

## **2.2 The critical role of medication reconciliation in preventing medication errors**

A robust medication reconciliation mechanism serves as a crucial safeguard against the translation of systemic flaws into actual medication errors, effectively preventing errors from propagating through prescribing, preparation, and system programming stages to the patient. Numerous studies have demonstrated that structured reconciliation processes can significantly reduce medication error rates across various clinical settings. For example, in prehospital emergency care and pediatric anesthesia, the implementation of cross-checking or double-checking mechanisms enables the timely identification and correction of potential errors without delaying clinical care. In routine clinical practice, critical steps such as dose verification and patient identity confirmation are particularly susceptible to interruptions, thereby increasing the likelihood of errors. Simulation studies indicate that standardized procedures combined with targeted interventions can effectively reduce reconciliation failures and medication errors attributable to interruptions. In environments utilizing electronic prescribing and clinical decision support systems, insufficient review of system alerts-especially during system malfunctions, can further elevate medication-related risks, underscoring the essential safety role of manual medication reconciliation. Overall, medication reconciliation is widely regarded as an efficient and direct strategy for enhancing medication safety.

## **2.3 The necessity of establishing standardized medication reconciliation processes**

Although medication reconciliation plays a vital role in ensuring medication safety, there remains a lack of unified standards in current clinical practice. Variability in workflows and operational approaches among healthcare personnel substantially weakens the protective effect of reconciliation processes. Evidence suggests that factors such as excessive workload, frequent environmental interruptions, the parallel use of paper-based and electronic systems, and habitual verification practices may compromise reconciliation quality and lead to the omission of critical steps. Quality improvement initiatives have shown that systematically integrating standardized medication reconciliation processes into ward management, medication regimen changes, and patient discharge procedures can reduce procedural variability, improve communication efficiency, and lower the incidence of medication errors. Such processes typically delineate responsibility, specify implementation timing and documentation requirements, and are supported by tools such as checklists, optimized electronic systems, and intelligent technologies (e.g., barcode scanning and mandatory verification steps), thereby providing a structured framework for medication safety.

## **3 The Role of Nurses in Medication Verification and Its Value in Risk Prevention**

### **3.1 Key control practices throughout the medication verification process**

In the processes of medication dispensing and administration, nurses are involved at every stage-from prescription initiation to medication preparation, administration, and post-administration monitoring-serving as a critical line of defense within medication safety verification systems. Nursing responsibilities extend beyond isolated time points and involve continuous, dynamic decision-making based on standard operating procedures and patients' clinical conditions. Prior to medication administration, nurses are required to complete several essential verification tasks, including confirmation of patients' allergy histories and key clinical indicators, assessment of potential drug incompatibilities, and verification of technical details such as dilution concentrations and dose calculations. These steps are frequently overlooked in practice yet are crucial for medication safety (Taş and Baykara, 2024; Nursery and Chrismilasari, 2024).

During the administration phase, nurses re-verify patient identity, assess the suitability of the care environment, and confirm the accuracy of dosage, route, administration method, and site. Continuous observation of patients' immediate responses enables early identification and timely management of potential adverse or emergency events (Uramatsu et al., 2024). Following medication administration, verification extends into a closed-loop management process focused on ongoing monitoring and standardized documentation. Nurses closely track patients' physiological and psychological responses and maintain detailed, traceable records of administration time, dosage, route, adverse reactions, and remaining medication volumes (Taş and Baykara, 2024).