Emergency Department Flow: Reducing Length of Stay for Lower-Acuity ED Patients at Nationwide Children’s Hospital

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Emergency Department Flow

Reducing length of stay for lower-acuity emergency department patients

Not all patients that enter an emergency department (ED) have a life-threatening or critical need for immediate care. But every patient in an ED expects to receive prompt, quality care upon arrival, regardless of his or her health condition. Nationwide Children’s Hospital (NCH) wants to improve efficiency in an effort to serve all ED patients in a reasonable amount of time without disrupting the quality of care provided.

In 2012, the Nationwide Children’s Hospital ED moved into new space, which boosted capacity by 20 rooms to a total of 62 rooms. After the move, the number of ED staff was increased to address the additional number of rooms and patient volumes. The configuration of ED rooms changed to geographic areas, called “pods.” The pods were defined by acuity and specialty, which included triage, trauma/critical care, and a blue pod with 20 beds for lower-acuity patients (see ED Configuration).

The blue pod receives up to 150 lower-acuity patients per day, depending on the time of the year. Patients are first seen by an RN at registration, where vital signs and weight are taken. If a blue-pod room is available, they immediately are taken to the room and receive an RN assessment. If a room is not available, the patient waits in the lobby until a room opens. Patients may be called from the lobby for an RN assessment, after which they return to the lobby or go to an open room if one has become available.

An NCH team monitored lower-acuity patient length of stay (LOS) in both the old ED and new ED. They recognized a correlation between patient satisfaction scores and LOS. According to Press Ganey results, patient-satisfaction scores at NCH are 67.6 percent when ED LOS times exceed 120 minutes. When LOS times are 120 minutes or fewer, the patient satisfaction scores rise to 86.1 percent. Therefore, it was clear the longer than desirable LOS for lower-acuity patients was impacting patient satisfaction at Nationwide Children’s Hospital. Therefore, the target was to discharge lower-acuity patients in less than 120 minutes, but from November 2013 through October 2014, this mark was achieved only 51 percent of the time.

Despite the new configuration and expansion, LOS for lower-acuity patients had not improved. “Our length of stay for the lower acuities had gone up since we came to the new hospital,” says Barb Abdalla, ED Nursing Director.

Dr. Gregory Stewart, ED Operations Advisor and Assistant Professor of Pediatric Emergency Medicine,
adds, “We objectively saw the length of stay was unchanged — even though there were more rooms — and, subjectively, families continued to feel the long waits. There were growing frustrations from the patients, their families, and the staff, and we identified the need to address the issue.”

**Working with AEH to Analyze the ED Problem**

Project teams had tried to tackle the ED LOS problem prior to moving to the new ED space, says Jonathon Schuller, Business Manager Emergency Medicine. “ED patient flow is always an overwhelming process to analyze because there are so many variables and the conditions are consistently changing. One of the opportunities of looking at this [with the Academy for Excellence in Healthcare (AEH)] was an ability to focus and identify root causes of patient wait time.”

The NCH ED had an improvement project accepted for an AEH scholarship, and the training at The Ohio State University gave a cross-functional improvement team (see Nationwide Children’s Hospital ED Improvement Team) new tools by which to assess the problem and identify causes. “When I went through nursing school, evidence-based research was limited to medical care and did not focus on operational processes,” says Terri Dachenhaus, RN Supervisor. “Attending AEH, it gave all of us the opportunity to learn how to appropriately analyze a process to find the root cause of the problem and make improvements.”

The AEH training in fall 2014 also exposed the improvement team to lean principles, some of which ran counter to their beliefs for how processes should function. Abdalla recalls a simulation exercise that revealed the inefficiencies associated with batching. “It made us realize that when we batch four patients into rooms, it really doesn’t help the process. All it does is stress us further on down the line. That was one of the big eye-openers for me.” She thought they were managing their time better by batching, “but we weren’t managing the patients’ time, which is really what we needed to focus on.”

The first few days at OSU also allowed the improvement team time to consider the scope of their project and the

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**Nationwide Children’s Hospital ED Improvement Team**

- Barb Abdalla, ED Nursing Director, RN
- Terri Dachenhaus, RN Supervisor
- Greg Stewart, ED Operations Advisor and Assistant Professor of Pediatric Emergency Medicine, MD
- Veronica Weber, Process Improvement Specialist
- Jon Schuller, Business Manager Emergency Medicine

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metrics they would use to measure progress. “We knew that we wanted to focus on flow, but the emergency room is a huge entity, so what part of that do we focus on, and then what is important for us to measure?” recalls Veronica Weber, Process Improvement Specialist. “The training was helpful to take us out of the hospital and give us some time to develop that plan.”

While at AEH the improvement team used value-stream mapping to examine flow for lower-acuity patients. They split the end-to-end lower-acuity process into steps prior to seeing the initial provider and the steps once with the provider (see ED Lower-Acuity Flow Map):

- **Prior to provider:** 12 minutes of patient-care time and 44 minutes of patient-wait time for the four process steps of registration, vitals, roomed, and RN assessment.
- **With provider:** 21 minutes of patient-care time and 9 minutes of wait time for the three process steps of initial provider, discharge, and environmental services (EVS).
- **Secondary patient flows:** RN assessment prior to having a patient roomed and/or patient orders (e.g., labs), if applicable.

**ED Lower-Acuity Flow Map**

![ED Lower-Acuity Flow Map Diagram](source: Nationwide Children's Hospital)
The improvement team analyzed process problems using fishbone diagrams (see Fishbone Analysis of Blue-Pod Problems), segregating the LOS problems into four general causes — process, staffing, orders, and miscellaneous — and identified root causes, which allowed them to explore opportunities for improvement.

The process problem causes were batching, lack of standard work, and poor communications. For example, patient-flow coordinators (PFCs) — more experienced nurses who facilitate patient flow — assigned patients to rooms across all acuity levels and pod areas of the ED. But their attention was, as expected, on higher-acuity patients; lower-acuity patients were often batched until the PFC had time to move them into rooms. This would lead to situations where blue-pod rooms were available, but lower-acuity patients had not been assigned rooms by a PFC.

A big takeaway for the team, recalls Schuller, was understanding how the PFCs were responsible for the entire ED: “When they got caught up, busy, and pulled for things with higher-acuity patients, the priority of being able to watch and keep the flow moving in blue pod came to a halt. They were the only ones that could assign the rooms.”

Terri Dachenhaus, RN Supervisor, says the PFCs batched rooms because they were trying to balance and prioritize patients among all of the ED assignments, regardless of acuity level. Yet this process was unnecessary and a carryover from the previous ED.

Dr. Stewart notes that batching migrated throughout the ED value stream and was eventually passed on to the physicians, which included them writing their discharge orders in batches. “You see the whole downstream effect. In the clinical world you don’t think of it in terms of batching, like in manufacturing, but essentially the same impact was happening.”

With this knowledge of why batching occurred in the ED, the team began to examine ways to move blue-pod room assignments from a centralized one-person-managed system to a pull system, one in which lower-acuity patients are “pulled” into rooms as rooms became available. The team identified the
opportunity to amend the PFC role within blue pod, which could help to eliminate the blue-pod constraint.

The improvement team found that even when rooms were efficiently assigned to lower-acuity patients, they might not immediately get physically moved to a room. “Sometimes in the computer, patients were cybered into a room [shown as assigned to a room], but they weren’t physically in the room,” says Dachenhaus. “There was a delay of 10 to 20 minutes, which showed our inefficiencies. The provider would go in there to see the patient, but they weren’t there. The RN would go in to do their assessment, and the patient wasn’t there.”

The improvement team identified an inconsistent process for staff — patient care assistants (PCAs), medics, suture technicians — for moving patients to rooms. Standard work was lacking and resulted in delays. “Lack of standardization created confusion.” says Dr. Stewart. “When we saw there was a need in triage, we would send staff to assist. In some of our focus group meetings, staff reported they would go to triage, but could not find the patient and would not know how to help.”

Mapping and analysis helped the team to recognize the two distinct processes for getting lower-acuity patients in rooms — when a room is available (direct to room and complete RN assessment there) and when rooms were not available and the patient waits (which is when the most variability in work occurred and where improvements were most needed). The team saw the opportunity to standardize the processes, using guidelines or checklists for those working in the area and those coming in to assist, says Weber. Practices also were put in place to have personnel in the blue pod move patients immediately to a room if they see a room is available, and then record the placement in the computer — rather than vice versa.

The team’s work with some other problem causes, such as staffing, was not as easy to initially address. In some instances it surfaced challenges of improving one piece of a large system without negatively impacting other parts of the system that shared resources. For example, the blue pod usually opens at 8 a.m. Although overall ED visits are higher later in the day, lower-acuity volume is high in the early morning. As the day progresses, the blue pod is then impacted by an increase in overall ED visits, with staff being pulled to higher-acuity patients. The team is trying to ensure that the blue pod opens promptly at 8 a.m. or earlier, which can help keep up with the day’s demand to come, but additional staffing has not been available to address later-day demand issues. The team has, though, examined patient volumes to get a better sense of the “breaking point” in the day in order to proactively shift resources accordingly and if possible.

Insufficient awareness of overall patient flow in the blue pod also was impacted by a lack of teaming (physicians, nurses, patient care assistants, etc., working collectively) and functional work silos; some nurses felt responsible for certain rooms rather than being aware of the flow needs of the entire low-acuity patients. “There wasn’t much communication, especially with the blue pod,” notes Dachenhaus. “We had suture techs doing procedures and we had nurses and nurse practitioners [going about their roles], but they weren’t collaborating and communicating as well as they could have been.” The AEH project
heightened recognition of this issue, prompting the improvement team to plan and develop practices that should create a more cohesive blue-pod staff.

**Tangible Changes, Measurable Results to Come**

Following their AEH training, the improvement team established LOS goals of 65 percent of lower-acuity patients discharged in 120 minutes or less by March 2015, and 80 percent of lower-acuity patients discharged by July 2015. In mid-March the goals had not yet been achieved — with higher censuses, higher behavioral health patients, and higher boarding of patients challenging the team’s measurable progress. Improvement was, nonetheless, underway.

Dachenhaus says the improvement project has raised awareness of improved ED staff teamwork, communication, and focus on flow, and that ongoing consistency of work, dialogue, and feedback will move the project toward its goals: “It’s gotten more people engaged in understanding what we’re trying to do and on board with this project… I think it will come around, and we’ll start seeing the positive impact this project is going to have for our patients and for the care we provide.”

The focus during AEH training, says Schuller, was on “how to think of things differently, which we came back and brought to the teams, the different disciplines, and all our different groups. We’re sharing that concept and throwing out a different way to think about flow. And it really seems to be catching on.” He says the improvement team is gradually overcoming the biggest barrier — changing ED culture and the fear of change.

Helping the team’s efforts for establishing a different way to think about work were the use of the focus groups early on during the project and ongoing interdisciplinary monthly meetings with staff (PCAs, providers, nurses, nurse practitioners, etc.). Those sessions also helped the improvement team to find leaders within each discipline who described and documented their roles — how they performed their work and the issues they encountered. (The ED has about 100 nurses, of whom 12 have been identified as lead nurses for the blue pod.) The discussions also surfaced differences in work relative to day or evening shifts and how activities and roles change when rooms are not available.

Based on the discussions and team analysis, Dachenhaus created a list of roles and expectations for each provider group, which was shared via email and posted in the blue pod. “There was a standardization of expectation,” says Dr. Stewart. “We thought everyone’s expectations were defined clearly at first, but one thing we learned is that people’s interpretations of what was expected really relied heavily on their past experiences.”

Different groups of providers had different habits, and as new staff came to the blue pod they, too, would bring varied work habits. This realization led the improvement team to implement huddles and to rely on the new lead nurse roles to guide staff. In the huddles, work groups come together every four hours to discuss the expectations, how to work collectively in a consistent manner, and interpret as a group how they should address the day’s conditions. The lead nurse works an entire shift, helping to maintain flow...
throughout the shift even though nurses may be coming in every four hours. Dachenhaus says she coaches
the lead nurses for a few hours each day to help standardize their role and “bring a lot more consistency
and stability to the group.”

“They’re going to know the process every time,” says Dr. Stewart. “That way, even though different
people might come in to different roles, there is a lead nurse who can lead the project every day, so
there’s less variation in interpretation.”

The improvement team also used information gathered in focus groups and meetings to change the
passive approach to patient flow. For example, some staff and disciplines were unlikely to look for
problem areas outside of the area to which they were assigned, instead waiting for instructions or waiting
for patients to be brought to them. “Now it’s really starting to create a culture of understanding flow and
understanding that we can’t wait for the next patient,” says Dr. Stewart. “We just keep moving. That’s
created more of a constant turnaround of patient rooms.”

A visual management system will help staff know where to help, when to pull patients, and how to react
to conditions in the blue pod (e.g., reallocating resources). “Currently, there are a lot of times it’s just up
to the person who’s on [staff] and the decisions of what their thresholds are, based on experience,” says
Schuller. “But [we need] to really analyze as a department when we need to react to certain conditions.”
The first step has been to discuss with nurses, clinical leaders, and physicians the conditions and measures
that warrant a reaction (e.g., patient wait time in the lobby, time spent prior to an assessment). Once the
reaction indicators have been identified and agreed upon, those measures can be put into an EMR
dashboard as predictors of when the blue pod is approaching constraints.

Other changes that the improvement team is studying and working to implement are:

• **Implement more consistent start times for providers and coordinate the times and locations of
  providers within a team (e.g., joint physician and nursing assignments):** “Things aren’t always
  lined up of where they start and where they’re going to be seeing their patients,” says Dr. Stewart.

• **Address lower-acuity patients who require orders (meds, labs, x-rays):** 26 percent of all lower-
  acuity patients required an order, but 70 percent of those with an LOS of greater than 120 minutes
  required an order, indicating that if orders could be initiated sooner in the patient-flow process the
  LOS could be reduced. Nurses in the triage area may be used to initiate orders if sufficiently
detailed with protocols.

• **Examine and improve the discharge process:** The team recognized that getting patients out of the
  ED was as important as getting them in, says Weber. “One of the things we’re stilling working on
  is who can discharge the patient? It’s not just the RN. The NPs also are working on trying to help
  facilitate getting them out as well, if the RN is busy.”
Early during the AEH training and improvement project, the team had hopes to develop some blue-pod autonomy. For many reasons that approach is proving to look “better on paper than in reality,” says Dr. Stewart. The team is trying, though, to control what it can in the blue pod without negatively impacting other ED areas. (The team originally was encouraged to scope their improvement project down from the entire ED, and chose lower-acuity patients because it is a more controlled environment.)

More important, successful changes to the blue pod will help the team to eventually roll out proven practices and concepts to higher-acuity patients and other parts of the ED. This will be necessary because the ED cannot become optimized for lower-acuity patients at the expense of higher-acuity patients — all areas eventually will need to improve together.

“It’s only been [two months] that many of the changes have been put in place,” notes Dr. Stewart. “The challenge has been to get this process rolling seven days a week on all shifts. I think we’re making progress on the education, but we’re definitely still seeing variability. On the days that we do [execute as designed] and we know the people who are on [staff] are trained and working, we see great results… We have evidence that it works. When we follow the process implemented, patient flow is improved. Now we need to continue educating everyone so we know they understand and will follow the process created.”

**AEH Commentary**

The improvement project at Nationwide Children’s Hospital illustrates the challenges of improving one process (lower-acuity care) that shares resources in a larger system (overall ED). Not only is the lower-acuity blue pod subject to flexible resources based on conditions throughout the ED — staff pulled from lower-acuity patients to higher-acuity patients — but any changes made to the lower-acuity area cannot negatively impact the whole ED or other processes (higher-acuity care). Yet this shared environment also provides the improvement team an opportunity to positively impact the overall ED, eventually migrating process improvements to other parts of the department.

As the team worked to overcome batching and lack of standardization and teaming in the ED, they learned that even though staff have moved into a new, reorganized facility, many legacy processes and ideas migrated with them from the previous space. The use of focus groups, monthly meetings, and daily huddles is helping the improvement team change the culture in the blue pod, which, too, should then disseminate throughout the ED.

The work at Nationwide Children’s Hospital also shows a best practice for learning and improving any process — getting regular input and feedback from those intimately familiar with the process. In focus groups and monthly meetings, the improvement team gained valuable insights from staff, identified problems and opportunities, and identified leaders for roles who could help them to establish standardized work and build buyin for the changes that needed to be made.
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.

Emergency Department Flow — Contacts

- Jonathon Schuller  
  Business Manager Emergency Medicine  
  Nationwide Children’s Hospital  
  614-722-4396  
  jonathon.schuller@nationwidechildrens.org

- Margaret Pennington  
  Faculty Director  
  The Academy for Excellence in Healthcare  
  The Ohio State University  
  614-292-3081  
  pennington.84@osu.edu

For Program Information

- Beth Miller  
  Program Director  
  The Academy for Excellence in Healthcare  
  The Ohio State University  
  614-292-8575  
  miller.6148@osu.edu