# Writing prescriptions: how to avoid common errors

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## Abstract

Prescribing medicines is the primary tool used by most healthcare systems to cure illness, relieve symptoms and prevent future disease. Prescribing is probably the most complex intellectual task required of doctors, requiring the formulation of an appropriate treatment regimen from the many thousands available, taking into account the infinite variation in the patients they encounter. Not surprisingly, suboptimal prescribing is common and represents an obvious target for quality improvement in healthcare. Common prescribing errors include omission of medicines that are indicated, selecting inappropriate drugs, choosing an incorrect dosage or frequency of administration and failures in the prescription-writing process. Factors involved in poor prescribing include the performance of prescribers themselves, the complexity of the tasks required of them and the systems in which they work. Prescribing can be improved by better education and training of prescribers, focusing on a rational approach. Other improvements should include better supervision and team-working, input from clinical pharmacists, electronic prescribing systems supported by decision support software, standardization of prescribing documentation and governance arrangements that recognize the importance of prescribing as part of good healthcare.


**Keywords** Decision support; hospital; medication error; pharmacist; prescribing; rational prescribing; system factors; trainee doctor

## Key points

- Prescribing errors are common, cause significant morbidity and represent an obvious target for quality improvement in healthcare
- Common prescribing errors include omission of medicines at transitions of care, selecting inappropriate drugs (e.g. contraindicated, not indicated, potential interaction, duplication of therapy), incorrect dosage or frequency of administration and failures in the prescription-writing process
- Causes of prescribing errors are multifactorial, with a complex interplay between prescribers themselves, the complexity of the tasks required of them and the systems in which they work
- Prevention of prescribing errors is likely to require various approaches including better education and training of prescribers, better task and role definitions, better supervision and team-working, and improvements to the systems in which prescribers work
- Other means of improving prescribing are input from clinical pharmacists, electronic prescribing systems supported by decision support software, standardization of prescribing documentation and governance arrangements that recognize the importance of prescribing as part of good healthcare

## Prescribing in healthcare

Prescribing medicines is central to the work of trainee doctors in most developed countries. They write a large proportion of the prescriptions (medication orders) in most hospitals, and the task is high-stakes for all concerned. For patients, medicines are a major influence on present and future health outcomes. For doctors and hospitals, prescribing represents an important source of clinical risk and cost.

Prescribing is also arguably one of the most complex intellectual challenges trainee doctors face. Prescribers have to select the correct medicine, dosage, route and frequency of administration, sometimes in the face of diagnostic uncertainty, taking into account predicted individual variability in drug-handling and response as a consequence of co-morbidity, genetics and interacting drugs (Figure 1).[1] Given that individual patients have different wishes and the outcome of any prescription is uncertain, the prescriber needs to counsel the patient and plan an appropriate strategy for monitoring and follow-up for evidence of benefit and harms.

## Prescribing errors

Given the complexity of the prescribing process, it is unsurprising that there is clear evidence of poor prescribing in all areas of healthcare. A prescription can be considered to contain an error if it results in either (1) a significant reduction in the probability of treatment being timely and effective, or (2) a significant increase in the risk of harm, when compared with generally accepted practice. Additional failures of the prescribing process considered in some studies are underprescribing (failure to prescribe a medicine that is indicated), overprescribing (prescribing a medicine that is not indicated or with which the patient is not concordant) and failing to put in placed adequate monitoring arrangements.

### Frequency

Many studies have investigated rates of error, with varying estimates depending on the definition of error used, the setting and the prescribers. Two of the largest studies focusing on trainee doctors in medical wards in UK hospitals showed that 7–10% of the prescriptions contained errors, based on the above definition.[2,3] Senior doctors also perpetrated prescribing errors, although at a lower rate.

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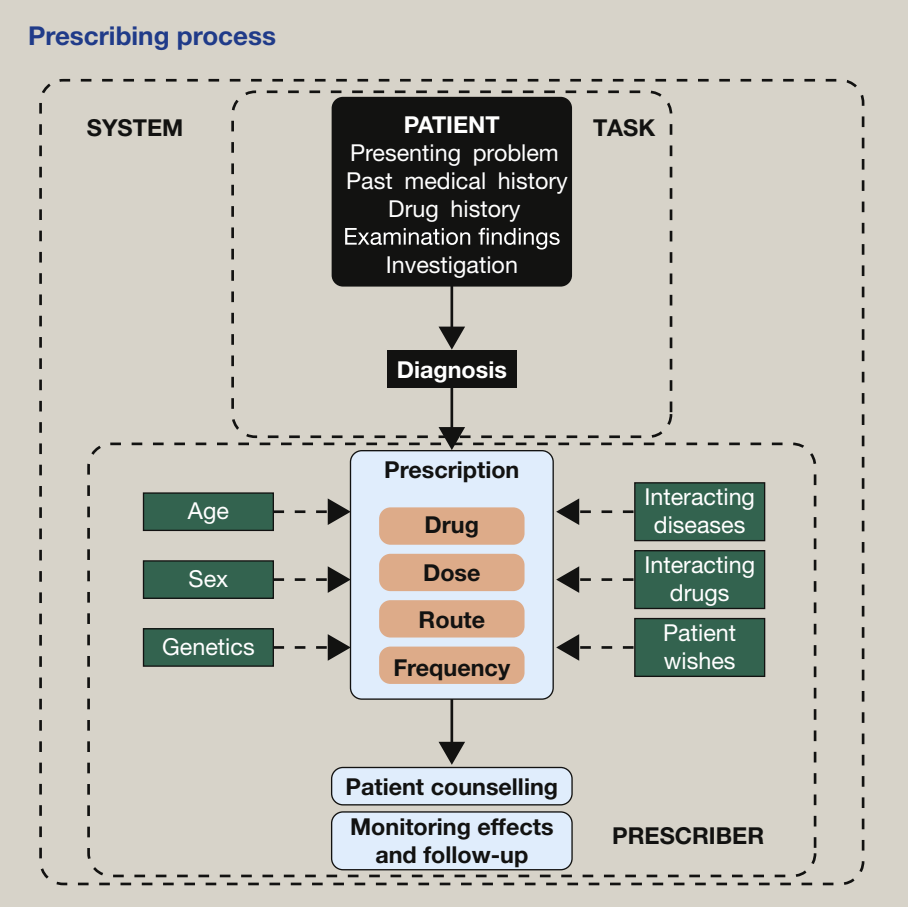


**Figure 1**

### Type

Common types of prescribing error are listed in Table 1.

### Causes

There are many factors that contribute to error (Table 2). The systems in which prescribers work are error-prone; they are often pressurized, full of distractions, carry a heavy burden of administration and require continuous multitasking. The number, complexity and vulnerability of hospital patients have also progressively increased, as have the standard treatment regimens for common conditions.

Some factors relate to prescribers themselves. Safe and effective prescribing must be based on a firm grounding in the principles of clinical pharmacology and knowledge of therapeutics. This must be combined with important skills such as the ability to search for information, communicate effectively with patients and colleagues, calculate doses and write prescriptions. Other important attitudes and behaviours include the ability to make judgements about competing risks and the motivation to be attentive to detail, check prescriptions and review outcomes.

## Rational approach to prescribing

The decision to prescribe should be preceded by establishing the likely diagnosis (or range of diagnoses), ideally based on a careful assessment of the patient that includes a clinical history, examination and relevant investigations. This allows the prescriber (ideally in discussion with the patient) to establish the goals of treatment, which can range from curing disease (e.g. antibiotics) and relieving symptoms (e.g. analgesics) to disease prevention (e.g. antihypertensives). The intention of rational prescribing is to maximize the benefits (i.e. achieving those goals) and minimize the adverse effects of the prescription (Figure 1).[4,5]

### Choosing the mode of treatment

Clinicians often have options with regard to treatment, including non-drug treatments and no treatment. For example, the management of arthritis might include reassurance, simple analgesia, physiotherapy, non-steroidal anti-inflammatory drugs, disease-modifying antirheumatic drugs, intra-articular corticosteroids or surgery. The choice will be influenced by the prognosis of the condition if left untreated, the likely benefits and hazards of each approach and the patient's preference.

### Choosing the drug, dosage, route and frequency

Having considered the diagnosis, prognosis and goals of therapy, prescribers may be able to select from several pharmacological options. The rational choice should maximize the benefit–harm balance based on drug and patient factors, taking into account restrictions based on availability and costs.

The selection of the best drug, dosage, route and frequency is influenced by several factors: