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A Clinical Perspective on Rational Medication Use, Patient Awareness and Preventable Harm

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ABSTRACT

Medicines have transformed modern healthcare. Conditions that once resulted in serious complications or premature death can now be managed effectively with appropriate treatment. However, in everyday clinical practice, one important concern continues to emerge: patients may receive the right prescription but still experience problems because medicines are not taken, understood or monitored correctly. As physicians, we spend considerable time diagnosing illnesses and selecting appropriate treatment. Yet the success of that treatment depends equally on what happens after the patient leaves the consultation room. A medicine is effective only when the patient understands why it has been prescribed, how it should be taken, and what precautions need to be followed.

INTRODUCTION

The World Health Organization (WHO) defined the rational use of medicine (RUM) as "patients receiving medications appropriate to their clinical needs, in doses that meet their individual requirements, for an adequate period of time, and at the lowest cost to them and their community." (1,2)

RUM is also conventionally defined as the use of an appropriate, efficacious, safe, and cost-effective medicine given for the right indications in the right dose and formulation at the right time intervals (3)

Worldwide, the irrational use of medicines is a major problem. It is estimated that half of all patients fail to take their medications properly and that more than half of all medications are prescribed, dispensed, or sold improperly. (4)

Irrational use of medicines is commonly expressed in terms of polypharmacy, inappropriate use of antimicrobials, over-use of injections, failure to prescribe in accordance with clinical guidelines, and inappropriate self-medication, often with prescription-only medicines and non-adherence to dosing regimens (5)

Community pharmacies play a vital role in promoting RUM by providing accessible healthcare services to the public. (6)

Within these pharmacies, dispensers, as frontline healthcare providers, have a significant responsibility in ensuring the safe and appropriate use of medications (7)

When dispensing prescribed and over-the-counter medications, providing patient counseling regarding discharge medication, or providing any other type of medication, the pharmacy professional should appropriately educate the patient on the name and description of the medication, duration of treatment, common side effects, therapeutic indications and contraindications, proper storage, refill information, and appropriate actions to be taken in case of a missed dose (8).

Studies done in Tanzania revealed that medicines are prescribed and dispensed irrationally in various settings (9,10)

Irrational use of medicines reported included over-prescribing of antibiotics and injections as well as prescription-only medicines being dispensed without a prescription (11)

However, most of the previous studies in Tanzania had been carried out in hospital settings only (12)

Those done in drug dispensing outlets such as community pharmacies were focused on antibiotics only (13,14)

The World Health Organization (WHO) has reported that more than 50% of medicines are used irrationally, whether in prescribing, selling, dispensing, or administering them to patients. (15)

The WHO emphasises the importance of rational medication use by ensuring medications are prescribed according to clinical needs and at affordable prices (16)

The increasing global incidence of irrational medication use is a significant concern for healthcare systems and providers. (17)

Poor adherence to good prescribing practices or irrational use of medicines is always a public health issue in developing countries, whereby Irrational medicine use refers to excessive, incorrect, or inappropriate use of medicines (18).

This results in emerging resistance to antibiotics, the use of multiple drugs, and irrational use of medicine by patients in the prevention or treatment of disease, which contribute to ongoing public health challenges. Poor prescribing stems from economic constraints, inadequate regulatory control, insufficient knowledge, and a shortage of experienced, trained staff (19).

As the world is aging, healthcare expenses are also increasing. According to the WHO 2021 report, global expenditures in the health sector doubled from USD 4.2

trillion in 2000 to USD 8.9 trillion in 2019, while primary healthcare contributes to more than half of the total expenditures (20).

1. The Growing Problem of Self-Medication

One of the challenges in healthcare today is the increasing tendency to use medicines without proper medical consultation.A patient develops a fever and immediately starts an antibiotic. Someone experiencing acidity takes a proton pump inhibitor repeatedly without investigating the underlying cause. Another patient develops knee pain and continues using painkillers for weeks, unaware of their potential effects on the kidneys, stomach or cardiovascular system.These situations reflect a common misconception: if a medicine has provided relief previously, it must be safe to use again.

However, symptom relief does not necessarily mean that the underlying disease has been treated.Even commonly available medicines can cause complications when used inappropriately. Repeated use of non-steroidal anti-inflammatory drugs, for example, may lead to gastrointestinal bleeding, kidney injury or worsening blood pressure in susceptible individuals.The availability of a medicine without a prescription should never be mistaken for a guarantee of safety.Public education must therefore focus not only on avoiding unnecessary medicines but also on helping people understand when symptoms require medical evaluation.

2. More Medicines Do Not Always Mean Better Treatment

Another important concern, particularly among older adults and patients with chronic illnesses, is polypharmacy.It is not unusual for a patient with diabetes, hypertension, heart disease and arthritis to consult several specialists and receive multiple prescriptions. Although each medicine may have a valid indication, the combined treatment can increase the risk of interactions, duplication, adverse effects and dosing mistakes.

Occasionally, patients continue taking medicines that were intended only for short-term use. Others may unknowingly take the same active ingredient under different brand names.

This highlights the importance of regular medication reviews.Every patient receiving long-term treatment should periodically have their medicines assessed to determine whether each one remains necessary, whether the dosage is appropriate and whether any treatment can be safely simplified.Reducing unnecessary medication, when clinically appropriate, can be just as important as prescribing a new medicine.

3. Diabetes: A Practical Example of Why Medication Education Matters

Diabetes management illustrates how closely medication safety is linked to patient education.Insulin and certain oral antidiabetic medicines are highly effective, but incorrect dosing, missed meals or inadequate monitoring can lead to hypoglycaemia.Some patients believe that taking an additional tablet will compensate for eating sweets or consuming a heavy meal. Others skip medicines when their glucose readings improve, assuming that treatment is no longer required.Both approaches can be harmful.

Patients must understand that diabetes medicines are part of a broader treatment plan involving diet, physical activity, regular monitoring and follow-up.For individuals receiving insulin, education about injection technique, storage, meal timing, dose verification and recognition of hypoglycaemia is essential.Equally important is ensuring that patients know what to do when they experience vomiting, dehydration, poor oral intake or an acute illness, as certain medicines may require temporary adjustments under medical guidance.

Good diabetes care is not simply about achieving an acceptable glucose reading. It is about achieving control safely, consistently and without avoidable complications.

4. The Missing Link: Communication Between Doctor and Patient

A prescription may be medically accurate and still fail to produce the expected results if the instructions are unclear.Medical terminology, complicated dosing schedules and limited consultation time can create misunderstandings. For example, instructions such as "twice daily," "before food" or "as required" may appear straightforward to a healthcare professional but may be interpreted differently by patients.Literacy levels, language barriers, visual impairment and dependence on family caregivers can further complicate medicine administration.

A useful approach is to ask patients to explain, in their own words, how they intend to take their medicines.This simple practice, often called the teach-back method, helps identify misunderstandings before they result in errors.Providing prescriptions in a language the patient understands, explaining the purpose of important medicines and encouraging questions can substantially improve the quality of care.A patient who understands the treatment is better equipped to participate safely in it.

5. Medication Safety Does Not End at Hospital Discharge

One particularly vulnerable period is the transition from hospital to home.During hospitalisation, some medicines are stopped, others are introduced and doses may be modified.After discharge, patients sometimes restart their previous prescriptions along with newly prescribed medicines, unintentionally duplicating treatment.A similar problem may occur when patients consult different hospitals or specialists without sharing their complete medication history.Before discharge, patients and caregivers should clearly understand which medicines to continue, which to discontinue and which doses have changed.

A single updated medication list, including drug names, doses, timings and relevant precautions, can prevent considerable confusion.For patients requiring long-term care, follow-up consultations should include medication reconciliation rather than focusing only on laboratory results and symptoms.

6. Digital Healthcare Can Strengthen Medication Safety

With the expansion of telemedicine and digital health services, there are opportunities to improve medication safety beyond traditional hospital visits.Electronic prescriptions, shared medication records, follow-up consultations and structured reminders can help patients maintain continuity of treatment.Remote monitoring is particularly useful in chronic conditions such as diabetes and hypertension, where treatment may need adjustment according to clinical parameters.However, technology should support clinical judgement, not replace it.

Patients increasingly obtain medicine-related information from search engines, social media and online discussions. While reliable digital resources can improve awareness, unverified recommendations may encourage inappropriate self-medication or unnecessary discontinuation of essential treatment.Patients should be encouraged to verify medication advice with qualified healthcare professionals before making treatment decisions.The goal of digital healthcare should be to make appropriate medical guidance more accessible, understandable and continuous.

7. A Shared Responsibility, Not Just a Patient's Responsibility

Medication safety is sometimes discussed as though patients alone are responsible for following instructions correctly.In reality, it is a shared responsibility involving prescribing

doctors, pharmacists, nurses, patients, caregivers and healthcare organisations.Doctors must consider individual risk factors, potential interactions and the need for each medicine.

Pharmacists play an important role in verifying prescriptions, identifying possible duplication and explaining appropriate medicine use.Nurses contribute to safe administration, monitoring and early identification of adverse reactions. Patients and families must communicate openly about allergies, existing medicines, missed doses, side effects and any difficulties in following the prescribed treatment.

Healthcare institutions must also promote systems that reduce preventable errors, particularly during prescribing, dispensing and transitions of care.

A culture of medication safety should encourage people to report mistakes and near misses without fear, so that healthcare teams can identify problems and improve existing processes.

The medicine is only half the treatment. The other half is knowing how to use it safely. Medicines save lives, control chronic diseases, and relieve suffering. Yet a medicine taken at the wrong dose, combined with another drug, used despite a serious allergy, or stored within a child's reach can cause preventable harm. The World Health Organization's Medication Without Harm initiative highlights medication-related harm as a major global patient-safety concern. Such harm can occur during prescribing, dispensing, administration, or monitoring. The encouraging message is that many medication errors are preventable. WHO: Medication Without Harm. A tablet that relieves an allergy may cause drowsiness while driving; a common painkiller may worsen kidney disease; and a medicine suitable for one adult may be dangerous for a young child. The golden rule is simple: Before taking any medicine, ask what it is for, how to take it, what to avoid, and when to seek help.

1. Drug Allergies:

Never ignore a previous reaction.Always inform your doctor about previous reactions to medicines, particularly antibiotics, painkillers and injections. Mention the exact medicine, the symptoms, how quickly they appeared and whether emergency treatment was required.A drug allergy may cause itching, hives, facial or tongue swelling, wheezing or difficulty breathing. Severe allergic reactions, called anaphylaxis, can be life-threatening.

What Should you do?

Keep a written record of confirmed or suspected drug allergies and carry it when visiting a hospital.

* Never deliberately retry a medicine that previously caused a severe allergic reaction unless an appropriate specialist-led evaluation or treatment plan specifically permits it.
* Remember that nausea, diarrhoea and other side effects do not automatically mean that you have a drug allergy. Ask a healthcare professional to clarify the difference.

Emergency Warning

Sudden difficulty breathing, swelling of the tongue or throat, collapse or faintness after taking a medicine requires immediate emergency care. Use prescribed adrenaline (epinephrine) if indicated and available, and call emergency services. Do not wait for a rash to appear.

1. Pregnancy and Breastfeeding:

Think of two patients, not one

Some medicines can affect fetal development, particularly at certain stages of pregnancy. Other medicines are essential for protecting both mother and baby. Breastfeeding also requires consideration because some medicines pass into breast milk.

Women who are pregnant, planning pregnancy or breastfeeding should tell their doctor before starting, stopping or changing a medicine. This includes prescription drugs, over-the-counter products, herbal preparations and nutritional supplements.

Never assume that a medicine is safe simply because it is commonly used. Equally, never stop essential treatment out of fear without medical advice. Uncontrolled asthma, epilepsy, hypertension or diabetes can also endanger a pregnancy.

People planning pregnancy should review their regular medicines in advance. If pregnancy is discovered after taking a potentially concerning medicine, contact the treating clinician promptly rather than panic or discontinue all treatment independently.

1. Driving and Operating Machinery: Are You Alert Enough?

Some medicines affect concentration, coordination, vision and reaction time—even when a person does not feel particularly sleepy.

Medicines that may impair driving include certain antihistamines, sleeping tablets, anxiety medicines, opioids, some antidepressants, anti-seizure drugs and muscle relaxants. Alcohol and combinations of sedating medicines may increase the risk.

For example, a person taking a medicine for sneezing may feel well enough to drive but react too slowly when a child suddenly crosses the road.

Precautions

* Read the label and ask your pharmacist whether the medicine affects driving.
* Be especially cautious when starting a medicine, increasing its dose or combining it with another medicine.
* Do not drive if you feel sleepy, dizzy, confused or visually impaired.
* Never assume that taking a medicine at bedtime guarantees that you will be alert the following morning.

(Source)-- US FDA — Some Medicines and Driving Don't Mix

1. Children and medicines: Store safely, dose accurately

Children are not simply small adults. Their doses may depend on body weight, age, the particular medicine and the condition being treated.

Accidental ingestion can occur within seconds when tablets, syrups, vitamins or supplements are left on a table or bedside.

Every household should follow these rules:

* Store medicines in a locked place, out of sight and reach of children.
* Keep medicines in their original, labelled containers and secure the caps after every use.
* Use an appropriate measuring syringe or device for liquid medicines, not an ordinary kitchen spoon.
* Check the child's weight, prescribed dose and concentration of the product. Different liquid formulations may contain different amounts of medicine.
* Never give a child's medicine based on an adult dose, or share prescriptions between siblings.
* Never describe medicines as sweets or candy.

If a child may have swallowed an unknown medicine or an excessive dose, seek urgent medical or poison-control advice. Do not wait for symptoms, induce vomiting or give

home remedies unless specifically instructed by a qualified professional.

(Source: CDC)— Safe Medicine Use and Storage

1. Existing diseases can change a medicine's safety

Before prescribing or purchasing a medicine, tell your doctor about all existing medical conditions.

* Kidney disease: Some medicines require dose adjustment or avoidance. Certain painkillers, including ibuprofen and diclofenac, can worsen kidney function in susceptible people.
* Liver disease: The liver processes many medicines. Some drugs and excessive doses of paracetamol (acetaminophen) can cause serious liver injury.
* High blood pressure and heart disease: Some oral decongestants used for colds can raise blood pressure or aggravate certain heart conditions. Some painkillers can also increase blood pressure or fluid retention.
* Diabetes: Certain medicines can alter blood glucose. Insulin and some diabetes tablets can cause dangerously low blood sugar, particularly when meals are missed or doses are incorrect.
* Asthma: Aspirin and other non-steroidal anti-inflammatory drugs (NSAIDs) can trigger respiratory reactions in susceptible people. Tell your doctor if painkillers have previously caused wheezing. Do not stop prescribed asthma controller inhalers without medical advice.
* Epilepsy and mental health conditions: Missed doses, abrupt withdrawal and interactions with other medicines can have serious consequences.
* Older adults: Multiple prescriptions, reduced kidney function, falls and memory difficulties increase the risk of medication errors. Periodic medication reviews are particularly valuable.

The same medicine may be appropriate for one patient and unsuitable for another. This is why medical history matters as much as the diagnosis.

1. Drug Interactions:
The hidden danger of combining medicines

Interactions can occur between prescription medicines, over-the-counter products, herbal remedies, supplements, foods and alcohol.

For instance, combining sedating allergy medicines with sleeping tablets may increase drowsiness. Some antibiotics interact with other drugs, while certain painkillers can increase bleeding risk in people taking anticoagulants such as warfarin.

Taking several products for fever, pain or cold symptoms may unintentionally duplicate the same active ingredient.

Maintain one updated list of everything you take and share it with every doctor and pharmacist. Include medicines prescribed by different specialists, vitamins, supplements and occasional remedies.

Do not start, stop or change a medicine solely on the advice of a friend, social-media post or unverified online source.

(Source: FDA) — Drug Interactions: What You Should Know

1. Antibiotics, Blood Thinners and Other High-risk Medicines
Antibiotics should be used only when clinically indicated. They do not treat viral illnesses such as most common colds. Follow the prescribed regimen and seek advice if side effects occur; do not use leftover antibiotics or share them with others.

People taking blood thinners need to understand bleeding precautions and interactions. Unusual bleeding, black stools or vomiting blood requires urgent medical assessment.

Insulin, medicines that lower blood glucose, opioids and certain other medicines also need careful dosing and monitoring. A dosing error involving these drugs can have serious consequences.

Never double a missed dose automatically. Instructions differ from one medicine to another; check the patient leaflet or ask a pharmacist or prescriber.

1. Before Surgery, During Illness and When Treatment Changes
Tell your surgeon and anaesthetist about all medicines, supplements, allergies and previous anaesthetic reactions before an operation or procedure. Some medicines require special planning, but stopping them without instructions may also be dangerous.

Vomiting, diarrhoea, dehydration, fever and poor food intake can change the safety of certain medicines, especially those used for diabetes, blood pressure or kidney disease. Ask your clinician for a personalised plan for these situations.

Check expiry dates and storage instructions. Some medicines require refrigeration, while others must be protected from heat and moisture. Never use another person's prescription, and dispose of unused medicines safely.

1. Recognise Warning Signs Early
Seek urgent medical attention for difficulty breathing, swelling of the throat, collapse, severe confusion, seizures, major bleeding or suspected overdose.

A new widespread rash, blistering or peeling skin, sores involving the mouth or eyes, yellowing of the eyes, or markedly reduced urine output also warrants prompt medical assessment. Do not dismiss a potentially serious reaction as a routine side effect.

Patients should report suspected adverse drug reactions to their healthcare professional. In India, suspected reactions can also be reported through the Pharmacovigilance Programme of India (PvPI), which supports the monitoring of medicine safety.

The Five-minute Medicine Safety Checklist
Before taking a new medicine, ask:

1. Purpose: Why am I taking it, and what benefit should I expect?
2. Dose: How much, how often and for how long?
3. Personal risks: Do my allergies, pregnancy, age or existing diseases change its safety?
4. Interactions: Can I take it with my other medicines, food, supplements or alcohol?
5. Precautions: Can it affect driving, work, sleep or safe storage at home?
6. Monitoring: What side effects should I watch for, and whom should I contact?
7. Follow-up: What should I do if I miss a dose, become ill or develop a reaction?

Make Medicine Safety a Family Habit
A prescription is not merely a list of tablets. It is a treatment plan that requires understanding, communication and responsible use. Doctors must prescribe carefully, pharmacists must explain clearly, and patients and caregivers must ask questions and follow instructions. Families must also protect children and older adults from accidental exposure and dosing errors.

Remember
The right medicine, for the right person, at the right dose, at

the right time—with the right precautions—is the foundation of safe treatment.

Public Health Note

This article is for awareness and does not replace individual medical advice. Never stop or alter essential prescribed treatment without consulting your healthcare professional, except where emergency services direct otherwise.

CONCLUSION

The Best Prescription Is One the Patient Understands.In clinical medicine, we often measure treatment success through laboratory results, symptom improvement and disease control. Yet another equally important measure is whether the patient can use the prescribed treatment safely in everyday life.The future of safer medication use lies not only in developing better drugs but also in improving patient education, communication, medication reviews and continuity of care.Every consultation offers an opportunity to prevent an avoidable medication-related complication. As physicians, our responsibility should extend beyond writing a prescription. We must ensure, as far as possible, that patients understand the treatment, recognise potential risks and know when to seek medical advice.A good medicine can treat a disease. But good communication, responsible prescribing and informed patients are what make treatment truly safe.

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