



Healthcare

INBRIEF®

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Medication Safety: Strategies for Reducing Ambulatory Risk

Notwithstanding a myriad of patient safety initiatives, medication errors in ambulatory care settings continue to occur, with serious and sometimes fatal consequences. Consider the following reported examples of medication-related adverse events:

- A surgical circulating nurse erroneously hands the surgeon an incorrect medication and the surgeon injects the medication into a patient's eye, resulting in near blindness.
- An anesthesiologist selects and administers an incorrect drug concentration, causing the patient to go into cardiac arrest.
- A patient is instructed using pharmaceutical Latin abbreviations to take a pill three times daily. Due to a low level of health literacy, the patient misunderstands and takes the pill every three hours, causing an overdose and extended hospitalization.
- A home healthcare patient continues to receive and take prescribed medications after the regimen should have ended due to a lack of communication between the caregiver and the physician, exacerbating an underlying condition.

Medication safety demands an ongoing commitment to **evaluate and improve** everyday processes, with the goal of ensuring that patients receive the **correct medication** at the **right time**, in the **right amount**, via the **correct route**.

Medication errors may be caused by a multitude of individuals, including ordering clinicians, dispensers, providers and patients. Preventing or mitigating errors in ambulatory care is a complex process, requiring more than an annual review of policies and procedures. Medication safety demands an ongoing commitment to evaluate and improve everyday processes, with the goal of ensuring that patients receive the correct medication at the right time, in the right amount, via the correct route.

Among the chief attributes of a strong medication safety program for ambulatory care settings are point-of-care access to historical patient-specific data, effective communication at critical transitions, and safe and effective use of technology, including computerized prescription, automatic dispensing and innovative drug administration systems. This edition of *inBrief*® features a self-assessment tool for consideration and adaptation to organizational needs. The tool focuses on the following critical issues:*

- Treatment team access to patient and clinical data.
- Safeguards for computer order entry.
- Automatic drug-dispensing systems.
- Handoff communication practices.
- Protocols for high-alert, non-standardized, and look-alike and sound-alike drugs.
- Safety parameters for medication administration devices.

* Safeguards for prescription drug monitoring programs are beyond the scope of this tool.

Medication Safety: A Self-assessment Tool

Medication Safety Practice	Present (Yes/No)	Comments
Patient and drug data management		
1. A complete drug history – including current prescription medications; over-the-counter medications and supplements; alternative therapies; and alcohol, tobacco and illicit drug use – is electronically accessible, as well as drug therapy records from recent episodes of care.		
2. Medication profiles are readily available at the point of care in electronic or paper form, and reflect up-to-date medication orders.		
3. Medication profiles include an allergy notation, including a tiered severity rating to alert staff of drug intolerances.		
4. Allergy alerts are visible on all screens or pages of the patient medication administration record (MAR).		
5. Patient weight and height measurements are always recorded in metric units to avoid potential confusion.		
6. Laboratory values and diagnostic reports are easily accessible to prescribing practitioners, either through an electronic health record tracking program or conspicuous placement in paper records.		
7. Machine-readable coding is used to check patient identity and drug data prior to administration of drugs. If this functionality is not possible, two patient identifiers (such as patient ID number and birthdate) from the original prescription are used for verification.		
8. Documentation occurs simultaneously with medication administration to prevent critical gaps or oversights.		
Computerized systems		
1. The system is linked to a patient's profile, in order to alert ordering practitioners of comorbid or chronic conditions.		
2. The system interfaces with a pharmacy, in order to facilitate information sharing.		
3. Patient allergies are noted and coded in the system before medications are ordered.		
4. The system screens against patient profiles for allergies, as well as contraindicated medications, potential interactions and inappropriate doses.		
5. The system requires practitioners to document why they are overriding an alert message regarding allergy status, maximum dose or potential drug interactions.		
6. The system incorporates precautions for look-alike and sound-alike drugs, such as placing them on different screens, showing names in boldface and/or uppercase letters, and triggering alerts for similar suffixes, such as XL, SR, ED and CD.		
7. Software does not allow for problematic notations and abbreviations (such as q.i.d., Sub q and D/C), as well as improper use of trailing/leading zeros.		

Medication Safety Practice	Present (Yes/No)	Comments
Computerized systems (continued)		
8. Automatic drug dispensing cabinets (ADCs), where available in treatment areas, are customized with medications required for the clinical specialty only.		
9. ADCs are not stocked with potentially hazardous compounds, such as vials of neuromuscular blocking agents and undiluted electrolytes.		
10. ADCs are double-checked by staff to ensure that high-alert medications are not present, and these checks are documented.		
11. ADC security databases are updated at least annually to remove expired access codes and create new passwords.		
12. ADC override reports and blind counts are monitored and reviewed via quality assurance processes.		
Handoff communication		
1. All medication containers prepared in advance – including IV and oral syringes, vials, bowls and basins – are appropriately labeled with the name of the patient, the drug's name, strength, dose, frequency and expiration date.		
2. Unit-doses of medications remain packaged up to the point of handoff/administration, in order to facilitate a final check of the MAR.		
3. All handoffs of prepackaged medications are preceded by a spoken exchange of information, which includes patient and drug name, as well as the dose, route and frequency of administration.		
4. Verbal drug orders from practitioners are acceptable only during emergencies or sterile procedures, and require the receiving party to transcribe the order, read it back to the prescriber and document the read-back for verification.		
5. Potential drug side effects are clearly communicated at points of transition and are documented on accompanying patient care plans and/or handoff reports.		
6. Written protocol addresses the safe use and disposal of anesthesia-related medications, requiring that syringes be prominently labeled with drug name, strength/concentration and expiration date.		
7. Patients receiving high-alert drugs via IV or epidural infusion are accompanied by a qualified nurse or licensed practitioner when transported between treatment areas, and the exchange from the accompanying practitioner to the receiving staff member involves a formal documented handoff.		
8. Staff members responsible for the ordering, transcribing, dispensing and/or administering of medications participate in documented simulations of higher-risk situations, in order to reinforce effective communication techniques and handoff practices.		
9. Patients are included in the handoff dialogue, when possible, in order to prevent errors, reinforce their awareness of the medication regimen and enhance post-discharge compliance.		

Medication Safety Practice	Present (Yes/No)	Comments
High-alert, non-standardized and look-alike/sound-alike drugs		
1. Documented procedures are implemented in order to prevent wrong dosages or concentrations of identified high-alert drugs (e.g., anti-coagulants, muscle relaxants, insulin, potassium chloride, opioids, adrenergic agents, dextrose solutions, chemotherapeutic agents).		
2. High-alert medications are accompanied by standardized orders and/or computerized safe-dosing guidelines, and are verified by two persons before administration.		
3. Pediatric medications are accompanied by standardized orders and/or computerized dosing guidelines, and are stored separate from adult dosages of the same medications.		
4. Infusions of high-alert drugs – such as IV opioids, epidural narcotic infusions and vasopressors – are standardized to a single concentration for use in the majority of cases.		
5. Dosages, formulations and concentrations of drugs on medication carts and in medication cabinets are secured and reflect emergency drug guidelines for both adult and pediatric patients.		
6. Antidotes and reversal agents for medications, as well as dosing guidelines, are available at the point of care.		
7. Appropriate measures are taken to avoid the risk of contrast-induced nephrotoxicity or allergic response, including use of nonionic contrast, adequate hydration and postponement of treatment, if necessary.		
8. Non-standardized drugs approved for therapeutic use have accompanying safety enhancements, including but not limited to parameters for use, prescription guidelines, administration checks, monitoring protocols and separate storage areas apart from other medications.		
9. Medications requiring multiple dilutions or extensive calculations are made available only when necessary, and are maintained in limited quantities for safety reasons.		
10. Clinical staff is educated about minimizing the risks associated with look-alike and sound-alike products, and their training is documented.		
11. Drugs with look-alike and sound-alike names are kept separate from each other, are not stored alphabetically with other stock medications, and have enhanced labels or other auxiliary warnings.		
12. Clinical staff is notified when medication stock is relocated or storage areas are reorganized, in order to reduce the likelihood of confusion or error.		
13. Pharmacists are available on-site or by telephone to consult with providers regarding prescribed medications.		

Medication Safety Practice	Present (Yes/No)	Comments
Medication device safety		
1. Staff is educated about operating medication devices – including standard infusion pumps, “smart pumps” and ancillary equipment – and undergo documented competency testing on their safe use on a cyclical and routine basis.		
2. Smart pumps and related devices are programmed to deliver maximum-dose alerts when administering potentially hazardous medications.		
3. Only one type or model of epidural pump is utilized, and it differs noticeably in appearance from standard IV infusion pumps.		
4. The type and number of syringe pumps used to deliver medications are limited, and all pumps are clearly marked to prevent mistakes.		
5. IV and epidural infusions are prominently labeled with the intended route of administration, and dosing concentration is consistent with infusion-pump programming (e.g., mg/kg/min).		
6. Tubing for epidural infusions differs noticeably from peripheral or central venous IV access tubing and does not contain Y-connector access ports.		
7. The distal ends of all tubing are clearly labeled for patients receiving multiple solutions via different routes, such as peripheral, central venous, arterial, epidural, enteral, bladder or other access sites.		
8. Syringes containing medications intended for oral/enteral administration are incompatible with the luer-locking mechanisms of IV infusion tubing, in order to prevent potentially catastrophic accidents.		
9. Solutions intended for infusion are verified jointly by two persons, unless the facility employs smart pump technology that checks doses and verifies bar codes at the point of care.		
10. The infusion verification procedure includes patient name and ID number, as well as: <ul style="list-style-type: none"> • Drug and base solution. • Drug concentration and rate of infusion. • Channel of administration (for pumps that offer multiple channels). • Line attachment. 		
11. Written policy prohibits the administration of IV boluses via an infusion pump, unless smart pump technology recognizes and permits programming for bolus doses.		
12. Trained technicians are available to provide prompt assistance in the event of a medication device malfunction.		

Disclaimer: This resource serves as a reference for allied healthcare facilities seeking to evaluate risk exposures associated with medication safety. The content is not intended to represent a comprehensive listing of all actions needed to address the subject matter, but rather is a means of initiating internal discussion and self-examination. Your organization and risks may be different from those addressed herein, and you may wish to modify the activities and questions noted herein to suit your individual organizational practice and patient needs. The information contained herein is not intended to establish any standard of care, or address the circumstances of any specific healthcare organization. It is not intended to serve as legal advice appropriate for any particular factual situations, or to provide an acknowledgment that any given factual situation is covered under any CNA insurance policy. The material presented is not intended to constitute a binding contract. These statements do not constitute a risk management directive from CNA. No organization or individual should act upon this information without appropriate professional advice, including advice of legal counsel, given after a thorough examination of the individual situation, encompassing a review of relevant facts, laws and regulations. CNA assumes no responsibility for the consequences of the use or nonuse of this information.

Quick Links

Agency for Healthcare Research and Quality, Patient Safety Network

- [Computerized Provider Order Entry](#), last updated September 7, 2019.
- [Medication Errors and Adverse Drug Events](#), last updated September 7, 2019.

Institute for Safe Medication Practices

- ["Guidelines for Safe Electronic Communication of Medication Information,"](#) January 16, 2019.
- ["Guidelines for the Safe Use of Automated Dispensing Cabinets,"](#) February 7, 2019.
- ["Independent Double Checks: Worth the Effort if Used Judiciously and Properly,"](#) June 6, 2019.
- ["List of Error-Prone Abbreviations,"](#) October 2, 2017.
- ["Targeted Medication Safety Best Practices for Hospitals,"](#) February 21, 2020.

National Center for Biotechnology Information, U.S. National Library of Medicine

- Tariq, R.A. et al. ["Medication Errors."](#) *StatPearls*, January 2020. Last updated June 15, 2020.

U.S. Food and Drug Administration

- ["Working to Reduce Medication Errors,"](#) August 23, 2019.

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