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Karolyn Annette Spinks
University of Wollongong

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The Impact of the Introduction of a Pilot Electronic Health Record System on General Practitioners' Work Practices in the Illawarra

Includes an Observation Study

A thesis submitted in fulfillment for the award of Masters
of Information and Communication Technology (Research)

Karolyn Annette Spinks

RN, Assoc Dip Comp Apl, B Comm BSA

School of Information Technology and Computer Science
University of Wollongong

2006

Certification

I, Karolyn Annette Spinks declare that this thesis, submitted in fulfillment of the requirements for the award of Master of Information and Communication Technology, in the school of Information Technology and Computer Science, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualification in any other university or academic institution.

Karolyn Spinks

24 April 2006

As reported anonymously in the London *Times*:
“After René Laënnec invented the stethoscope in 1816... That the [stethoscope] will ever come into general use notwithstanding its value is extremely doubtful, because its beneficial application requires much time and gives a good bit of trouble to the patient and to the practitioner, and because its hue and character are foreign and opposed to our habits and associations...”

Slack W. (2001). *Cybermedicine, How Computing Empowers Doctors and Patients for Better Health Care*, Jossey-Bass, A Wiley Company, San Francisco, California, p 88.

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Staff at the Illawarra Division of General Practice

I would also like to acknowledge the financial support of an Australian Postgraduate Award Industry (APAI) scholarship whilst undertaking this research.

Dedication

This thesis is dedicated to all the people that read it who may take some interesting and worthwhile information away with them in doing so.

Abstract

This thesis assessed the impact of the use of information technology (IT), specifically, electronic health records (EHRs), on general practitioners' (GPs') clinical work practices in NSW, Australia. The research framework and context was taken from EHR initiatives proposed by the Australian Commonwealth and State Governments for improving the Australian Healthcare system. A new system that provided increased access to electronic patient information was trialed in the Illawarra Region of NSW specifically utilizing a Smart ID Information System. The current research was administered under this larger project. The current research examined the Smart ID Information System (a pilot system designed to emulate EHRs) so the impact of EHRs on GPs' work practices could be considered.

GPs work practices are hindered partially because Information and Communication Technology (ICT) infrastructure is not yet available to support them in their need to easily exchange patient information. Consequently patient clinical information is sometimes unavailable because it involves a labour intensive process to obtain that information. In solving the above problems with EHRs other problems are created such as positive identification of patients and their results and records. Also, issues of the threat to patients' privacy and confidentiality are enormous. The research question is therefore: how are GPs' clinical work practices impacted by the introduction of EHRs and associated unique patient identifiers (UPIs)?

The research methodology was both a quantitative and qualitative inquiry which focused on two aspects of the Smart ID Information System project. It was broken into two parts plus supplementary results from a closely related study were used as secondary data. Firstly, a perception study investigated GPs' perceptions of current and future accessibility to patient clinical information and what their needs were, for acceptance of EHRs in general practice. This study was achieved through interviewing GPs. Secondly, an observation study investigated how the adoption of EHRs in the form of a pilot EHR system (Smart ID Information System) impacted on GP clinical work practices through observation of GP work practices. Results from secondary data were included here and discussed in the conclusion.

Results of the perception study showed GPs agreed there was a problem with the exchange of patient information and the information flow between health service providers. The GPs were generally willing to use IT (via EHRs) to improve their work efficiency. They believed EHRs could help provide a solution, which overcame the existing problem of lack of patient information. The GPs were keen to increase the amount of information exchanged. Overall the idea of the Smart ID Information System as a pilot EHR system was well received by the GPs interviewed but the GPs highlighted the pilot EHR system implemented must be simple to use. Results of the observation study showed GPs successfully used the pilot EHR system within their consulting environment. The GPs proved they could successfully access the patient's record, integrate this access procedure and subsequent discussion of the information with the patient, into the consultation whilst maintaining their autonomy for their personal routine and work practices. The GPs found the access and consent procedure facilitated via the I-keys was quick and simple to use despite slow system performance. Both consultations in which the system was used were longer. Results of follow-up interviews from secondary data indicated GPs were willing to accept the technology knowing the benefits they would gain from its use. Of the GPs interviewed one GP thought consultations were longer, a second GP thought the length of consultations stayed the same.

In conclusion the research found GPs agreed their work practices were hindered by inefficiencies due to non-availability of patient clinical information, and any system to improve this efficiency must be simple to use. EHRs (and UPIs) have minimal impact on GPs work practices and GPs studied were reasonably comfortable with the impact EHRs have on their work practices but this is only if EHRs do not significantly lengthen consultation times, such an EHR system runs efficiently, and excellent infrastructure is in place to support GPs. Results relating to consultation length with EHRs were inconclusive due to some consultations staying the same and some becoming longer. However, there is a possibility consultation length will increase with EHRs due to increased availability of patient information and dependency on prevailing technology.

The current research involved a direct GP – patient relationship. Future research of EHRs in general practice could include an extension of the current research to incorporate an indirect GP – patient relationship. This is where significant benefits lie

for GPs and patients from using EHRs. Another suggestion of future research could be the impact of EHRs and UPIs on the work practices of practice management staff, including receptionists and practice nurses working in GP's surgeries.

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List of Acronyms and Abbreviations

AHMAC	Australian Health Ministers Advisory Council
AMA	Australian Medical Association
APA	American Psychiatric Association
CPR	Computerized Patient Record
DHAC	Department of Health and Aged Care
DHHS	Department of Health and Human Services
EHR	Electronic Health Record
GP	General Practitioner
GPB	General Practice Branch (in Dept of Health and Aged Care)
GPCG	General Practice Computing Group
GPFG	General Practice Financing Group
GPPAC	General Practice Partnership Advisory Council
GPSRG	General Practice Strategy Review Group
HIC	Health Insurance Commission
HINA	Health Information Network Australia
ICT	Information and Communication Technology
IDGP	Illawarra Division of General Practice
IS	Information System
NSW MACPHI	NSW Ministerial Advisory Committee on Privacy and Health Information
NEHRT	National Electronic Health Records Taskforce
NHIMAC	National Health Information Management Advisory Council
NHS (UK)	National Health Service, UK
MRN	Medical Record Number
PAS	Patient administration system
PCP	Primary Care Partnerships
PDA	Personal Digital Assistant
PIP	Practice Incentives Program
RACGP	Royal Australian College of General Practitioners
SSL	Secure Socket Layer
WAP	Wireless Application Protocol
UOW	University of Wollongong
UPI	Unique Patient Identifier

Publications Arising From the Research

1. Spinks K., Soar J., Cooper J., (2003). "Changes in GP Workflow Associated With E-consent and Access Control to Remote Patient Clinical Information", In *Proc. Health Informatics Conference (HIC 2003)*, Sydney, Australia, Aug 10-12, 2003, Handbook of Abstracts (Eds) Coiera E., Simpson C., ISBN #:0 9751013 0 7 (Title of Abstract in Handbook: What is the impact on GP workflow processes of Patient Identifiers/UPIs in primary care?)
2. Spinks K, Cooper J, (2001) "Results of a Study of Acceptance of Unique Patient Identifiers in a General Practice Setting", In *Proc. Health Informatics Conference (HIC 2001)*, Canberra, Australia, July 29-31, 2001, Handbook of Abstracts (Eds) James P., Smith J., Smith L., ISBN 0 9585370 8 9 (Title of Abstract in Handbook: GP attitudes to and acceptance of a Smart IS using distributed patient information folders and UPIs)
3. Spinks K., Fulcher J., Dalley A., (2001) "Survey of GP Attitudes to smartcards", In *Proc. 10th Health Informatics Association NSW Conf.*, Hunter Valley, NSW, Australia, 17-18 February.