

EDITORIAL

Electronic prescribing in hospitals: the road ahead

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The use of computers in general practice has grown dramatically in response to initiatives such as the Commonwealth Government's Practice Incentives Program (PIP). In contrast, the use of computers in hospitals has changed little over the past few years. Whereas 65% of general practices qualified for the electronic prescribing component of the PIP¹, a survey in three Melbourne teaching hospitals revealed that only two out of 30 residents used computers for purposes other than reviewing patient results.²

The progress of computing in Australian general practice has recently deviated markedly from that of our public hospitals. Whereas electronic prescribing has become commonplace in general practice, our hospitals still rely on paper-based drug charts and outdated reference texts to support the management of inpatients' medication. While general practitioners are rapidly embracing the internet as a real-time source of clinical knowledge, many hospitals do not offer doctors and healthcare professionals internet access on the wards. This deviation represents a reversal of fortune for our hospitals which have provided doctors with electronic access to patients' laboratory results for many years.

In this issue...

There has been rapid growth in the use of information technology in medicine. Many general practitioners are now prescribing electronically, but Hugo Stephenson informs us that hospitals are being left behind.

The management of opioid dependence is controversial, but new treatments are becoming available. Alex Wodak briefly reviews the available options.

Successful treatment depends on an understanding of physiology. Brian Nankivell tells us how to assess renal function, while Jenny Martin and Michael Fay explain the principles of drug interactions involving the cytochrome P450 system.

Interactions are a risk of drug treatment, but Andrew Herxheimer proposes that we should talk more about harms than risks. Neil Buchanan gives examples of drugs that can provoke seizures, while Geraldine Moses reminds us that even 'natural' substances can cause harm.

The Quality in Australian Health Care Study suggested that 50% of adverse events occurring in our hospitals are highly preventable.³ A recent study in the USA has also highlighted problems with hospital prescribing.⁴ These include:

- unawareness of best-practice recommendations
- failure to alter drug therapy in the face of altered physiology
- disregarding a patient history of allergy to the same medication class
- prescribing the wrong drug name, dose form or abbreviation
- incorrect dosage or frequency calculations
- illegible writing and failure to communicate important information.

How many of these adverse events could have been prevented by electronic prescribing and decision-support programs?

Most medical schools incorporate information technology into the undergraduate curriculum. When working for prolonged periods in our public hospitals, new graduates will not have the opportunity to use their knowledge of computers. There is now a real risk that these doctors will become deskilled.

Why has general practice taken the lead in leveraging information technology to improve clinical practice? While financial incentives have certainly contributed significantly to the dramatic growth seen over the past year, factors such as increasing consumerism and the evolution of communication technology have contributed to this growth.⁵ Furthermore, the commitment to 'legacy' systems has prevented large hospitals from embracing evolving technologies.

These legacy systems, which have been purchased over the past decade at enormous cost, provide access to patient management information and clinical results. Due to the proprietary nature of these systems, adding new applications can be both costly and time-consuming. Many hospitals are essentially locked into a cycle of dependence upon a single software provider that can only be broken by significant investment in system design and integration. Unfortunately, given the range of proprietary systems used within our hospitals, there cannot be a 'one size fits all' solution.

Hospitals have also suffered from the lack of practical solutions for the clinical interface. While the nature of most general practice consultations remains compatible with the use of a desktop computer, it is impractical (and prohibitively expensive) to expect medical officers to carry laptops on ward rounds, or to continually log on to computers located at every bedside.

Although bulky pen-based systems have been hailed as potential solutions for several years, the release of affordable hand-held computers should bring the possibility of electronic prescribing and decision support at the bedside closer to reality.

In further contrast to general practice, the hospital prescribing environment involves multiple prescribers, a wide range of drugs and methods of delivery and, importantly, is intimately related to drug dispensing. As a result, even the functionality of existing general practice prescribing packages must be significantly re-engineered to be useful in the hospital environment.

Despite the problems, considerable efforts are now being made to implement electronic strategies in our public hospitals. Several major hospitals are evaluating existing general practice prescribing packages to assess their suitability for hospital practice. Others have been developing software in-house to integrate with their existing information technology infrastructure. The Royal Melbourne Hospital is developing an antibiotic decision-support system which will suggest appropriate antibiotics based on patients' microbiology records. Many hospitals are now piloting programs that promote electronic communication with local general practitioners to encourage greater continuity of care. Importantly, as interest in clinical information technology is rapidly spreading throughout the hospital system, clinicians are now participating more actively in this new era of hospital-based clinical practice.

Hospitals in the USA are providing hand-held computers to doctors and nurses to use at the bedside. Many integrated healthcare packages now offer electronic prescribing through these hand-held systems. The popularity of these hand-held computers across a wide range of industries will result in even greater functionality emerging without significantly increasing deployment costs.

With the introduction of State-based legislation, such as the

Electronic Transactions (Victoria) Act 2000, pre-existing legal obstacles to electronic prescribing are rapidly disappearing. While a handful of hospitals have called for tenders to pilot electronic prescribing systems as isolated projects, a co-ordinated approach is required to ensure that the benefits of electronic prescribing can be delivered consistently across our hospital system.

Financial incentives have clearly been effective in promoting the use of computers in general practice. These incentives have coincided with increased consumer awareness, exponentially increasing volumes of clinical knowledge and decreasing costs of upgrading technology. With the same forces for change now appearing in our hospitals, the opportunity is emerging for incentive programs to encourage hospitals to follow the lead of general practice by adopting electronic prescribing and decision-support systems.

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Letters

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Treating head lice

Editor, – I would like to correct an error in the article by Dr Wargon (*Aust Prescr* 2000;23:62-3).

The comment that an organophosphate insecticide 'acts by non-reversibly blocking acetylcholine' is not correct. These compounds act by non-reversibly blocking the enzyme acetylcholinesterase which is responsible for degrading acetylcholine at nerve terminals. The effect of this enzyme inhibition is an excess acetylcholine activity rather than any blocking of the effects of this neurotransmitter.

Maldison (malathion) initially undergoes bioactivation in the insect to the active compound which, by my understanding, acts predominantly in the insect's central nervous system.

Pyrethroids (also mentioned in the article) act on voltage-dependent sodium channels in the nerve cell membranes.

With some of these drugs, this results in repetitive nerve firing and release of excess acetylcholine at the nerve terminal. The end result with some pyrethroids is therefore similar to that with the organophosphates.

Excess muscarinic activity resulting from the clinical use of reversible anticholinesterases (e.g. neostigmine) is a common problem which is overcome in anaesthetic practice by the concurrent administration of an antimuscarinic drug (e.g. atropine) that does block the action of acetylcholine at muscarinic receptors. This is important to prevent the severe bradycardia that would otherwise occur.

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