

MEDICATION ERRORS

SUMMARY

- + Medication errors are the single most preventable cause of patient injury.
- + They are responsible for about 25% of litigation/medicolegal cases against general practitioners
- The problems, sources and methods of avoiding medication errors are multifactorial and multidisciplinary
- + Illegibility, drug name confusion and use of decimal points are common contributory factors

Medication errors, defined as any error in the prescribing, dispensing or administration of a drug whether there are adverse consequences or not, are the single most preventable cause of patient injury.^{1,2} These errors can occur at any stage in the drug use process from prescribing to administration to the patient. A recent report by the Institute of Medicine (IOM) estimated that errors in medical management cause between 44,000 and 98,000 deaths each year in USA hospitals.³ In the USA it has been suggested that the rate of serious medication error is approximately 7%.² Medication errors are not confined to the hospital setting. Reports from the Medical Defence Union and the Medical Protection Society revealed that 25% and 19%, respectively, of legal claims against general practitioners related to medication errors.^{4,5}

The occurrence of medication errors can compromise patient confidence in the healthcare system and in addition, increase healthcare costs.⁶ Economic consequences may include the award of damages to the patient, extension of a patient's stay in hospital and the potential financial support required for long term care of a patient who suffers permanent injury.⁷ In the USA, it has been estimated that the cost of adverse drug events, a proportion of which are due to medication errors, was \$5.6m per year for a 700 bed teaching hospital.⁸

Types of Medication Errors

Medication errors can be broadly classified as prescribing, dispensing or drug administration errors:

Prescribing Errors

Prescribing errors may be defined as an incorrect drug selection for a patient, be it the dose, the strength, the route, the quantity, the indication, the contraindications.⁹ This definition can be further expanded to include failure to comply with legal requirements for prescription writing. The prescriber must specify the information which the pharmacist needs to dispense the drug in the correct dosage and form and the directions the patient needs to take it safely.^{10,11} A study undertaken in the hospital setting by Lesar *et al* found an error rate of 4 errors per 1000 medication orders. Of the errors with potential for adverse patient effects, drug allergies accounted for 12.1%, wrong drug name, dosage form or abbreviation for 11.4% incorrect dosage calculations for 11.1% and incorrect dosage frequency for 10.8%.¹²

Dispensing Errors

Dispensing errors are errors that occur at any stage during the dispensing process from the receipt of a prescription in the pharmacy through to the supply of a dispensed product to the patient.¹³ Studies in the USA have estimated that dispensing errors occur at a rate of 1-24%.¹⁴ Dispensing errors may undermine the patient's confidence in the pharmacist and increase the likelihood of litigation procedures.¹⁵ These errors include the selection of the wrong strength/product. This occurs primarily when two or more drugs have a similar appearance or similar name (look-a-like/sound-a-like errors – Table 1). The use of computerised labelling has led to the emergence of transposition and typing errors which are among the most common causes of dispensing error.¹³ Other potential dispensing errors include wrong dose, wrong drug, wrong patient.

Administration Errors

A drug administration error may be defined as a discrepancy between the drug therapy received by the patient and the drug therapy intended by the prescriber.¹⁶ Drug administration is associated with one of the highest risk areas in nursing practice. The “five rights” have long been the basis for nurse education on drug administration i.e. giving the right dose of the right drug to the right patient at the right time by the right route.^{16,17} Drug administration errors largely involve errors

of omission where administration is omitted due to a variety of factors e.g wrong patient, lack of stock. Other types of drug administration errors include wrong administration technique, administration of expired drugs and wrong preparation administered.

Contributing Factors to Medication Errors

The problems and sources of medication errors are multidisciplinary and multifactorial.⁹ The action of one individual alone is rarely the solitary cause of a medication error or incident, rather a variety of contributing factors combine to cause incidents.

Contributing factors to prescribing error occurrence include:^{17,18}

- Illegible handwriting
- Inaccurate drug history taking
- Drug name confusion (Table 1)
- Inappropriate use of decimal points
- Use of abbreviations
- Use of verbal orders

Irrespective of how accurate or complete a prescription is, it may be misinterpreted if it cannot be read. While the prescriber has a professional responsibility to issue a safe and legible prescription, haste, fatigue or a lack of understanding of the importance of clear prescribing may contribute to illegibility. In addition, poorly written prescriptions may delay administration of medications.^{6,19,20} Computer generated prescriptions can help reduce the risk of prescribing errors due to illegible handwriting, although they in turn may give rise to further problems such as incorrect drug selection. Lack of knowledge of the prescribed drug, the recommended dose and the patient may also contribute to prescribing errors.¹⁷

Table:1 Drug Names That May Be Confused

Aminophylline	Amitriptyline
Carbamazepine	Carbimazole
Chlorpromazine	Chlorpropamide
Daonil®	Danol®

Losec®	Lasix®
Senokot®	Seroxat®
Inderal®	Ipral®
Trental®	Tegretol®
Epilim®	Epanutin®

One of the most important causes of dispensing errors is confusing the name of one drug with another (Table 1).¹⁰ Lack of knowledge on new medicines and the use of outdated and/or incorrect references can also be a contributory factor.¹³ Other factors include poor dispensing procedures with inadequate checking, unreasonable workloads and poor housekeeping standards. Studies have also supported an association between dispensing errors and lighting levels, prescription workload and noise. It is suspected that distractions and interruptions can lead to performance errors.¹⁴ In addition, not challenging unusual doses, dispensing unfamiliar products, dispensing before seeing a written order may lead to errors.²¹

Contributing factors to drug administration errors include failure to check the patients identity prior to administration and storage of look-a-like preparations side by side in the drug trolley. Environmental factors such as noise, interruptions while undertaking the drug round and poor lighting may also contribute to error. The likelihood of error is also increased where more than one tablet is required to supply the correct dose or where a calculation to determine the correct dose is undertaken.

Methods of Minimising Medication Error Occurrence

Medication errors can be prevented by alterations in the system for ordering, dispensing and administration of drugs.²²

The potential for medication error occurrence in the Irish Healthcare system exists and must be addressed. Ensuring that up-to-date reference sources are available to healthcare professionals will help to minimise errors due to lack of knowledge. The use of computerised physician order entry systems have been shown to reduce medication errors however the use of information technologies will not, on

their own, solve the problem. Other methods of minimising prescribing errors include:

- Ensuring knowledge of a drug before prescribing
- Ensuring an accurate drug history is taken
- Printing the drug name and patient details clearly on the prescription
- Including all details of drug therapy i.e. name of drug, dose, directions, duration of therapy
- Not leaving a decimal point “naked”. A zero should always precede expression of values <1 e.g 0.1. Ten-fold errors in dose have occurred due to the use of a trailing zero.
- Avoiding the use of abbreviations e.g. AZT, ISMN, FeSO₄, U
- Being aware of sound-a-like products²⁰

Information has been published by the Pharmaceutical Society of Ireland for pharmacists on how to deal with dispensing errors.²³ Reductions in dispensing errors can be helped by:

- Ensuring a safe dispensing procedure
- Using different brands or separating products that look-a-like
- Focusing on the task in hand, keeping interruptions to a minimum and maintaining their workload at a safe and manageable level
- Being aware of high risk drugs e.g. Potassium chloride, cytotoxic agents
- Introducing good housekeeping practices^{13,14,20}

Drug administration errors may be minimised by the following:

- Checking patients identity
- Having dosage calculations checked independently by another healthcare professional before the drug is administered
- Having the prescription, the drug and the patient in the same place so they can be checked against one another
- Ensuring that medication is given at the correct time
- Minimising interruptions during drug rounds²⁴

Conclusion

Each healthcare professional shares a responsibility for identifying contributing factors to medication errors and for using that knowledge to reduce their occurrence. Both experienced and inexperienced staff may be responsible for medication errors. A multidisciplinary approach to solving this problem should be promoted whereby all parties address the issue of reducing medication error occurrence. Development of a multidisciplinary approach has been slow, possibly due to the reluctance or unwillingness of the doctor, pharmacist or nurse to admit to a medication error. It is important that an attitude of “no blame” is adopted as incident reports in the past were often used as instruments of punishment, thereby creating a sense of unfairness and a fear of discipline. Apart from ensuring the well-being of patients in their care, the increasing risk of medical litigation means that healthcare professionals cannot ignore a medication error when it occurs.

References

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