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# Electronic medical records – where to from here?

Ninety percent of general practitioners use computers. Computers are being used by GPs for an increasingly broad range of functions. Effectively, Australia now has a national electronic medical record (EMR) based in general practice. The true benefits of having an EMR will only be realised when we move beyond the idea that it is simply information that was once recorded on paper. Electronic medical records allow multiple sources of information to come into play in the consultation. This article looks at the future of the EMR in general practice and how we can use it to improve patient care.

■ **Twenty-five years ago I bought a medical practice. At the time, patient records were on 8 x 5 inch cards, receipts were done using the Kalamazoo system, suture material was okay to reuse if soaked in antiseptic solution, and the only transfer of information was by telephone or mail. How times have changed! Like me, 90% of general practitioners now have a computer on their desk;<sup>1</sup> 65% of us use our computers to the level of progress notes/clinical records.<sup>2</sup> The only time I really need paper now is to generate information such as referrals and investigation requests for use outside the practice.**

The information on GPs' computers Australia wide effectively forms a national electronic medical record (EMR) based in general practice. An EMR is an electronic representation of the medical information of an individual, and is distinct from an electronic health record (EHR). The terminology around EMRs and EHRs can be quite confusing. In this article, EMR is used in a specific way in order to differentiate it from EHR. The EMR consists of the electronic information about a patient recorded in an individual clinic, and performs a similar function to that previously performed by the paper record. The EHR, on the other hand, is a summary of health events (usually drawn from several EMRs) and may consist of the elements that are eventually shared in a national EHR. Importantly, not everything put in your EMR should, or will be, available to a shared EHR.

Table 1. Sources of information in the consultation

Information type	Source
Demographic details	Patient
Visit details: progress notes, examination findings, diagnoses	Patient and doctor
Drug information	Companies, government
Checklists	Profession
Patient information material	Profession, companies, government
Decision support	Profession
Test results	Companies
Disease information	Profession, companies, government

## The impact of the electronic medical record

The EMR is able to manipulate the consultation in ways we are yet to appreciate. New technology is often first referenced back to a familiar technology: the car was first described as a 'horseless carriage'; the mobile telephone is no longer simply a 'phone'. My computer was once really just an electronic prescription pad, which offered some help navigating the labyrinthine Pharmaceutical Benefits Scheme regulations. Gradually I used more and more functions that mimicked, and then extended, the paper record.

The computer is changing the ways we consult. In a 14 minute consultation, at least 2 minutes will be spent interacting solely

with the computer.<sup>3</sup> We know that in psychological consultations doctors move their focus from computers to the patient,<sup>4</sup> and that the computer can exert significant influence on shaping the beginning of the consultation.<sup>5</sup> The computer has been posited to be a third player in the consultation.<sup>6</sup>

I used to rely on the patient, colleagues, my memory and a few textbooks for any information I needed. Now, in addition, multiple sources of information are inserted into the consultation via the computer (*Table 1*). This means I have easy access to up-to-date clinical information at the point of care. It also means that third parties (including government, colleges and drug companies) can influence the outcome in ways not possible before.<sup>7-9</sup>

### More than just pieces of information

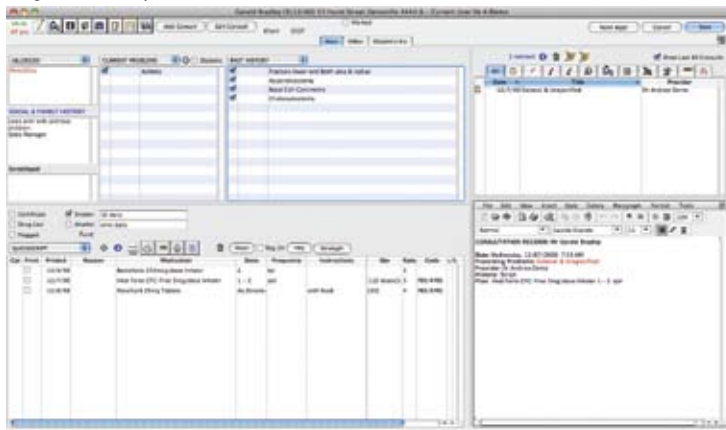
As I worked with computers more, I tried to replicate the familiar, putting data into spots that recreated the paper record I once used. The example in *Figure 1* is provided by the program Genie,<sup>10</sup> but all are similar. It shows a screen that mimics The Royal Australian College of General Practitioners health summary sheet. Yet the data in the electronic version is comprehensive (with precise details such as drug doses clearly displayed) and easy to modify. To get to this screen you may well have passed several screens that remind you about immunisations, recalls, or even birthdays!

It is the computer's ability to manipulate data that sets it above the paper record. However, for the EMR to be of the greatest benefit, the data entered must be accurate. Demographic details are the crucial link, for they not only identify the patient to the practice, but they also form the basis from which the patient's identity is validated for transfer of information, and provide criteria for population based activities (Pneumovax for those over 65 years of age, for instance). Eventually, when the National E-Health Transition Authority (NEHTA) and Medicare finish their work, each Australian will have an individual health care identifier (IHI) available to them. Still, when we have an IHI, continued checking of the accuracy of information will remain vital.

In the example in *Figure 1*, we can see multiple pieces of information including current medications, allergies, family history and past history. These are a reflection of the continuing relationship that GPs have with their patients and form the background to any new information that enters the consultation. There is a tendency to consider the information in the computer as constituent data elements or raw chunks of information.<sup>11</sup> I have argued elsewhere<sup>12</sup> that compartmentalising the information into discrete categories puts us in danger of losing the overall picture; we will lose the forest in the trees, and the patient in the bits of information. In my own practice I have tried to reconcile this dilemma by rethinking how I conceptualise information.

Mishler<sup>13</sup> describes the different voices the doctor and patient bring to a consultation as 'the voice of medicine' and 'the voice of the lifeworld'. Mishler believed that the communication in consultations is distorted by the conflict between the structured voice of medicine

Figure 1. Example of an electronic medical record



and the unstructured life of patients.<sup>13</sup> These categories are not pure; in practice, the different voices blur in consultations and the result, as GPs well know, can be quite chaotic.<sup>14</sup>

Information in the EMR can be characterised similarly. Some of the information is easily coded in a structured way (eg. drugs), while some is not so easily coded. One example is allergy. An allergy recorded in the EMR can be a true allergy (immune modulated reaction), such as to penicillin, or a side effect, such as vomiting with morphine. And what about a patient who is allergic to a long list of drugs, plastics, dust mites, mould, wheat, dairy and yeast? All of a sudden the description has greater richness than just a technical recording of information. But with richness comes greater difficulty in coding in a way suitable for sharing.

The situation becomes even more complex when considering social, occupational and family history. Here we are truly moving beyond data elements to information that becomes part of the patient's narrative. Information about sexuality, relationships and family structure all combine to give the reader a feel for the patient's 'lifeworld'. When information is entered into the computer, an electronic reflection of that person – the patient 'inscribed' rather than the patient 'embodied'<sup>15</sup> – is created. General practitioners need to also consider the uses to which the EMR will be put. Most of these are familiar: the aide memoire, the ability for another doctor in the practice to continue care in the GP's absence. However, in the future, information appropriately recorded in the EMR could be put to secondary use, including in an individual electronic health record (IEHR).

### Individual electronic health records

Without doubt, Australia will have an IEHR of some description in the next few years. At present, the most comprehensive data set in this country sits on GPs' servers in a disconnected fashion. Therefore, a large proportion of the information for IEHRs will come from the general practice EMR.

The IEHR will include shared data about health events, hospital admissions, significant diagnoses and drugs. It will go to a repository to be accessed when needed by other providers. The repository may be a large central one, or it may be a series of local repositories. No

longer will GPs struggle with what happened, what was prescribed, and what tests were done at 'St Elsewheres'. No more struggling with patient's vague descriptions of uncertain allergies or 'the little white tablets' for a medication list.

Shared information will be placed in the EMR in an area where it can be coded and standardised so that it can then be understood by others in an electronic environment. This means it must be coded using a scheme called 'SNOMED-CT' (Systematized Nomenclature of Medicine – Clinical Terms), the Australian adopted standard. This coding is why blood pressure entered as free text is not as valuable as BP entered in the structured area of the program. That is also why many programs ask GPs to clarify if a diagnosis of 'skin lesion' is actually 'lesion, skin, localised'. General practitioners may not see the direct benefit of making sure data is coded correctly; however they will see the benefits when accessing information from other providers. It is beyond the scope of this article to discuss the privacy and consent issues that this new environment raises.

### Other secondary uses of data in the EMR

Data from the EMR could be used in many domains, including public health surveillance and clinical research. Of particular relevance to general practice are programs such as the Australian Primary Care Collaboratives Program and the Practice Health Atlas. These programs use the data in an individual practice to give feedback information to improve practice. Using the 'plan, do, study, act' cycle, they interrogate practice data and present it in summary form, allowing practice teams to implement changes to improve quality. Unlike the IEHR, where the benefit is indirect, the value of correctly coded data here is of direct benefit to the GP. However, as with IEHR requirements, this process can only occur if the data is structured in such a way as to be accessible to the extraction and manipulation programs. A patient who takes glipizide, for example, must also have a recorded diagnosis of noninsulin dependent diabetes.

### Conclusion

The EMR has changed – and will continue to change – the way we work in general practice. It acts as a focus and a repository, an interpreter and a facilitator, for information about patients. Data entered in the EMR must be accurate and coded correctly for it to be useful. I have described two immediate uses for the EMR, but there will be more and different demands made of health data in the future. Good data brings endless possibilities. However, it is important to remember that patients tell us stories – and we must not lose the narrative.

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