City of New York

OFFICE OF THE COMPTROLLER

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COMPTROLLER

MANAGEMENT AUDIT

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Deputy Comptroller for Audit

Audit Report on the Evaluation of the Efforts to Manage Emergency Department Wait Times by Kings County, Lincoln, and Elmhurst Hospitals

MD13-112A
September 18, 2014
http://comptroller.nyc.gov

THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
1 CENTRE STREET
NEW YORK, NY 10007

SCOTT M. STRINGER
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September 18, 2014

Dear Residents of the City of New York:

My office has audited the New York City Health and Hospitals Corporation (HHC) to determine whether it had controls in place to evaluate the efforts made in reducing Emergency Department (ED) wait times. We perform audits such as this as a means of increasing accountability and ensuring that City agencies are operating in the best interest of the public.

This audit determined that Kings County, Lincoln, and Elmhurst hospitals failed to provide sufficient evidence to support their claims of reductions in ED wait times. The limited documentation these facilities provided generally did not reflect changes before and after the initiatives to reduce ED wait times were implemented. As a result, the audit was unable to determine the extent to which these hospitals formally evaluated and measured their wait time reduction efforts.

To address this issue, the audit recommended that HHC should assess the effect of initiatives undertaken to reduce ED wait times by collecting adequate supporting documentation and engaging in a thorough and comprehensive evaluation to determine whether goals are being met and resources are being efficiently allocated.

The results of the audit have been discussed with HHC officials, and their comments have been considered in preparing this report. Their complete written response is attached to this report.

If you have any questions concerning this report, please e-mail my audit bureau at audit@comptroller.nyc.gov.

Sincerely,

Scott M. Stringer

TABLE OF CONTENTS

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AUDIT REPORT IN BRIEF

This audit determined whether the New York City Health and Hospitals Corporation (HHC) had controls in place to evaluate the efforts made in reducing Emergency Department (ED) wait times.

According to the Center for Disease Control (CDC), ED visits nationwide increased 32 percent between 1999 and 2009, resulting in ED overcrowding and increased wait times in some hospitals. New York State has the fourth-longest average ED wait time in the nation (6.1 hours). ED crowding in the United States has been called a "national epidemic" by the Institute of Medicine.[1]

HHC's 11 acute care hospitals reported 1,190,413 ED visits in 2012. Since 2007, HHC hospitals have been using an approach called Breakthrough, based on an efficiency process developed by Toyota, to address ED wait time delays as well as to identify inefficient processes, improve patient care, and generate savings and new revenue.

Audit Findings and Conclusion

Kings County, Lincoln, and Elmhurst hospitals failed to provide sufficient evidence to support their claims of reductions in ED wait times. The limited documentation provided by these facilities generally did not reflect changes before and after the initiatives to reduce ED wait times were implemented. As a result, we were unable to determine the extent to which these hospitals formally evaluated and measured their wait time reduction efforts. Thus, while Kings County and Lincoln Hospitals publicly reported reductions in wait times in HHC newsletters, we were unable to confirm the claimed reductions as a result of HHC's failure to provide evidence to substantiate these claims.

[1] The Institute of Medicine is an independent, nonprofit organization that works outside of government to provide authoritative advice to decision makers and the public.

Audit Recommendation

Based on our findings, we recommend that HHC should:

- Assess the effect of initiatives undertaken to reduce ED wait times by collecting adequate supporting documentation and engaging in a thorough and comprehensive evaluation to determine whether goals are being met and resources are being efficiently allocated.

Agency Response

In their response, HHC officials agreed with the audit's recommendation.

INTRODUCTION

Background

New York State has the fourth-longest average ED wait time (6.1 hours) in the nation, according to a study published by the American College of Emergency Physicians in 2014. From 1999 to 2009, the number of visits to EDs increased 32 percent nationwide according to the CDC. Increased ED volume has resulted in ED overcrowding and increased wait times in some hospitals. ED crowding in the United States has become so severe that the Institute of Medicine calls it a "national epidemic." New York City hospitals that are members of the HHC system are not immune to problems with wait times in EDs. In 2012, HHC reported that 1,190,413 ED visits were made to its 11 acute care hospitals.

Since 2007, in an effort to address delays in ED wait times as well as other issues with hospital operations, HHC member hospitals have been using an approach called Breakthrough, based on an efficiency process developed by Toyota.[2] Breakthrough is designed to identify inefficient processes, improve patient care and patient and staff experience, and generate savings and new revenue.

One of the tools Breakthrough uses to reduce ED wait times are Rapid Improvement Events (RIEs), intense workshops designed to address operational weaknesses. Through the RIEs, operational improvements are designed and tested, with the goal of eliminating process steps that have little value. According to HHC officials, the factors that contribute to long wait times can vary significantly from hospital to hospital. Consequently, HHC has determined that each of its member hospitals should be primarily responsible for the identification, implementation, monitoring, and evaluation of initiatives focused on reducing wait times. This audit focused on the ED initiatives taken to reduce wait times at three HHC member hospitals: Kings County (Brooklyn), Lincoln (Bronx), and Elmhurst (Queens).

All HHC hospitals but Elmhurst use the Quadramed Computerized Patient Record System (Quadramed) to assist management in their daily activities; Elmhurst uses a similar computer patient record system called Allscript. Both Quadramed and Allscript display a whiteboard to monitor daily bed availability, equipment, and staffing assignments which are updated in real-time. The systems also display a dashboard which reports overall status of the ED in near real time. The information displayed on the dashboard includes:

1. The number of patients in the ED;
2. The number of patients checked in and waiting to be triaged;[3]
3. The number of patients who have been triaged and are waiting to be seen by a physician; and
4. The number of patients who have been seen by a physician and are waiting for a bed to become available.

Dashboard reports also show historical trending on ED volume and throughput (i.e., processing time) metrics, including the aggregate times from the patients' (1) arrival in the ED to triage, (2) arrival to first provider (nurse practitioner, physician assistant, resident, or attending physician),

[2] The Toyota Production System ("lean methodology") is used by numerous companies across various industries to reduce inefficiencies and improve the overall value of their end product to customers.
[3] "Triage" refers to the process of determining the priority of patients' treatments based on severity of condition.

(3) arrival to disposition,[4] and (4) length of stay in the ED for both discharged and admitted patients. The times reported for the throughput metrics are captured in two fields, the "event time" and the "documentation time." Event times automatically capture the times the notes were filed and are usually not editable by the user. Users input documentation times that reflect in date and time fields the actual times the events occurred according to the medical notes.

Table I shows the HHC-reported number of ED visits and wait times for Kings County, Lincoln, and Elmhurst hospitals in 2012.

Table I

ED Visits and Wait Times for Kings County, Lincoln, and Elmhurst Hospitals in 2012

Hospital	Total Number of Patients Arrived to ED in Calendar Year 2011	Total Number of Patients Arrived to ED in Calendar Year 2012	ED Length of Stay for Discharged Patients in Calendar Year 2012 (Average Median Wait Times) (hh:mm)	ED Length of Stay for Admitted Patients in Calendar Year 2012 (Average Median Wait Times) (hh:mm)
Kings County Hospital Center	143,171	143,717	3:43	15:13
Lincoln Medical Center	155,298	166,281	2:14	6:06
Elmhurst Hospital Center	143,466	91,202[5]	4:38	5:42[6]

Objective

To determine whether HHC has control processes in place to evaluate the efforts made in reducing ED wait times.

Scope and Methodology Statement

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The primary audit scope period was Fiscal Year 2013, July 1, 2012, through June 30, 2013. However, some of the efforts we identified to reduce patient wait times in the ED began in prior

[4] The decision to discharge or admit an ED patient.
[5] We obtained this figure from the dashboard reports provided by HHC. According to HHC officials, this figure does not include 56,571 pediatric patients. We did not add the pediatric patients to this figure because HHC did not provide us with the median wait times for the pediatric patients.
[6] The calculations reported by Elmhurst Hospital Center for "ED Length of Stay for Admitted Patients" did not include dwell time because Elmhurst's patient records system does not report data in this way.

fiscal years and so, where relevant, we requested and reviewed earlier data. Please refer to the Detailed Scope and Methodology at the end of this report for specific procedures and tests that were conducted.

Discussion of Audit Results with HHC

The matters covered in this report were discussed with HHC officials during and at the conclusion of this audit. A preliminary draft report was sent to HHC officials to be discussed at an exit conference. HHC officials waived the exit conference, instead referring to a letter dated April 7, 2014, that HHC officials sent to the Comptroller's office. The letter stated that HHC, "respectfully disputes the preliminary conclusion. We continuously evaluate the efforts made to reduce ED Wait time using the ED Dashboard and Quality Assurance data." The draft report was sent to HHC officials with a request for comments. We received a written response from HHC on September 5, 2014. In their response, HHC officials agreed with the audit's recommendation.

The full text of the HHC response is included as an addendum to this report.

FINDINGS AND RECOMMENDATIONS

While Kings County, Lincoln, and Elmhurst hospitals each represented that they had achieved reductions in ED wait times, none of the three hospitals had sufficient evidence to support that conclusion, thus rendering the auditors unable to determine the extent to which each hospital formally evaluated and measured their wait time reduction efforts. Thus, while Kings County and Lincoln Hospitals publicly reported reductions in wait times in HHC newsletters, the hospitals provided no evidence to substantiate those claims, and therefore, we were unable to confirm the claimed reductions. Furthermore, while some documentation was provided, it generally did not reflect changes before and after the initiatives were implemented to reduce ED wait times.

The absence of formal evaluations and adequate supporting documentation hinders management's ability to both assess the degree to which goals have been met and evaluate the cost benefit of those efforts. It also prevents the individual hospitals and HHC as a whole from determining best practices that can be replicated in other hospitals that have had continued difficulties reducing ED wait times.

Insufficient Evidence That the Hospitals Evaluated Efforts to Reduce ED Wait Times

Kings County, Lincoln, and Elmhurst each claimed a reduction in their ED wait times reported and cited various efforts they had undertaken as the cause of the improvements. In response to requests for information from the audit team, officials from each of the hospitals provided extensive descriptions of the efforts they made to reduce wait times. Most of the initiatives reported were based on RIEs and included: performing pre-triage[7] and mini-registration[8]; creating a "Fast Track Unit" to care for patients with minor issues such as cuts, sprains, etc.; having daily "huddles" to identify and correct "bottlenecks" in patient flow; using National Emergency Department Overcrowding Scale (NEDOCS), a protocol to monitor bed capacity; and using electronic whiteboards and dashboards.

However, despite numerous requests for documentation, including specific requests for analyses and evaluations of the initiatives that reportedly were undertaken, the hospitals provided little information. The chiefs of emergency medicine for the three hospitals in our sample said that for some of the efforts reported, they did not maintain evidence of evaluations, particularly in connection with efforts made prior to 2013, and that in connection with other efforts, they did not conduct a formal evaluation. In addition, they asserted that because some outcomes reported were qualitative, they did not or could not be quantified (e.g., the results of improving signage throughout ED).

Hospital officials said that the hospitals use the dashboard throughput metrics to evaluate their performance regarding ED wait times and cited the installation of whiteboards and dashboards as key to improving ED wait times for all of their hospitals. In response to requests for documentation of evaluations made by the hospitals, we were only provided with dashboard reports for January 2012 through May 2013 for Kings County and Elmhurst and for January 2012 through December 2013 for Lincoln. According to HHC officials, because the dashboards

[7] Recording Log-in/Arrival information.
[8] The patient is asked for basic information such as name, address, and date of birth in an attempt to retrieve the patient's medical history. If the information is already available in the hospital's system, this will expedite the full registration process.

were not fully operational before January 2012, no reliable data for 2011 was available, and so they did not provide reports or data on the throughput metrics prior to January 2012.

The installation of the whiteboards began in Queens Hospital in 2010 and were installed in 10 hospitals, with the final installation occurring in Kings County in 2011. Elmhurst installed a computer patient record system called Allscript which contained a similar whiteboard and dashboard system.

While officials gave a lot of credit to the whiteboards and dashboards for improving ED wait times, they said that a formal assessment was not necessary because this change "clearly improved ED flow." Furthermore, we were unable to determine the degree to which gains reportedly realized by HHC met the goals it envisioned when it decided to install whiteboards and dashboards.

The key initiatives undertaken at each of the hospitals are described below. While we could confirm that many of these initiatives had been undertaken based on information provided at our walk-through meetings and observations, we could not verify what actual changes resulted from these initiatives due to the lack of data maintained by the hospitals. We were unable to verify the hospitals' claims that the efforts described below actually improved ED wait times since none of the hospitals maintained documentation that reflected systematic measurement and analysis of their efforts. This lack of documentation also limits HHC's ability to formulate best practices to help further improve ED wait times throughout its system.

Kings County Hospital Initiatives

Kings County Hospital officials provided insufficient evidence that they conducted an adequate evaluation of the efforts undertaken to reduce wait times for three of the four key initiatives identified. Based on our walk-through meetings with hospital officials and the various materials they provided, we identified four key initiatives that Kings County Hospital officials said they undertook to improve wait times between 2009 and 2013.[9]

1. Pre-triage - Log-in/Arrival to triage
2. Post-triage - For patients who are unable to be placed in a treatment bay due to lack of space, a provider will begin evaluation by ordering labs/X-Rays, etc. In some limited cases, the patient may be fully treated and discharged at this point.
3. Overcrowding - An ED and hospital wide response that takes place due to ED overcrowding, usually due to capacity issues across the institution.
4. Staffing Levels Based on Patient Volume

Hospital officials provided us with sufficient evidence of a formal evaluation for the initiative related to the pre–triage process. The RIE began in June 2009 and ended in 2010. Officials provided a graph reflecting the times for the median log-in (arrival) to triage covering the period June 2009 through June 2013. The baseline (pre-implementation) from June 2009 was 34 minutes. The graph indicated a reduction to 27 minutes for median log-in to triage from June 2009 to June of 2013.

[9] According to a March 20, 2012, report to the HHC Board of Directors, Kings County Hospital was recognized nationally for using Breakthrough methodologies to transform its ED, improve efficiency and patient flow, and shorten patient ED wait times. The report states that the total time a patient spent in the Kings County Hospital ED was reduced by 36 minutes.

However, for the initiatives related to the post-triage and overflow response processes, hospital officials were unable to provide sufficient evidence that these initiatives were formally evaluated. The RIE related to the post-triage initiative began in 2010 and was closed in 2011. Hospital officials provided us with no baseline figures against which to measure any productivity gains. The only documents they provided were productivity graphs for September and October 2013 (absent the data supporting these graphs), two years after the initiative was implemented, and well after any productivity changes resulting from the initiative would have been evident.

The overflow response initiative, which began in December 2011 and is on-going, was designed to address overcrowding in the ED. Hospital officials perform daily huddles with staff and use NEDOCS to manage bed capacity for admitted patients. Hospital officials provided a protocol sheet, "huddle" follow-up sheets, and a graph for patient dwell time.[10] However, the graph did not reflect a baseline or target time, the time period of the evaluation, or the reduction in dwell time from 17 hours to nine hours claimed by hospital officials.

For the initiative related to staffing levels, Kings County officials contended that an evaluation was not necessary. However, without an evaluation, we question how officials were able to assess the degree to which the initiative was successful or whether it had any impact at all.

In May 2012, HHC publicly reported that Kings County lowered its wait time throughput metrics. HHC did not indicate the specific initiatives taken to reduce the wait times. However, the newsletter reported that average wait times from log-in to triage improved 52 percent in the adult ED and 62 percent in the pediatric ED, going from 31 minutes to 15 minutes and from 52 minutes to 20 minutes, respectively. It did not indicate the time periods for the claimed reductions. We requested the analyses supporting the reductions, but never received them. Consequently, we were unable to confirm the reductions claimed in the newsletter.

Lincoln Hospital Initiatives

Lincoln Hospital officials provided limited or no evidence that they conducted an adequate evaluation of the efforts undertaken to reduce wait times for the 10 key initiatives identified. Based on our walk-through meetings with hospital officials and the various materials they provided, we identified 10 key initiatives that Lincoln Hospital officials said they undertook to improve wait times between 2010 and 2013.

1. Admitting Process - Period from designating a patient for admittance to finding a bed for the patient
2. Triage to Discharge - Period from triage to the point that the patient leaves hospital
3. Patient Flow from Pre-Triage to First Contact with ED Provider - Period from arrival to the point that the patient is seen by an ED provider
4. Distribution of Patients to Teams of Providers - Period from arrival to being seen by an ED provider
5. Staff Communication
6. Construction Phase II VVSM - Completion of the new ED
7. Triage Flow

[10] Dwell time is defined as the time a patient remains in the ED after the provider has decided the patient should be admitted and is affected by the number of available beds.

8. 2P Pediatric ED - Completion of the new Pediatric ED
9. 2P Adult ED - Completion of the new Adult ED
10. 2P Adult Fast Track and ED Administration Area - Design centralized administrative and staff areas

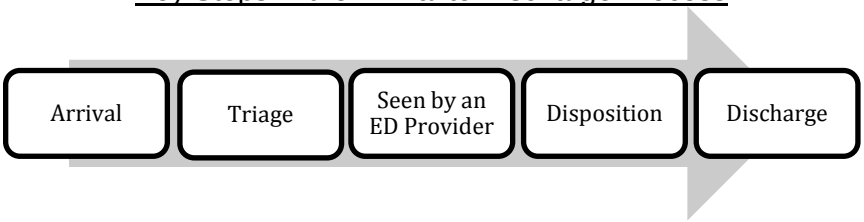
For the initiatives related to the admitting processes and triage to discharge processes, hospital officials were unable to provide evidence that these initiatives had been formally evaluated. The admitting process initiative was implemented in October 2010. However, the hospital only provided us with dashboard reports from November 2012 and June 2013. These reflected that the median ED dwell time decreased from two hours 11 minutes in November 2012 to one hour and 59 minutes in June 2013. However, the data provided did not reflect that a baseline had been established at the time the admitting process initiative was first implemented in 2010 or that a target time had been set. In addition, the median times from November 2012 and June 2013 provided to us for comparison purposes were from more than two years after this initiative was implemented. Therefore, we could not determine the extent to which the initiatives aimed at reducing wait times resulted in productivity changes.

The hospital implemented the triage to discharge initiative in November 2010. Hospital officials provided us with dashboard reports that showed that, as of June 2013, the median time of arrival to disposition for *admitted* patients was four hours and 19 minutes and the median time of arrival to disposition for *discharged* patients was two hours and 36 minutes. Again, this data did not reflect a baseline or a target time for either metric and did not include before and after comparisons.

In addition, the median times provided measured the *arrival to disposition* process and did not directly correlate to the *triage to discharge* process that hospital officials identified as the focus of the triage to discharge initiative. As illustrated in Chart I, the process from arrival to discharge, as described by hospital officials, may be broken down into five separate stages.

Chart I

Key Steps in the Arrival to Discharge Process



As illustrated by Chart I, the measurement of *arrival* to *disposition* times for admitted and discharged patients did not directly overlap with the time the patients spent between *triage* and *discharge*. Rather, the measurement of arrival to disposition excluded the period of time between disposition and discharge and included in its measure the time between arrival and triage. However, the initiative as described to the audit team focused solely on the period between *triage* and *discharge*.

For the remaining eight initiatives, officials provided no evidence of a formal evaluation, contending that evaluations were not always necessary. Nevertheless, Lincoln officials claimed that two of these initiatives—patient flow from pre-triage to first contact with ED provider and

distribution of patients to teams-- were responsible for the reduction in wait times, as shown in Table II below.

Table II

Initiatives Undertaken at Lincoln with Reported Reductions in Wait Time

Process/RIE	Approximate Date Implemented as per HHC	Specific Outcomes Claimed by HHC
Patient Flow from Pre-Triage to First Contact with ED Provider	September 2010	Reduced the time patients wait from pre-triage to transporter contact by 19 minutes
Distribution of Patients to Team	June 2011	Reduced patient wait time and unevenness of patient distribution to teams. Reduced the number of patients seen in main ED

Despite indicating that they achieved reductions in wait times, hospital officials provided no evidence to support the specific outcomes claimed in the table. As a result, we were unable to verify the reported reductions and question how officials, absent an evaluation, arrived at the claimed results reflected in Table II.

In May 2012, HHC publicly reported that Lincoln lowered its ED wait times. As was the case with Kings County, the specific initiatives taken to reduce the wait times were not indicated. However, the newsletter said that the length of stay for treated and released patients was reduced by 40 minutes and the time patients spent waiting between triage and seeing a doctor was reduced by 25 minutes. There was no indication of the time period in which this claimed reduction occurred, or any indication of what the wait times had been reduced from and what they were after the reductions. Additionally, we requested the analyses supporting the reductions in these metrics, but never received them. Consequently, we were unable to confirm the reductions claimed in the newsletter.

Elmhurst Hospital Initiatives

Elmhurst Hospital officials provided limited or no evidence that they conducted an adequate evaluation of the efforts undertaken to reduce wait times for 16 of the 17 key initiatives identified. Based on our walk-through meetings with hospital officials and the various materials they provided, we identified 17 key initiatives that Elmhurst Hospital officials said they undertook to improve wait times from 2008 to 2013.

1. ED/X-ray Cycle Time – Period from the x-ray being ordered to the point that the patient returns to ED after the x-ray is completed

2. Consultation Service Cycle Time – Period from the consultation being ordered to the consultation (written or oral) being completed

3. Data Prep for Value Stream Analysis and Model Flow Cell - The "pre-work" done to gather the data needed to evaluate the particular process being re-worked and the

calculations done to attempt to determine how best to match volume/demand with resources

4. External Triage[11] – Period from patient arrival in ED to the beginning of external triage
5. Fast Track Throughput – Period from patient arrival in ED to patient discharge (for fast track patients only)
6. Fast Track Flow - Period from triage to completion of treatment (for fast track patients only)
7. Fast Track Model Flow Cell – Improving patient efficiency in fast track by matching resources to needs
8. Front End 2P – Planning and preparation for moving fast track from prior space to the new space by redefining patient flow, staffing, equipment, and resources
9. Internal Triage[12]– Period from (non-critical) patient arrival in ED via ambulance to triage
10. Provider Assessment in the ED – Period from triage completion to the point that a patient is seen by an ED provider (for urgent patients only)
11. Radiology Turnaround Time – Period from the X-ray being ordered to the point that the X-ray is read by radiologist or ED doctor
12. Registration – Period from patient arrival to the ED to mini-registration (initial documentation of patient visit)
13. RIE Front End Process Registration, Mini Registration, Sorter – Period from patient arrival to ED to the point that the patient is triaged (externally)
14. RN Triage Assessment – Period from patient arrival in triage to be seen by nurse to completion of triage
15. RIE: Provider Assessment – Period from triage completion to the point that the patient is seen by an ED provider
16. X-ray Cycle Time – (A two-part process.) Part 1: Period from the X-ray being ordered to the point that the patient is ready to go for x-ray. Part 2: Period from when the patient is ready to go for X-ray to the point that the patient returns to the ED
17. X-ray order to patient ready for transport (from ED to X-ray department)

For a number of processes, hospital officials appeared to have implemented multiple initiatives that addressed the same process. For example, the external triage initiative (implemented in February 2010) and the RIE front end process registration initiative (implemented in August 2011) both appeared to address the process starting with a person's arrival to the ED and ending with the person being triaged.

11 External triage refers to the triage process performed by nursing staff that occurs in the ED's "external triage space," which is adjacent to the waiting room. The patients triaged in that space are primarily those who walk into the ED and are deemed to have medical conditions that are likely more stable (i.e., laceration on the hand, sprained ankle).
12 Internal triage refers to the triage process performed by nursing staff that occurs inside the ED's "internal triage space." The patients who are triaged in that space are those brought in by ambulance and/or those who walk in, but are deemed to be potentially more ill.

Regarding evidence that they performed formal evaluations of these initiatives, hospital officials provided adequate evidence for only one initiative, the X-ray order to patient ready for transport initiative implemented in April 2013. For that initiative, officials provided an example of a trip ticket,[13] a radiology tracking tool used to identify the time the order was placed, the patient ready time, the time the patient was picked up from the ED, the time the patient was returned to the ED, and the total turnaround time from the time the order was placed to the time the patient was returned to the ED. In addition, they provided data from the RIE conducted for this initiative, identifying the beginning baseline time from April 2013 of 32 minutes and the target time of 20 minutes. According to the evidence provided, the times were also calculated and reviewed in July and October 2013. The evaluation revealed that the final RIE time for this initiative was 15 minutes, a 17-minute reduction.

For the radiology turnaround time initiative implemented in February 2013, Elmhurst officials provided some limited evidence of an evaluation. Specifically, Elmhurst officials provided data from the RIE conducted identifying the baseline time of 92 minutes, a target time of 60 minutes, and the times achieved for June, July, and October 2013, all of which were below the target time of 60 minutes. Officials did not provide any supporting documentation, such as data supporting these reductions, for the times achieved.

For the "front end 2P" initiative, hospital officials contended that an evaluation was not necessary because the fast track area was still in the process of being re-designed.

Elmhurst officials reported that 11 of the remaining 14 initiatives contributed to a reduction in wait times. Table III identifies these initiatives and their reported reductions.

Table III

Initiatives Undertaken at Elmhurst with Reported Reductions in Wait Time

Process/RIE	Approximate Date Implemented as per HHC	Specific Outcomes as per HHC
X-ray Cycle Time	3/9/2009	21% Reduction
Consultation Service Cycle Time	4/20/2009	33% Reduction
Fast Track Throughput	8/10/2009	49% Reduction
External Triage	2/22/2010	68% Reduction
Internal Triage	3/22/2010	13% Reduction
Fast Track Flow	4/19/2010	32% Reduction
Provider Assessment in the ED	5/17/2010	67% Reduction
Registration	5/23/2011	38% Reduction
RIE Front End Process Registration, Mini Registration	8/22/2011	49% Reduction
RN Triage Assessment	10/24/2011	22% Reduction
RIE: Provider Assessment	11/14/2011	52% Reduction

However, officials did not provide any evidence of evaluations to support the specific outcomes claimed. Consequently, we were unable to confirm the reductions claimed by the hospital and

[13] The trip ticket identified the type of treatment scheduled, the sending unit (e.g. the ED), transporter name, patient's special conditions, and recent or anticipated changes in the patient's condition.

again questioned how officials, absent an evaluation, arrived at the reductions reported in the table.

Conclusion

HHC officials at Kings County, Lincoln, and Elmhurst said that, for the most part, the efforts they have undertaken have been successful in reducing wait times. However, given the absence of formal evaluations and/or sufficient documentation to support those evaluations, we were unable to confirm that these efforts have in fact paid dividends for HHC's patients and taxpayers. Furthermore, due to the lack of adequate data, officials are hindered in effectively assessing the degree to which the initial goals of the initiatives were met and the costs/benefits of these initiatives achieved. As stated in Comptroller's Directive 1, *Principles of Internal Control*, "Management, throughout the organization, should be comparing actual functional or activity level performance data to planned or expected results, analyzing significant variances and introducing corrective action as appropriate."

Evaluations are critical for managers to ensure that resources dedicated to improving processes have been allocated in the most efficient and effective manner. They would also be useful to others, such as other HHC hospitals, in deciding whether and how to implement similar initiatives.

Recommendation

1. HHC should assess the effect of initiatives undertaken to reduce ED wait times by collecting adequate supporting documentation and engaging in a thorough and comprehensive evaluation to determine whether goals are being met and resources are being efficiently allocated.

   HHC Response: "We accept your recommendation and will strive to improve evaluation and supportive documentation for our continuing work on reducing wait times."

DETAILED SCOPE AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objective. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter.

The primary audit scope was Fiscal year 2013. However, some of the efforts we identified to reduce patient wait times in the ED based on our walk-throughs and observations began in 2008. Although some efforts began years ago, they are still ongoing because of continuous changes in ED environments.

We requested the ED organizational charts for all 11 acute care hospitals, but received and reviewed organization charts of only five of the hospitals—Coney Island, Bellevue, Elmhurst, Kings County, and Woodhull. HHC did not provide us with organizational charts for the remaining six hospitals.

We selected Kings County Hospital as the hospital for our initial walk-through meeting because of an HHC Today May 2012 newsletter promoting the success of the "Breakthrough" methodology implemented at Kings County and a reduction in wait time of 36 minutes. Lincoln and Elmhurst hospitals were selected based on an analysis of the number of emergency department visits by patients during 2011—with both having the highest numbers of visitors.

To obtain an understanding of patient flow in the emergency departments for the three hospitals in our sample, we requested the hospitals' policies and procedures related to ED wait times and conducted interviews with the chiefs of emergency medicine and other officials at Kings County, Lincoln, and Elmhurst hospitals. We reviewed the *ICIS ED Module User's Guide.*[14] With regard to the hospitals' policies and procedures, we received only a one-page procedure for "Visual Triage and Log-In" from Kings County on December 17, 2013 – approximately eight months after we requested it. HHC did not provide any other policies or procedures for Kings County or the other two hospitals, Lincoln and Elmhurst.

To obtain an understanding of the computer patient record system used by HHC, we conducted a walk-through with the chief medical informatics officer and other officials. We also reviewed the median wait times for the throughput metrics reported by HHC from its dashboard reports from January 2012 through December 2013.

We requested from HHC's central office documentation on the RIEs that were conducted by the three sampled hospitals, including a full description of the RIE, signed attendance logs for the events, materials/power point presentations used at events, and any additional supporting documentation. Initially, HHC did not want to provide the information because it said that the individuals who participated in the RIEs were promised confidentiality. On August 15, 2013, HHC officials, the former deputy comptroller for audit, and the assistant comptroller for management audit met to discuss our request and their concerns. The officials agreed that RIE participants' names and subjective language used by participants in their discussions of the various topics would be redacted on the documents provided as long as they did not directly

14 A guide for ED staff for using new notes in Quadramed to standardize ED documentation across HHC.

relate to the process. On September 4, 2013 – 30 business days from the date of our original request – we received RIE A3 reports of the initiatives undertaken to reduce ED wait times for the three hospitals. However, upon reviewing the A3 reports, we found that not only were the participants' names redacted, but also most of the data and other related information pertinent to our review such as expected outcomes, solutions, and completion plans (including timeliness measures such as metric baselines and initial and targeted results), among other categories. The redactions did not have a material effect on our ability to determine whether the initiatives were evaluated. HHC did not provide any other supporting documentation.

On September 26, 2013, we requested meetings with officials from each of the hospitals to discuss the initiatives undertaken and their impact. However, HHC responded that our request to revisit the hospitals was a "duplication of efforts from the initial site visits." Instead, officials from HHC Central requested a meeting to further discuss our request to re-visit the hospitals. Using the information provided at our walk-through meetings and observations, we compiled a list of the initiatives undertaken at each of the hospitals. On October 18, 2013, we e-mailed the list of initiatives to HHC and asked that evidence of analyses of the performance/effectiveness of the listed efforts be provided at the meeting, which was held on November 7, 2013.

After the meeting, on November 14, 2013, HHC provided us with spreadsheets with additional information on the initiatives. The hospitals used the listing we sent them and added columns with information including date (processes/RIEs) implemented, tracking/specific metrics, countermeasures taken, results to countermeasures, and specific outcomes. We later met with officials from each of the sampled hospitals again to discuss the information in the spreadsheets and additional documents provided to determine the control processes used to evaluate the performance/effectiveness of the initiatives.

To obtain an understanding of the Breakthrough methodology used by HHC to assist in reducing ED wait times, we reviewed the contract HHC entered into with Simpler Consulting of North America, LLP and met with the senior vice president of the division of organizational innovation and effectiveness.

To obtain information on topics discussed at the ED director meetings relating to improving patient flow at each of the hospitals, we reviewed the minutes from their monthly meetings for January 2012 through July 2013.

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September 5, 2014

HHC Response to NYC Comptroller's Draft Audit Report on Emergency Department Wait Times MD13-112A

Dear Ms Landa,

Thank you for the opportunity to respond to your draft report on Emergency Department Wait Times. Since the entrance conference on April 30, 2013 your team has undertaken an exhaustive review at NYC Health & Hospitals Corporation that was largely focused on three of our busiest emergency departments at Lincoln, Kings County and Elmhurst hospitals. Lincoln Emergency Department is one of the 5 busiest departments nationally, and all 3 hospitals serve New York as level 1 trauma units. We are aware that at several times during the audit, definitional issues were problematic in getting to a joint understanding of what was being measured and the interpretation of performance data.

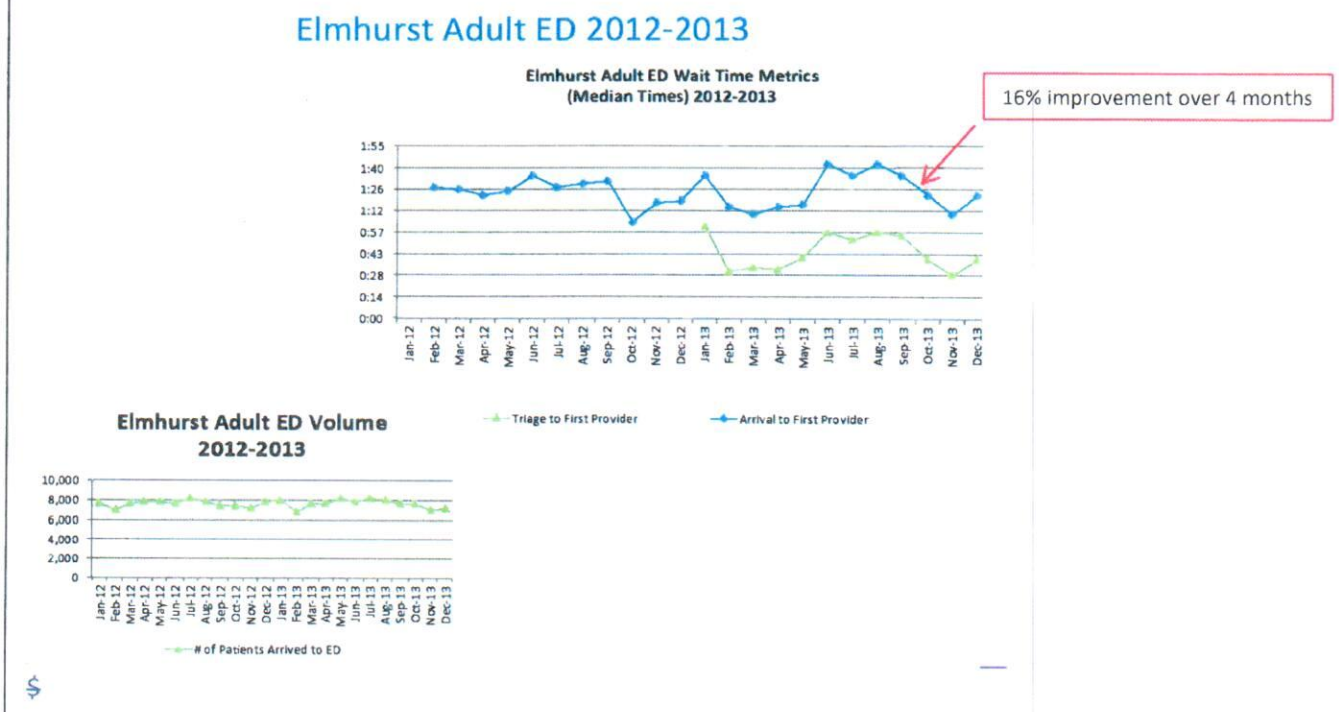
ED wait time, as defined by the ACEM and reported online[i], refers to the "average time patients spend in the ER before being seen a provider (usually a doctor)" and is made up of the time from arrival to triage plus the time from triage to provider. Clearly, sicker patients wait much less time than less acutely ill patients; and this is facilitated by the triage system, with categories 1-5 based on reducing risk of life threatening illness to that patient. Category 1 patients (the potentially sickest category) had a waiting time of between zero and 6 minutes during the month of June 2014. During the period calendar years 2012 and 2013, average waiting time for all triage category adult patients at Lincoln Hospital was 72 minutes, at Kings County was 75 minutes and at Elmhurst was 86 minutes, with little or no improvement during those 2 years.

ED cycle time or length of stay is defined as the time from arrival to release, and for admitted patients it is the time from arrival to the time of departure from the ED to another part of the hospital. Along with the "waiting time" in the previous paragraph, these times are routinely monitored at each facility and reported to facility oversight committees and the HHC Board of Directors. In addition, ED cycle times are reported to the federal agency Centers for Medicare & Medicaid. It is this level of monitoring and oversight which has been steadily built up over the last three years that underpins our view that our

hospitals did in fact "measure their wait time efforts". Average ED cycle time for admitted patients for 10 HHC Emergency Departments improved more than 20% from 653 minutes to 514 minutes between January 2013 and June 2014.

Further, an examination of data captured from our monitoring system in Figure 1 gives an insight as to why some improvements may have been appropriately claimed with two or more months of improvement in a particular measurement. It is also clear from the same figure that some of those claims may have been premature, in that the improvements could not be sustained. In an environment as complex as a busy Emergency Department there are many potential reasons why improvement is not sustained.

Figure 1



Again we thank you for providing an opportunity to comment on your draft report on this important topic. We accept your recommendation and will strive to improve evaluation and supportive documentation for our continuing work on reducing waiting times. This work is a high priority for HHC. We would also like to suggest a correction to your Table 1 for Elmhurst Hospital total number of patients seen in calendar year 2012 (column 2). The number 91,202 should be replaced with 147,773, as the 91,202 did not include pediatric patients.

Sincerely yours,

Antonio D Martin for Raj

Ramanathan Raju MD

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[1] http://projects.propublica.org/emergency/ accessed Sep 3, 2014