

5.2 Nursing interventions and preventive measures targeting major adverse events

NSI-based analyses help delineate the most common and modifiable adverse event profiles in older patients and guide the implementation of stratified, individualized prevention strategies. Evidence indicates that key nursing-sensitive issues requiring focused attention in older populations include infections, pressure injuries, bladder overdistension, malnutrition, delirium, falls, and medication-related harm (Järbrink et al., 2025; Koehl, 2023). Using falls as an example, nursing interventions should emphasize dynamic assessment at admission and throughout hospitalization, optimization of environmental safety and care coordination, appropriate use of assistive devices, and enhanced monitoring of medication-related risks. Concurrently, patient and family education and caregiver guidance should be strengthened to improve risk recognition, ensuring that process measures are traceable and auditable. In long-term care settings, multifactorial fall prevention programs-including exercise and balance training, environmental modification, medication review (especially psychoactive medications), management of orthostatic hypotension, and foot and footwear assessment-are recommended to reduce fall and fracture risk. However, studies also indicate that without deeper organizational transformation, quantifiable effects may be limited, underscoring the importance of using NSIs such as fall rates as feedback triggers to iteratively refine interventions.

Pressure injury prevention should be guided by outcome indicators such as pressure injury incidence and the proportion of newly acquired pressure injuries, and linked with process indicators including completion of skin risk assessments, adherence to repositioning schedules, and utilization of pressure-relieving devices to form executable nursing care pathways. Research shows that nursing-sensitive problems such as pressure injuries, malnutrition, and infections are not uncommon among older trauma patients, highlighting the central role of systematic risk assessment, early mobilization, skin care, elimination management, and nutritional support as core nursing responsibilities (Järbrink et al., 2025). Systematic reviews further indicate that ward-level, multicomponent interventions targeting “mobility-nutrition-cognitive engagement,” when combined with evidence implementation frameworks and adapted to local barriers, can improve mobility and functional outcomes, increase nutritional intake, and reduce delirium-thereby achieving a bundled reduction in multiple geriatric nursing-sensitive complications. Perioperative nursing studies also demonstrate that targeted interventions-such as temperature management, pain and anxiety control, close monitoring, and effective communication-can reduce emergence agitation and related complications in older surgical patients while improving satisfaction, suggesting that strengthening care processes can translate into improved outcomes (Hu and Peng, 2025).

Medication safety represents a critical NSI domain requiring focused governance. Reviews and clinical recommendations emphasize that pharmacist- or physician-led medication reviews, geriatric-friendly order sets, and team-based optimization of high-risk prescriptions can reduce the risk of adverse drug events (ADEs); however, effects on “hard outcomes” (e.g., hospitalization and mortality) are inconsistent, highlighting the importance of implementation quality, interprofessional collaboration, and integration with nursing monitoring processes (Koehl, 2023). Building on this foundation, events such as unplanned device removal and catheter-associated infections should be addressed through process optimization and behavioral standardization: strengthening assessment of cognitive and delirium risk and caregiver strategies, standardizing restraint use, refining protocols for catheter fixation and maintenance, and reducing medication errors through double checks, smart medication alerts, and closed-loop medication administration systems to achieve multi-point risk reduction.

5.3 Strengthening nursing staff training and risk management in geriatric care

Nursing staff competence and organizational risk management capacity are critical determinants of adverse events in older patients, and systematic development should target vulnerabilities identified through NSIs. Randomized controlled studies show that safety culture training programs in intensive care settings can significantly improve nurses’ safety knowledge, attitudes, practices, and perceptions of the work environment, indicating that the “safety culture-behavior-outcome” chain can be activated through training (Shoukr et al., 2025). Studies in geriatric specialty hospitals further demonstrate that patient safety competence and clinical experience are important predictors of safe nursing behaviors, underscoring the need for targeted training in patient safety competencies and retention of experienced nursing staff. In long-term care facilities, qualitative interview studies suggest that