



Top tips for GPs

Strategies for safer prescribing

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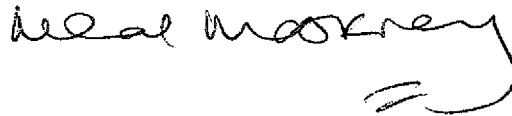
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Introduction

We are very grateful to Professor Tony Avery, Professor of Primary Healthcare, University of Nottingham for authoring this document for the National Prescribing Centre. Since we commissioned the document 18 months ago, we have developed additional materials related to decision making. In the next few months we will publish a MeReC Bulletin "Making Decisions Better" and then a further MeReC Bulletin linking decision making with educational theory and implementation. These are exciting times for those of us interested in the dynamics of how evidence becomes practice. We are delighted to publish this succinct summary of some of the key evidence-into-practice issues in prescribing and therapeutics.



*Programme Director
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Foreword

The prescribing of medicines in primary care is one of the most powerful tools we have available to improve the health of patients. Nevertheless, armed with such potent drugs, there is always a risk that patients will be harmed. Sometimes this happens despite the highest quality clinical care, but in other situations care is sub-optimal. The problem is that in the messy and time-constrained reality of clinical practice it is impossible to do everything perfectly; human beings, even in optimal settings and aided by decision support systems, are inherently fallible.¹

The main purpose of this document is to review strategies which may help improve the safety of prescribing and other aspects of medicines management in primary care.

Firstly, however, it is worth considering the size and nature of the problem and then to highlight some of the reasons why we make mistakes.

Medication errors and patient harm in primary care

Several studies have investigated the incidence of errors in different aspects of the medicines management process in primary care. These come up with a wide range of estimates of the size of the problem, but there is no doubt that patients are frequently put at risk and sometimes suffer harm.

A recent systematic review, that focused on the UK literature, found a prescribing error rate of around 7.5% and showed that around one in 15 hospital admissions are medication related, with two-thirds of these being preventable.² A recent study in UK care homes showed that 70% had one or more medication errors,³ and a study from the US showed that care home patients have a roughly 50 per cent chance of having a preventable adverse drug event each year.⁴

Whether prescribing errors result in harm to patients depends on a number of factors, but certain patients are at particularly high risk and it is important to be aware of the drugs that are commonly associated with morbidity in general practice.

Which patients are most at risk?

Risks associated with medication errors are particularly high in the following groups of patients:

- the old, particularly when frail
- those with multiple serious morbidities
- those taking several potentially hazardous medications
- those with acute medical problems
- those who are ambivalent about medication taking or have difficulty understanding or remembering to take medication

Therefore, in these patients, it is important to take particular care when first prescribing, to prioritise medication review, and to check purposefully for communication issues.

What are the drugs most commonly associated with preventable adverse events?

Table 1 shows a number of medicines commonly associated with preventable adverse events in general practice. It is worth noting that just four classes of drug are associated with around half of preventable medication related hospital admissions.⁵ These are antithrombotics (such as aspirin), anticoagulants, NSAIDs and diuretics. The major risk from the first three of these drug groups is GI bleeding and when used in patients at high risk of adverse events (as they often are) it is critically important to ensure that they are prescribed as safely as possible.

*What
are the
underlying
causes of
medication
errors
and how
can these
errors be
prevented?*

Table 1: Drugs commonly associated with preventable harm in general practice

Drugs with narrow therapeutic index

- digoxin
- methotrexate
- warfarin

Other commonly used drugs

- antithrombotics such as aspirin
- cardiovascular drugs including diuretics, beta-blockers and ACE inhibitors
- CNS drugs including antiepileptics, opioid analgesics and psychotropics
- drugs used for the treatment of diabetes mellitus
- NSAIDs
- systemic corticosteroids

Human error

It is common when we have made a mistake to think “How could I have been that stupid?”⁶ When presented with the facts after the event, it is often hard to believe how, for example, we have managed to get a dose wrong; prescribed when there are contraindications; not communicated effectively with a patient; or failed to monitor repeat medicines properly.

The problem is that in our busy working lives we sometimes act (or fail to act) without purposeful checking or without considering all the information needed to make a safe decision. This is a common human failing which arises from our tendency to favour a mode of decision-making that is “intuitive, automatic, fast, frugal and effortless”, known as system 1 processing.⁶ Indeed without this we would not be able to work as quickly and efficiently as we do most of the time. Nevertheless, with something as important as patients’ health in mind, it is essential that we recognise when to override this intuitive way of decision-making. At a simple level this means using a brief but purposeful, conscious, and analytical checking process before acting (known as system 2 processing); at a more complex level it involves ensuring that all essential information is available before making a decision, and really thinking decisions through in a deliberate and effortful fashion.

These points are illustrated below with respect to knowledge-based mistakes and slips and lapses.

Not knowing enough about the patient

Sometimes adverse events occur because we do not have enough information about the patient when making prescribing decisions. The major problem here is prescribing without realising that there is a contraindication, caution or history of allergy. Examples include prescribing amitriptyline to patients with a cardiac

Keeping up-to-date with knowledge about medicines and how to use these safely is a priority for continuous professional development.

dysrhythmia, or prescribing penicillin-based antibiotics to patients with penicillin allergy.

The key to preventing these types of error is to have all necessary information about the patient available at the point of decision-making. Having up-to-date, properly coded, electronic health records helps with this, and also enables the generation of accurate electronic hazard alerts. Nevertheless, a high level of vigilance is necessary on the part of the prescriber, particularly when using high-risk drugs in high-risk patients.

Not knowing enough about the medicine

Lack of knowledge of drugs, including how they should be prescribed, their contraindications, side-effects and interactions is an important cause of medication error. Sometimes the problem occurs in relation to high-risk drugs initiated in secondary care such as amiodarone and methotrexate. At other times we fail to recognise serious hazards such as the prescribing of NSAIDs in renal failure or hazardous drug-drug combinations.

For those medicines initiated in secondary care with shared care arrangements, it is important to learn about the key hazards associated with those medicines and to stick closely to the advice given on prescribing, monitoring and when to refer back to secondary care.

For those drugs more commonly used in primary care, the traditional approach to minimising drug errors is to work from a relatively restricted range of drugs, where one can build up a good knowledge and understanding. However, a recent analysis based on the General Medical Council data on hospital prescribing errors⁷ found that errors occurred more frequently with medicines with which prescribers were familiar; and fewer errors occurred when prescriptions were being written for unfamiliar medicines.⁸ One explanation may be the lone use of the “intuitive” (system 1) decision making system when prescribing familiar medicines without the “analytical” (system 2) check being activated, whereas when prescribing an unfamiliar medicine this cannot take place without “analytical” decision-making. Opting, whenever possible, for relatively safe drugs that have few serious interactions, makes sense.

Keeping up-to-date with knowledge about medicines and how to use these safely is a priority for continuous professional development. It is also very important to have access to accurate information at the point of prescribing decision-making: if in any doubt, check things out (see **Table 2** for a number of respected sources of drug information).

There is much that could be done to improve the hazard alerts on GP computer systems, and a major problem is the poor signal to noise ratio. Nevertheless, computerised hazard alerts have been shown to significantly reduce medication errors⁹ and provide important “nudges”¹⁰ in the direction of safer prescribing for those that choose to read the warnings. So whilst the low specificity (lots of false positive alerts) of drug interaction checks on practice computer systems can be annoying, they sometimes remind us of very serious hazards. As humans we are all fallible, and therefore it is worth purposefully considering each alert before deciding whether or not to prescribe.

Helpful reference sources for drug interactions are the British National Formulary

(BNF) and Stockley's Drug Interactions.¹¹ For monthly updates on prescribing safety, it is worth subscribing online to *Drug Safety Updates* from the Medicines and Healthcare products Regulatory Agency (MHRA) (see Table 2). Many of these key resources are now collated in one place by [NHS Evidence](#).

Table 2: Sources of drug information for doctors and patients

For doctors
<ul style="list-style-type: none"> British National Formulary (which also gives websites and telephone numbers for other important sources of drug information): http://bnf.org/bnf/index.htm
<ul style="list-style-type: none"> Clinical Knowledge Service: http://cks.library.nhs.uk
<ul style="list-style-type: none"> Drug datasheets: http://emc.medicines.org.uk
<ul style="list-style-type: none"> Drug safety updates from the MHRA: www.mhra.gov.uk/Publications/Safetyguidance/DrugSafetyUpdate/index.htm
<ul style="list-style-type: none"> Drugs and Therapeutics Bulletin: http://dtb.bmj.com
<ul style="list-style-type: none"> Medication monitoring advice for commonly prescribed drugs is available at: www.ukmi.nhs.uk/Newmaterial/html/docs/21100201.pdf and a more recent and comprehensive list is available at: www.nelm.nhs.uk/en/NeLM-Area/Evidence/Drug-Monitoring/Suggestions-for-Drug-Monitoring-in-Adults-in-Primary-Care/
<ul style="list-style-type: none"> National Electronic Library for Medicines: www.nelm.nhs.uk
<ul style="list-style-type: none"> National Prescribing Centre (advice on quality prescribing, medication review and repeat prescribing): www.npc.nhs.uk/improving_safety/improving_quality/index.php
<ul style="list-style-type: none"> NHS Connecting for Health projects (including the Electronic Prescriptions Service and the Summary Care Record): www.connectingforhealth.nhs.uk/systemsandservices
<ul style="list-style-type: none"> National Patient Safety Agency: www.npsa.nhs.uk
<ul style="list-style-type: none"> Stockley's Drug Interactions, 9th wEdition, Pharmaceutical Press (also available as a pocket guide): www.pharmpress.com
<ul style="list-style-type: none"> The whole range of drug information products from the pharmaceutical press available at: www.medicinescomplete.com
For patients
<ul style="list-style-type: none"> Drug information leaflets for patients are available from: http://emc.medicines.org.uk
<ul style="list-style-type: none"> Information leaflet on medical conditions and their treatment are available from various sites including: www.cks.nhs.uk/information_for_patients
<ul style="list-style-type: none"> The "Ask about Medicines" website has useful information and its 'route-finder' links to other gateways and websites: www.askaboutmedicines.org
<ul style="list-style-type: none"> Examples of patient decision aids are available on the NPC website: www.npc.nhs.uk/patient_decision_aids/pda.php
<ul style="list-style-type: none"> A patient's guide to medication review, produced by the Department of Health and the Medicines Partnership is available at: www.keele.ac.uk/pharmacy/npcplus/medicinespartnershipprogramme/medicinespartnershipprogrammepublications/focusonyourmedicines/apatientguidetomedicationreview/med-rev-focus-on-your-medicines.pdf

All websites above accessed February 2011

These problems often occur against the background of overwork, stress and multiple competing demands.

Slips and lapses when prescribing

In addition to knowledge-based mistakes, there are also slips, lapses and failures to check actions that can lead to patients receiving the wrong prescription, the wrong medicine, the wrong dose or the wrong instructions. Sometimes this can have potentially fatal consequences for patients, for example, accidentally selecting penicillamine rather than penicillin from a computerised drop-down menu or accidentally selecting an inappropriately high dose of an opiate.

These problems often occur against the background of overwork, stress and multiple competing demands. Nevertheless, the risks can be minimised in several ways. Firstly, as slips and lapses occur without conscious knowledge it is essential to actively use the “analytical” (system 2) decision-making process to check prescriptions before signing them. Secondly, it is important to have a low threshold for double checking things when dealing with high-risk drugs or high-risk patients, particularly dosage calculations. Thirdly, teamwork can be helpful. This includes having well-informed patients who may be able to spot an error, as well as good working relationships with community pharmacies.

Communication problems

Communication problems often contribute to adverse events associated with medication errors; and are sometimes the main cause. The most common problems with communication occur between the doctor and patient, but there are also major issues at the interface between primary and secondary care.

Communication with patients

It's not uncommon for patients to suffer from medication related adverse events because either they do not have sufficient knowledge of their medical conditions and the medicines they are taking, or they have not been given an adequate explanation of how to take the medicines, the side-effects to look out for and what monitoring is needed. The situation may be exacerbated by missing or incomplete directions on prescriptions, found in 36% of prescriptions in a UK based systematic literature review.²

Communication problems resulting in under use, overuse or incorrect use of medication are particularly important in the following conditions where preventable drug-related hospital admissions may result:

- asthma
- coronary heart disease with angina
- diabetes mellitus (especially in patients taking insulin)
- epilepsy
- heart failure

For these conditions it is particularly important to try to make sure that patients have a good level of knowledge and understanding of their medicines. It is often difficult and inappropriate to provide all of this information in a single

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GP consultation, but it is possible to build up patients' knowledge and understanding over time, with the support of practice nurses and community pharmacists. The use of patient information leaflets and websites may also be helpful (see **Table 2**).

Sharing decisions with patients is an important general principle and one that can be helped by the use of patient decision aids (PDAs). These allow the patient to be involved in making decisions about treatment options, armed with accurate information on risks and benefits. A recent Cochrane systematic review¹² showed that PDAs help to improve patient knowledge and realistic expectations whilst reducing the proportion of people remaining undecided. A number of PDAs are available on the NPC website (see **Table 2**); the NICE guideline of lipid modification recommends using the NPC patient decision aid.¹³

Communication between primary and secondary care

In terms of communication between primary and secondary care, it is not uncommon for patients to suffer harm as a result of lack of information, inaccurate information, incomplete information or failure to act upon information that has been provided. The *National Patient Safety Agency* (NPSA) received reports of over 21,000 patient safety incidents relating to omitted or delayed medicines (including 27 deaths and 68 severe harms) between 2006 and 2009¹⁴. Two of the themes identified as causes of these incidents were the failure to prescribe new or routine medicines, and the failure to supply discharge medication.

Considerable efforts are being made in various parts of the UK to address these gaps. Approaches that appear to be effective include faxing medication histories (or sending details in a letter) when patients are admitted to hospital; having admissions ward pharmacists to help with medicines reconciliation; rapid transfer of accurate and complete medicines information to general practices on discharge from hospital; and the setting up and use of joint district-wide drug formularies and shared care protocols. In the future, access to electronic information on patients' medications may become routine in the NHS, but further progress is required on national IT programmes.

One very important issue is the danger associated with transfer of medicines information onto the practice computer once a patient has been discharged from hospital, or following outpatient visits. Unless this is done - or at least carefully checked - by clinically trained staff, there are serious risks of inadvertent transcription errors or duplication of medicines. Clinicians may be as prone to transcription errors as reception staff, but at least they have the clinical knowledge to recognise a potentially dangerous dosage or therapeutic duplication.

Medication monitoring

It is important to monitor patients for the effects of medications and any side-effects, particularly for high-risk drugs in high-risk patient groups. Indeed, inadequacies in patient monitoring account for around a quarter of preventable medication-related hospital admissions.⁵

it is important to have agreed policies for laboratory test monitoring of drugs, so that patients do not slip through the net and suffer from a complete lack of monitoring.

Monitoring for side-effects is particularly important in older people, patients on multiple drugs, and patients with hepatic or renal impairment (where drug metabolism or excretion may be reduced, leading to drug toxicity).

Effective medication monitoring can help to identify problems before they result in serious patient harm. Nevertheless, the evidence base for the benefits of medication monitoring is not strong for many drugs, particularly in terms of the frequency of monitoring. Even so, it is important to have agreed policies for laboratory test monitoring of drugs, so that patients do not slip through the net and suffer from a complete lack of monitoring. Advice on laboratory test monitoring is available from the [BNF](#) drug datasheets, and the NPSA. The North West Medicines Information Service produced useful guidance in 2002 which could be adapted to the needs of individual general practices (see [Table 2](#) for further details).

Medication review

It is important for patients' medications to be reviewed periodically to ensure that essential laboratory tests are undertaken; side-effects are detected; patients are given essential information and are involved in decisions about their medicines; and that therapy is optimised.

Undertaking high-quality medication reviews can be a challenge in busy general practices. In straightforward cases, reviews can be incorporated into normal follow-up consultations.

In more complex cases it is important to find ways of ensuring that adequate time is given to medication review, so that discussions around medicines do not get squeezed into the final couple of minutes of the consultation. One option is to make it clear to patients that the consultation is primarily for the purposes of reviewing medications. Another option is to make use of practice pharmacists and pharmacy advisors to help with these complex medication reviews.

Repeat prescribing

Repeat prescribing brings benefits of convenience to both doctors and patients. However, repeat prescribing systems are complex and there are safety risks at various points in the process. Some of the key points are outlined in [Table 3](#), but more detailed advice is available in the [Good practice guide to quality repeat prescribing](#) from the National Prescribing Centre (see [table 2](#)).

Practices need to be aware of changes that will affect repeat prescribing systems with the introduction of the Electronic Prescriptions Service, that will allow for electronic transfer of prescriptions between general practices and community pharmacies (see [Table 3](#)).

Table 3: Key points for safe repeat prescribing**Authorising repeat prescriptions**

- only appropriately qualified prescribers should be allowed to put medications on repeat prescription
- an appropriate review date needs to be set, taking account of the need for monitoring of therapeutic benefits and potential adverse effects

Dealing with requests for repeat prescriptions

- patients need to know how the practice repeat prescription system works and what the rules are
- requests must be dealt with accurately, securely and within an agreed timeframe, *e.g.* 48 hours
- With paper-based systems, patients should be encouraged to use the repeat prescription request slip rather than giving oral requests

Deciding if the repeat prescription should be generated

- An administrative check needs to be done to determine:
 - is the drug on the repeat prescriptions list?
 - is the drug within its review date?
 - is the request earlier (or later) than expected?
- if in doubt, a clinician/qualified prescriber should be asked to make the decision about whether a prescription should be generated

Prescription production, signing and return to patient

- most repeat prescriptions are generated electronically and there are significant safety benefits to this
- a qualified prescriber needs to check that the prescription is safe (with reference to the patient's records where appropriate) before signing
- if a review is required, the patient should be advised to make this appointment

Practice points

10 top tips for safe prescribing

Having outlined the nature and causes of medication errors in general practice, along with some suggestions for how errors can be prevented, here are 10 tips for safe prescribing:

- 1.** Keep yourself up-to-date in your knowledge of therapeutics, especially for the conditions you see commonly
- 2.** Before prescribing, make sure you have all the information you need about the patient, including co-morbidities and allergies
- 3.** Before prescribing, make sure you have all the information you need about the drug(s) you are considering prescribing, including side-effects and interactions
- 4.** Sometimes the risks of prescribing outweigh the benefits and so before prescribing think: 'Do I need to prescribe this drug at all?'
- 5.** Check computerised alerts in case you have missed an important interaction or drug allergy
- 6.** Always actively check prescriptions for errors before signing them
- 7.** Involve patients in prescribing decisions and give them the information they need in order to take the medicine as prescribed, to recognise important side-effects and to know when to return for monitoring and/or review
- 8.** Have systems in place for ensuring that patients receive essential laboratory test monitoring for the drugs they are taking, and that they are reviewed at appropriate intervals
- 9.** Make sure that high levels of safety are built into your repeat prescribing system
- 10.** Make sure you have safe and effective ways of communicating medicines information between primary and secondary care, and acting on medication changes suggested/initiated by secondary care clinicians

Conclusion

This article has outlined a number of strategies for safer prescribing along with a range of valuable information sources for clinicians and patients. If the suggestions given seem straightforward, we need to ask why patients continue to be exposed to unnecessary risk from medicines in our practices?

Atul Gawande notes that:

"better is possible. It does not take genius. It takes diligence. It takes moral clarity. It takes ingenuity. And above all, it takes a willingness to try."¹⁵

The clarity of purpose and willingness to try should not be difficult for us given that "first do no harm" is the central ethical principle on which most of us wish to practice. Ingenuity is also a quality strongly associated with GPs. Perhaps most important, then, is the diligence which needs to come from recognition of the dangers of our tendency to favour a mode of decision-making that is "intuitive, automatic, fast, frugal and effortless"⁶. Instead, we need to employ a purposeful, conscious, and analytic checking process when prescribing, communicate well and have robust medication safety systems in our practices.

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