Background
Methodist Medical Center of Illinois in Peoria recognized some time ago that they needed to remodel the triage area at the entrance to their Emergency Department (ED). The reasons were typical of many EDs across the country.

Originally designed to handle 28,000 patients per year, the Methodist ED found itself handling nearly twice that load. Space was cramped. Hospital staff and the physicians of the independent practice staffing the ED were all dissatisfied.

The flow around the registration area was congested with lots of cross-traffic—with patients, doctors and nurses in the mix (see diagram). Patients did not always know where to go. Confusion spilled into the treatment area, where patient flow was uneven. (Fig. 1, a, b.)

In the waiting area, nurses and security personnel lacked a direct line of sight to waiting patients. And across the whole ED, wait times varied, and were longer than staff and patients thought they should be.

Although funds had been set aside to reconfigure the ED, hospital leaders had yet to embark on a remodel, in part because they remained unsure about the best way to proceed. They wanted to make optimal use of the resources allocated. At first, they were convinced they would need to add on to the building.

To move the project forward, Methodist employed Lean practitioners from Healthcare Performance Partners who were experienced in Lean-led hospital design. Together, they would look at their processes from the patient’s point of view, and then design the facility around them. They would build as much flexibility into the plan as possible, to accommodate future process improvements.

“A-ha” moments
Because they are such busy, high-volume places, EDs often come to be viewed as stand-alone entities. They are not. Every time the ED admits a patient, for example, systems in other departments, from imaging to discharge planning, come into play.

In the first of many “a-ha” moments, the group began to understand that the team created to work on the design would need to include staff members from across the hospital, not just folks from the ED. It would need to include staff members from all levels of authority, too, not just department leaders. In addition to ED Service Line Director, Anthony Howard, who led the event, the group also included the lead ED physician, Gregory Sowards, MD, and architect Deborah Baker as equal participants. Adding their perspectives were CNAs, technicians, pharmacists, nurses, IT specialists, and personnel from imaging, registration and facilities management.

This wide-ranging team embarked on a 3P, a disciplined, four-day planning and design exercise.
They began by methodically working through the way work was currently done. “Everyone had an opinion about why things were the way they were,” said one Lean practitioner. “But we used actual observations to painstakingly construct the way work was really done. We outlined problem areas in great detail. Then we created a future state—the way things could work best in the future. Envisioning the future state was tough and time-consuming, but the entire team felt rewarded by the results.”

**Implementation**

3P is structured innovation that begins with traditional value stream mapping and then asks participants to imagine the ways in which the whole value stream (or service line) could be optimized. The focus is on breaking out of traditional thinking to arrive at the best solution, so that old problems are not imported into new buildings, and so that future Lean process improvements will be possible.

“3P accelerates design because it allows cross-disciplinary teams of staff members and physicians to envision the ideal design themselves, with new levels of detail and clarity that emphasize patient service over departmental silos. The value comes from having frontline people delineate their processes and potential spaces, rather than transferring all the decision making to the architect at too early a stage. This increases the chances that the final product will align with the way they work and with what the patients need.”

HPP’s Lean practitioners led the team in observations on the floor, to help sort genuine process problems from problems of perception. Key concerns (Fig. 2) included patient flow; staffing; supplies and equipment; security; patient privacy; and clear delineation of roles and responsibilities.

The next step in the 3P was the “Seven Ways” exercise, with several sub-teams quickly trying as many possible layouts for the future state as possible. The idea behind the Seven Ways is to induce breakthrough thinking, evaluating ideas that may even seem outrageous, or on the margins of thought. Teams evaluate these ideas, merge and “steal” the best, and come up with the top two or three. Then they worked together to “hybridize” those best ideas, achieving consensus on the top model.

Because the end product is a tangible design, the process is thought of as “trystorming,” not just free-floating “brainstorming.” The end product is a plan that addresses layout and resource requirements, standard work, and pathways and flows for work in the future state (Fig. 3).

The group then set about to mock-up the preferred plan, first as a 3D scale model using simple foam core, and then trying out a few spaces in actual size by taping them out on the floor (Fig. 4, a, b).

**Results**

The 3P team was able to deliver valuable information to the architect, enabling her to come up with a design that would meet the necessary criteria. The design would quickly be approved at the executive level.

“In four days of 3P, we uncovered more and better information than I could uncover in a month of ordinary user group meetings,” said Deborah Baker. “This was a fast way to get at the valid information I needed. Being part of the team and watching as people came up with what was...
important—that was extremely valuable, and will reduce the amount of rework I have to do.”

Among the concept design highlights were a true separation of urgent care and ED patients, reducing congestion in the separately. Patients will be in the line of sight at all times, improving quality of care and security.

As often happens after a 3P, the team discovered process improvements that could be put into use even before the remodel is complete. For example, the new quick-registration process is done in about a minute (a 96 percent improvement), and total wait time to see a physician are toward the target of six minutes (an 88 percent improvement). And, freeing up space for three additional urgent care bays makes the entire patient flow smoother.

Perhaps the most significant achievement of the team was that the design will accommodate 25 percent greater capacity on the front end, which will create even greater capacity potential in the treatment area. This increase will be possible through space reconfiguration alone, without adding on to the building.

Dr. Sowards, the chief ED physician, participated all day, for each of the four days. He said that the 3P broke down communication barriers, uncovered genuine root causes, and removed long-standing irritants. Although it was a significant investment of his time, he believes it will provide big dividends in a unit that will serve patients, staff and physicians exceedingly well, long into the future.

The proposed design can be accommodated without adding on to the hospital. Not only will the ED be able to serve the current number of patients, but a 30% increase in urgent care visits as well. By freeing up two additional spaces in the urgent care area, ED capacity also increased.

Said CEO Debbie Simon, “We waited three years to start, because we wanted to get the most out of our precious construction resources. In four days, we accomplished more planning than we had been able to do in three years. Not only is the project moving forward, but the data gathered really gave us a way to guide the work.”

---

**SUMMARY: CONDITIONS FOR SUCCESS**

This 3P was successful in quickly bringing out valuable information in a format that could be used and acted upon. The four-day event formed the basis for design, and also a framework of data that can be used to measure progress. Conditions for success included:

- A cautious organization that wanted to optimize every bit of resource going into the ED remodel.
- Willingness by the ED chief, an independent physician, to attend all four days and help with the fact-building and mockups.
- Having the architect as part of the design concept team from the very start.
- Assembly of a team that included not only department leads, but other people at varying levels of authority.
- Observation and data, which allowed the team to examine the work as it actually was.
- Patient creation of a future state as a team goal.
- Designing separate treatment areas for Urgent Care patients and higher-acuity patients.
- Actual future state simulation and 3D modeling by the team.
Qualitative Gains

The following chart describes the improvements to the flow of patients, supplies and equipment that will be achieved with only minor additions to the building:

<table>
<thead>
<tr>
<th>Qualitative Gain</th>
<th>Value Diamond*</th>
<th>Before</th>
<th>After</th>
<th>Anticipated Metric Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased Flow</td>
<td>Financial</td>
<td>No separation in waiting area for sick patients (vomit, fever, etc.) and higher ESI level patients.</td>
<td>Separated Urgent Care patients in ED from Higher ESI Level patients by separating treatment areas in the design.</td>
<td>Fewer people leave without being seen (LWBS)</td>
</tr>
<tr>
<td></td>
<td>Time</td>
<td>No dedicated areas for Urgent and ED care.</td>
<td>Utilized one entrance and &lt; 1 min quick registration process to direct patients to the correct treatment area decreasing waiting time</td>
<td>Reduced length of stay (LOS)</td>
</tr>
<tr>
<td></td>
<td>Time/Satisfaction</td>
<td>One way into ED and Urgent services</td>
<td>Utilized separate exit areas in ED ad Urgent areas from main entrance to reduce congestion and improve one-way and “U” shape patient flow.</td>
<td>Increased Patient Satisfaction Score</td>
</tr>
<tr>
<td></td>
<td>Quality</td>
<td>Current Nursing and Security view to registration, waiting, and treatment areas blocked</td>
<td>Nursing and Security can see all areas for quick reaction to patient needs and processing</td>
<td>Increased Patient Satisfaction Score</td>
</tr>
<tr>
<td>Increased Usable space of the area with only minor additions on to the building.</td>
<td>Financial</td>
<td>48,500/year volume</td>
<td>Designed to have 25% greater capacity on the front end which equates to even greater capacity potential behind the ED wall.</td>
<td>Admission Rate $ to be calculated.</td>
</tr>
<tr>
<td>Increased patient Satisfaction</td>
<td>Satisfaction</td>
<td>Congestion and confusion in entry way, multiple flows in one area, sick patients wait with broken arms, etc.</td>
<td>All roles defined by Standard Work.</td>
<td>Increased Patient Satisfaction Score; reduced LOS</td>
</tr>
<tr>
<td></td>
<td>Satisfaction</td>
<td>Congestion and confusion in entry way, multiple flows in one area, sick patients wait with broken arms, etc.</td>
<td>Separate flows for urgent care vs. ED</td>
<td>Increased Patient Satisfaction Score; reduced LOS</td>
</tr>
<tr>
<td>Increased patient and employee satisfaction</td>
<td>Satisfaction</td>
<td>Congestion and confusion in entry way, multiple flows in one area, sick patients wait with broken arms, etc.</td>
<td>Increased usable space by 30%</td>
<td>Increased Patient Satisfaction Score; reduced LOS</td>
</tr>
</tbody>
</table>

*The Value Diamond (© HPP) is a lean tool to help clarify the impact on the organization and prioritize the work. Each point on the lean value diamond affects the others: satisfaction, quality, time and financial impact. Going over the lean diamond as part of 3P creates consensus about what will be measured during design. It’s a kind of quality checklist, a touchstone that can be consulted over and over.