Tapping into employee expertise and experience to create highly efficient healthcare spaces **O**

The architect architect us



By

Mark A. Trotter, AIA, ACHE; Healthcare Regional Leader; Flad Architects For Flad Architects, building a new emergency department for the staff of Mercy Medical Center – North Iowa meant building with the staff. Working within a Lean 3P quality system and utilizing a large-scale kaizen event, Mercy and Flad gathered a team of hospital employees and other stakeholders to design and build a full-scale model of the new ED. To hear them tell it, the team of Flad Architects in conjunction with the local firm of Bergland & Cram Architects was on hand to establish parameters, facilitate the process, and provide the expertise to translate a model into an operational, code- and budgetcompliant space. But the design itself? That came not from the architects but from the nurses, doctors and other Mercy employees.

Flad Architects

Mercy Medical Center-North Iowa





It's not uncommon for a construction project to begin with a box. That box just usually isn't made of cardboard. And architects generally are the ones developing a design, presumably in an office, maybe at a drafting table or certainly a computer, after a series of tours, meetings and interviews. Not so for Mercy Medical Center–North Iowa.









MERCY ED KAIZEN DESIGN EVEN

Its new 25,000-square-foot emergency department was designed in a warehouse, and the people conjuring up the plan were doctors, nurses, EMTs, pastors and custodians seemingly everyone but an architect.

It may sound backward to those who aren't familiar with Lean 3P. Lean is both an operational philosophy and management system modeled after the Toyota Production System. Businesses espouse it to drive efficiency and eliminate waste. Already widespread in manufacturing, the Lean approach is growing more common in the construction and healthcare industries, particularly as the latter faces shrinking margins, skyrocketing costs and increasing regulation.

Lean is multi-faceted and is realized through a variety of tools, exercises and principles. One of those is 3P. Here the 3P refers to people, preparation and process; although different approaches might have a slightly different set d , of Ps. For example, some skip the preparation and focus on product. Regardless, the 3Ps remain constant within an organization's Lean framework, and companies use 3P to identify and correct weaknesses in all facets of operation and to cultivate employee participation in efficiency seeking. This employee engagement is considered key to developing a culture of continuous improvement, one of the fundamental components of a Lean methodology.

Mercy had adopted the Lean quality system in 2006 as the framework for how it would do business. It also espoused an organization-wide commitment to process excellence. With these two ideologies working in concert, it quickly became clear that there were inefficiencies in the emergency department and that the space itself was chief among them.

More specifically, the old ED was somewhat crowded and lacked privacy. Doctors, patients, and family members all utilized the same central double-loaded corridor. The 14 rooms were routinely overtaxed, which meant patient waits were unnecessarily long. Supply storage was inconsistent, so nurses could work with varying degrees of ease depending on where they were treating patients. Nurses frequently walked the expanse of the ED to retrieve suture kits, IV equipment or other supplies. There was little consistency room to room. The inadequate space was taking a toll on all the employees, not just the nurses.

"We had good staff and technology, but a nonfunctional ED," says Jim FitzPatrick, who was then the medical center's CEO. "The reality is that we were at a point ... when we couldn't ask people to spin faster. A lot of well-meaning healthcare organizations would just have people work harder and harder and harder. We couldn't do that anymore. There comes a point when healthcare organizations have to fix the processes and the space."

Fully dedicated to operating within Lean 3P, FitzPatrick insisted on a design and construction approach not simply consistent with it, but instead driven by it.

"I was committed to it to my core." FitzPatrick says. "Mercy Medical Center is a great organization that has won a lot of trophies, but we also had some bad processes that had been created over time and compounded. Our process excellence efforts, though, generated a lot of And in solving this problem – an inefficient ED – FitzPatrick knew that staff needed to be involved. "Staff – they know what's working and what's not working," he says. "As leaders, sometimes we don't give people the permission to get in and fix what's wrong, to get in, explode it, and build it back up from scratch."

success. We were creating a culture top to bottom where everyone is working to be problem solvers every day."

The new ED was an opportunity to build on that trend.

Flad, along with Bergland & Cram, and Mercy used a kaizen design event to gain the bottomto-top input and insight. The paragon of Lean practice and easily the marquee event of any Lean redesign, a kaizen is an intense yet novel exercise in which a team tackles and resolves a problem within predetermined parameters and in a predetermined amount of time. Employees are pulled out of their usual work context and focus exclusively on a single or set of process improvements. Only there were no vitals to monitor. No linens to change. No emergencies at all to tend to. Just the singular task of designing a new emergency department from the ground up. Emergency Department Medical Director Dr. Matthew Schiller says the kaizen event sent a powerful message to the staff involved. "It told them that their input and suggestions were important enough to be paid a week's wages for them," he says.

Mercy reached even further and invited not only employees but also other stakeholders. First responders, a mortician, former patients, even the Mason City mayor dedicated an entire week to the Mercy ED.

The goal was to finish the week with a solid design and plan in place, which was no small order for a group of people who had never designed a building before.

There was a lot at stake and the risks were high, says Schiller, one of the participants in the kaizen event. "It was a daunting task to think page 5

about building a new emergency department from scratch," he says. "This is something that would be in use for 50 years. We couldn't make mistakes."

So when his team was assembled and given orders to design a non-acute team, Schiller says they weren't sure where to start. All they had was an actual gurney in the middle of an open warehouse room, so that is where they began. Nurses figured out where they would want to stand to run an IV, and then the team built an IV cart out of cardboard. They put a cardboard monitor on the wall. When they needed actual equipment, they got it. They used wheelchairs to determine the width of doors.

Over the course of the week they put walls up and tore walls down. They moved outlets and changed doorways. They conducted simulations and ultimately settled on designs that the entire team supported. Schiller says it was an exhausting five days, but one he would gladly repeat because 18 months later when the real walls went up, the finished space looked exactly the way Schiller and the other participants had built it.

"We built our ED before we built it, and we worked in it before we worked in it," he says. "We built a department that works perfectly for how we take care of patients.





MERCY MEDICAL CENTER ED

FitzPatrick says the Lean 3P approach generated some features and insights that may not have emerged from a more traditional design process. Among them are the following.

Dual-door trauma rooms that eliminate bottlenecks by having separate entrances for EMTs and trauma staff.

17 universal rooms that are identical down to cabinetry and even outlet placement. This allows medical staff to operate instinctively and reflexively. Nurses always know when they have to leave room for supplies and when they can find them bedside. "One of the things that was essential in the design was decreased waste, and a big part of the waste that nurses experience is walking," explains Patti Peterson, director for emergency services. "Now they don't have to leave to get the supplies that they use 80 percent of the time. The things they use every day are in the room."

The elimination of electronic or computerized supply machines. The team instead adopted a two-bin manual system drawn directly from the Japanese auto industry. Storage cabinets are stocked from the outside while nurses draw supplies from the inside. Full bins are pulled in. Empty bins are pushed out and refilled by supply chain staff. It's audaciously simple, but it works so long as the staff maintains the process. "If you don't follow the process, you run out of supplies," Peterson says.

Private patient rooms that allow for more frank discussions with patients, enhancing patient care.

Family viewing rooms that afford time to grieve when a loved one is lost. These spaces are critical to the emotional and spiritual side of healthcare, and yet they allow for the universal rooms to be cleared and prepped for the next patient. This design respectfully balances some of the often-conflicting demands on ED space.

A new ergonomic principle. The 2/5 rule guides equipment and supply placement to minimize workplace injuries for employees. In essence, it states that design should minimize reach below two feet and beyond five feet off the finish floor. Elegantly simple, the 2/5 rule emerged organically from the Mercy ED kaizen week. In the first several months post occupancy, Schiller has not found anything he would have done differently. He says the space looks and works exactly as designed and intended. "The department that we built here wouldn't be the perfect department for another department in another state. I don't think we built the perfect ED period," he says. "I think we built the perfect ED for us. I think we went through the perfect process."

Peterson agrees. "For me, it was a gift. I had been through some ER renovations before, but nothing like this. It just wowed me. It's something I never thought I'd get to be a part of," she says. "I know this is all Lean methodology and 3P process, but it is really about the people."

She says both firms, Flad and Bergland & Cram, as well as Mercy leadership sustained

their commitment to staff input throughout construction, reconvening teams whenever equipment or finish decisions were required or to reach consensus on change orders. No decisions were made without the original teams' approval.

While it's still too early for any hard numbers on the renovation's impact on efficiency, Peterson looks forward to data that supports the early positive feedback. She says nurses seem calmer and the entire space is quieter and less chaotic. Schiller, too, expects patient outcomes and satisfaction to reflect the improved employee engagement and contentment.

And regardless of any survey results, Schiller believes that Lean 3P gave Mercy exactly what it needed: "I would go so far as to say I would never build any new construction in healthcare without going through this process."

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