

Lean business approach helps hospitals run more efficiently

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Implementing a well-established business approach allowed physicians to shave hours off pediatric patient discharges without affecting readmission rates, according to researchers at Penn State Hershey Children's Hospital.

This approach could help hospitals around the country open up existing beds to more [patients](#), and reduce emergency department crowding and lost referrals without investing significant capital.

Most hospitals have a fixed number of staffed beds available for patients. When hospitals are at or exceed capacity, admitted patients may be kept in the ED or "boarding," elective and urgent care may be delayed or patients may be referred to another [hospital](#) that can accommodate them. Nationwide, these limitations in access to care are producing overcrowding and safety concerns across [health care organizations](#), specifically in emergency departments.

Reducing inpatient discharge delays could free up beds and improve patient flow without compromising quality of care.

To investigate how to discharge patients more efficiently, Michael Beck, associate professor of pediatrics at Penn State College of Medicine, and a physician at Penn State Hershey Children's Hospital, turned to Lean Six Sigma, a methodology widely used in other industries. LSS aims to improve effectiveness and efficiency by eliminating waste in hospital processes.

"Lean Six is designed to reduce delays, defects and deviations through waste elimination and creation of standard practices," said Beck. "It emphasizes creativity over capital by finding the most efficient sequence of steps in a process to improve quality without adding significant costs."

Process changes were implemented in the Children's Hospital's Division of Pediatric Hospital Medicine to reduce discharge delays from the general pediatric service.

In most academic medical centers, teams led by an attending physician staff rounds. Depending on the size of a service line, a single attending physician may oversee as many as 15 patients. With rounds typically lasting about 180 minutes, each patient is seen for only 10 to 11 minutes. This model rushes doctors; limits the amount of time they spend with patients, residents and medical students; and ultimately delays discharge times because there is insufficient time to conduct the entire discharge process at the bedside.

For this study, the researchers formed an additional rounding team, creating two functional teams each consisting of an attending physician and at least one senior resident and one intern. They worked in parallel and divided the caseload equally. They also introduced discharge checklists to standardize the process and completed each patient's departure paperwork at the bedside. Another aspect of the intervention introduced an evening team huddle including all support staff to identify and eliminate barriers for patients the hospital planned to discharge the next morning.

Over the six-month study, the Lean Six interventions significantly sped up discharges in the intervention group, when compared to historical controls. The intervention allowed the entire discharge by 10:45 a.m. compared to 2:05 p.m. for the control group, a 200-minute difference. The median time of discharge was 93 minutes earlier in the intervention

group than in the control group. The researchers published their results in the *Journal of Hospital Medicine*.

"We successfully eliminated an hour-and-a-half off all of our discharge times—consistently, predictably and reliably—for the busiest months of the year," Beck said. "We were discharging 45 percent more patients per day, faster than the control groups, without increasing length of stay or increasing 7, 14, or 30-day [readmission rates](#)."

The Children's Hospital diverted only one referral during the study, compared to 20 during the same six-month period the previous year. The financial effect was estimated at between \$275,000 and \$412,000 in additional revenue. ED boarding hours – the time patients waited without an available room for inpatient admittance – were reduced by 22 percent.

As discharge delays decreased, patient satisfaction increased. Surveys found that 75 percent of patients said they would recommend the hospital to others, compared to 53 percent before the study.

Physicians within the group were also more satisfied with the new model. This is important, because staffing two teams meant that doctors worked an average of two to three extra weeks during the intervention period. Despite this, 100 percent of them voted to continue with the new model.

"We spend more time in the patients' rooms, engaging them in discussions and teaching the residents and med students," Beck said. "So not only does this newer model appear to be effective and more efficient, it appears to be a staff and customer satisfier, which are key elements in sustainability."

Also working on this project was Kirk Gosik, department of public

health sciences, Penn State College of Medicine.

Provided by Pennsylvania State University

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