

# Patient Safety in Medical-Surgical Settings

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## Abstract

Patient safety in medical-surgical settings is a critical component of quality healthcare, given the high risk of adverse events associated with complex patient conditions, invasive procedures, and intensive treatment regimens. This review article aims to explore the concept of patient safety, common safety issues, contributing risk factors, and evidence-based strategies to minimize preventable harm in medical-surgical units. It also highlights the essential role of nurses, interdisciplinary collaboration, leadership commitment, and patient involvement in fostering a culture of safety. Key patient safety challenges such as medication errors, surgical site infections, patient falls, pressure ulcers, communication failures, and equipment-related incidents are discussed in detail. The review further examines systemic and organizational factors including staffing shortages, staff burnout, inadequate training, and environmental constraints that contribute to safety incidents. Evidence-based interventions such as standardized communication tools (SBAR), surgical safety checklists, electronic health records, medication reconciliation, and infection prevention protocols are emphasized as effective strategies for improving patient outcomes. Emerging innovations, including artificial intelligence, predictive analytics, and simulation-based training, are also briefly explored as future directions in patient safety enhancement. The article concludes that a multidisciplinary, system-based approach supported by strong leadership, continuous professional development, and active patient engagement is essential for sustaining a safe healthcare environment in medical-surgical settings.

**Keywords:** Patient safety, Medical-surgical nursing, Medication errors, Infection control, Nursing care quality

## INTRODUCTION

Patient safety is a fundamental component of quality healthcare and remains a major priority in medical-surgical settings, where patients are often critically ill, undergoing complex treatments, or recovering from surgical procedures. Despite advances in healthcare systems, preventable adverse events such as medication errors, infections, patient falls, and communication failures continue to pose significant challenges. These incidents not only increase morbidity and mortality but also contribute to prolonged hospital stays and higher healthcare costs.

Medical-surgical units are particularly vulnerable due to high patient turnover, workload demands, and the need for coordinated multidisciplinary care. Ensuring patient safety in such environments requires adherence to evidence-based practices, effective communication, adequate staffing, and a strong organizational safety culture. Nurses play a central role in maintaining safety through continuous monitoring, timely intervention, patient education, and advocacy.

This review highlights key patient safety issues in medical-surgical settings, explores contributing risk factors, and discusses evidence-based strategies and innovations aimed at reducing preventable harm and improving patient outcomes.

## DEFINITION OF PATIENT SAFETY IN HEALTHCARE

Patient safety is defined as “the absence of preventable harm to a patient and reduction of risk of unnecessary harm associated with health care to an acceptable minimum.” It encompasses a framework of organized activities that create

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cultures, processes, procedures, behaviors, technologies, and environments in healthcare that consistently and sustainably lower risks, reduce the occurrence of avoidable harm, make errors less likely, and reduce the impact of harm when it does occur.<sup>[1]</sup> The principle “First, do no harm” is fundamental to all healthcare services, emphasizing that no patient should be harmed in the course of receiving care.<sup>[2]</sup>

## IMPORTANCE OF PATIENT SAFETY IN MEDICAL-SURGICAL UNITS

Patient safety is of paramount importance in medical-surgical settings, where patients are often vulnerable due to acute illness, surgical procedures, or complex medical conditions. These units are high-risk environments for medical errors and adverse events, such as medication errors, surgical complications, and hospital-acquired infections.<sup>[3,4]</sup> Ensuring patient safety not only protects patients from harm but also improves health outcomes, reduces healthcare costs, and strengthens trust between patients and providers.<sup>[5]</sup> The World Health Organization (WHO) highlights that globally, 1 in 10 patients experiences harm during healthcare, underscoring the need for robust safety measures.<sup>[6]</sup>

## SCOPE AND OBJECTIVES OF THE REVIEW

This review aims to:

- Summarize the current understanding of patient safety in medical-surgical settings
- Highlight key strategies and interventions that promote patient safety
- Discuss the role of healthcare professionals, particularly nurses, in maintaining and enhancing patient safety
- Identify challenges and opportunities for improving patient safety in medical-surgical units.

The scope of this review includes the prevention and mitigation of harm, the importance of a safety culture, and the continuous improvement of care processes in medical-surgical environments.<sup>[7]</sup> Nursing professionals play a critical role in patient safety through vigilant monitoring, effective communication, and the implementation of evidence-based practices.

## UNDERSTANDING PATIENT SAFETY

### Core principles of patient safety

Patient safety is guided by a set of core principles that form the foundation for safe, high-quality healthcare. These principles include:

- Error prevention: Strategies are implemented to anticipate, identify, and mitigate risks before they result in harm.<sup>[6]</sup>
- Transparent reporting and learning: An open culture encourages reporting of incidents and near misses, allowing for learning and continuous improvement.<sup>[6]</sup>
- Standardization and best practices: Universal standards and evidence-based practices are adopted to minimize variability and improve outcomes.<sup>[6]</sup>

- Technology and automation: Digital tools and automation are used to enhance accuracy, communication, and timely intervention.<sup>[6]</sup>
- Patient engagement: Patients are actively involved in their care, which improves safety and outcomes.<sup>[3]</sup>
- Culture of safety: Organizations foster a culture where safety is prioritized at all levels, with leadership commitment and accountability.<sup>[7]</sup>

## THE “TO ERR IS HUMAN” REPORT AND ITS IMPACT

The landmark report *To Err is Human: Building a Safer Health System* by the Institute of Medicine (now the National Academy of Medicine) in 1999 brought global attention to the prevalence of medical errors and the need for systemic changes in healthcare. The report estimated that between 44,000 and 98,000 Americans died annually due to preventable medical errors. It shifted the focus from individual blame to system failures, emphasizing that most errors result from poorly designed processes rather than individual negligence. The report called for:

- A system-based approach to preventing errors
- Standardization of care processes
- Improved reporting and analysis of adverse events
- Greater transparency and patient involvement.

The impact of the report was profound, leading to increased research, policy changes, and the adoption of patient safety initiatives worldwide.<sup>[8]</sup>

## COMMON PATIENT SAFETY TERMINOLOGIES

Understanding key patient safety terms is essential for effective communication and incident management:

- Adverse event: An unintended injury or complication resulting in disability, death, or prolonged hospital stay, caused by healthcare management rather than the patient’s underlying disease.<sup>[4]</sup>
- Near miss: An event or situation that could have resulted in patient harm but did not, either by chance or through timely intervention.<sup>[9]</sup>
- Sentinel event: An unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof, that signals the need for immediate investigation and response.<sup>[2]</sup>

## COMMON PATIENT SAFETY ISSUES IN MEDICAL-SURGICAL SETTINGS

Medical-surgical units are dynamic environments where multiple patient safety risks coexist. The following are among the most prevalent and significant safety issues:

### Medication errors

Medication errors are a leading cause of preventable harm in medical-surgical settings. These errors may occur at any

stage of the medication process – prescription, dispensing, administration, or monitoring – and can result from incorrect dosages, wrong medications, or improper timing. Adverse drug events account for a substantial proportion of reported incidents and can lead to serious patient harm or even death.<sup>[7,9]</sup>

### **Surgical site infections (SSIs)**

SSIs are a major concern following surgical procedures. They can arise from poor hygiene, inadequate sterilization, or environmental contamination in the operating room. SSIs not only prolong hospital stays and increase healthcare costs but also significantly impact patient morbidity and mortality.<sup>[10]</sup>

### **Patient falls**

Patient falls are among the most frequent adverse events in hospitals, with rates ranging from 3 to 5/1000 bed-days. Falls can result in injuries such as fractures or head trauma, leading to longer hospitalizations and increased healthcare expenses. More than one-third of falls result in injury, underscoring the importance of fall prevention strategies in medical-surgical units.<sup>[10]</sup>

### **Pressure ulcers**

Pressure ulcers, also known as bedsores, develop when prolonged pressure damages skin and underlying tissue. They are highly preventable but affect more than one in ten adult hospital patients. Pressure ulcers can cause pain, infection, and prolonged recovery and are associated with significant physical, psychological, and financial burdens.<sup>[2]</sup>

### **Communication failures**

Ineffective communication among healthcare team members is a critical risk factor in patient safety. Miscommunication can lead to procedural errors, delayed treatments, or inappropriate interventions. Structured communication and clear protocols are essential to minimize these risks, particularly in high-stakes environments such as the operating room and medical-surgical units.<sup>[11]</sup>

### **Equipment-related injuries**

Equipment failures or improper use of medical devices can result in patient injuries. These include technical malfunctions, incorrect settings, or lack of maintenance. Equipment-related incidents can lead to procedural complications, delays, or direct harm to patients. Regular maintenance, proper training, and adherence to safety protocols are crucial for minimizing these risks.<sup>[12,13]</sup>

## **RISK FACTORS CONTRIBUTING TO PATIENT SAFETY INCIDENTS**

### **Nurse–patient ratio and staffing issues**

Nurse–patient ratio is a critical determinant of patient safety. Multiple studies have demonstrated that higher nurse workloads – resulting from higher patient-to-nurse ratios – are strongly associated with increased risks of adverse events, including medication errors, patient falls, pressure ulcers, infections, and even mortality.<sup>[14]</sup> For example, each additional patient assigned

to a nurse on a medical-surgical unit has been shown to increase the odds of 30-day mortality by 12–16%. Inadequate staffing also leads to unfinished nursing care and rationing of essential interventions, further compromising patient safety.<sup>[15]</sup>

### **Fatigue and burnout among staff**

Fatigue and burnout among nursing and healthcare staff are significant contributors to patient safety incidents. Overworked and stressed staff are more likely to make errors, miss important clinical cues, and experience reduced job satisfaction and emotional exhaustion.<sup>[8]</sup> Burnout is exacerbated by high patient loads, long shifts, and insufficient support, all of which can negatively impact the quality and safety of patient care.

### **Inadequate training or knowledge**

Lack of adequate training or insufficient knowledge among healthcare staff is a well-documented risk factor for patient safety incidents. Gaps in clinical skills, unfamiliarity with new equipment or protocols, and insufficient continuing education can lead to procedural errors, incorrect medication administration, and delayed interventions. Ongoing professional development and competency-based training are essential for maintaining high standards of care and minimizing risks.

### **Environmental and organizational factors**

Environmental and organizational factors play a substantial role in patient safety. Poorly designed workflows, lack of standardized protocols, inadequate equipment maintenance, and insufficient communication systems can all contribute to errors and adverse events.<sup>[4]</sup> Organizational culture, leadership support, and the availability of resources also influence the likelihood of safety incidents. A positive safety culture – where staff are encouraged to report errors and near misses without fear of punishment – is vital for continuous improvement and risk reduction.

## **EVIDENCE-BASED STRATEGIES TO ENHANCE PATIENT SAFETY**

### **Use of safety checklists (e.g., WHO surgical safety checklist)**

Safety checklists, such as the WHO Surgical Safety Checklist, have proven to be highly effective in reducing surgical complications and mortality. These checklists standardize critical steps before, during, and after surgery, ensuring that safety protocols – such as correct patient identification, antibiotic prophylaxis, and equipment checks – are consistently followed. Their use has been associated with significant reductions in SSIs, retained foreign objects, and post-operative complications.<sup>[12]</sup>

### **Standardized handoff communication (e.g., situation, background, assessment, recommendation [SBAR] technique)**

Standardizing communication during patient handoffs – such as the SBAR technique – reduces miscommunication and

errors. SBAR provides a structured framework for conveying critical information, ensuring that all team members have the same understanding of a patient's status and needs. This approach is especially valuable during shift changes, transfers, and multidisciplinary rounds and has been shown to improve patient outcomes and safety.<sup>[16]</sup>

### Medication reconciliation practices

Medication reconciliation is a systematic process of reviewing a patient's medications at every transition of care to identify and resolve discrepancies. This practice reduces the risk of medication errors, adverse drug events, and omissions, particularly in patients with complex medication regimens. Accurate reconciliation helps ensure that patients receive the correct medications at the right dosages and times.<sup>[3,7]</sup>

### Implementation of electronic health records (EHR)

EHRs enhance patient safety by providing real-time access to accurate and comprehensive patient information. EHRs support medication management, alert providers to potential drug interactions, and facilitate communication among healthcare teams. Their use has been associated with reduced medication errors, improved documentation, and better coordination of care.<sup>[3,7]</sup>

### Infection prevention protocols

Infection prevention protocols are essential in reducing healthcare-associated infections, such as SSIs and central line-associated bloodstream infections. Key strategies include strict hand hygiene, proper use of personal protective equipment, timely removal of invasive devices, and adherence to aseptic techniques. These protocols are supported by national and international guidelines and have been shown to significantly decrease infection rates and improve patient safety.<sup>[13]</sup>

## ROLE OF THE MEDICAL-SURGICAL NURSE IN PATIENT SAFETY

### Monitoring and surveillance of patients

Medical-surgical nurses play a pivotal role in the ongoing monitoring and surveillance of patients. This includes conducting comprehensive head-to-toe assessments, tracking vital signs, interpreting laboratory results, and identifying early signs of clinical deterioration. By maintaining close observation, nurses can promptly detect complications such as infections, hemodynamic instability, or adverse reactions to medications, thereby preventing escalation of harm.<sup>[17]</sup> Their vigilance is essential for timely interventions and ensuring patient stability throughout hospitalization.

### Advocacy and patient education

Nurses serve as advocates for their patients, ensuring that care plans are tailored to individual needs and that patients' rights and preferences are respected. They provide patient and family education about diagnoses, treatments, self-care strategies,

and safety precautions. Educating patients empowers them to participate in their own care, reduces anxiety, and improves adherence to treatment regimens, all of which contribute to safer outcomes.<sup>[18]</sup> Advocacy also involves communicating patients' concerns and needs to the healthcare team.<sup>[19]</sup>

### Reporting and documenting adverse events

Accurate and timely reporting and documentation of adverse events, near misses, and safety concerns are crucial responsibilities of medical-surgical nurses. Documentation provides a legal record and supports quality improvement by identifying patterns or root causes of errors. Reporting incidents encourages a culture of transparency and accountability, which is fundamental for learning from mistakes and preventing recurrence. Nurses are often the first to recognize and escalate safety issues, making their role in reporting indispensable.<sup>[3,7]</sup>

### Participation in quality improvement initiatives

Medical-surgical nurses actively participate in quality improvement initiatives aimed at enhancing patient safety. This includes involvement in safety committees, root cause analyses, and the implementation of evidence-based protocols and checklists. By contributing their frontline perspective, nurses help shape policies, workflows, and educational programs that reduce risks and improve care delivery.<sup>[20]</sup> Their engagement ensures that interventions are practical, patient-centered, and effective in real-world clinical settings.

## LEADERSHIP AND ORGANIZATIONAL SUPPORT

### Creating a culture of safety

A strong patient safety culture is foundational to reducing errors and improving outcomes in medical-surgical settings. This culture is characterized by shared values, attitudes, and behaviors that prioritize safety at every organizational level. Key components include leadership engagement, staff empowerment, open communication, and continuous learning. Leadership must visibly commit to safety by participating in safety initiatives, allocating resources, and communicating clear safety goals. Staff should feel psychologically safe to report errors and near misses without fear of retribution, fostering transparency and accountability.<sup>[21]</sup>

### Role of hospital administration and nurse managers

Hospital administrators and nurse managers play a pivotal role in shaping and sustaining a culture of safety. Their responsibilities include:

- **Strategic planning:** Integrating patient safety into organizational goals and operational plans
- **Resource allocation:** Ensuring adequate staffing, funding, and technological support for safety initiatives
- **Visible leadership:** Conducting safety rounds, participating in root cause analyses, and being present on clinical units to demonstrate commitment
- **Support for staff:** Providing mentorship, recognizing safety champions, and supporting staff development<sup>[3,7]</sup>
- **Accountability and transparency:** Establishing clear

expectations for safety performance and promoting open dialogue about safety concerns.

Nurse managers, in particular, serve as role models, advocates, and facilitators for frontline staff, ensuring that safety protocols are understood and consistently applied.<sup>[22]</sup>

### **Safety training and continuous professional development**

Ongoing safety training and professional development are essential for maintaining a high standard of patient care and safety. Organizations should offer regular education sessions on safety principles, emerging best practices, and new technologies.<sup>[7]</sup> Continuous learning is facilitated by:

- Regular safety training: Scheduled workshops, simulations, and e-learning modules to reinforce safe practices
- Peer-to-peer learning: Encouraging mentorship and knowledge sharing among staff to learn from real-world experiences
- Feedback and improvement: Using incident reports, safety audits, and root cause analyses to identify areas for improvement and implement changes<sup>[23]</sup>
- Integration of best practices: Adapting evidence-based safety interventions from leading healthcare organizations into local workflows.<sup>[24]</sup>

## **PATIENT INVOLVEMENT IN SAFETY**

### **Educating patients about their treatments and medications**

Patient education is a cornerstone of safety in medical-surgical settings. Informing patients about their diagnoses, planned procedures, medications, and expected outcomes empowers them to participate actively in their care. Clear explanations help patients recognize potential side effects, monitor symptoms, and adhere to treatment regimens, reducing the risk of errors and complications.<sup>[4]</sup> Nurses play a critical role in delivering tailored education, ensuring that information is understandable and actionable for each patient.<sup>[12]</sup>

### **Encouraging patient and family participation in care decisions**

Engaging patients and families in care decisions fosters a partnership approach to safety. This involvement can include shared decision-making about treatment options, participation in care planning meetings, and involvement in safety initiatives such as bedside rounds or advisory councils.<sup>[10,12]</sup> When patients and families are encouraged to ask questions, voice concerns, and contribute to care plans, they become valuable partners in error detection and prevention. This collaborative approach is recognized by leading organizations like The Joint Commission and the WHO as a key strategy for reducing preventable harm.<sup>[7,11]</sup>

### **Strategies for improving health literacy**

Health literacy – the ability to understand, process, and act on health information – is essential for effective patient engagement and safety. Strategies to improve health literacy include:

- Using plain language: Communicating in clear, jargon-free terms and checking for understanding
- Visual aids and demonstrations: Utilizing diagrams, videos, or hands-on demonstrations to reinforce instructions
- Teach-back method: Asking patients to repeat information in their own words to confirm comprehension
- Written materials: Providing written summaries and instructions tailored to the patient's reading level and language preference
- Multimodal communication: Combining verbal, written, and digital resources to reinforce key messages<sup>[4]</sup>
- Environmental cues: Using signage, labels, and assistive devices in patient rooms to support self-management and safety awareness.<sup>[9]</sup>

## **CHALLENGES AND BARRIERS**

### **Resistance to change**

Resistance to change is a significant barrier in advancing patient safety. Healthcare staff may be reluctant to adopt new protocols or technologies due to fear of increased workload, lack of confidence in new systems, or perceived threats to established routines. This resistance can delay or derail the implementation of evidence-based practices and safety initiatives.<sup>[22]</sup>

### **Underreporting of incidents**

Underreporting of adverse events and near misses remains a persistent challenge. Factors contributing to underreporting include fear of blame or punitive action, lack of feedback on reported incidents, and the perception that reporting will not lead to meaningful change. This limits the ability of organizations to learn from mistakes and implement preventive measures.<sup>[20]</sup>

### **Lack of standardized protocols**

Inconsistent or absent standardized protocols across medical-surgical units can lead to variability in care and increased risk of error. Without clear, evidence-based guidelines, staff may rely on individual judgment, which can result in unsafe practices and adverse outcomes.<sup>[17]</sup>

### **Budget and resource constraints**

Limited financial and human resources can hinder the adoption of patient safety initiatives. Insufficient staffing, inadequate training, and lack of access to necessary equipment or technology are common challenges that compromise the ability to maintain a safe environment for patients.<sup>[11]</sup>

## **FUTURE DIRECTIONS AND INNOVATIONS**

### **Role of artificial intelligence (AI) and predictive analytics**

AI and predictive analytics hold promise for enhancing patient safety by identifying patients at risk of adverse events before they occur. These technologies can analyze large datasets to detect patterns, predict complications, and alert healthcare providers to intervene early, potentially reducing harm and improving outcomes.

## SIMULATION-BASED TRAINING FOR SAFETY PRACTICES

Simulation-based training provides healthcare professionals with opportunities to practice safety-critical skills in a controlled, risk-free environment. This approach helps staff develop competence, confidence, and teamwork and is increasingly recognized as an effective method for improving patient safety and preparing for real-life emergencies.

### National and international patient safety frameworks

Adopting national and international patient safety frameworks – such as those developed by the WHO and The Joint Commission – can guide healthcare organizations in implementing best practices, standardizing care, and fostering a culture of safety. These frameworks provide evidence-based recommendations and support continuous improvement in patient safety.<sup>[25]</sup>

## CONCLUSION

### Summary of key points

Patient safety in medical-surgical settings is a multifaceted challenge that requires attention to clinical, organizational, and technological factors. Common issues include medication errors, infections, falls, and communication failures, all of which are influenced by staffing, training, and resource availability. Evidence-based strategies such as safety checklists, standardized communication, medication reconciliation, and infection prevention protocols have proven effective in reducing harm.

### Importance of a multidisciplinary approach

A multidisciplinary approach is essential for advancing patient safety. Collaboration among nurses, physicians, administrators, and patients fosters a culture of safety, encourages shared learning, and supports the implementation of innovative solutions. Leadership commitment and organizational support are critical for sustaining improvements and overcoming barriers.

### Recommendations for practice and policy

- Promote a culture of safety by encouraging open communication, non-punitive incident reporting, and continuous learning<sup>[26]</sup>
- Invest in staff training and development to ensure competency in safety practices and the use of new technologies
- Standardize protocols and documentation to reduce variability and improve care coordination
- Allocate adequate resources for staffing, equipment, and technology to support patient safety initiatives
- Embrace innovation by integrating AI, predictive analytics, and simulation-based training into routine practice
- Align with national and international frameworks to guide policy and practice and ensure continuous quality improvement.<sup>[27]</sup>

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