

HQI ANALYSIS

The Top Five: A Review of Post-Pandemic Patient Safety Priorities

2024

Introduction

The COVID-19 pandemic triggered massive shifts in the global health landscape¹ as health systems and clinicians were strained to their limits with over 800 million cases and a profound loss of life worldwide².

Broadly, COVID-19 lockdowns led to diminished social skills and contributed to escalating tensions in hospitals. In clinical settings, rising patient anxieties and a sense of lost control led to increased aggression toward health care staff. Additionally, the time-consuming process of donning extensive personal protective equipment hindered patient interaction.

All of this took its toll on patient safety in five areas where progress had previously been steady and improving:

- **Falls** — Restrictive visitation policies kept families from the bedside, and their absence contributed to a surge of harm-related falls as patients were unable to receive assistance from their loved ones.
- **Medication events** — An increasingly sicker patient demographic (older, taking numerous medications, and experiencing lengthier hospitalizations) and a less-experienced work force contributed to an increase in adverse events related to medications.
- **CAUTIs** — The strain on critical care resources combined with a multitude of staffing issues directly contributed to an increase in catheter-associated urinary tract infections (CAUTI).
- **CLABSIs** — The strain on critical care resources combined with a multitude of staffing issues directly contributed to an increase in central line-associated bloodstream infection (CLABSI)³.
- **Pressure injuries** — Prolonged reliance on ventilators and extended hospital stays undermined pressure injury prevention.

These challenges were magnified by an increase in stress that left one-third of physicians and half of nurses burned out and seriously considering leaving the profession⁴. Challenges included:

- Dependence on traveler staff who were unfamiliar with their settings increased the chances for workflow disruptions.
- Increased reliance on newly graduated nurses resulted in a multitude of safety risks — inexperienced clinicians had to grapple with high-acuity patients who required advanced clinical acumen and sound judgment.
- Workforce shortages that spiked due to health care staff contracting the virus and a high rate of burnout put additional pressure on remaining employees, compromising patient safety and staff morale.

Although the World Health Organization officially declared an end to the COVID-19 emergency in May 2023, many of the same problems present at the height of the pandemic remain today.

Among them are the workforce issues, which have led to increases in harmful events that were once under control but saw a resurgence during the pandemic. CLABSI and CAUTI rates, as well as the incidence of falls and pressure injuries, have again taken center stage. As these challenges continue, hospital leaders are calling for a return to fundamental principles — “getting back to basics.”

The call to get back to basics stems from the recognition that quality and patient safety issues in health care are directly related to workforce disruptions. Many nurses are still relatively green and would benefit from a reinvigoration of timeless patient safety principles, such as rigorous adherence to infection control and championing the reporting of near misses. These principles represent a resolute commitment to harm reduction and set a course back toward obtaining national benchmarks that were achieved prior to the pandemic.

Identifying the Five Patient Safety Priority Events

This starts with recognizing the setbacks that were wrought by the pandemic — the five areas where a return to principles could help set things on the right track.

Hospital Quality Institute (HQI) assessed hospital discharge and incident reports for the year prior to, during, and after the COVID-19 pandemic (2019 to 2021). The assessment revealed five priority areas that have served as longstanding indicators of quality care. The discharge encounter data was drawn from the Hospital Quality Improvement Platform (HQIP) and CHPSOData platform incident reports.

The “Top 5” categories are based on the highest reported patient safety events and from clinical indicators that have long been markers for safe clinical care. Each category represents a unique threat to a patient’s well-being.

Patient Safety Priority 1: Falls

The Challenge of Patient Falls

Despite hospitals’ efforts to implement prevention programs, falls remain a significant concern. Defined as “an unplanned descent to the floor where the participant comes to rest on the ground, floor or lower level,” falls are the most common source of preventable injury according to the Agency for Healthcare Research and Quality (AHRQ). Up to 35% of falls result in injury that can cost up to \$14,000 per incident and increase patient lengths of stay by an average of 6.3 days⁵.

According to AHRQ, 95% of fall-related hip fractures happen from falling sideways. In addition, 42% of falls happen during walking and 14% of falls happen during transfers. Given that 80% of falls occur without observation and in the absence of health care professional assistance⁶, it is not surprising that the national rate of hospital falls increased during the pandemic.

Prior to the pandemic, family members played a crucial role in fall prevention. However, when patients were placed in isolation, family members were no longer permitted in their rooms, contributing to the rise in fall incidents. Notably, the number of patient fall safety events submitted to CHPSO rose by 9% from 2019 to 2020. While reported fall events decreased by 5% in 2021 as the pandemic receded, they remained higher than the levels seen in 2019. Serious harms related to falls saw a steady increase over the three-year period (see Figures 1 & 2).

Fig. 1 – Patient Falls Reported (CHPSO)

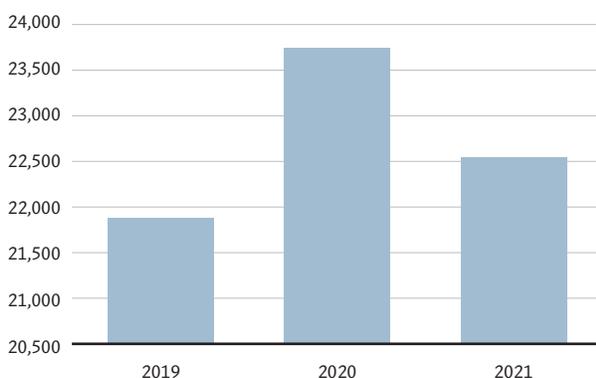
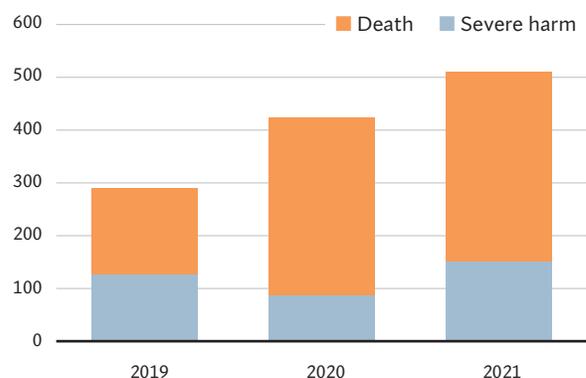


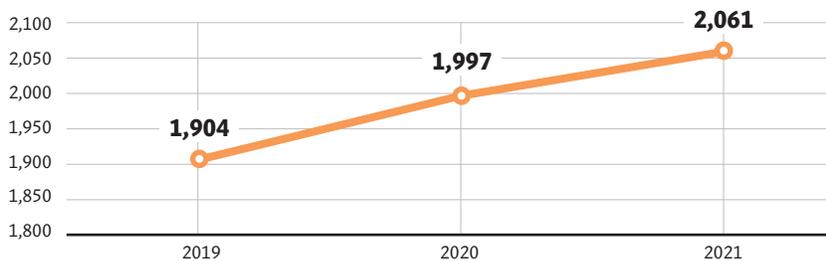
Fig. 2 – Serious Harm Related to Patient Falls (CHPSO)



Identifying the Five Patient Safety Priority Events

Emergency departments, already under immense pressure, also experienced a steady increase in falls from 2019 to 2021 (see Figure 3). Overwhelmed and exhausted staff members bore the brunt of maintaining safety protocols alongside frustrated patients who often expressed anxiety and fear through aggression.

Fig. 3 – Patient Falls Trend in the Emergency Department (CHPSO)

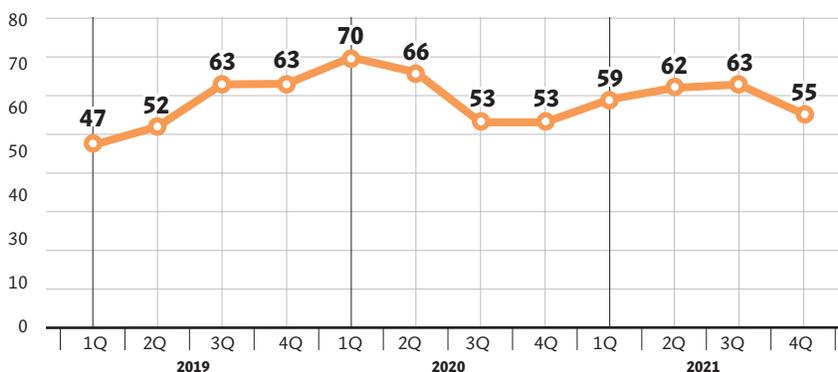


Identifying At-Risk Patients

Patients with an elevated risk of falling typically exhibit the following characteristics⁶ (see Figures 4 & 5):

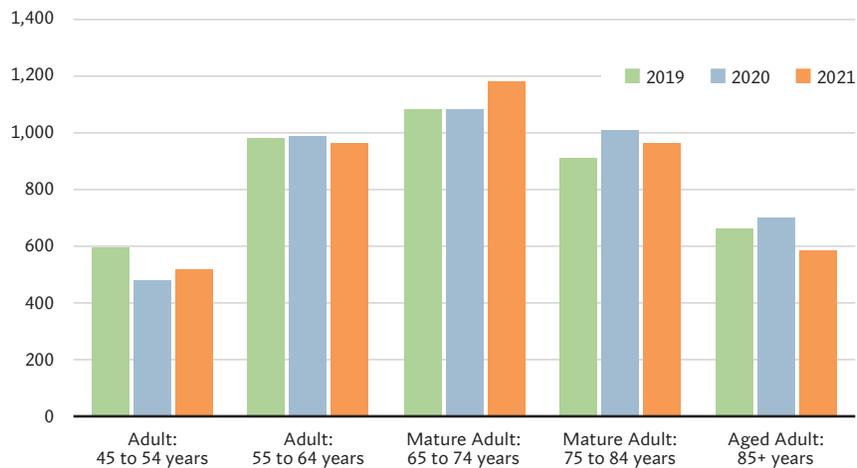
- Male
- Over age 65
- Recent onset of urinary incontinence or heightened urinary frequency
- Adverse reactions to medications
- Neurological and/or cardiovascular instability
- Recent fall history
- Unsteady gait
- Signs of agitation or confusion
- Medical history that includes diabetes and/or hypertension

Fig. 4 – Falls in California Hospitals Per Quarter (HQIP)



Identifying the Five Patient Safety Priority Events

Fig. 5 – Top Age Groups Most Affected by Falls, By Year (CHPSO)



Essential Strategies for Fall Prevention and Reduction

Given the frequent occurrence of patient falls during hospitalization, it is imperative for hospitals to execute a range of interventions to prevent such incidents. They include:

- Making environmental modifications
- Utilizing mobility assessment tools
- Conducting post-fall discussions
- Prescribing exercises to enhance mobility
- Providing assistive devices
- Conducting interdisciplinary assessments of patients' cognitive status, nutritional intake, and medication use

Considering this work, hospitals must recognize that effective fall prevention is predominantly achieved through evidence-based patient education. Similarly, reductions in fall rates and associated injuries are primarily attributed to the education and training of staff in fall prevention strategies. It is essential to respect patients' desires for autonomy while providing clear guidance on when to seek and accept assistance. Notably, chair alarms, bed alarms, wearable sensors, and risk assessment tools have not been reliably proven to reduce fall rates⁵.

Patient Safety Priority 2: Medication Events

Understanding Medication Safety

Medication is a hallmark of modern medical practice. However, the prevalent utilization of pharmacotherapy is inherently tied to a distinct spectrum of patient safety hazards. Adverse drug events (ADEs), medication errors, and adverse drug reactions (ADRs) were the impetus for the contemporary patient safety movement inaugurated by the 1999 report *To Err Is Human: Building a Safer Health System*.

Identifying the Five Patient Safety Priority Events

ADEs, incidents where a patient is harmed because of exposure to a medication⁷, constitute a prevailing category of preventable patient harm. Annually, ADEs precipitate 70,000 visits to the emergency department and lead to approximately 100,000 hospitalizations⁸. The incidence of ADEs affects close to 5% of hospitalized patients – making it one of the most frequently encountered health care errors⁹.

Medication safety has been a hospital priority for decades and is a [longstanding patient safety goal of The Joint Commission](#). Despite the focus, medication-related incidents were one of the highest reported events during the assessment period for this analysis and remain so today. During the pandemic, there was a shift in focus, resulting in fewer incidents being reported from 2019 to 2021. This may have been due to time constraints in filling out incident reports. In addition, traveler nurses, due to their temporary status, and new nurses overwhelmed with patient care, may not have prioritized incident reporting. It's important to note that the overall rate of medication-related incidents increased (*see Figures 6 & 7*).

Fig. 6 – Medication Error Rate (CHPSO)

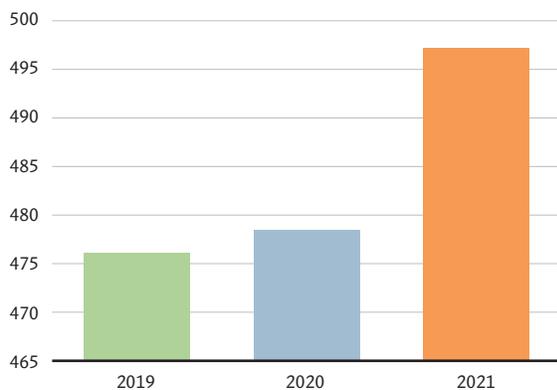
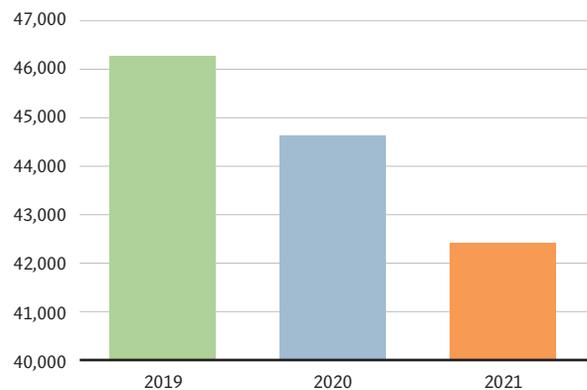


Fig. 7 – Medication Events Reported (CHPSO)



Proportionally, medical/surgical units experienced the highest medication-related incidents. Looking specifically at the high-risk drug class of anticoagulants, the occurrences of ADEs displayed a declining trend, although notable “pandemic bumps” coincided with patient surges observed in the latter part of 2020 and early 2021 (*see Figure 8*). Adults in the age brackets 55 to 64 and 65 to 74, were the most significantly affected patient population (*see Figure 9*).

Patients at Risk for Medication Errors

The populations most at risk of experiencing adverse drug events are at opposite ends of the age spectrum. Infants between the ages of 0 and 1 exhibit a notably high rate of medication errors, often stemming from dosage calculations based on their body weight¹⁰. Adults 65 years of age or older face an elevated likelihood of ADEs due to the presence of multiple chronic conditions, potentially unnecessary concurrent medication usage (polypharmacy), and, like children, an increased susceptibility to ADRs. Further, certain factors contribute to a heightened ADE risk, including limited health literacy and prescriptions for medications with similar names or appearances⁷. Individuals prescribed antidiabetic drugs, anticoagulants, antiplatelet medications, and opioids are also at increased risk of ADEs.

Identifying the Five Patient Safety Priority Events

Fig. 8 – Anticoagulant ADEs in California Hospitals by Quarter (HQIP)

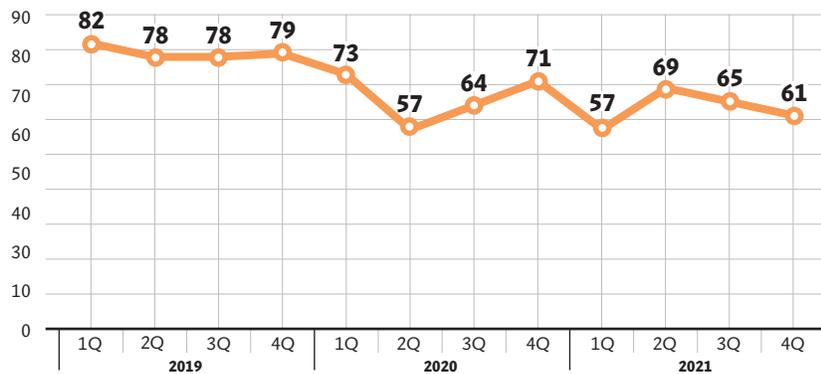
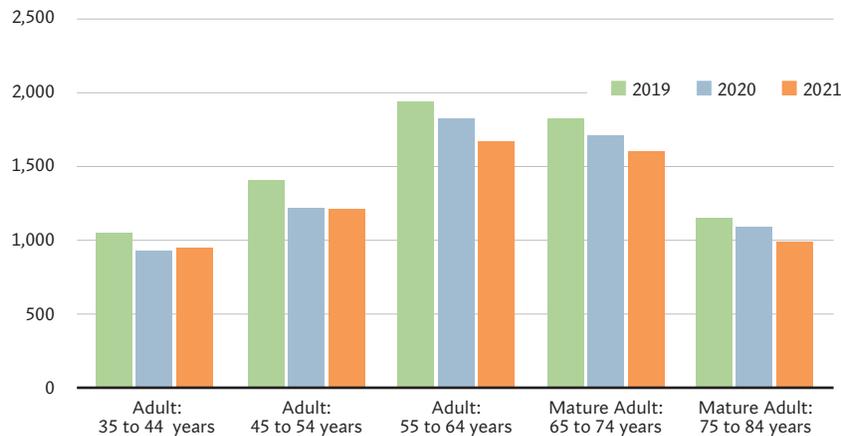


Fig. 9 – Medication Errors by Age Group (CHPSO)



Essential ADE Prevention and Reduction Measures

Embracing fundamental principles in medication safety involves considerable cultural work, which goes beyond a mere adherence to behavioral norms. It encompasses the mindset of harm prevention that drives patient safety efforts. Given the frequent use of pharmaceuticals in patient care, effectively preventing ADEs requires a comprehensive shift in health care providers’ attitudes and beliefs, alongside practices like reconciling medications at admission, using advanced storage and dispensing technologies, and employing smart pump systems with infusion guardrails.

Clinicians must possess knowledge of reversal agents for a broad range of medications and recognize the significance of collaborating with administrators to ensure these agents are adequately stocked. Interdisciplinary teams — consisting of pharmacists, nurses, and physicians who exhibit tenacious determination and expertise — should set the standard for error reporting⁹.

Identifying the Five Patient Safety Priority Events

Clinical leaders should serve as proponents for a culture of learning and champion the wisdom derived from near misses. These near misses are often regarded as fertile ground for organizational growth and improvement. In fact, some safety experts suggest that as many as 44% of all incidents should be categorized as near misses. To encourage widespread participation in error reporting, it is essential to actively nurture a culture of transparency, facilitated by streamlined reporting mechanisms that prioritize simplicity. The fundamentals of medication safety are underscored by a firm commitment by health care professionals to eschew a blame-oriented environment, which would deter the open sharing of mistakes.

Patient Safety Priority 3: CAUTI

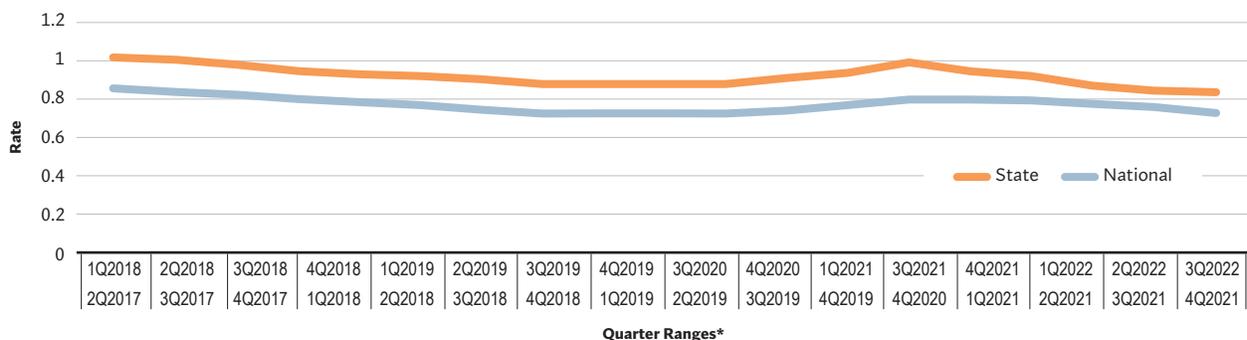
The Significance of CAUTI

CAUTIs persist as the most prevalent hospital-acquired infection. CAUTI is defined as an infection acquired during a hospital stay by a patient admitted for reasons unrelated to the infection, and one where the infection was neither present nor incubating at the time of admission¹¹. CAUTIs result in a spectrum of complications, including bladder spasms, urethral trauma, chronic infections, emotional distress, sepsis, endocarditis, and other forms of morbidity and mortality^{12,13}.

The Centers for Disease Control and Prevention reports that 15% to 25% of hospitalized patients receive urinary catheters as part of their medical care. This common practice of indwelling catheter use comes with a 3% to 10% daily risk of infection¹³. Estimates suggest CAUTI rates range from one to two cases per 1,000 patient days, a metric employed for comparative purposes across health care facilities with varying acuity levels. Of the approximately 13,000 annual hospital deaths attributable to health care-associated infections, CAUTIs account for 75% of hospital-acquired urinary tract infections¹⁴.

California has had consistently higher rates of infection than the national average (see Figure 10). Even with a downward trend in rates, the pandemic presented a significant obstacle to CAUTI prevention. Nationwide in 2021, CAUTI rates failed to revert to their pre-pandemic levels. This increase in CAUTI rates is reasonably attributed to persistent challenges, including understaffing, workplace violence, burnout among health care professionals, and increased turnover.

Fig. 10 – California and National CAUTI Rates from (2018 to 2022 State/2017 to 2021 National)



*Discontinuity of data is due to CMS halting of reporting during the COVID-19 pandemic.

Identifying the Five Patient Safety Priority Events

Patients Vulnerable to CAUTI

Patients who require prolonged urinary catheterization face an increased risk of developing CAUTIs. With each passing day of catheterization, the risk of bacteriuria escalates significantly, ranging from 3% to 10%. After 30 days of catheter use, the likelihood of bacteria reaching and being detected in the urine approaches 100%. The most frequently implicated organisms in UTIs are *Escherichia coli* and *Klebsiella pneumoniae*.

Effective CAUTI Prevention Strategies

The fundamental principle for preventing CAUTIs is to avoid the prolonged use of urinary catheters altogether, unless clinically necessary. Given the stagnation of CAUTI occurrences, hospitals should employ vigilant monitoring to recognize changes in rates and respond appropriately. If hospital interventions produce evidence of a reliable reduction in rates, interventions should be further studied and shared to see if results can be replicated. Novel interventions such as external female catheters and two-person catheter insertion procedure (2CIP) have not been reliably proven to reduce rates of CAUTI occurrence^{15,16}.

Patient Safety Priority 4: CLABSI

Understanding CLABSIs

CLABSIs contribute significantly to patient mortality each year. Given the critical role of intravascular catheters, commonly referred to as “central lines,” in the care of critically ill patients, health care providers adhere to strict protocols to prevent associated complications.

Despite these stringent measures, the incidence of CLABSIs remains alarmingly high, with mortality rates reaching up to 25%. The prevalence of CLABSIs stands at approximately five cases per 1,000 patient days, notably affecting intensive care unit (ICU) patients, where 48% are equipped with central venous catheters. This translates to a whopping 15 million central line days annually, with each CLABSI incurring an average cost increase of \$16,550¹².

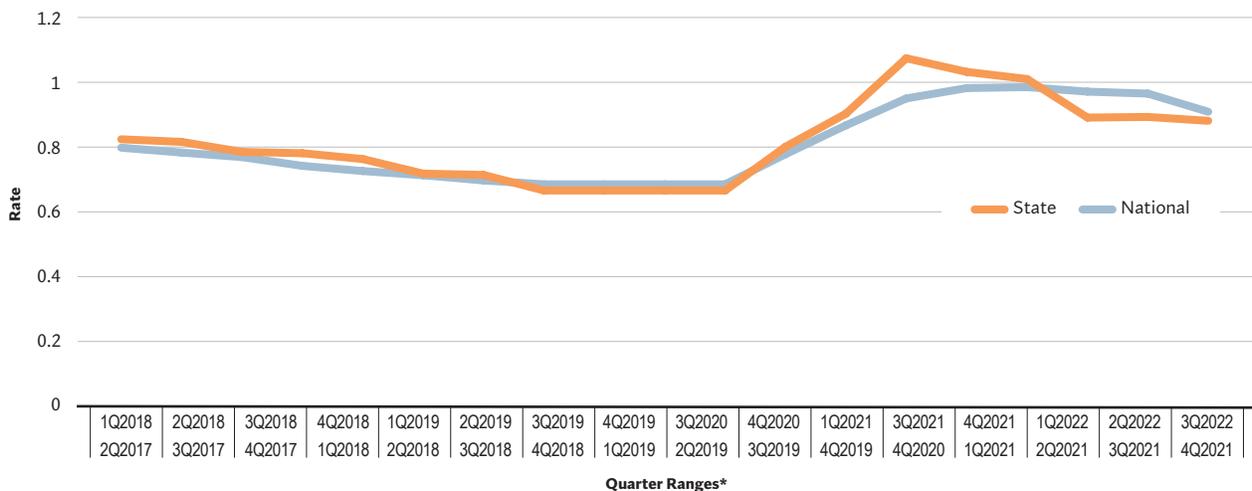
In 2014, national CLABSI rates were reduced by half¹⁸. This reduction was primarily attributed to the widespread adoption of evidence-based practices¹⁹. These effective strategies were well-integrated into hospital protocols, enabling CLABSI rates at many facilities to meet national benchmarks prior to the onset of the COVID-19 pandemic. However, the pandemic introduced several factors that contributed to an elevated risk of CLABSIs:

- Prolonged ICU stays
- Increased utilization of central lines
- Higher incidence of renal replacement therapy among patients¹⁸

Consequently, hospitals nationwide witnessed a sharp increase in CLABSI rates, with California bearing a particularly heavy burden (*see Figure 11*). As the pandemic receded, the return to established CLABSI prevention protocols resulted in a subsequent decrease in CLABSI rates. Since 2021, there has been a discernible decline in statewide CLABSI rates, though they remain elevated compared to before the pandemic.

Identifying the Five Patient Safety Priority Events

Fig. 11 – California & National CLABSI Rates



*Discontinuity of data is due to CMS halting of reporting during the COVID-19 pandemic.

Identifying Patients at Risk of CLABSI

Patients with a heightened risk of developing CLABSIs include those who are:

- Undergoing lipid-based or parenteral nutrition infusion during extended hospital stays
- Coping with compromised immune systems (e.g., organ transplant recipients or chemotherapy patients)
- Battling pre-existing pulmonary conditions (e.g., chronic obstructive pulmonary disease)
- Equipped with multiple central lines or lumens^{18, 19}

Risk is further compounded by noncompliance with insertion checklists and frequent access to central lines. In ICUs, the presence of specific pathogens like *Staphylococcus aureus* and *Staphylococcus epidermidis* are common contributors to CLABSIs²⁰. Notably, in pediatric ICUs, exceeding 80 central line accesses within three days significantly elevates the incidence of CLABSIs¹⁷.

Proven CLABSI Prevention Techniques

Embracing a back-to-basics approach to prevent CLABSIs involves a steadfast commitment to research-supported interventions. Use of the [CLABSI bundle](#), composed of a set of evidence-based protocols, consistently yields a reduction in CLABSI incidents¹⁹.

Identifying the Five Patient Safety Priority Events

Patient Safety Priority 5: Pressure Injuries

The Impact of Pressure Injuries

Pressure injuries, formerly referred to as pressure ulcers, represent a significant challenge to patient safety. These potentially life-threatening wounds affect a startling one in 10 patients²¹. While these injuries manifest in four defined stages, the most common are Stages I and II. Although all stages of pressure injuries carry inherent risks, they escalate considerably in Stages III and IV, where injuries are especially prone to severe complications. These complications encompass a spectrum of grave conditions²², including:

- Cellulitis
- Gas gangrene
- Osteomyelitis
- Septicemia
- Necrotizing fasciitis

Studies have shown the most common anatomical locations for pressure injury development are the sacrococcygeal region (lower back) and the calcaneus in the hindfoot (heel)²³.

People 65 and older are most significantly affected by pressure injuries (see Figure 12). These injuries are predominantly observed in ICUs and medical/surgical units. Over the three-year period, death and severe harm from pressure injuries increased by 400% (see Figure 13). During the same period, the rate of pressure injuries also increased.

Fig. 12 – Pressure Injuries in Newborns, Children, Adults, and Older Adults (HQIP)

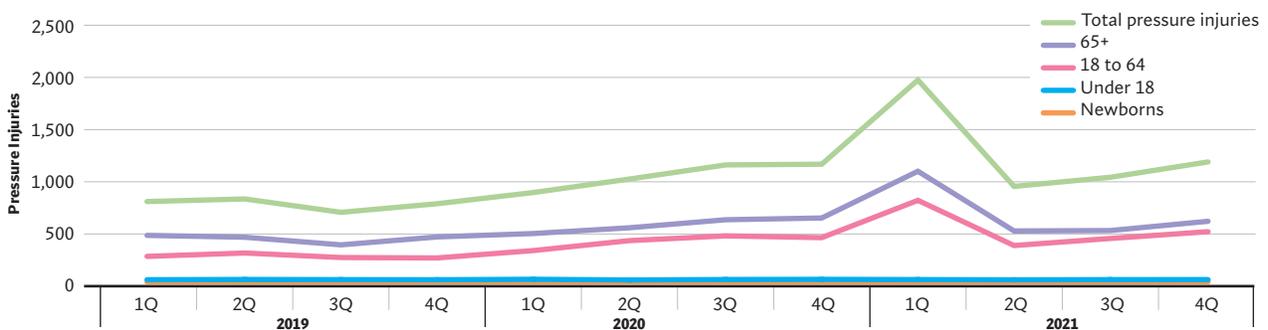
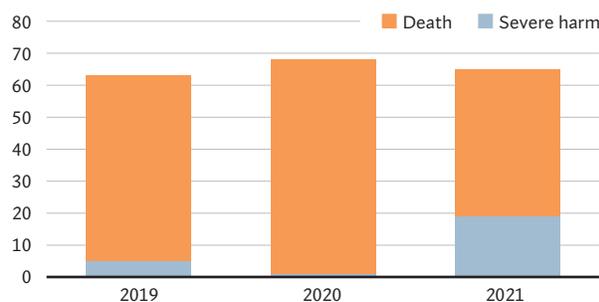


Fig. 13 – Pressure Injury Rate (CHPSO)



Identifying the Five Patient Safety Priority Events

Patients Prone to Pressure Injuries

Patients at an elevated risk of developing pressure injuries often exhibit impaired mobility or complete immobility, rendering them unable to respond to pain — the body’s early warning system against prolonged pressure²². Numerous patient risk factors contribute to the development of pressure injuries. These include²²:

- Advanced age
- Elevated C-reactive protein levels
- Reduced sensation
- Malnutrition
- Vascular insufficiency
- Exposure to factors like skin friction, shear forces, or moisture, particularly in patients experiencing incontinence

Core Approaches for Pressure Injury Prevention and Reduction

A back-to-basics strategy for the prevention of pressure injuries entails the best practices of inspection, palpation, and interdisciplinary collaboration skills. Health care teams must maintain a heightened level of vigilance in monitoring patients who exhibit infrequent movements and extended intervals between such movements²⁴.

Hospitals should consider implementing a structured framework to ensure ready access to wound care and dietary specialists who can provide monitoring protocols and consultation services for the management of advanced-stage cases²¹. The treatment of pressure injuries involves the application of specialized dressings containing materials like hydrogels, hydrocolloids, or saline-moistened gauze. These dressings play a crucial role in promoting the growth of granulation tissue and facilitating the healing process²². When devitalized tissue — which serves as a potential reservoir for bacterial contamination — is present, therapeutic measures such as debridement become necessary.

Hospital initiatives aimed at ensuring both safe patient handling and the prevention of worker injuries should provide comprehensive guidelines and standards for evaluating and enhancing patient mobility. These measures are essential in safeguarding against patient deconditioning. The [Bedside Mobility Assessment Tool](#) has amassed considerable evidence demonstrating its effectiveness in standardizing patient mobility assessments, enhancing communication among staff members, promoting the correct use of mobility equipment, and facilitating the mobilization of patients²⁵.

Conclusion

While evaluating the *Top 5* patient safety priorities, which included conversations with health care leaders, HQI observed a significant resurgence of commitment among both professionals and organizations. This renewed dedication is fueled by practices tailored to support the recently licensed workforce who stand at the forefront of delivering high-quality health care services.

The journey toward enhancing patient safety necessitates that hospitals maintain an unwavering focus on delivering comprehensive support to clinical managers, charge nurses, and preceptors. These individuals play pivotal roles in guiding and mentoring the next generation of health care providers. To address the formidable challenge of high turnover rates and bolster staff retention, comprehensive education and training programs play a central role. These programs are designed not only to build competence but also to nurture confidence and a profound sense of belonging within the health care workforce. Critical to this mission is the presence of adequately supported preceptors who facilitate the seamless integration of new hires into the health care ecosystem. Their role in ensuring the readiness and safety of these fledgling professionals cannot be overstated.

HQI is acutely aware of the risk of overwhelming dedicated staff. As such, the implementation of these transformative initiatives requires a gradual, step-by-step strategy. That includes simplifying approaches for new hires, providing them with a sturdy basis upon which to build their careers.

How HQI is Helping Hospitals

HQI is committed to helping members in their patient safety journeys, especially in these challenging times. Focusing on education, HQI will provide [ongoing opportunities](#) in the form of webinars, Safe Tables, and regional educational forums related to these issues and more. Additionally, HQI is dedicated to improving the foundation for safe, high quality care — by addressing the needs of the health care workforce. Through education and special programming such as the [HQI Cares program](#) and [workplace violence initiative](#), HQI is advancing the overall culture of safety and supporting stressed workers.

California hospitals should take advantage of these member benefits and participate as much as they are able in this effort. HQI welcomes your comments and suggestions and looks forward to partnering in this all-important call to action.

Appendix

Patient Safety Priority 1: Falls

Resources for Fall Prevention and Reduction

- [Agency for Healthcare Research and Quality \(AHRQ\) | Preventing Falls in Hospitals](#)
- [Age-Friendly Health Systems | Center | AHA](#)

Patient Safety Priority 2: Medication Safety

Resources for Medication Events

- [CDC Medication Safety Program](#)
- [CDC Adverse Drug Events](#)

Patient Safety Priority 3: CAUTI

CAUTI Prevention Resources

- [HSAG](#)

Patient Safety Priority 4: CLABSI

CLABSI Prevention Resources

- <https://www.cdc.gov/hai/bsi/clabsi-resources.html>
- <https://www.hsag.com/es/hqic/tools-resources/infection-prevention/>

Patient Safety Priority 5: Pressure Injuries

Pressure Injury Prevention Resources

- <https://www.ahrq.gov/patient-safety/settings/hospital/resource/pressureulcer/tool/pu3.html>

References

1. *COVID-19 and resilience of healthcare systems in ten countries.* Arsenault, C. et al. June 2022, *Nature Medicine*, Vol. 28, pp. 1314-1324
2. *Towards a more efficient healthcare system: Opportunities and challenges caused by hospital closures amid the COVID-19 pandemic.* Saghafian, S., Song, L. D., Raja, A. S. June 2022, *Health Care Management Science*, Vol. 25, pp. 187-190
3. *2023 National Healthcare Quality and Disparities Report Executive Summary.* Agency for Healthcare Research and Quality. Rockville, MD: Dec. 2023, AHRQ 23(24)
4. *Confronting health worker burnout and well-being.* Murthy, V. H. July 2022, *New England Journal of Medicine*, Vol. 38, pp. 577-579
5. *Preventing Falls in Hospitalized Patients: State of the Science.* LeLaurin, J. H., Shorr, R. I. March 2019, *Clinics in Geriatric Medicine*, Vol. 35, pp. 273-283
6. *Interventions to reduce falls in hospitals: a systematic review and meta-analysis.* Morris, Meg E. et al. May 2022, *Age and Ageing*, Vol. 51(5), pp. 15, afac077, <https://doi.org/10.1093/ageing/afac077>
7. *Medication Errors and Adverse Drug Events.* AHRQ. Sept. 2019, <https://psnet.ahrq.gov/primer/medication-errors-and-adverse-drug-events>
8. *Medication administration error perceptions among critical care nurses: a cross-sectional, descriptive study.* Alzoubi, M. M. et al. May 2023, *Journal of Multidisciplinary Healthcare*, Vol. 2023(16), pp. 1503-1512
9. *Individual Characteristics That Promote or Prevent Psychological Safety and Error Reporting in Healthcare: A Systematic Review.* Wawersik, D. M., Boutin Jr, E. R., Gore, T., Palaganas, J. C. April 2023, *Journal of Healthcare Leadership*, pp. 59-70
10. *Medication Errors in Pediatric Patients After Implementation of a Field Guide with Volume-Based Dosing.* Rappaport, L. D., Markowitz, G., Hulac, S., Roosevelt, G. February 2023, *Prehospital Emergency Care*, Vol. 27(2), pp. 213-220
11. *Urinary catheters: history, current status, adverse events and research agenda.* Feneley, R. C., Hopley, I. B., Wells, P. N. Aug. 2015, *Journal of Medical Engineering & Technology*, Vol. 39(8), pp. 459-70
12. *Strategies to Prevent Catheter-Associated Urinary Tract Infections in Acute Care Hospitals: 2014 Update.* Lo, E. et al. May 2014, *Infection Control and Hospital Epidemiology*, Vol. 35(5)
13. *Estimating health care-associated infections and deaths in U.S. hospitals.* Klevens, R. M. et al. March-April 2002, *Public Health Reports*, Atlanta, CDC, Vol. 122(2)
14. *An evaluation of daily bacteriologic monitoring to identify preventable episodes of catheter-associated urinary tract infection.* Garibaldi, R. A., Mooney, B. R., Epstein, B. J., Britt, M. R. Nov.-Dec. 1982, *Infection Control*, Vol. 3(6), pp. 466-470
15. *The two-person catheter insertion procedure reduces catheter-associated urinary tract infections.* Rahmawati, L., Tamaela, J. M., Anika, L., Wicaksana, A. L. Aug. 2021, *Enfermería Clínica*, Vol. 31(3)
16. *Effect of a Female External Urinary Catheter on Incidence of Catheter-Associated Urinary Tract Infection.* Zavodnick, J., Harley, C., Zabriskie, K., Brahmabhatt, Y. Oct. 2020, *Cureus*, Vol. 12(10)
17. *Novel risk factors for central-line associated bloodstream infections in critically ill children.* Woods-Hill, C. et al. Jan. 2020, *Infection Control & Hospital Epidemiology*, Vol. 41(1), pp. 67-72
18. *Association between parenteral nutrition-containing intravenous lipid emulsion and bloodstream infections in patients with single-lumen central venous access: A secondary analysis of a randomized trial.* Gavin, N. C. et al. June 2023, *Journal of Parenteral and Enteral Nutrition*, Vol. 47, pp. 783-795
19. *Bloodstream Infection Event (Central Line-Associated Bloodstream Infection and Non-central Line Associated Bloodstream Infection).* NHSN, CDC. Jan. 2024, cited Oct. 2023, http://www.cdc.gov/nhsn/pdfs/pscmanual/4psc_clabscurrent.pdf
20. *Central Line-associated Bloodstream Infections: CLABSI Care Bundle Approach of Prevention.* Veer, N., Sharma, J. Jan. 2023, *International Journal of Nursing and Medical Investigation*, Vol. 8, pp. 4-9

References

21. *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide*. 2014. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, Pan Pacific Pressure Injury Alliance. Haelsler, E. (Ed.), Cambridge Media: Osborne Park, Australia, cited October 2023, https://www.nzwcs.org.nz/images/International_PUG/Quick_Reference_Guide_DIGITAL-PPPIA-Jan2016.pdf
22. *Global prevalence and incidence of pressure injuries in hospitalized adult patients: A systematic review and meta-analysis*. Li, Z., Dr. Lin, F., Prof. Thalib, T., Prof. Chaboyer, W. May 2020, *International Journal of Nursing Studies*, Vol. 105
23. *Mepilex Border Sacrum and Heel Dressings for the Prevention of Pressure Ulcers: A NICE Medical Technology Guidance*. Marshall, C. et al. March 2019, *Applied Health Economics and Health Policy*, Vol. 17, pp. 453-465
24. *Continuous pressure monitoring of inpatient spinal cord injured patients: implications for pressure ulcer development*. Fryer, S. et al. Feb. 2023, Vol. 61
25. *Implementing Bedside Mobility Assessment Tool to Improve Patient Outcomes and Staff Communication*. Rose, A. et al. Jan. 2022, *MEDSURG Nursing*, Vol. 31(1), pp. 32-36