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IMPACT ASSESSMENT PAPER

## Six Sigma Lean Fall Project at Mercy Health Clermont

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## Six Sigma Lean Fall Project

### *Reinforcing fall-prevention practices and developing new methods for accountability*

Patient safety is top of mind at most if not all hospitals across the country. Patients have enough problems by their presence in a healthcare facility, and they don't need their health negatively impacted during their stay. Mercy Health Clermont near Cincinnati, Ohio, has always had preventable harm as its top priority, so, as with most healthcare organizations, any injury or incident is cause for alarm and action.

“Patient safety and preventable harm is embedded in the hospital’s culture throughout the entire system,” says Kim Brown, quality and patient safety performance improvement coordinator. “Patient falls are closely monitored on a daily basis and thoroughly investigated using post-fall huddles and the hospitalwide daily safety call. We track all falls per 1,000 patient day rates, and in 2014 we noticed our fall events were no longer declining. In fact, we had an increased fall rate of 14 percent [from 76 to 91].” MHC also had sustained its first two serious reportable events (SRE) since March 2011.

The Centers for Medicare & Medicaid Services (CMS) have identified falls as preventable events that should never occur, and lists them as Hospital-Acquired Conditions (HAC) for which reimbursement will be limited. Patient falls dramatically affect patient health and healthcare costs: according to the Joint Commission, approximately 11,000 fatal falls occur in hospitals annually; 30-35 percent of patients who fall sustain an injury; and fall-related injuries add 6.3 days to a patient’s hospital stay and cost hospitals thousands of dollars per fall.<sup>1</sup>

MHC wanted to strengthen its current fall-prevention processes, and submitted a fall-reduction initiative — Six Sigma Lean Fall Project — to the Academy for Excellence in Healthcare (AEH) at The Ohio State University. MHC improvement teams had attended AEH training in the past for other initiatives, and Gayle Heintzelman, CNO and site administrator, had been pleased by the progress of those AEH projects.

#### **Mercy Health Clermont (MHC)**

Mercy Health Clermont is located east of Cincinnati, Ohio, and is a member of the Mercy Health System, which includes 23 hospitals and more than 450 locations in Ohio and Kentucky.

MHC was established in 1973 and features one of the region’s newest and largest intensive care units, dedicated wound care centers, medical and surgical care, cardiology and pulmonology care, 24/7 emergency care, oncology, orthopedics, adult behavioral health, rehabilitation services, physical therapy, pain management, an offsite outpatient surgery center, and an offsite 24/7 emergency care unit.

MHC recently ranked lowest in harm events among Mercy Health hospitals in southwest Ohio, and the healthcare system also reports low mortality and LOS-rate rankings.

<sup>1</sup> Joint Commission Center for Transforming Healthcare, April 28, 2014.

“[Heintzelman] was concerned with our 14 percent fall-rate increase and our two SRE fall events, and she requested an interdisciplinary fall-reduction team,” says Brown. The CNO selected a core team to send to AEH that covered the major disciplines associated with patient interaction and safety: quality, safety, rehab, and environmental services (see *Mercy Health Clermont Improvement Team*).

“Each of the four individuals selected had very specific areas where they can improve the fall rate,” describes Brown. “I couldn’t ask for a better group of people. They’re very goal-oriented. They’re managers. They know that they must have outcomes and results, and they know they have to answer to them.”

## Working with AEH

The core improvement team began training in March 2015 at AEH, where they advanced their understanding of lean and six sigma tools and techniques, specifically the DMAIC (design, measure, analyze, improve, and control) improvement process, care mapping, data analysis, and gemba techniques.

The team’s work would complement existing MHC fall- prevention efforts. “All MHC patients received universal fall-prevention interventions for environmental safety, medication education safety, nonskid footwear, intentional rounding for toileting, or any other needs,” says Brown. “In addition to universal fall prevention, MHC identified those at risk for falls and implemented a plan of care for their safety. It began with all patient admissions getting a fall-risk assessment, called the ‘Morse Fall Scale,’ and ABCD<sup>2</sup> risk tool.”

The Morse Fall Scale is done on admission, twice daily, and/or with any change in the patient’s condition. A patient with a low fall risk gets universal fall precautions applied; a medium fall risk requires additions of a fall-risk indicator outside of the patient’s room and a plan of care; and a high fall risk requires a fall-risk indicator outside the room, orange wrist band, bed/chair alarm at all times, increased rounding, and a plan of care (see *Morse Fall Scale*).

“There were procedures and policies in place,” says Michele Flannery, manager of rehab services. “But we didn’t know how we were adhering to them or whether we were adhering to them. That’s one of the things that we first took on as the baseline — to try to see if everybody knows what the policies are and is following them.”

### Mercy Health Clermont Improvement Team

#### Core team:

- Bonna Bauer, Manager of Plant Ops & Security and Safety Officer
- Kim Brown, Quality & Patient Safety Performance Improvement Coordinator
- Michele Flannery, Manager of Rehab Services
- Michele Whitt, Manager of Environmental Services

#### Expanded team:

- Micki Smith, RN Clinical Coordinator
- Amy Wright, Physical Therapist
- Mechell Juska, Transport Supervisor
- Jennifer Lacortiglia, RN Informatics Coordinator
- Rosemary Shelton, Patient Care Assistant
- Julie Cope, RN
- Ashley Fischer, RN

**Morse Fall Scale**

Risk factor	Scale	Score
History of falls (last 30 days)	Yes	25
	No	0
Secondary diagnosis	Yes	15
	No	0
Ambulatory aide (uses prior to or during admission)	Furniture	30
	Crutches/Cane/Walker	15
	None/Bedrest/Nurse assist	0
IV access	Yes (intermittent or continuous infusion)	20
	No	0
Gait/Transferring	Impaired	20
	Weak	10
	Normal/Bedrest/Immobile (non-ambulatory)	0
Mental status	Forgets limitations	15
	Oriented to own ability	0

To obtain Morse Fall Score, total the scores from the six categories above:

**High risk** = 45 and higher (requires arm band and exit alarm)

**Moderate risk** = 25-44 (requires sign by door)

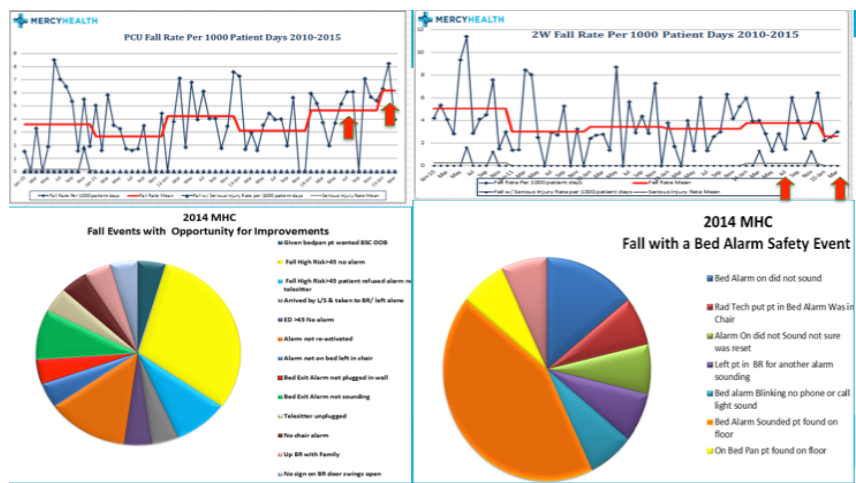
**Low risk** = 0-24

For example, the Morse Fall Scale involves a subjective review of a patient’s condition and could result in inconsistent application of procedures. “We may need to reframe it and re-reference it, and that is what we’re working on currently,” says Flannery. The team tested the review process with managers and nursing committees in order to see how more education would “get it honed in to be more objective.”

Back at MHC the improvement team expanded its membership to include the organization’s fall task force and other staff representatives. The group analyzed and charted patient falls and their causes to further understand the problem, and conducted FMEA (failure mode effects analysis) on processes and subprocesses related to falls, as required by the Joint Commission.

“There were so many issues that we identified; it was quite complex,” notes Brown. The team’s care map, gemba visits, and guidance from AEH helped the team evaluate fall causes in more detail (see *Fall and Bed Alarm Control Charts and Data*). The team eventually grouped causes into three primary problems:

**Fall and Bed Alarm Control Charts and Data**



Source: Mercy Health Clermont

- *Policies and procedures:* Individuals did not know the fall-prevention requirements or believed they did not know how to act on them. Some felt overworked and unable to properly address requirements, and a rare few simply believed it wasn't their job to be involved with fall prevention. Brown says administration has been keenly aware of staffing constraints, and had tried various methods to get more engagement from the available workforce, such as use of sitters to prevent falls by patients, especially those at high acuity and with high risk.
- *Alarm management:* The team found examples of alarms malfunctioning, not activated or reactivated, or incorrectly hooked up; staff alarm fatigue/uncertainty; nurses not properly assigned into the system to receive the routed alarms; and patients refusing alarms (either they really did not want it or were not convincingly instructed of the need for them to be on an alarm). Some whiteboards in patient rooms did not indicate fall risk, so when an alarm sounded and staff entered the room, they did not know the fall risk level of the patient.
- *Pre-fall care delivery and prevention:* This category included a patient's fall risk incorrectly assessed, fall risk not reassessed (requirement of every 12 hours), staff unaware of a patient's fall-risk assessment, and staff unaware of a patient's injury risk. For example, says Flannery, "Not all staff know where the shift assessment is in the Epic [EHR]. The PCA [patient care assistant] was unable to see the patient is a fall risk when they opened their Epic page."

## Implementing Countermeasures

The improvement team believed the policy and procedures issue was "fairly systemic," and as such would involve a continuous long-term effort to ensure everyone knew and followed hospital practices. Yet they also wanted to enact countermeasures that would help the situation quickly:

- The team incorporated a large alert in the Epic system to immediately identify a patient that is a high fall risk.
- Physical therapists and occupational therapists were required to write a patient's mobility needs on a whiteboard in each room (in green color to make it stand out from other information).

"We immediately instituted things that we felt that we could actually change," recalls Brown. "But, in addition to that, we were always very well aware that process improvement is processing the workflow, making it hardwired, and then holding people accountable." Hospital staff turnover and day-to-day demands of frontline work can make this challenging, she adds. "What we have to do is mentor them and guide them through the processes that we find that they're falling short on in addition to our new process that we want to institute. We want to make sure that we reinforce that."

The improvement team — with input from frontline staff, managers, the fall task force, environmental staff, and administrative staff — developed a fall-risk tip sheet to enforce policies and procedures and alarm management, guiding staff toward standardized activities when treating low-, medium-, and high-risk patients. "For anybody to think in healthcare that you can just do it one time and it sticks on the wall, it doesn't happen," says Brown. "It's not necessarily because people don't want to do it. It's all the

complexities that are involved out there today. You just have to understand that it needs to be constantly reinforced.”

The improvement team also prioritized policy and alarm problems, and developed a rolling action-item list for ongoing tracking of the following causes:

- Assessment
- Staff unaware of fall risk
- Staff unaware of patient mobility and fall risk
- Fall-prevention contract not implemented and patient refusals
- Alarms malfunctioning
- Staff alarm fatigue/uncertainty
- Alarms not appropriately routed
- Alarm alerts not activated or reactivated with high-risk patients

The action-item list recorded the cause (e.g., staff unaware of fall risk), individual/group responsible (e.g., six sigma fall team), action/deliverable (e.g., educate staff on visual queues required for medium- and high-fall-risk patients per policy, give tip sheet, and develop system to audit compliance), and a means to track progress (e.g., monitoring and nursing reports reviewed).

## Progress and Longer-Term Initiatives

The improvement team began conducting gemba audits in the spring after their initial countermeasures and tracking procedures were introduced. The audits assessed adherence to fall-prevention practices: fall-risk wrist band worn, fall-risk orange light on above a patient’s doorway, bed alarm activated, and bed alarm set to the correct zone. The initial audit results indicated the team was making progress:

- Gemba audit April 16 — 0 percent compliance
- Gemba audit April 30 — 60 percent compliance
- Gemba audit May 19 — 47 percent compliance
- Gemba audit May 29 — 67 percent compliance

In addition to the audit outcomes, the team was able to incorporate all risk data in the Epic EHR, thus alerting PCAs to patient risk levels, and the whiteboards in patient rooms were being updated on a regular basis and helping staff grasp the situation when called into a room. In addition, Bonna Bauer, manager of plant ops and security and safety officer, says technical issues related to alarm setups were addressed by maintenance staff, such as securing alarm cables to beds and ensuring proper connections.

Despite the relatively quick wins, the team still recognized the need to move beyond adherence to existing policies and use of alarm technologies. This is why MHC pursued broader, cultural solutions — a *No Pass Zone* project initiated by the falls task force and a pod-nursing pilot program — that can impact employees throughout the organization and patient care.

### *No Pass Zone*

A team was assigned to the *No Pass Zone* program, which is intended to drive proactive and timely responsiveness to patient needs — responding to patient needs before they become mobile and fall. The *No Pass Zone* team discusses the initiative with different departments and functions and conducts training for how to address situations and the escalation protocol when they cannot. With the program, all MHC staff (nurse, physicians, maintenance, etc.) are responsible for addressing patient needs as rapidly as possible:

- *Responsiveness*: All employees will be responsible to go into a patient room if they see a call light on or if they hear noises (e.g., beeping, call for help). No MHC employee should ever pass a room with call light on without entering.
- *Acknowledgment*: When a patient or visitor is within 10 feet of an employee, the employee should acknowledge the individual by making eye contact and smiling. At a 5-foot range, employees will greet the individual, introduce themselves, and offer assistance. If the patient or visitor requests something employees can resolve, they resolve it immediately or otherwise seek more information or assistance from a primary care giver, PCA, RN, etc. If assistance requires other staff, the employee that initiates the exchange communicates the duration that will be required and offers an explanation to the patient or visitor.


The *No Pass Zone* project changes the expectations of many MHC staff. For example, when the program rolled out in the progressive care unit (PCU), the team met with PCU maintenance, sought their feedback on the program, discussed barriers, and trained them on actions to take that typically would not have been considered their role, such as calling the nurses' desk or calling an aide when they encounter a patient issue they are not qualified to address. "That is something that they have to become comfortable with, and they cannot be met with resistance when they do that," says Michele Whitt, manager of environmental services. "It has been a process that everybody has been involved in."

Flannery says the Press Ganey score in the progressive care unit where the *No Pass Zone* was first implemented has risen to a top-quartile ranking, and the improvement team believes the cultural approach can be replicated elsewhere with similar outcomes.

As part of the *No Pass Zone*, MHC also introduced the *Stop the Fall Challenge* initiative to reduce patient falls related to toileting assistance (as much as half of all falls are related to toileting needs). The improvement team audited response times of telemetry and med/surg from the moment a patient presses the toileting button to staff contact with the patient (see *Toileting Assistance Audit*). They were able to track these times through the badges worn by nurses and PCAs. Of the 406 events tracked, while the mode was around 5 minutes, the average time was 17 minutes and 32 seconds — exceptionally high because some times exceeded *40 minutes*; the fastest response was 3 seconds. The team polled nurses and PCAs and asked about barriers with toileting procedures, which included poor teamwork and "not my

job” reactions. A goal for expected response time was set at less than 5 minutes, and MHC began tracking this measure for each unit.

### Toileting Assistance Audit

 <b>Unit Activity Report</b> (Detailed record of all activities per Unit/Team in date order) For 5/10/2015 - 5/24/2015 07:00 am - 07:00 pm Mercy Clermont - 2 West Date: 5/19/2015			
<b>Room: 2 West</b>			
X Toilet Start	Call Placed		11:30 pm
Go to Toilet	Call Placed		00:00:01
Notified:		ext. 83775	00:00:01
Go to Toilet	Call Placed		00:00:14
Notified:		ext. 83775	00:00:14
	Exited	ext. 50227	00:00:15
Go to Toilet	Call Placed		00:00:27
Notified:		ext. 83775	00:00:27
Unresolved Toilet	Call Placed		00:00:40
Notified:	South Console console		00:00:40
	North Console console		00:00:40
	East Console console		00:00:40
Answered @	East Console console		00:00:54
X Toilet Reminder	Call Placed		00:00:54
Call Completed			00:00:56
Unresolved Toilet	Call Placed		00:08:55
Notified:	South Console console		00:08:55
	North Console console		00:08:55
	East Console console		00:08:55
Answered @	East Console console		00:09:13
X Toilet Reminder	Call Placed		00:09:13
Call Completed			00:09:21
(PCA)	Entered	ext. 43981	00:12:04
	Exited	ext. 43981	00:12:32
<b>TOTAL TIME:</b>			<b>00:12:32</b>

Source: Mercy Health Clermont

### Pod-Nursing Pilot Program

The MHC improvement team explored the potential for developing a pod-nursing approach, which they believed could improve staff accountability. They presented a cost-benefit analysis to administration because it would affect staffing, says Brown, and this effort covered a range of costs specific to MHC that roll up because of falls (e.g., costs for patients who stay longer, cost for procedures and testing, cost of time associated with nursing staff and ancillary staff, etc.). The team also discussed the approach with managers, nurses, and PCAs; MHC had used pods in the past, and nursing staff provided feedback on the barriers and benefits of pod-team approach.

“We were all in agreement that this could be something that we look at, especially if it would mean that we would have another set of hands,” says Flannery. “Not a lot of people love change, but I think that they were willing to give it a chance because we were given that extra staff.”



The team began a trial of the pod-nursing program in the med/surg unit in August, reorganizing how registered nurses (RNs) and PCAs work together. The improvement team met with the Nursing Shared Leadership Group to establish guidelines and logistics for the new teamwork framework (see *Pod Changes*). After approximately one month, the pods were “working out the bugs,” says Flannery, but initial reaction was that communication had improved because PCAs work regularly with the same two nurses rather than four or five and members of the pod feel accountable to their team.

### Pod Changes

Pre-pod nursing units	Pod-nursing units
30 patients distributed among six RNs and two PCAs	30 patients distributed among three pods
PCAs may work with different RNs during a shift	Each pod includes two RNs and one PCA
RNs have maximum of five patients	RNs have maximum five patients
Each PCA has 10 to 20 patients	Each PCA has 10 patients
2 PCAs on staff	3 PCAs on staff

Brown says the pod approach is new to many on the unit, including managers, who must rethink how to deal with acuity (i.e., rather than balancing patients among eight providers they are balancing loads among three pods). They also are assessing how they locate pods; ideally they would keep everyone in a pod close together in a unit, but that may not always be possible given how patients are distributed. “They have to have some flexibility in this and use their own critical thinking,” adds Brown.

Throughout the pod trial MHC will track patient falls, harm events, patient satisfaction, response to calls, help from hospital staff, employee engagement, and financials. In addition, quarterly meetings will be conducted with the fall task force to review falls, fall data, audits, and effectiveness of the pod program. If the pods generate improvement, the concept will be expanded to other areas, such as PCU, and with could be expanded to sister hospitals in southwest Ohio.

“It’s going to take multitudes of things to decrease [falls],” says Brown, emphasizing that it will take and continuous reinforcement of practices to improve the patient environment. “It’s the trending that we’re looking at... We need to be accountable to seeing a decline in the trending of the mean rate of falls.”

The improvement team began to merge its activities into the fall task force, which meets monthly, and some improvement team members now serve on that team. The fall task force will monitor all fall events, fall reductions, process improvement, and compliance. They also will conduct audits and gemba walks, and analyze the results of what has occurred during the month. “They will make sure that everyone is making adjustments as needed,” says Brown, “and that we’re following through on all of the policy and procedure compliances we need to get in line, the alarm management compliances we need to get in line, and the pre-fall responsiveness and proactivity that they need to have [in place].”

As team members conduct gemba walks and audits, they can record their observations using a smartphone survey-tool app that allows them to download findings into a database. The surveying reinforces the need

for frontline compliance to be 100 percent and 24 hours per day, and allows team members to immediately share results — good and bad — with managers and leadership.

Frontline staff helped to develop the procedures put in place, reminds Bauer, and their involvement and continued engagement is necessary for success. “You’re showing them that you’re supportive of them; you’re not blaming them. We’re here to help them succeed. And, most importantly, we’re here to make sure that our patients don’t get injured while they’re here to get better. We’re a healthcare facility. Our intention is not to harm patients, it’s to make patients better and healthier than they were when they arrived.”

### **AEH Commentary**

The project at Mercy Health Clermont (MHC) to prevent patient falls is a major, ongoing undertaking that involves all personnel and many approaches. It illustrates that when patient safety is the objective, no individual is without a role in the improvement process. As such, the improvement team that attended AEH training coordinated their activities with existing MHC initiatives and teams. And as with any improvement project, they also analyzed the current situation with new eyes and considered new ways to address root causes of the problem in order to develop a better future state. They implemented many short-term countermeasures that quickly showed promise, but they also recognized the need for longer-term programs that would change workforce culture and frontline behaviors.

When reinforcing the existing fall-prevention measures in place at MHC and gaining support for new approaches, the improvement team followed two critical practices that help any healthcare improvement initiative to produce sustainable results: establish the means to continuously reinforce best practices (e.g., regularly engaging and soliciting input from frontline staff, training and education, tip sheets) and routinely monitor progress toward key performance indicators, which provides confidence to sustain and expand the reach of effective practices and the data-based insights to move in a different direction if necessary.

## **About AEH**

The Academy for Excellence in Healthcare blends in-person class time with hands-on project work, interactive simulations, and recurrent coaching, all aimed at helping healthcare teams spark actionable change at their organization. At the heart of this program is a real-world workplace problem each participant team selects and commits to solving through five intensive days on campus, followed several weeks later by two days of project report-outs and lean leadership training. This project-based approach pays immediate dividends and lays the groundwork for transformational change.



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