Patient Safety Primer Last Updated: September 2019

The Pharmacist's Role in Medication Safety

Background

As discussed in the related primer on medication error, adverse drug events occur when exposure to a medication results in harm. Correct medication use occurs when the "five rights" are followed, meaning the right dose of the right medication is administered to the right patient, at the right time, and by the right route. However, this simple phrase obscures the fact that the five rights must be individualized, as they are affected by the patient's age, medical condition, physiologic status, and other factors such as allergies. While pharmacists' contribution to medication safety has been historically focused on dispensing, pharmacists' roles have expanded as medication therapy has increased in complexity, and many patients—even those with serious illness—can now receive care in the home and in community settings.

According to the American Pharmacists Association, pharmacists in all settings have eight essential medication-related responsibilities linked to improving patient safety. These eight responsibilities and examples of how they can affect patient safety are outlined in the Table.

Safety action	What is involved	Example of impact
Ensure access to medication	Evaluate ability to pay for medication; explore alternative medications or payment means	Finding patient assistance programs or working with insurers to make medication available that patients otherwise could not afford, improving adherence and safety
Supply medication information	Educate patients and caregivers on safe and	Reviewing proper dosing with patients or providers can prevent

	effective medication use	medication errors and adverse drug interactions
Evaluate medication appropriateness	Assess medication appropriateness, effectiveness, and safety for each individual patient	Individual consideration of "five rights" in light of patient condition, medication list, age, weight, ethnicity, diet, allergies, and kidney and liver function can result in recommendations for changes in therapy or monitoring to increase medication safety
Improve medication adherence	Help patients take medication as it is prescribed	Reviewing how patients are using medications can result in suggestions for changes in medication, dosing, or additional therapies that improve patient adherence
Provide health and wellness services	Deliver direct health and wellness service	Blood pressure screenings can reveal poorly controlled hypertension
Medication management	Comprehensive review of patient's full medication	Pharmacist review may determine which of several medications is causing an adverse

	regimen to ensure medications work well together and avoid problems (e.g., interaction)	effect; simplify a patient's medication regimen; identify gaps in reaching treatment goals; or prevent prescription of medications that have adverse interactions
Assess health status	Determine current patient status and medication effectiveness; provide guidance regarding medication therapy	Pharmacist may detect dangerously low or high blood pressure and recommend changes in medication therapy and thereby prevent harm
Coordinating care transitions	Coordinate medication management across care transitions; assist with care coordination for transitions	Pharmacist-led medication reconciliation may identify potential interactions or omissions from medication list at transitions in care, which are prone to error.

Source: *Pharmacists' Impact on Patient Safety: A Joint Project of the American Pharmacists Association Academy of Pharmacy Practice and Management and*

Academy of Pharmaceutical Research and Science. Washington, DC: American Pharmacists Association; 2016. https://www.pharmacist.com/pharmacists-impact-patient-safety.

Pharmacists also have a crucial system-level role in planning and leading medication safety programs and improvement initiatives within health care organizations. These initiatives may include developing risk-specific protocols for high-alert medications; identifying and evaluating high-risk processes (e.g., total parenteral nutrition, compounding, pediatric dose preparation) that require special attention, protocols, and training; evaluating medication error data; evaluating and implementing new medication technologies; and fostering robust error reporting processes. Clinical trials are another area in which pharmacist leadership in designing safe protocols is critical, as there are fewer standardized safeguards in place to ensure correct medications and doses are delivered to patients.

Current Context

Pharmacists have a central role in ensuring medication safety across the continuum of care. The complexity of the medication prescribing and delivery processes can make it difficult to prove the beneficial effect of pharmacists on adverse outcomes directly, but pharmacist involvement has been shown to reduce errors, improve prescribing practices, and enhance patient monitoring across settings. For example, a cluster-randomized trial of pharmacist involvement in medication management planning on hospital admission showed a dramatic reduction in medication errors within the first 24 hours of hospitalization. A meta-analysis of 13 studies of pharmacist interventions at transitions of care estimated a 37% reduction in medication errors and a decrease in emergency department visits after hospital discharge. A recent randomized controlled trial of a pharmacist-led intervention in primary care practices in the United Kingdom tested an intervention bundle comprised of review of electronic medical records, prescriber feedback, education on error reduction, and support for improving local safety

systems. This bundle of practices resulted in significant increases in appropriate prescribing and monitoring practices for specific error-prone situations, such as elderly patients taking loop diuretics or angiotensin-converting enzyme inhibitors. Despite these generally positive results, many health systems have found it difficult to hire enough qualified pharmacists, either because of a shortage in the available pharmacists or the costs of implementation. Given the latter factor, further studies that consider the return-on-investment of pharmacist-led safety programs should be considered.

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Cox N, Tak CR, Cochella SE, et al. *The Journal of the American Board of Family Medicine*. 2018;31.

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Effectiveness of pharmacist intervention to reduce medication errors and health-care resources utilization after transitions of care: a meta-analysis of randomized controlled trials.
De Oliveira GS, Castro-Alves LJ, Kendall MC, et al. *Journal of patient safety*. 2017.

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Improving admission medication reconciliation with pharmacists or pharmacy technicians in the emergency department: a randomised controlled trial.
Pevnick JM, Nguyen C, Jackevicius CA, et al. *BMJ quality & safety*. 2018;27:512-520.

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Targeted Medication Safety Best Practices for Hospitals.
Horsham, PA: Institute for Safe Medication Practices; 2020.

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Medication safety systems and the important role of pharmacists.
Mansur JM. *Drugs & aging*. 2016;33:213-21.

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Pharmacist medication reviews to improve safety monitoring in primary care patients.
Gallimore CE, Sokhal D, Schreiter EZ, et al. *Families, systems & health : the journal of collaborative family healthcare*. 2016;34:104-13.

JOURNAL ARTICLE › REVIEW
Impact of pharmacist involvement in the transitional care of high-risk patients through medication reconciliation, medication education, and postdischarge call-backs (IPITCH Study).
Phatak A, Prusi R, Ward B, et al. *Journal of hospital medicine*. 2016;11:39-44.

Phatak A, Prusi R, Ward B, et al. *Journal of hospital medicine*. 2016;11:39-44.

JOURNAL ARTICLE › STUDY
A pharmacist-led information technology intervention for medication errors (PINCER): a multicentre, cluster randomised, controlled trial and cost-effectiveness analysis.
Avery AJ, Rodgers S, Cantrill JA, et al. *Lancet (London, England)*. 2012;379:1310-9.

JOURNAL ARTICLE › STUDY
Medication error prevention by pharmacists.
Blum K, Abel SR, Urbanski CJ, et al. *American journal of hospital pharmacy*. 1988;45:1902-3.

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Ten ways to improve medication safety in community pharmacies.
Rupp MT. *Journal of the American Pharmacists Association : JAPhA*. 2019;59:474-478.

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ISMP medication error report analysis.
Cohen MR.

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