



Supporting junior doctors in safe prescribing



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Foreword

The prescribing of medicines is a fundamental part of the interaction between doctors and patients, but prescribing errors are common. Junior doctors need to develop the technical skill to write accurate prescriptions – the first essential of safe prescribing. Their medical colleagues, clinical pharmacists, and nursing staff can all help with this. The more complex skill of making appropriate therapeutic decisions will only come with guidance from senior clinicians and practice in a protected environment. This brief guidance sets out how trusts can support safe prescribing among trainee doctors.

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The World Health Organization launched its third global patient safety challenge, Medication Without Harm, in March 2017. The overall goal of the challenge is to improve medication safety by strengthening the systems for reducing avoidable medication-related harm. Prescribers, particularly junior doctors, are a key component of these systems.

As a medication safety officer, much of my role is to raise awareness of high-risk medicines and practices and explore how their risks may be mitigated. Supporting junior doctors and others on the safer use of medicines, and sharing learning through reporting and feedback, are essential aspects of this role.

I welcome this guidance, which draws on the literature as well as experience and the views of doctors, pharmacists and medication safety officers to make recommendations for enabling safer prescribing within trusts.

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Key recommendations

Prescribing induction should be practically focused and should cover key safety principles.

Postgraduate medical education leads must work collaboratively with medication safety officers to identify opportunities to promote safer prescribing within the wider curriculum.

Junior doctors should be provided with regular feedback on prescribing errors; this should be done in a structured and supportive manner.

Incident reports and other routinely collected data on prescribing errors should be used to identify areas for improvement and should feed into both quality improvement initiatives and postgraduate education and training.

Active efforts need to be made by trusts to create safer working environments to support safe prescribing.

Implementation of these recommendations within trusts should be supported by a board level director with responsibility for quality and safety.

Why have we produced this guidance?

Junior doctors are responsible for two thirds of all hospital prescriptions. Prescribing is a significant part of their role, but despite this, induction processes and postgraduate teaching around safe prescribing can be variable. Moreover, there is lack of a concerted effort to address the safety culture around safe prescribing, with junior doctors often being unaware of their mistakes and not always receiving the feedback that they need to learn and to continuously improve.

Who is this guidance for?

The aim of this guidance is to give postgraduate medical education leads and those responsible for quality and safety within trusts a framework to address these issues. We believe that the implementation of these recommendations will lead to improved support for junior doctors and safer care for patients.

Background

Prescribing errors account for a significant proportion of all medication errors and are an important cause of harm to patients.¹

The term 'prescribing error' incorporates irrational prescribing, inappropriate prescribing, under-prescribing, overprescribing and errors in writing the prescription.² An international systematic review highlights that they are a common occurrence, affecting 7% of medication orders and 50% of hospital admissions.³

The EQUIP study by Dornan *et al*³ and the PROTECT study by Ryan *et al*¹ are the largest hospital-based UK studies so far to have investigated the prevalence and causes of prescribing errors, across twenty English hospitals and eight Scottish hospitals respectively. These studies found that foundation year 1 (FY1) and foundation year 2 (FY2) doctors write approximately two thirds of hospital prescriptions, and have a significantly higher prescribing error rate compared to consultant grade doctors (Table 1).^{1,3}

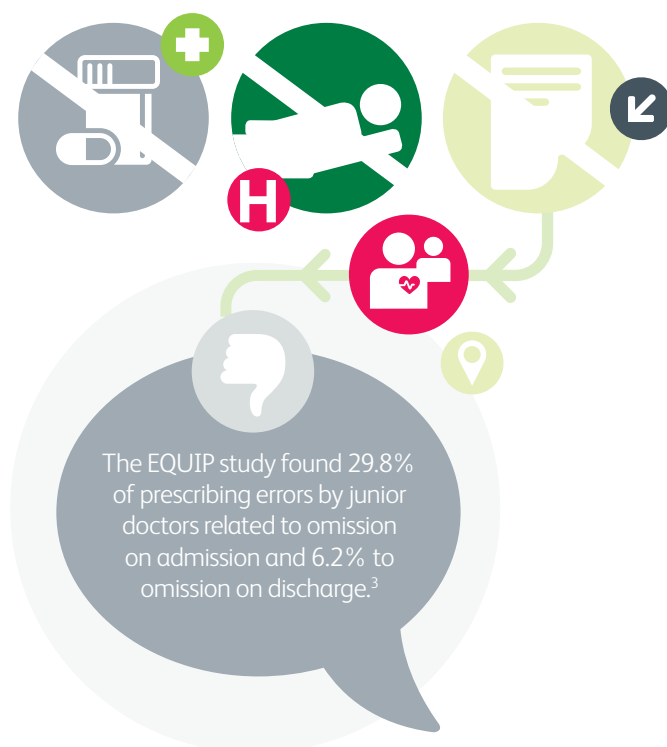
Table 1. Average prescribing error rates by medical prescriber grade

Prescribing error rates	EQUIP study	PROTECT study
Total	8.9%	7.5%
FY1	8.4%	7.4%
FY2	10.3%	8.6%
Consultant	5.9%	6.3%

Common errors

The classes of drugs most commonly involved in prescribing errors are analgesics, antimicrobials, bronchodilators, antianginals, corticosteroids and controlled drugs.³ Prescribing for elderly patients⁴ and those with renal or hepatic impairment are other areas of difficulty for FY1 prescribers.⁵

Incorrect dosage, omission of therapy (including inaccurate medicines reconciliation) and incomplete prescriptions are the most common types of prescribing errors.³



The causes of prescribing errors among junior doctors are complex and multifactorial^{3,6-10} (see Table 2), suggesting that multiple interventions targeting different parts of the prescribing process are needed to support junior doctors to prescribe safely, and in turn minimise the risk of errors.

Table 2. The causes of prescribing errors

The environment



- ✓ Complex and high-pressure working environments, particularly relating to workload, time constraints and frequent interruptions
- ✓ Specific working environments: working on wards with a high turnover of patients, difficulty accessing prescribing support and/or relevant clinical information out of hours
- ✓ Staffing issues:
 - > Inadequate staffing
 - > High turnover of staff and the use of locum staff
 - > Shift patterns and rotas resulting in unfamiliarity with processes and/or patients

The individual



- ✓ Lack of knowledge/experience
- ✓ Low self-awareness
- ✓ Perception that prescribing tasks are routine/not of high importance
- ✓ Feeling tired, hungry, stressed or unwell
- ✓ Low morale or mental health issues
- ✓ Challenges faced when transitioning from undergraduate training to being a FY1, and similarly at other career change points

The team



- ✓ Hierarchical structures leading to a reluctance among trainees to ask senior colleagues for advice and guidance around prescribing
- ✓ Miscommunication within the team
- ✓ Uncertainty in prescribing responsibility within teams
- ✓ Overdependence on safety-netting mechanisms (for example junior doctors relying on nurses/pharmacists to identify and correct their errors)
- ✓ Lack of a safety culture and shortcomings in supporting an open, blame-free environment

Systems



- ✓ Poor access to protocols and guidelines
- ✓ Lack of standardisation and unfamiliarity with drug charts or e-prescribing systems
- ✓ Primary/secondary care interface communication issues
- ✓ Poor feedback mechanisms

Task



- ✓ Prescribing outside routine practice
- ✓ Complex disease, polypharmacy
- ✓ Language and communication barriers
- ✓ Unfamiliarity with the individual patient (often linked to shift-work)

Although most prescribing errors are intercepted before they cause harm, it appears that the current system heavily relies on nurses and pharmacists identifying errors and correcting them before a drug is administered. Furthermore, newly qualified doctors are often unaware of their errors and are therefore being denied a valuable opportunity to learn from their mistakes. A better approach would be to try and prevent errors from occurring in the first instance, and to create a culture that proactively encourages continuous learning and reflection.

Section 1: Education and practical resources to support safe prescribing

1.1 Induction in safe prescribing

It is widely recognised that the theoretical knowledge acquired during undergraduate training does not always fully equip FY1 doctors to competently navigate the often complex, multifactorial prescribing situations they face.¹ Although continued improvement in undergraduate medical training is essential, the provision of tailored induction in prescribing skills is necessary to bridge the gap that currently exists, and to help contextualise prescribing skills and knowledge.

It may be impractical to comprehensively cover all common and serious errors, but induction does provide an opportunity to cover key safety principles, as outlined in the Royal Pharmaceutical Society's *A Competency Framework for all Prescribers*.¹¹

Key safety principles for prescribing

- Taking an accurate drug history
- Checking for and acting on allergies and sensitivities, drug-drug and drug-disease interactions
- Involving patients in prescribing decisions, where possible
- Identifying and using reliable and validated sources of information when prescribing
- Only prescribing within one's own scope of practice, and seeking help where necessary
- Taking responsibility for one's own prescribing
- Being receptive to feedback on prescribing errors
- Employing timely and effective communication around prescribing, particularly on hospital discharge

Junior doctors should be signposted to the competency framework,¹¹ which they can use as a self-assessment tool, enabling them to identify and reflect on areas where they need to further develop their skills.

Recommended format for prescribing induction

- Familiarise new doctors with local prescribing systems, eg the drug chart or electronic prescribing system
- Include interactive, practical prescribing exercises
- Signpost to locally available tools and resources that support safe prescribing
- Use the opportunity to build relationships between doctors and pharmacists

With respect to the format of prescribing induction, new doctors report a preference for practical prescribing exercises,¹² as opposed to a purely theoretical teaching format. Both induction and the four days of work-place base shadowing, which trusts are now mandated to provide FY1 doctors with,¹³ are important opportunities to ensure that new doctors are familiar with the prescribing systems that they are expected to operate.

Prescribing exercises should ideally cover common errors and errors that lead to serious harm. There is national patient safety data that can be used to support this (www.cas.dh.gov.uk), but trusts should also seek to incorporate material based on the prevalence of medication errors locally.

Online e-learning modules in drugs and therapeutics, such as those provided by SCRIPT (www.safeprescriber.org) and the British Pharmacological Society, can be used to encourage self-directed learning and can supplement material covered during induction. If they form a part of mandatory training, junior doctors should be provided with protected study time to complete these modules.

1.2 Incorporating prescribing into the wider curriculum

Importantly, induction should not be viewed as the only opportunity to provide education and training in prescribing skills. Prescribing should be viewed as an integral part of the foundation doctor training programme and should be covered opportunistically within other subject areas. For this to happen, postgraduate medical education leads must work collaboratively with medication safety officers to identify opportunities to address therapeutics within the wider curriculum. For example, safe prescribing practices around insulin regimens should be covered when teaching the management of Type 1 diabetes.

1.3 The use of assessment

The national prescribing safety assessment is a standardised, 2-hour online assessment which aims to ensure competency in the safe and effective use of medicines among medical undergraduates. It is now compulsory for all medical students to undertake this exam prior to starting in post as new doctors. It has played an important role in increasing the profile of medicines safety within the undergraduate curriculum.¹⁴

Nonetheless there is still a role for locally developed prescribing assessments that replicate real-life prescribing scenarios and use trust-specific protocols and guidelines, as they can be useful in contextualising the application of prescribing skills and knowledge.^{15–17} Furthermore, the use of local assessment can help highlight knowledge gaps that need to be addressed by individual doctors within their first few weeks of training, especially if supported with feedback from pharmacists. There should be a standardised approach to supporting junior doctors who fail a prescribing assessment (national or local), with additional support and supervision being provided in the first instance. If, however, there are sufficient concerns regarding prescribing competence and safety, it may be necessary to apply temporary sanctions on an individual doctors' prescribing rights.

Case study 1: Prescribing assessment at Kent, Surrey and Sussex LETB

Kent, Surrey and Sussex local education and training board (LETB) have developed a prescribing assessment based on data from the National Patient Safety Agency prescribing safety alerts. This is supported by the provision of structured, one-on-one feedback sessions with junior doctors, addressing errors made in the assessment, and signposting to relevant online e-learning (SCRIPT) modules, ensuring that FY1 doctors address their knowledge gaps.

1.4 The role of the multidisciplinary team

The multidisciplinary team – in particular, nurses, pharmacists and senior doctors – have a strong role in supporting junior doctors with safe prescribing.



Senior doctors: Senior doctors should oversee prescriptions of junior doctors, particularly in their first few months as new prescribers. With other colleagues, they can help to teach the skills of safe prescribing.



Hospital pharmacists: Junior doctors need a clear understanding of the role of the hospital pharmacist. They should know how to seek advice on the wards and when on-call. Hospital pharmacists should be encouraged to participate in ward rounds, where they can support junior doctors with 'on-the-spot' guidance and feedback related to prescribing. The Royal Pharmaceutical Society Roadmap to Advanced Practice¹⁸ and Professional Standards for Hospital Pharmacy Services¹⁹ clearly outline the role of the pharmacist and pharmacy team in supporting safe and effective prescribing.



Nurses: Nurses have an important role in helping junior doctors understand the system in which they are prescribing, particularly the practical aspects of prescribing. They will often identify errors or incompleteness, and will advise on routes and frequency of administration to meet the patients' needs. They will also be key in ensuring team working of all professionals in the ward or department.

Although advice may be sought from the wider multidisciplinary team, junior doctors must be aware that responsibility for the prescription rests solely with the prescriber. Therefore, it is advisable to question and clarify third party advice, and if necessary verify it using validated sources such as the *British National Formulary (BNF)* before signing a prescription.

1.5 Practical resources

There are a variety of practical resources that can be used to support safe prescribing. These include:



➤ The *BNF* – junior doctors must know how to navigate the *BNF* and be able to find the information they need to prescribe safely.



➤ Local protocols and clinical guidelines – these should incorporate information about safe prescribing, and this information should be easily accessible in clinical areas.



➤ Mobile apps – provide greater portability and accessibility in clinical environments.²⁰ Trusts should provide junior doctors with information and advice on accredited apps (eg the *BNF* app) and make active efforts to ensure that junior doctors are using reliable sources. Trusts may also use available online platforms to upload local prescribing guidelines, but they must take responsibility for quality assuring the content, and ensuring that it is kept up-to-date and error-free.



> Pocket prescribing cards – these can be useful for commonly prescribed drugs and those which need to be prescribed in emergency situations (eg anaphylaxis, status epilepticus). There is evidence that they can improve the speed and confidence of junior doctors in initiating management plans for acutely unwell patients.^{21,22}

1.6 Electronic prescribing

Trusts are encouraged to transition to electronic prescribing (e-prescribing) systems as soon as the infrastructure is in place and the necessary training can be delivered to staff.

Benefits of e-prescribing systems^{23,24}

- > Improved legibility of medication orders
- > Elimination of lost or misplaced paper charts
- > Access to in-built clinical decision support (alerting the user to allergies, dose errors, drug-drug and drug-disease interactions) and relevant clinical guidelines
- > Improved accountability, supporting mechanisms to give feedback to individuals on prescribing errors. (Users must be reminded that their personal password and login details are equivalent to their signature. They must log out of their accounts after use, otherwise errors that they are not directly responsible for may be attributed to them)

The provision of appropriate training is necessary to realise the potential benefits of electronic prescribing.²⁴ Junior doctors and other prescribers need to be familiar with the functionality of the system, and they need to have an awareness of the potential sources of error that e-prescribing lends itself to. Despite its benefits, e-prescribing is not error-free and can lead to new types of error.

Key errors associated with electronic prescribing²⁴⁻²⁶

- > Making the wrong selection from a picking list or drop-down menu (this includes drug selection errors, dosage/route selection errors, patient selection errors and therapeutic timing errors)
- > Errors arising from incomplete display of information and prescriptions being ordered and signed for without review of the entire drug regime
- > Failure to change suggested default settings when indicated, eg assigning an incorrect start/end date for therapy due to a default selection made by the system
- > Failure to amend auto-population of pre-defined order sentences which are either incorrect or inappropriate
- > Errors arising from overdependence on clinical decision support systems

Essential advice to be given to junior doctors using electronic prescribing systems⁴

- > Review all the drugs prior to completing a new prescription
- > Double check that you have prescribed what you intended to, before signing the prescription
- > If prescribing remotely, ensure that you communicate what you have prescribed to the patient and to the ward nurses
- > Sign out of the system when you have finished prescribing



Perhaps most importantly, junior doctors need to be aware that relying on the computer system alone to identify potential errors and interactions is ill-advised. Prescribing decisions should be systematically thought through and, if necessary, manually checked using available resources.

‘Computerised decision support should never be designed to replace human knowledge but should be used judiciously to support clinicians in their own decision making’²⁰

Despite the potential benefits of computerised decision support, in practice most alerts are overridden or ignored.²⁷ Junior doctors need to be made aware of the concept of ‘alert fatigue’, be encouraged to reflect on their practice and, in turn, get the best out of a system which offers in-built decision support.

Key points

- The implementation of electronic prescribing should be supported with training so that users are familiar with the functionality of the system
- Junior doctors need to be aware that e-prescribing is not error-free, and that prescribing decisions must be judiciously thought through, even if facilitated by computerised clinical decision support
- Junior doctors should be made aware of the existence of ‘alert fatigue’ and should be encouraged to reflect on their practice, with respect to using computerised decision support

Section 2: Safety culture

The perception by the medical profession that prescribing is of less importance than other areas of practice, and the potential for this to significantly impact upon the development and strengthening of safe prescribing practices, has been noted.²⁶ The presence of medical hierarchies, an ambivalence towards prescribing errors, the failure to remedy error-provoking environments, and the suboptimal use of incident reporting systems are key areas that need to be addressed in order to create a strong safety culture around prescribing.

2.1 Team culture

There have been reports of junior doctors compromising their opinion when prescribing, due to the influence of medical hierarchies within teams.²⁷ Hierarchical arrangements can also make it difficult for junior doctors to ask for advice or support with prescribing, and the belief that the medical profession should be experts, rather than learners, can lead to underuse of reference sources when prescribing.²⁸ Seeking advice and support needs to be encouraged, and should be perceived as good practice.

This can be fostered by:

- investing in good working relationships between junior doctors and hospital pharmacists
- encouraging the use of prescribing mentors
- actively signposting to locally available tools and resources that facilitate safe prescribing
- modelling of help-seeking behaviour by senior doctors.

Case study 2: The use of pharmacist buddies/mentors at County Durham and Darlington NHS Foundation Trust

All FY1 doctors at Darlington NHS Foundation Trust are assigned a pharmacist buddy; where possible, this is the pharmacist assigned to their base ward. On their first day, junior doctors are allocated a timetabled session with their pharmacist buddy, during which they go through a checklist of essential information and are given a prescribing factsheet.

This initiative has fostered positive relationships between FY1 doctors and pharmacists and has increased the confidence of junior doctors with prescribing by:

- increasing contact with an assigned pharmacist during induction
- providing structure to the initial meeting between the ward pharmacist and FY1 doctor
- providing a key contact who junior doctors can seek advice from for prescribing related queries in their first few months as new prescribers.

2.2 The provision of feedback

As most errors are intercepted before they lead to harm, there is concern that new doctors develop a degree of complacency around prescribing.^{9,28} This can be mitigated in part by a system which promotes feedback and learning (Figure 1).^{29,30} Pharmacists often review prescription charts and correct prescribing errors, which are not reported as incidents.³¹ However, there is still likely to be valuable learning for the prescriber and the provision of feedback can help address complacency towards prescribing errors.³² Face to face feedback given in a timely manner should be the gold standard, as this allows adequate exploration of the error, and supports both learning and behaviour change.³²

The opportunity to learn from mistakes through peer discussion is reported to be of value.³² This might involve discussion around serious incidents or near misses, or it may be based on common errors identified within a department. It is important that these discussions are non-threatening and 'blame-free', in order to promote learning.

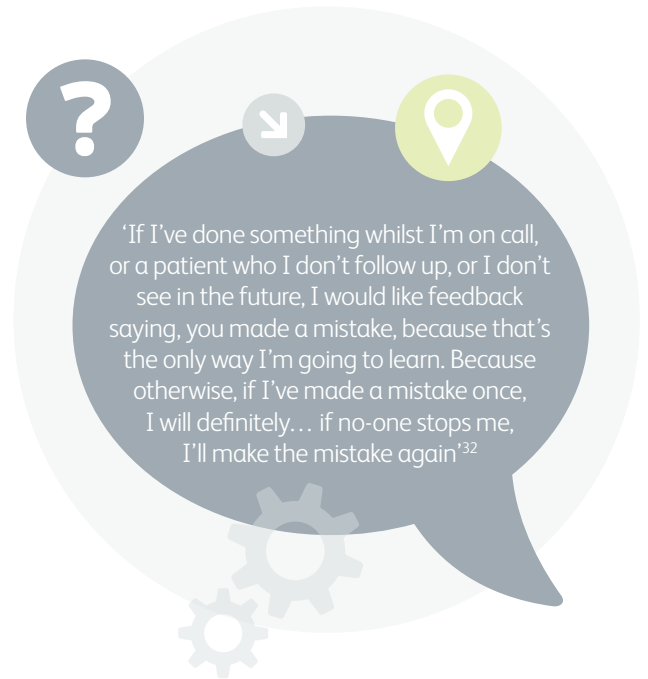
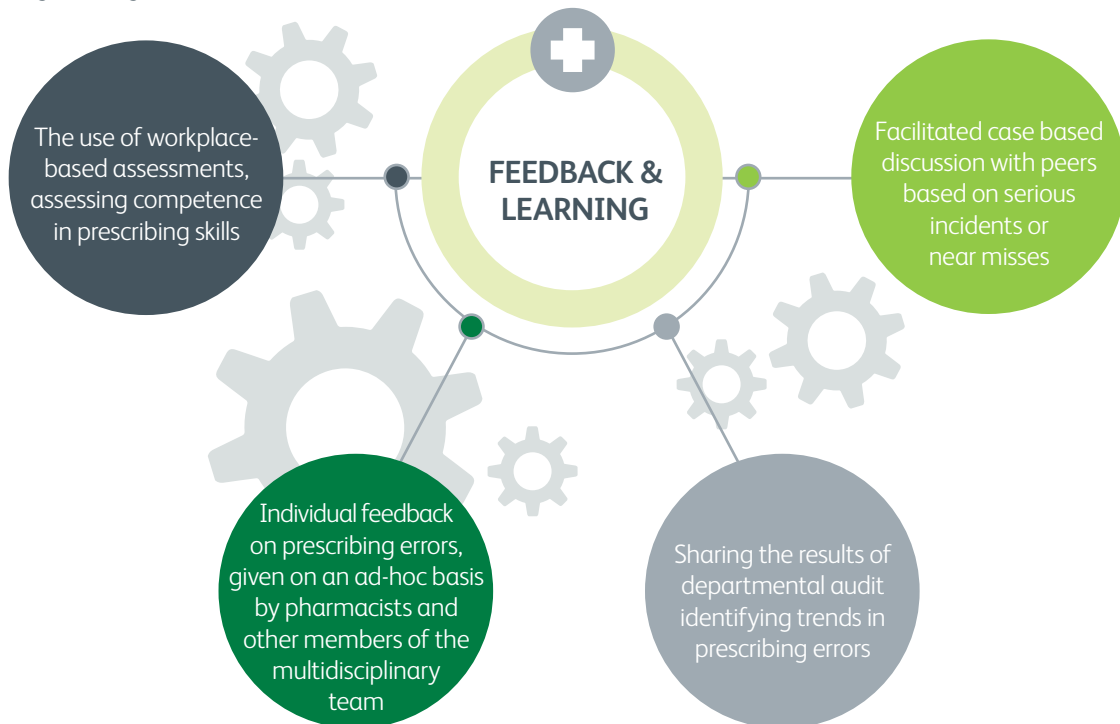


Figure 1. Modes of providing junior doctors with feedback and ways to encourage learning from errors.



Case study 3: The use of peer discussion at UCLH NHS Foundation Trust

Every two to three months, the medication safety officer presents an 'error of the month' in the final 20 minutes of scheduled teaching sessions for FY trainees. The purpose is to share lessons and recommendations from a specific error, and to discuss wider practical implications for the FY trainees' practice. The sessions act as a two-way feedback and learning mechanism, as they also provide the FY trainees with an opportunity to highlight organisational or system issues to the medication safety officer, which may be error-provoking.

As prescribing is a key competency, it should also be assessed through the use of formative workplace based assessments, in which prescribing is either directly observed or prescribing decisions and actions are reviewed in the form of a case based discussion. This provides an opportunity to give feedback in a safe space and offers a structured format within which to do that.

Sharing data from departmental audits is also helpful in raising awareness that prescribing is a high-risk clinical activity. However, the provision of information alone is not enough to change systems, culture and behaviour. Trusts are encouraged to use audit data to actively engage frontline staff in quality improvement activities, and should seek to embed a culture of continuous improvement with respect to medication safety.

2.3 Creating safer environments for prescribing

Hospital wards can be busy, noisy working environments. Staff are subjected to repeated interruptions while doing important tasks such as prescribing, despite the knowledge that safe prescribing requires the concentration and attention of the prescriber.^{33,34} It is clear that the working environment must be addressed in order to improve prescribing safety. Below are some practical suggestions:

- The use of prescribing stations – the use of a dedicated area where prescribers cannot be interrupted, except in an emergency. This was trialled in a paediatric intensive care unit and led to a significant reduction in prescribing error rate.³⁵
- Implementing a pause on hospital ward rounds – on busy ward rounds, the team should ensure that there is sufficient time to review prescribed medications. It is important that if amending or prescribing new medicines, adequate time is allowed for the prescriber to document a clear, accurate and legible prescription, before the team moves on to review the next patient.
- If a trust is using electronic prescribing, then they should ensure the adequate provision of electronic portals and portable devices to support this, particularly on ward rounds.

2.4 Incident reporting

Increased incident reporting is a strong positive indicator of a good safety culture.³⁶ It is well recognised that there are shortfalls in the current system, with significant underreporting of incidents and near misses, especially in relation to medicines.³¹ The consensus is that prescribing errors that have led or which had the potential to lead to serious harm should be formally reported via incident reporting systems.

It is recommended that, from the very beginning of foundation training, junior doctors should be:

- supported to understand the reporting process
- encouraged to engage in regular and timely reporting
- kept informed of the actions taken following an incident they have reported or been involved in
- provided with feedback to encourage personal and organisational reflection.

The high proportion of unrecorded independent interventions made by pharmacists and nurses indicates that opportunities for learning may be lost when systems rely solely on data from incident reporting, and therefore other, more systematic forms of data collection should also be explored. For example, structured case record review – a systematic way of reviewing case notes, which allows individuals and organisations to ask why errors have occurred – may be a particularly powerful way for junior doctors to detect adverse events, understand why systems work the way they do, identify contributory factors and address the underlying issues to drive improvement.³²

Safety culture for prescribing – what does good look like?

- Encourage a supportive clinical environment across the entire team, where seeking advice and support is perceived as good practice.
- Create a culture in which prescription writing is viewed as being important.
- Support mechanisms to provide feedback on prescribing errors.
- Create safe working environments which minimise the risk of prescribing errors due to interruptions and time constraints.
- Engage staff in regular incident reporting from early in their careers.
- Explore alternative approaches to identifying prescribing errors.

Conclusion

This report is intended to give those responsible for medication safety within trusts key guidelines on how best to support junior doctors with prescribing. Prescribing induction is necessary to ensure junior doctors are equipped with the principles to be safe and competent prescribers. However, it should not be viewed as a one-off opportunity to impart knowledge on prescribing. As it forms an essential part of every junior doctor's role, there needs to be an ongoing focus on prescribing safety within the wider curriculum. The multidisciplinary team have a role in supporting junior doctors with safe prescribing – in particular, nurses, pharmacists and senior doctors.

It is however clear that improved education and training is only one part of the solution. Both organisations and individuals need to learn from mistakes and invest in systems that support a culture of continuous learning and reflection. As part of this, more concerted efforts need to be made to give feedback to individual prescribers and departmental/ trust level data on prescribing errors should proactively be used to inform ongoing quality improvement.

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