

# Inpatient Fall Rates Persist:

Using Restraint-free Technology

To Augment Fall Prevention Protocols

*Inpatient falls remain one of the most vexing patient-safety problems facing healthcare leadership, impacting clinical and financial outcomes. Regulatory bodies and healthcare leaders have studied the problem from numerous angles to address the continued costs and the morbidity and mortality associated with falls. By applying multifactorial fall prevention strategies, organizations have lowered fall rates in the past. Yet, falls and injuries from falls continue to devastate patients and their families, indicating that multifactorial fall prevention protocols alone are not enough. What can organizations do to enhance their already robust multifactorial fall prevention protocols?*

---

## *The Impact of Inpatient Falls*

---

***700,000 to 1 million***

*people fall annually in U.S. hospitals, resulting in nearly 11,000 deaths.*

*Of the nearly 1 million patients who fall each year,*

***25-50% will sustain injuries.***

## Executive Summary

Between 700,000 and one million patients fall annually in hospitals and long-term care facilities in the United States. Of those, 25-50% will be injured, and 11,000 will die.<sup>1-3</sup> Falls also place great financial burden on the healthcare industry. Falls are the leading cause of preventable inpatient injuries, yet simply being admitted to the hospital increases a patient's risk of falling. For healthcare organizations, injuries associated with inpatient falls can add an additional six to seven hospital days, resulting in an average cost of \$14,056 per patient to treat fall injuries.

---

### *The Cost of Inpatient Falls*

---

**\$50 billion**

is spent annually on medical costs associated with non-fatal fall injuries, and \$854 million is spent on fatal falls.<sup>1</sup>

Taking their cues from regulatory bodies, hospitals and long-term care facilities have created multifaceted fall prevention protocols, which have lowered fall rates. Despite prioritizing fall prevention and promoting restraint-free technology, falls and injuries continue. The reluctance to augment established multifactorial fall prevention protocols with non-restraint technology allows inpatient falls to persist.

Fortunately, some organizations have discovered that supplementing house-wide fall prevention initiatives with restraint-free sensor belts reduces falls. This guide will discuss what facilities can do to bolster fall prevention initiatives with restraint-free technology, thereby lowering their fall rates.

*Inpatient Fall Rates Persist: Using Restraint-free Technology To Augment Fall Prevention Protocols* aims to help hospitals, long-term, and rehabilitation care facilities address the hurdles associated with enhancing their fall prevention initiatives with restraint-free sensor belt technology. It presents information from current literature and input from frontline managers and nurses who have successfully enhanced their multifactorial protocols using restraint-free sensor belt technology. Part 1 reviews the organizational costs of inpatient falls and a brief history of fall prevention; Part 2 focuses on what organizations can do to enhance multifactorial fall prevention protocols with restraint-free technology.

## Part 1: Cost of Falls and Injuries / History of Fall Prevention

### Cost of Inpatient Falls and Injuries Related to Falls

Nearly 1 million patients fall in U.S. hospitals annually, of which 25-50% are injured. As of October 2008, the Centers for Medicare & Medicaid Services (CMS) shifted the accountability of fall prevention to healthcare providers and organizations when they stopped reimbursing hospitals for costs associated with patient falls, such as fractures, dislocations, and intracranial injuries.<sup>2-9</sup>

### Organizational Cost is Twofold

Healthcare organizations bear the cost of treating fall-related patient injuries. This organizational cost is twofold: the expense of treating patient injuries related to falls and the cost of creating and implementing organizational systems to prevent falls and injuries related to falls.

### Cost of Patient Falls

The annual cost of treating fall-related injuries averages \$14,056 per patient and can add up to seven additional hospital days. The estimated annual cost of treating serious injuries related to inpatient falls in the U.S. is \$50 billion.<sup>1</sup>

---

*A special CDC report found that hospitalized falls were more expensive to treat than falls in other settings.<sup>10</sup>*

---

### Cost of Fall Prevention

Organizations expect to incur costs to implement multifactorial strategies to reduce their fall rates; however, these interventions are costly. One systematic review reported that the cost to design and implement multifactorial fall interventions ranges from \$4,300 to \$120,000.<sup>11</sup>

*"I don't know how much the Posey® HeadStart® Notification Sensor Chair Belts cost, but I'm sure it's not as costly as treating a fall. That's why getting leadership on board with this product was so easy." Emily Hess, RN, BSN, Clinical Educator at Aspirus Wausau Hospital in Wausau, Wisconsin*



## History of Fall Prevention

Given the heavy personal and financial impacts of falls on patients and hospitals, healthcare organizations trialed multiple fall prevention strategies including risk identification with targeted interventions, exercise programs, patient/family engagement and education, and interprofessional management of patient-specific conditions such as hip fractures.<sup>12</sup> While these strategies led to fall reduction rates, fall prevalence remained elevated.

---

### *Focusing on Fall Prevention*

---

**Falls are defined as unplanned descents to the floor with or without injury.**

Regulatory bodies in the U.S., including the Centers for Medicare & Medicaid Services (CMS) and The Joint Commission (TJC), have focused on fall prevention policies and their implementation for decades.

---

## From National Directives to Multifactorial Interventions

Efforts to prevent inpatient falls and injuries gained momentum nationwide after The Joint Commission's 2015 Sentinel Alert 55 published that *falls with serious injuries* were consistently reported among the top ten sentinel events.<sup>13</sup> To address that "sustained reduction (of falls) has proven elusive," TJC recommended several evidence-based strategies for fall prevention and reduction, allowing healthcare leaders to decide which ones are best suited for their organization's needs.<sup>13</sup>

In response, many organizations created new fall prevention protocols and guidelines by replacing simple fall risk score calculations with multidisciplinary approaches that included several TJC-recommended actions.<sup>8</sup> The most successful multifactorial fall prevention programs implemented TJC strategies such as:

- Improving fall risk assessment processes
- Adding visual cues to alert staff of high-risk patients
- Addressing staff communication regarding fall risk status
- Ensuring adherence with protocols and safety practices, such as focusing on safety transfers while toileting
- Improving education of patients and all staff levels
- Correcting deficiencies in the physical environment, such as use of alarm mats and low beds

This laborious process resulted in numerous multifactorial fall prevention approaches, each unique to its own organizational system. Yet, even with multifactorial fall prevention in place, inpatient falls and injuries are ongoing, complex, and costly. *Are there cost-effective steps healthcare leaders can take to boost the multifactorial fall prevention protocols they've already initiated?*

### Non-Restraint Fall Prevention Tools

Over recent years several technology-based fall prevention applications have emerged to prevent, detect, and monitor falls. Technology such as alarm- and sensor-based products, wearable sensors, video monitoring, virtual reality, and robotics have obtained superior patient care outcomes.<sup>14</sup> This technology has assisted in providing inexpensive and easy-to-implement tools to decrease overall fall rates. These devices have allowed fall prevention tools to reinvent themselves, morphing from basic restraints to interactive technology. Unfortunately, organizational mindset has been slow to adapt.

Current thinking for use of technology-based fall prevention products, especially self-releasing alarm belts, is that they are a step down from a restraint. Yet, according to CMS, self-releasing alarm belts are classified as fall prevention tools, not restraints.<sup>15</sup> These tools are designed to allow patients to turn, sit up, shift, and move in beds and chairs while providing the opportunity for them to self-release.

*If a patient can "easily remove" a device, the device would not be considered a restraint. "Easily remove" means the manual method, device, material, or equipment can be removed intentionally by the patient in the same manner as it was applied by staff.<sup>15</sup>*

For organizations who have mastered the proper application, teaching, and documentation of these devices, non-restraint, self-releasing technology is quickly becoming a commonly used fall prevention tool. This technology provides the earliest possible notification that a patient is at immediate risk of exiting a chair or bed, while simultaneously providing staff additional time to respond — all without restraints.

*According to CMS, self-releasing alarm belts are classified as fall prevention tools, not restraints.<sup>15</sup>*

### Need for Non-Restraint Fall Prevention Technology

The emergence of COVID-19 has challenged hospitals to prioritize infection control policies above traditional patient safety and fall prevention strategies.<sup>12</sup> The increased need for closed patient doors to restrict airflow may delay staff response times and limit visual observation. Further, staffing shortages contribute to reduced nurse/patient ratios, which, when combined with extended work hours, push safety initiatives to take a back seat. These crucial changes

prompted nursing managers to seek new non-restraint bed and chair technologies that are staff friendly and allow more time to get to patients and prevent falls.

*“This is a different time in nursing where staffing is a huge crisis, not even a problem, a crisis. When we are working with bare-bones staff especially, this product gives us more of a head start to get into a patient’s room versus a pad alarm which tells us the patient is already up. The belt alarm lets us know the patient is getting up and it gives us time to get to them. That’s why we use them; these belt alarms help us keep our patients safe.” Emily Hess, RN, BSN, Clinical Educator at Aspirus Wausau Hospital in Wausau, Wisconsin*

As the average age of the global population increases, clinical care challenges may worsen. And as nurses age out of nursing, the quality and quantity of nurses available to impact patient falls will decrease. This dynamic will force nurses to compensate and leave many older adults at a high risk of falls in restraints or unrestrained and unmonitored. Non-restraint technology has emerged to challenge the mindsets of organizations to see fall prevention as something more than restraints or sensors.

---

*Restraint-free bed and chair sensor technology is designed to allow patients to move, sit up, and remember to request help before standing and offers a non-invasive way to monitor patient movement without using restraints.*

---

### Struggling To Connect Fall Initiatives

While it is maintained that effective multifactorial programs reduce falls and maximize quality of life, it is also evident that technology-based tools play a significant role in fall reduction. Yet, many organizations struggle to understand the distinction between multifactorial approaches and multiple fall safety technology devices. Further, even more fail to connect these initiatives at the clinical level.

Despite numerous multifactorial fall prevention protocols in place and the availability of various fall- and injury-prevention technologies, inpatient falls continue. In response, healthcare leaders may attempt to correct the issue by redesigning the multifactorial approach, gathering and analyzing baseline fall data, or establishing new fall response policies. Still, other organizations have discovered that non-restraint technology supports their current fall protocols, allowing staff time to prevent falls and curbing organizational costs related to falls.

### Successfully Augmenting Multifactorial Strategies

Because healthcare organizations can pick and choose which nationally recommended actions to include in their fall prevention strategies, there’s little evidence on *which* fall prevention interventions work. Due to this imprecise approach, technology is one tool clinicians have used to successfully boost multifactorial strategies. Non-restraint technology, such as self-releasing

sensor belts, has augmented fall prevention initiatives for several hospitals and long-term care facilities.

### Merging Protocol with Technology

Unit leaders at the Center for Rehabilitation at Wilmington Hospital reported that the use of “self-releasing alarm belts” for qualifying patients was their “most significant and most effective decision” when seeking to lower their center’s overall fall rate.<sup>16</sup>

In addition to revamping their multifactorial approach — everything from implementing the Morse Fall Risk Assessment Tool to creating new policies on post-fall responses — Wilmington Hospital noted that using self-releasing alarm belts allowed “staff additional time to prevent a fall.”<sup>16</sup>

Yale New Haven Hospital trialed the hook-and-loop alarm belt for use alongside their hospital’s multilayered fall prevention initiatives. According to Yale New Haven Hospital leaders, “The value of the belt is that it doesn’t restrain patients.” They found that the product allowed patients to remove the belt themselves, serving as a reminder rather than a physical restraint.<sup>17</sup>



*“We reached out to The Joint Commission, and, based on the intent, they are not restraints. In our policy we state that patients have to be physically capable of releasing the belt themselves. We do not consider them a restraint. As long as the (hook-and-loop fastener) is placed in the front and the patient is physically capable of removing it, the belt is utilized as a reminder and/or an early warning system for the staff to be able to respond quickly to hopefully prevent a fall.” Tracy Chu, MS, RN, CCRN, Clinical Quality RN at Sutter Health in Sacramento, California*

*“These products fit our ‘less restrictive interventions’ criteria and work alongside our fall prevention and injury prevention bundles. When assessed, not all patients need all the interventions in our fall prevention bundle. Since the HeadStart Sensor Alarms are not part of the bundle, nurses are able to complete individual fall assessments and initiate use of the belts as a nursing intervention. Just as fall risk bundles are reassessed daily, use of these products is reassessed*

*daily.” Danyel Johnson, MSN, RN, CNN, CNS at Cone Health in Greensboro, North Carolina*

## Part 2: Augmenting Fall Prevention Initiatives

Hospital system approaches to fall prevention have created safer environments. And fall prevention technology, such as restraint-free chair and bed sensor alarms, have proved to be essential components of fall prevention frameworks beyond multifactorial protocols. The ideal model of fall prevention unites multifactorial initiatives and non-restraint technology, allowing a clear distinction between the intent of each fall prevention protocol and tool. This unique connection can be individualized to each patient and safely directed by the nursing process.

---

*The ideal model of fall prevention unites multifactorial initiatives and non-restraint technology.*

---

Despite its simplicity, nurses remain hesitant to initiate non-restraint, technology-based chair and bed belt options for two main reasons. First, there is little emphasis for nurses to maximize critical thinking skills to implement non-restraint options for qualifying patients, such as self-releasing chair or bed sensors. Second, organizations are not clearly differentiating strategies and devices that prevent falls from those designed to prevent fall-related injuries.

## TWO key elements to overcome the hurdles to uniting multifactorial initiatives and non-restraint technology

### 1. Support the Nursing Process

---

*Since 1995 patient falls and fall-related injuries have been considered nurse-sensitive indicators because fall prevention depends on the quality and quantity of nursing care.*

*By deeming falls a nurse-sensitive indicator, the American Nurses Association demonstrated that nurses play a crucial role in fall outcomes.<sup>18</sup>*

---



The National Database of Nursing Quality Indicators (NDNQI) recognizes nurse-sensitive indicators (NSIs) as a reflection of the structure, process, and patient outcomes of nursing care.<sup>19</sup>

The nursing process guides clinical practice decisions that exist outside the application of generalized protocols and is how nursing directly impacts patient care. Beyond implementing generalized fall protocols, nurses can significantly reduce fall risks by using clinical judgment in daily practice.

Clinical care is a crucial component of fall prevention yet integrating fall prevention guidelines into daily clinical practice and individualizing them for each patient remains challenging for organizations.<sup>20,21</sup>

---

*The quality of nursing interventions directly affects patient outcomes.*

---

#### *Tailor Patient Care*

Organizations have developed numerous fall prevention guidelines and protocols to address the problem of inpatient falls. Still, such guidelines are not individualized and possess technology that is not tailored to patients. The individualization of patient care — including the application of guidelines — is dependent on quality nursing care.

One study found that over 34% of inpatient falls are related to toileting, and over half of all patients had no toileting strategies documented in their individual care plans.<sup>22</sup> Nurses can apply the nursing process to individualized care plans with the intent to either broaden or narrow a patient's fall interventions. Unfortunately, most organizational systems fail to campaign for a level of nursing-directed clinical care that can provide individual fall prevention strategies, let alone tailored toileting strategies.

#### *Fall Risk Is More Than a Number*

Electronic medical record (EMR) screening tools are used to determine patient fall risk upon admission. These tools slot patients into low, moderate, or high fall risk categories. To satisfy the organization's duty to document patient protection, patients are categorized into an appropriate care box based on a fall risk score alone instead of a complete fall risk assessment. Nurses are obliged to follow the checklist and implement fall prevention protocols as the screening tool indicates, often in lieu of completing a nursing assessment — the foundation of the nursing process.

Nurses are aware of these limitations and how they impact the quality of nursing care. A study found that nurses' reports of the most effective fall prevention interventions in adult acute care settings were not the most frequently utilized fall prevention interventions.<sup>23</sup> The disconnect isn't due to a lack of nursing knowledge or education but rather to nurses' perceptions of what they consider best for their patients. Ayton and colleagues reported that nurses felt general fall

prevention protocols for patients with high fall risks didn't necessarily pertain to all high-risk patients.<sup>24</sup> Thus, the existence of multifactorial fall prevention protocols does not guarantee effective implementation of them, even with fall risk scores in place.

When fall prevention protocols are applied without quality nursing assessments, the nursing process is suppressed, individualized patient care is neglected, and inpatient falls continue.

---

*Nurses' unique perspectives on what is best for their patients are crucial since they provide 24/7 care for patients and oversee safety precautions including fall prevention strategies.*

---

### *Empower Nurses*

In some healthcare organizations, such as the Department of Veterans Affairs (VA), registered nurses perform fall and fall-injury risk assessments upon admission.<sup>17,25</sup> When this practice widens to other healthcare settings and hospitals, true cultural change can emerge, allowing nurses to practice to the full extent of their expertise, utilizing the nursing process — assessment, diagnosis, outcome identification, and evaluation.

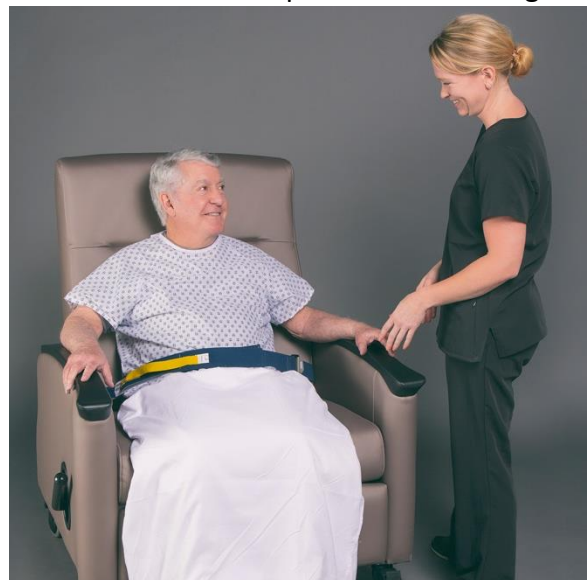
Several organizations have reinforced their multifactorial fall prevention initiatives by allowing nurses to complete fall and fall-injury risk assessments and use clinical judgment to initiate non-restraint technology, such as self-releasing sensor belts.

Organizations can empower nurses to use the nursing process to impact fall prevention.

- **Assessment**

Authorize nurses to complete fall and fall-injury risk assessments with a standardized, validated tool upon hospital admission. Nurses have the clinical expertise and training to engage in population-specific fall and fall injury assessments as part of the interdisciplinary team. Nurses can identify when additional safety measures are required to augment hospital-wide guidelines.

*"We have the Hester Davis Scale for Fall Risk Assessment tool built into our electronic medical record (EMR). Patients who score two or higher in mobility or mental status automatically qualify for the Posey HeadStart Notification Sensor Chair Belts as long as they can teach back*



*(demonstrate ability to release)."*

*Emily Hess, RN, BSN, Clinical Educator at Aspirus Wausau Hospital in Wausau, Wisconsin*

- **Diagnosis**

Allow nurses to follow the nursing process in daily clinical practice and develop individualized fall prevention plans of care based on nursing diagnoses. Nurses are knowledgeable about the vulnerability of the populations they serve and allow that knowledge to direct their critical thinking skills. Implementing care plans specific to patients, populations, or settings allows a direct impact on falls as a nurse-sensitive indicator.

*At our organization, "the use of the Posey HeadStart Notification Sensor Chair Belts is left up to the clinical judgment of the nurse. For the staff, the chair belts provide a level of comfort in knowing that when the patient is trying to mobilize, the belt will alarm, and they will have time to respond to the patient." Tracy Chu, MS, RN, CCRN, Clinical Quality RN at Sutter Health in Sacramento, California*

- **Outcome Identification**

Ensure nurses are a part of multidisciplinary fall prevention teams. Nurses are familiar with fall prevention strategies which allow them to identify outcomes for individual patients and correlate outcome results to specific populations and settings.

*"We allow nurses to do a complete assessment, determine the value of use to the patient, implement the Posey HeadStart Notification Sensor Chair Belt, teach and educate the patient and family, document appropriately under less restrictive interventions, and evaluate the outcome daily." Danyel Johnson, MSN, RN, CNN, CNS at Cone Health in Greensboro, North Carolina*

- **Evaluation**

Enable nurses to evaluate outcomes of generalized protocols and patient-specific care plans. At the point of care, nurses are uniquely positioned to identify contributing factors that affect the success or failure of patient interventions. Plans must be in place to evaluate the effectiveness of all prevention tools, including technology-based tools.

*At Cone Health, the clinical nurses run department-specific, quarterly audits to obtain feedback about "fall prevention interventions such as 'was the patient's initial fall risk properly identified on admission' and 'was injury risk properly assessed?'" Danyel Johnson, MSN, RN, CNN, CNS at Cone Health in Greensboro, North Carolina*

---

*Nurses have the expertise to perform fall and fall-injury risk assessments, initiate organizational fall prevention guidelines, and apply the nursing process to individualize fall prevention care beyond organizational guidelines.*

---

## 2. Untangle Dual Initiatives

### **CREATING AN ENVIRONMENT OF FALL PREVENTION IS NOT THE SAME AS CREATING AN ENVIRONMENT WHERE FALL-RELATED INJURIES ARE REDUCED.**

Fall prevention is standard practice in inpatient care, with injury prevention from falls taking a back seat.<sup>26</sup> Organizations have known for decades that risk factors for falling may differ from risk factors for injurious falls, yet the dividing line is vague.<sup>26</sup> Falls, and the resulting injuries, are often discussed in the literature as a single issue. For example, consider details such as *harmful falls contribute to prolonged hospital stays, and the estimated annual cost of serious injuries from inpatient falls in the United States is about \$50 billion.*<sup>2-9</sup> Although these statistics are accurate, they express an interconnection that is challenging to separate into its core components: fall prevention and fall-related injury prevention.

---

*Most multifactorial strategy approaches reduced fall rates; however, evidence for reducing fall-related injuries remains inconclusive.*<sup>19</sup>

---

Since the two initiatives are profoundly connected, it's not surprising that products designed to prevent falls are lumped in with devices intended to prevent fall-related injuries.<sup>26</sup> Regulatory standards, such as those recommended by TJC, often focus on strategies addressing both fall prevention and fall-related injury prevention. The dual emphasis is crucial to overall patient safety but confusing in application. These initiatives, although related, are unique and should be considered separately so they can be applied to each patient accurately.

---

#### *Clarification*

*Devices designed to prevent falls include bed and chair alarms, lap belts, gait belts, chair wedges, and nonslip footwear.*<sup>26</sup>

*Devices designed to prevent fall-related injuries include floor matting or compliant flooring, hip protectors, low-low beds, safe exit sides, and helmets or protective caps.*<sup>26</sup>

---

To overcome the confusion, some organizations created stronger fall prevention policies and protocols or introduced more robust fall risk tools. But since neither is inclusive to fall nor fall-injury prevention, nurses face continual uncertainty.

As nurses seek to initiate safety measures, the result is often indecision and reluctance. Worried about mistaken application, nurses are hesitant to initiate strategies beyond those indicated by the fall risk score completed on admission. In addition, when nurses do reach for specific fall or injury interventions, inaccurate documentation will likely follow due to the inability to distinguish fall prevention from injury prevention.

For example, when nurses cannot distinguish the impact a device will have on a particular patient, they are more likely to avoid it rather than introduce additional risk factors for that patient. Being unable to distinguish the differences between current safety technologies is crucial to understanding how CMS defines restraints versus non-restraints. To accurately guide device application, tools must be properly classified, and intention of use clarified.

*“We document the use of these belts in our EMR flowsheets in the ‘additional interventions’ or ‘less restrictive interventions’ sections. We document here because we want to give credit to the fact that these belts are not restraints; they are a less restrictive intervention. We encourage staff to use them as in ‘Before you jump to a restraint, which is a lot of work, here is something you can try. You don’t need an order to use these like you do for restraints.’ If nurses take them out and use them and find it’s not working with a patient, they can reassess the situation and move in another direction.” Danyel Johnson, MSN, RN, CNN, CNS at Cone Health in Greensboro, North Carolina*

*“For us, considering the belts as a non-restraint alternative comes down to education, demonstration, and documentation. Nurses must provide education to the patient on how to remove the device and the patient must be able to successfully demonstrate how to remove it themselves. Documentation in the EMR reflects that the patient was educated with return demonstration on this particular intervention. We want a very clear distinction between what is a restraint and what is not.” Allyson Kirkman, MSN, RN-BC, WTA at Cone Health in Greensboro, North Carolina*

When the initiatives and outcomes of these two issues are intermingled, nurses are forced to depend on screening tools to determine patient needs and the necessary interventions instead of their nursing judgment. It is essential to implement these devices appropriately in managing and preventing falls and injuries. Using the appropriate device at the right time with the right patient is crucial to patient safety and aids in proper documentation of devices. To impact patient safety initiatives, nurses must understand the difference between fall prevention and fall-related injury prevention and learn to differentiate specific fall prevention guidelines and devices from injury prevention guidelines and devices.

Organizations can distinguish fall prevention from fall-injury prevention.

- Educate staff on the unique purpose of all tools and resources, such as when and how to use each item. This will allow effective implementation of each device as it was intended to either prevent falls or reduce injuries from falls.
- Initiate routine in-services and vendor orientation to improve compliance and enhance nursing application of critical thinking.
- Support standardized implementation of non-restraint safety products into clinical decision tools, care plans, and protocols that address when to use appropriate material resources.

*“We have a fall prevention bundle and an injury prevention bundle,” says Allyson Kirkman, MSN, RN-BC, WTA at Cone Health in Greensboro, North Carolina. Patients are evaluated by nurses based on separate criteria for each, which may include a history of falling, use of anticoagulants, or previous hospitalizations.*

*To promote less restrictive fall prevention interventions, “all fall prevention products are displayed with requisition numbers on a reference flyer including pictures. Nurses need to know what options they have.” Danyel Johnson, MSN, RN, CNN, CNS at Cone Health in Greensboro, North Carolina*

When nurses are equipped to distinguish safety devices from safety strategies and are encouraged to critically determine when patients need restraints versus non-restraints, patient falls and injuries will decrease.

---

*It’s easy to confuse these two initiatives because being admitted to the hospital increases a patient’s risk of falling and falls are the leading cause of preventable injury during hospital admissions.<sup>26</sup>*

---

## Summary

Each year healthcare organizations endure the financial burden of injuries related to falls, the stigma associated with heavy morbidity and mortality fall rates, and disappointing patient outcomes such as decreased quality of life and long-term health complications.

To remedy these issues, healthcare leaders have implemented multifactorial fall prevention directives, yet evidence remains uncertain if multifactorial interventions are enough on their own. Additionally, emergence of restraint-free bed and chair technology sensors has evolved,

challenging the mindsets of organizations to identify fall prevention devices beyond restraints or sensors.

To create quality fall prevention models, organizations must combine multifactorial initiatives and non-restraint technology. Elements needed to ensure restraint-free sensor belt technology becomes a successful part of all multifactorial fall prevention initiatives include the following:

1. Allowing nurses to guide restraint-free sensor belt technology decisions with the nursing process because patient falls and fall-related injuries are nursing-sensitive indicators, and fall prevention depends on the quality and quantity of nursing care.
2. Distinguishing fall prevention from fall-injury prevention initiatives and tools is key to the accurate application and documentation of fall safety initiatives and devices.

Although inpatient falls and injuries are more costly than ever before, organizations can enhance their multifactorial fall prevention protocols with non-restraint technology to keep patients safe.

## Frontline Patient Safety Experts

Emily Hess, RN, BSN, Clinical Educator at Aspirus Wausau Hospital in Wausau, Wisconsin

Tracy Chu, MS, RN, CCRN, Clinical Quality RN at Sutter Health in Sacramento, California

Danyel Johnson, MSN, RN, CNN, CNS at Cone Health in Greensboro, North Carolina

Allyson Kirkman, MSN, RN-BC, WTA at Cone Health in Greensboro, North Carolina

All four have been involved in implementing technology, such as restraint-free bed and chair sensors, in their facilities.

*Written by Julie Nyhus MSN, FNP-BC, for Posey, a TIDI Products brand.  
Copyright © 2023 TIDI Products, LLC. All rights reserved.*



## References

1. Kartiko S, Jeremitsky E, Cripps MW, Konderwicz I, Jarosz E, Minshall CT. Fall prevention initiative: A fall screening and intervention pilot study on the ambulatory setting. *J Trauma Acute Care Surg*. 2020;88(1):101-105. doi:10.1097/TA.0000000000002514.
2. Ganz DA, Huang C, Saliba D, Shier V. Preventing falls in hospitals: a toolkit for improving quality of care (Prepared by RAND Corporation, Boston University School of Public Health, and ECRI Institute under Contract No. HHS2902010000171 TO #1.). Rockville, MD: Agency for Healthcare Research and Quality, 2013. <https://www.ahrq.gov/patient-safety/settings/hospital/fall-prevention/toolkit/index.html>
3. Currie L. Fall and Injury Prevention. In: Hughes RG, ed. Patient safety and quality: an evidence-based handbook for nurses (Prepared with support from the Robert Wood Johnson Foundation) AHRQ publication NO.08–0043. Rockville, MD: Agency for Healthcare Research and Quality, 2008. [https://books.google.com/books?hl=en&lr=&id=QFg\\_YnoXR6IC&oi=fnd&pg=PA1&ots=F5Nfo5LxoJ&sig=G1yFGxt9e3MhV5qrXXD\\_Lfz2XyM#v=onepage&q&f=false](https://books.google.com/books?hl=en&lr=&id=QFg_YnoXR6IC&oi=fnd&pg=PA1&ots=F5Nfo5LxoJ&sig=G1yFGxt9e3MhV5qrXXD_Lfz2XyM#v=onepage&q&f=false)
4. Bouldin ELD, Andresen EM, Dunton NE, et al. Falls among adult patients hospitalized in the United States: Prevalence and trends. *J Patient Saf*. 2013;9:13–17.
5. Wong CA, Recktenwald AJ, Jones ML, et al. The cost of serious fall-related injuries at three midwestern hospitals. *Jt Comm J Qual Patient Saf*. 2011;37:81–7.
6. Galbraith JG, Butler JS, Memon AR, et al. Cost analysis of a falls-prevention program in an orthopaedic setting. *Clin Orthop Relat Res*. 2011;469:3462–8.
7. Haines T, Kuys SS, Morrison G, et al. Cost-Effectiveness analysis of screening for risk of in-hospital falls using physiotherapist clinical judgement. *Med Care*. 2009;47:448–56.
8. Turner K, Staggs V, Potter C, Cramer E, Shorr R, Mion LC. Fall prevention implementation strategies in use at 60 United States hospitals: a descriptive study. *BMJ Qual Saf*. 2020;29(12):1000-1007. doi:10.1136/bmjqs-2019-010642
9. Centers for Medicare & Medicaid Services. Hospital-acquired conditions. Updated 8/12/2022. Accessed 11/8/2022. [https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Hospital-Acquired\\_Conditions](https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Hospital-Acquired_Conditions)
10. Burns ER, Stevens JA, Lee R. The direct costs of fatal and non-fatal falls among older adults - United States. *J Safety Res*. 2016;58:99-103. doi:10.1016/j.jsr.2016.05.001
11. Alipour V, Azami-Aghdash S, Rezapour A, et al. Cost-Effectiveness of multifactorial interventions in preventing falls among elderly population: A systematic review. *Bull Emerg Trauma*. 2021;9(4):159-168. doi:10.30476/BEAT.2021.84375.1068
12. Wilson MA, Hacker Teper M, Sinno M, et al. Designing and implementing a zero harm falls prevention program: A quality improvement study. *J Nurs Care Qual*. 2022;37(3):199-205. doi:10.1097/NCQ.0000000000000617
13. JointCommission.org. Preventing falls and fall-related injuries in health care facilities. Sentinel Event Alert 2015:1–5. <https://www.jointcommission.org/>

[/media/tjc/documents/resources/patient-safety-topics/sentinel-event/sea\\_55\\_falls\\_4\\_26\\_16.pdf](#)

14. Oh-Park M, Doan T, Dohle C, Vermiglio-Kohn V, Abdou A. Technology Utilization in Fall Prevention. *Am J Phys Med Rehabil*. 2021;100(1):92-99. doi:10.1097/PHM.0000000000001554
15. Centers for Medicare and Medicaid Service State Operations Manual – Appendix A, Rev. 200, 02/21/20. Accessed November 8, 2021. [https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/som107ap\\_a\\_hospitals.pdf](https://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/downloads/som107ap_a_hospitals.pdf)
16. Alderson FE, Boivin J. Self-releasing alarm belts: It takes two. *American Nurse Today*. 2017;12(3):25-26.
17. Wicker D, Boivin J. Hook-and-loop alarm belt: A vital component in a fall-prevention toolkit. *American Nurse Today*. 2017;12(1):26-27.
18. Quigley P. We've made gains in preventing falls, but more work remains. *American Nurse Today*. 2015;10(7).
19. Dykes PC, Burns Z, Adelman J, et al. Evaluation of a patient-centered fall-prevention tool kit to reduce falls and injuries: A nonrandomized controlled trial. *JAMA Netw Open*. 2020;3(11):e2025889.
20. Florence CS, Bergen G, Atherly A, Burns E, Stevens J, Drake C. Medical costs of fatal and nonfatal falls in older adults. *J Am Geriatr Soc*. 2018;66(4):693-698. doi:10.1111/jgs.15304
21. Stahl Wexler S, O'Neill D'Amico C. Creating an environment of falls prevention: Evidence-based practice can reduce falls and fall-related injuries. *American Nurse Journal*. 2015;10(7):6-7.
22. Rose G, Decalf V, Everaert K, Bower WF. Toileting-related falls at night in hospitalised patients: The role of nocturia. *Australas J Ageing*. 2020;39(1):e70-e76. doi:10.1111/ajag.12696
23. Tzeng HM, Yin CY. Perceived top 10 highly effective interventions to prevent adult inpatient fall injuries by specialty area: A multihospital nurse survey. *Appl Nurs Res*. 2015;28(1):10-17. doi:10.1016/j.apnr.2014.04.005
24. Ayton DR, Barker AL, Morello RT, et al. Barriers and enablers to the implementation of the 6-PACK falls prevention program: A pre-implementation study in hospitals participating in a cluster randomised controlled trial. *PLoS One*. 2017;12(2):e0171932. doi:10.1371/journal.pone.0171932
25. U.S. Department of Veterans Affairs. VHA National Center for Patient Safety. Falls Toolkit. Updated July 18, 2019. Accessed November 1, 2022. <https://www.patientsafety.va.gov/professionals/onthejob/falls.asp>
26. Hester A. Preventing injuries from patient falls: Learn tips for averting injuries after a fall. *American Nurse Today*. 2015;10(7):8-9.