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Decrease Doc-to-Decision Times for Major EMS Patients at Mount Carmel East

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Improvement team tackles issues that delay disposition orders

The emergency department (ED) at Mount Carmel East (MCE) in Columbus, Ohio, receives 86,000 visits per year and is one of the busiest in central Ohio. The ED also is a primary point of contact to the hospital for many living in the region — receiving care in the ED and discharged or admitted from the ED — and performance there leaves a lasting impression on the community. Volumes in the 50-bed department were rising, but delays in the department were rising as well. This was leading to increased patient length of stay (LOS), decreased patient satisfaction, an increase in the number of patients who left the ED without being evaluated, and the potential for poor patient outcomes.

MCE previously had worked to improve aspects of the ED, such as services that feed the department. But poor staff engagement and high labor turnover kept some improvements from sticking. It became clear that an overall ED improvement project that incorporated leadership, including physicians, into analysis and solutions was needed, says Jameson Rehm, Performance Excellence Manager. “We needed something that was really going to kind of push us into the next level, and it would bring the entire leadership team along with it.”

A cross-functional improvement team was formed, which included Dr. Emily Seng, emergency room physician and the ED’s medical director. The team trained at the Academy for Excellence in Healthcare at The Ohio State University in February. Dr. Seng says she joined the project “kicking and screaming” and was not pleased to dedicate two weeks to the AEH training — five days of initial training and five days of follow-up training after the team develops and begins to implement improvement ideas. In July Dr. Seng admits, “I completely and totally underestimated the value of these two weeks... It’s worth the time investment.”

Other Mount Carmel hospitals had also sent staff to the AEH training at OSU, and those working on process improvements in the hospital system had relayed their positive experiences. “I knew it was an opportunity for us, and could provide excellent training to the leadership team,” says Rehm. At AEH the team learned about and/or improved their understanding of lean tools and techniques, such as value-stream mapping, waste elimination, flow and pull concepts, A3 problem solving, and root-cause analysis.

Mount Carmel East

Mount Carmel East (MCE) is a 338-bed hospital in Columbus, Ohio, with more than 10,000 employees, 1,600 physicians, and 1,000 volunteers. MCE includes:

- Mount Carmel East Heart Center
- Mount Carmel East Maternity Center
- Endoscopy lab
- Neuroscience unit
- Bruce E. Siegel Center for Health Education
- Multiple intensive care units
- 50-bed emergency department that receives 86,000 patients per year

Identifying the Problem and Delays

The MCE team observed the department and mapped the end-to-end value stream for patients arriving at the ED. They documented the many steps a patient travels with sticky notes on a wall, and grouped the steps into chunks of activities (see *Current-State Value Stream Map*). The map helped them to pinpoint delays, including the initial RN assessment/triage, specimen collection, order clarification, timely transport of patients for CT scans, and the time from a physician writing the disposition order (where the patient will go from ED) to the patient’s departure from the ED.

Clinic Improvement Team

- Terri Arnold-Brown
- Michael Samczak
- Dr. Emily Seng
- Jami Hart
- Stephanie Naumann-Day
- Jameson Rehm

“Emergency medicine is unique in that we are very dependent on multiple other departments to allow us to work, more so than probably any other department in the hospital,” says Dr. Seng. Some delays found by the team were more in the control of ED staff than others. So the team chose to focus on what they could address: improving the efficiency from the point of contact with a provider to the point where the provider has all the information necessary for a disposition order, which is the decision to admit or discharge the patient (doc-to-decision time). In addition, their project focused on admitted patients (higher acuity) because metrics related to that group “would allow us to look at a lot of different processes and make a more global change that will affect most of our patients,” says Jami Hart, RN.

At the beginning of the AEH project in February 2016, the team recorded the following performance measures for the ED:

- Takt time was 5.76 minutes (the cadence needed to service patients coming into the ED)
- Overall ED process time was 257 minutes, of which only 28.4 percent was value-added time
- Overall ED LOS for admitted patients was 355 minutes
- Overall ED LOS for discharged patients was 194 minutes
- Doc-to-decision time was 155 minutes.

Current-State Value Stream Map



Source: Mount Carmel East

The team set a near-term goal to reduce the doc-to-decision time for admitted patients to 135 minutes by April 2016.

The team also was well aware that high staff turnover contributed directly and indirectly to ED delays. In July 2015, the ED had a 16.7 percent nurse turnover rate, says Hart. As part of identifying the problem and delays, the team surveyed ED staff members and asked them for their perceptions of what contributed to the biggest delays in the ED. In addition to eliciting information that could help identify problems, the communication with staff also began to engage individuals outside of the team in the improvement effort.

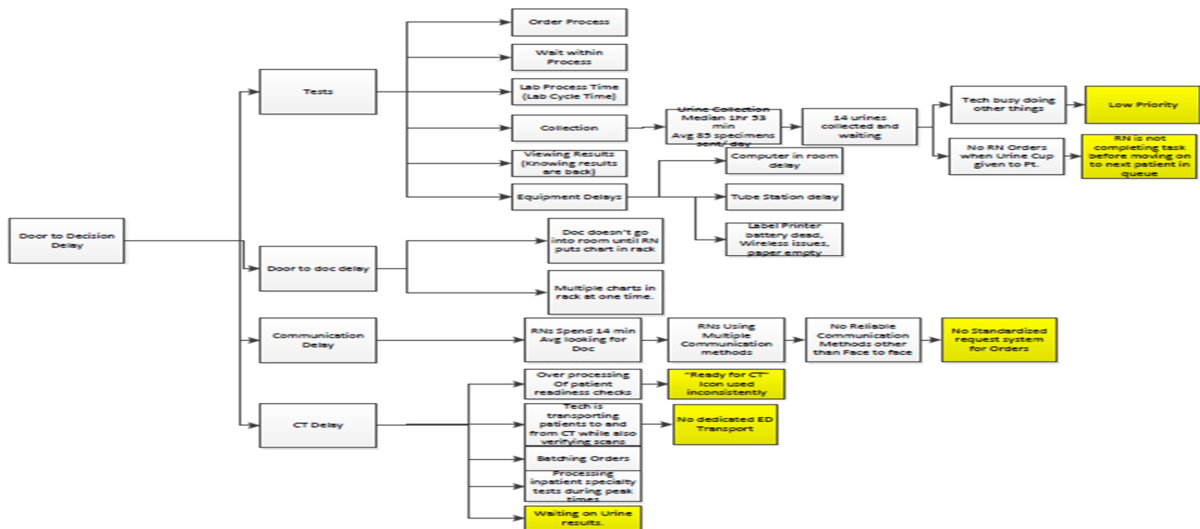
Root Causes and Countermeasures

The team created cause maps to explore the top four categories of delays related to the doc-to-decision delay — urine tests, communication delays, CT scan delays, and doctor delays (see *Cause Map*). All of the cause categories aligned with the ED staff’s surveyed perceptions of the problem as well. The cause map helped the improvement team to uncover root causes of the four categories of delays and develop countermeasures to resolve issues.

Urine Tests

The team found that urine tests took 1 hour 53 minutes from order to collection. Contributing to this excessive time was batching of orders, various periods of waiting (waiting for the order, for the patient to provide urine, for urine-test results), excessive motion, and errors (mislabels, lost samples, spilled samples). The team also realized that many in the department considered urine tests a low priority, despite the many ED population groups that require them before treatment can begin.

Cause Map



Source: Mount Carmel East

The team established a goal for urine tests of 15 minutes from order to collect. Among the countermeasures to reach that target were standardizing the urine-test process, assigning ownership of the process to the intake nurse, prioritizing sample collection by high-priority patient populations, and educating staff (impact to patients, problems with batching). An intake folder for the intake RN would be used to facilitate ease of ordering, and the standard urine-test process would help the team achieve its goal:

1. Intake RN will provide urine cup and instruction to patient.
2. RN places order for urine test and urine pregnancy test.
3. When patient returns, intake RN scans patient, prints labels, and places specimen in bag.
4. Intake RN notifies ED tech that urine is ready to be sent.
5. ED tech completes process and sends specimen to the lab.

Dr. Seng says the countermeasures, especially education, increased awareness of the importance of the urine-test process. In March 2016, the *median* order-to-collect time was 81 minutes. The countermeasures were rolled out in May, and median times dropped to 10 minutes in May and 11 minutes in June (a reduction of more than 80 percent).

The *average* order-to-collect times dropped by more than 60 percent (162 minutes in March to 53 minutes in May and 59 minutes in June), but a few extreme outliers pushed the average times longer: “When we miss the boat, we really miss it,” says Dr. Seng. “So now we’re going back and looking at the population where if we don’t get it in 10 minutes it’s more likely to take several hours to obtain, and really hone in on what the process is or what the delay is in those [circumstances] so we can get those numbers even better.”

Communication delays

Patients usually don’t leave an ED until they see a doctor, which means that physicians need to know when and where their services are required. On average, RNs spent 14 minutes looking for a physician, in part due to the layout of the ED, and RNs would use a variety of communication methods — including walking around looking for them — to try to contact physicians. In fact, the team found that only face-to-face communication was reliable, but that often meant multiple RNs rushing to a one physician when they became available.

The team proposed that staff in the ED use Jabber — an instant messaging format — as a standardized tool for RN-to-physician communications. An ED physician will receive a message on their PC and/or smartphone in real-time, alerting them that a patient is ready to be seen (critical communications will continue to be broadcast over the public address system).

Jabber was selected because it already existed at MCE and the team could focus on only one format to standardize and improve — rather than many people trying to fix multiple formats. Dr. Seng and Michael Samczak, RN, trialed Jabber, and during the test found that nurses were usually the ones trying to initiate communication (i.e., open doctors were not looking for nurses). The Jabber implementation was delayed

because ED physicians are contract employees, and unless they also hold an administrative role, such as Dr. Seng, they are not given an MCE email account.

The team is working with Human Resources and the Information Technology department to resolve the email-access issue. In lieu of applying that solution, the team has given Spectralink mobile phones that communicate over an internal network to the rest of the ED staff. “We have an assignment tab [on which] our [unit coordinators] have been putting phone numbers down for the techs, medics, and nurses,” says Hart. “That opens our communication more so we’re not walking around the ER looking for staff members.”

The mobile phones are also being used to get the pharmacy to alert the ED when a medication arrives. Previously, medications not found in the department’s medicine dispenser unit would be tubed up to the ED from the pharmacy. Staff would have to repeatedly check if the medication was sent and had arrived — the order-to-administration time was 55 minutes. Now the pharmacy calls the RN that placed the order when it has been sent to the ED. This should result in a decrease in time as well as wasted motion and time on the part of nurses, who will be able to remain with their patients. In addition, a separate improvement project will begin in August to explore further improvements to the order-to-administration process.

CT delays

CT scan turnaround time in February was 74 minutes. CT scan is a hospital department separate from the ED. In addition to tasks specific to their role (e.g., verify and process paperwork, scan patients, search for test results required prior to CT), CT staff often transport patients back and forth from the ED. The team observed the process and found that CT staff would frequently batch patients, have difficulty finding a patient (not in the correct waiting area), pick up patients before they were ready for CT scan (no prerequisite testing, no IV access), wait on lab/urine results, and/or wait for an open CT table.

Work done by the improvement team on urine-test time reductions had some impact on CT turnaround performance (approximately a 10-minute reduction). A CT scan cannot be performed on a woman of child-bearing age unless there is a urine pregnancy test. “We did notice that when tracking the reasons for delays and getting patients back to CT, urine [test] wasn’t on the list anymore,” says Rehm. But even when a urine test is not in the CT scan equation, turnaround times are still 47 minutes.

The improvement team determined that delays related to CT scans were beyond the scope of the AEH improvement project and would require a specific initiative and more information and analysis. This project will look at staffing to demand, capacity planning, and improved interaction with ED staff. The team proposed development of a Radiology A3 (a “child A3” off the ED A3), and the project kicked off in June. Rehm says the subteam project found a significant amount of non-value-added time, such as waiting for an IV to be placed, and walking to locate a patient.

Doctor delays

The fourth cause identified by the improvement team focused on the time it takes a physician to get started with a patient. Prior to training at the AEH, ED staff and team members believed this to be a major contributor to overall ED delays. But when examining the cause more closely, they found only minor delays, such as physician waiting to enter a room until a patient's chart is in the rack.

ED culture

An overarching concern for the improvement team was the culture in the ED. How could they get staff to take some ownership in the improvement project as well as improve their own satisfaction working within the ED. The team explored the issue in detail beyond simply labor turnover rates, and was surprised to find via a survey that the level of engagement was better than anticipated. Nonetheless, the team proposed a number of initiatives to boost staff morale, engagement, and satisfaction:

- *Staff communication:* “We’ve put in several different ways for the staff to communicate what they think is not going right and what is going right, and to give us their suggestions to improve,” says Dr. Seng. “We want to give the best experience for our patients, and the fact of the matter is that we only do that if we can make the ability to care for the patients easier.” To facilitate this, the team “resurrected” a unit-based counsel that offers advice to ED leadership. For example, shift times were changed based on recommendation from the counsel and a survey of nurses.
- *Fundraiser:* Two pediatric deaths occurred in February in the ED, and the events emotionally affected the ED staff. The team developed a team-building fundraiser project — a crib drive — intended to secure cribs for families in need, help the ED staff deal with the infant deaths, and bring awareness to the high infant-mortality rate in Columbus.

The ED fundraiser raised \$5,125 for safe sleep for infants, which translates into approximately 90-100 pack-and-play sets for our mothers in need. The improvement team also believes the effort has had a positive effect on staff.

- *Professional excellence program (PEP):* This program enables RNs to accumulate credits as they undertake new activities and expand their roles, and the credits will impact future compensation. The program is intended to advance nurses’ skills, engage them in improving ED processes, and get them involved in an improvement project. Hart has brought PEP nurses from other areas of the hospital to the unit-based counsel meeting, where they advised counsel members on how to apply the program to the ED. “We [assigned] 125 employees into five different clinical managers, and we are looking into their goals and trying to help them reach their goals.”

Hart sees PEP project-related work as an opportunity to bring fresh eyes to nurses in the ED, just as she has experienced on the AEH project. “When you’re in the field, you see it medically, and sometimes stepping outside and just observing what we’re doing [you] realize the delays and the waste that are happening.” Hart conducts daily huddles in the ED, and now tries to bring that same process perspective into those meetings — discussing causes of a problem rather than chalking it up to a “horrible day.”

The programs intended to improve workplace culture as well as the overall doc-to-decision project helped to lower nurse turnover in the ED to 3.8 percent in June (65 percent decrease from prior to the AEH project and a 77 percent decrease compared to July 2015).

ED Improvements and Next Steps

Even though implementation of countermeasures did not begin until mid- to late-spring — and other countermeasures, such as for CT scan delays, are only getting underway — the process and culture changes are impacting the MCE ED. The team’s goal was to reduce the doc-to-decision time for admitted patients to 135 minutes average — June performance was 139 minutes. Similarly, the doc-to-decision time for discharged patients just missed a goal of 107 minutes (June performance 112 minutes).

The overall ED LOS for admitted patients fell from 355 minutes in February to 289 minutes in May and 305 minutes in June. Hart notes, “The admitted length of stay has a lot of variables in it, not just process variables, meaning that it is not just intrinsic to what happens in the emergency department. If there’s no bed available upstairs, that person stays with us, and that increases their length of stay and then that increases all of our length of stays.”

The admitted LOS also can impact discharge LOS. Discharge LOS fell by 19 percent and 14 percent in May and June, respectively. Rehm says the AEH project has contributed to the discharge time reduction, but other projects — getting admitted patients from an ED bed to hospital bed — also has contributed. “We have plans to start another project looking at our discharge patients specifically and how long they’re sitting in the bed having been discharged before they’re actually out of our department,” adds Dr. Seng.

Press Ganey patient satisfaction scores with the ED also have improved: Prior to the AEH project, 60 percent of patients indicated they would likely recommend (12 percent marked the “top box” for likely to recommend). In June, 77 percent were likely to recommend (37 percent top box).

Dr. Seng says the AEH project has evolved to the point where it is no longer a “project,” instead branching off to subteams and projects and now incorporated into the ED’s daily management system. “It’s how we’re going to do things.” The three-level management system uses tier boards and standup meetings in front of the boards:

- *Tier one:* Frontline staff
- *Tier two:* Clinical nurse managers, nurses, and the unit manager
- *Tier three:* Medical director, director of the department, and nursing directors

“My leadership meetings are standing in the hallway,” says Dr. Seng. “The process improvement meetings are standing in the hallway, which brings radiology, pharmacy, lab, social work, all of those parties. We all stand in the hallway, they all update their boards, and then we have CIPA [continuous improvement and preventive action] cards that we go through.”

CIPA cards are like mini-A3s, adds Rehm. “It’s a way to capture ideas from every level of the organization and keep track of it on the tiered accountability board.”

“More or less anything that we discover is a project,” says Hart of the standup meetings. “Getting the staff involved is going to be a huge thing for us, because having that kind of commitment from our staff is going to make things work better. The people who work in the unit know how to fix the problems.”

MCE ED also participates in an ED Collaborative with all of the local Mount Carmel emergency departments in which directors, medical directors, and educators meet and review an ED scorecard for the hospitals. For example, the scorecard tracks doc-to-decision times across four Mount Carmel EDs (East, West, St. Ann’s, and Grove City). Dr. Seng will report on what the MCE ED has done with the AEH project and share the group’s process changes, successes, and plans going forward. She also can discuss project approaches that will help others make improvements.

“Don’t assume you know what the problem is,” Dr. Seng advises. “And my second suggestion to any group who wants to start lean management is to pick a subject other than what they are operating on. Lean really started clicking with me when we had to do the exercises that had absolutely nothing to do with hospitals, nothing to do with medicine, because I didn’t go in there with some preconceived knowledge; all I could do was think about the process. I think that especially in healthcare, we are experts in our field, and it’s sometimes hard to separate the expertise in the field with understanding the lean principles.”

AEH Commentary

The MCE project illustrates the importance of a leadership-driven, cross-functional improvement effort that brings together doctors, nurses, managers, technicians, and improvement specialists — especially for a department such as ED where all those roles interact on a regular basis under stressful conditions. “That kind of stuff really helps to form a team, because we can understand each other’s roles better this way, and understand how we impact one another,” says Hart.

The project also shows that observation and understanding of the current state of a value stream is a foundational step that surfaces problems, dispels preconceived opinions, and helps to break a complex environment into manageable and addressable chunks. The MCE team also supported their observations by going to the gemba and surveying staff, blending a qualitative and quantitative assessment, which helped them to isolate delays and drive to root causes of those delays. Hart says, “The biggest thing for me was doing the observation and standing back and watching what the actual delays were instead of just assuming what the delay was.”

Lastly, improvement requires data. The MCE team was detailed in the measures they captured — overall within the ED to gauge the impact to patients moving through the department, as well as specific to an activity or process, which was necessary to propose and implement countermeasures and then gauge the outcomes of their efforts.

About AEH

The Academy for Excellence in Healthcare blends in-person class time with hands-on project work, interactive simulations, and recurrent coaching, all aimed at helping healthcare teams spark actionable change at their organization. At the heart of this program is a real-world workplace problem each participant team selects and commits to solving through five intensive days on campus, followed several weeks later by two days of project report-outs and lean leadership training. This project-based approach pays immediate dividends and lays the groundwork for transformational change.



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