**National Quality Forum—Evidence (subcriterion 1a)**

**Measure Number** (*if previously endorsed*)**:** 0496

**Measure Title**: Median Time from ED Arrival to ED Departure for Discharged ED Patients

**IF the measure is a component in a composite performance measure, provide the title of the Composite Measure here:** Click here to enter composite measure #/ title

**Date of Submission**: 4/16/2018

**Please note**: 2014 submission text in black | 2018 submission text in red

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| **Instructions**  *Complete 1a.1 and 1a.2 for all measures. If instrument-based measure, complete 1a.3.*  *Complete* ***EITHER 1a.2, 1a.3 or 1a.4*** *as applicable for the type of measure and evidence.*  *For composite performance measures:*  *A separate evidence form is required for each component measure unless several components were studied together.*  *If a component measure is submitted as an individual performance measure, attach the evidence form to the individual measure submission.*   * All information needed to demonstrate meeting the evidence subcriterion (1a) must be in this form. An appendix of *supplemental* materials may be submitted, but there is no guarantee it will be reviewed. * If you are unable to check a box, please highlight or shade the box for your response. * Contact NQF staff regarding questions. Check for resources at [Submitting Standards webpage](http://www.qualityforum.org/Measuring_Performance/Submitting_Standards.aspx). |

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| **Note: The information provided in this form is intended to aid the Standing Committee and other stakeholders in understanding to what degree the evidence for this measure meets NQF’s evaluation criteria.**   1a. Evidence to Support the Measure Focus The measure focus is evidence-based, demonstrated as follows:   * Outcome: [**3**](#Note3) Empirical data demonstrate a relationship between the outcome and at least one healthcare structure, process, intervention, or service. If not available, wide variation in performance can be used as evidence, assuming the data are from a robust number of providers and results are not subject to systematic bias. * Intermediate clinical outcome: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#Note4)that the measured intermediate clinical outcome leads to a desired health outcome. * Process: [**5**](#Note5) a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#Note4) that the measured process leads to a desired health outcome. * Structure: a systematic assessment and grading of the quantity, quality, and consistency of the body of evidence [**4**](#Note4) that the measured structure leads to a desired health outcome. * Efficiency: [**6**](#Note6) evidence not required for the resource use component. * For measures derived from patient reports, evidence should demonstrate that the target population values the measured outcome, process, or structure and finds it meaningful. * Process measures incorporating Appropriate Use Criteria: See NQF’s guidance for evidence for measures, in general; guidance for measures specifically based on clinical practice guidelines apply as well.   **Notes**  **3.** Generally, rare event outcomes do not provide adequate information for improvement or discrimination; however, serious reportable events that are compared to zero are appropriate outcomes for public reporting and quality improvement.  **4.** The preferred systems for grading the evidence are the Grading of Recommendations, Assessment, Development and Evaluation [(GRADE) guidelines](http://www.gradeworkinggroup.org) and/or modified GRADE.  **5.** Clinical care processes typically include multiple steps: assess → identify problem/potential problem → choose/plan intervention (with patient input) → provide intervention → evaluate impact on health status. If the measure focus is one step in such a multistep process, the step with the strongest evidence for the link to the desired outcome should be selected as the focus of measurement. Note: A measure focused only on collecting PROM data is not a PRO-PM.  **6.** Measures of efficiency combine the concepts of resource use and quality (see NQF’s [Measurement Framework: Evaluating Efficiency Across Episodes of Care](http://www.qualityforum.org/Publications/2010/01/Measurement_Framework__Evaluating_Efficiency_Across_Patient-Focused_Episodes_of_Care.aspx); [AQA Principles of Efficiency Measures](http://www.aqaalliance.org/files/PrinciplesofEfficiencyMeasurementApril2006.doc)). |

**1a.1.This is a measure of**: (*should be consistent with type of measure entered in De.1*)

Outcome

Outcome: Click here to name the health outcome

Patient-reported outcome (PRO): Click here to name the PRO

*PROs include HRQoL/functional status, symptom/symptom burden, experience with care, health-related behaviors.* (*A PRO-based performance measure is not a survey instrument. Data may be collected using a survey instrument to construct a PRO measure.)*

Intermediate clinical outcome (*e.g., lab value*): Click here to name the intermediate outcome

Process: This measure calculates the median time from emergency department (ED) arrival to time of departure from the emergency room for patients discharged from the emergency department.

Appropriate use measure: Click here to name what is being measured

Structure: Click here to name the structure

Composite: Click here to name what is being measured

**1a.2** **LOGIC MODEL** Diagram or briefly describe the steps between the healthcare structures and processes (e.g., interventions, or services) and the patient’s health outcome(s). The relationships in the diagram should be easily understood by general, non-technical audiences. Indicate the structure, process or outcome being measured.

**2014 Submission**: Not Applicable

**2018 Submission**: NQF #0496 measures the median time from ED arrival to ED departure, which documents a patient’s length of stay in the emergency department. Facilities that report a high median time from arrival to departure may experience significant ED crowding, which is associated with unfavorable health outcomes, including longer hospital stays, increased costs, and higher mortality rates (Sun et al., 2013). By improving ED throughput times, facilities can increase ED patient volume, decrease the number of patients who leave without being seen, reduce costs, and increase patient satisfaction (Bucci et al., 2016; Chang et al., 2017; Zocchi et al., 2015).

REFERENCES:

1. Bucci, S., A. G. de Belvis, S. Marventano, A. C. De Leva, M. Tanzariello, M. L. Specchia, W. Ricciardi and F. Franceschi. Emergency department crowding and hospital bed shortage: Is Lean a smart answer? A systematic review. Eur Rev Med Pharmacol Sci, 2016, 20(20), 4209-4219.
2. Chang, A. M., A. Lin, R. Fu, K. J. McConnell and B. Sun. (2017). Associations of Emergency Department Length of Stay With Publicly Reported Quality-of-care Measures. Acad Emerg Med, 24(2), 246-250.
3. Zocchi, M. S., M. S. McClelland, and J. M. Pines. Increasing Throughput: Results From A 42-Hospital Collaborative To Improve Emergency Department Flow. The Joint Commission Journal on Quality and Patient Safety, 2015, 41(12):532–542.
4. Sun, B.C., Hsia, RY, Weis, RE, Zingmond, D, Liang, L.J., Han, W., McCreath, H., Asch, S.M. Effect of emergency department crowing on outcomes of admitted patients. Annals of Emergency Medicine, 2013 Jun, 61(6):605-611.

**1a.3** **Value and Meaningfulness:**  **IF** this measure is derived from patient report, provide evidence that the target population values the measured ***outcome, process, or structure*** and finds it meaningful. (Describe how and from whom their input was obtained.)

**2014 Submission**: *Blank – new question*

**2018 Submission**: Not applicable

**\*\*RESPOND TO ONLY ONE SECTION BELOW -EITHER 1a.2, 1a.3 or 1a.4) \*\***

**1a.2** **FOR OUTCOME MEASURES including PATIENT REPORTED OUTCOMES - Provide empirical data demonstrating the relationship between the outcome (or PRO) to at least one healthcare structure, process, intervention, or service.**

**1a.3.****SYSTEMATIC REVIEW(SR) OF THE EVIDENCE (for intermediate outcome, PROCESS, or STRUCTURE PERFORMANCE measures, including those that are instrument-based) If the evidence is not based on a systematic review go to section 1a.4) If you wish to include more than one systematic review, add additional tables.**

**What is the source of the systematic review of the body of evidence that supports the performance measure? A systematic review is a scientific investigation that focuses on a specific question and uses explicit, prespecified scientific methods to identify, select, assess, and summarize the findings of similar but separate studies. It may include a quantitative synthesis (meta-analysis), depending on the available data. (IOM)**

☐ Clinical Practice Guideline recommendation (with evidence review)

☐ US Preventive Services Task Force Recommendation

☐ Other systematic review and grading of the body of evidence (*e.g., Cochrane Collaboration, AHRQ Evidence Practice Center*)

☐ Other

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| **Source of Systematic Review:**   * **Title** * **Author** * **Date** * **Citation, including page number** * **URL** |  |
| Quote the guideline or recommendation verbatim about the process, structure or intermediate outcome being measured. If not a guideline, summarize the conclusions from the SR. |  |
| Grade assigned to the **evidence** associated with the recommendation with the definition of the grade |  |
| Provide all other grades and definitions from the evidence grading system |  |
| Grade assigned to the **recommendation** with definition of the grade |  |
| Provide all other grades and definitions from the recommendation grading system |  |
| Body of evidence:   * Quantity – how many studies? * Quality – what type of studies? |  |
| Estimates of benefit and consistency across studies |  |
| What harms were identified? |  |
| Identify any new studies conducted since the SR. Do the new studies change the conclusions from the SR? |  |

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**1a.4 OTHER SOURCE OF EVIDENCE**

*If source of evidence is NOT from a clinical practice guideline, USPSTF, or systematic review, please describe the evidence on which you are basing the performance measure.*

**1a.4.1** **Briefly SYNTHESIZE the evidence that supports the measure.** A list of references without a summary is not acceptable.

**2014 Submission**: Not Applicable

**2018 Submission**: The measure developer conducts an annual review of clinical practice guidelines and the peer-reviewed literature to identify evidence and/or new studies that relate to the measure or its clinical intent. Citations and summaries for seven reports included in this review can be found in **Section 1a.4.3.**

The evidence base for NQF #0496 shows that ED throughput is a meaningful indicator of hospital quality of care, and validates that shorter ED lengths of stay lead to improved clinical outcomes (Gardner et al. 2018). Mullins et al. studied data from *Hospital Compare*, which use the *Reporting Rate* strata for NQF #0496; the research team concluded that there is widespread variation in performance across the United States and that ED crowding is linked to inpatient quality outcomes (2014). An analysis of data from 2,619 hospitals showed that reducing ED length of stay is associated with increased patient satisfaction and decreased likelihood that a patient will leave before a medical professional sees him or her (Chang et al. 2017). Authors of multiple studies describe quality improvement and Lean-based interventions, which aim to improve ED throughput time and show that ED crowding and timely throughput remain high-priority issues for hospitals (Melton et al. 2016; Allaudeen et al. 2017; Bucci et al. 2016). A 2017 guideline prepared by the American College of Emergency Physicians (ACEP) justifies the separate measurement of patients for mental health and psychiatric services (captured in the *Psychiatric/Mental Health Rate* strata), based on evidence that the clinical needs for these patients substantively differ from those patients seeking non-psychiatric treatment (Nazarian et al. 2017).

Collectively, the findings from these studies and guideline suggest that there is room for improvement in the time from a patient’s arrival to the time of his or her departure, and that important differences in both the ED throughput time and overall treatment approach exist for those seeking mental health or psychiatric treatment, when compared to the overall population. This evidence base supports the continued utility of NQF #0496.

**1a.4.2 What process was used to identify the evidence?**

**2014 Submission:** Environmental scan

**2018 Submission**: The measure developer conducted a review of clinical practice guidelines, peer-reviewed literature, and related policy during the NQF #0496’s annual literature review to identify additional evidence and/or new studies that support the measure’s intent. The measure developer identified relevant peer-reviewed publications by searching the PubMed MEDLINE database for evidence made available from January 1, 2013 to September 30, 2017, limiting included results to those published in the English language and that had abstracts available in PubMed. The search initially identified 127 articles; a further review by the developer’s team refined this evidence base, resulting in the inclusion of seven articles in the body of evidence below. Citations and abstracts from this effort can be found in **Section 1a.4.3**.

**1a.4.3.** **Provide the citation(s) for the evidence.**

**2014 Submission**:

* Pines JM, Hollander JE, Localio AR, Metlay JP. The association between emergency department crowding and hospital performance on antibiotic timing for pneumonia and percutaneous intervention for myocardial infarction. Acad Emerg Med. 2006 Aug;13(8):873-8.
* Fee C, Weber EJ, Maak CA, Bacchetti P. Effect of emergency department crowding on time to antibiotics in patients admitted with community-acquired pneumonia. Ann Emerg Med. 2007 Nov; 50(5):501-9, 509.e1.
* Diercks DB, Roe MT, Chen AY, Peacock WF, Kirk JD, Pollack CV Jr, Gibler WB, Smith SC Jr, Ohman M, Peterson ED. Prolonged emergency department stays of non-ST-segment-elevation myocardial infarction patients are associated with worse adherence to the American College of Cardiology/American Heart Association guidelines for management and increased adverse events. Ann Emerg Med. 2007 Nov;50(5):489-96.
* Chaflin DB, Trzeciak S, Likourezos A, et al. Impact of delayed transfer of critically ill patients from the emergency department to the intensive care unit. Crit Care Med. 2007;35:1477-1483.
* Richardson DB. Increase in patient mortality at 10 days associated with emergency department overcrowding. Med J Aust. 2006;184:213-216.
* Sprivulis PC, DaSilva JA, Jacobs IG, et al. The association between hospital overcrowding and mortality among patients admitted via Western Australian emergency departments. Med J Aust. 2006;184:208-212.
* Carr BG, Kaye AJ, Wiebe DJ, et al. Emergency department length of stay: a major risk factor for pneumonia in intubated blunt trauma patients. J Trauma. 2007;63:9-12.
* Pines JM, Localio AR, Hollander JE. The impact of emergency department crowding measures on time to antibiotics for patients with community-acquired pneumonia. Ann Emerg Med. 2007;50: 510-516.
* Derlet RW, Richards JR. Emergency department overcrowding in Florida, New York, and Texas. South Med J. 2002;95:846-9.
* Derlet RW, Richards JR. Overcrowding in the nation's emergency departments: complex causes and disturbing effects. Ann Emerg Med. 2000;35:63-8.
* Fatovich DM, Hirsch RL. Entry overload, emergency department overcrowding, and ambulance bypass. Emerg Med J. 2003;20:406-9.
* Hwang U, Richardson LD, Sonuyi TO, Morrison RS. The effect of emergency department crowding on the management of pain in older adults with hip fracture. J Am Geriatr Soc. 2006;54:270-5.
* Krochmal P, Riley TA. Increased health care costs associated with ED overcrowding. Am J Emerg Med. 1994;12:265-6.
* Kyriacou DN, Ricketts V, Dyne PL, McCollough MD, Talan DA. A 5-year time study analysis of emergency department patient care efficiency. Ann Emerg Med. 1999;34:326-35.
* Nawar ED, Niska RW, Xu J. National Hospital Ambulatory Medical Care Survey: 2005 emergency department summary. Adv Data. 2007; (386):1-32.
* Richardson DB. Increase in patient mortality at 10 days associated with emergency department overcrowding. Med J Aust. 2006;184:213-6.
* Sprivulis PC, et al. The association between hospital overcrowding and mortality among patients admitted via Western Australian emergency departments. Med J Aust. 2006;184:208-12.
* Trzeciak S, Rivers EP. Emergency department overcrowding in the United States: an emerging threat to patient safety and public health. Emerg Med J. 2003;20:402-5.
* Wilper AP, Woolhandler S, Lasser KE, McCormick D, Cutrona SL, Bor DH, Himmelstein DU. Waits to see an emergency department physician: U.S. trends and predictors, 1997-2004. Health Aff (Millwood). 2008;27:w84-95.

**2018 Submission:**

Bucci, S., A. G. de Belvis, S. Marventano, A. C. De Leva, M. Tanzariello, M. L. Specchia, W. Ricciardi and F. Franceschi. Emergency department crowding and hospital bed shortage: Is Lean a smart answer? A systematic review. Eur Rev Med Pharmacol Sci, 2016, 20(20), 4209-4219.

OBJECTIVE: Emergency Departments (EDs) worldwide face the challenges of crowding, waiting times, and cost containment. This review aims to provide a synthesis of the current literature focused on how Lean Thinking Principles and tools can be applied in an ED to address overcrowding and hospital admissions. MATERIALS AND METHODS: Primary studies showing Lean interventions and implementation in ED visits, not requiring additional resources measuring specific outcomes (i.e. length of stay, patient volume, patient satisfaction, waiting times for the first visit, waiting times for diagnostic results, left without being seen) were selected. PubMed, Scopus, CINAHL, EconLit, NHS Economic Evaluation Database, Business Sources Complete, and Health Technology Assessment were used to conduct searches. Full-text articles of all potentially relevant publications were reviewed for eligibility. Discrepancies were resolved through discussion by all reviewers. Quality assessment and critical appraisal of selected studies were also evaluated by applying the Quality Improvement Minimum Quality Criteria Set. RESULTS: Nine before-and-after studies met these eligibility criteria. Management of patient flow was the main intervention. Almost all studies showed EDs performance improvement: increased patient volume, decreased length of stay and number of patients left without being seen, reduced costs, and increased patient satisfaction. Only one case reported worse results after Lean intervention implementation. CONCLUSIONS: Though Lean Principals have been used in healthcare for many years conclusion of their effects could still not be drawn. Surely, human-centered approach, top management support, work standardization, resources allocation and adaptation to the local context seem to be crucial for success. Furthermore, higher quality studies are needed: specific research design, appropriate statistical tests and outcome measures are needed. Before large-scale implementation, further studies are needed to evaluate the true ability of Lean interventions to improve healthcare delivery.

Chang, A. M., A. Lin, R. Fu, K. J. McConnell and B. Sun. Associations of Emergency Department Length of Stay With Publicly Reported Quality-of-care Measures. Acad Emerg Med, 2017, 24(2), 246-250.

Chang et al. studied assessed the association between changes in publicly reported ED length of stay (LOS) and changes in quality-of-care measures in a national cohort of hospitals. The cohort consisted of 2,619 hospitals. Each additional hour of ED LOS was associated with a 0.7% decrease in proportion of patients giving a top satisfaction rating, a 0.7% decrease in proportion of patients who would “definitely recommend” the hospital, and a 6-minute increase in time to pain management for long bone fracture (p < 0.01 for all). A 1-hour increase in ED LOS is associated with a 44% increase in the odds of having an increase in left without being seen (95% confidence interval = 25% to 68%). ED LOS was not associated with hospital readmissions (p = 0.14) or time to percutaneous coronary intervention (p = 0.14). In this longitudinal study of hospitals across the United States, improvements in ED timeliness measures are associated with improvements in the patient experience.

Gardner, R. M., N. A. Friedman, M. Carlson, T. S. Bradham and T. W. Barrett. (2017). Impact of revised triage to improve throughput in an ED with limited traditional fast track population. Am J Emerg Med., 36(1), 124-127.

BACKGROUND: Emergency department (ED) crowding is associated with patient safety concerns, increased patients left without being seen (LWBS), low patient satisfaction, and lost ED revenue. The objective was to measure the impact of a revised triage process on ED throughput. METHODS: This study took place at an urban, university-affiliated, adult ED with an annual census of 70,000 and admission rate of 34%. The revised triage approach included: identifying eligible patients at triage based on complaint, comorbidities, and illness acuity; and reallocating a nurse practitioner (NP) into our triage area. We trialed the intervention from 1100-2300 on weekdays from January 13-26, 2016. Adult patients who were not likely to require intensive evaluations were eligible. Primary outcomes were throughput measures including: time to provider, ED length of stay (LOS), and LWBS. Pre- and post-intervention metrics were compared using the Mann-Whitney U test, given the non-normal distribution of the metrics. RESULTS: The NP evaluated 120 patients of which 101 (84%) were discharged, 3 (2.5%) admitted, and 16 (13%) required more intense evaluation. Time to provider decreased from a median (IQR) of 42 (16, 114) to 27 (12.4, 81.5) minutes (p<0.01) and ED LOS from 290 (194.8, 405.6) to 257 (171.2, 363.4) minutes (p<0.01) for all patients not admitted and not requiring a consult. LWBS decreased from a pre-trial 4.6% to 2.2% (p<0.01). CONCLUSION: The revised triage intervention was associated with improvements in several ED throughput metrics and a reduction in LWBS.

Mullins PM, Pines JM. National ED crowding and hospital quality: Results from the 2013 Hospital Compare data. Am J Emerg Med 2014; 32(6): 634-639.

We explored Hospital Compare data on emergency department (ED) crowding metrics to assess characteristics of reporting vs non-reporting hospitals, whether hospitals ranked as the US News Best Hospitals (2012-2013) vs unranked hospitals differed in ED performance and relationships between ED crowding and other reported hospital quality measures. An ecological study was conducted using data from Hospital Compare data sets released March 2013 and from a popular press publication, US News Best Hospitals 2012 to 2013. We compared hospitals on 5 ED crowding measures: left-without-being-seen rates, waiting times, boarding times, and length of stay for admitted and discharged patients. Of 4810 hospitals included in the Hospital Compare sample, 2990 (62.2%) reported all ED 5 crowding measures. Median ED length of stay for admitted patients was 262 minutes (interquartile range [IQR], 215-326), median boarding was 88 minutes (IQR, 60-128), median ED length of stay for discharged patients was 139 minutes (IQR, 114-168), and median waiting time was 30 minutes (IQR, 20-44). Hospitals ranked as US News Best Hospitals 2012 to 2013 (n=650) reported poorer performance on ED crowding measures than unranked hospitals (n=4160) across all measures. Emergency department boarding times were associated with readmission rates for acute myocardial infarction (r=0.14, P<.001) and pneumonia (r=0.17, P<.001) as well as central line-associated bloodstream infections (r=0.37, P<.001). There is great variation in measures of ED crowding across the United States. Emergency department crowding was related to several measures of in-patient quality, which suggests that ED crowding should be a hospital-wide priority for quality improvement efforts.

Nazarian DJ, Broder JS, Thiessen ME, Wilson MP, Zun LS, Brown MD, American College of Emergency Physicians. Clinical policy: critical issues in the diagnosis and management of the adult psychiatric patients in the emergency department. Ann Emerg Med. 2017 Apr; 69(4):480-98.

This clinical policy from the American College of Emergency Physicians addresses key issues for the diagnosis and management of adult psychiatric patients in the emergency department. A writing subcommittee conducted a systematic review of the literature to derive evidence-based recommendations to answer the following clinical questions: (1) In the alert adult patient presenting to the emergency department with acute psychiatric symptoms, should routine laboratory tests be used to identify contributory medical conditions (non-psychiatric disorders)? (2) In the adult patient with new-onset psychosis without focal neurologic deficit, should brain imaging be obtained acutely? (3) In the adult patient presenting to the emergency department with suicidal ideation, can risk-assessment tools in the emergency department identify those who are safe for discharge? (4) In the adult patient presenting to the emergency department with acute agitation, can ketamine be used safely and effectively? Evidence was graded and recommendations were made based on the strength of the available data.

Sun, B. C., A. Laurie, L. Prewitt, R. Fu, A. M. Chang, J. Augustine, C. t. Reese and K. J. McConnell. “Risk-Adjusted Variation of Publicly Reported Emergency Department Timeliness Measures.” Annals of Emergency Medicine, 2016,67(4):509-516 e7.

The Centers for Medicare & Medicaid Services (CMS) recently published emergency department (ED) timeliness measures. These data show substantial variation in hospital performance and suggest the need for process improvement initiatives. However, the CMS measures are not risk adjusted and may provide misleading information about hospital performance and variation. We hypothesize that substantial hospital-level variation will persist after risk adjustment. This cross-sectional study included hospitals that participated in the Emergency Department Benchmarking Alliance and CMS ED measure reporting in 2012. Outcomes included the CMS measures corresponding to median annual boarding time, length of stay of admitted patients, length of stay of discharged patients, and waiting time of discharged patients. Covariates included hospital structural characteristics and case-mix information from the American Hospital Association Survey, CMS cost reports, and the Emergency Department Benchmarking Alliance. We used a γ regression with a log link to model the skewed outcomes. We used indirect standardization to create risk-adjusted measures. We defined "substantial" variation as coefficient of variation greater than 0.15. The study cohort included 723 hospitals. Risk-adjusted performance on the CMS measures varied substantially across hospitals, with coefficient of variation greater than 0.15 for all measures. Ratios between the 10th and 90th percentiles of performance ranged from 1.5-fold for length of stay of discharged patients to 3-fold for waiting time of discharged patients. Policy-relevant variations in publicly reported CMS ED timeliness measures persist after risk adjustment for nonmodifiable hospital and case-mix characteristics. Future "positive deviance" studies should identify modifiable process measures associated with high performance.

Zocchi, M. S., M. S. McClelland, and J. M. Pines. Increasing Throughput: Results From A 42-Hospital Collaborative To Improve Emergency Department Flow. The Joint Commission Journal on Quality and Patient Safety, 2015, 41(12):532–542.

#### BACKGROUND: An 18-month collaborative in 42 hospitals across 16 communities in the United States to improve emergency department (ED) flow was conducted from October 2010 through March 2012. METHODS: Hospitals were invited to participate through the Aligning Forces for Quality (AF4Q) program. Each participating hospital identified one or more interventions to improve ED flow and submitted data on four measures of ED flow: discharged length of stay (LOS), admitted LOS, boarding time, and left without being seen (LWBS) rates. Participating hospitals also provided quarterly progress reports on challenges encountered and lessons learned. Univariate linear regression was used to assess the effectiveness of interventions at the hospital level, where an improvement was defined as a negative slope in one or more of the throughput indicators. Challenges and lessons learned were tabulated and described. RESULTS: A total of 172 interventions were implemented across the 42 hospitals. Two thirds (n = 28) demonstrated improvement on at least one measure of ED flow. Among hospitals demonstrating improvement, the average reduction in discharged LOS was 26 minutes (95% confidence interval [CI] 11 to 41); admitted LOS, 36.5 minutes (95% CI 20 to 53), boarding time, 20.9 minutes (95% CI 12 to 30), and LWBS seen rates decreased by 1.4 absolute percentage points (95% CI 0.2 to 2.7). Teams were frequently challenged by issues related to leadership, staff buy-in, and resource constraints. CONCLUSION: The majority of hospitals in this collaborative improved on one or more ED flow measures. Many challenges were shared across hospitals, demonstrating that successful approaches to ED flow improvement require certain fundamental elements, including engaged leadership and staff, and sufficient resources.