Extent and utilisation of computerisation in Australian general practice

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ABSTRACT

Objective: To assess the availability of computers to general practitioners and individual GPs' use of computers for clinical functions.

Design, setting and participants: A secondary analysis of data from a random sample of 1319 Australian GPs who participated in the Bettering the Evaluation and Care of Health (BEACH) survey, a continuous cross-sectional survey of general practice activity, between November 2003 and March 2005. Participants reported the availability of computers at their major practice address and the clinical functions for which they used the computers.

Main outcome measures: Proportion of practices with computers available; proportion of individual GPs who used computers for clinical purposes.

Results: The proportion of GPs not using a computer was 11.2% (6% did not have a computer at their major practice address and a further 5.2% chose not to use an available computer). The majority of GPs using a computer at work used it for electronic prescribing (94.7%), ordering tests (82.2%) and keeping some patient data in an electronic medical record (79.5%). Of those with clinical software available ($n = 1114$), 6.6% chose not to use it. A third of GPs (32.8%) kept all patient information in an electronic format. The proportion of GPs keeping all data electronically and using all clinical functions available in their computer was 21.7%.

Conclusion: While the physical presence of computers has increased significantly over the past decade, GPs are still reluctant to fully embrace the technology.

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Computers were initially used in general practice only for administrative purposes, but over the past decade general practitioners have increasingly been using them for other tasks, such as prescribing, referring, ordering investigations, receiving test results and seeking assistance with clinical decision making.

More recently, government incentives for Australian general practices to computerise have increased the uptake of computer technology. Since 1998, computerisation has been included as a component of the Practice Incentives Program (PIP),[1] whereby practices attract a payment from the federal government if they prescribe electronically, have the capacity to transfer clinical information electronically, and use bona fide electronic prescribing software that includes a patient medical record.[2]

The National e-Health Transition Authority (NeHTA) was established in July 2005 by the Australian, state and territory governments to accelerate the adoption of an electronic health information system across Australia. NeHTA aims to develop specifications, standards and infrastructure necessary for an interconnected health sector.[3] The Council of Australian Governments recently approved $130 million to deliver a unique health care identification number for all individuals, a unique identification number for every health care professional, and a common language for health communications.[4] The computerisation of general practice is a prerequisite for the success of a communication network across the health care system.

The decision of the Australian Department of Health and Ageing to cease funding support for the General Practice Computing Group in August 2005 suggests an assumption that general practice has achieved a "satisfactory" level of computerisation. The number of practices reporting computer availability at accreditation or claiming PIP payments may have influenced this assumption. In July 2003, 87% of the estimated 6000 general practices in Australia had undertaken accreditation against the standards of the Royal Australian College of General Practitioners (RACGP).[5] In the 2003–04 year of the national Bettering the Evaluation and Care of Health (BEACH) survey, 98% of participants in accredited practices reported having a computer available (unpublished data). The Productivity Commission recently reported that practices taking part in the PIP in 2004 covered around 80% of Australian general practice patients and that 93.2% of these practices were prescribing electronically and 92.0% were using computers to send and/or receive data.[6]

The extent to which individual GPs use computers for clinical purposes is unknown. Our study investigates GPs' access to computers at their major practice address and the extent to which individual GPs report using a computer for a range of clinical purposes.

METHODS

Our study is a secondary analysis of data from the BEACH program, whose methods have been published in detail elsewhere.[7] BEACH is a paper-based, continuous cross-sectional survey of general practice activity. Each year, about 1000 GPs from a national rolling random sample (drawn by the Australian Department of Health and Ageing) participate in the BEACH program. GPs provide patient demographics and encounter information for 100 consecutive, consenting, unidentified patients. They also provide demographic information about themselves and their practices on a GP profile questionnaire.

The sample used in our analysis was shown to be representative of the GP population in Australia.[7] Our study focused on the GP profile questions related to computer use. From November 2003 to March 2005, GPs were asked about computer availability at their major practice address and about individual computer use for clinical purposes. Each GP was asked to what extent computers were used:

- at the GP's major practice address (possible responses: not at all, for billing, for prescribing, for medical records, for other administrative tasks, for Internet/email); and
- by the GP at work (possible responses: not at all, for test ordering, for prescribing, for medical records, for Internet, for email).

GPs were also asked what prescribing and/or medical record software was used at their practice.

On planning analyses it became apparent that the information about computerised

1 Computer availability at major practice address

	Number of GPs reporting computer availability for specific functions	Proportion (of GPs in all practices [*n* = 1319])*	Proportion (of GPs in practices with computers [*n* = 1240])
No computer	79	6.0%	—
Computer available for:			
Billing	1050	79.6%	84.7%
Prescribing	1101	83.5%	88.8%
Medical records	934	70.8%	75.3%
Other administrative tasks	974	73.8%	78.5%
Internet/email	888	67.3%	71.6%

GP = general practitioner. * 1319 GPs from 1190 individual practices. Some practices had more than one GP participate during the study period. ◆

medical record use lacked the specificity to determine the amount or type of patient information being stored in the computer. A follow-up questionnaire was sent to all GPs who had reported computerised medical record use. We asked, "To what extent did you use a computerised medical record for your patients at the time you participated in BEACH?". Tick-box response options were: fully computerised, including all externally generated correspondence; fully computerised, other than externally generated correspondence; partially computerised, with items specified (questionnaire available at <http://www.fmrc.org.au/publications/appendices/>). A section was also available for GPs' comments.

Definitions

- *Computer availability:* a computer is available (whether used or not) at the major practice.
- *Computer use:* computer is used by the responding GP for any function.
- *Clinical computer use:* GP uses computer for clinical function(s) (ie, prescribing, test ordering, medical records).
- *Non-clinical computer use:* GP uses computer for administrative functions, Internet and/or email only; clinical components not used.
- *Medical record use:* clinical records component of medical software is used for storage of some or all patient data.
- *Fully computerised:* medical records component of software used for all patient data including externally generated correspondence.
- *Partially computerised:* medical records component of software used to store some but not all patient information.

Statistical methods

Results are reported as proportions. Where GPs did not provide responses, they were removed from the total sample before calculations. Denominators varied depending on the component being analysed (eg, all GPs, GPs with computers, GPs with clinical software).

Ethics approval

The BEACH survey and the follow-up questionnaire were approved by the Human Research Ethics Committee of the University of Sydney and the Ethics Committee of the Australian Institute of Health and Welfare.

RESULTS

Computer availability at major practice address

Of the 1336 BEACH participants, 17 did not respond to questions on computer availability. The 1319 respondents represented 1190 individual practices (some practices had more than one GP participate during the study period). Of the 1319 respondents, 79 (6.0%) did not have a computer in their practice. Counting each practice once, the proportion of practices without a computer available was 6.3%. Where computers were available, their use for electronic prescribing and medical record keeping was high, particularly for electronic prescribing (Box 1).

Computer use and clinical software use by individual GPs

Seventy-nine GPs did not provide responses on individual computer use. Of the 1240 who did give responses, 64 (5.2%) reported not using an available computer. This figure, combined with the 6.0% of GPs having no computer at their practice, meant that 11.2% of GPs were not using a computer in their practice.

The majority of GPs used a work computer for electronic prescribing, ordering tests and keeping some or all patient data in medical records. Just over half used email and slightly more used the Internet (Box 2). Six per cent of doctors with clinical software available reported not using that software (most were Internet and/or email users).

Computer functions used by GPs at work

About a third of GPs used the computer and clinical software for all five nominated functions. A further 16.1% used the computer for test ordering, prescribing and medical records but did not use the Internet or email (Box 2).

Of the 872 GPs who were posted a follow-up questionnaire, 681 (78.1%) returned completed forms. About half (51.9%) nominated the fully computerised medical record option. This equates to a third (32.8%) of all practising GPs in this sample who were using computers at work. The proportion of GPs who used their computer for all possible clinical activities, kept all clinical patient information in computerised medical records, and used email and the Internet was 21.7% (results not tabulated).

Comments were received from 215 GPs (31.6%). GPs questioned the reliability of their computer systems (typical comments were: "duplicates are kept on paper"; "dual system — all notes kept on both computer and paper"; "we maintain hard copies of all information because of periodic crashes"). Lack of consensus in practice policy was also a concern raised ("Some of the doctors at our practice use computers, some use paper notes. I use both"; "I only keep paper records for very occasional visitors — this only applies to me, not to my partners").

DISCUSSION

Our study shows how rapidly computers have been integrated into general practice over the past decade. A 1997 ACNielsen report found that 31% of practices had computers.[8] Since then, the proportion has risen to 94%, as our results show. However, while the physical presence of computers in practices has increased significantly, there is still reluctance among GPs to fully embrace the technology for clinical processes.

The Productivity Commission report states that PIP practices in 2004 covered about 80% of Australian general practice patients.[6] The Commission reported that

2 Computer and software use by individual GPs at work*

	Number of GPs using computers and software for specific functions	Proportion (of all GPs with computers and software available [n = 1240])†	Proportion (of GPs who use computers and software [n = 1097])‡
Computer use			
Computer not used at all	64	5.2%	—
Computer used for:			
Test ordering	902	72.7%	82.2%
Prescribing	1039	83.8%	94.7%
Medical records	872	70.3%	79.5%
Internet	732	59.0%	66.7%
Email	652	52.6%	59.4%
Clinical software:			
Available and used	1040	83.9%	93.4%
Available but not used	74	6.0%	6.6%
Use of clinical functions			
Clinical functions not used at all§	143	11.5%	—
All clinical functions	460	37.1%	41.9%
Test ordering + prescribing + medical records	200	16.1%	18.2%
Test ordering + prescribing + medical records + Internet	83	6.7%	7.6%
Test ordering + prescribing	57	4.6%	5.2%
Test ordering + prescribing + Internet + email	45	3.6%	4.1%
Prescribing + medical records + Internet + email	44	3.5%	4.0%
Prescribing only	42	3.4%	3.8%
Internet + email	26	2.1%	2.4%
Prescribing + medical records	20	1.6%	1.8%

GP = general practitioner. * 1114 respondents provided data on individual computer use, clinical functions and name of software. † Excludes missing data from 79 GPs who did not provide responses on individual computer use. ‡ Excludes data from 79 GPs with no computer available and from 64 GPs who choose not to use available computers. § Computer used for accounts, administration, Internet and/or email only. ◆

93% of PIP practices were prescribing electronically — a figure similar to the proportion of GPs in our study using electronic prescribing (95%). However, while the Commission found that 92% of PIP practices "had the capacity to send and/or receive clinical information via use of computer technology",[6] only 67% of the GPs in our study were using the Internet and 59% using email — even though 81% reported having these computer services available at their major practice. Having the capacity for these services satisfies PIP requirements but does not guarantee their use by individual GPs.

The results of our study show a distrust of the reliability of computer systems, evident in comments about "down times" and "crashes" and in claims by many that data stored on computer are being backed up with a paper copy. This double-handling for already time-constrained GPs highlights their lack of confidence in their computer systems. Furthermore, in some practices, patient information is being recorded on paper by some GPs and in a computer by others, for the same patients. In some practices, this occurs only at times when the system is down, but in others, the inconsistency seems to stem from a lack of agreement between practitioners. A reasonable assumption is that neither version of the patient record is complete — certainly, neither is likely to be as comprehensive as could be assumed if all patient information was kept in one format.

Only one in five GPs uses the computer to its full capacity and keeps all patient information in the one record. These GPs are the only participants in our study who would be able to provide comprehensive current data exchange with other areas of the health sector. The paper-based or hybrid nature of practice records for the remaining 80% would prohibit the extraction of all pertinent information in an event summary of the type recently mooted for the now defunct Health*Connect*.[9]

Some reasons for the lack of commitment to electronic systems were offered by the GPs in our study: prohibitive upkeep costs, lack of confidence in computer systems, privacy and security issues, disagreement among partners, patients' attitudes, lack of knowledge of the software, and the inability to type as quickly as writing. Whatever the issues, they will need to be resolved if general practice is to fully adopt e-health initiatives. Recent comments by a high-level Department of Health and Ageing bureaucrat reinforce the notion that the federal government is committed to general practice implementing electronic medical records — under the potential threat of higher indemnity premiums, restricted Medicare access and loss of practice accreditation for non-compliance.[10,11] The same bureaucrat also raised conjecture over who should bear the cost of implementing a national e-health system, noting "it's up to health professionals and the software vendors to be setting up the system".[10,12] If GPs are being coerced into adopting a system in which they have little confidence, at a cost to be borne by themselves and the software vendors, and with no funding for technical support, it is unrealistic to expect an electronic health information system linking health providers to succeed.

In assessing study limitations, we considered the possibility of recall bias in collecting details about electronic medical records by follow-up. We also considered whether GPs who participate in BEACH surveys (on paper) may be less likely to be computerised. However, our methodology has already shown the BEACH sample to be representative of practising GPs in Australia.[7]

An investigation to compare the quality or completeness of patient data stored in computerised medical records with those held on paper would be useful. As work progresses on formulating standards and a minimum dataset, we look forward to the potential health benefits of an electronically connected health system in which valid,

representative data would be accessible from the medical records of consenting patients.

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COMPETING INTERESTS

None identified.

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