

Decreasing ED Ambulance Diversions at Providence Health System in Alaska

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A recent study by the National Center for Health Statistics found that, on average, an ambulance in the United States is diverted every minute to another hospital due to emergency room overcrowding. The study, to be published in the journal *Annals of Emergency Medicine*, underscores the fact that this is a nationwide problem, and that ED diversions often produce a negative chain reaction in the system.

Six years ago, the rising number of ambulance diversions at Providence Health System in Alaska had begun to surface as a noticeable issue. By 2000, the ambulance divert rate increased from 3 percent to 5 percent, and tripled in the following year to 16 percent.

In 2002, the divert rate peaked at 21 percent and the hospital embarked on an ambitious improvement initiative to address the issue. The results of the initiative led to the implementation of a series of policy and process changes. The hospital also developed a Web-based inpatient capacity tool to assist with patient throughput.

The efforts led to some success – reducing the divert rate in 2003 to 12 percent and in the first three months of 2004 to 8 percent. The organization assumed that policy and process changes were effectively decreasing the incidence of diversions.

Renewed Focus

Despite overall improvement, however, considerable variation persisted over time. In the second quarter of 2004, the diversion rate tripled to 24 percent and peaked in the month of July with the ED being on diversion 51 percent of the time.

To analyze and correct this issue, a Six Sigma project was chartered in June 2004. Along with the focus on metrics, GE's Change Acceleration Process (CAP) and Work-Out tools were introduced to address cultural issues and help facilitate effective decision-making based on credible data.

The project focused specifically on reducing diversions as a result of critical care at capacity to zero, and reducing diversions as a result of ED at capacity to 3.4 percent. The established timeline to achieve the target rates was 1.5 years, or by the end of 2005. The project was actually completed well ahead of schedule in January 2005.

Department managers were initially skeptical since diversion was seen as a way to control patient flow on the inpatient floors and in the ED. Physicians had mixed reactions. Some felt the hospital should never divert for any reason and others felt diversion was a reasonable tool to promote safety, especially during times of high capacity and stress. Change management tools and support from a new emergency department manager helped the team gain consensus and sustain improvement.

Providence, Alaska Six Sigma Team ED Ambulance Diversion Project

An interdisciplinary team of Green Belts initiated the project:

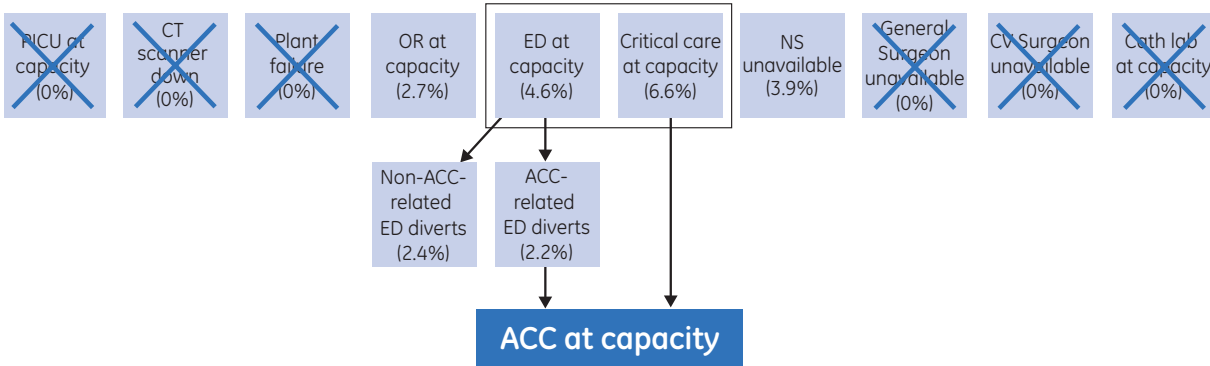
- Dave Ingraham, MD, Green Belt, ED Medical Director
- Roy Davis, MD, Green Belt, Chief Medical Officer
- Dana Montgomery, Green Belt, Financial analyst
- Katha Boucha, Master Change Facilitator

During the analyze and improve phases, the team expanded to include:

- Barb Simonsen, Trauma Coordinator
 - Judy Ori, ED Clinical Manager
 - Jackie Mossakowski, ANE for ED and Critical Care
 - Margaret Auble, Critical Care Clinical Manager
 - Karen Edmondson, Manager Patient Care Resources
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DIVERSION IS ALL ABOUT "ACCESS"



ACC at capacity is the driving factor in 79 percent of all diversions due to ED and critical care at capacity

Examining the Data

During the initial phases of the project, the team first had to reconcile sources of information. Multiple data sets on the same episodes of diversion led to varying interpretations of the meaning of diversion data. The use of CAP and Work-Out tools enabled the team to reach agreement on a common data set to be kept in one location that could be easily accessible by all stakeholders. This transparency helped reduce the "incorrect" interpretation of diversion data.

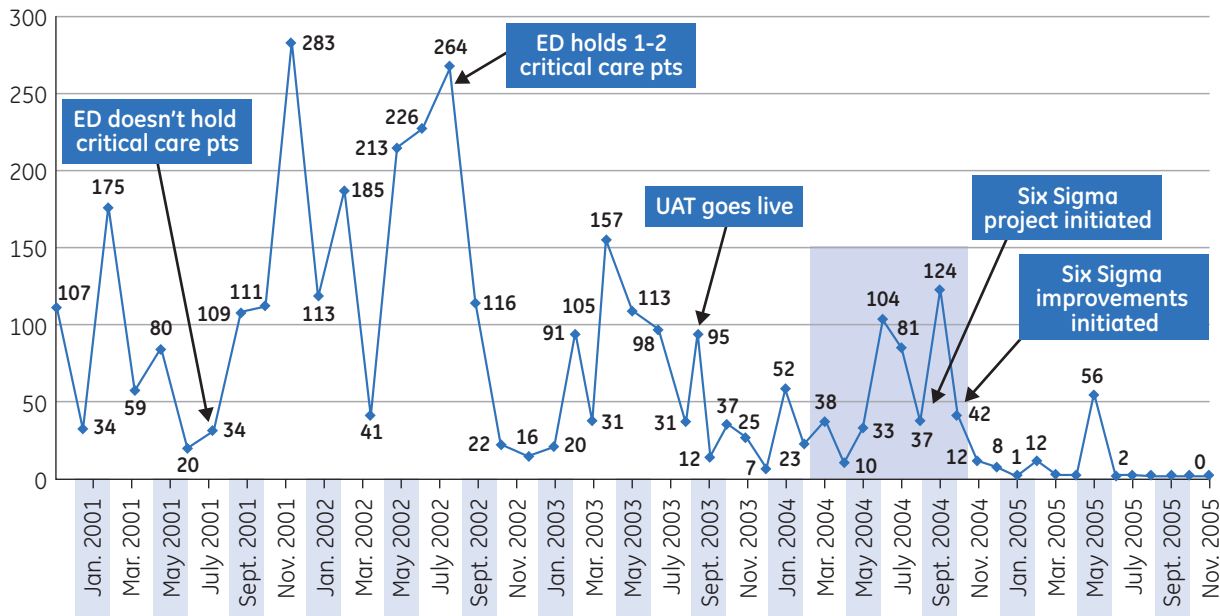
Early analysis estimated the average cost for one hour of diversion was \$3,400. Realizing the financial impact helped to change perceptions from senior management and line staff. The data also clearly indicated that the solution must be focused on the critical care unit.

Before the new standard operating procedures were put in place, there was little rigor around accurate data collection within and among various data sets. Different departments maintained multiple data sets on the same diversion episodes. Definitions and time stamps were not standardized, and access to the various databases was restricted.

Clear definitions were established for each type of diversion. Data entry was simplified and made electronic so that raw data entries were all saved in an electronic record. Time stamps were agreed upon and became part of the SOP for generating the summary diversion sheet.

In addition, the electronic data entry page was designed to reduce entry errors. An SOP was developed so the raw data could be accurately summarized and the summary sheet was made available on the hospital intranet. The roles of the individuals responsible for data entry and the creation of the diversion summary sheet were clearly defined to reduce variation in the interpretation of the raw data and its translation to the summary sheet.

Critical Care Diverts 2001-2005



Data-Driven Solutions and Results

As the data collection process became more rigorous and common misinterpretations of data were corrected, the team was able to focus on solutions for the most significant and frequent causes of diversion. Most dramatic was the demonstration that disproved a previously held assumption regarding critical care diversions.

Prior to rigorously defining and measuring the categories, it appeared the majority of diversions occurred because no critical care bed was available. Further investigation, however, revealed that the majority of the time “no bed available” was indicated, it was actually because there was no staffed bed, which would indicate staffing issues, rather than a physical bed-limitation issue.

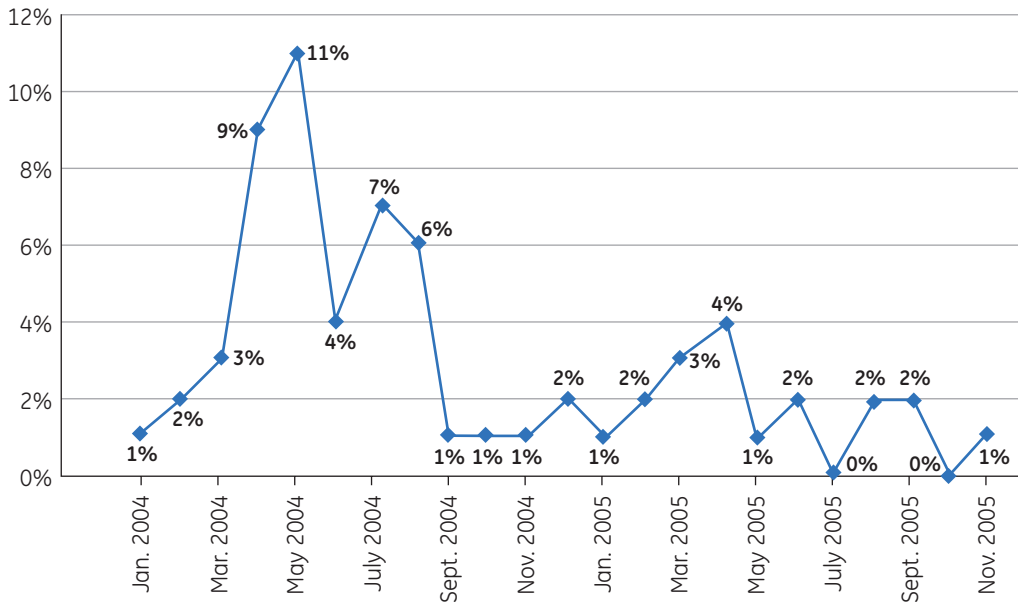
The statistical analysis led the team to identify and implement a number of solutions, including the following:

- New SOPs were created for the collection of diversion data
- An electronic data-collection tool was developed
- SOPs were developed for the translation of raw data to a summary sheet
- Diversion summary data was published on an accessible hospital intranet site

- Goals and targets for diversion were established
- Staff was educated on the importance of length of stay as a contributor to staffing needs in the adult critical care unit
- A high census policy was developed to correct resource issues before a diversion became necessary
- An interventional cardiac recovery unit was developed to reduce burden on the critical care unit
- Alternatives were established for placement of critical care patients with prolonged length of stays
- Critical care house conveniences were identified at times of high census
- The team recommended proper use of float pool staffing for unexpected vacancies rather than supporting core staffing

The project successfully increased net revenue by \$1.04 million on an annualized basis. The hospital was able to decrease diversions due to critical care at capacity by an average of 26 hours per month. Keys to success included adherence to a well-defined diversion policy with very clear definitions and determining the average cost of an hour of diversion. The transparency of data also helped to reduce misinformation and its impact on the organization.

Percentage of Hours ED at Capacity 2004-2005



Organizational Learning and Growth

Among the qualitative results coming from the project, the team was able to benefit from substantial organizational learning through the trials and the successes achieved. This occurred in cycles of reflection that created the platform for the next discovery and learning, and built an awareness of several important considerations:

- Value of accurate data and transparency
- Importance of understanding and communicating the cost of diversions
- Power of uniting around a clear, unified goal
- Impact of a policy change on outcome
- Effect of leadership focus and skills to drive culture change

This project also illustrated that unexpected events are sometimes helpful. The new critical care manager was not a predicted event, and although her ability to help change the culture to positively impact diversion rates was not foreseen, it was greatly appreciated. Margaret Auble demonstrated what a transformational leader can do. Her determination and commitment drove a cultural change within the critical care staff to provide the right care at the right time in the right setting.

Summary of Key Project Benefits

- Net revenue increase of \$1.04 million on an annualized basis
- Better patient access through decreased diversions due to “critical care at capacity” by an average of 26 hours per month
- Provided significant opportunities for organizational learning, collaboration and growth

In conjunction with other projects targeting the house-wide admit and discharge process, this effort helped to provide greater access to patient care. It was part of a larger Six Sigma initiative at Providence Alaska that trained six Black Belts and 10 Green Belts. The organization has since trained its own Master Black Belts and is also incorporating Lean into its performance improvement toolset.

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