An overview of e-prescribing in secondary care

Abstract

Healthcare organisations are now having to address the plan outlined in the *NHS Outcomes Framework* while at the same time reducing spending. One area that can help them achieve this is electronic-prescribing (e-prescribing). This article describes the existing prescribing challenges hospitals face and discusses how e-prescribing can address these. It examines the practicalities of introducing e-prescribing to a busy hospital setting and steps that can be taken to make the process as straightforward as possible.

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IN AN IDEAL WORLD, patient records would be centralised, and accessible in both primary and secondary care. These records would be updated automatically by electronic prescribing (e-prescribing) so that all healthcare providers are kept up to date with the patient's prescription status, including any allergies and previous adverse reactions. All new hospital prescriptions would be checked for clinical appropriateness and, if allowed on the local formulary, sent electronically for ordering. Medicines would be dispensed by robot and sent to the right hospital location via an automated in-house delivery system. At discharge from hospital, patients would take their medicines from the ward and information regarding any changes to medicines would automatically be available to the GP when the patient revisited primary care.

Despite today's technology being advanced enough to make this possible, there is still some way to go. However, one area where the technology can be implemented is secondary care e-prescribing, which is a major step towards seamless medicines management.

E-prescribing has been widely available for a number of years. In England, many NHS trusts were deterred from implementing an e-prescribing system until the implications of the National Programme for Information Technology (NPfIT) became clear. Part of the NPfIT was focused on the procurement of hospital-wide electronic medical systems from three main system suppliers. However, there has been a lack of progress in this area. With the recent announcement of the closure of the NPfIT (Department of Health (DH) 2011), and with the government exploring alternative provisions, organisations are reassessing how technology can help them address the *NHS Outcomes Framework 2011/12* (DH 2010) and reduce spending. The implementation of e-prescribing is one way in which these efficiencies can be achieved.

Problems with prescribing in hospital

E-prescribing is described by NHS Connecting for Health (2007) as 'the utilisation of electronic

systems to facilitate and enhance the communication of a prescription or medicine order, aiding the choice, administration and supply of a medicine through knowledge and decision support and providing a robust audit trail for the entire medicines use process'.

Most prescriptions in hospitals are handwritten. As well as requiring others to be able to decipher the handwriting to understand the drug and dose required, there is a risk that important information, such as the frequency of medication administration or the prescriber's signature, is accidentally omitted from the original prescription. Verifying or chasing this missing information may result in wasted time for the nurse or pharmacist and unnecessary delays to sourcing and administering the medicine.

In many cases, there is a level of urgency when prescribing and administering medicines in hospitals. Any errors that may delay this process could have serious implications for the patient. A report from the National Patient Safety Agency (NPSA) (2010) looked at the effect of errors during the prescribing, dispensing, supply or administration of medicines in hospitals. The report assessed a number of incident reports of omitted or delayed medicines and identified common themes that resulted in drug administration failures. These included intending to prescribe but not actually prescribing medicines; medicines not being available during normal working hours; medicines not being available out of hours; medicines being prescribed, but not administered; patients not being on the ward; medicines being administered to the wrong patients; and discharge medicines not being supplied.

The topic of discharge medicines also arose in a Care Quality Commission (2009) report, which examined the management of medicines following patients' discharge. The report included the results of a survey involving general practices covered by 12 primary care trusts; 81% of practices stated that details of medicines prescribed by hospitals were incomplete or inaccurate on discharge summaries 'all' or 'most' of the time.

Delays at discharge can extend unnecessarily the time patients remain in hospital, which can in turn have an effect on other aspects of their stay. For example, the NPSA (2010) report cited an incident in which a long delay in waiting for discharge medicines delayed a patient's lift home, which led to a rushed discharge process. As a result, the discharge medicines were not explained fully and the patient ended up being re-admitted at a later date. Delays at discharge can also be time consuming for nursing teams that still have to tend

to patients who no longer require their care and prolong bed occupation times unnecessarily. As well as the potential delay that can be caused by illegible or incomplete handwritten prescriptions, there is also a risk of human error. Caution must be exercised to ensure that any drugs prescribed do not conflict with any medicines the patient is already taking or allergies that the patient may have.

In addition, issues can arise if the desired drug is not readily available from the pharmacy, if hospital policy has changed regarding what medicine should be prescribed for specific ailments, or if new or alternative drugs have become available. It is worth considering that, with so many new drugs constantly being developed, physicians and nurse prescribers who are already busy are under increasing pressure not only to keep up to date with what is available, but also to be aware of how each of these new drugs interacts with other medicines the patient may be taking.

Research into e-prescribing

Trusts are increasingly considering e-prescribing as a means of improving on the traditional handwritten approach to prescribing. In September 2010, research among attendees at the National ePrescribing Forum found that 82% of respondents were either thinking of implementing or were in the process of implementing an e-prescribing system (Crowe *et al* 2010). The survey identified that knowledge support, decision support and interoperability with other elements of the hospital patient administration system functionality were cited as being the areas of greatest interest.

E-prescribing has been found to reduce considerably the number of prescription errors. Kaushal *et al* (2010) found that healthcare providers who used an electronic system to make prescriptions were seven times less likely to make errors than those writing prescriptions by hand. A total of 3,684 paper-based prescriptions were assessed at the start of the study and 3,848 paper-based and electronic prescriptions written one year later. After one year, the percentage of errors dropped from 42.5% when written by hand to 6.6% for the providers using the electronic system. For those who continued writing prescriptions by hand, the percentage of errors increased slightly from 37.3% to 38.4%. Problems with illegibility were eliminated by e-prescribing (Kaushal *et al* 2010). However, other studies have shown that although serious errors are reduced following the introduction of e-prescribing, new types of prescribing error are occurring.

Donyai *et al* (2007) investigated the effects of e-prescribing on prescribing quality, as indicated by

prescribing errors and pharmacists' clinical interventions, in one UK hospital. The study highlighted new error types that were specific to e-prescribing which mainly involved selection of the incorrect dose or frequency from a menu, and inappropriate use or selection of default doses. Donyai *et al* (2007) concluded that while the system reduced straightforward errors in medication order writing, prescribers and ward pharmacists need to be aware of these new types of error so that they can be identified and rectified.

E-prescribing systems must therefore be designed to minimise errors, for example, by establishing a 'favourites' formulary so that prescribers prescribe drugs they are familiar with or provide a link within the e-prescribing system to the *British National Formulary*.

Advantages of e-prescribing

E-prescribing enables multidisciplinary teams to prescribe, order and administer medicines to patients by electronic means, and provides an audit trail attributed to each healthcare professional and each drug. It eliminates confusion over handwriting interpretation or incomplete prescriptions. As any potential information gaps or uncertainty are flagged at the time of prescribing while the prescriber is present, they can be addressed immediately, eliminating the need for further investigation later.

While e-prescribing systems vary, there are some essential elements that should remain, for example using portable devices such as laptops or tablets on which to generate the prescription. The use of barcoding for patient records makes patient identification simpler, and is commonplace in some countries, such as Italy. Hospitals in England have been given until the start of October 2013 by the Information Standards Board for Health and Social Care to issue a barcode to every patient with an identity band (Information Standards Board for Health and Social Care 2011). By cross-checking the patient's barcode with the barcode on the prescribed medicine at the point of administration – typically at the patient's bedside on the ward – an automatic process will be triggered which will confirm that the correct drug is going to the correct patient.

E-prescribing systems should automatically highlight patient allergies, thus ensuring prescribers are aware of them. Should they still opt to prescribe the drug – either intentionally or by accident – a warning will be given so that they are aware of the potential consequences of their decision.

By providing a detailed log of a patient's medicine history, prescribers can easily view and analyse what drugs have been taken previously. Any potential incompatibilities with new medicines being prescribed can be automatically flagged and addressed before the prescribing process goes any further and subsequently needs to be rectified. This can prove particularly beneficial if a patient is on long-term medication or, as is often the case when the patient moves from one ward or department to another, if more than one person is likely to be prescribing. The identification of drug interactions requires careful consideration to avoid false alerts so that the focus remains on serious interactions. A full description of all interactions should also be available to be checked if the prescriber wishes.

For busy ward staff, e-prescribing can improve the efficiency of drug rounds and administration times. Medicines rounds will be simplified by the use of complete lists of patients and the drugs prescribed for each individual, allowing better planning and execution of the round. Any overdue administrations are automatically flagged, avoiding the risk of missed doses. In cases where drugs have not been administered, the system will automatically require a member of staff to record the reason why – thereby serving as an additional prompt for action and keeping a necessary audit trail of activity. The automatic dose-checking capability of e-prescribing prevents the risk of an overdose.

Missing drug charts will become a thing of the past as all prescriptions are recorded electronically where they can be accessed by healthcare professionals throughout the hospital. Hospitals can set up drug templates for specific conditions, for example for routine post-operative drugs. This can help eliminate the need to re-write prescription charts, speeding up the prescribing process further. Creating a consistent, standardised, hospital-wide approach such as this for certain medications and conditions can also help assist with the management of pharmacy stock control levels.

The benefits of e-prescribing go beyond improving patient safety and operational efficiency. The technology can also bring significant financial savings. Beard (2009) estimated that a 1,000-bed hospital with an annual budget of approximately £250 million can expect to see a saving of around 2% or £5 million per annum by implementing e-prescribing. These savings were attributed to a number of factors such as staffing efficiencies, a reduction in medicine errors and a reduction in the space required to store paperwork. An additional efficiency results from the system discouraging or preventing prescribers from selecting non-formulary drugs (allowing for over-riding where necessary), and encouraging the prescription of generic rather than branded products, when it is safe and appropriate to do so.

Considerations when introducing e-prescribing

As with all new technology, the uptake of e-prescribing by clinical teams will depend largely on how well it can be introduced with minimum disruption to established working practices. System flexibility is key and any new system should be adapted to fit in with existing practices so that minimal training is needed. Pharmacists should be part of the e-prescribing procurement and evaluation team because their extensive experience in designing paper-based systems and hospital medication management processes will be invaluable in ensuring that any new system meets the hospital's specific needs.

To help eliminate any concerns about introducing the new system, it is important to keep teams updated on the implementation progress. Likewise, feedback on the system during and after implementation should be encouraged to ensure staff remain involved, to provide a forum for suggestions and to avoid any breakdown in communication. Having support from managers, in particular, will assist implementation. NHS Connecting for Health (2009) advised that 'e-prescribing projects will, inevitably, raise some resistance, perhaps quite a lot from some clinical quarters. If senior managers are anything other than fully supportive, then e-prescribing projects may be wounded or even fatally challenged'.

Hospitals should also consider appointing departmental e-prescribing champions who recognise the value of the new technology. It is hoped their passion and enthusiasm for the technology will be transmitted to their colleagues and they can help in responding to any concerns or questions at a departmental level, thereby helping to maintain the smooth running of the system.

From a practical perspective, as much preparation as possible should be done beforehand, for example identifying any potential 'dead spots' in the hospital's wireless coverage, which can be rectified where possible before they cause problems during implementation of e-prescribing. In addition, information should be gathered about clinical and non-clinical processes, resources, reported errors and so on. The anticipated benefits of e-prescribing should be defined and recorded. In this way, the benefits of the e-prescribing system can be evaluated fully once the system is in operation to encourage and motivate all involved as well as to justify the investment.

Ultimately, the success of e-prescribing relies on the willingness of healthcare staff to adopt the technology. However, this can often be dependent on the relevance of the technology to their day-to-day roles. Clinical teams should therefore provide feedback on where improvements can be made, ensuring that any new system not only meets patients' needs, but also has a positive effect on the working lives of those using it.

Conclusion

As with the introduction of any new technology or change in working practice, the roll-out of e-prescribing may be challenging to some trusts. Information about the benefits of implementing this type of system in terms of cost savings, improved efficiencies and improved patient safety should be provided. Sufficient forward planning will assist introduction of the new technology into the workplace with minimal disruption to clinical teams **NS**

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