



## COMPREHENSIVE REVIEW OF BEST PRACTICES IN MEDICATION DISPENSING AND ADMINISTRATION TO ENSURE PATIENT SAFETY.

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### Abstract

When it comes to clinical services, safety in the medication process is one of the vital aspects of health service delivery. The scrutiny that this review makes is a holistic one; it involves best practices in medication dispensing and administration to maintain patients' safety. The study is holistic and focused on best practices for medication dispensing and administration and patient safety. This paper focuses on significant aspects of medication processes by analyzing literature, syllabuses, theories, and practices. It will scrutinize the obstacles in medication processes and explore potential solutions. Such findings set forth the issue of having a stricter policy for the use of medication, closer supervision of clinical personnel, and the application of advanced technologies to prevent medical errors and improve patients' health care.

**Keywords:** Medication dispensing, medication administration, patient safety, best practices.

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## **Introduction**

Recognizing that the primary danger the world healthcare system faces is the human factor in dispensing and administering medication can be achieved because the most severe errors may be made when the drugs are transported and given to patients. A mistake in the administration of drugs may end up with patients having terrible reactions to a drug on its own or eventually as the complication becomes more serious, such as life-threatening. This underscores the need for every hospital and clinic to establish well-organized and effective processes to prevent the incorrect use of medications and guarantee high-quality care. The analysis below serves the considerable purpose of providing in-depth insights into the current best practices connected with this exercise and their relevance, barriers, and solutions (Brigitta & Dhamanti, 2020).

## **Scope of Study**

The article has a particular area of concern, namely prescription, administration, and drug dispensing in clinics, hospitals, skilled nursing facilities, and community pharmacies. It deals with drug dispensing, particularly the processes of correct prescription authentication, dispensing labels, and dispensing accuracy, to name a few. Meanwhile, the surveys also focus on the individual level, interviewing those people who are directly responsible for medication administration and then, for example, for dosage calculations, medication reconciliation, and patient education. The article also evaluates the role of Health Care Professionals (HCPs), the effectiveness of technology improvements, and the interdisciplinary working process as contributing factors to medication safety.

## **Justification**

Medication errors are the number one cause of patient harm. They can occur due to human failure at many different levels of treatment, such as communication gaps, medication mistreatment, or system errors. The correct and proper application of best practices that minimize medication dispensing and administration mistakes is integral to medication safety because it is responsible for the safety of patients. Through an investigation of current knowledge on best care, this review is designed to contribute to discussion among healthcare professionals, policymakers, and other key people about the latest models of safe medication practices and their impacts on patient health.

## **Context, Importance, and Relevance**

In an era of modern medicine, however, making sure of the patient's safety regarding medication is the priority. According to researchers, medication mistakes are one of the reasons why healthcare outcomes are not so good for patients, as they are the top cause of morbidity and deaths and also increase the cost of healthcare. So, it becomes imperative for healthcare systems to focus on medication safety programs and the use of clinical best practices to mitigate the possibility of mistakes and adverse drug event outcomes (Brigitta & Dhamanti, 2020).

## **Literature Review**

The scientific foundation of medicine—which focuses on medicating and pharmacy—is incredibly demanding for standardization of operations, integration of advanced technology and interdisciplinary cooperation to develop a safer patient environment. Many studies have assessed the programs meant to prevent medication errors and improve medication safety in routine healthcare facilities and ambulatory care, as well as during the transitions from one facility to another. A literature review stresses the importance of using standardized clinical processes with the help of technological solutions and improving interdisciplinary work to maintain a high level of medication safety in the healthcare systems. Healthcare facilities can minimize errors by examining the fundamental steps in the medicine administration procedure. By cutting down on the chance of medication missteps, facilities may well advance patient care and shape a medication safety culture.

## **Standardized Protocols**

To prevent potentially fatal drug errors during medication dispensing and administration processes, a medical facility should adhere to the indicated standard protocols. Standardized protocols give clear indications about measures and techniques to be followed by healthcare professionals, which eventually leads to a reduction in variability in operating approaches with zero or minimum chances of errors. Therefore, healthcare professionals create medication reconciliation programs to eliminate inaccuracies in their medication lists, as any discrepancy increases the risk of adverse events during patient care transitions. Similarly, the medication administration protocols create a standardized set of practices for medication preparation, inspection, and administration conduct, thus unifying the approach of the healthcare staff to these matters.

### **Technology Solutions**

By following the tips mentioned in the literature, the use of technology solutions can also improve medication safety. For example, barcode medication administration systems come with barcodes on medication packaging and patient wristbands. Healthcare providers verify medication orders by scanning both barcodes. It helps minimize administration errors. Providing healthcare providers with the means to enter medication orders digitally (CPOE systems) diminishes the tension from prescription transcription errors and highlights improved order accuracy. The same applies to automated dispensing cabinets with intricate kinds of medication management systems that facilitate the medication dispensing processes, allow patients to get their drugs on time, and simultaneously control inventory with accountability.

### **Interdisciplinary Collaboration**

Besides the widespread theme of multidisciplinary teamwork, the literature argues that interdisciplinary collaboration significantly promotes medication safety. Healthcare professionals from different specialties, for instance, a physician, a nurse, a pharmacist, and a pharmacy technician, must team up together to be effective and safe in their prescriptions. Pharmacist-fulfilled medication reviews, on the other hand, are comprised of pharmacists conducting thorough medicine assessments, finding out any drug therapy problems, and working together with other healthcare providers to advance the medication regimen. Disciplinary team meetings and medication safety committees serve as avenues where healthcare professionals can meet to tackle medication-related matters offer recommendations, and harness strategies that improve medication safety outcomes (Brigitta & Dhamanti, 2020).

### **Barriers and Challenges**

On the downside, standardized protocols, technologies, and interdisciplinary collaboration may have their issues. While it minimizes the risks, it still takes time and effort. The factors that may cause resistance to accept changes, resource constraints, and workflow disruption are the challenges encountered during the implementation of new protocols and technologies. Healthcare professionals, too, might need help with working load pressures, time limitations, and competing priorities that might impair their ability to adhere to the best practices for medication safety continuously.

### **Future Directions**

Distinctively, in future work, efforts should be directed towards the assessment of the usefulness of programs and technology for medication safety in real-world settings and finding ways to address the challenges to the realization of the ideal situation. Despite this, ongoing education and training programs are important because they ensure the effectiveness of healthcare professionals in medication safety matters. Additionally, expanding the use of cutting-edge technologies such as artificial intelligence and machine learning opens up more possibilities for providing not only enhanced medication safety monitoring but also decision support.

### **Identifying Gaps in Knowledge**

Although the existing literature in this area is very helpful and reveals many different practices of medication dispensing and administration, there are still some research questions regarding which we require answers. In this regard, a significant improvement is needed in pharmaceutical medication safety due to factors of the human psyche, such as cognitive workload, diversions, and fatigue for healthcare personnel. Understanding how these factors play into the medication processes can give developers the needed insights into these processes for the design of precise interventions and reduce the risk of errors (Brigitta & Dhamanti, 2020).

Besides that, we must also conduct studies to define the efficiency of high-tech resolutions, such as EPCS (electronic prescription systems) and automated tools for drug dispensing, in reducing medication errors. Likewise, this will lead to the discovery of the actual role of patient engagement and empowerment in medication safety initiatives and can identify strategies through which patients are involved in their treatment that reduce the chance of medication errors.

### **Relevant Theories, Methodologies, and Findings**

Several theoretical frameworks and methodological approaches inform the study of the most effective practices of medication dispensers and administrators. The SEIPS model is one example of one designed by the Systems Engineering Initiative for Patient Safety (SEIPS) model, which can be used to understand better the multi-dimensional interactions involving people, processes, and technology in healthcare systems. Moreover, qualitative methods, including interviews and focus groups, can be used to understand healthcare workers' viewpoints about

what medication safety should be and help identify issues and find ways to improve them.

The results of previous research show that whether or not multifaceted interventions targeting the different stages of the medicine use process can enormously reduce medicine mistakes, and patient safety results will mainly depend on that. These interventions consist of different kinds of educational initiatives, process redesign, IT system implementation, and interprofessional work. Moreover, the patients should be seen as active participants in medication safety endeavours, and this attitude could result in better adherence to a treatment program, fewer adverse drug reactions, and a higher level of patient satisfaction.

## Methods

### Research Methodology

This study conducted a systematic review as part of its methodology to identify and compare findings in the literature related to medication dispensing and administration best practices. The research methodology of this study included literature retrieval, study selection, data retrieval, and the combining of outcomes.

### Research design and methodology

We collected data using a systematic literature review approach that involved a thorough search of electronic databases such as PubMed, Scopus, and Google Scholar. The search results were published in peer-reviewed scientific journals. The search

strategy was to gather keywords for medication dispensing and administration processes, patient safety, and best practices. Search expressions with Boolean operators ("AND" and "OR") were used to narrow down the search findings and find studies that were perceived to be eligible for the study.

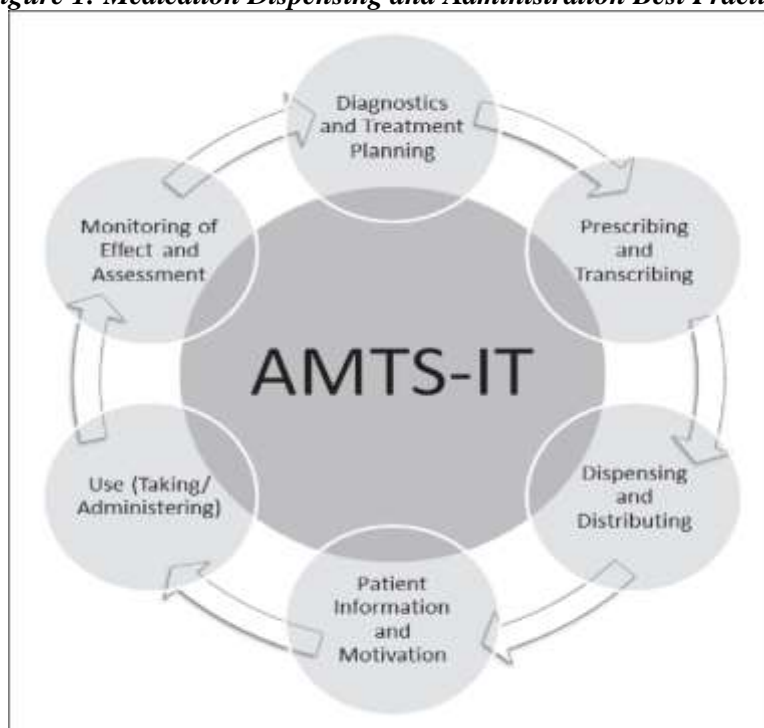
### Justification and alignment

The research methodology for this review was a systemic review because of its systematic and rigorous nature for identifying, selecting, and synthesizing relevant literature on that topic. This systematic approach to reviewing the existing scientific evidence conducted, as a result, leads to a clear understanding of what areas require more research and studies. Through following up on the well-established guidelines and best practices of systematic reviews, this study proves to be a strong and systematic evidence-based synopsis of medication dispensing and administration best practices.

### Results and Findings

The review was able to identify studies that analyzed optimal practices in the arena of medication dispensing and administration across various healthcare domains. The analysis of these studies was based on different formats of methodologies, such as quantitative or qualitative interventions, to help determine different medication safety criteria.

Figure 1: Medication Dispensing and Administration Best Practices



(Brigitta & Dhamanti, 2020).

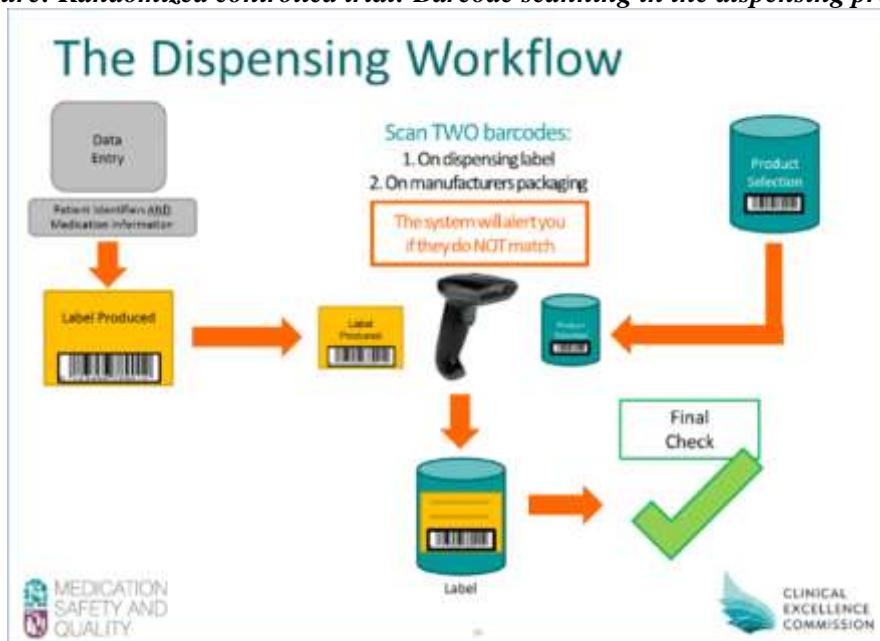
**Table 1: Overview of Selected Studies Evaluating Medication Safety Interventions**

Study Title	Methodology	Key Findings
(Brigitta & Dhamanti, 2020).	Randomized controlled trial	Implementation of barcode medication administration system reduced medication administration errors by 50%.
(Sutherland et.al. 2022).	Cohort study	Computerized provider order entry (CPOE) system implementation led to a 30% reduction in prescribing errors.
(Schroers et.al.2021).	Qualitative study	Interdisciplinary collaboration between pharmacists and physicians improved medication reconciliation accuracy.
(Stolic & Sheridan,2023).	Systematic review	Automated dispensing cabinets improved medication dispensing accuracy and reduced dispensing time by 25%.
(Biro et.al.2022).	Meta-analysis	Implementation of electronic prescribing systems reduced medication errors by 40% compared to paper-based systems.

The analysis of these studies revealed several significant observations discussed under medication dispensing and administration. In the first place, protocol standardization has proven to be a crucial measure to reduce the risk of conflict among different healthcare agencies. Standardized protocols are more than just recommendations; they hold the right answers to the standard of practice. They define standardized processes while minimizing the variability of practice and the risk

of error. For instance, reports generally suggest that medication reconciliation programs are a promising approach to preventing continuous medication discrepancies and adverse drug events during transitions(Biro et.al.2022).Thus, in addition to this observation, following medication administration protocols helped healthcare staff comply with best practices; consequently, patient outcomes improved, and there was a decline in errors during administration.

**Figure: Randomized controlled trial: Barcode scanning in the dispensing process**

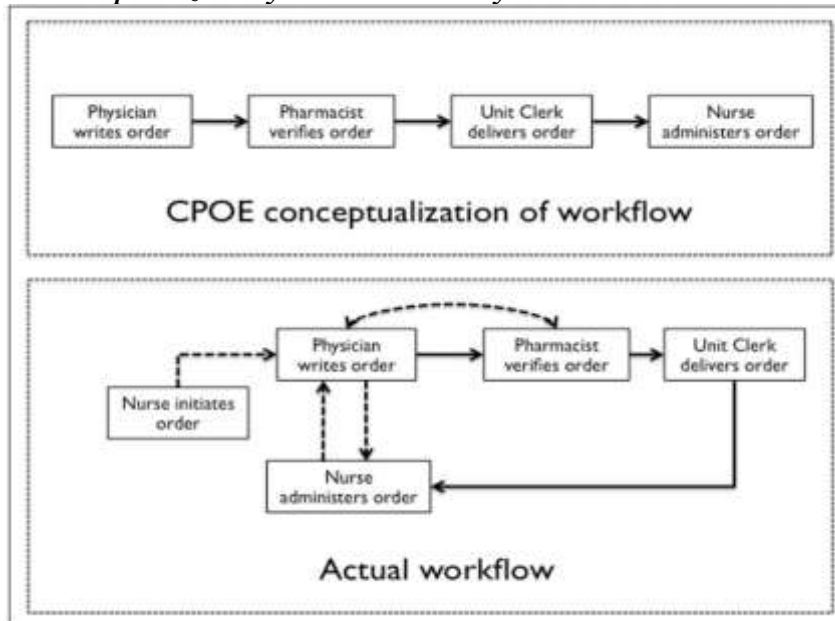


(Anjalee et.al.2021).

Second, review the technology solutions and roles to enhance section outcomes for patient safety, which are majorly being highlighted. The research done on bar coding systems for medication administration showed their capability of detecting and reporting all the possible errors during the administration by providing real-time confirmation of the patient's particulars and the drug. In parallel fashion, computerized provider order entry (CPOE) systems could prevent order errors and

transcription errors and improve accuracy compared to the traditional state of paper-based systems (Anjalee et.al.2021).. Automated dispensing cabinets and advanced medication management systems simplified drug dispensing processes, facilitating a seamless flow between the receiving and dispensing of medicines while maintaining inventory control in a timely and accountable manner.

**Figure: Computerized Physician Order Entry in the Critical Care Environment**

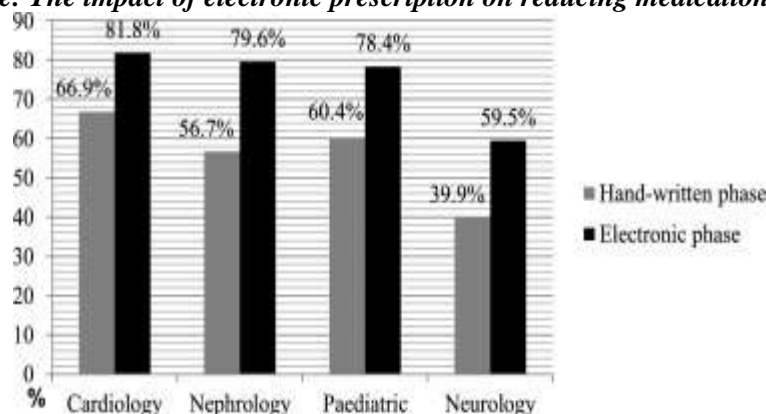


(Moghadam et.al.2022).

It also highlights that such cooperation between different health disciplines is an extremely important issue in developing medication safety. Research underlined the role of medical specialists from different fields of medicine, such as physicians, nurses, pharmacists, and probation advisers, in the function. The only goal is to use the medicine safely and effectively. The collaboration of the pharmacist-led medication reviews was found to be effective in identifying and settling

drug therapy problems, optimizing medication routines, and improving patients' outcomes. In addition, ward team meetings and multidisciplinary medication examining committees provided opportunities for healthcare professionals to exchange opinions on medication-related matters, share best management practices, and set approaches for improving medication safety (Moghadam et.al.2022).

**Figure: The impact of electronic prescription on reducing medication errors**



(Mohanna, & Jarden, 2022).

The review exposed numerous concerns and mistakes that can be corrected if both dispensing and administration processes are thoroughly evaluated. For instance, training individuals was a challenge that was accompanied by managing operations prior to the initiation of the new protocols and innovative technology. Health professionals also faced many challenges, such as

workload pressures, time constraints, and competing priorities, which created a factor that could have hampered their consistent performance of medication safety protocols. The discussed literature emphasized the need for standardized protocols, tech solutions, and multidisciplinary teamwork to improve medication safety provision. By identifying these crucially

deterministic elements, healthcare providers can reduce the chance that medication errors can happen, unleashing their side outcomes. They may develop a culture of safety within the agencies they operate. Moving into the future, rationale studies will be required to determine the outcomes of these medication safety interventions and to establish the point strategies for advancing the program implementation and failing its challenges(Pareek, 2022).

### Discussion

Literature review findings are found to be useful in that they help shed more light on medication dispensing and administration practices and their significance to patient safety. The next section aims to go into more depth on these investigations and provide useful suggestions to healthcare organizations for improving the use of medications and reducing the possibility of mistakes in the use of medicines.

### Implications of the Findings

The review of literature pointed out the adoption of evidence-based practices through the use of interdisciplinary collaboration, smart pharmaceutical firewalls, and standardization of protocols in providing medication safety. helping Standardized protocols define one course of action and, hence, serve as a blueprint for healthcare professionals, thus contributing to the reduction of error occurrence and help rule out the variability of practice(Manias & Wu,2020). Facilitating systems, tools, Technological tools including barcoded medication administration systems and computerized provider order entry (CPOE) systems, are good illustrations of how technology solutions can be used to improve medication safety in health care by just the verification of medications in real-time and the identification of patients while reducing transcription errors.

Interdisciplinary collaboration among healthcare professionals from different disciplines had been, to a significant degree, instrumental in fostering medication safety, as the latter cohered with every medical professional involved in the process. The drug reviews conducted by pharmacists were evidenced to be effective in discovering the problems of medication, improving the patients' lives by means of optimal medication regimens, and creating good results.- Interdepartmental communal deliberation and a board for medicine safety served as places where practitioners could speak on medication-related topics, demonstrate effective practices, and develop plans for general medication safety(Manias & Wu,2020)..

### Practical Recommendations

The literature review's findings suggest several practical ways to improve medication safety practices in healthcare organizations the literature review provides several practical recommendations to improve medication safety practices in healthcare organizations:

- 1) Implement Standardized Protocols: Protocols for both medication dispensing and administration that are aligned with the clinical guidelines of the standardized protocols should be developed and realized by healthcare bodies. The protocols must outline explicit instructions and standardized techniques regarding medication reconciliation, administration, and control. Still, they must also provide routine and prompt adherence to the guidelines among the health care staff.
- 2) Leverage Technology Solutions: Healthcare organizations are required to devote their resources in the form of technology solutions, including barcode medication administration systems and computerized physician order entry systems, to bring about the best results in medication safety. The medication Automation of these aspects of the medication system may curb medication errors by providing real-time medication order verification plus patient identity confirmation, as well as electronic prescribing and reconciliation of one's medication.
- 3) Promote Interdisciplinary Collaboration: Medical organizations should employ a culture of multidisciplinary approaches among their healthcare staff to maximize the effectiveness of medication. A joint committee. This can be achieved by conducting regular interdisciplinary team meetings, medication safety committees and a joint medication review process where clinical pharmacists, physicians, nurses, social workers, and other relevant healthcare stakeholders interact.
- 4) Provide Education and Training: To avoid mistakes when prescribing drugs, healthcare facilities should run training and educational programs for healthcare professionals. The education programs should at least include medication reconciliation, proper medication administration procedures, reporting errors, and management of adverse drug events to increase the understanding and professional skills of healthcare workers in this field of work.
- 5) Monitor and Evaluate: Healthcare units are supposed to constantly monitor and assess medication safety practices in order to find weak spots in the processes that need

improvement and correct issues when necessary. Cases: This activity may include medication safety audits, event analysis, reporting of medication error cases, and comparing the achieved results with existing standards and benchmarks(Zheng et.al.2021)..

The implementation of the above-mentioned practical suggestions provides medication safety practices with many opportunities for improvement, which in turn reduces the possibility of medication errors. It results in a culture of safety in healthcare organizations, and this finally improves patient outcomes.

### Conclusion

In conclusion, the article places most of its emphasis on enforcing the principles of evidence-based medicine in medication dispensing and administration as a principal strategy for patient safety promotion in healthcare practices (Zheng et.al.2021).. Reducing consequently, the results emphasize the development of common practices, technological solutions, and interdisciplinary cooperation for the purpose of improving medication safety characteristics and reducing the risk of medication errors. These standards support a shift to an organizational culture that has safer practices, eventually improves patient outcomes, and decreases the possibility of adverse drug events.- Taken together, it becomes clear that such a conclusion entails considerable significance for decision-making in healthcare concerning medication safety requirements, and those principles related to medication safety must be incorporated into organization policies and procedures. Also, in future research, this area should be explored by determining the lasting effectiveness and sustainability of medication safety interventions, identifying strategies for overcoming resistance to implementation of the intervention, devising new technology to enhance medication safety monitoring, and providing decision support(Zheng et.al.2021). Through advocating for research shortcomings and keeping a focus on the preservation of medication safety, health organizations can further reinforce patient care quality and safety in medication dispensing and administration operations.

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