centre for health informatics

annual report 04

THE UNIVERSITY OF
NEW SOUTH WALES

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what we do

Building a sustainable health system for the 21st Century will require the reinvention of much of the present day system, and require the intelligent use of information and communication technologies to deliver high quality, safe, efficient and affordable health care. This is the domain of health informatics.

The Centre for Health Informatics seeks to be a driver of fundamental and applied research that firstly maps the complex organisational systems that sustain today's health system, and then designs scientifically rigorous and system wide interventions that will be the platforms upon which our future health system is based.

CHI partners with major health service providers, ensuring new systems are developed collaboratively. CHI, where appropriate, commercialises technologies and processes to develop the national e-Health industry, and protect its IP to facilitate the exploitation of Australian inventions in the international marketplace.

CHI makes contributions to:

SCIENCE:

Break-through discoveries in information, communication, cognitive and organisational science needed to support health service innovation at a system level.

POLICY:

Providing expert input and leadership into government, shaping policy priorities and goals.

INNOVATION:

Invention of novel technologies and methods that can transfer into industry and health services.

EDUCATION:

Training future researchers through postgraduate research degrees, and educating clinicians, technologists and policy makers in health informatics through postgraduate coursework programs.

contents

chairman's report

Australia is about to embark upon the single largest information technology investment in its history. Over the next twenty years, the health system will make unparalleled investments in new technologies to build a single national health information system. Both State and Federal governments are now sharply focused on harnessing ICT to improve health care efficiency, effectiveness and safety. Internationally, the UK's NHS has already committed £6 billion to build its national information infrastructure, the largest IT project in British History. Canada's Health Infoway has committed C$1.1 billion to the development of electronic health information systems. In April 2004, the US President signed an Executive Order initiating "The Decade of Health Information Technology" and the development of a national patient record infrastructure. In Australia, $60 million was allocated in the 2004 Federal budget to progress trials of HealthConnect, the beginning of our own national health information system. In December 2004, our National Health Information Strategy was launched, bringing together for the first time the IT plans of all State and Federal jurisdictions and over $1.2 billion will be expended on health IT by the States and Federal government over the next five years.

The Centre for Health Informatics (CHI) has a pivotal role to play in the development of the national health IT strategy, and in guiding its implementation. Founded in 2000, CHI has grown to become the largest and most respected academic informatics research group in Australia. We are very pleased to see the continued emergence of sister organisations, both at other universities, and in organisations like the CSIRO, and their presence strengthens the national portfolio. Indeed, Australia still remains significantly under-capacity in health informatics by comparison with other nations like the US, UK and many European nations, and there is a pressing need for the research community to grow substantially beyond its current small base.

Over 2004, CHI has continued to mature as an organisation and our research output has grown, most of it achieving visibility internationally. As a consequence CHI is now widely recognised internationally for the quality and significance of its research, and is on track to become one of the pre-eminent international health informatics research institutes.

Professor Richard Henry
Chair, Management Committee
Acting Dean, Faculty of Medicine

director's report

Research at the Centre for Health Informatics is sharply focused on improving our understanding of health systems and health care organisations. We are committed to conducting both fundamental research where clear gaps in knowledge are evident, but also to work as closely as possible with clinicians, industry and government organisations, so that we continue to focus on national priorities.

While the evidence grows for the effectiveness of Information and Communication Technologies (ICT) in many health service settings, there are still considerable risks to the widespread adoption of ICT. There remain too many large-scale failures, and clinicians are still too often disappointed by the systems provided for them. Many factors contribute to the poor uptake or failure of IT in health. We lack clear measures to benchmark the impact of IT, especially at the organisational level, making it hard to know why projects succeed or fail. We know remarkably little about the complex nature of clinical work and decision-making. Information models that work well in industries like aviation have not migrated readily into health. Health, with its many professional subgroups and complex work processes has fewer formal control mechanisms than other industries. Variability in resource availability and the expression of disease between individuals also hinders the mass automation of health processes.

Consequently, the poor uptake of IT in health care is in part due to a failure to design flexible information systems that support complex health care decisions, and a lack of evaluation models to benchmark the impact of these systems. Health informatics research has focussed sharply on these issues recently, identifying how people and organisational factors strongly influence IT system use. The socio-technical nature of health information systems is slowly being revealed as a major determinant of success. As a result, the traditional 'technology push' that characterises much IT investment in health is being replaced by the recognition that information systems encompass people and their interactions, and not just the technology.

Academic organisations like CHI have a special role to play in supporting the national agenda. Industry typically welcomes technical innovation, but lacks the ability to engage in long-term R&D. Governments for their part are not well placed to keep in-house experts in complex multi-disciplinary fields like health informatics. As a result, CHI's remit is therefore to conduct longer-term projects, often of a fundamental nature, which cannot be supported by the short

funding cycles of industry or government. We constantly envision new futures in response to the health system's needs, and explore new, sometimes radical solutions to meet them. CHI is thus something of a 'hot house' for ideas. We also have a clear role in guiding and supporting government, industry and health services in shaping policy and plans in the near term. CHI is a unique and multi-disciplinary organisation, and the expertise of its staff puts it in a very strong position to provide advice and guidance on many complex ICT and informatics issues. Locally, we have continued to work closely with government, and have research projects in partnership with both the NSW Department of Health and the Federal Department of Health and Ageing. We are also building links to new organisations like the NSW Cancer Institute, which has a strong interest in improving health service delivery.

CHI underwent some organisational changes over 2004, in keeping with its continued growth. Our sister organisation, the Biomedical Systems Laboratory, lead by Professor Branko Celler, has continued to develop rapidly and this year became a stand alone organisation, focusing specifically on the development of home telecare systems and biomedical devices. Professor Celler was a co-founder of CHI, and until now has been its Co-Director. His passion, commitment and energy in developing the Centre is much appreciated. Space became a pressing challenge for us with the continued growth in staff levels, and with the strong support of Professor Bruce Dowton, Dean of the Faculty of Medicine, the Centre has found a new home at the University's historic Cliffbrook Campus at Coogee. Professor Dowton has been a strong champion for the Centre and has been instrumental in supporting it since foundation. I personally would like to thank Bruce for his unwavering loyalty and support, and wish him the very best of futures as he now leaves the role of Dean.

We are thankful that our work has been so well received by its funders, and the broader clinical community, and over 2005 will continue to develop our research program, to ensure it remains at the cutting edge of clinical informatics.

Professor Enrico Coiera
Director

highlights and achievements of 2004

- The excellence of our researchers was reflected in the award of two Fellowships, starting in 2004. Johanna Westbrook was awarded a prestigious NHMRC Population Health Career Development Award, and Vitali Sintchenko was awarded a Fellowship in Decision Support by the National Institute of Clinical Studies.
- A strong performance in national competitive grants schemes saw three new projects commence in 2004, two from the NHMRC and one Discovery grant from the ARC, collectively worth $636,000.
- Our staff presented 17 conference papers, including two full papers and a poster at Medinfo in San Francisco, our field's most important international event. Our research generated 31 papers in the international scientific literature. One issue of the Journal of the American Medical Informatics Association (JAMIA), the peak journal in our field, carried three separate original papers with authors from CHI.
- We developed the first national guidelines for the evaluation of decision support technologies, under contract from the Federal Department of Health and Ageing, and launched the accompanying web site at the National Health Summit in December 2004.
- Commercialisation of our QuickClinical intelligent web search technologies, in partnership with Unisearch Pty Ltd, saw us build partnerships with content providers, and earn much needed funds by provision of software and consultancy services through the year. Unisearch progressed our patent applications for QuickClinical through to the national phase, after succeeding with our international patent application.
- In partnership with the Wentworth Area Health Service, we were funded by the NSW Department of Health to be the independent evaluators of the Virtual Critical Care link (ViCCU) between Nepean and Blue Mountains hospitals.
- We provided consultancy to the National Institute of Clinical Studies (NICS) to assist them in defining their strategies in electronic decision support, and to the Smart Internet CRC to assist them in aligning their research with e-Health priorities.
- Staff developed and launched three new post-graduate subjects in Health Informatics, Medical Decision Making, and Health Systems Simulation, taught via the School for Public Health and Community Medicine at UNSW.
- Our staff were invited to present invited addresses at international events including IT in Health Care: Sociotechnical Approaches in Portland Oregon, a NHS National Knowledge Service Workshop on Knowledge Support in London, and the Health-e-Nation Conference in Melbourne.
- Geoff McDonald, our Research Fellow in Systems Simulation, was elected VP of the Health Policy Special Interest Group of the System Dynamics Society (based in New York), presented two papers at the Oxford International System

Dynamics Conference and won a large consulting project to develop a Systems Simulation of the role and future value of the pharmacist in the Australian Health System.

- Steve Tipper moved from his role as business manager to part time research fellow, splitting his time between CHI and the new Centre for Health Assets Australasia, and was a named investigator on their successful $1.8 million grant from the NSW Department of Health.
- Annie Lau, one of our PhD candidates, won the School of Public Health and Community Medicine award for "Student of the Year" and another staff member Nerida Creswick was awarded an APAI scholarship and commenced her PhD studies at CHI.
- We hosted a one day think tank on the future of e-health and the Internet at the ATP research park, in partnership with the Smart Internet CRC, producing an innovative interactive video record of the day for all participants.
- CHI staff were involved in organising committees for the successful World Congress on Medical Informatics Conference in San Francisco, and were also appointed to the organising committee for the next Conference, in 2007, in Brisbane. CHI was also asked to host a satellite conference in 2007, to specifically look at socio-technical aspects of health informatics.
- And certainly not least amongst these, we successfully moved the Centre from the main UNSW campus to our new seaside home at UNSW's Cliffbrook Campus, whilst mostly keeping our good humour!

partners

CHI's research is supported by the following organisations:

> **NSW Health**

> **Australian Research Council (ARC)**

> **National Health and Medical Research Council (NHMRC)**

> **Department of Health & Ageing**

> **Smart Internet Technology CRC**

> **National Institute of Clinical Studies**

science

break-through discoveries that drive health service innovation

CHI conducts fundamental and applied research to map the complex nature of health systems and design scientifically rigorous interventions that will sustain tomorrow's health system.

CLINICAL DECISION MAKING

Good clinical decisions rely upon clinicians' abilities to access up-to-date evidence. Online information retrieval systems are designed to deliver this information, yet there is poor evidence about how these systems work in every day clinical practice and whether use improves decision-making.

In 2004, the Centre's research made a major contribution to answering these questions. This work included experimental studies and a world-first study examining 55,000 NSW clinicians' use of a web-based evidence system to support clinical decision-making. In practice, there is a strong correlation between clinicians' information searching activity and patient admissions to hospital.

Our clinical trial of the use of our own web search system, called Quick Clinical, by 227 general practitioners across Australia showed, contrary to many expectations, that doctors will use information retrieval systems during patient consultations. Over 80% of GPs believed use of the system had the potential to improve patient care and 25% of users reported direct experience of improvements in care. The results demonstrated that such systems significantly improve clinicians' performance in correctly answering questions.

A trial of PDA's in intensive care showed that decision support technologies can directly affect outcomes by significantly reducing length of stay in ICU and reducing unnecessary prescription of antibiotics.

The Centre continued to build its research reputation in the design and execution of multi-method evaluation approaches to understand the impact of clinical information systems. This work was highlighted in a presentation at the 11th World Congress on Medical Informatics in San Francisco.

ELECTRONIC-CONSENT

Who can see your health record?

While patient privacy has captured most attention in the discussion about electronic health records, the more difficult issue of patient consent has been ignored.

How do we ensure a consumer's wishes to limit who can see their confidential health records? How do we keep records safeguarded, whilst still building an electronic record that is quick and easy to use by clinicians, and financially affordable to build?

Our publication of a major white paper in the Journal of American Medical Informatics Association has provided a clear framework to understand these e-consent challenges, and has been pivotal in starting an international debate that addresses this crucial new research topic.

JAMIA, 11: 129-40, 2004

policy

expert input and leadership that shapes public policy

Through lobbying and partnering, CHI helps to shape policy that supports the take-up and the evolution of informatics technologies throughout the health system.

national guidelines for electronic decision support

Safe and sound

It takes something like 10 years for a new compound to go from laboratory to clinical trial, and many more before a drug's safety and efficacy are proven. Why isn't clinical software treated as rigorously? Commissioned by the Federal Department of Health and ageing, CHI developed the first national guidelines for the evaluation of electronic clinical decision support systems (http://www.ahic.org.au/evaluation/index.htm). These guidelines are a world first and come at a time when there is growing debate about the safety and quality of clinical software.

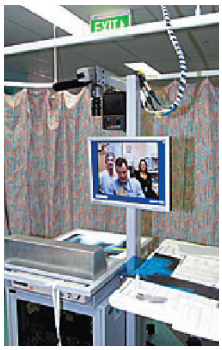
It is difficult to propose a single evaluation methodology that meets the diverse needs of both the software and clinical communities. Different user groups have different evaluation tasks and objectives. Even the choice of evaluation method is sometimes unclear, given the complexities of health services, and the limited opportunities to carry out rigorously controlled trials. These guidelines outline approaches to testing the clinical effectiveness of decision support systems, their integration into existing work practices, user acceptability and technical evaluations of the software and knowledge bases.

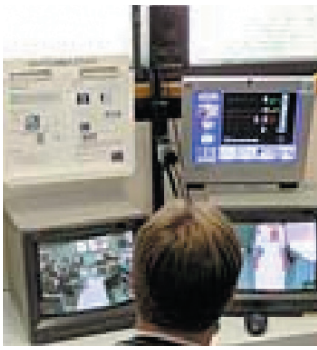
Is telemedicine cost-effective?

We have been engaged by NSW Health and the South Western Sydney Area Health Service to independently evaluate a prototype telemedical link set up by CSIRO between the Emergency Departments in Nepean Hospital, and its small satellite in the Blue Mountains, which does not employ Emergency Physicians. This two-year project will evaluate the clinical impact of this new service, and look for evidence that the changes in clinical outcome are cost effective for the State.

Strategic advice

Several of our partner organisations have commissioned CHI to assist with their long-term strategic planning over 2004. The National Institute of Clinical Studies (NICS) has asked us to assist it in developing its work-plan for electronic decision support, and the report was presented to the NICS Board where it was instrumental in setting organisational strategy in decision support. Over the year we also briefed the Smart Internet Technology CRC about opportunities for its technologies to be applied in healthcare and the British Medical Journal Knowledge group commissioned Professor Coiera to develop long-term strategy options for its electronic publishing business.





Planning the future of e-Health

There are few opportunities to carry out long term strategic thinking, given the immediate challenges facing policy development for e-Health. In conjunction with the Smart Internet CRC, CHI ran a forward looking one day workshop bringing together participants from health and IT sectors, including NSW Health, Microsoft, CSIRO, and R&D groups from across NSW. The day's work resulted in an ambitious sketch of a 20-year plan for e-Health activities in Australia. All the discussions of the day, and the final plan, were recorded and a DVD proceedings is available on request.

Shaping policy

CHI staff actively engage in State and National committees and policy fora, providing expert advice on health informatics issues. Through membership of the Australian Health Information Council (AHIC), we have contributed to ongoing policy thinking around electronic decision support, national capacity building in research and education, the professionalisation of informatics, and nurturing a culture of evaluation for health IT projects. Through membership of the State Ministerial Advisory Council for Medical and Health Research, we have ensured that the substantial opportunities for linking the State's research strengths in IT with the State's advantages in translational research are recognised. We continue to participate in activities that will mould a State research platform in health informatics.

innovation

inventing novel technologies and methods for industry and health services

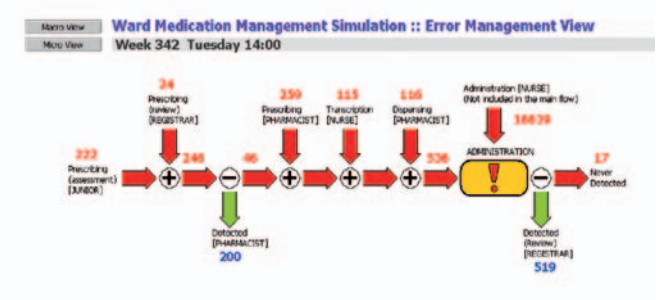
To translate our basic discoveries into tools that will shape the future of healthcare, CHI is focused on protecting its IP, developing demonstrator projects with partners in the health sector, and where appropriate commercialisation of our innovations.

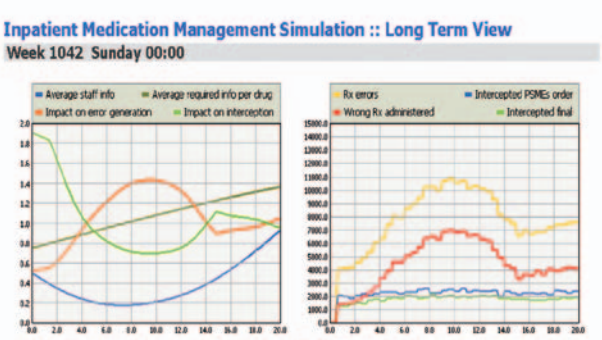
See one, simulate one, do one

Managing the complexities of health services is immensely challenging. We expect clear evidence that our treatments are going to work before we give them to our patients, but most attempts at altering the structure of health services are based on guess work, because we always seem to be moving into uncharted waters. Dr Geoff McDonnell is building virtual Health Systems that will give health policy makers and administrators a tool that will help them understand the likely consequences of their decisions. Running simulations for different scenarios often reveals major unanticipated side-effects because our health system's complexity is beyond our ability to think it through. Using hybrid modelling approaches including system dynamics and agent-oriented models, this research has the potential to fundamentally alter the way we think about health policy and approach system management.

Software to interpret complex radiology images

Working with Pittwater radiology and Phillips, Dr Tatjana Zrimec is working with the UNSW School of Computer Science on a new generation of intelligent image interpretation software, funded by an ARC Linkage grant. Three dimensional lung images from high resolution CT have more information in them than a radiologist can easily examine in a routine test. Our software is able to automatically pick out crucial features of normal and abnormal lung structure, and diagnose the cause of the abnormality for a number of important pulmonary diseases.

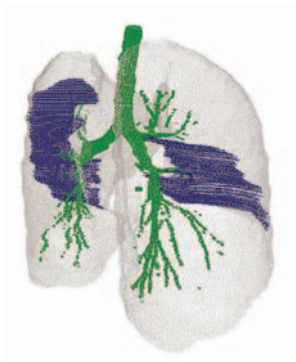


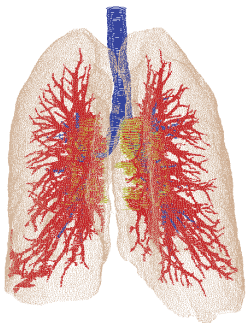


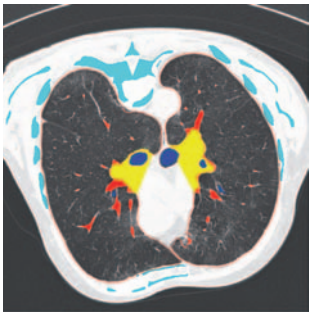
Quick Clinical: The future of Internet search for health care

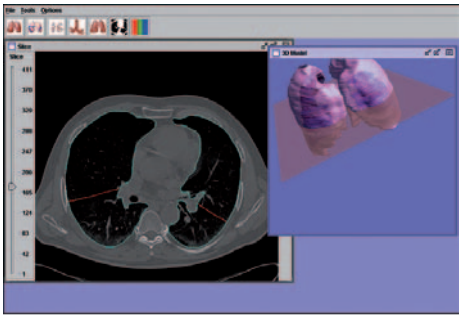
Is this a "Google-killer'?

One new article is added to the medical literature every 26 seconds or less. The world's output of science and engineering publications grew by 40 percent between 1988 and 2001. In other words it seems published scientific knowledge has at least doubled in size over the last 30 years. Consequently, for clinicians and researchers, it is no longer possible to keep 'up-to-date' simply by browsing the latest literature or attending occasional update courses. Increasingly information retrieval systems are seen as the tool we will need to use in routine practice to find the evidence that can answer questions about patient treatments and clinical outcomes. Unfortunately, modern search engine technology is not specifically designed to meet the needs of clinical work, and the Quick Clinical (QC) research program at CHI is aimed at developing innovative technologies that will transform the way clinicians access and use clinical evidence. In our studies, QC is twice as fast to use as standard search engines, and it is designed to be customised to meet the specific needs of different clinical groups and organisations. QC is protected by patent, and has been supported by ARC SPIRT funding in partnership with Merck Sharpe and Dohme and by an NHMRC Development grant. The system has undergone extensive clinical trials, and will undergo an RCT in 2005. We have already licensed QC technologies to two organisations with major international parent companies, and are now looking to see just how far we can take this innovative technology.









education

Training future researchers and educating clinicians, technologists and policy makers in health informatics

The Centre has attracted high calibre research students from a broad range of disciplines who are undertaking research at the cutting edge of health informatics. These students are an important element in our efforts to build national health informatics research capacity.

Annie Lau:
The impact of information searching on decision-making - the investigation of cognitive biases during information searching.

Aamir Malik:
Content Based Medical Image Retrieval Systems - segmentation of HRCT Lung images and classification of images without keywords or annotations.

Vitali Sintchenko:
Decision by Design - Decision support for antibiotic prescribing in critical care.

George Alvarez:
Communication patterns of medical teams in the intensive care setting.

Nerida Creswick:
The impact of point of care clinical systems (PoCCS) on the work of clinical groups.

Marilyn Rob:
Ear, nose and throat surgery among young Australian children.

The Centre is engaged in health informatics education within the medical under-graduate and the post-graduate programs of the School of Public Health and Community Medicine. In 2004, subjects included health informatics principles, decision support systems, and health systems simulation. It is anticipated that a Masters program in Health Informatics will be offered in 2006.

International interest in the Centre's research brought visitors from United Kingdom, United States of America, France and Denmark.

Our visitors have included:

Professor Robert Friedman, Chief of the Medical Information Systems Unit at Boston Medical Center and Professor at the Boston University School of Medicine.

Associate Professor Christian Nøhr, Department of Development and Planning, Aalborg University.

Associate Professor Ole Hejlesen, Head of Medical Informatics Group, Department of Health Science and Technology, Aalborg University.

Professor Bill Hersh, Professor and Chair of the Department of Medical Informatics & Clinical Epidemiology in the School of Medicine at Oregon Health. Professor Hersh is a world expert on the use of online evidence retrieval systems.

Our first international visiting fellow joined us for a one year study period. Assistant Professor Natalie Souf, from the Centre d'Etude et de Recherches en Informatique Médicale (CERIM) at the Université of Lille two, France was a Visiting Senior Research Fellow. Nathalie worked on context-aware computing, exploring how we can make medical devices respond to their local environment.

UK study tour

The Centre hosted a study tour of senior National Health Service (NHS) executives and health professionals from 29 November to 3rd December. The NHS in the UK announced a health information technology budget of £6.2 billion during the year. Study tour participants were particularly interested to learn of the Centre's work in delivering research evidence about the impact interventions, such as decision support systems, have on clinical care and factors which influence the extent to which such systems integrate into clinical work processes.

centre for health informatics

Statement of Financial Performance
for the Year Ended 31 December 2004

	2004 $	2003 $	Notes
Income			
External Funds (i)	1,717,627.75	1,206,998.34	1
Other	353,218.99	23,435.63	2
Faculty Contribution	426,467.12	419,845.35	
UNSW Contribution	14,602.00	7,358.00	3
Total Income	2,511,915.86	1,657,637.32	
Expenses			
Payroll	1,699,159.39	1,220,743.19	4
Equipment	82,864.45	32,489.52	5
Materials	508,580.59	184,158.32	6
Travel	61,444.55	37,555.17	7
Total Expenses	2,352,048.98	1,474,946.20	
Operating result	159,866.88	182,691.12	
Surplus (Deficit) Bfwd from Prior Year	769,462.43	586,771.31	
Accumulated Funds Surplus (Deficit)	929,329.31	769,462.43	
(i) Excludes debtors (unpaid invoices)	265,922.00	486,597.44	

Notes to the Statement of Financial Performance

Note: Due to the departure of the Biomedical Laboratory from the Centre's operations, the 2003 figures have been adjusted to allow comparison with the 2004 figures. The Faculty Contribution & related costs are included in this statement.

1 Awarded new ARC & NHMRC grants

2 Awarded new projects from industry

3 Increase in RIBG funds

4 Due to the additional grants/projects in the Centre, the payroll expenditure has increased as new staff have been employed to conduct research & an increase of 4% due to the enterprise agreement

5 & 6 Additional grants/projects has increase expenditure relating to Equipment and Materials due to an increase in purchases to conduct research for all new grants/projects

7 Increase in Travel relates to an increase in conference attendance and field work

appendix

staff

Professor Enrico Coiera
Director

Associate Professor Johanna Westbrook
Deputy Director

Dr Tatjana Zrimec
Senior Lecturer

Sarah Behman
Business Manager

Steven Tipper
Business Manager/
Research Fellow

Andrew Georgiou
Senior Research Fellow

Dr Bob Jansen
Senior Research Fellow

Margaret Williamson
Senior Research Fellow

Dr Geoff McDonnell
Research Fellow

Dr Farah Magrabi
Research Fellow

Dr Vitali Sintchenko
NICS Research Fellow

Martin Walther
Software Engineer

Ken Nguyen
Software Engineer

Nadine Mallock
Research Assistant

Michelle Brear
Research Scientist

Rita Chan
Software Engineer

Rosemary Spencer
Research Scientist

Sangeeta Ray
Research Scientist

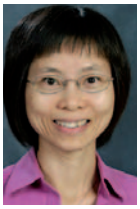
Amanda Ampt
Research Scientist

Victor Vickland
Research Scientist

Samantha Sheridan
Administrative Assistant

Keri Bell
Administrative Assistant

Nerida Creswick
PhD Student



Becky Siu
Administrative Assistant

Aamir Malik
PhD Student

Annie Lau
PhD Student

Dr George Alvarez
Masters Student

Marilyn Rob
PhD Student

grants

Evaluating the impact of information and communication technologies on organisational processes and outcomes: a multi-disciplinary, multi-method approach.

Funding Source:	NSW Health	
Investigators:	A/Professor J Westbrook, Dr AS Gosling, Dr R Iedema, A/Professor J Braithwaite, Professor E Coiera, D Ayres, T Mathieson	
Funds:	2003($)	$135,468
	2004($)	$136,968
	2005($)	$137,606
	2006($)	$137,606
Funding Source:	Australian Research Council (ARC) Linkage grant	
Industry Partner:	NSW Health	
Funds:	2003($)	$138,193
	2004($)	$136,225
	2005($)	$139,076
	2006($)	$107,228

Changing decision-making behaviour in general practice by providing access to online evidence.

Funding Source:	National Health & Medical Research Council (NHMRC) Project grant	
Investigators:	Professor E Coiera, A/Professor J Westbrook, Professor M Kidd, Professor R Day	
Funds:	2004($)	$139,250
	2005($)	$67,125

Development of techniques and models to evaluate the impact of health information technologies on clinical practice and outcomes, 2004 NHMRC Population Health Career Development Award

Funding Source:	National Health & Medical Research Council (NHMRC)	
Investigators:	A/Professor J Westbrook	
Funds:	2004($)	$85,250
	2005($)	$85,250
	2006($)	$85,250
	2007($)	$85,250
	2008($)	$85,250

Learning strategies for personal agents to assist professional users in searching the web

Funding Source:	Australian Research Council (ARC) Discovery Project	
Investigators:	Professor E Coiera, Professor P Compton, Dr T Zrimec	
Funds:	2004($)	$102,340
	2005($)	$104,489
	2006($)	$104,489

Development of the QuickClinical on-line evidence based decisions support system

Funding Source:	National Health & Medical Research Council (NHMRC) Development grant	
Investigators:	Professor E Coiera, A/Professor N Lovell	
Funds:	2004($)	$124,500

Development of a 'benchmark' evaluation methodology for electronic decision support systems in the clinical environment

Funding Source:	Australian Department of Health and Ageing	
Investigators:	Professor E Coiera, Dr C Newman, A/Professor J Westbrook	
Funds:	2004($)	$90,909
	2005($)	$113,636

Intelligent search integration engine and content parser for a Web content management and retrieval environment

Funding Source: Australian Research Council (ARC) SPIRT grant

Investigators: Professor E Coiera, A/Professor N Lovell

Funds:		
	2001($)	$139,731
	2002($)	$146,958
	2003($)	$92,021
	2004($)	$12,062

NSW Health Capacity Building Infrastructure grant

Funding Source: NSW Department of Health

Investigators: Professor E Coiera, Professor B Celler, A/Professor J Westbrook, A/Professor N Lovell

Funds:		
	2003-2004($)	$500,000
	2004-2005($)	$500,000
	2005-2006($)	$500,000

Virtual Critical Care Unit evaluation project

Funding Source: Wentworth Area Health Services, NSW Department of Health subcontract

Investigators: Professor E Coiera, A/Professor J Westbrook

Funds:		
	2004($)	$50,000
	2005($)	$125,000
	2006($)	$25,000

Agent Mediated Team Interaction in a hospital environment project (extension)

Funding Source: Smart Internet Technology CRC

Investigators: Professor E Coiera, A/Professor W Wobcke

Funds:		
	2002($)	$38,250
	2003($)	$66,356
	2004($)	$104,606
	2005($)	$30,220

Electronic Decision Support Systems action plan to improve use of evidence

Funding Source: National Institute of Clinical Studies (NICS)

Investigators: Professor E Coiera, Dr R Jansen

Funds: 2004($) $100,000

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e-Health Demonstrator Project

Funding Source: Smart Internet Technology CRC

Investigators: Professor E Coiera, Dr R Jansen

Funds: 2004($) $51,000

2005($) $17,000

National Institute of Clinical Studies (NICS) Fellowship Sintchenko

Funding Source: National Institute of Clinical Studies (NICS)

Funds: 2004($) $36,000

2005($) $72,000

2006($) $12,000

publications

Books and Book Chapters

Coiera E, Designing interactions (2004) in M Berg (ed), *Health Information Management - Integrating Information Technology in Health Care Work*, Routledge, London, pp.101-124.

Fieschi M, **Coiera E**, Li Y (eds) (2004) *Proceedings of the 11th World Congress on Medical Informatics - Medinfo 2004*, IOS Press, 2 volumes.

Journal Articles - refereed

Adily A, **Westbrook JI, Coiera EW**, Ward J (2004) Use of on-line evidence databases by Australian public health practitioners, *Medical Informatics & the Internet in Medicine*, vol.29, no.2, pp.127-136.

Ash J, Berg M, **Coiera E** (2004) Some unintended consequences of information technology in health care: the nature of patient care information system related errors, *Journal American Medical Informatics Association*, vol.11, no.2, pp.104-112.

Bolton P, Tasker J, **Tipper S** (2004) Medical review by GPs reduces polypharmacy in the elderly: a quality use of medicines program, *Australian Journal of Primary Health*, vol.10, no.1, pp.78-82.

Coiera E (2004) Four rules for the reinvention of healthcare, *British Medical Journal*, vol.328, pp.1197-1199.

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Penn D, Burns J, **Georgiou A**, Powell Davies PG, Harris M (2004) Evolution of a register recall system to enable the delivery of better quality of care in general practice, *Health Informatics Journal*, vol.10, no.3, pp.165-176.

Rob MI, **Westbrook JI**, Taylor R, Rushworth RL (2004) Increased rates of ENT surgery among young children. Have clinical guidelines made a difference? *Journal of Paediatrics and Child Health*, vol.40, no.11, pp.627-632.

Sintchenko V, Coiera E, Iredell J, Gilbert G (2004) Comparative impact of guidelines, clinical data, and decision support on prescribing decisions: an interactive web experiment with simulated cases, *Journal of the American Medical Informatics Association*, vol.11, no.1, pp.71-77.

Spencer R, **Coiera E** (2004) Variation in communication loads on clinical staff in the emergency department, *Annals of Emergency Medicine*, vol.44, no.3, pp.268-273.

Westbrook JI, Gosling AS, Coiera E (2004) Do clinicians use online evidence to support patient care? A study of 55,000 clinicians, *Journal American Medical Informatics Association*, vol.11, pp.113-120.

Conference Papers – full papers refereed

Magrabi F, Westbrook JI, Coiera E, Gosling AS (2004) *Clinicians' Assessments of the Usefulness of Online Evidence to Answer Clinical Questions*, 11th World Congress on Medical Informatics, Fieschi M, Coiera E, Li Y (eds), Washington, USA, IOS Press, pp.297-300.

Westbrook JI, Braithwaite J, Iedema R, **Coiera E** (2004) *Evaluating the impact of information communication technologies on complex organizational systems: a multi-disciplinary, multi-method framework*, 11th World Congress on Medical Informatics Fieschi M, Coiera E, Li Y (eds), Washington, USA, IOS Press, pp.1323-1327.

Conference Papers, Presentations & Invited Presentations

Coiera E (2004) *Evaluation standards for decision support*, NHS National Knowledge Service Workshop on Knowledge Support/Decision Support Systems, May, London, United Kingdom.

Coiera E (2004) Invited Keynote. *IT in Health Care: Sociotechnical Approaches*, Second International Conference, September, Portland, USA.

Coiera E (2004) Invited Lecture. *Fitting IT into the Clinical Workplace*, Health-e-Nation Conference, March, Melbourne.

Gilbert GL, Kong F, **Sintchenko V** (2004) *From raw data to cost effective health care*, Proceedings of the Australian Society for Microbiology National Conference, September-October, Sydney, Abstract SY38.3.

Iedema R, Forsyth, Delaney G, Jacob S, **Westbrook JI**, Braithwaite J, Barton M (2004) *Video ethnography as a methodology for studying the technologization of practice*, 11th World Congress on Medical Informatics, Medinfo 2004, September, San Francisco, USA [Poster].

Madden L, **Westbrook JI**, O'Sullivan B, Simpson D (2004) *Tailoring Public Health Publications to Meet Workforce Needs*, 18th World Conference on Health Promotion, Melbourne [Poster].

Rudrapatna M, Sowmya A, **Zrimec T**, Wilson P, Kossoff G, Lucas P, Wong J, Misra A, Busayarat S (2004) *IMIKA - Internet-based medical image & knowledge acquisition, Electronic Imaging Science and Technology*, IS&T/SPIE's 16th Annual Symposium, January, San Jose, USA.

Sintchenko V (2004) *Clinical microbiology meets informatics: new approaches to improve laboratory utilisation*, Proceedings of the Australian Society for Microbiology National Conference, September-October, Sydney, Abstract SY38.2.

Sintchenko V, Gilbert GL (2004) *Strategic use of pathology informatics to improve health care quality and safety*, Transforming Australia's Health System/Proceedings of the National Health Information Summit, December, Melbourne.

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Westbrook JI (2004) Invited presentation. *Do guidelines make a difference and how can you tell?* 2nd Guidelines International Network Conference, December, Wellington, New Zealand.

Westbrook JI, (2004) *Do online evidence systems help experience clinicians to answer clinical questions?* National Institute for Clinical Studies (NICS) breakfast forum, June, Sydney.

Zrimec T, Busayarat S (2004) *A 3D model of the human lung with lung regions characterization*, Proceedings of the 2nd International Symposium 3D Data Processing, Visualization and Transmission, IEEE Computer Society, October, Singapore.

Zrimec T, Busayarat S, Wilson P (2004) *A 3D model of the human lung*, Proceedings of the 7th International Conference on Medical Image Computing Assisted Intervention, Lecture Notes in Computer Science, September, Saint-Malo, France.

Zrimec T, Busayarat S, Wilson P (2004) *3D modelling and visualisation of the human lung*, 3DPV 2nd International Symposium on 3D Data Processing, Visualization and Transmission, September, Thessaloniki, Greece.

Media

Specialist search engine, *The Australian*, 13 July 2004

Searching for Better Questions, *The Australian*, 20 July, 2004.

Will Rule-Based Search Patent Kill Google? *WebProNews*, 19 July 2004

Off the dial at drugs.com, *Sydney Morning Herald* 11 October 2004

Health care in need of values transplant, *Sydney Morning Herald* 15 May 2004

Interview with Prof Coiera, ABC Radio National's "The Buzz", 23 October 2004-
http://www.abc.net.au/rn/science/buzz/stories/s1229961.htm

World first in search technology, *Uniken*, July 2004

Patents

Coiera E, **Vickland** V (2004) *Quick Clinical Search Profiles*, File: 01/1649, This patent has passed the PCT international phase and has now progressed to national phase in Australia, Canada, China, Europe, India, Japan, South Korea, New Zealand, Singapore, USA

staff contributions

Committees

Professor Enrico Coiera

Chair, NSW Health IT Industry Reference Group

Australian Health Information Council

Ministerial Advisory Council in Medical and Health Research in NSW

Cancer Research Advisory Committee of the Cancer Institute NSW

MedInfo 2007 – Organising committee

Associate Professor Johanna Westbrook

NSW Health Electronic Medical Record (EMR) Management Committee

NSW Health Electronic Medical Record (EMR) Research & Evaluation Committee

Australian College of Health Informatics Membership Committee

National Institute for Clinical Studies Fellowship Review Committee

11th World Congress on Medical Informatics (MedInfo 2004) Member

Scientific Review Panel

Dr Vitali Sintchenko

Member, Pathology Informatics Working Party, Royal College of Pathologists of Australasia

Chair, eNotification Pilot Study Working Party, NSW Health

Steve Tipper

Vice Chair, Health Informatics Society of Australia

Health Informatics Society of Australia Executive Committee, NSW Branch

UNSW Pharmacology, Clinical Pharmacology & Therapeutics Advisory Committee

MedInfo 2007 – Organising committee

Sarah Behman

OHS Committee

Editorial Boards

Professor Enrico Coiera

HealthInsite

Deputy Editor, Artificial Intelligence in Medicine Journal

Journal of the American Medical Informatics Association

International Journal of Medical Informatics

Knowledge Engineering Review

Journal of Medical Internet Research

The Informatics Review

Other current appointments

Professor Enrico Coiera

OpenClinical - Member Scientific Advisory Board

HIC 2003 - Chair scientific committee

MedInfo 2004 - Member Scientific Program Committee

Dr Vitali Sintchenko

Centre for Infectious Diseases and Microbiology - Public Health, Westmead (CIDM-PH)

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