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eHealth technologies in primary health care: current strengths and limitations

eHealth aims to improve the quality and safety of Australia's health system by introducing a more efficient way to collect and share information such as prescriptions and test results.[1] The primary health care sector could benefit substantially from the widespread use of eHealth technologies.[2] The National E-Health Transition Authority is currently working with numerous stakeholders, including GPs and allied health professionals to develop an eHealth uptake plan.[2] This *RESEARCH ROUNDup* focuses on the use of eHealth technologies in primary health care, by exploring the benefits and current limitations of a number of eHealth tools.

What are eHealth technologies?

eHealth involves the use of information and communication technology in the field of health care, with the aim to streamline communication between providers by enabling records, referrals, and clinical information to be stored and communicated electronically in a secure manner.[3,4,5] Examples of eHealth tools include electronic health records, health information websites, decision support programs and electronic prescribing software.[3,6,7]

Electronic health records

The central aim of electronic health records is to make health information available to all providers involved in the care of a patient, at any time and in any health care setting.[8] Electronic records have the capacity not only to contain medical histories and treatment notes, but also to include digital images and scanned documents,[8] enabling the creation of a complete medical history. Personally controlled electronic health records (PCEHR) are controlled by individual patients, who make decisions about what information is made available to which providers.[3,8,9,10]

Electronic records are easier to access, modify, store and share compared to their paper-based counterparts.[8] For primary health care providers, the main advantage of using electronic health records is improved access to health information,[9] which may result in better care and reduce duplication of services.[8,11,12,13] These benefits are particularly important for current health challenges such as chronic disease management. Access to shared clinical information by a multidisciplinary team of providers is likely to support team-based care across geographical boundaries; and lead to improved continuity of care.[13] Furthermore, electronic records increase the capacity to use clinical data, either within practices or benchmarked against similar practices, for the purposes of quality improvement.

Electronic clinical decision support systems

Electronic clinical decision support systems typically involve the storage and use of electronic patient and prescription data in order to:

⇒ generate patient-specific advice

⇒ issue warnings about potential drug interaction effects

⇒ prompt reminders regarding screening and lifestyle modification.[7,14]

Demographic and clinical patient data are used in conjunction with guidelines to generate appropriate recommendations.[8,15] The alerts, prompts and reminders are issued to providers during a standard patient consultation and can be active, in that they require a response, or passive, where no action from the provider is required.[8]

The main benefit for primary health care providers is instant and automated decision support.[11,16] These systems have the potential to enhance practitioner performance, by improving decision making in areas that are frequently overlooked, such as diet and exercise advice.[8]

Computerised provider order entry and electronic prescribing

Computerised provider order entry systems are designed to simplify the process of entering and reviewing orders and results for laboratory tests, radiological images and referrals.[8,14] Electronic prescribing, which is an extension of these systems, is frequently integrated into the software packages. Electronic prescribing enables direct communication between health care providers and pharmacists and is used to input, modify and fill medication prescriptions.[8] The systems can perform automatic dosing adjustment calculations based on stored patient information.[14,15]

The benefits of using these systems include:

⇒ greater efficiency, as orders and test results are no longer required to be physically transported between providers, reducing turnaround time[8]

⇒ direct and efficient communication between providers and pharmacies, rather than relying on patients or courier services, which may result in delays or loss of information[8]

⇒ improvements in legibility, which are likely to result in fewer errors and associated delays[8]

⇒ improved patient safety through the use of automatic dosage adjustments, which would reduce the likelihood

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of dangerous or ineffective medication doses being prescribed.[14,15]

Current limitations and challenges

While many primary health care professionals understand the benefits of using eHealth technologies, uptake of clinical decision support systems and other tools is generally low, with availability not guaranteeing uptake.[7,15,17,18] Common barriers identified by primary health care professionals include lack of training, cost and concerns about privacy, security and a potential increase in workload.[14,15,17,18,19,20] Some providers feel that over-reliance on computers in the practice room may have a negative impact on the doctor-patient relationship if patients perceive the computer as an intrusion.[8,14]

The main barriers to the adoption of the PCEHR include concerns about privacy, unintentional leakage of information and potential withholding of information by consumers.[9,11] While consumer control is a key feature of the PCEHR, it may compromise care if consumers are too focused on protecting their privacy and fail to share important clinical information.

Alert fatigue is the major limitation of clinical decision support tools. If these systems provide too many general warnings and recommendations, some health professionals may disable the alerts or become desensitised to them.[7,8,21,22] On the other hand, over-reliance on decision-support systems and over-estimation of their effectiveness and accuracy could lead to a deterioration of health care providers' skills, and ultimately contribute to poorer performance.[8]

Future directions

While many of the identified barriers have been the focus of programs and projects undertaken by Divisions of General Practice across Australia, ongoing coordinated support and planning are required to achieve successful implementation of eHealth technologies.

⇒ Financial incentives are likely to encourage adoption of new technologies,[11,12,18,19,20] and minimise the relatively higher costs faced by smaller practices and practitioners located in rural and remote areas.[23,24]

⇒ The poorer infrastructure in rural and remote areas would also need to be addressed.[18,23]

⇒ Systems need to be in place to provide ongoing and comprehensive training and technical support.[18,23]

⇒ It is important that the systems are easy to use and incorporate all of the necessary tools in one place, which would ensure that providers are able to use these tools to enhance their interaction with patients, rather than detract from it.[7,15,16,18,25,26]

⇒ Providers using different computer systems or software programs need to be able to effectively transmit information between systems.[27]

⇒ In order to address alert fatigue, alerts can be graded by severity, making it difficult to ignore or override alerts of high clinical importance.[15]

Finally, it is important to put in place a system of accreditation and minimum standards for eHealth software.[21,22,28] This would ensure that the programs are suitable for use in the Australian context and are up to date with the latest clinical guidelines.

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