



Course: Patient Safety Solutions

Topic: Improving medication safety



Summary

Medications can greatly improve health when used wisely and correctly. Nevertheless, medication errors are common and cause preventable human suffering and financial cost. Remember that using medications to help patients is not a risk-free activity. Know your responsibilities and work hard to make medication use safe for patients.

Why focus on medications?

Medication use has also become increasingly complex. There has been a substantial increase in the number and variety of medications available. Medications have different routes of delivery and variable actions (eg long-acting, short-acting). Sometimes the same formulation of a particular drug is sold under more than one trade name, which can cause confusion.

Although treatments for chronic disease have improved over the years, there are more patients with multiple co-morbidities that need multiple medications. This increases the risk of drug interactions, side-effects and mistakes in administration.

The process of delivering medications to patients often involves a range of health-care professionals. Communication failures can lead to gaps in the continuity of the process. Health professionals have access to a vast range of medications to choose from, so there are many different medicines they need to be familiar with.

Some definitions

- **Side-effect:** side-effect is a known effect, other than that primarily intended, relating to the pharmacological properties of a medication.
- **Adverse reaction:** a reaction occurs when unexpected harm results from a justified action, when the correct process was followed for the context in which the medication was used.
- **Adverse drug event:** an event involving medication (an adverse drug event) may be preventable (e.g. the result of an error) or may not be preventable (e.g. an unexpected allergic reaction in a patient taking a medication for the first time, as described above).
- **Adverse drug reaction:** any response to a medication that is noxious and unintended. This WHO definition includes injuries that are judged to be caused by the drug and excludes drug-related injuries that are caused by error.

Prescribing

A *prescription* is an order to take certain medications. In many countries, the prescriber has legal responsibility for the clinical care of the patient, as well as a role in monitoring the safety and efficacy of the drug(s). Prescribing a medication requires the health professional to make a decision about the drug, the drug regimen, the documentation of the drug in the health-care records, and the ordering.

Health professionals are assisted in their prescribing by evidenced-based practices that ensure the right drug is given appropriately to the right patient. In addition, health professionals are also required to take into account the patient's preferences, values and economic circumstances. In some settings, there may also be limited resources and restrictions on what can and cannot be supplied to patients.

Errors are known to occur in the prescribing stage and are often associated with a health professional's inexperience and lack of knowledge about the medication, failure to follow an agreed protocol, or other factors such as tiredness and lapse of memory.

In addition to prescription drugs, patients self-prescribe and take drugs that they buy over the counter. Sometimes these drugs can cause adverse events, particularly when taken along with other medications. Consumers should always seek advice from pharmacists when they intend to mix over-the-counter drugs with their prescription medications.

Medication error

Any preventable event that may cause or lead to inappropriate medication use. A medication error may result in:

- an adverse event, in which a patient is harmed;
- a near miss, in which a patient is nearly harmed;
- neither harm nor potential for harm or patient harm.

Such events may be related to poor professional practice, health-care products, procedures and systems, including: prescribing; order communication; product labelling, packaging and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.

Medication errors

- Medication error is a common cause of preventable patient harm.
- The USA-based Institute of Medicine (IOM) estimates that one medication error occurs per hospitalized patient per day.
- Researchers in other countries have reported similar findings.
- About 15% of the prescribing errors reach patients; the others are caught in time by pharmacists and other health-care workers (importance of teamwork to prevent adverse events).

Manufacturing, distribution and marketing

Before drugs can be used on humans, they must be tested to make sure they are safe. The development and manufacturing of drugs is highly regulated in most countries.

Steps in using medication

There are a number of discrete steps in using medication: prescribing, dispensing, administering and monitoring are the four main ones. Doctors, pharmacists, patients and other health-care professionals all play major roles in this process.

- **Prescribing:** the prescribing health-care professional must choose an appropriate medication for a given clinical situation, taking the individual patient factors into account. The prescriber needs to select the most appropriate administration route, dose, time and regimen.
- **Dispensing:** a pharmacist will transcribe and check the prescription written by the prescribing health professional and will then pick the medication and document the process.
- **Administering:** administering a medication may include obtaining the medication and having it in a ready-to-use form. This may involve counting, calculating, mixing, labeling or preparing the drug in some way. Administering always includes the need to check for allergies and to make sure that the correct dose of the correct medicine is given to the correct patient via the correct route at the correct time.
- **Monitoring:** involves observing the patient to determine whether the medication is working, being used correctly and not causing harm.

Risks of medication use

The use of medicines contains certain risks. Different risks and opportunities for error are associated with different steps in the medication process. These errors often involve communication failures.

Prescribing

- Inadequate knowledge about drug indications, contraindications and drug interactions can lead to prescribing errors.
- Failure to consider physical, cognitive, emotional and social factors that might alter prescribing, such as allergies, pregnancy, co-morbidities, health literacy and other medications the patient may be taking is another source of potential errors.
- It is not possible for an individual health-care professional to remember all the relevant details necessary for safe prescribing, without referring to reference materials.
- Errors may involve prescribing for the wrong patient, the wrong dose, the wrong drug, the wrong route or the wrong time for drug administration.
- Other sources of prescribing errors are inadequate communication, illegible writing of prescriptions and mathematical errors made in calculating dosages and concentration of medications.
- These errors can be a result of carelessness or fatigue, but can also be the result of a lack of training and unfamiliarity with how to manipulate volumes, amounts, concentrations and units and/or a lack of access to updated parameters. A calculation error can occur when transposing units (e.g. from micrograms to milligrams). This type of miscalculation may result in a 1000 times error.

Dispensing

High pharmacy workload, defined as the number of prescriptions dispensed per pharmacist work hour, can lead to increased risk of dispensing a potentially unsafe medication.

The following steps can be taken by pharmacists to decrease the risk of a dispensing error:

- ensure correct entry of the prescription;
- confirm that the prescription is correct and complete;
- beware of look-alike, sound-alike drugs (similar drug names account for one-third of medication errors);
- be careful with zeros and abbreviations;
- organize the workplace;
- reduce distraction when possible;
- focus on reducing stress and balancing heavy workloads;
- take the time to store drugs properly;
- thoroughly check all prescriptions;
- always provide thorough patient counseling.

Administering

Classic administration errors are the wrong drug being used, or the wrong dose of a drug being given to the wrong patient, by the wrong route, at the wrong time. Not administering a prescribed drug is another form of administration error. Other administration errors include inadequate communication & documentation or calculation mistakes eg for IV drugs.

Monitoring

Errors in this area include inadequate monitoring for side-effects, not ceasing medication once the prescribed course has been completed or is clearly not helping the patient, and not completing a prescribed course of medication. There is a particular risk of a type of communication failure when a patient changes, or moves from hospital to community setting or vice versa.

Contributory factors for medication errors

Medication events are frequently multifactorial in nature. This is important to understand for a number of reasons. In trying to understand why an error occurred, it is important to look for all the contributing factors, rather than the most obvious reason or the final step in the process. Strategies to improve medication safety also need to target multiple points in the process.



Contributory factors for medication errors

- **Patient factors:** certain patients are particularly vulnerable to medication errors. These include patients with specific conditions (e.g. pregnancy, renal dysfunction, etc.); patients taking multiple medications, particularly if these medications have been prescribed by more than one health-care provider; patients with a number of health problems; and patients who do not take an active interest in being informed about their own health and medications.

Patients with memory issues (e.g. Alzheimer patients) and patients who cannot communicate well, including unconscious patients, babies and young children, and patients who do not speak the same language as the staff, are also particularly vulnerable to medication errors.

- **Staff factors:** include inexperienced personnel; rushing, as in emergency situations; multitasking; being interrupted mid-task; fatigue, boredom and lack of vigilance. A lack of checking and double-checking habits can also lead to medication errors, as do poor teamwork, poor communication between colleagues and a reluctance to use memory aids.
- **Workplace design factors:** include the absence of a safety culture in the workplace, e.g. lack of reporting systems, failure to learn from past near misses and adverse events, inadequate or untrained staffing.

Other workplace design factors include: absence of readily available memory aids for staff and/or other information on specific medications, poor or no access to diagnostic data for the pharmacy team and inappropriate storage of medications, e.g. different drugs with confusingly similar names kept near one another or medicines not stored in easy-to-use forms or in their usual place.

- **Medication design factors:** some medications can be easily confused: pills are similar in appearance (e.g. colour, shape), have similar names or ambiguous labelling. Different preparations or dosages of similar medication may have similar names or packaging or differentiate themselves from the usual preparation only by using a pre- or suffix. Other possible risks may result from very small print, so difficult to read labelling, difficult-to-read dose information on vials or lack of measuring instruments (e.g. spoons for syrups).
- **Technical design:** for example, identical connectors for IV lines and intrathecal lines allow for drugs to be given via the wrong route.

Some ways to make medication use safer

1. Use generic names

Medications have both trade names (brand name) and generic names (INN, active ingredient). To minimize confusion and simplify communication, it is helpful if staff use only generic names.

2. Tailor prescribing to individual patients

Factors to consider include allergies, pregnancy, breastfeeding, co-morbidities, other medications the patient may be taking, and the size and weight of the patient.

3. Learn and practise collecting complete medication histories

Medication histories should be taken by both prescribing health professionals and pharmacists.

4. Know which medications used in your area are associated with high risks of adverse events

Some medications have a reputation for causing adverse drug events. This may be due to a narrow therapeutic window, particular pharmacodynamics or the complexity of dosing and monitoring (e.g. insulin, oral anticoagulants, neuromuscular-blocking agents, digoxin, chemotherapeutic agents, IV potassium and aminoglycoside antibiotics).



5. Be very familiar with the medications you prescribe

Never prescribe a medication you do not know much about. Become familiar with medications frequently used, including pharmacology, indications, contraindications, side-effects, special precautions, dosages and recommended regimens for these medications.

6. Use memory aids

With the growth in the number of medications and the increasing complexity of prescribing, relying on memory alone is not sufficient. Health-care professionals should become familiar with selecting independent, evidence-based memory aids and should view relying on memory aids as a marker of safe practice rather than a sign that their knowledge is inadequate. Examples of memory aids include pocket-sized textbooks, pharmacopoeias, and information technology, such as computer software (decision/dispensing support) packages and digital assistants.

The 5 Rs for medication safety:

- right drug
- right route
- right time
- right dose
- right patient

Add-ons: right documentation and the right (of staff, patient and carer) to question medication orders.

7. **Remember the 5Rs.** Use 5Rs when dispensing or administering medication.

8. Communicate clearly

Clear, unambiguous communication will help to minimize assumptions that can lead to errors among a health-care team. When communicating about medications, state the obvious, as often, what is obvious to the doctor or pharmacist may not be obvious to the patient or nurse and vice versa.

Bad handwriting can lead to dispensing errors. Health professionals should write clearly and legibly including their name and contact details.

9. Develop checking habits

Checking should be an important part of prescribing, dispensing and administering drugs. Health professionals are responsible for every prescription they write and every drug dispensed or administered. Check the 5 Rs and for allergies. High-risk medications and situations require extra vigilance with checking and double-checking, for example, when very potent emergency drugs are being used to treat a critically ill patient. Double-checking own and colleagues' actions contributes to good teamwork and provides additional safeguards.

Computerized prescribing does not remove the need for checking. Computerized systems solve some problems (e.g. illegible handwriting, confusion around generic and trade names, recognizing drug interactions), but also present a new set of challenges

Useful maxims:

- unlabelled medications belong in the bin;
- never administer a medication unless there is 100% certainty about what it is.

Patients should be encouraged to be actively involved in their own care and medication process. They should be educated about their medication(s) and contribute significantly to improving the safety of medication use.

10. Report and learn from medications

Whenever an adverse drug event or near miss occurs, there is an opportunity for learning and improving care. The reporting of errors is facilitated when trust and respect have been established between health-care professionals. For example, pharmacists are more likely to report and explain near-miss errors when prescribers are open to listening to explanations.