

General practitioners' perceptions of the pharmaceutical decision-support tools in their prescribing software

Michael D Ahearn and Stephen J Kerr

ADOPTION OF information technology (IT) in general practice has accelerated in recent years, as practices take advantage of federal government Practice Incentives Program (PIP) payments that were specifically targeted to improve IT uptake. The Health Insurance Commission estimates that, as at August 2002, 89% of practices were collecting PIP payments for electronic prescribing.¹

The Federal Government's National Electronic Decision Support Task Force has defined "electronic decision support" as "access to knowledge stored electronically to aid patients, carers, and service providers in making decisions on health care".² Computerised prescribing, combined with decision-support features, has in some cases demonstrated benefits for general practitioners and patients, including enhanced safety of prescribing.³ However, the development and subsequent integration of decision-support tools has happened in an ad-hoc and uncoordinated fashion, with different products evolving in different ways. In particular, there is no established framework of standards for quality and safety within which software developers are required to work. Similarly, there are no uniform requirements in areas such as drug and disease terminology and coding; messaging and communication; and clinical knowledge databases.^{2,4}

Different prescribing programs feature various tools to support GPs in making prescribing decisions. These are often in the form of prompts, warnings, or links to additional information to assist in the decision-making process and streamline work practices. A recent study in the United Kingdom⁵ assessed GPs' views of the relevance of drug-interaction alerts in their prescribing

ABSTRACT

Objectives: To explore how Australian general practitioners use pharmaceutical decision-support (PDS) systems; to determine GPs' perceptions of the deficiencies and strengths of these systems; and how they believe they can be improved.

Design and setting: Qualitative analysis of discussion from three focus groups of GPs (from one rural and two urban Divisions of General Practice) between April and May 2002.

Participants: 22 GPs selected to include users of the five most popular prescribing/clinical practice software products available in Australia.

Main outcome measures: Advantages and disadvantages of using PDS software; ideas for improving PDS systems; attitudes to electronic evidence-based guidelines.

Results: GPs believed that important interactions may be missed because of desensitisation resulting from too many alerts (which also intrude on workflow); that interaction alerts need to be severity graded and only significant ones should appear; and that improved computer-user interface design could enhance the usefulness of PDS systems.

Conclusions: Our results will provide useful feedback to government, software vendors and software developers on the needs and expectations of end users and on the development of agreed software standards.

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software and the frequency with which they admitted to overriding these alerts. Thirty-six per cent of respondents admitted to sometimes dismissing alerts without properly checking them (eg, because the interaction was not serious, or was irrelevant to the patient), 55% thought the alerts would be more useful if they were severity graded, and 52% said they had more faith in other information they could obtain.

There is little information available, however, about the attitudes of Australian GPs in these areas. The objectives of our study were to explore how GPs use pharmaceutical decision-support (PDS) systems currently available (within prescribing software or as stand-alone systems), GPs' perceptions of the strengths and deficiencies of these systems, and how GPs believe they can be improved.

METHODS

Three GP focus groups were conducted between April and May 2002. We approached several IT officers of Divisions of General Practice to help us select GPs who used software for all prescribing, and who ideally had some knowledge of the decision-support tools within their software. The GPs were chosen from one rural and two urban Divisions, and included users of five of the most popular prescribing software packages available in Australia. These software products were identified through discussion with Divisional IT officers and National Prescribing Service facilitators within Divisions.

Data collection and analysis

In the focus-group meetings, we asked the participants questions relating to:

- the usefulness of alerts and prompts within their prescribing software;
- perceived effects of these alerts and prompts on their prescribing behaviour;
- ideas to improve PDS tools;

National Prescribing Service, Surry Hills, NSW.

Michael D Ahearn, GradDiplIT, Decision Support Officer;

Stephen J Kerr, BPharm, PhD, Decision Support Coordinator.

Reprints will not be available from the authors. Correspondence: Mr Michael D Ahearn, National Prescribing Service, Level 1, 31 Buckingham Street, Surry Hills, NSW 2010. mahearn@nps.org.au

- attitudes to electronic evidence-based guidelines; and
- ideas about decision-support tools that operate independently of the prescribing software.

The meetings were audiotaped and transcribed. After the first meeting, we began preliminary content analysis of responses to identify emerging themes for discussion in subsequent focus-group meetings. Focus groups were conducted until no new themes emerged after the third focus-group meeting.

Both of us independently analysed the responses to arrive at a list of themes and subthemes. The list was refined, through an iterative process, until consensus was reached. Responses were then allocated to each of these themes or subthemes.

RESULTS

Some characteristics of participating GPs are summarised in the Box. The greater number of GPs using Medical Director software in our focus groups reflects the dominance of this product in the marketplace. (As group participants were using a variety of software products incorporating different decision-support features, some responses are not relevant to every product in the marketplace.)

The main themes identified, and a selection of GPs' comments, are set out below.

Theme 1: Reaction to prompts

GPs found some of the prompts (particularly drug-interaction alerts) annoying or unhelpful, and often ignored or skipped over them. However, it was acknowledged that in some circumstances the prompts were helpful or essential in managing a patient (eg, when known allergies meant certain drugs were contraindicated).

Theme 2: Concerns and potential problems

Concerns over the comprehensiveness, accuracy and evidence base of the information in alerts predominated. The deficiencies of existing systems were raised: for example, some GPs were aware of important interactions that

Characteristics of study participants and the prescribing software used

Division of General Practice	Number (sex) of participants	Software program (number of users)
Western Sydney (NSW)	4(M), 4(F)	Medical Director* (8)
Hunter Rural (NSW)	4(M), 1(F)	Medical Director (3), Medical Spectrum† (2)
Melbourne (VIC)	7(M), 2(F)	Medtech32‡ (3), Genie§ (3), Medical Spectrum (2), Locum¶ (1)

*Health Communication Network, Sydney. †Medical Spectrum, Brisbane. ‡Medtech Australia, Melbourne. §Genie Solutions Pty Ltd, Indooroopilly. ¶Global Health Ltd, Melbourne.

were mentioned in printed textbooks but were not picked up by the interaction checking facility of their prescribing software. Another concern was the lack of alerts (in all but one software package) relating to drug contraindications for patients with certain diseases.

Theme 3: Effects on prescribing behaviour

GPs perceived that prompts had positive effects on their prescribing behaviour, such as increasing their awareness of patient allergies that would preclude the prescription of certain drugs. Prompts were sometimes useful to educate patients, assist with compliance or facilitate interaction with a patient.

On the other hand, GPs felt that desensitisation to alerts could increase the danger of missing an important interaction alert or other useful information.

Theme 4: Need for training

Some GPs were concerned that they did not have sufficient training to make use of all the decision-support features available in their software program, such as diabetes registers, customisable fields (ie, features that can be changed to suit the individual GP's requirements) and reporting systems. Consequently, many GPs used their prescribing software simply for prescribing.

Theme 5: Helpful features of decision-support systems

The features of decision-support systems that GPs found helpful included sensitivity settings for drug interaction alerts, having the default setting on the "cancel" button (instead of the "OK" button) for prompts about serious interactions (thereby preventing the user from easily overriding the alert, inten-

tionally or by accident), and having important warnings appear in red.

Theme 6: Suggested improvements

GPs had a number of suggestions for improving the functionality or "user-friendliness" of the software they were using, in order to streamline their work processes and improve their ability to care for patients. Some of the issues identified and sample responses are given below.

Display and access to product information

"...need more context-relevant information, which can be expanded if needed — especially information on dosage and when to take".

Inclusion or integration of guidelines or evidence-based medicine resources

"...would be useful to have drug-disease interactions".

"Travel medicine [should be] available in the software — free to use."

"... [would be useful] to be able to get a differential diagnosis by typing in all the symptoms".

Severity grading of warnings

"[There should be] severity ratings so that only severe alerts come up."

"... [would be useful to] have the warnings in a list graded by colour — most significant first — and then say yes or no next to the warning".

"Rating of alerts is good and bad — if you select only the serious ones, you might miss something nonetheless."

Programming/user-interface issues

"For serious allergy interactions, it should stop you from prescribing unless you've made a serious effort to override it."

"To be able to sort the list of drugs in current medication by diagnosis or condition would be very useful, especially with

older patients where there is a long list of drugs.”

“There should be a box where you put their creatinine clearance — then the software uses that data to decide whether this drug is safe or not.”

“[I need] a dosage calculator for paediatric drugs — mg per weight — although this would also mean that I need to keep weight up to date.”

“A simple logical step when you’re adding an allergy... would be to click a button [to] send to ADRA [Adverse Drug Reactions Advisory Committee]... [This] would increase their capture enormously. [It would be] such a useful thing for the community to see all these data coming in about things like the incidence of cough with ACE [angiotensin-converting enzyme] inhibitors.”

Theme 7: Attitudes to evidence-based guidelines

Ease of access and seamless integration of guidelines into software packages dominated the discussions on this theme:

“I would use electronic guidelines much more if they were easier to access. Changing CDs all the time takes time out of the consultation.”

“Until you marry decision-support info, guidelines, warnings, etc, to the clinical stuff, it’s useless.”

“Guidelines can change. Doctors must be allowed to make individual decisions as to whether to follow or not.”

“Guidelines must be easier to search and intuitive, so you don’t waste time navigating around.”

“Guidelines need to be external to the prescribing software.”

“... seems quicker to refer to guidelines in a book.”

“It’s got to be easier to look up than a book, otherwise you won’t use it.”

“I don’t use any separate clinical decision-support tool in the consultation because of time problems, losing eye contact with patients, etc. It needs to be very slick for it to be useful.”

DISCUSSION

The issues raised by participants in our focus groups echoed the concerns of GPs in the UK study.⁵

All software programs used by GPs in our focus groups featured warnings about drugs contraindicated for patients

with certain allergies. While GPs considered that PDS tools were an important resource, they found prompts and alerts annoying when they were very repetitious, time-consuming, or not relevant to the prescribing decision. When the prompts are of little clinical significance, or inappropriate for a particular patient, GPs may become desensitised to warnings. This is particularly a problem when alerts are presented in “modal dialog boxes”. (A modal dialog box [or window] is one that requires the user to click one of two buttons [typically “OK” and “Cancel”] in order to resume the previous task. In other words, it becomes the “active window” in the application, and no other tasks can be performed until the user intervenes to close it.) However, modal alerts were seen as necessary in cases where GPs ought to be prevented from prescribing a certain drug (eg, a drug contraindicated for patients with a particular allergy). Procedural constraints of this kind are a reliable form of error proofing⁶ and a means of reducing preventable morbidity and mortality.⁷

One reason for the number and frequency of alerts is the inclusion of many theoretical and minor drug interactions. To reduce this problem, GPs proposed that programs should incorporate a more sophisticated system of grading interaction alerts (based on their clinical significance), or the facility to customise alerts. So, for example, a clinician experienced in prescribing antidepressants could elect to suppress all but the most critical warnings with this class of drugs. On the other hand, GPs recognised that, while it might be preferable to be alerted only to important interactions, what is not important for one patient may be critically important for another.

GPs were very clear that PDS systems, to be acceptable, must improve consultation workflow and not hamper interactions with patients.⁸ They felt that many electronic resources had poor search engines, or were cumbersome and time-consuming to navigate. Moreover, the GPs did not always have confidence in the comprehensiveness of PDS alerts or the evidence base behind them. In some cases, they felt more comfortable consulting a book, especially when electronic guidelines were not integrated with the prescribing software.

A major barrier to developing more sophisticated decision-support tools is the

lack of agreed standards in areas such as drug and disease terminology. The Medicines Coding Council of Australia has been working to develop and implement unique numbering codes for all pharmaceutical products available in Australia, but agreement by all stakeholders has not been reached and a final product is likely to be many months away. Similarly, there are no agreed standards for message content and format, accuracy of information and representation of clinical knowledge, although many individuals are lobbying for some standards to be mandated in these areas.⁴

The GPs in our focus groups were predominantly computer literate and at similar stages of learning in the use of their software packages. However, they believed that many of their colleagues were not particularly computer literate and would require support and training to make full use of their prescribing software to enhance patient care. It is possible that our selection process resulted in fairly homogeneous groups that introduced a systematic bias into our results, and that some important issues may have been missed. Nevertheless, the responses of GPs in our study will provide useful input for policymakers, government, the National Prescribing Service, and developers of medical software and decision-support resources in designing systems that better meet the needs and expectations of end users. They may also stimulate discussion between the software industry and relevant stakeholders to seek consensus on priority areas for PDS systems, and on an agreed set of requirements for accreditation of software, which will ultimately benefit GPs, other health professionals and patients.

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COMPETING INTERESTS

None identified.

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time capsule

General practice in the city

The newly qualified man may be contemplating starting as a general practitioner in the City of Sydney and after thirty-two years' experience in [the city], I may be able to give some advice as to his taking such a step...

My advice to any young graduate thinking of general practice in the city is that of *Punch* to those about to take a step in another serious direction — "Don't!"

If he still persists, he must try to get some friendly society lodge work and even if successful in that he must be prepared for a long waiting period. I would say to any young medical practitioner, do your resident hospital appointments, then see something of the outside world, get into general practice in the suburbs or country...

A Maitland Gledden, Sydney, NSW

General practice in the suburbs

...A few years' practice in the country is an excellent preliminary to suburban work. The experience gained by the practitioner... stands him in good stead when he settles down in the suburbs...

In choosing a suitable locality the medical man should try to find one of the newer suburbs which is not too thickly populated, where there is plenty of spare ground and where buildings are constantly going up. In this type of suburb population will grow rapidly and the doctor's practice will grow with it. If he chooses one of the older suburbs, where nearly every foot of ground is built on and consequently where there is little room for increase of population, the growth of his practice will depend on the number of patients he can get away from his colleagues. This is often a long job and usually an unpleasant one. The question is often asked: "How long should a squatter be prepared to last?" The answer... Personally, I think if the squatter has not made good in three years, it would be advisable for him to "seek fresh fields and pastures new"...

The suburban practitioner has the great advantage over the country one of having specialists always available to come to his assistance either privately or at hospital... Even if the specialist is not able to do much in the way of a cure, the attendant's position is much strengthened by the specialist's opinion and advice... I would urge the suburban practitioner in cases when a pathological examination has to be made, to try to educate his patient to go to a private practitioner. Far too many patients are sent to the Board of Health or the public hospital. It will often surprise the practitioner to find how many of his lodge patients can afford one or two guineas for a special pathological report...

C H E Lawes, Petersham, NSW

General practice in the country

...There are two types of country practitioners, those who belong to the community and become part and parcel of it; the other especially the younger men who commence because it is cheaper and there is less opposition and they can learn their work and perhaps earn enough money to commence in a bigger centre...

The first thing we have to decide is whether we will serve God or Mammon...

If we serve God, we shall serve the community faithfully. Our work will go on and on improving and our reputation with it.

If we serve Mammon, life will be more or less easy. We may make money and become the popular doctor... We shall become past masters in the art of saying and doing the right thing. We shall know exactly what the patients themselves want to do and shall advise them to do it...

The universal use of cars, good roads and the telephone have quite altered the country doctor's life. Trips which took you all day, you do now in a few hours. Patients come in much more often to see you, so that travelling is much less... Life is much easier, yet it has lost much of its charm. One misses a good pair of horses or a hack for which you have more than a kindly feeling, especially on moonlight nights, in big timber and places where the fairies dwell...

...You have to be doctor, nurse and everything that entails. The great difficulty is to teach people that orders are orders. Orders should be given in plain words and they should be quite simple ones and if the case is urgent, they should always be written down...

The question of fees is a difficult one. The main duty of us country practitioners is to serve the community. In most country districts our patients are chiefly strugglers or fighting an uphill game... It is just that we receive reward for our labour, yet it is impossible to charge for labour done. You alter a patient's whole outlook, alter the whole course of his life and perhaps charge half a guinea, you operate and save him from certain death and only charge a small fee, which is all out of proportion...

...We receive little honour as men call honour; we can earn an income, we can never get riches; we can understand and live to the meaning of Kipling's lines:

*Not as a ladder from earth to heaven,
Not as a witness to any creed,
But simple service simply given to his own kind
In their common need.*

Horace Pern, Leongatha, VIC

Med J Aust 1929; 2: 276-282