



Preventing Falls Among Behavioral Health Patients

An evidence-based fall prevention program yields positive results.

ABSTRACT

Background: Inpatient falls are among the most common hospital incidents reported. Fall-related injuries have significant implications for patients, staff, and organizations. Adult behavioral health inpatients are responsible for higher rates of injurious falls and challenge traditional fall prevention methods. An inpatient behavioral health unit in an acute care hospital identified an increased rate of injury from falls per 1,000 patient-days in three months; three falls resulted in major injury.

Purpose: The purpose of this quality improvement (QI) report is to describe the redesign of a fall prevention program for adult behavioral health inpatients using evidence-based practice (EBP) and QI methods.

Methods: Root cause analyses (RCAs) were conducted on all three fall-related major injuries. Concurrently, a literature review identified EBP recommendations for fall prevention on behavioral health units. A fall prevention action program was developed consisting of four elements: RN education to improve Morse Fall Scale scoring, individualized fall prevention patient plans, revised staff workflow, and improved fall prevention communication.

Results: There were no fall-related injuries for six months and no fall-related major injuries for 12 months following implementation of the fall prevention program. Overall, this reduction in fall-related major injuries was sustained over a 21-month period.

Conclusion: An interprofessional team approach using EBP and RCA is effective in redesigning and implementing a fall prevention program for the adult inpatient behavioral health population.

Keywords: behavioral health, evidence-based practice, fall prevention, falls, inpatients, quality improvement

Inpatient falls are among the most common incidents reported in the acute care hospital setting. A 2015 review of 23 studies examining factors that contributed to falls among patients in acute care hospitals found that the incidence of fall-related injuries ranged from 6.8% to 72.1%.¹ Recent research that examined changes in fall and fall-related injury rates among hospital patients showed a decrease in overall falls from 36% in 2001 to 19.5% in 2017 and, in the same period, a more than 50% decrease (6% to 2.4%) in falls that resulted in moderate or severe injury.² The researchers found a similar trend in the psychiatric service line, with fall-related injuries decreasing from 40% to less than 20% in the same time period.² Fall-related injuries are consistently among the top 10 sentinel events reported by the Joint Commission.³

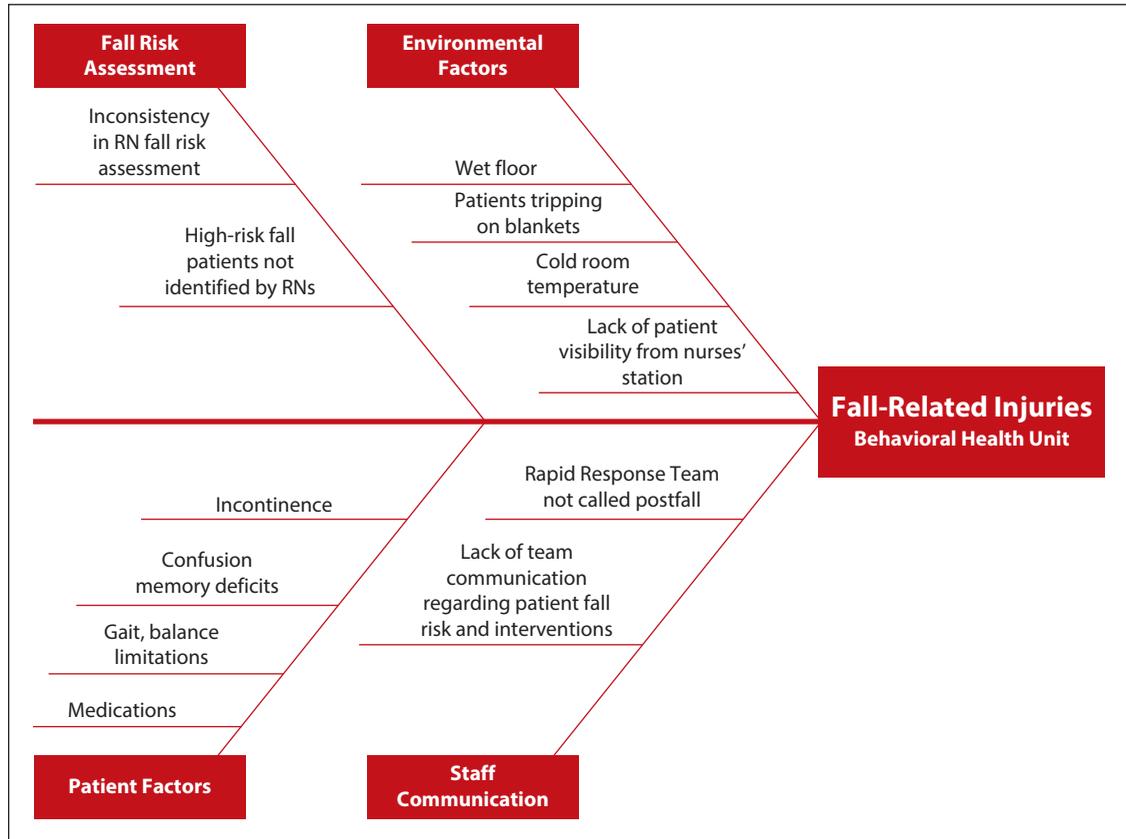
Fall-related injuries have significant implications for patients, staff, and organizations. Hospital

patients who have experienced a fall-related injury can suffer from increased length of stay, reduced independence (which may be temporary or permanent), and a possible diminishment in overall quality of life.⁴ On average, length of stay increases by six to 12 days at an additional direct cost of \$13,316; additional indirect costs to patients may result from loss of income, skilled nursing facility care, and litigation expenses.^{4,6} Further, there is a significant inverse relation between nurse job satisfaction and patient falls in the acute care setting.⁷

In the behavioral health setting, fall and fall-related injury rates are higher than those on medical-surgical units.^{8,9} The age of the patients in our behavioral health acute care setting ranges from 18 to 90 years; patient mobility varies greatly; and a variety of mental health disorders, including substance use and abuse disorders, result in a range of patient fall prevention and safety needs and pose a challenge to traditional fall prevention



Figure 1. Root Cause Analysis Fishbone Diagram



methods.⁸ The majority of behavioral health patients are at high risk for falls because they take psychotropic medications, experience agitation, and have a limited ability to follow instructions and realize limitations.^{10, 11} Among behavioral health patients, falls are most frequently related to deficits in mobility, such as when patients are attempting to get out of bed, walk to the bathroom, or change from a sitting to a standing position.⁸ Standard safety measures, such as bed and chair alarms, can escalate agitation and pose safety threats in this patient population.¹¹

Significance of the problem. On an 18-bed adult inpatient behavioral health unit in an acute care hospital in a semirural, Mid-Atlantic state, there were no fall-related injuries per 1,000 patient-days from January through September 2016. From October through December 2016, six fall-related injuries occurred, increasing the rate of such injuries from 0 to 5.43 per 1,000 patient-days. Of the six patients who fell, three had minor injuries, and three experienced hip fractures, a major fall-related injury. One hip fracture occurred each month in

this three-month period. Before the increase in fall-related injuries, the behavioral health unit was implementing general safety strategies for fall prevention, which included use of the Morse Fall Scale (MFS) to assess fall risk, nonskid slippers for patients, and yellow door signs that identified certain patients as being at risk for falls. The six fall-related injuries were a catalyst for the behavioral health team to evaluate the unit's fall prevention program and develop population-specific intervention strategies to address the increased fall-related injury rate.

Purpose. The aim of this quality improvement (QI) project was to reduce the rate of fall-related injuries on the adult inpatient behavioral health unit. The purpose of this QI report is to describe the redesign of a fall prevention program for adult behavioral health inpatients using evidence-based practice (EBP) and QI methods.

METHODS

A unit-based QI team was established to achieve the aim of this project. The team members consisted of the behavioral health unit clinical manager, the lead

clinical nurse, the executive director of behavioral health services, the chair of the organization's fall prevention collaborative committee, the manager of accreditation and patient safety, and the coordinators of accreditation and patient safety. All members of the QI team were aware of the increase in fall rates, the aim of the project, and the institutional fall prevention policy and procedures.

In December 2016, the QI team completed a root cause analysis (RCA) of each of the three major fall-related injuries that occurred from October through December 2016.¹² (RCAs are used in a variety of scientific and technological fields, including health care, to identify and describe fundamental causal factors that contribute to problems or accidents and plan ways to prevent their recurrence.¹³) The RCAs aimed to identify factors that caused or contributed to the increase in falls and fall-related injuries. These factors could be categorized as relating primarily to the clinical environment (environmental factors), nursing practice (fall risk assessment and staff communication), and the patient and overall health (patient factors); see Figure 1.

unit clinical manager to explore the patient's perceptions of why a fall occurred and what factors contributed to it. The health assessment examined comorbidities, diagnoses, and treatments related to falls. The QI team members evaluated all of the environmental, nursing practice, and health elements of the RCAs and summarized evaluation findings in a written narrative. Team members noted any unsolicited patient narratives that might contribute to the elucidation of how falls occurred. The QI team conducted a fall risk communication and collaboration session to share assessment findings and establish a revised fall prevention program.

In the assessment of nursing practice, the team identified inconsistencies in the use and scoring of the MFS and a lack of interrater reliability when the scale was used. RNs completed the MFS twice daily for each patient (on each shift and as needed with changes in mental status), but the level of risk assessed often varied from shift to shift. The QI team concluded that some RNs lacked a clear understanding of the MFS criteria for comorbidity/secondary diagnosis scoring and how to include the patient's medications as part of that score. An RN would often rate

Our experience highlights the fact that a team approach to improving patient safety and satisfaction is necessary.

Assessments. The QI team assessed the behavioral health unit's physical environment to identify fall risks resulting from environmental factors. For example, the team reviewed the facility's equipment and its location on the unit to see whether it presented an obstacle or a risk to patients who might trip over it. The team also evaluated the unit's physical layout and other potential hazards. The typically cold air temperature on the unit was also an important factor, for reasons that are described below.

The nursing practice assessment included a workflow evaluation, reinforcement of the correct use and scoring of the MFS in shift huddles and patient hand-offs, and interprofessional communication and collaboration to reduce fall risk. Patient assessment consisted of interviews in the form of open-ended conversations conducted by the behavioral health

secondary diagnoses based on the patient's primary diagnosis and not consider additional secondary diagnoses pertinent to behavioral health patients, such as mania, psychosis, and cognitive impairment. Frequently, nurses wouldn't consider the impact of medications on fall risk, including dizziness, reduction of blood pressure, and nausea. The lack of knowledge in these areas led to inconsistent risk assessment using the MFS and a lack of interventions tailored to individual patients based on their specific risk factors and medications.

The QI team's assessment of nursing practice also identified inconsistencies in interprofessional communication between RNs and behavioral health technicians regarding patients' fall risk and the development of individualized interventions to reduce falls. Each patient's fall risk was communicated



verbally in RN-to-RN handoff at the beginning of each shift and documented in the electronic health record (EHR); however, RNs didn't consistently report the patient's fall risk to the oncoming behavioral health technician. RNs also didn't consistently communicate each patient's specific fall risk factors and the plan to reduce those risks to the oncoming RN and behavioral health technician. All patients at risk for falls had a general fall risk care plan, but these interventions didn't address specific risk factors. Typically, the care plans included interventions for identifying fall risk and patient education.

literature on multifactorial interventions implemented in both behavioral health and other health care environments that might contribute to an updated fall prevention program appropriate for the adult inpatient behavioral health setting.

Development of the unit-based safety committee. The QI team communicated the results of the RCAs at the behavioral health unit staff meeting in December 2016. All unit staff reviewed the organization's fall management procedure and a general inpatient fall and injury prevention self-learning module in November and December

A thorough RCA process involving patients' perspectives is necessary to identify all factors contributing to injury.

The QI team's assessment of the environment identified risk factors such as cold air temperature on the unit and slippery floors in the common area. Patients confirmed in interviews (patient assessments) that the environmental risk factors the team identified were accurate. Patients frequently walked in the unit's common area with bath blankets hanging around them and often trailing under their feet. When nurses would ask patients not to walk around with blankets to reduce the risk of tripping, patients would say they were cold. In the RCA process, the QI team interviewed patients who fell, and they said they were often cold in the unit's common area and wrapped themselves in blankets for warmth. Patients also confirmed that floors were often slippery, and the availability and use of red, slip-resistant socks was inconsistent. Another environmental issue was that the RN staff workflow kept nurses at the nurses' station rather than in the patients' common area, reducing their ability to monitor patients visually.

Concurrently with the RCAs, RNs completed a fall risk literature review on the MFS and evidence-based fall prevention for adult behavioral health patients. The QI team decided that the MFS was appropriate for use in this patient population, but there was a need to educate nurses on how to use the scale. The literature confirmed that the MFS scoring could vary based on patient factors such as medications, clinical presentation, and diagnoses. The team members gathered information from the

2016. Review of the RCAs resulted in the establishment of a unit-based safety committee comprising behavioral health unit nurses, clinical nursing assistants, psychiatric technicians, the behavioral health unit clinical manager, and the behavioral health unit resource clinical nurse.

Intervention. The safety committee developed an action plan to reduce behavioral health inpatient falls. The revised falls action program consisted of four elements—RN education to improve MFS scoring, individualized fall prevention patient plans, revised staff workflow, and improved fall prevention communication—and was implemented between January and February 2017. The staff workflow was revised to allow the unit staff to maintain a constant presence in the common area. Nurses and behavioral health technicians no longer received report in the nurses' station, now it was given in the unit's common area to support increased visibility of patients.

The safety committee enhanced verbal and written communication on patient fall risk for RNs and psychiatric technicians by adding patients' fall risks to the two whiteboards at the nurses' station, with a red square denoting elevated fall risk so the unit's team members could easily see it. Each patient's fall risk level and specific risk factors were also added as standard components of the handoff. All patients at risk for falls were identified with a yellow fall-alert bracelet and signs on the door to the patient's room.

The psychiatric technician documentation screens in the EHR were modified to allow for robust documentation of both fall risk and patient-centered intervention strategies.

As a substitute for traditional patient gowns and to prevent patients from wearing blankets as they ambulated on the unit, the QI team provided patients with warm sweat suits. Wireless bed and chair alarms were purchased for use with impulsive patients.

A staff nurse education module on the correct use of the MFS was implemented unit-wide and focused on specific fall risks among behavioral health patients. A staff nurse on the safety committee developed a 20-minute slide presentation for the onsite education module. The education module on the MFS and the fall prevention program was presented at the unit staff meetings and was required viewing for new hires during orientation. RNs also incorporated use of the MFS and fall prevention education into the patient group discussions each evening, which focused on keeping patients safe and preventing falls.

suits, including tops and pants, was \$3,000. The sweat suits were labeled with the organization name and unit using a fabric marker. Use of the new patient apparel was piloted on all patients in January 2017 and evaluated for organizational feasibility, patient compliance, and impact on fall prevention. The pilot confirmed that providing warm sweat suits to patients was feasible, and patients complied with wearing the sweat suits and reported that they were satisfied with the intervention. The sweat suits solved the problem of patients using blankets for warmth, even at the risk of tripping on them, and therefore was accepted as an effective intervention to reduce environmental factors that contribute to falls.

Measures and analysis. The outcome measure for this QI project was the rate of fall-related injuries per 1,000 patient-days after implementation of the revised fall prevention program. Data on fall-related injuries were collected from the hospital's incident reporting system and quality reports, and a retrospective

A reduced fall-related injury rate has been maintained for two years since implementation of the revised fall prevention program.

Lean kata methodology was used to assist with the transition from patient gowns to sweat suit apparel. Lean kata is a process improvement method that comprises a four-step repetitive routine to guide continuous improvement. The four steps are plan, do, check, act.¹⁴ The following is an example of how this problem-solving method works: prior to the QI project, a staff member noted that one patient wore a sweatshirt provided by a family member for warmth in the common area. The safety committee discussed this observation and the benefit of this behavior. As a result, the committee developed the plan to provide warm sweat suits for all behavioral health patients on the unit, discussed the cost versus the benefits with nursing administrators, and established consensus on purchasing and providing the sweat suits. The unit manager went to a local distributor and selected a variety of sizes, all in a shade of gray. The total cost for the purchase of 100 sweat

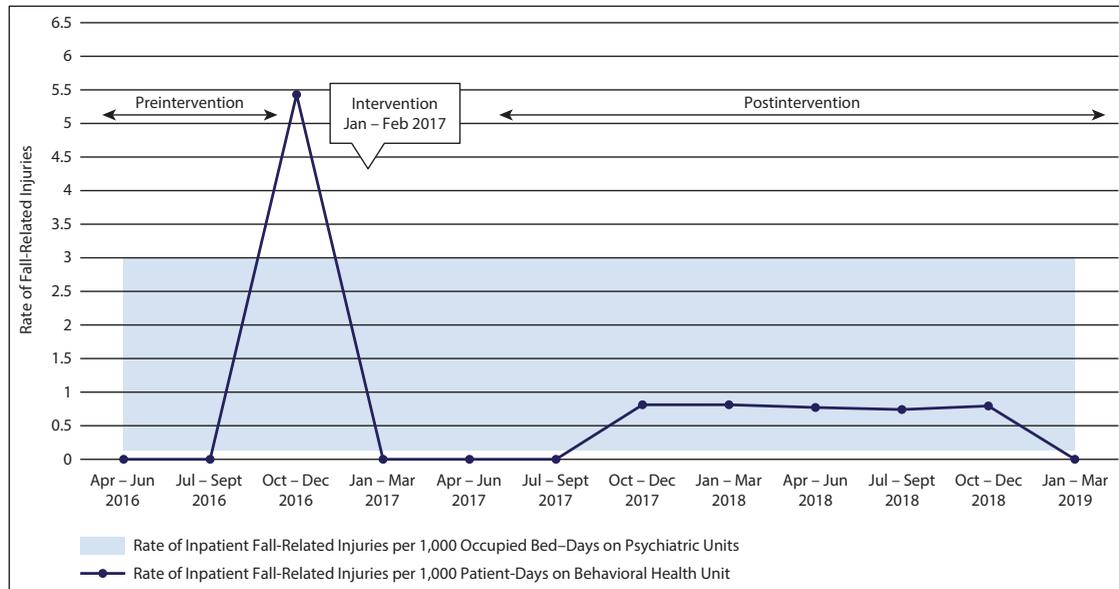
comparative analysis was conducted. Descriptive statistics were used to compare the rates of fall-related injuries three months before and 21 months after intervention. The QI team and the safety committee established an ongoing process for evaluation of the established fall prevention program interventions.

RESULTS

The rate of fall-related injuries decreased from 5.43 to 0 per 1,000 patient-days—a rate that lasted for six months after implementation of the revised fall prevention program. The unit had 10 fall-related injuries from October 2017 through December 2018, a rate of 0.78 per 1,000 patient days. Nine of the falls were categorized as minor injuries that resulted in a bruise or erythema. Most of these falls occurred in the patient's room and were related to patient factors such as medications, unsteady gait, and impulsive behavior. None of the falls were related to environmental factors, such as slips or trips. Two of the nine



Figure 2. Quarterly Fall-Related Injuries on the Behavioral Health Unit



The rate of fall-related injuries on the behavioral health unit decreased from 5.43 to 0 per 1,000 patient-days after the fall prevention intervention (January–February 2017) and has been consistently low for the next 21+ months. Overall, the unit’s fall-related injury rate has been within the range of 0.08 to 3 per 1,000 occupied bed–days on inpatient psychiatric units (represented by the blue shading).⁸

minor-injury falls were categorized as unanticipated physiological falls that occurred as a result of patient seizures. No major fall-related injuries occurred for 12 months after implementation of the revised fall prevention program. However, there was one major fall-related injury in March 2018 because of a patient’s syncopal event.

Currently, after any fall on the unit, nurses conduct a postfall huddle that also includes behavioral health technicians and the patient. This allows for rapid identification of factors that contributed to the fall and implementation of additional safety interventions if necessary. Postfall huddles were conducted after all the falls that occurred following implementation of the revised fall prevention program. Nursing practice now requires a postfall huddle form to be completed and submitted to the unit clinical manager and the hospital’s falls collaborative committee. The safety committee reviews any new postfall huddle forms at its next meeting and discusses any opportunities for improvement in practice. In addition, an RCA is conducted for all moderate or major fall-related injuries by the organization’s manager of accreditation and patient safety with the unit management team and staff. For example, an RCA was conducted for the major fall-related injury that occurred in March 2018, and it was determined the root cause was a syncopal episode.

The safety committee’s review of postfall huddle forms did not identify the need for any revisions to

the fall prevention program. Several patients who fell had not been identified as being at risk for falls using the MFS prior to their falls, indicating a need for ongoing education regarding use of the MFS.

An overall reduction in the rate of fall-related injuries per 1,000 patient-days was sustained for 21 months after the intervention, and the most recent data show no fall-related injuries (see Figure 2⁸). Overall, the unit’s fall-related injury rate has been consistent with the reported range of 0.08 to 3 fall-related injuries per 1,000 occupied bed–days on inpatient psychiatric units.⁸

DISCUSSION

This project delineates the implementation of EBP and QI methods for the successful redesign of a fall prevention program on an adult inpatient behavioral health unit. The primary aim of the project, to reduce the rate of injury, was achieved. As noted above, the fall-related injury rate decreased from 5.43 to 0 per 1,000 patient-days over the six months after implementation of the intervention. While the rate of 0 falls per 1,000 patient-days was not sustained for a longer period, a reduced fall-related injury rate has been maintained for two years since implementation of the revised fall prevention program.

A comprehensive RCA process helped the QI team identify the necessary elements for the successful redesign of a fall prevention program in an inpa-

tient behavioral health setting. This RCA confirmed findings in the literature indicating that fall prevention strategies assessment and intervention must be multifactorial.^{8,15} Consistent with the literature specific to falls on the behavioral health unit, the RCA identified person-specific intrinsic factors, physical environment, and risky behavior as influencing factors, leading to the specific elements the QI team used to redesign the fall prevention program.^{8,15} Change in the workflow, allowing for increased observation in the common area, and robust documentation in the psychiatric technician dashboard in the EHR supported identification, intervention, and documentation of patient-centered, incidental factors contributing to fall risk.

The inclusion of patients' perspectives, the first key element of this project, on factors that contributed to the falls they experienced offered substantial information that was useful in the RCA. The patient perspective revealed the person-specific and physical environment factors that influenced the falls. An important example of the successes that can be achieved using the plan, do, check, act methodology is the patient-identified factor of wearing or wrapping themselves in blankets because of the cold air temperature on the unit, and the intervention of providing sweat suits to remedy the patients' discomfort. Another example is the patient-identified risk factor of slippery floors, and the team's intervention of providing and diligently documenting the use of nonskid

team and safety committee members was essential in the identification of the need for a revised fall reduction program and additional staff education, as well as an understanding of the challenges to patient safety posed by the physical design of the behavioral health unit. Both nurses and psychiatric technicians identified the difficulty of maintaining uninterrupted visibility of patients in the common area as a challenge and a factor that contributed to falls. And both psychiatric technicians and nurses identified a reconsideration of staff traffic patterns in the common areas as a possible solution. Staff traffic patterns in the common area were redesigned, resulting in more frequent walk-throughs and enough space to update charts in the common area. Another factor that contributed to falls was a lack of proper communication between nurses and psychiatric technicians. To improve consistency in scoring the MFS, all staff members' use of the tool to assess risk was evaluated. Further, education on the appropriate use of the MFS addressed "practice drift" in the way nurses used the tool and communicated the scores obtained to fellow nurses and overall fall risk to psychiatric technicians.

The innovative approach to patient apparel, while successful, has some lingering challenges. Staff initially noted that patients would often take the sweat suits home, which resulted in having to reorder them. While the patients appreciated the warmth and comfort of the sweat suits as well as the increased privacy they provided (as compared

The sustainability of no fall-related injuries is a challenge and requires continual focus and diligence among the interprofessional team.

socks. As Quigley and colleagues noted, even trying to stand up from a sitting position or attempting to walk to the bathroom could be considered risky behavior under these conditions.⁸ For example, one patient on our unit slipped on a wet floor because he urinated on himself when getting up. These two findings as a cause of falls led to interprofessional team inquiry, the second key element of this project.

The QI team's inclusion in the RCA process of the second key element of this project—interprofessional team inquiry, communication, and collaboration—was critical. Interprofessional inquiry among QI

with open-backed gowns) to those ambulating around the unit, laundering them was a struggle. The sweat suits required professional laundering, and almost immediately some went missing. A tracking system for sweat suit return was established between the laundry facility and the acute care organization. Both nurses and technicians monitored the use and placement of the suits while patients were on the unit.

Limitations. The findings of this QI project are not generalizable, nor are those of our RCA process. The specifics of the QI team and safety committee



structures and the assessment methods used in this project were designed to meet the specific needs of our unit and organization.

Implications for practice. A team approach has been successful in integrating practice change and awareness of the fall prevention program for all staff members on the behavioral health unit. The implementation of change is not easy and presents ongoing challenges for unit staff members. The sustainability of no fall-related injuries is a challenge and requires continual focus and diligence among the interprofessional team. The revised fall prevention program resulted in changing many aspects of care at once, which affected team communication, falls risk assessment practices, unit workflow, and the physical environment. These changes were made rapidly to prevent additional major fall-related injuries. The safety committee did not develop a formal plan to evaluate the program changes, other than to monitor the patient fall rate (that is, other changes in process were not individually monitored or evaluated). A more detailed evaluation approach may have been useful in sustaining no fall-related injuries over a longer period.

The unit's clinical educator provided an MFS and fall prevention education presentation as a single session without additional formal reinforcement, although the education content remains available for staff to review independently. The unit staff may have benefited from periodic unit-based education to reinforce the content of the MFS and fall prevention education module, especially if additional emphasis had been placed on its application to nursing practice.

The team continues to address these needs to incorporate successful changes into nursing practice on the adult behavioral health unit. Our experience highlights the fact that a team approach to improving patient safety and satisfaction is necessary. Unit change has not come without difficulties, such as promoting the crucial understanding among staff members that fall risk must be assessed continually and overcoming a too-often inconsistent consideration of psychiatric medications and diagnoses in accurately determining patient fall risk. (Previously, it was standard practice to look only at medical-surgical diagnoses in the secondary diagnoses area of the MFS.) Staff members can be resistant to change, and the QI team continues to address staff issues carefully.

An interprofessional team approach using EBP and QI methods, such as conducting RCAs and using the lean kata method, has been effective in the redesign and implementation of a fall prevention

program for an adult inpatient behavioral health population. A staff-driven approach to fall prevention that is tailored to the unique needs of this patient population is essential to the reduction of falls and fall-related injuries. A thorough RCA process involving patients' perspectives is necessary to identify all factors contributing to injury. Ongoing education in fall risk assessment, patient-centered care, and environmental risks is necessary to sustain a reduction in the fall rate in the adult inpatient behavioral health unit population. ▼

Stephanie Ann Ocker is a clinical educator and staff nurse at Meritus Medical Center, Hagerstown, MD, where Sandra A. Barton, now retired, was a staff nurse, Norma Bollinger is a nurse residency program facilitator, Cynthia A. Leaver is a nurse research consultant, Sarah Harne-Britner is administrative director of professional practice and development, and Melanie M. Heuston is chief nursing and patient care services officer. Contact author: Stephanie Ann Ocker, stephanie.ocker@meritushealth.com. The authors have disclosed no potential conflicts of interest, financial or otherwise.

REFERENCES

1. Zhao YL, Kim H. Older adult inpatient falls in acute care hospitals: intrinsic, extrinsic, and environmental factors. *J Gerontol Nurs* 2015;41(7):29-43.
2. Taylor B, et al. Implementation of fall preventions over the past 15 years: impact on inpatient injury and insights for the future. *J Nurs Care Qual* 2020 Jan 16. Online ahead of print.
3. Joint Commission. Preventing falls and fall-related injuries in health care facilities. *Sentinel Event Alert* 2015(55):1-5.
4. Oliver D, et al. Preventing falls and fall-related injuries in hospitals. *Clin Geriatr Med* 2010;26(4):645-92.
5. Wong CA, et al. The cost of serious fall-related injuries at three Midwestern hospitals. *Jt Comm J Qual Patient Saf* 2011;37(2):81-7.
6. Zhao YL, et al. Multilevel factors associated with injurious falls in acute care hospitals. *J Nurs Care Qual* 2018;33(1):20-8.
7. Choi J, Boyle DK. RN workgroup job satisfaction and patient falls in acute care hospital units. *J Nurs Adm* 2013; 43(11):586-91.
8. Quigley PA, et al. Reducing falls and fall-related injuries in mental health: a 1-year multihospital falls collaborative. *J Nurs Care Qual* 2014;29(1):51-9.
9. Tideiksaar R. *Falls in older people: prevention and management*. 4th ed. Baltimore, MD: Health Professions Press; 2010.
10. Lenze E. Psychotropic drugs and falls in older adults. *Psychiatr Times* 2018;35(3).
11. Malik A, Patterson N. Step up to prevent falls in acute mental health settings. *Nursing* 2012;42(7):65-6.
12. Morse JM. *Preventing patient falls: establishing a fall intervention program*. 2nd ed. New York, NY: Springer Publishing Company; 2009.
13. Patient Safety Network. *Root cause analysis: background*. Rockville, MD: Agency for Healthcare Research and Quality; 2019 Sep. Patient safety primer; <https://psnet.ahrq.gov/primer/root-cause-analysis>.
14. Lean Enterprise Institute. *Knowledge Center. Lean lexicon: kata*. n.d. <https://www.lean.org/lexicon/kata>.
15. Healey F, et al. Falls prevention in hospitals and mental health units: an extended evaluation of the FallSafe quality improvement project. *Age Ageing* 2014;43(4):484-91.