# Improving ED Flow through the UMLN II

Good Samaritan Hospital Medical Center
West Islip, NY
437 beds, 50 ED beds
http://www.goodsamaritan.chsli.org

Good Samaritan Hospital Medical Center, a member of Catholic Health Services of Long Island, serves the community on the south shore of Long Island in West Islip, New York. In 1995, Good Samaritan was designated a Level II trauma center. Good Samaritan's ED serves over 100,000 visits per year.

## The Problem

Good Samaritan's LWBS rate (2.1 percent) is close to the national average (2.0 percent) [http://www.ahrq.gov/qual/nhqr07/Chap4.htm]. After reviewing their data, ED leaders found that 87 percent of LWBS patients are triaged as ESI III [http://www.ahrq.gov/research/esi/esihandbk.pdf ], and the highest LWBS rates occur among a subset of ESI III patients presenting with one of the following six chief complaints: abdominal pain, flank pain, headache, pregnancy complication, vaginal bleeding and vomiting. From December 2008 to February 2009 the ED saw 11,714 ESI III patient visits. Of these 622 (5.3 percent) were from the subset described above. The LWBS rate for the ESI III subset was 12.5 percent, compared to 3.3 percent for other ESI III patients.

## The Solution

Under the Urgent Matters collaborative, Good Samaritan implemented a strategy to immediately direct a subset of ESI III patients to a dedicated physician and NP.

## STEEP

- Safe-- With Mid-Track, the ED is able to expedite treatment for a subset of ESI III patients) whose conditions can potentially become life-threatening. It also reduces left without being seen rates for this patient population.

- Efficient—With Mid-Track, the ED can serve higher patient volumes.

- Patient-Centered—the Mid-Track environment is quieter and less busy than the main ED. Providers are able to spend more time caring for each patient.

## Results

Between December 2009 and February 2010, the ED saw 11,071 ESI III patient visits, 731 of which were from the subset. The LWBS rate for the ESI III subset was 4.9 percent, a statistically

significant improvement from the prior year despite the rise in patient volume. The LWBS rate for other ESI III patients remained unchanged at 3.3 percent. The strategy is favored by staff and well received by patients.

**Background**

In 2007, Good Samaritan's LWBS rate reached 3.5 percent. After further analysis, the ED discovered that 75 percent of LWBS patients were triaged as ESI III, 85 percent of which presented with one of six chief complaints (abdominal pain, flank pain, headache, pregnancy complication, vaginal bleeding, and vomiting). The LWBS rate for this subset of ESI IIIs was 3.7 percent, compared to 3.1 percent for all ESI III patients and 2.1 percent for all ED patients.

In addition to having the highest LWBS rates, this subset also has the longest physician wait times—the median time is 78 minutes, compared to 48 minutes for all ESI IIIs. Part of the reason is that these patients fall in the middle—complaints too complex for Fast Track, yet not serious enough for direct admitting to the ED. However, the potential for these conditions to become life-threatening while waiting to be seen is a major patient safety and quality of care concern.

Previous attempts to address the needs of these patients have been marginally successful. The first attempt created a fourth district in the ED specifically for ESI III patients. Unfortunately this strategy was piloted during one of the busiest months in the ED, causing the remaining districts to become quickly overburdened. Initial data showed that the district model clearly benefited ESI III patients presenting with abdominal pain—their LOS decreased by about an hour—however the LOS for chest pain patients increased. For these reasons the ESI III district was terminated after approximately one month.

The second attempt increased the ED's capacity to hold patients. Since expanding the ED was not an option, the ambulatory surgery unit agreed to let the ED use its space from 4p.m. to 12a.m., Monday through Friday. The space was considered for many different types of patients but ultimately, it was used as an observation unit (the "O" unit) for patients who would likely be discharged but needed to wait for test results or consults, which could take several hours.

Although the unit was not specifically restricted to ESI III patients, the vast majority of patients sent to this unit were ESI IIIs. These patients are brought upstairs to the ASU and cared for by a Nurse Practitioner until their test results are ready. Initially, ED physicians resisted sending patients to the O unit because:
(1) They couldn't keep an eye on them once they went upstairs, and;
(2) Another patient would eventually take their place in the main ED which meant being responsible for two patients now instead of one.

To prompt physicians to start using the O unit, the ED Chair used to "troll for patients" in the main ED who could be sent upstairs. Nurse practitioners in the O unit were also very aggressive about calling the main ED to find out if there were eligible patients for their unit. After some time, physicians adopted the idea and began to send patients to the unit. Eventually, staff started

asking whether the unit's hours and days of operation could be expanded. The O unit evolved into the current strategy, Mid-Track.

The decision to implement Mid-Track was based largely upon the ED's prior efforts to improve care for its ESI III patients. The Mid-Track was considered the most likely to have a notable impact on LWBS rates, particularly among the subset of ESI IIIs presenting with one of the six chief complaints..

Additionally, some of the preliminary steps necessary to implement the Mid-Track had already occurred:
(1) The benefit to patients with abdominal pain had been demonstrated with the ESI III district, and;
(2) The space, staffing (NPs and LPNs) and staff buy-in for Mid-Track had been obtained through the establishment of the O unit. O unit NPs were especially excited about Mid-Track because it would require them to be more involved in patients' care and enable them to make better use of their skill set.

Good Samaritan's decision to participate in the LNII was influenced by three key factors. First was the ED chair's prior participation and overall positive experience with the first Urgent Matters Learning Network at a different hospital. LNI fostered institutional collaboration to address the issue of overcrowding created an opportunity for staff to gain experience making rapid cycle changes, and provided access to consulting services. The second factor was senior leaders' strong support of initiatives designed to improve patient flow. Data showing the impact of patient flow in the ED on the hospital admission rate proved to leaders that ED overcrowding is hospital-wide issue rather than just an ED issue. A third reason for participating in LNII was the local and national visibility.

**Improvement Strategy: Mid-Track**

Mid-Track operates from 4 p.m. to 12a.m., Monday through Friday. At 4 p.m., patients triaged as an ESI III with 1 of 6 chief complaints are seen immediately by a physician stationed in triage (referred to as the Mid-Track physician). This physician conducts an initial evaluation and orders appropriate tests. Six new electronic forms (one for each chief complaint) were created for Mid-Track, functioning as a checklist for Mid-Track physicians. Each form includes:

(1) An abbreviated questionnaire for history;
(2) A couple of standardized questions for the physical;
(3) A list of all orders associated with a Mid-Track patient's chief complaint, and;
(4) Space for free text.

Each section appears on one screen as opposed to separate tabs. Because the form is integrated with the chart, everything entered on the form gets transferred directly to the chart.

Following the physician evaluation in triage, patients are sent upstairs to the ASU where they are received by a NP who coordinates their care with the triage physician. The majority of Mid-Track patients are discharged.

The Mid-Track unit started on August 20th 2009. On average, 13 patients a day are seen in Mid-Track but up to 19 patients have been Mid-Tracked in one day. About 1 to 2 patients are being admitted to the hospital from Mid-Track per day, usually for an appendectomy or D&C. Approximately 75 percent of patients are female, the vast majority of which present with OB/GYN-related complaints. The volume of Mid-Track-eligible patients typically reaches a maximum of 10 patients by 1 p.m. and drops to a minimum of 4 patients between 10p.m. to 11 p.m. These findings suggest that it would be beneficial to start Mid-Track earlier than 4 p.m. However, this is currently not feasible given the hours of operation for the ASU (8a.m. to 4p.m.). Mid-Track operates from 4p.m.–12 p.m., but depending on the census upstairs, patients are no longer admitted after 11:00 p.m to ensure the physician has enough time to complete the assessment and initial workup before the shift ends.

**Implementation**

UMLNII patient flow team members reported that pre-implementation planning took longer than anticipated. Although the strategy selection process was straightforward and many of the resources were already in place, transitioning from the O Unit to Mid-Track required more effort than just "flipping a switch". For instance, the team spent several hours mapping out different workflows for when and where patients are registered, where blood is drawn and where CT scans are performed. It quickly became apparent that the patient flow process for Mid-Track involves more staff members and workflows than originally anticipated. To be able to successfully train staff on such a complex process, the team developed a detailed flow chart. The start date was delayed by 2 months so that this important task could be completed.

Some challenges followed the implementation. First, not having a blood label printer in triage and not being able to print labels specifically for Mid-Track patients turned out to be unexpected barriers to workflow. Since the entire department is only allowed a single label printer, the lab tech has to travel back and forth between the ED, where the printer resides, and triage, where Mid-Track patients have their blood drawn (a significant distance). The inefficiency became apparent when Mid-Track opened at 4 p.m. By this time there are 5 or 6 patients waiting to go to Mid-Track, therefore, the lab tech is already behind. To avoid further delay, a supply of labels is printed in advance and kept in triage. Lab techs use these yellow labels for initial Mid-Track patients to indicate that these tests should be expedited. Once caught up they switch to white labels. Occasionally the tech still needs to go to the main ED to get labels but this workaround has mitigated this issue significantly.

Sometimes when the Mid-Track is slow and the waiting room busy, triage nurses and Mid-Track physicians will send patients upstairs whose conditions are not eligible but could benefit from the level of care provided in Mid-Track. However, for the Mid-Track to operate efficiently, it was found that providers need to comply with pre-determined eligibility requirements (e.g., the 6 chief complaints) and not "stray" when the waiting room becomes crowded (e.g., staff need to "triage the patient, not the room").

Another challenge has been the high volume of patients assigned to Mid-Track after it opens. During the first hour, the NP typically sees 6 patients and by the end of the second hour she may have as many as 9. This workload overwhelmed some of the NPs, so the ED chair responded by sending a resident from the main ED to help the NP on occasion. More commonly, the physician assigned to Mid-Track also steps in to help provide care when the unit becomes busy. This latter approach has proven successful so far and has been integrated into the process as needed.

Training on the patient selection criteria and flow process for Mid-Track was provided to all physicians, NPs, triage RNs, lab techs, and registrars. Staff meetings, notices and letters were used to inform and educate staff on the protocol. NPs and lab techs got it immediately and followed the process without issue, whereas some physicians and nurses initially deviated from the protocol. They were sending patients without one of the six chief complaints to Mid-Track. To address this, the ED leadership continued to reinforce the new protocol. Admitting clerks also required some additional training once Mid-Track started. For example, when a triage nurse identifies a Mid-Track patient, their status in the registration system is assigned as OW. As soon as the admitting clerk sees an OW, they are supposed to register the patient in the triage area.

Although most of the staffing needed for Mid-Track was in place prior to implementation, finding 6 to 7 physicians with adequate experience to staff Mid-Track required more effort than anticipated. To cover 5 Mid-Track shifts, an additional physician was hired to expand the pool of available ED physicians (physicians are not permanently assigned to work in Mid-Track, they rotate). The ED chair also needed to be selective in choosing physicians who "best match that patient population". While their diagnostic approach cannot be too conservative, their utilization rate needs to be low to avoid bringing the Mid-Track to a halt. Most, but not all physicians fit this profile.

Buy-in and support from various stakeholders throughout the hospital facilitated implementation. Before Mid-Track started there was an electric buzz among ED staff. NPs were already accustomed to the role from having previously worked in the observation unit. Following the success of the O unit, staff members welcomed the idea and were eager to see the strategy succeed from the outset. The endorsement of the strategy by departments outside of the ED, such as infection control (IC), was instrumental to the strategy's success. IC can be a major impediment to ED throughput because it must filter all admissions for possible isolation. Inviting IC staff to participate in strategy selection and planning activities enabled the team to address IC's concerns. Senior hospital administrators have been on board with the Mid-Track idea from the beginning. Additionally, staff needed cooperation with the ASU to use its space.

The ED chair's strong leadership and commitment was also cited as an important facilitator. His leadership was necessary to hire an additional physician and lab tech. Further, he was instrumental in getting a dedicated data analyst. He showed his commitment to the project by getting involved in the day-to-day execution and modification of the strategy. During the initial days, he worked the inaugural Mid-Track shift and then alongside Mid-Track physicians to monitor protocol compliance and help them resolve any issues.

The electronic medical record was customized in house to develop the 6 Mid-Track patient forms. The hospital has an IT system that produces data to support the rationale for many process changes. Data helped identify patient populations who stood to benefit the most from patient flow improvement strategies.

Since 2007, the hospital uses a 5-level ESI triage acuity system. This facilitates the process for identifying patients who are eligible for Mid-Track.

Although staff reported that they would have implemented the strategy regardless of their participation in LNII, all agree that participating in LNII facilitated Good Samaritan's efforts for several reasons. First, it provided an opportunity to learn how other hospitals were addressing ED overcrowding, reinforcing to staff that ED overcrowding is a common problem that many hospitals are struggling to improve. Second, it re-energized the patient-flow committee. Good Samaritan had a hospital-wide patient-flow committee that met monthly. However the individuals on the committee did not have the authority to make decisions necessary to affect flow, so it eventually fell by the way side. The CMO, CNO and other department members attend these meetings now, and ideas are acted upon.

LNII mobilized the staff. When something is being done as part of Urgent Matters, it is understood that "this is a commitment we have made and we have to follow through on it." It provides them with a rallying cry.

Finally, LNII encouraged an assessment of all ED patient throughput processes. It also increased the flow of data reporting on patient flow up the chain of command (to senior leadership).

**Resources**

The implementation required the purchase of 12 reclining hospital chairs (total cost $24,000) and one GYN stretcher ($12,000). A construction project ($8000) to remodel the triage bay used for Mid-Track has been planned. It also required an additional physician and a dedicated lab tech. Funds to hire a physician were available in the budget prior to the implementation. Shortly after implemented, ED staff identified the need for a dedicated ultrasound tech due to the high volume of patients presenting with OB/GYN complaints. The ultrasound department agreed to place an extra tech in Mid-Track from 4p.m. to12p.m at no additional cost to the ED.

The UMLNII patient flow team from Good Samaritan spent a total of approximately 65 hours on the strategy. Although it took the team longer than they expected to implement the strategy, the total time is less than the time that other UMLN II hospitals spent on their strategies. Good Samaritan had the advantage that many of the steps necessary to implement the Mid-Track were previously implemented with the O unit process change. The majority of staff time was spent upfront designing the Mid-Track process to optimize patient flow. The ED director department chair spent the most time on the strategy (25 hours), followed by the ED data analyst (13 hours).

**Results and Continual Improvement**

### *Impact on Patient Flow*

Between December 2009 and February 2010, the LWBS rate for the subset of ESI III patients declined from 12.7 percent to 9.6 percent. This improvement is statistically significant, and all the more remarkable considering the 17.5 percent increase in the volume of this patient population during that timeframe. There was also a statistically significant decline in LOS for the ESI III subset.

### *Staff and Patient Perceptions*

Feedback from patients seen in Mid-Track is very positive. They like not having to sit in the waiting room following triage. They think the care they receive in Mid-Track is more "individualized" and attentive, and that the ASU is quieter and less chaotic than the main ED.

Feedback from ED staff is also positive. Mid-Track NPs and LPNs want it to be open longer. NPs like the autonomy, the space and the slower pace in Mid-Track.

Mid-Track physicians are appreciative because they do less paperwork since the NP is able to complete it. Mid-Track patients forms have also been very well received by physicians. They would like to have similar forms developed for non-Mid-Track patients. Working in triage, however, is a new and challenging experience for them—the environment has been difficult to adapt to because it is loud and distracting. The workspace is also much smaller than what they are accustomed to in the main ED.

Charge nurses and physicians in the main ED have reported that the waiting room is less crowded. While this doesn't necessarily affect their workflow it has notably reduced their stress level. Triage nurses "love" having physicians in triage and like that there are fewer patients sitting in the waiting room.

The ED chair has not received a single negative comment about Mid-Track from any staff member. While this does not imply that staff members do not think there is room for improvement, no one is saying that it is a disaster.

### *Sustainability*

Overall, staff members' outlook on the strategy's current and continued success is favorable. They cannot imagine the ED without the Mid-Track and hope it will eventually be expanded to include weekends. Staff members expect that both employee and patient satisfaction will increase as a result of Mid-Track.

More data is needed to determine whether the initial changes observed in LWBS rates and LOS for this subset of ESI IIIs are sustainable. The economic value of the strategy must also be demonstrated before an additional investment in resources is made to expand service.