

# PATIENT SAFETY ALERT™

*A quarterly supplement on best practices in safe patient care*

## Construction brings opportunity to boost patient safety

*Safety-oriented planning should precede building process*

Health care facility construction, whether a new building or an expansion of an existing medical center, can present a number of challenges, not the least of which is maintaining quality of care and patient safety if the work involves adding on to a currently functioning hospital. However, two far-sighted facilities have demonstrated that new construction projects actually can present an opportunity to *improve* safety — if you plan far enough ahead.

For example, even before the first spade was turned in the ground, the new St. Joseph's Hospital building in Westbend, WI, was far safer than its predecessor. This was by design.

"One of our administrative staff said we should start thinking about how to increase safety through hospital design," explains **John Reiling**, MBA, MHA, CEO at St. Joseph's, part of a small regional health system.

### ***Plan for safety before work begins***

About a year ago, Reiling had the opportunity to discuss the construction/safety issue with national leaders in the area of patient safety, including representatives from the American Hospital Association, the Joint Commission on Accreditation of Healthcare Organizations, the American Medical Association, the Institute for Healthcare Improvement, and several nursing schools. This was made possible through a "learning lab" program funded by a grant from the University of Minnesota.

The bulk of the work took place even before the design process began, Reiling notes. "We developed two key themes," he says. "First, that facilities design can impact patient safety; the

very nature of a facility can cause you to make errors. It can be something as simple as where to put a sink so people will be more likely to wash their hands."

The second theme revolved around learning about designing safety. "The people we spoke to were not aware of any institution that had done homework on this subject, so there was nowhere to go to find out about designing safety," Reiling notes. "However, we realized [what we learned] could be helpful to the industry."

The learning lab was held April 18-19, 2002. "We were really honored by the caliber of participants," Reiling says. In addition to the aforementioned organizations, participants included key physicians, board members, nurses, management, frontline employees, and supervisors.

"We also included health systems we compete with and collaborate with in the region," he says. The architects and contractors, who by then had been retained, participated in observing the learning lab, and some actively participated in the discussions.

"We talked about safety relative to the process of design and whether there was something we should do differently," Reiling observes. "We also talked about precarious events, which are somewhat similar to sentinel events. We went through major errors; for example, with falls, we discussed how to use facility design to lower the fall rate."

Through this series of discussions and breakout sessions, a series of recommendations was created, detailed in a six-page brochure. "We came up with our guiding principles of design and a checklist for employees to use to see if they were hitting the mark," Reiling explains.

In a traditional hospital design process, Reiling explains, you go through what is called a roll-in program, which encompasses how many beds you need to fill, what your patient volume will be, and so on. "Then, you basically translate rooms into spaces, then department adjacencies, and then you design a detailed drawing of each space," he notes.

The St. Joseph process was impacted by the safety emphasis. "When we talked about the rooms we needed, and the size required for, say, nursing rooms or radiology, we asked ourselves if they should be the same size if safety was our goal. This led to some changes," Reiling notes.

One of the areas affected was adjacencies. "We conducted a failure mode analysis around each design phase," Reiling reports. "We tried to figure out the impact of adjacencies on safety."

For example, a draft of the adjacencies was studied for its impact on the most vulnerable patients. "We went through the ED [emergency department] and asked what would happen if we had to do a direct admit to the ICU [intensive care unit]," Reiling observes. "We talked about what could go wrong. As result of those exercises, we did modify our adjacencies."

### ***Uninterrupted flow of care***

At Rockdale Hospital in Conyers, GA, work has just begun on a project that will more than double the capacity of the ED, adding more than 18,000 sq. ft. to enhance treatment of minor care and major illnesses and injuries. Eight minor care rooms will be added to the current four, and 10 rooms will be added to the 10 existing rooms in the acute care center. In addition, a 14-bed, 23-hour observation unit is under construction.

Despite the extensive nature of the construction work, hospital officials anticipate that the ED will remain fully operational throughout the process.

At Rockdale, extensive planning helped ensure an uninterrupted flow of care during construction. This is due in large part to the fact that the staff became involved in the construction planning process approximately 18 months before work started on the ED expansion.

"It's very important to have everybody's participation," notes **Kay Neal**, RN, clinical nursing director for the Rockdale ED. "That means not only the ED staff but administration, the lab, radiology, pharmacy, materials management, and the facilities department."

When the ED first became aware of the planned expansion, a planning team was organized with representatives from both the day shift (supervisors) and night shift (charge nurse) as well as staff physicians. "For awhile, we were meeting every two weeks," Neal recalls. "Our biggest concerns were the safety of the patients and having as little interruption to patient flow as possible."

To that end, the team provided input not only on the layout of the department, but on each of the rooms, indicating how patients would move through the system.

Once their portion of the construction plans was finished, they turned to the issue of staging the construction in such a way as to optimize safety. This called for regular meetings with the contractor, Batson-Cook Company, whose Atlanta office had extensive experience with hospital construction.

"We would meet weekly with Batson-Cook to talk about the staging of construction," Neal says. "Facilities management and infection control conduct a hazard vulnerability surveillance prior to each staging of construction."

Potential hazards include such things as dust, which patients must be kept from inhaling, to the creation of inclines that might be too steep for some patients, she notes.

### ***Interfacing with the builder***

The ED's interface with Batson-Cook will be an ongoing, and very necessary, process until construction is completed.

"Take patient flow," Neal offers. "We have created many new operational efficiencies that have been incorporated not only into the new plans, but into the staging as well. For instance, we have identified the fact that for a nurse to be able to assess patients in triage, you need more than one nurse during that process. Accordingly, Batson-Cook will build us a temporary second triage room during construction, so we can begin to benefit from this new efficiency even before the construction is done."

As part of the process, the ED's ambulatory entrance will be moved. The team had discussed with Batson-Cook where the new entrance would be, and how that entrance must be visible to staff so they can see patients arriving and give them assistance getting out of their cars if it is required.

"We also planned the construction to where we won't have to shut down any rooms," Neal adds. The new areas will be built out first, the staff will

move in there, and then the older space will be renovated before staff move back in.

"The connection between the two areas will be the last thing Batson-Cook does, so it won't affect patient care at all," she explains.

Hospital/builder interface is critical to optimizing patient safety and quality during any construction project, Neal says.

"We will continue to have weekly meetings throughout the process," she notes. "In addition, the construction supervisor and myself will have two-way (telephone/walkie-talkies) communications every day. So, for example, if they are doing work that is making a lot of noise when a physician needs things to be especially quiet, I can call him and ask him to stop that particular work for 15 minutes or so. It saves me from putting on a hard hat and running out to find him."

### ***Right approach can change the culture***

Reiling says that the proper design strategy can contribute to a significant, safety-oriented cultural change at a health care facility.

"We wanted this [construction design process] to change the culture of the organization, to make it more centered on safety, and there's no question it did this. If you focus on patient safety in design, you *will* change the culture," he adds.

Once people become engaged in the issue, the elements of a patient-safe culture are reinforced, he explains.

"Take reporting what your errors are — you need to know that because you want to design around it," he says. "Then, we started dealing with blameless cultures."

Designing a hospital takes a lot of organizational energy, he says. "If throughout the process you talk about safety all the time, that in itself makes it a high priority, and you start to change how you operate. If you really think about facilities, they are the mechanisms through which we create processes."

The site dedication for the new facility was held place in late October. It will have 80 beds, as opposed to the 100-plus currently operating in the existing facility.

"It will be scaled down, but it will take care of a growing population," Reiling says.

For other safety professionals facing new construction work, Neal has this advice: "I just think it's important that when you do construction, you keep patient safety and your employees in mind and think of operation efficiencies — how you can

maintain them during construction and enhance them even while construction is ongoing."

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## **Test interventions for improving safety**

Spurred by the Institute of Medicine report and a strong ongoing concern for patient safety, the University of Michigan Health System (UMHS) in Ann Arbor has instituted a far-reaching program called the Patient Safety Enhancement Program (PSEP). Launched in 2000, the PSEP has three overriding objectives:

- Conduct, synthesize, and disseminate research aimed at reducing hospital-associated patient complications.
- Systematically evaluate errors in processes of care that undermine patient safety.
- Operationalize these research findings by systematizing methods to improve the safety of hospitalized patients.

Currently, the PSEP is focusing on the research component, with an emphasis on reducing hospital-associated complications.

"What we are trying to do is to proactively implement new interventions to prevent adverse events before they occur," notes **Sanjay Saint**, MD, MPH, associate professor of internal medicine at UMHS and the Ann Arbor VA Hospital and director of the PSEP. "And then we will study the results to see if these patient safety interventions make a difference in the real world."

### ***Determining research targets***

How did the PSEP decide which interventions to study first? "We focused on areas we thought were problems associated with patient safety that affected not only our patients, but also patients in other systems — common problems, and areas where we thought we had interventions that were likely to work, based on a synthesis of the literature," Saint explains.

The team recognized that vascular catheter-related infections are common, costly, and harmful to a large percentage of all patients who are hospitalized. "Having performed a systematic review of the literature, we found a certain type of catheter likely to reduce the risk by about 40%," Saint says.

The catheter, which is coated with the anti-septics chlorhexidine and silver sulfadiazine, was introduced into all of UMHS's intensive care units in the summer of 2001, and pre- and post-evaluations were conducted on rates of infection. "We found about a 36% reduction in infection," notes Saint.

The research team also sought to determine the financial impact of the intervention. "Even though the additional upfront cost was \$25 per catheter tray, when we took into account the reduction in antibiotic usage and lengths of stay, we determined that we will save about \$100,000 a year," he says, "So we view this as a win/win; it's good for both patient safety and for the health care system."

### **Testing other interventions**

Another intervention being tested involves urinary catheters. "Hospital-acquired urinary tract infections are the most common found in hospitals — about 40% of all patients get them, because one in every four patients admitted will get a urinary catheter sometime in their stay," Saint notes. Also, based on the literature, the PSEP team knew that having a catheter was not justified between one-third and one-half of each day a patient had one.

"This doesn't meet the [Centers for Disease Control and Prevention's] criteria," Saint asserts. "We also know that about 40% of attending physicians, when specifically asked, are unaware of whether their patient has a catheter or not."

The research team decided that, rather than relying on the memory of the physician, they would allow the system to help improve patient safety. "We have instituted a pilot study whereby a clinical nurse puts a reminder on the chart of any patient who has had a catheter for two days or more, so the physician will hopefully look at it and decide whether or not to remove it," Saint explains.

"Once we have our CPOE [Computerized Physician Order Entry system, currently under development], the reminder will automatically appear on the screen." With this intervention, "before" and "after" evaluations will be conducted, using a concurrent control group.

Because Saint and his team believe that poor communication is a major contributing factor to poor quality of care, a third intervention currently is in the thinking stage.

"We are going to try to optimize the transfer of information to the outpatient physicians," he adds.

The team will be putting together a one-page computerized document, filled out during the hospital stay, that covers the key portions of the stay that the outpatient provider needs — diagnosis at discharge, medications, a brief hospital course, follow-up appointments, and a new area — what needs to be done by the outpatient provider.

"For example, if the hospital noticed blood in the stool, the patient would likely need a colonoscopy," Saint explains. "Our plan is that the form will be faxed on the day of discharge to all of the patient's referring physicians, so they will have it before the first follow-up visit."

Underlying all of these efforts is an abiding belief that patients ultimately hold the key to improved safety. "The best way for a patient to help prevent a medical error is to have them become an active member in their care," he says.

He recommends that patients:

- Speak up when they have questions or concerns.
- Keep a list of the medicines they take.
- Make sure they get the results of any test or procedure.
- Talk with their doctor and health care team about their options if they need hospital care.
- Make sure they understand what will happen if they need surgery.

"The patients need to ask questions throughout their treatment and be aware of what their diagnosis is, as well as what medications they are being prescribed," Saint concludes.

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*Also, visit these web sites:*

• **U-M Patient Safety Enhancement Program** at [www.med.umich.edu/psep](http://www.med.umich.edu/psep).

• **Agency for Healthcare Research and Quality** at [www.ahrq.gov/consumer/20tips.htm](http://www.ahrq.gov/consumer/20tips.htm).

• **American Medical Association — National Patient Safety Foundation** at [www.ama-assn.org/ama/pub/category/5343.html](http://www.ama-assn.org/ama/pub/category/5343.html).

• **National Patient Safety Foundation** at [www.npsf.org](http://www.npsf.org).] ■