

A Tale of Two Falls

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The Cases

Case #1: A 79-year-old woman with a history of impaired cognition at baseline was brought from a skilled nursing facility to the emergency department (ED) for evaluation of shortness of breath. Her physical exam was notable for altered level of consciousness, increased respiratory effort, audible wheezing and diffusely diminished breath sounds, hypotension, and bradycardia. She was initially treated with albuterol without improvement, which prompted the initiation of bilevel positive airway pressure (BiPAP). The chest x-ray demonstrated opacity of the right lung due to pleural effusion and atelectasis. A bedside thoracentesis was planned. Given her clinical condition, a fall risk armband was applied, and general safety and fall-prevention measures were implemented.

During the thoracentesis, the clinician lowered the right side-rail, but the side-rail was not raised after the procedure was completed. While the clinician was relaying the care plan to the nurse at the nurses' station, a thud was heard. The patient was found on the floor lying on her right side. She sustained head trauma, blunt trauma of the cervical spine, right rib fractures, and a right femur fracture. A cervical collar was placed, and conservative treatment was ordered.

Case #2: An 81-year-old woman with a history of dementia and atrial fibrillation on apixaban was brought in by ambulance for evaluation of generalized weakness and a ground-level fall at home, where she was living independently. At the initial ED presentation, she was alert and oriented, and her vital signs were stable, with a blood pressure of 110/79, heart rate of 86, respiratory rate of 16 breaths per minute, and pulse oximeter reading of 96% on room air. Her initial workup was significant for a pulmonary embolism in the right lung.

When the clinician came to the patient's room to describe the care plan, the patient was found on the floor confused. The clinician verbally recommended remote video observation or application of a belt restraint to prevent another fall. A belt restraint was applied to the patient; however, no order was written. A few moments later, after the patient was assigned an inpatient bed, the ED nurse notified the receiving nurse of the impending transfer, but no direct verbal handoff was provided.

The patient transport team transferred the patient from the ED to the inpatient unit. The receiving nurse asked the transport team and attempted to contact the ED nurse about the indication for the belt restraint, but no information was available, and the electronic health record (EHR) did not show any orders or notes explaining the clinical indication for a belt restraint. The patient was alert and cooperative, so the receiving nurse removed the belt restraint and the patient was transferred from the gurney to the bed. Twenty minutes later, a thud was heard from the patient's room, and the patient was found face-down on the floor, confused with a hematoma on her forehead. A head CT revealed a new left subdural hemorrhage, and she was treated conservatively, with monitoring for neurological changes.

The Commentary

by Victoria Jackson, DNP, RN, PHN, FNP-C, PA-C and Anna Satake, PhD, MSN, GCNS, RN

Background

Falls are the leading cause of fatal and nonfatal injuries in persons 65 years and older.¹ In the hospital, older adults are 50% more likely to have a fall than younger patients, and, after a fall, they have a higher risk for increased hospital length of stay, decreased mobility, increased mortality, and discharge to a long-term care facility.^{2,3} Additionally, having had a fall within the prior 12 months is associated with increased risk of a fall occurring in the future, making it a significant risk factor to be considered when conducting a fall risk assessment.⁴ Persons at highest risk for injury, such as bone fracture or internal bleeding, should be identified. Advanced age along with multiple medical conditions or medications can increase the risk for a bone fracture and/or bleeding.

Clinical Risk Factors for Falls and Injuries

The cause of a fall usually is multifactorial and complex including both intrinsic and extrinsic factors. Intrinsic risk factors include advanced age, deconditioning or decreased mobility, and conditions contributing to cognitive impairment (e.g., dementia, stroke, brain injury, delirium).^{5,6} Extrinsic factors include environmental risks (e.g., tripping or slipping hazards, clutter, unfamiliar environment, lighting) and medications, including polypharmacy and high-risk medications such as sedatives, diuretics, antidepressants, psychotropics and antipsychotics.^{7,8,9} Preventing falls in the hospital requires assessment of patients' risk factors upon admission and as their conditions change. While different falls risk assessment tools can identify patients' individualized risks, ongoing assessments of the environment should be included as environmental conditions often change in busy acute care settings. These conditions can be reassessed during regular rounds throughout the shift.

Falls can happen at any age, but older adults are at higher risk given physiological changes. Age-related changes in muscle mass, also known as sarcopenia, can contribute to weakness and gait and balance instability, increasing the risk of falls in older adults. Additionally, changes in hearing, vision, and reflexes can increase the risk of falls in older adults. Delirium, mild cognitive impairment, and dementia are risk factors for falls and injuries related to falls, as they impact an individual's orientation, visuospatial skills, judgment, executive function, and attention.^{10,11,12} Other medical conditions such as urinary tract infections and incontinence can also contribute directly or indirectly to falls. Medications that cause

dizziness or sedation or promote diuresis increase the risk of recurrent and injurious falls.¹³ Although it is not an exhaustive list, [The American Geriatrics Society Beers Criteria® for Potentially Inappropriate Medication Use in Older Adults](#) contains a list of medications that may increase the risk of falls. Patients treated in an inpatient setting are also at higher risk for several reasons. First, acute conditions such as the pleural effusion in Case #1 and the pulmonary embolism in Case #2 often result in physical deterioration, including hypoxia, hypotension, tachy- or brady-arrhythmias, and generalized weakness. Although restraints are often used to prevent falls in the inpatient setting, a systematic review of nine studies including adults in acute care hospitals and nursing homes found that restraints are not effective in reducing falls or injuries.¹⁴

The patient in Case #1 above had several risk factors for falls—advanced age, impaired cognition, altered level of consciousness, hypotension, hypoxia, and possible weakness. Given the limited information provided, it is unknown if other risk factors were present, such as medications, mobility limitations or environmental risks such as lines/tubes. This patient did have a fall risk armband placed, which suggested a screening process was in place to identify high risk patients. While applying a fall risk armband helps the team know that someone is at risk of falling, it doesn't inform them of what is needed to reduce their risk or prevent a fall. In this patient's case, there was no evidence that individualized risk reduction strategies were in place. A possible contributing factor to this fall was a clinician not ensuring the environment was safe before leaving the room by placing the side rail back up. If the patient did not have cognitive impairment or altered level of consciousness, she may have been able to self-identify her risk and request the side rail to be raised. The use of siderail(s) to prevent falls is controversial, especially if they are used as a restraint (all 4 up), as they can increase the risk of entrapment or the risk of injury if crawled over. Siderails on a bed can support a patient's feeling of safety and possibly prevent inadvertently rolling out of bed; however, they have not been shown to decrease the rate of falls.¹⁵

In Case #2, the patient's advanced age, dementia, recent fall at home, complaint of generalized weakness, and anticoagulant use put her at risk for falls and serious injuries from falls. Given her multiple risk factors, fall prevention strategies should have been implemented earlier in the clinical care of this patient. There is limited information about the assessment, workup, and treatment that followed the patient's initial fall at home and first fall in the hospital. We do not know if the patient's fall at home resulted in head trauma, which may have predisposed her to another fall. Additionally, we do not know what personalized fall interventions were implemented aside from a belt restraint. Unfortunately, it was not until the patient had a fall in the ED that the healthcare team ordered the belt restraint, which may cause more harm than good, as it has not been shown to be effective in reducing consecutive falls and is associated with longer hospital stays, increased frequency of in-hospital death, and increased time expenditure from the nursing team, according to a retrospective cohort study in an acute care hospital.¹⁶ Less restrictive options to reduce falls (e.g., one-on-one sitter, bed alarms) were not considered. Poor hand-off communication of patient's fall risk and prevention strategies, change in department, and worsening cognition may have contributed to the risk of falls and injuries.

Approaches to Improving Safety

Assessment and Identification of Risk for Falls and Injuries

Fall risk assessment tools are used to identify if a person is at high risk, to then trigger the creation and implementation of a fall prevention care plan.¹⁷ There are about 23 fall risk assessment tools targeted for hospital use but [no single tool](#) has ideal performance in all settings. Careful evaluation should occur to identify the tool that best fits a particular setting.¹⁸ The [Agency for Healthcare Research and Quality \(AHRQ\)](#) has reinforced the importance of identifying and addressing a patient's individual fall risk factors more than determining their risk of falling.¹⁹ Thus, while a fall risk assessment tool may facilitate implementation of systematic processes for identifying risk across healthcare organizations, it is more important to implement strategies to decrease individualized risk. These tools systematically evaluate individual factors such as age, mobility, medications, and cognitive status to identify patients at higher risk.²⁰ Hospitals can then tailor care plans with multifaceted interventions, such as frequent monitoring, mobility aids, and staff assistance, thereby mitigating potential falls and their associated complications.²¹ This proactive approach not only improves patient outcomes but also promotes a safer healthcare environment overall.

Persons at highest risk for injury such as a bone fracture or internal bleeding should be identified. Advanced age increases the risk for both fractures and internal bleeding. Conditions such as osteoporosis and medications that increase bone mineral loss (e.g., glucocorticoids) increase the risk of fractures. Bleeding risk is increased if a person is on an anticoagulant, has low platelet counts, or advanced age. A 2024 National Patient Safety Goal set forth by The Joint Commission is to “reduce the likelihood of patient harm associated with the use of anticoagulant therapy”.²²

In summary, risk assessment tools are not enough on their own to prevent falls but can be useful when combined with additional strategies. One such tool, [The STRATIFY Risk Assessment Tool](#), helps healthcare providers to identify fall risk factors that staff can then use to develop personalized care plans. This 5-item validated tool is easy to use and score. Another simple tool is to remember the ABCS:

- A: **A**ge greater than 85 years or frailty;
- B: **B**ones, meaning orthopedic conditions such osteoporosis or osteopenia, metastatic bone cancer, history of fracture, and prolonged steroid usage;
- C: anti-**C**oagulation through anticoagulants or bleeding disorders; and
- S: recent **S**urgery.

Because the STRATIFY Risk Assessment Tool and the ABCs do not account for other risk factors (e.g., the patient's medications, the specific hospital unit), they must be used in conjunction with clinical judgment to ensure a comprehensive evaluation.^{23,24,25}

Fall Prevention

A systematic review of clinical practice guidelines on fall prevention found that most guidelines strongly recommend that clinicians conduct risk stratification, assess gait and balance, employ fracture and osteoporosis management, review medications, and consider referral for physical therapy, appropriate footwear, and environmental modifications.²⁶ Hospitalized patients who are identified as high-risk almost always have a fall risk identification bracelet applied soon after admission. Fall prevention strategies as in Case #1, however, must include more than fall risk identification bracelets. The quality of the evidence in the studies of fall risk identification bracelets was very low as an individual intervention.²⁷ The prevention of

falls in hospitalized patients is multifaceted and includes several strategies: patient and clinician education, environmental changes, safe mobility (i.e. assistive devices and exercises), safe medication use, optimal nutrition, management of cognitive impairment and falls mitigation policies, systems, and leadership.²⁸

In both cases presented, cognitive impairment was noted either from dementia or delirium due to a medical condition, increasing the risk for falls due to poor situational and safety awareness and judgment.

Interventions commonly used to reduce fall risk for someone with cognitive impairment include increased supervision such as a sitter/tele sitter, alarms, or even restraints depending on the patient's impulsiveness. However, there has not been supporting evidence that individual interventions such as sitters (in-person or tele), restraints, or alarms significantly impact falls or injuries from falls.²⁷ Thus, we do not know if restraints would have prevented the fall or injury from the second case or contributed to a worse injury. We also do not know if having the rail up for the first patient would have prevented a fall. However, increased vigilance of all hospital staff is imperative when a patient is in a state of cognitive impairment. Proactively ensuring environmental safety for patients who are not able to call for assistance would include ensuring that upper side rails are up, items wanted by the patient are in reach, and the room is made as safe as possible before leaving.

Preventing patient falls is everyone's responsibility on the healthcare team. Thus, it is important that systems adopt and disseminate practices to screen, identify, and implement prevention strategies. Ensuring that appropriate departments and disciplines are trained in their specific roles and responsibilities in risk identification and fall prevention helps to keep patients safe from falling.²⁸

Communication

While individual efforts to prevent falls are important, both cases highlight the need for improved communication and teamwork among healthcare team members. For example, in Case #2, there was no direct verbal communication between the ED nurse and the receiving nurse during a patient's transition in care, which did not allow the receiving nurse to question the use of the belt restraint. Effective communication among healthcare providers is critical to safe patient care, but care teams are often distracted or under time pressure to respond to other patient care needs, limiting their ability to participate in exchanging information. [TeamSTEPPS](#), an evidence-based set of tools to improve communication and teamwork skills, may facilitate proper handoffs during transitions in patient care. Using a tool like [I-PASS](#) not only ensures sharing of clinical information related to patient care but also promotes a clear transfer of responsibility and allows the receiver to confirm their understanding and to ask questions about the plan of care.

The use of technology has created opportunities for non-verbal and asynchronous communication. Electronic health records (EHRs) contain numerous features that allow healthcare providers to rapidly share information. For example, flags are alerts within the EHR containing information about high-risk clinical situations (e.g., anticoagulant use, cognitive impairment) that may impact the safety or quality of healthcare; flags can be configured to pop up upon accessing the patient's record, requiring healthcare providers to acknowledge the information before proceeding with other actions. However, flags can contribute to "[alert fatigue](#)" or desensitization to safety alerts. Secure instant messages within the EHR can be a useful tool for communicating or clarifying information quickly. Secure instant messages can be

considered an adjunct to a handoff; however, they may contribute to inefficient or delayed care when healthcare providers are not readily available. Timely written orders and progress notes also serve to communicate the patient's care needs and health status when verbal communication is not available. For example, in Case #2, the receiving nurse could have used secure chat to ask the ED nurse for clarifying information about the belt restraint use. Also, the receiving nurse could have reviewed the order and notes indicating the need for a belt restraint, had the previous clinicians promptly entered this information in the EHR. Of course, there is some risk in relying on the EHR for important communication, as nurses may correctly prioritize observation of the patient over studying the EHR.

Summary

When reviewing the potential cause and contributing factors of a hospital patient fall, it is important to consider the patient's individual risk factors and what interventions are in place to reduce those risks, along with the contributing environmental and staff/provider factors. Education and communication across disciplines may help to prevent some falls, especially in inpatient settings with relatively high staffing levels. [AHRQ's toolkit for in-hospital fall prevention](#) provides a roadmap on how to evaluate your organization's practices, readiness to change and adopt evidence-based interventions and assessments, and processes to evaluate the change.

Take-Home Points

- If a patient is confused and has a high risk of falling, it is imperative that all staff who work with the patient ensure the environment is safe before leaving the room.
- Implement evidenced-based handoffs to ensure opportunities to discuss and ask questions about the patient's plan of care, including mitigation of risk factors for falls.
- Fall injuries such as fractures and internal bleeding occur more often in high-risk populations such as older adults, those on anticoagulants or those with other medical conditions that increase the risk of injury. These individuals need to be assessed thoroughly after a fall for possible injury.
- Everyone working with the patient from all departments and disciplines has some responsibility to prevent patient falls and harm while in the hospital. Ensure everyone has a safety awareness focus.

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References

1. Older Adult Falls Data. Centers for Disease Control and Prevention, National Center for Injury and Control. Accessed June 26, 2024. [\[Free full text\]](#)
2. Dolan H, Rishel C, Rainbow JG, et al. Relying on myself: the lived experience of being at risk for falling in the hospital among older adults. *Geriatr Nurs*. 2022;47:116-124. [\[Available at\]](#)
3. Magnuszewski L, Wojszel A, Kasiukiewicz A, et al. Falls at the geriatric hospital ward in the context of risk factors of falling detected in a comprehensive geriatric assessment. *Int J Environ Res Public Health*. 2022;19(17):10789. [\[Free full text\]](#)
4. Wapp C, Mittaz Hager AG, et al. History of falls and fear of falling are predictive of future falls: outcome of a fall rate model applied to the Swiss CHEF Trial cohort. 2022;14;3:1056779. [\[Free full text\]](#)
5. Heikkilä A, Lehtonen L, Junttila K. Fall rates by specialties and risk factors for falls in acute hospital: a retrospective study. *J Clin Nurs*. 2023;32(15-16):4868-4877. [\[Free full text\]](#)
6. Chang WP, Jen HJ, Huang TW. A retrospective cross-sectional study on the risk factors of recurrent falls among inpatients. *J Nurs Care Qual*. 2022;37(2):E31-E37. [\[Available at\]](#)
7. Poh FJX, Shorey S. A literature review of factors influencing injurious falls. *Clin Nurs Res*. 2020;29(3):141-148. [\[Available at\]](#)
8. Seppala LJ, van de Glind EMM, Daams JG, et al. Fall-risk-increasing drugs: a systematic review and meta-analysis: III. Others. *J Am Med Dir Assoc*. 2018;19(4):372.e1-372.e8. [\[Available at\]](#)
9. Delbaere K, Kochan NA, Close JC, et al. Mild cognitive impairment as a predictor of falls in community-dwelling older people. *Am J Geriatr Psychiatry*. 2012;20(10):845-853. [\[Available at\]](#)
10. Muir SW, Gopaul K, Montero Odasso MM. The role of cognitive impairment in fall risk among older adults: a systematic review and meta-analysis. *Age Ageing*. 2012;41(3):299-308. [\[Free full text\]](#)
11. Montero-Odasso M, Speechley M. Falls in cognitively impaired older adults: implications for risk assessment and prevention. *J Am Geriatr Soc*. 2018;66(2):367-375. [\[Available at\]](#)
12. Delara M, Murray L, Jafari B, et al. Prevalence and factors associated with polypharmacy: a systematic review and meta-analysis. *BMC Ger*. 2022;19;22(1):601. [\[Free full text\]](#)
13. Shorr RI, Guillen MK, Rosenblatt LC, et al. Restraint use, restraint orders, and the risk of falls in hospitalized patients. *J Am Geriatr Soc*. 2002;50(3):526-529. [\[Available at\]](#)
14. Huynh D, Lee ON, An PM, et al. Bedrails and falls in nursing homes: a systematic review. *Clin Nurs Res*. 2021;30(1):5-11. [\[Available at\]](#)
15. Spennato U, Lerjen N, Siegwart J, et al. Prevalence, risk factors and outcomes associated with physical restraint in acute medical inpatients over 4 years—a retrospective cohort study. *Geriatrics (Basel)*. 2023;8(1):15. [\[Free full text\]](#)
16. Park SH, Lee YS. The diagnostic accuracy of the Berg Balance Scale in predicting falls. *West J Nurs Res*. 2017;39(11):1502-1525. [\[Available at\]](#)
17. Strini V, Schiavolin R, Prendin A. Fall risk assessment scales: a systematic literature review. *Nurs Rep*. 2021;11(2):430-443. [\[Free full text\]](#)
18. Miake-Lye IM, Hempel S, Ganz DA, et al. Inpatient fall prevention programs as a patient safety strategy: a systematic review. *Ann Intern Med*. 2013;158(5 Pt 2):390-396. [\[Free full text\]](#)

19. Matarese M, Ivziku D, Bartolozzi F, et al. Systematic review of fall risk screening tools for older patients in acute hospitals. *J Adv Nurs*. 2015;71(6):1198-1209. [[Available at](#)]
20. Morris R, O'Riordan S. Prevention of falls in hospital. *Clin Med (Lond)*. 2017;17(4):360-362. [[Free full text](#)]
21. The Joint Commission. *2024 Hospital National Patient Safety Goals*. Accessed July 5, 2024. [[Free full text \(PDF\)](#)]
22. Aryee E, James SL, Hunt GM, et al. Identifying protective and risk factors for injurious falls in patients hospitalized for acute care: a retrospective case-control study. *BMC Geriatr*. 2017;17(1):260. [[Free full text](#)]
23. Oliver D, Papaioannou A, Giangregorio L, et al. A systematic review and meta-analysis of studies using the STRATIFY tool for prediction of falls in hospital patients: how well does it work? *Age Ageing*. 2008;37(6):621-627. [[Free full text](#)]
24. Oliver D, Daly F, Martin FC, et al. Risk factors and risk assessment tools for falls in hospital in-patients: a systematic review. *Age Ageing*. 2004;33(2):122-130. [[Free full text](#)]
25. LeLaurin JH, Shorr RI. Preventing falls in hospitalized patients: state of the science. *Clin Geriatr Med* . 2019;35(2):273-283. [[Free full text](#)]
26. Montero-Odasso MM, Kamkar N, Pieruccini-Faria F, et al. Evaluation of clinical practice guidelines on fall prevention and management for older adults: a systematic review. *JAMA network open*. 2021;4(12):e2138911. [[Free full text](#)]
27. Morris ME, Webster K, Jones C, et al. Interventions to reduce falls in hospitals: a systematic review and meta-analysis. *Age Ageing*. 2022;51(5):afac077. [[Free full text](#)]
28. Hill A, McPhail SM, Waldron N, et al. Fall rates in hospital rehabilitation units after individualised patient and staff education programmes: a pragmatic, stepped-wedge, cluster-randomised controlled trial. *The Lancet*. 2015;2592-2599. [[Available at](#)]

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