patients were included in the study. There were no statistical differences in age, gender, race, or resource utilization between cohorts. Patients seen in chairs had an average LOS of 101 minutes compared to the case control cohort of 138 minutes ($p < 0.001$). Patients seen in chairs with complaints of extremity injury, cough, dental pain, otalgia, ocular complaints, and genitourinary complaints had an improvement in LOS compared to their cohorts ($p < 0.05$). Also, during the study period 2,369 patients were seen in the fast track area with an average LOS of 172 minutes. This compares favorably with the year prior which saw 2,022 patients with an average LOS of 178 minutes. Average fast track LOS was decreased despite a 17% increase in total number of patients seen.

Conclusion: Treating certain low acuity patients in chairs can decrease patients' LOS and potentially improve throughput of all patients in the urgent care area.

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Stakeholder Views on Emergency Department Operational Challenges: Causes and Potential Remedies

Dagan Schwartz

Emergency Medicine, Ben-gurion University, kiryat-Ono/Israel

Study/Objective: To assess Emergency Department (ED) and hospital management views regarding major ED operational challenges, factors causing them and ways of overcoming them.

Background: The ED is the main hospital gateway and the initial site for diagnosis and emergency medical care. In recent years, ED overcrowding has worsened in Israel and worldwide. Overcrowding has been shown to adversely affect patient service and care, fostering patient and caregiver dissatisfaction as well as lowering quality of care metrics, such as: time to pain control and time to antibiotic care and even increasing mortality.

Methods: Stakeholder views on ED operational challenges can provide insights to the major challenges, their causes and ways of overcoming those challenges. Additionally, differences in perceptions between the stakeholders may themselves present a challenge. Face to face semi-structured interviews were conducted with 51 ED head nurses, ED directors and hospital directors of the 17 busiest EDs in Israel.

Results: "Overcrowding" was assessed by interviewees to be the most prevalent and acute operational problem, followed by prolonged waits and lengths of stay. Interviewees considered overcrowding a symptom of other operational difficulties, but also a cause of additional operational and clinical difficulties. While few interviewees attributed operational difficulties to suboptimal process management and decision making, many suggested improving operations management, within the ED and in its hospital interactions as promising interventions. Despite agreement on most topics, a major view difference between ED and hospital managers concerned the importance of interventions to minimize ED boarding.

Conclusion: All three interviewee groups mostly agreed with each other and with the recent literature regarding operational challenges and their causes. Disagreement was noted regarding minimizing ED boarding. Most interviewees suggested improving operations management within the ED and in its interfaces with the hospital.

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The Affordable Care Act and Changes in Emergency Department Usage between Two Michigan Hospitals

Howard A. Klausner¹, Randy Bitrus², Amanda Robicaud², Alex Poznanski²

1. Emergency Medicine, Henry Ford Hospital, Detroit/MI/United States of America
2. Oakland University, Rochester/MI/United States of America

Study/Objective: This study's objective is to evaluate how the Affordable Care Act (ACA) has affected Emergency Department (ED) admissions, rates, and total annual visits.

Background: The ACA has provided individuals the ability to obtain health insurance. If the ACA has an impact on ED utilization is unknown.

Methods: This retrospective observational study occurred at two hospitals in Michigan. One hospital is urban-based in Detroit, Michigan with an ED annual census of 95,000. The other is a suburban hospital in Grosse Pointe, Michigan with an

ED annual census of 10,000. These EDs were evaluated to compare the effects of health care reform on different populations. Admissions data were collected from both hospitals during the period of March 2009 and September 2013. In order to assess influence of the ACA on admission rates, a multi-variable binary logistic regression model was computed.

Results:

Time Period	Response	Suburban Hospital	Urban Hospital
Pre-ACA	Admit	17 (0.16%)	21,067 (23.61%)
	Non-Admit	10,321 (99.84%)	68,145 (76.39%)
Post-ACA	Admit	39 (0.12%)	68,654 (22.41%)
	Non-Admit	32,536 (99.88%)	237,736 (77.59%)

Table 1. Summary of admission rates by hospital and period. For patients visiting the suburban hospital, those who visited after the ACA came into effect had a (nonsignificant) 27% (OR: 0.73; 95% CI, 0.42-1.32; P value = .275) reduced likelihood of being admitted as compared to before the ACA came into effect. Finally, there was a (non-significant) 28.4% (OR: 1.28; 95% CI, 0.71-2.23; P value = .391) increase in the odds ratio of admitting post-ACA for the urban hospital as compared to post-ACA for the suburban hospital.

Conclusion: There was not a significant change in admissions rates post-ACA implementation for either hospital. Total annual census at both sites decreased the year post-ACA. While there has been a change in ED utilization in the short-term, it may be too early to see the long-term impact of the ACA.

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Hemin Microglia NLRP3 Protein N-methyl-D-aspartic Acid Receptor 1 Inflammasome

Lei Li

Research Institute Of Surgery, Third Military Medical University, Chongqing/China

Study/Objective: In this study, we aim to test the hypothesis that NLRP3 signaling pathway takes a vital position in ICH-induced secondary inflammatory damage, and detect the role of N-methyl-D-aspartic acid receptor 1 (NMDAR1) in this progress.

Background: Inflammation plays a critical role in secondary brain damage after intracerebral hemorrhage (ICH). However, the mechanisms of inflammatory injury following ICH are still unclear, particularly the involvement of NLRP3 inflammasome, which are crucial to sterile inflammatory responses.

Methods: ICH was induced in mice by microinjection of hemin into the striatum. The protein levels of NMDAR1, NMDAR1 phosphorylation, NLRP3 and IL-1b were measured by Western blot. The binding of NMDAR1 to NLRP3 was detected by immunoprecipitation.

Results: The expression of NMDAR1, NMDAR1 phosphorylation, NLRP3 and IL-1b were rapidly increased after ICH. Hemin treatment enhanced NMDAR1 expression and NMDAR1 phosphorylation, as well in cultured microglial cells treated by hemin. Hemin up-regulated NLRP3 and IL-1b level, which was reversed by MK801 (NMDAR antagonist) in vitro. Hemin also promoted the binding of NMDAR1 to NLRP3.

Conclusion: Our findings suggest that NMDAR1 plays a pivotal role in hemin-induced NLRP3-mediated inflammatory damage through synergistic activation.

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Improving Efficiencies with Real Time Locating Systems in Emergency Departments

Gary M. Mann

Emergency Medicine Program, Rouge Valley Health System-Ajax and Pickering Health Centre, Thornhill/ON/Canada

Study/Objective: To demonstrate improved efficiencies in Emergency Department patient flow and performance metrics using Real-Time Locating Systems.

Background: Efficiency is key in managing ED overcrowding. Utilizing a Real-Time Locating System (RTLS), our ED effectively manages ever-increasing volumes and acuity of emergency patients, including Mass-Casualty Event (MCE) victims.

Methods: RTLS systems are fully automated; they continually monitor locations of patients, staff, and assets, giving instantaneous visual status, measuring key metrics, and reporting key performance indicators. In addition to displaying patients' locations, RTLS measures and displays milestones based on time, location, acuity, and interaction; these are automated via customizable, intuitive software and low maintenance hardware. RTLS allows to identify treatment, space status, and availability, management of waiting room times, wait time to the physician's initial assessment (PIA), and overall length of stay (OLOS). Key assets are easily located when needed. Enhanced RTLS safety features include ability to track staff contacts with Infectious patients, as well as button-press alerts when staff need help urgently. The system displays data in different formats, including overhead floor-plan views displaying treatment space status, patient name, staff locations, and patient assignments. List views give information concerning complaint, acuity, disposition, location, and length of stay. Color flags provide visual warnings when approaching mandated targets for PIA and OLOS. This system is particularly useful in MCE's, where victims can rapidly be tagged and assigned triage levels.

Results: Despite the annual volume of ED patient growth of 35% since introduction of RTLS (in addition to other efficiencies), PIA time dropped by 85%. Patient and staff satisfaction improved dramatically. RTLS has been shown to be a useful modality in mass-casualty events.

Conclusion: RTLS is a low-cost, highly effective solution to help manage ED overcrowding by increasing efficiency, safety, and satisfaction among ED patients and staff by continuous