MEDINFO 2007
HISA Ltd Australia
© 2007 The authors. All rights reserved.

Application of Wireless and Mobile Computing Technologies to Improve the Efficiency of Patient Care and Education: The Role of Medical Engineering and Information Technology

Lin Guo[a]

Centre for Adult and Paediatric Gastroenterology, Institute of Cell and Molecular Science, Queen Mary's School of Medicine and Dentistry Barts and The London, , Queen Mary, University of London, UK.

Abstract

This study explored the potential of the application of wireless and mobile computing technologies to be used in improving the efficiency of patient care and education and future developments in information and communication technologies to support healthcare professionals and medical students in healthcare research, medical education and training. The design used for this study was a systematic review of published materials obtained from EMBASE and MEDLINE online databases, and the Cochrane Library database, including personal observations. Today, more than 50% of healthcare professionals and medical students are using Personal Digital Assistant with expected growth of more than 75% by year-end 2007. In addition, wireless and mobile computing technologies allows Personal Digital Assistant to connect directly to networks or the Internet. Studies relating to processes of patient care and should evaluate mobile computing technologies as a potential timesaving tool. Wireless and mobile computing technologies is only beginning to take its first step in improving patient care and education. They have shown a positive impact on patient safety, health care efficiency, and ultimately patient satisfaction.

Keywords:

wireless and mobile computing technologies, patient care and education, efficiency, personal digital assistant

Introduction

Wireless is a term used to describe telecommunications in which electromagnetic waves (rather than some form of wire) carry the signal over part or all of the communication path.[1] Mobile Computing is a generic term describing your ability to use technology 'untethered', that is not physically connected, or in remote or mobile (non static) environments.[2] The term of wireless and mobile computing technologies is evolved in modern usage such that it requires that the mobile computing activity be connected wirelessly to/through the application of internet or to/through a private network. This connection ties the mobile device to centrally located information and/or application software through the use of battery powered, portable, and wireless computing and communication devices.[1, 2] This includes devices like laptops with wireless LAN or wireless WAN technology, smart mobile phones, wearable computers and Personal Digital Assistants (PDAs) with Bluetooth or IRDA interfaces.

This study explored the potential of the application of wireless and mobile computing technologies to be used in improving the efficiency of patient care and education and future developments in information and communication technologies to support healthcare professionals and medical students in healthcare research, medical education and training.

Design and methods

The design used for this study was a systematic review of published materials obtained from EMBASE and MEDLINE online databases, and the *Cochrane Library* database, including personal observations. Materials that match the set criteria on the application of wireless and mobile computing technologies in medical engineering and information technology research for healthcare professionals and medical students to improve the efficiency of patient care and education were selected and analysed following the United Kingdom National Health Service Centre for Reviews and Dissemination Guidelines. A variety of data collection approaches were developed to ensure data were collected on the various aspects.

Results

Wireless and mobile computing technologies is seen to be convenient to get in touch, compact, fast and portable, but problems are attached to the levels of security, confidentiality and scalability of the hardware. It is also apparent that most commonly used wireless and mobile computing technologies within the health contexts is the Personal Digital Assistant. Today, more than 50% of healthcare professionals and medical students are using Personal Digital Assistant with expected growth of more than 75% by year-end 2007.[3] Not only can the healthcare professionals and medical students use the tool on the Personal Digital Assistant as a quick look-up resource at the bedside, but

can also flag a topic for further research when back in the office. Changes in treatment guidelines, concerns about patient safety, efforts to contain costs, time limitations, and better informed patients make it critical to have clinical reference information at the point of patient care and education.[4] In addition, wireless and mobile computing technologies allows Personal Digital Assistant to connect directly to networks or the Internet.

Discussion

According to the results of this systematic review of this study, wireless and mobile computing technologies has become a valuable resource for both healthcare professionals and medical students over the past decade. This has enabled new perspectives to be developed on the interface between hardware, software and education and training processes for those involved in delivering healthcare research. Studies relating to processes of patient care and should evaluate wireless and mobile computing technologies as a potential timesaving tool, as they can be synchronised with hospital information systems to facilitate retrieval of patient information. The findings also indicate that the healthcare professionals and medical students would benefit from some technologies that they can easily use to search for such sources as database, E-journals and the Internet. At a theoretical level, wireless and mobile computing technologies such as Personal Digital Assistant is ideal for meeting these needs. Further study on processes of patient care and education should also explore wireless and mobile computing technologies as vehicles for disseminating evidence-based guideline recommendations.

Conclusion

Wireless and mobile computing technologies is only beginning to take its first step in improving patient care and education. They have shown a positive impact on patient safety, health care efficiency, and ultimately patient satisfaction. The integration of the Internet and wireless and mobile solutions will transform the use of information and communication technologies in patient care and education and take it in the role of medical engineering and information technology. The potential of wireless and mobile computing technologies is vast and its principles, application and practices are seen as a choice for healthcare professionals and medical students to be in the right place at the right time. In the future we will see more valuable resources in improving patient care and by developing wireless and mobile computing technologies.

References

[1] https://SearchMobileComputing.com, accessed on 4th November 2006

[2] http://en.wikipedia.org/wiki/Mobile_computing, accessed on 5th November 2006

[3] Osonnaya C and Osonnaya K. Information management in healthcare: analysis of trends and issues. International Journal of Medicine 2004; 1: 5-8

[4] Guo L and Osonnaya C. Improving the efficiency of patient care and education: the role of medical engineering and technology in gastroenterology. International Journal of Medicine 2006; 3: 149-151. (In press)

Address for correspondence

Mr Lin Guo
Centre for Adult and Paediatric Gastroenterology
Institute of Cell and Molecular Science
Queen Mary's School of Medicine and Dentistry
Barts and The London
Queen Mary, Uiversity of London
Whitechapel, London
E1 2AL
UK
E-mail: in.guo@qmil.ac.uk or guolinlondon@yahoo.co.uk