

TARGET AUDIENCE: Pharmacists and technicians interested in actions they can take to reduce errors.

EDUCATIONAL OBJECTIVES

After participating in this application-based activity pharmacists and pharmacy technicians will be able to:

- Review the most common errors made by health-care practitioners including pharmacy staff
- Identify the factors contributing to the occurrence of errors
- Describe the process of reporting errors
- Characterize modifications in the workplace intended to reduce errors



The University of Connecticut School of Pharmacy is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

Pharmacists and pharmacy technicians are eligible to participate in this application-based activity and will receive up to 0.2 CEU (2 contact hours) for completing the activity, passing the quiz with a grade of 70% or better, and completing an online evaluation. Statements of credit are available via the CPE Monitor online system and your participation will be recorded with CPE Monitor within 72 hours of submission

ACPE UAN: 0009-0000-21-016-H03-P
0009-0000-21-016-H03-T

Grant funding: None

Cost: \$7 for pharmacists
\$4 for technicians

INITIAL RELEASE DATE: May 15, 2021

EXPIRATION DATE: May 15, 2024

To obtain CPE credit, visit the UConn Online CE Center

<https://pharmacyce.uconn.edu/login.php>.

Use your NABP E-profile ID and the **session code**

21YC16-XBA32 for pharmacists or

21YC16-TAX46 for pharmacy technicians

to access the online quiz and evaluation. First-time users must pre-register in the Online CE Center. Test results will be displayed immediately and your participation will be recorded with CPE Monitor within 72 hours of completing the requirements.

For questions concerning the online CPE activities, email joanne.nault@uconn.edu.

You Asked for It! CE



© Can Stock Photo / sqback

Law: "A Danger to the Public"--Would that be me?

ABSTRACT: Errors in the pharmacy workplace can have devastating consequences. Estimates of the rate of prescription errors vary widely and the outcomes from errors also differ. Errors may occur anytime during prescription processing and may have many different causes. The most common error (and potentially the most serious) by pharmacist or technicians is dispensing the wrong drug or dose. Recent media reports of pharmacy errors have focused attention on the workplace environment as a contributing factor. This continuing education activity describes the types and major causes of errors and examine recent regulatory changes in the pharmacy and technician workplace aimed at reducing errors.

FACULTY: Gerald Gianutsos, Ph.D., J.D., R.Ph., is an Emeritus Associate Professor of Pharmacology at the University of Connecticut, School of Pharmacy.

FACULTY DISCLOSURE: Dr. Gianutsos has no actual or potential conflicts of interest associated with this article.

DISCLOSURE OF DISCUSSIONS of OFF-LABEL and INVESTIGATIONAL DRUG USE: This activity may contain discussion of off label/unapproved use of drugs. The content and views presented in this educational program are those of the faculty and do not necessarily represent those of the University of Connecticut School of Pharmacy. Please refer to the official prescribing information for each product for discussion of approved indications, contraindications, and warnings.

INTRODUCTION

The insurance company has me on hold, but the phone keeps ringing. Overnight prescription orders still need to be filled. Darlene, the technician, says someone is leaving on a trip tomorrow and wants me to call her physician for refills. She also wants to speak to me about a cold medication for her two-year-old daughter. Someone else is waiting for a shingles vaccine ... Wait, did I give Mr. Brown the right dose of warfarin?

Will I make a mistake today? That question is understandably at or near the top of the list of worries that most working pharmacy staff have. Time/work pressures and the potential consequences of an error to both the pharmacist and the patient amplify the concern. Errors by pharmacists may result in guilt, disciplinary actions, employment termination, and lawsuits. Most importantly, errors can lead to patient harm and even death. A recent *New York Times* article on phar-

TO REGISTER and PAY FOR THIS CE, go to: https://pharmacyce.uconn.edu/program_register.php

PAUSE AND PONDER: How many errors do you think you made in the past year?

macist errors observed that “(t)he people least surprised by such mistakes are pharmacists” with one pharmacist quoted as saying “I am a danger to the public.”¹ Can that danger be ameliorated?

This continuing education activity will review the factors contributing to dispensing errors. In addition, it will discuss efforts by state regulatory agencies and professional organizations to reduce errors and promote patient safety, with an emphasis on workplace issues.

MEDICATION ERRORS

There are many kinds of errors in medicine. A medical error is defined generally as “a preventable adverse effect of medical care, whether or not it is evident or harmful to the patient.”² Any healthcare practitioner can make an error.

The most common medical error in the United States (U.S.) is an adverse drug event (ADE).² ADEs are defined as “an injury resulting from medical intervention related to a drug” which includes not just medication errors, but also adverse drug reactions, allergic reactions, and overdoses.³ ADEs may be preventable or non-preventable. Preventable events involve an error, while non-preventable ADEs refer to a drug-induced harm occurring despite appropriate use of medication (e.g., an idiosyncratic response).⁴ This continuing education activity will discuss preventable errors.

Errors associated with medications are widespread. The U.S. Food and Drug Administration (FDA) receives more than 100,000 reports each year associated with suspected medication errors.⁵ The National Academy of Medicine estimates that more than 50 million medication errors occur in the U.S. each year, of which about 6.5% are considered clinically significant.⁶ Although not all medication errors result in harm, ADEs are responsible for approximately 700,000 emergency department visits and 100,000 hospitalizations each year in the U.S.⁷

Researchers estimate that medication errors cause 1 of 131 outpatient and 1 of 854 inpatient deaths⁸ and 7,000 to 9,000 deaths each year in the U.S. may be attributable to medication errors.⁹ Costs associated with morbidity and mortality from medication errors may approach \$77 billion in the U.S.¹⁰ In addition to the financial costs, patients affected by medication errors experience physical and psychological pain and suffering. Medication errors may also reduce patient satisfaction with the healthcare system and may lead to an erosion of trust in healthcare.⁸ Clearly, this is an issue of great concern.



PHARMACY ERRORS

Frequency

While medication errors can occur anywhere within the health-care system, the focus of this continuing education activity is pharmacy personnel’s errors. It is difficult to obtain reliable data on the frequency of errors due in part to inconsistent definitions of what constitutes an error, poor reporting of errors, and varying research methodologies.¹¹ In addition, patients do not discover or report many errors.^{1,9} A recent meta-analysis found dispensing error rates ranging from 0.00003% to 55% based on past research.¹¹ The meta-analysis included published studies between 1995 and 2011 that examined errors from between one and 260 pharmacies using different data collection methods. The most common methodologies used to identify a dispensing error are direct observation, record review or audit, “secret shoppers,” and self-reports.¹¹ The enormous variability makes conclusions about the occurrence of errors difficult. There is also a great range of outcomes following an error, from no effect to death. Nevertheless, the potential for harm in community pharmacies is high.¹¹

Much of the most widely cited data still being relied upon was obtained many years ago and may not necessarily reflect the current environment. A 1999 investigation in Massachusetts by a newspaper found that 4% of the prescriptions dispensed in community pharmacies contained errors, mostly involving the wrong drug or wrong dose.¹² An observational study conducted in community pharmacies in 1996 detected an error rate of about 3%.¹³ Half of the 206 pharmacists responding to a survey in 1997 reported that they believed that they had made a dispensing error in the two months prior to the survey.¹⁴ Another study, looking at dispensing from a hospital outpatient pharmacy almost four decades ago (1983), found an error rate of approximately 5% with no significant difference between pharmacists and technicians.¹⁵



© Can Stock Photo/gurza

Despite the variability, a generally accepted reasonable estimate of dispensing errors is approximately 1% to 2%.^{7,11,16} Experts estimated that 4.38 billion prescriptions were filled in 2019 and that number will probably rise to just under 5 billion by 2025.¹⁷ Thus, even at a low projected error rate of 1%, more than 43,800,000 pharmacy errors would occur annually—that’s almost 120,000 each day. It is estimated that a typical community pharmacy in the U.S. commits about two clinically significant medication errors each week.⁷

What are the Most Common Errors?

An error may occur at any stage of therapy, from prescribing to dispensing to the medication’s incorrect use by the patient. Pharmacy staff may commit an error at any phase of prescription processing, from receiving the prescription from the patient or prescriber up to delivery to the patient. Errors may result from an act of commission (e.g., dispensing the wrong drug) or omission (e.g., failure to properly counsel a patient).^{8,10}

According to the Academy of Managed Care Pharmacy, the most common dispensing errors are dispensing an incorrect medication, dosage strength, or dosage form; miscalculating a dose; and failing to identify a drug interaction or contraindication.¹⁰ A literature review of 60 papers also found that the most common types of dispensing errors were supplying the wrong drug, strength, form, or quantity, and mislabeling medication with incorrect directions.¹⁸

A study examining community pharmacy errors reported to the New Hampshire Board of Pharmacy over a five-year period (2007 to 2012) also found that the most common error was dispensing an incorrect drug, accounting for 40% of the reported errors.¹⁹ The next most common errors were dispensing the incorrect dose (31%), or incorrect directions (12%). More than three quarters of the errors occurred with new prescriptions. The initial processing/data entry phase accounted for 26% of errors; of these errors, pharmacy technicians processed 73% of prescriptions, pharmacists processed 15%, and pharmacy interns processed 6%. The researchers could not determine who processed the remaining 6%. An additional 28% of errors occurred during the prescription assembly phase when medications are taken from the shelf and placed into prescription containers. Delivery to patients accounted for 7% of errors. Readers should view these results with caution since they are based on errors that generated complaints to the Board and may not represent errors generally. Significantly, more than two-thirds (68%) of the errors occurred when there was only one pharmacist on duty; 29% of the errors occurred when two

Table 1. Common Causes of Pharmacy Errors

- Look-alike/sound alike drug names
 - Confusion due to similar labeling appearance or name
 - Adjacent placement on shelves
 - Wrong selection from drop-down menu
- Interruptions/distractions
- Confirmation bias
- Pharmacy workload
 - Prescription volume
 - Fatigue
 - Metrics tracking
- Ignoring alerts
- Work environment (e.g., lighting, noise)

pharmacists were on duty. Some of the pharmacists involved reported that they were responsible for filling between 251 and 300 prescriptions per day without additional pharmacist coverage or overlap. The pharmacists noted that this was a typical work condition and not the result of a pharmacist shortage or reduced staffing due to illness. These factors will be discussed in more detail later.¹⁹

Dispensing the wrong drug was also reported as the most common dispensing error (37%) by the Healthcare Provider Service Organization based on liability claims over a five-year period (2012 to 2017).²⁰ Other common alleged errors included dispensing the wrong dose (15%), failure to consult the prescriber on questions or concerns (5%), prescriptions given to the wrong patient (5%), compounding calculation or preparation errors (5%), labeling errors (2%), and wrong instructions or failure to provide instructions (2%). The practice sites with the most frequent claims were independent pharmacies (55%), followed by compounding or specialty pharmacies (18%), national chains (12%), hospital pharmacies (8%), and mail order pharmacies (2%). Ninety-six percent of claims were against pharmacists and 4% against technicians. Many claims were brought as a result of patient death or permanent harm.²⁰ The other studies cited above include errors that may not have resulted in patient harm. Nevertheless, despite the different methodologies and endpoints used, the studies consistently report dispensing the wrong drug or dose as the most common types of error. These kinds of errors are linked to a high risk of producing significant injury.

WHY DO ERRORS HAPPEN?

Many factors contribute to errors in the pharmacy (see [Table 1](#)). Literature reviews have identified mix-ups between look-alike and sound-alike drugs, high workload, and interruptions and distractions as increasing the occurrence of dispensing errors.^{16,18,20} However, interpretation of these studies is confounded by the same issues that provide widely disparate error rates such as differences in study setting, research methodology, and operational definitions for dispensing errors.¹⁸

Some mistakes may be due to failure to take appropriate safety steps when handling drugs with confusing or similar drug names or those that share adjacent placement on shelves. A mistake may occur during verbal or telephone communication, during order transcription, or may be due to illegible handwriting, wrong drug selection from a drop-down menu, or look-alike packaging. Look-alike packaging is especially troublesome when products have similar label or cap colors or highly stylized graphics and prominent corporate names and logos that may obscure other information.^{9,20-22} A list of often confused drug names maintained by ISMP may be found here <https://www.ismp.org/recommendations/confused-drug-names-list>.

The FDA has become concerned about look-alike/sound-alike drug names. Its Division of Medication Error Prevention and Analysis (DMEPA) is responsible for monitoring and preventing medication errors related to drug naming, labeling, and packaging prior to marketing.⁵ The DMEPA reviews and determines the acceptability of proposed proprietary names of drugs to minimize medication errors associated with product name confusion as part of the FDA preapproval process. DMEPA also reviews proposed container labels, carton labeling, prescribing information, and packaging.⁵ They consider factors such as spelling, pronunciation, and the name's appearance when written.⁷ The FDA rejects approximately one of every three proposed names.⁷ They also monitor post-marketing error reports and may take regulatory action such as revising the labeling or issuing a safety communication to help prevent errors due to name confusion. In some cases, the FDA may even consider a change to the drug's name after it has been on the market.⁵

The increasing use of electronic tools such as computer physician order entry systems and medication bar-coding may be reducing certain errors.²⁰ Pharmacy staff may also reduce the frequency of errors reaching the patient by reviewing the information with the patient or counseling at the time of dispensing.²⁰

ERROR REPORTING

Error reporting has been identified as one area of "opportunity" for community pharmacists to reduce errors.⁷ Understanding and sharing information about the scope, prevalence, magnitude, and conditions contributing to errors may be a necessary

step in preventing their future occurrence.⁷ There are many ways of reporting errors.

The Institute for Safe Medication Practices (ISMP) established a voluntary program, the ISMP National Medication Errors Reporting Program (ISMP MERP), which encourages healthcare practitioners to report errors "with the hope that future errors and patient harm will be prevented."²⁴ The program's objectives are to

- Learn the underlying causes of reported medication errors or hazards
- Disseminate recommendations to organizations to prevent future errors
- Provide guidance to healthcare community, regulatory agencies, and pharmaceutical and device manufacturers

Despite the presence of voluntary reporting programs, the rate of voluntary error reporting by pharmacists and pharmacy technicians is low. A healthcare policy group has enumerated several factors that may help explain the low reporting rate among healthcare workers.⁷ These include

- No clear definition of what constitutes a medication error
- Complex reporting processes
- Lack of time and resources
- Fear of punishment or ridicule
- Reluctance to report incidents involving other staff members

In addition to voluntary reporting to an independent organization, many State Boards of Pharmacy require or encourage error reporting. Most boards only require internal reporting within a particular setting, where errors must be logged and open for board inspection during routine visits and in response to investigation of complaints. For example, the Ohio Board does not require pharmacists to report an error unless it is the result of reckless behavior or unprofessional conduct or causes harm to the patient.²⁵

Boards of pharmacy may require a continuous quality improvement (CQI) policy for errors. North Dakota, for example, mandates the establishment of a CQI program "for the purpose of detecting, documenting, assessing, and preventing incidents, near misses, and unsafe conditions."²⁶ It also requires pharmacies to conduct a Quality Self-Audit at least quarterly to determine whether incidents have decreased and assure that the pharmacy complies with preventive procedures.

A majority of state boards do not require pharmacies to report errors, and do not conduct thorough investigations when they occur unless someone has filed a complaint.¹ Moreover, many

mistakes go unreported because companies reach settlements with victims or their families which frequently include confidentiality agreements.¹ Reportedly, at least one chain has a form that staff members complete when an error occurs that asks whether the victim is a “media threat.”¹ When asked by the *New York Times*, the chain would not provide details on what it referred to as its “escalation process.”¹ Consequently, it is difficult to determine the rate and severity of pharmacy errors accurately.

WHAT MAY HAPPEN IF AN ERROR OCCURS?

If a pharmacy staff member commits an error that is reported, a state board of pharmacy may take a disciplinary action, but among the states, application of the action differs.⁷ In the typical situation, the board will learn of the incident when a patient or caregiver files a complaint, which the board is obligated to investigate.⁷ If the board conducts an investigation, it generally focuses on individual pharmacists, not workplace conditions.¹

Most states do not have specific rules or regulations that specify that errors are actual regulatory violations, and most determinations are made on a case-by-case basis.^{27,28} The investigation includes gathering information about the incident and the pharmacy staff member(s) involved. A survey of pharmacy board policies in response to medication errors found that, in most cases, there are no formal regulations, policies, or procedures specifically related to the sanctions applied when an error occurs. The rationale for punitive action is usually an effort to address public health and safety.²⁸ Boards usually use their discretion in dealing with individual pharmacists who commit errors.^{27,28} This results in a non-uniform approach to identifying, analyzing, and disciplining pharmacists following error reports.

The types of punitive action vary considerably among the different state boards (see **Table 2**). Sanctions appear to have more to do with specific features surrounding the error (e.g., the error severity, the level of the patient injury, the nature of the patient complaint) than with any actual behavior or perceived competence on the part of the pharmacist or the systems that contributed to the error.^{27,28} In many cases, different sanctions are applied for the same actions leading to the error, based upon the severity of patient harm.²⁸ Disciplinary action may include revocation or suspension of the pharmacist’s license (or a technician’s, if licensed), a fine, probation, a public reprimand, community service, or additional or special continuing education.^{7,27} A typical fine may be up to \$5,000 per occurrence.²⁷ The major factors considered in determining the punitive action are the seriousness of the error, the actual injury suffered by the patient, patient complaints, and factors related to the pharmacist.²⁷ An employer may also terminate the pharmacy staff member’s employment. Some pharmacies have policies stating that a disciplinary action by a board may be grounds for dismissal.⁷ Of course, the pharmacy staff member may also be subject to a civil (negligence) lawsuit filed by the patient or caregiver for an injury resulting from the error.

Table 2. Types of Punitive Actions Employed by State Pharmacy Boards for Pharmacy Errors

ACTION	PERCENT OF STATES
License revocation	90
License probation	90
Suspension of license	88
Civil penalties	72
Reimburse expenses	52
Incarceration	36
Mandated continuing education	30
Community service	4
Non-punitive actions	4
Public reprimand	4

Eighteen states indicated incarceration for medication errors was a possible (but uncommon) outcome.²⁷ Despite the lack of specific regulations, some boards (assisted by state district attorneys or county prosecutors) interpret certain errors as violations of their pharmacy practice act (e.g., dispensing the incorrect medication is labeled as “misbranding,” or a lack of professional judgment in processing a prescription).²⁷

Corrective action plans and process improvement were lacking in a majority of state board of pharmacy actions.²⁸ Almost half of respondents to a survey indicated there was no requirement for performance improvement or system redesign. When system redesign was warranted, the responsibility usually rests with the pharmacist who made the error or the pharmacist-in-charge.²⁸ The Board often does not review the corrective plan and boards implemented mandatory error reporting in the corrective action only 20% of the time.²⁸ Most commonly, the board’s actions mandated additional training or continuing education or developing best practices. For example, in Idaho, pharmacists who make minor errors (e.g., errors with lack of intent), must complete 18 hours of continuing education instead of the normal 15.⁷ Almost two-thirds of states surveyed do not require medication safety or medication error training for its licensees.²⁸ On the other hand, at least two states (Maryland and Massachusetts) take a non-punitive approach to error incidents, focusing on system-wide improvements rather than individual pharmacist responsibility.²⁷ Punitive action is reserved for pharmacists who are deemed incompetent.²⁷ There is some feeling that threats of prosecution and punitive action will discourage error reporting and prevent the facilitation of attempts to understand their causes and safety improvement.²⁷

WORKPLACE ISSUES

The pharmacy work environment influences the risk of making an error heavily. Likely, this does not come as a big surprise to most pharmacy personnel. High workload, interruptions, distractions, and the physical work environment (e.g., lighting,

PAUSE AND PONDER: Can you describe a situation at your workplace that caused you to lose your focus?

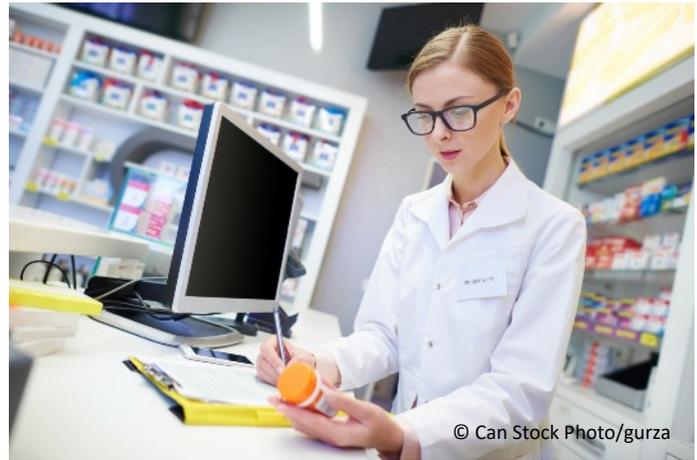
noise) are among the factors that have been identified as contributing to dispensing errors.^{7,8,16,18,29}

Frequent interruptions can have a significant detrimental effect on memory and cause a loss of concentration, increasing the risk of errors. Interruptions may also reduce a pharmacist's ability to follow-up on alerts such as drug interactions appropriately.^{20,29} On the other hand, satisfaction with working conditions and staffing was associated with a reduction in error risk.¹²

Errors are also associated with workload. Pharmacists interviewed by the *Chicago Tribune*³⁰ and the *New York Times*¹ for articles on pharmacy errors, related that they felt overwhelmed by workplace pressures to work quickly and meet quotas. The *New York Times*¹ report cited a pharmacist in North Carolina who worked a 13-hour shift with no breaks and filled 552 prescriptions during his workday, one every minute and 25 seconds while performing his other duties. It is unlikely any pharmacist reading this is surprised by this information. Studies have described a relationship between prescription volume and errors.¹² A survey of pharmacists in Texas in 2001 found that the estimated risk of errors was positively related to the number of prescription orders filled per hour.¹² In particular, as the mean rate of filling prescriptions surpasses 20 to 24 per hour, the risk of making an error increases significantly.^{12,31,32}

In addition to mistakes during prescription processing and distribution, pharmacist and pharmacy workload were significant predictors of dispensing potential drug-drug interactions in a survey of community pharmacists in 18 metropolitan areas.²⁹ The survey estimated that the relative risk of dispensing a drug interaction increased by 3% for each additional prescription processed per pharmacist hour. The authors concluded that as pharmacists become busier, they have less time to evaluate and act on drug interaction warnings.

In response to the growing concern over workplace issues many public health organizations and state regulatory bodies have proposed guidelines or regulations to address pharmacy workload and performance metrics. In an effort to promote safety, the National Pharmacists Association advocated for pharmacist dispensing limits more than 30 years ago. They recommended that a pharmacist fill no more than 15 prescriptions an hour.³¹ More recently, some states have proposed dispensing limits for pharmacists by regulation (discussed below).



© Can Stock Photo/gurza

While the risk of errors related to the volume of prescriptions filled by a typical pharmacist causes concern, the danger may be further aggravated by some pharmacy chains' implementation of time guarantees that promise patients that prescriptions will be filled quickly. While the guarantee provides a benefit to the busy consumer, it is also a safety concern, since the haste to live up to the guarantee may increase the likelihood that a medication error may occur.⁷ The pressure for speed comes not only from the employer; one study found that the second most frequent source of pharmacist error was "patient in a hurry."²²

A related problem is the use of performance metrics and tracking.^{1,33} That is, monitoring different elements of the pharmacist's work output, such as compliance with time guarantees, follow-up phone call reminders to encourage refills or prescription pick-up, and the number of vaccinations administered. Pharmacy managers use metrics for performance evaluation and metrics may potentially impact continuing employment. Nearly 60% of pharmacists surveyed said they "agree" or "strongly agree" that they "feel pressured or intimidated to meet standards or metrics that may interfere with safe patient care."¹ As one pharmacist interviewed by the *New York Times* stated, "Metrics put unnecessary pressure on pharmacy staff to fill prescriptions as fast as possible, resulting in errors."¹

Chain store representatives interviewed by the *New York Times* said metrics are meant to provide better patient care, not to penalize pharmacists. They also claimed that some are related to reimbursements by insurance companies and the government. In a recent survey by the State Board in Missouri, many pharmacists said that the focus on metrics was a threat to patient safety and their own job security.¹ Pharmacists recognize that the tracking can serve a purpose, such as reminding patients about refills or vaccinations, but they take issue with employers that evaluate pharmacy staff based on their ability to hit targets for evaluation, including areas where the employee-pharmacist has no control.

Many organizations advocate for the elimination of prescription time guarantees and performance metrics.⁷ The American Pharmacists Association approved a resolution in 2018 that “encourages the adoption of patient-centered quality and performance measures that align with safe delivery of patient care services, and opposes the setting and use of operational quotas or time-oriented metrics that negatively impact patient care and safety.”³⁴

Similarly, the ISMP MERP Council “recommends community pharmacy leadership, state boards of pharmacy, payers, and other stakeholders work together to eliminate the use of prescription time guarantees and inducements for such in community pharmacy.” Instead, the Council endorsed promoting community pharmacies’ clinical and safety activities and the availability and value of patient education services.

REGULATORY CHANGES

States have begun considering regulatory changes regarding the very serious workplace conditions contributing to errors in the pharmacy. Illinois passed noteworthy changes to their Pharmacy Practice Act in 2020.^{33,36} The changes in the law were in response to a *Chicago Tribune* investigation that revealed that pharmacies failed to warn patients about dangerous drug combinations.¹ Newsroom reporters posed as patients and visited pharmacies, attempting to fill two prescriptions that would produce a dangerous interaction. They conducted 30 tests at each of the major chains in the Chicago area and at a few independent pharmacies. Pharmacists dispensed the two drugs together without any warning 52% of the time.³⁶ The investigation’s results also prompted Illinois Senator Richard Durbin to call for national policies to protect consumers, including asking the Centers for Disease Control and Prevention (CDC) to determine the problem’s nationwide prevalence and to provide guidance to pharmacy boards.³⁷ He also asked the CDC to examine how patient safety and pharmacist errors may be impacted by workload, company performance metrics that track prescriptions, and the length of time consumers wait for prescriptions to be filled.

The new act in Illinois has several important provisions.³⁸ First, it restricts the pharmacy workday (pharmacist, intern, or technician) to no more than eight hours. It also mandates breaks for pharmacists. The employer must provide a pharmacist with a minimum of two 15-minute paid rest breaks and one 30-minute meal period in each workday on which the pharmacist works at least seven hours. A pharmacist who is entitled to breaks is not required to work more than five continuous hours before being given the opportunity to take the meal break. The pharmacist must be given access to a private break room for break time with adequate seating and tables. If the pharmacist is not provided with the required break time, the pharmacist is entitled to three times the pharmacist’s regular hourly rate of pay for each workday during which the required breaks were

not provided. During the break time, the pharmacy may be closed or remain open. In addition, when a pharmacist is on break, pharmacy technicians, pharmacy students, and other authorized support staff may continue to perform duties they are ordinarily allowed to execute. However, pharmacy technicians or support staff may not perform any duties that require the professional judgment of a pharmacist (e.g., patient counseling, drug regimen review, and clinical conflict resolution). Only prescriptions that have received final verification by a pharmacist and do not require counseling may be dispensed. In addition, the act limits the number of prescriptions that can be filled by a pharmacist to 10 per hour.

It also requires that pharmacies to have at least one pharmacy technician on duty whenever the practice of pharmacy is conducted and mandates at least 10 pharmacy technician hours per 100 prescriptions filled. Finally, the act provides protection for whistle-blowers (either pharmacists, interns, or technicians) reporting violations of safety policies. It also mandates record keeping on errors and on break periods.³⁸ The bill has drawn heavy opposition from pharmacy industry lobbyists and skepticism from the state’s governor.³⁰

Minnesota has also enacted rules on pharmacy work conditions.³⁹ A pharmacy cannot require a pharmacist, pharmacist-intern, or pharmacy technician to work longer than 12 continuous hours per day. It also mandates a 30-minute break for pharmacy staff working more than six continuous hours. In addition, it requires that a pharmacist, pharmacist-intern, or pharmacy technician be allowed “adequate time from work within each four consecutive hours of work to utilize the nearest convenient restroom.”³⁹ The changes came about after pharmacists complained that were afraid to drink liquids during a shift because they might not be able to get to the bathroom.¹ New Hampshire also has enacted a rule permitting a 30-minute break for pharmacists who work more than eight hours. The new rule took more than four years to be approved due to opposition from the pharmacy industry.¹

California has a law that says that community pharmacist cannot be required to work alone (but it does not apply to hospital pharmacies).⁴⁰ However, the law has reportedly been largely ignored and the state board is trying to clarify the regulation.¹ California also requires every pharmacy to have a quality assurance program that documents medication errors attributable to the pharmacist or other pharmacy personnel.⁷ The pharmacist is expected to inform the patient and prescriber that an error has occurred and use the program to develop systems and workflow processes designed to prevent errors.⁷

In Oregon, the Board of Pharmacy may discipline a pharmacy that fails to “provide a working environment that protects the health, safety and welfare of a patient.”⁴¹ This includes “sufficient personnel to prevent fatigue, distraction, or other conditions that interfere with a pharmacist’s ability to practice with

reasonable competency and safety”; opportunities for uninterrupted rest periods and meal breaks; and adequate time to complete professional responsibilities. These responsibilities include verification of each prescription’s accuracy, counseling, and drug utilization review.

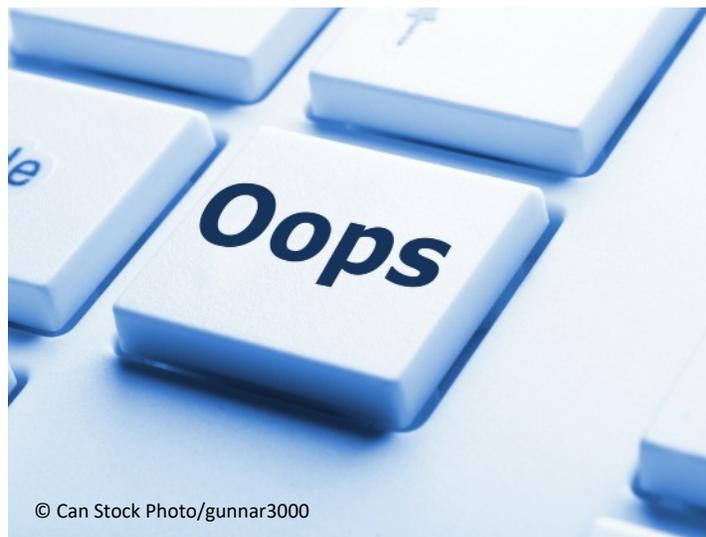
The Board of Pharmacy in South Carolina issued a position statement “to promote the health and safety of patients, and to ensure compliance with the South Carolina Pharmacy Practice Act.”⁴² The statement “supports the concept that meal and rest breaks are basic conditions of employment in a pharmacy.” Furthermore, it “encourages employers to value and prioritize patient safety, quality of care, and pharmacist well-being when setting workload expectations and ensure the pharmacy workforce is adequately staffed, trained, and utilized to complete the expected work.” It also encourages “employers to value patient safety over operational efficiency and financial targets.”⁴²

Some states are attempting to produce changes in the workplace by working behind closed doors. Missouri’s Board of Pharmacy has reportedly invited employers to private meetings to discuss issues about errors, staffing, and patient safety after reviewing the results of a pharmacist survey it conducted in 2019.¹

States are also attempting to reduce the pharmacist’s workload by giving more responsibility to technicians instead of enacting regulations with strict limits. Fifteen states allow pharmacy technicians to accept verbal prescriptions, and 12 states allow pharmacy technicians to transfer prescriptions from one pharmacy to another.⁴³

Some states, such as Wisconsin and Idaho, have instituted a program known as “tech-check-tech” (TCT).⁴⁴ The program, most commonly found in institutional settings, allows specially trained pharmacy technicians, instead of the pharmacist, to perform the final verification (i.e., final check) on prescriptions filled by another technician. The accuracy for final product verification was found to be comparable for pharmacists and technicians (99.3% versus 99.6%),⁴³ indicating that TCT does not compromise patient safety. Along with granting technicians more responsibility, Idaho has also sought greater accountability: as a response to increasing technicians’ roles in the pharmacy, the Idaho board passed regulations which would discipline technicians in the same way they do pharmacists in the case of an error.⁷ Ordinarily, pharmacists are responsible for mistakes made by technicians whom they supervise.

Delegating this responsibility to the technician reallocates the pharmacist workload and allows the pharmacist to perform patient care services.⁴³ In the states that have active TCT practices or pilot programs, studies have found that pharmacists reported saving as many as 30 hours per pharmacist per month.⁴³ In one pilot program, patient care services (medication review, medication therapy management) increased by 19% after TCT was implemented.⁴³ Implementation of this program not only reduc-



© Can Stock Photo/gunnar3000

es the time spent on more routine task by the pharmacist by providing more time for counseling, but increases error detection before errors can cause harm.^{20,45}

To be approved for TCT in Wisconsin, a technician must average 20 hours per week at the pharmacy, have a minimum of 2,000 hours of experience and at least six months of employment at the participating pharmacy. Additional didactic and practical training, including procedures on reporting errors, and validation and periodic revalidation, are also requirements.⁷ Although not directly related to minimizing errors, during the recent pandemic some states made other changes to the technician workplace by increasing their technician-to-pharmacist ratio, up to as much as eight technicians per pharmacist in Indiana.

Another approach to improving dangerous workplace conditions is to make the employer liable for errors due to staffing. In 2020, the State of Oklahoma fined a pharmacy chain \$125,000 for conditions including inadequate staffing and prescription errors.⁴⁶ This is an uncommon action, sanctioning the employer rather than the individual pharmacist for an error.

According to the complaint, two board compliance officers went to one of the stores to investigate a report of a mislabeled prescription and “witnessed a chaotic scene including the phones ringing almost all of the time, along with constant foot traffic and drive thru traffic.”⁴⁶ In a subsequent audit, officials found an error rate of 22%, although most of the errors were minor. In another store of the same chain, investigators found that one pharmacist was responsible for checking 194 prescriptions in a six-hour shift, more than one every two minutes. As part of the resolution, the pharmacy agreed to distribute a memo to its pharmacists in the state informing them that they must act if working conditions at the pharmacy could lead to problems with safely filling prescriptions; the memo also contained assurances that pharmacy personnel reporting these issues will not face retaliation. The pharmacy chains have minimized employees’ complaints, claiming that staffing is sufficient and errors are rare.⁴⁶

This approach is not new. In 1999, the Board of Pharmacy in Washington reached an agreement with a chain pharmacy after receiving 134 complaints of dispensing errors over a three-year period. The pharmacy was fined \$50,000 and agreed to review its staffing policies but made no assurances that any policies would be changed.³¹

SUMMARY AND CONCLUDING COMMENTS

To err is human, and pharmacy staff will make errors despite their best efforts. Errors can occur at any step during prescription processing. The error rate is not well validated due to many methodological variables, and estimates vary widely. However, even at low rates, the number of patients affected is large and the consequences, although usually minor, can be catastrophic. Pharmacy staffs, of course, do not want to commit errors and removing the triggers for errors is a welcome outcome. Evidence supports the concept that workplace pressures and insufficient staffing, high prescription volume, and interruptions, and distractions exacerbate the risk of errors.¹⁹

Concerns over errors spurred Illinois and other states to revise their Pharmacy Practice Acts to relieve some of the workload pressure on pharmacists. Typical changes include limits on the workday length, mandated breaks, limits on the number of prescriptions a pharmacist can dispense over time, and reconsideration of tracking metrics. Other changes include expanding the use of technicians and allowing more time for pharmacists to provide services related to patient care. Will these innovative changes spread? One proposal recommended establishing a framework similar to the one used in Illinois at the national level.³³ If these policies become the new normal, will they have a significant impact on errors? In the meantime, pharmacists and technicians should be extra vigilant to avoid being the object of the next media investigation that casts the profession in a bad light and hope they do not become “a danger to the public.”

Figure 1 walks you through ways to reduce the likelihood of error in your workplace.

Figure 1. Reducing the Danger Level in Your Workplace

Best

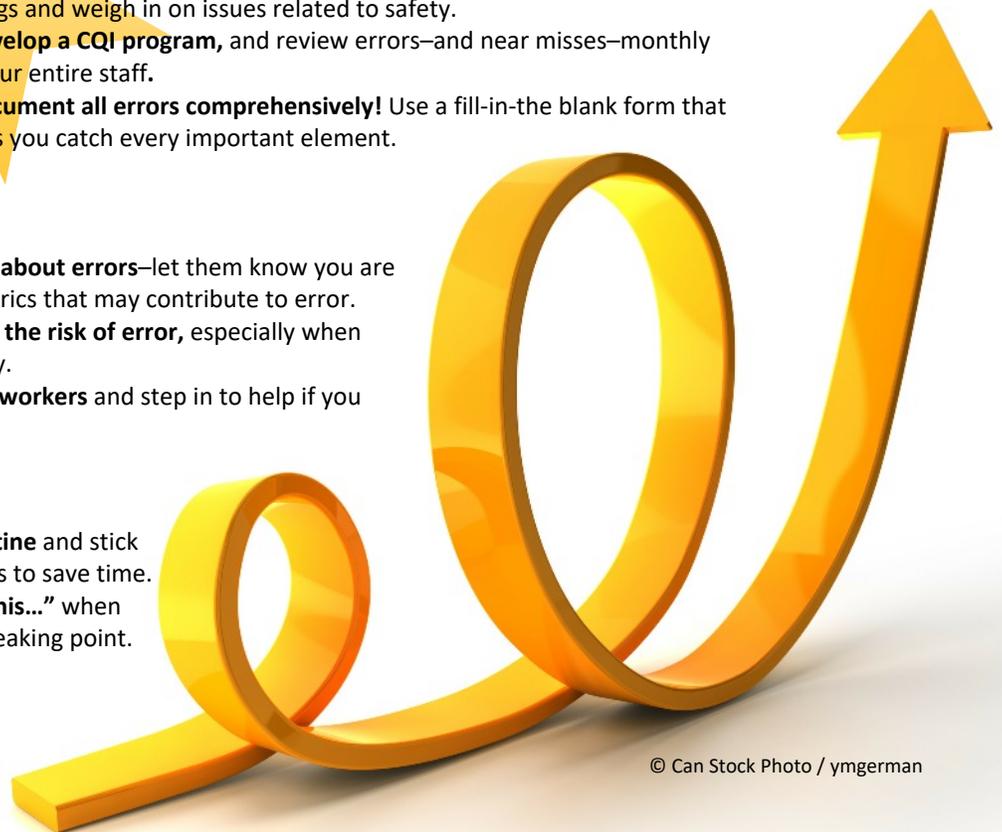
- 1 **BE COMMUNITY CHAMPIONS.** Attend your state Board of Pharmacy meetings and weigh in on issues related to safety.
- 2 **Develop a CQI program,** and review errors—and near misses—monthly with your entire staff.
- 3 **Document all errors comprehensively!** Use a fill-in-the blank form that ensures you catch every important element.

Better

- 1 **Talk to your managers about errors**—let them know you are concerned and discuss metrics that may contribute to error.
- 2 **Educate patients about the risk of error,** especially when pharmacy staff has to hurry.
- 3 **Work together with coworkers** and step in to help if you see a coworker in trouble.

Good

- 1 **Develop a filling and checking routine** and stick to it without wavering—never skip steps to save time.
- 2 **Say, “Excuse me—I need to finish this...”** when people try to interrupt you at a bad breaking point.
- 3 **Pay attention** to the task at hand!



© Can Stock Photo / ymgerman

REFERENCES

1. Gabler E. How chaos at chain pharmacies is putting patients at risk. *New York Times*. January 31, 2020. Accessed May 4, 2021. <https://www.nytimes.com/2020/01/31/health/pharmacists-medication-errors.html>
2. Carver N, Gupta V, Hipskind JE. Medical Error. *Stat Pearls* [Internet]. February 16, 2021. Accessed May 4, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK430763/>
3. U.S. Department of Health and Human Services Office of Disease Prevention and Health Promotion. Adverse drug events. Accessed May 4, 2021. [https://health.gov/our-work/health-care-quality/adverse-drug-events#:~:text=An%20adverse%20drug%20event%20\(ADE,care%20settings%2C%20and%20outpatient%20settings](https://health.gov/our-work/health-care-quality/adverse-drug-events#:~:text=An%20adverse%20drug%20event%20(ADE,care%20settings%2C%20and%20outpatient%20settings)
4. Recommendations to enhance accuracy of prescription/medication order writing. Revised October 22, 2014. National Coordinating Council for Medication Error Reporting and Prevention. Accessed May 4, 2021. <https://www.nccmerp.org/recommendations-enhance-accuracy-prescription-writing>
5. Working to reduce medication errors. August 23, 2019. U.S. Food and Drug Administration. Accessed May 4, 2021. <https://www.fda.gov/drugs/information-consumers-and-patients-drugs/working-reduce-medication-errors>
6. Aspden, P, Wolcott, JA, Bootman, JL, and Cronenwett, LR, eds. (2007). Preventing medication errors. Washington, DC: The National Academies Press. Accessed May 4, 2021. <http://nap.edu/11623>
7. Discern Health. Addressing Medication safety in community pharmacy. January 2018. Accessed May 4, 2021. <http://www.discernhealth.com/wp-content/uploads/2018/07/Medication-Safety-Community-Pharmacy-White-Paper-2018-02-27.pdf>
8. Wittich CM, Burkle CM, Lanier WL. Medication errors: an overview for clinicians. *Mayo Clin Proc*. 2014;89(8):1116-25. doi: 10.1016/j.mayocp.2014.05.007.
9. Tariq RA, Vashisht R, Sinha A, Scherbak Y. Medication Dispensing Errors and Prevention. February 16, 2021; *Stat Pearls* [Internet]. Accessed May 4, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK519065/>
10. Medication Errors. July 18, 2019. Academy of Managed Care Pharmacy. Accessed May 4, 2021. <https://www.amcp.org/about/managed-care-pharmacy-101/concepts-managed-care-pharmacy/medication-errors>
11. Campbell PJ, Patel M, Martin JR, et al. Systematic review and meta-analysis of community pharmacy error rates in the USA: 1993-2015. *BMJ Open Qual*. 2018;7(4):e000193. doi:10.1136/bmj-oq-2017-000193.
12. Bond CA Raehl CL. Pharmacists' assessment of dispensing errors: risk factors, practice sites, professional functions, and satisfaction. *Pharmacotherapy*. 2001;21(5):614-626.
13. Flynn EA, Barker KN, Gibson JT, et al. Relationship between ambient sounds and the accuracy of pharmacists' prescription filling performance. *Human Factors*. 1996;38(4):614-622.
14. Buchanan TL, Barker KN, Gibson JT, et al. Illumination and errors in dispensing. *Am J Hosp Pharm*. 1991;48:2137-2145.
15. McGhan WF, Smith WE, Adams DW. A randomized trial comparing pharmacists and technicians as dispensers of prescriptions for ambulatory patients. *Medical Care*. 1983;21(4):445-453.
16. Flynn EA, Barker KN, Carnahan BJ. National observational study of prescription dispensing accuracy and safety in 50 pharmacies. *J APhA*. 2001;43(2):191-200.
17. Statista. Total number of retail prescriptions filled annually in the United States from 2013 to 2025. April 2020. Accessed May 4, 2021. <https://www.statista.com/statistics/261303/total-number-of-retail-prescriptions-filled-annually-in-the-us/#:~:text=It%20is%20estimated%20that%20in,filled%20throughout%20the%20United%20States>
18. James L, BM, Barlow D, McCartney R, et al. Incidence, type and causes of dispensing errors: a review of the literature. *Int J Pharm Pract*. 2009;17(1):9-30.
19. Pervanas HC, Revell N, Alotaibi AF. Evaluation of medication errors in community pharmacy settings: a retrospective report. *J Pharm Technol*. 2016;32(2):71-74.
20. CNA and Healthcare Providers Service Organization. *Pharmacist Liability Claim Report* (2nd Edition). March 2019. Accessed May 4, 2021. <http://www.hpso.com/Documents/Risk%20Education/individuals/Claim-Reports/Pharmacist/HPSO-CNA-Pharmacist-Claim-Report-2019.pdf>
21. ISMP publishes top 10 list of medication errors and hazards covered in newsletter. January 16, 2020. Institute for Safe Medication Practices. Accessed May 4, 2021. <https://www.ismp.org/news/ismp-publishes-top-10-list-medication-errors-and-hazards-covered-newsletter>
22. Lopes J, Joaquim J, Matos C, Pires T. Medication errors in community pharmacy: potential causes and strategies for prevention. *Clin Therap*. 2015;37(8 Supp): E119.
23. List of confused drug names. Institute for Safe Medication Practices. Accessed May 4, 2021. <https://www.ismp.org/recommendations/confused-drug-names-list>
24. About medication errors. 2021. National Coordinating Council for Medication Error Reporting and Prevention. Retrieve from: <https://www.nccmerp.org/about-medication-errors>
25. Pharmacist duty to report requirements. Updated October 8, 2020. State of Ohio Board of Pharmacy. Accessed May 4, 2021. <https://www.pharmacy.ohio.gov/Documents/Licensing/Pharmacist/General/Pharmacist%20Duty%20to%20Report%20Requirements.pdf>
26. 61-02-01-18 Continuous quality improvement. North Dakota Board of Pharmacy. Accessed May 4, 2021. <https://www.legis.nd.gov/files/rule-changes/changes/bop040514changes.pdf>
27. Holdsworth M, Wittstrom K, Yeitakis T. Current approaches to punitive action for medication errors by boards of pharmacy. *Ann Pharmacother*. 2013;47(4):475-481. doi: 10.1345/aph.1R668.
28. Degnan DD, Hertig JB, Peters MJ. Board of Pharmacy practices related to medication errors and their potential impact on patient safety. *J Pharm Pract*. 2018;31(3):312-321.
29. Malone DC, Abarca J, Skrepnek GH, et al. Pharmacist workload and pharmacy characteristics associated with the dispensing of potentially clinically important drug-drug interactions. *Med Care*. 2007;45(5):456-62. doi: 10.1097/01.mlr.0000257839.83765.07.

30. Roe S, Long R, King K. Pharmacists miss half of dangerous drug combinations. *Chicago Tribune*. December 2016. Accessed May 4, 2021. <https://www.chicagotribune.com/investigations/ct-drug-interactions-pharmacy-met-20161214-story.html>
31. Hendren J. Overwork threatens druggists accuracy. *LA Times*. February 27, 2000. Accessed May 4, 2021. <https://www.latimes.com/archives/la-xpm-2000-feb-27-mn-3125-story.html>
32. Kistner UA, Keith MR, Sergeant KA, et al. Accuracy of dispensing in a high-volume, hospital based outpatient pharmacy. *Am J Hosp Pharm*. 1994;512:793-797.
33. Grant CD, Desautels DJ, Puthota J. Reform workplace practices of chain pharmacies to reduce medication errors. *J Sci Policy Governance*. 2020;17(2): Accessed May 4, 2021. https://www.sciencepolicyjournal.org/uploads/5/4/3/4/5434385/grant_desautels_puthota_jspg_v17.2.pdf
34. Actions of the American Pharmacists Association House of Delegates. March 16-19, 2018. Accessed May 4, 2021. <https://www.pharmacist.com/sites/default/files/files/2018%20Report%20of%20the%20AphA%20House%20of%20Delegates%20-%20FINAL.pdf>
35. Statement advocating for the elimination of prescription time guarantees in community pharmacy. October 31, 2013. National Coordinating Council for Medication Error Reporting and Prevention. Accessed May 4, 2021. <https://www.nccmerp.org/statement-advocating-elimination-prescription-time-guarantees-community-pharmacy>
36. Kilbridge S. Barlett & Steele Gold Award: How we did it. National Center for Better Journalism. November 28, 2017. Accessed May 4, 2021. <https://businessjournalism.org/2017/11/barlett-steele-gold-award/>
37. Long R, Roe S. After Tribune investigation, Durbin pushes interactive drug protection for consumers. *Cap Gazette*. December 16, 2016. Accessed May 4, 2021. <https://www.capitalgazette.com/ct-drug-interactions-durbin-pharmacy-20161216-story.html>
38. Illinois Public Act 101-0621. Accessed May 4, 2021. <https://www.ilga.gov/legislation/publicacts/101/PDF/101-0621.pdf>
39. Minnesota Administrative Rules. 6800.2160. Pharmacy Work Conditions. Accessed May 4, 2021. <https://www.revisor.mn.gov/rules/6800.2160/>
40. California Business & Professions Code. §4113.5. Accessed May 4, 2021. https://leginfo.ca.gov/faces/codes_displayText.xhtml?lawCode=BPC&division=2.&title=&part=&chapter=9.&article=7.#:~:text=4113.5,he%20or%20she%20was%20designated.&text=The%20proposed%20replacement%20pharmacist%20Din,to%20approval%20by%20the%20board.
41. Oregon Board of Pharmacy Rules §855-041-1170 Grounds for Discipline. Accessed May 4, 2021. <https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=254929>
42. South Carolina Board of Pharmacy Position Statement Working Conditions in Pharmacies. Accessed May 4, 2021. <https://llr.sc.gov/bop/pforms/workingconditions.pdf>
43. Berenbrok LA, Carroll JC, Coley KC, McGivney MS. Pharmacy technician role expansion: an evidence-based position paper. July 2018. Accessed May 4, 2021. <https://www.nacds.org/pdfs/pharmacy/2020/Pharmacy-Technician-Expansion-Position-Paper.pdf>
44. McKee J. Tech check tech: pilot program tests expansion of technician roles. *J Pharm Technol*. 2008;24:47-50.
45. Allan EL, Barker KN, Malloy M, et al. Dispensing errors and counseling in community practice. *Am Pharm*. 1995;NS35:25-33.
46. Gabler E. CVS Fined for prescription errors and poor staffing at pharmacies. *New York Times*. July 16, 2020. Accessed May 4, 2021. <https://www.nytimes.com/2020/07/16/business/cvs-pharmacies-oklahoma.html>