Organization: Sinai Hospital of Baltimore
Solution Title: Ambulance Immediate Offload Project: Leading to Increased Safety and Improved Care for the Entire Community
Focus Area: Emergency Department
Program Project Description:

Yellow alert is a capacity status, communicated by hospitals to the local Emergency Medical Services (EMS) division of the Maryland Institute for Emergency Medical Services Systems (MIEMSS). The “yellow alert” status results in diversion of all non-emergency ambulance transports to the next closest facility. Diversion is used to allow overcrowded emergency departments (ED) time to recover and decompress (Asamoah, Weiss, Ernst, Richards, & Sklar, 2008; Hitchcock et al., 2010). However, other consequences of diversion often include dissatisfaction and increased risk for patients who are diverted a greater distance to hospitals where they and their primary care providers (PCP) may not be known, delays and decreased efficiency for EMS personnel in responding to 911 emergency calls, and a negative effect on the hospital’s reputation with EMS and the local community (Asamoah et al., 2008; Cooney, Wojcik, Seth, Vasisko, & Stimson 2013; Stead, Jain & Decker, 2009).

Previous attempts to decrease or eliminate diversion had failed due to the resulting increase in ambulance offload delay (AOD). AOD has been defined by the National Association of EMS Physicians (NAEMSP) as the difference between the patient’s arrival time and the time of complete transfer of care, which includes handoff report from EMS personnel to the nurse and offloading of the patient to the ED stretcher (Cooney et al., 2013). Increased AOD results in a delay in the patient’s care and a delay in the availability of EMS for community emergencies (Cooney et al., 2013). Studies have also shown that efforts to reduce diversion time may result in significantly increased AOD because the underlying issues of overcrowding have not been addressed (Asamoah et al., 2008; Cooney et al., 2011). Cooney, Wojcik, Seth, Vasisko, and Stimson (2013) argue that hospitals must focus on decreasing AOD rather than diversion in order to be successful and have an impact on patient outcomes. The Department of Health and Human Services has also expressed concern that excessive AOD could also be a violation of the Emergency Medical Treatment and Active Labor Act in some situations (Cooney et al., 2013). When AOD increases in a Maryland hospital, EMS applies the MIEMSS diversion status, called
“reroute,” resulting in an automatic bypass of the facility and counteracting the facility’s efforts to decrease diversion.

**Problem Description**

Although red alert and trauma bypass are not based on ED resources, yellow alert and reroute reflect directly on the capacity of the ED to receive more patients. Out of the 23 hospitals in MIEMSS Region III, Sinai Hospital had the highest number of combined yellow alert and reroute hours for the nine months preceding the start of this project. Our monthly average was 179.6 hours. Because we used diversion so frequently, our city EMS insisted that we find a solution. However, our efforts to just stop using diversion usually failed because AOD would increase and ambulances would line up in the hallway waiting for an available bed, causing EMS to place us on reroute status (see Appendix A). Through the literature review, we found that this is a common scenario nationwide and is referred to as “parking.” There was a need to find a solution that focused on reducing AOD.

Reduction in Sinai AOD times supports the: 1) Decrease or elimination of yellow alert and reroute hours to improve our patient care outcomes with a more timely treatment of patients, and 2) Enhancement of hospital relations with MIEMSS and EMS and, 3) Improvement of Sinai’s reputation for timely service. But most importantly, EMS could respond more quickly to the emergency needs of the community, improving pre-hospital patient outcomes.

**Baseline Data and Goals**

The outcomes metrics used for this project include total monthly diversion time, measured in hours (defined for this project as combined yellow alert and reroute hours), and average AOD time, measured in minutes. Although an official U.S. national benchmark for AOD was not found in the literature, the legal standard in Nevada is 30 minutes, consistent with the EMS standards in many individual county systems (Barton, Tataris, Backer, & Bartleson, 2013). The Canadian national benchmark is also 30 minutes (Cooney et al., 2013). The Sinai ED average AOD baseline for fiscal year (FY) 2013 (July to March) was 26 minutes. The baseline for average monthly diversion hours for FY 2013 (July to March) was 168 hours. Goals, set at the onset of the project include total diversion hours (yellow alert and reroute) less than or equal to five hours per month, and average AOD less than or equal to 10 minutes.
Process

Sinai uses the Rosswurm and Larabee (1999) “Model for Change to Evidence-Based Practice” to promote evidence-based change. This model provides a guide for problem identification and definition, literature search and appraisal, solutions development, and integration of solutions into practice (Rosswurm and Larabee, 1999). By following this model, our solution will be based on the best available evidence and will be more sustainable.

Solution

The purpose of this project was to alter patient flow patterns in the ED so that ambulance patients could be received immediately and EMS personnel could be freed up to respond to the next waiting call. Three new roles were introduced to help redirect patient flow and allow for immediate offloading of ambulance patients: Ambulance Triage Nurse (ATN), Throughput Nurse (TN) and Throughput Critical Care Technician (TCCT). The concept of these new roles was envisioned by Director Diane Bongiovanni, MA, BSN, RN, CHEP, NEA-BC. The project was led by Clinical Leader Amy Riesner, MSN, BSN, RN, CHEP, NREMT-P, who also communicated the process to EMS and worked with them to improve the EMS-nurse transfer process. Senior ED nurses, Lakecia Lewis, BSN, RN, CEN and Alma Ta-Asan, BSN, developed and piloted the roles and created role descriptions and guidelines to help standardize the expectations. Many staff nurses were involved in evaluating, through assessment and trials, the details of how these roles would operate to be most effective in the ED. The finalized role descriptions and guidelines were then incorporated into ED processes.

Initially, these roles were set up to operate between the hours of 11:00 a.m. and 3:00 a.m., although the charge nurse was allowed to reassign the staff after 1:00 a.m. based on ED census and throughput needs. The ATN is assigned to the ambulance bay and receives ambulance arrivals immediately onto stretchers in the hallway, allowing EMS personnel to leave as soon as handoff report is completed. The ATN initiates care and a physician, aware of the patients through electronic documentation, will respond to the hallway if needed. The TN is responsible for managing and facilitating the flow of all patients through the ED. The TCCT assists the TN in facilitating the movement of patients. The new process was initiated on April 1, 2013.
Measurable Outcomes

A log was kept by the ATN for all ambulance patients. In addition, patient offload times were captured in the electronic tracking system. The average AOD time, has been less than 7 minutes per month since the project was initiated, meeting the goal of less than or equal to 10 minutes (see Exhibit A, Sinai ER-7 Average Ambulance Offload Delay).

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<tbody>
<tr>
<td>AOD</td>
<td>26</td>
<td>5.1</td>
<td>3.6</td>
<td>6.6</td>
<td>6.5</td>
<td>6.6</td>
<td>5.7</td>
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<tr>
<td>AOD Goal</td>
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Exhibit A, Sinai ER-7 Average Ambulance Offload Delay

The total diversion hours for April 2013 through June 2013 was less than five hours total, meeting the goal of less than or equal to five hours per month (see Exhibit B, Sinai ER-7 Total Monthly Diversion Hours).

<table>
<thead>
<tr>
<th>Hours</th>
<th>Jul 2012 - Mar 2013 Avg/Month Baseline</th>
<th>April 2013</th>
<th>May 2013</th>
<th>June 2013</th>
<th>July 2013</th>
<th>August 2014</th>
<th>Sep 2013</th>
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<tbody>
<tr>
<td>Monthly Reroute Hrs</td>
<td>11.6</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>0.21</td>
<td>0</td>
<td>0.1</td>
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<td>Monthly Yellow Alert Hrs</td>
<td>168</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3.63</td>
<td>0</td>
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<tr>
<td>Total Monthly Yellow/Reroute Hrs</td>
<td>179.6</td>
<td>0.2</td>
<td>0</td>
<td>0</td>
<td>3.84</td>
<td>0</td>
<td>2.1</td>
</tr>
<tr>
<td>Monthly Yellow/Reroute Hrs Goal</td>
<td>100</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
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</table>
Exhibit B, Sinai ER-7 Total Monthly Diversion Hours

The significant drop in both AOD and diversion hours has impacted our patients, our hospital and our community. The ATN is able to assess and start treating the patient very quickly, if not immediately, leading to more timely interventions and better outcomes. The ability to release EMS personnel quickly has meant better EMS response times for patients in the community who may be acutely ill. In September 2013, Sinai ED, with the second-highest number of ambulance arrivals, was ranked number one by Baltimore City Fire Department for percent of ambulance patients offloaded within 20 minutes! (Baltimore City Fire Department, 2013).

Sustainability

One of the lessons learned during this process was that communication between the ATN and the TN is a key factor in success. This process was implemented quickly in response to external forces. It was budget-neutral, created by realigning nurse assignments. The roles were firmly defined so that the process could be hardwired, especially during times of stress. However, there is not a provision for a transition of roles when ambulance census is low or the ED is not holding many admissions. The project team continues to look for ways to improve the process. Improvement in handoff communication among the team and improved critical thinking in the movement of patients could improve sustainability. Nurses are currently working on a workgroup to find ways to improve utilization of these roles and also to enhance the privacy and comfort for these hallway patients. Future construction plans include a specified holding room for offloading ambulances.

Time Frame

The roles were initiated on April 1, 2013. Data is collected monthly. Initially, these roles were set up to operate between the hours of 11:00 a.m. and 3:00 a.m., although the charge nurse is allowed to reassign the staff after 1:00 a.m. based on ED census and throughput needs. There has been discussion among stakeholders of increasing this time period. This project will be monitored for six months if the goal continues to be met. If the goal is not met, monitoring will continue for one year and then be re-evaluated.
Collaboration and Leadership

This was a highly collaborative project with strong guidance from leadership. When faced with a possible break-down in the hospital-EMS relationship, a solution had to be found quickly. The process of change is always difficult, especially in a fast-paced, critical environment where every second counts. The vision, encouragement and support of our leadership along with the hard work and commitment of the staff is what made this work. Physicians, nurses critical care technicians (CCT) and pre-hospital leadership worked together through meetings, emails, phone conversations, brainstorming sessions, workgroups and live trials to develop a workable and sustainable solution. By setting expectations in the beginning and monitoring our progress, we have kept our staff informed and engaged.

Innovation/Conclusion

The solution is innovative in that it is not a solution we have seen elsewhere and it significantly changes the context for provision of emergency care for ambulance arrivals. Our solution demonstrated extraordinary, measurable results and has sustained these results consistently for five months. Our solution drew upon the combined efforts of ED leadership, staff nurses, CCTs, physicians and EMS leadership, exhibiting strong collaboration. Our ED director not only envisioned this new process, but provided the necessary time, resources and support to achieve it. The strength and commitment of our leadership was a key factor in the success of our innovation. We believe we have advanced the culture of patient safety, not only for our own patients, but also throughout the greater Baltimore area. Pre-hospital personnel report that when ambulances are “parked” at hospitals in one area of the city, they are pulled from anywhere else they can be found, decreasing the resources available in all areas (and delaying the overall response). Sinai Hospital’s solution has wide-ranging implications for improvement in our ability as a community to respond to patient emergencies, both inside and outside of the hospital.
References


Appendix A

Traditional Responses to ED Overcrowding
Appendix B

Project Team

Diane Bongiovanni, MA, BSN, RN, CHEP, NEA-BC, Emergency Department Director of Patient Care Services

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Will Williams, Captain, EMS Quality Assurance / Improvement Officer, Baltimore City Emergency Medical Services

Christian Griffin, NREMT-P, Fire Director, Baltimore County Emergency Medical Services