UNSW

CHI • Centre for Health Informatics
THE UNIVERSITY OF NEW SOUTH WALES • SYDNEY • AUSTRALIA

http://www.chi.unsw.edu.au

Annual Report 2002

CENTRE FOR HEALTH INFORMATICS

ANNUAL REPORT

2002

Table of Contents

Introduction

The Centre for Health Informatics (CHI) became operational at the beginning of 2000, and now is the largest health informatics research group in Australia, with 23 full time research staff and 8 research students. It has attracted over $6 million in funding since its inception, and continues to grow its research output year on year. CHI has successfully completed several large-scale projects for both State and Federal departments of health, and senior staff sit on Federal and State policy bodies and are regularly consulted because of the broad mix of expertise now contained in the Centre.

The Centre for Health Informatics has developed as a collaborative venture of the Faculty of Medicine and the Faculty of Engineering in close association and with the Graduate School of Biomedical Engineering (GSBME). The two Co-Directors of CHI are Professor Branko Celler (Electrical Engineering) and Professor Enrico Coiera (Medicine) who are assisted by A/Prof. Nigel Lovell (GSBME), Deputy-Director (Engineering Informatics) and A/Prof. Johanna Westbrook Deputy-Director (Clinical Informatics).

Aims

The Centre's aim is to research, develop and commercialise information and communication technologies and processes specifically targeted at healthcare priority areas. It aims to become one of the top five health informatics research groups internationally by 2005, foster a national research culture of excellence in informatics, and develop a state and national capacity that enables wide scale improvements in health service delivery through the appropriate and intelligent use of information and communication technologies.

Objectives

The Centre for Health Informatics is committed to research and education that:

- Leads the way, producing and distributing world-class research in the development and application of information and communication technologies (ICT).
- Provides training and development opportunities to build up State and Australian expertise
- Fosters the development of a State and national consensus on the key ICT research problems requiring attention
- Encourages the use of robust research and development methodologies

Research

CHI operates four research streams:

Evidence-based Decision Support: Conducting basic research into clinical evidence needs at the point of care, barriers to the uptake of evidence, and developing technologies to provide on-line access to clinically relevant information to support decision making by clinicians and consumers.

Clinical Communications: Understanding how organisational communication processes impact the quality and safety of health care delivery, and how new processes and technologies can be used to improve communication.

Informatics Evaluation: Assessing the effectiveness of new information and communication technologies in improving health outcomes and delivery.

Home Telecare: Design and evaluation of monitoring systems that will facilitate the management of patients in their home, with information passed to their primary care giver, and with the overall objective of improving clinical outcomes, reducing overall health expenditure and allowing the elderly and the chronically ill to stay at home longer.

Mission

Over the past year, the Centre has pursued its core objectives of:

- Fostering co-operative relationships between the University, Federal and State Health Departments, Regional and Area Health Services, and individual institutions;
- Providing a local UNSW, State and National focus for multi-disciplinary research and development activities in the field of health informatics;
- Responding in a timely way to requests from groups inside and outside the University for advice and consultation on health information systems issues, including undertaking research consultancies where appropriate;
- Facilitating the development of training and education systems in health informatics both within and outside the University; and
- Communicating effectively the results of research and analysis to relevant policy-makers and decision-makers in the health care system.

Goals

To this end the Directors committed the Centre to the following goals in 2002:

- Continue to develop the key research streams for Centre activity in the medium-term (2-5 years);
- Identify new research projects for development in 2002 based on core capabilities and strategic considerations;
- Develop the Centres' physical facilities on the UNSW campus with capacity for growth in both Medical Informatics and Biomedical Systems laboratories and a reduced Secretariat;
- Plan and implement systems for effective Human Resources management in recruitment, selection and retention of research and administrative staff; and
- Plan for alternative funding to that previously available from UNSW central fund allocations in 2000-2002, to support core infrastructure as a basic resource for future years of operation.

Specific achievements

Key achievements include:

- Completion of a 2-year evaluation of the NSW Departments of Health's Clinical Information Access Project (CIAP), demonstrating the critical role that online evidence access plays in enhancing clinical decisions across the state, as well as the significant barriers that remain to its widespread adoption across all areas.
- Partnering with NSW DOH to obtain an Australian Research Council Linkage Grant, commencing 2003, to evaluate the forthcoming state-wide Point of Care Clinical Systems (PoCCS) project, worth over $1 million in cash.
- Continued partnering with Merck Sharpe and Dome in an Australian Research Council SPIRT Grant (commenced 2001, worth over $1.5 million in cash), to develop software technology that provides general practitioners with immediate access to relevant evidence at the point of care. A national trial in 2002 of the resulting Quick Clinical (QC) system involved 250 GPs. It has demonstrated that the technology is effective in answering clinical questions, is clinically acceptable, and can be used effectively at the point of care. The system will be commercialised in 2003.
- Completion of a Commonwealth-funded (GPCG $286,000) trial of home telecare technologies in rural and urban settings, to assist chronically ill and/or elderly patients maintain their health at home as long as possible. Commercialisation of this technology is underway through a private company, Medcare Systems Pty Ltd.
- Partnering with HPM Technologies (a wholly-owned subsidiary of HPM Industries Pty Ltd) in the establishment of an Australian Research Council Linkages Grant Project to commence in 2003, which will develop Smart Home technologies. This 5-year grant includes collaboration with Argus Solutions Limited in the use of their iris recognition technology.

Directors Report

Medical Informatics Laboratory – Prof Enrico Coiera

The Medical Informatics Laboratory conducts its research around three intertwined themes of:

- Evidence-based Decision Support;
- Clinical Communication; and
- Informatics Evaluation.

The drivers for our research are the increasingly challenging clinical environment, in which both consumers and clinicians struggle to work within an ever more complex health system, constrained by diminishing resources. We believe that mastery of the health system's information and communication processes is one of the keys to the development of a sustainable health system in the future.

As in previous years, the year work for the Lab remains busy and challenging, as new projects are undertaken, sometimes with very short lead times between conception and implementation. The capacity for the Lab to respond rapidly to requests from Government and Industry has increased significantly in the last year, as the research staff have now developed considerable expertise in their specific project areas. I am pleased to report that each project met reporting obligations under the different grant agreements, delivering to time and budget.

Highlights of this year's research include:

- Delivery of the final report of the statewide analysis of clinician use of the New South Wales Department of Health's Clinical Information Access Project (CIAP). The CIAP is accessible to over 55,000 clinicians across the State. Our research represents possibly the first large-population based examination of the use of evidence in routine practice;
- Securing an ARC Linkage grant of over $1 million dollars, in partnership with the NSW Department of Health, to evaluate their forthcoming state-wide Point of Care Clinical System (POCCS), which will eventually see leading edge information technology deployed at the point of care across all the state's hospitals.
- Completion of a tender for the Federal Department of Health and Ageing, surveying the state of Decision support technologies nationally and internationally
- Completion of Version 3 of the Quick Clinical system (QC2), which is the code name for our ARC SPIRT funded program looking at innovative ways of delivering on-line information to clinicians in a way that matches the needs of their clinical tasks, and the time-pressured demands of their work environment. At the end of 2002 we completed our national trial of QC3, with over 220 general practitioners using the system in routine practice; and

- The completion of a project funded by the National Institute of Clinical Studies for a project that spans the evaluation and decision support streams, comparing the effectiveness of QC and traditional information retrieval systems.

A key feature of the Laboratory is a conscious attempt to foster a cohesive culture that is supportive of individuals, embraces multidisciplinary work, and encourages responsibility taking and continuing professional development. We carry out a series of half-yearly reviews to encourage interaction between the different projects, and once each year spend a rewarding and challenging two days off-site where all the project team members work together to shape a shared vision of where MIL will head in the next few years.

One of the biggest challenges in developing the Laboratory has been the ongoing task of building research teams where most individual researchers come to the work without the needed cross-disciplinary skills required in health informatics. Over the last two years, that situation has changed, and our staff with technology backgrounds has a much richer understanding of the health issues that drive the Laboratory's research programs. Equally our clinically trained staff are now much more familiar with the process of technology design and implementation, a prerequisite for going from clinical problem to informatics solution.

The work completed over the last year will form the basis of a large number of publications that will come out over he next 12 months, and is also seeding the conceptualization of several new projects, which are currently the subject of new grant applications. We are thankful that our work has been so well received by its funders, and the broader clinical community, and over 2003 will engage in a complete review of the Laboratory's research program, to ensure it remains at the cutting edge of clinical informatics.

Biomedical Systems Laboratory - Prof Branko Celler

2002 was a year of intense activity to capitalise on the benefits of the clinical trial of home telecare funded by the Department of Health and Ageing in 2001, but not completed until September of 2002. This highly successful clinical trial demonstrated that system was useable, acceptable, effective and reliable both by patients and clinicians.

Sydney patients were finally disconnected in June 2002, against their strenuous objections and Wagga Wagga patients were disconnected in September of 2002. Extensive debugging and additional system development has taken place in 2002 and the Home Telecare System (HTS) is now extremely reliable, robust, fully functional and ready for manufacturing and full scale deployment.

The clinical trial carried out in 2001-2002 resulted in significant cost overruns and the development of a significant budget deficit exceeding $400,000 in the core operating account of the Biomedical Systems laboratory. Whilst this deficit would in no way impact on the operation of the Centre for Health Informatics, as the account was established under the School of Electrical Engineering and Telecommunications, redressing this budget deficit became a major priority for the laboratory.

Following a detailed representation to the Deputy VC of Research Prof. Mark Wainwright, pointing out that a significant reason for the cost overrun, was the long delay in obtaining insurance cover for Clinical Trials following the collapse of its previous insurer, a decision was made to provide $100,000 from central funds to assist with the recovery of the deficit.

As a result of a long term relationship with HPM, its General Manager, Mr. Peter Simon agreed to provide a grant in aid of $400,000 through the University Foundation which would substantially eliminate the remaining deficit. The first $200,000 of this endowment was paid in late 2002 and the second $200,000 is to be paid in April of 2003. In return Mr. Peter Simon is to be identified as a Foundation Sponsor of the Biomedical Systems Laboratory.

A major event which gave the Centre of Health Informatics a significant level of national exposure, was the launch of The Home Telecare System by the Minister of Health and Ageing, the Hon. Kay Patterson in the Tyree Room of the Scientia at the University of NSW on the 30th August 2002. The Vice Chancellor, the Pro VC for Research, the Pro VC for Education and the Deans of the Faculties of Medicine and Engineering as well as approximately one hundred invited guests from academia and industry attended this event.

It was well reported on Channel 9 News and by the press and led to a number of follow up articles on radio and the print media.

The other major event of the year was the news of the success of two five-year grants submitted earlier in 2002 to the ARC. These are described in the appendix and together represent some of the largest grants awarded by the ARC in 2002 anywhere in Australia. Together with some modest additional funding, these research grants will provide financial stability for the Biomedical Systems Laboratory for the next five years.

State of Development of the HTS
The HCWS and related products are being commercialised through MedCare Systems Pty Ltd, a start-up company located at the Australian Technology Park. An industrial design team was established to carry out a manufacturing and aesthetic re-design of the HCWS with the intention of seeking TGA approval and volume manufacturing and marketing by of September 2003. Business modeling and planning was also begun for both public and private sector markets.

MedCare Systems released an Information Memorandum in December of 2002 seeking investment of more than $2,500,000 in order to finance commercialization of the home telecare system and the establishment of an international sales and marketing organization. MedCare Systems has committed as part of its business plan to contribute between $200 – 400,000 per annum in research contracts to the Biomedical Systems Laboratory. These research contracts will be established through the University Research Office under normal University guidelines.

The Home Telecare Project in 2001 was a major investment for CHI and the BSL, which is sure to lead to major new R&D opportunities in the coming years.

Management Committee

It is a requirement of the University that a Management Committee be established for each Centre. The management committees, according to University guidelines, should consist mainly of University staff with a direct interest in the affairs of each Centre including the Dean of the relevant Faculty as Chairperson. Our Management Committee is constituted in accordance with UNSW guidelines and comprises Deputy Vice-Chancellor (nominee); Dean, Faculty of Medicine; Dean, Faculty of Engineering; Co-Director, Faculty of Engineering; Co-Director, Faculty of Medicine. Since this Committee has governance responsibility for operational management of the Centre it meets quarterly. Three meetings were held during 2002, the number in brackets represents attendance:

- Professor Bruce Dowton, (Chair) Dean, Faculty of Medicine   (3)
- Professor Brendon Parker, (Deputy Chair) Dean, Faculty of Engineering   (2)
- Professor Colin Sutherland, representing the Pro-Vice-Chancellor (Research)   (2)
- Professor Branko Celler, Co-Director of CHI, Faculty of Engineering   (2)
- Professor Enrico Coiera, Co-Director of CHI, Faculty of Medicine   (3)
- Professor Gavin Andrews, Scientia Professor, School of Psychiatry,Faculty of Medicine (appointed June 2002) (2)
- Professor Paul Compton, Head, School of Computer Science & Engineering   (2)

An Advisory Committee to assist and guide Directors and the Management Committee on all policy matters was re-composed in August 2002 with acceptances from:

- Professor Branko Celler, Co-Director of CHI, Faculty of Engineering, UNSW
- Professor Enrico Coiera, Co-Director of CHI, Faculty of Medicine, UNSW
- Ms Dianne Ayres, Clinical Systems Strategy Unit, Information Management Directorate, NSW Health Department, Australia (*)
- Professor Kenneth Brummel-Smith, Bain Chair, Providence Centre on Aging, Portland, USA
- Professor John Fox, Head, Advanced Computation Laboratory, Cancer Research UK, London Research Institute, UK
- Dr Robert Wooding, Chief Information Officer, Health and Aged Care (*)
- Professor Edward H Shortliffe, Professor and Chair, Department of Medical Informatics, Columbia University, USA
- Dr Steinar Pedersen, President of the International Society of Telemedicine, Head Department of Telemedicine, University Hospital of Troms, Norway
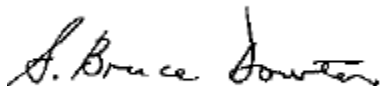
The membership changed in 2002 to include additional representatives of Government instrumentalities & industry (*).

Comment from the Chair of the Management Committee

I am pleased to present the annual report of the Centre for Health Informatics. The Centre has exhibited strong growth in competitive research grants in this, its third year of operation. The number of successful research consulting engagements with Commonwealth, State and Industry partners is pleasingly increasing. The total turnover of research funds awarded to CHI since its inception exceeds $2.5 million and both laboratory components of the Centre have achieved excellent results in securing grants for 2003.

The Management Committee of CHI has actively monitored the progress of scientific development in both the Biomedical Sciences and Medical Informatics Laboratories. Enhanced financial reporting has provided the Management Committee with a clear view of annual performance.

The trajectory of CHI for further enhancing contributions to Australia and beyond in the important dimensions of its work is excellent and the Management Committee is pleased to commend the annual report.

Professor SB Dowton

Centre Projects

Evaluation Research Stream

1) Evaluation of the Clinical Information Access Program (CIAP)

Funding Source: NSW Department of Health

Investigators: A/Professor Johanna Westbrook & Dr Sophie Gosling

Duration: 3 Years

Funds: 2000($): 11,650
2001($): 252,594
2002($): 192,503

Description:

The Clinical Information Access Project (CIAP) provides health professionals in New South Wales with online access to clinical decision support information at the point of care. CIAP is designed to support evidence-based practice in order to improve the quality of patient care. CIAP also has an important role to play in supporting clinicians geographically isolated from colleagues and resource bases.

The CHI designed a two-year evaluation program of CIAP consisting of four stages. The aim of the CIAP evaluation was to improve understanding of clinicians' information needs and assess the extent to which the CIAP supports clinical decision-making processes and improves patient care. The three central questions addressed by the research were: Do clinicians use online evidence and why do they use it? What factors influence online evidence use? What impact does use have on clinical practice?

Stage 1 comprised a web-log analysis of the use of CIAP by the 55,000 clinicians across NSW who have access. Stage 2 involved in-depth case studies at three hospitals in NSW to examine factors associated with high and low rates of CIAP use. Stage 3 consisted of a statewide survey of clinicians to determine self-reported rates of use, reasons for evidence seeking and impact on patient care. In total 5511 surveys were returned. Stage 4, completed in 2002, involved piloting two methods, the critical incident technique and journey mapping, to assess the impact of online evidence on clinicians' decision-making processes and patient care.

The evaluation showed that CIAP is a highly used and valued resource by clinician groups in NSW. The four-stage evaluation program successfully achieved the project aims and has substantially improved understanding of clinicians' information needs and the extent to which CIAP supports clinical decision-making processes and improves patient care. The triangulated research design which applied multiple methods to examine the issues of interest produced robust results and allowed great confidence to be placed in the project conclusions. The methods tested and evaluation results obtained provide a strong foundation upon which future clinical information systems may be evaluated. Where relevant the researchers presented recommendations for consideration by NSW Health.

Widespread disseminated of study methods and results have been a priority during the project to ensure high levels of local and international peer review. In total over 25 formal presentations reporting the project findings and seeking input have been undertaken. The reports of each of the four evaluation stages have been distributed via the Area Health Services. The results obtained are also of considerable international interest. Additional detailed analysis of data has resulted in two papers accepted for publication in international journals, and a further two are under editorial consideration. Several more papers are in preparation.

2) Point of Care Clinical Systems (PoCCS)

Funding Source: NSW Department of Health

Investigators: A/Professor Johanna Westbrook & Dr Sophie Gosling

Duration: 1 Year

Funds: 2002($): 62,438

Description:

CHI was commission by NSW Health to undertake a review of the evidence regarding the impact of point of care clinical systems (PoCCS) on health care processes and outcomes and to design a framework for the evaluation of these systems in NSW. This final report presents evidence of the impact of PoCCS on health care as well as findings from interviews with stakeholder groups in NSW regarding their experiences and expectations of PoCCS. Previous approaches to the evaluation of PoCCS are examined, identifying strengths and limitations. This information provided the foundation upon which an integrative, comprehensive evaluation model for PoCCS was developed which addresses five dimensions of the use and impact of PoCCS - safety, quality, efficiency, organizational and technical issues.

3) National Institute of Clinical Studies (NICS)

Funding Source: National Institute of Clinical Studies (NICS)

Investigators: Prof Enrico Coiera, A/Professor Johanna Westbrook &
Dr Sophie Gosling

Duration: 1 Year

Funds: 2002($): 82,952

Description:

Online clinical information retrieval (IR) systems located at the point-of-care may help clinicians be evidence-based. Current online clinical IR systems are based upon a standard library search model (LM). However, the context of care imposes different constraints upon decision-making and information needs. Clinicians have diverse skill sets, education and resources. Consequently IR systems need to be designed to the specific needs of different clinical contexts. To address this, the CHI has developed an information retrieval system, called Quick Clinical (QC), which is structured around clinical questions, localised to the needs of different clinical groups. The QuickClinical (QC) information retrieval system is possibly the first of a new generation of intelligent evidence delivery systems that are designed to search for evidence using clinical questions. Designed and built by the Centre for Health Informatics, QuickClinical aims to make the search for, and access to, evidence as natural a part of routine clinical work as possible, with the hypothesis that this will enhance the usage of evidence in routine clinical care.

This study compared the effectiveness of two IR systems (LM and QC) for three user groups (n=75): 26 hospital doctors (HDs), 18 general practitioners (GPs) and 31 clinical nurse consultants (CNCs). In a laboratory environment, clinicians were presented with eight clinical scenarios. Clinicians were randomised to use either system. The responses to the scenarios were compared pre and post the use of the allocated IR system. Fifty clinicians participated in focus groups following system use. Both systems resulted in a mean increase of 20% in the proportion of correct answers clinicians gave after searching. CNCs commenced searching with fewer correct answers than doctors, but after using the system obtained as many correct answers as the doctors. Overall the QC system was faster at finding correct answers than the LM system. QC was faster and more accurate for doctors, but not for CNCs. There was a wide range of views regarding the IR systems. This study indicates that online evidence is moderately useful for clinicians, but further work is needed to tailor systems to different clinical groups and contexts of care to increase their effectiveness. Further work is being undertaken to develop and refine the QC model and to test its effectiveness in real time clinical settings.

Communication Research Stream

1) Communication behaviours in the clinical setting

Funding Source: NSW Department of Health

Investigators: Professor Enrico Coiera, Ms Rosemary Spencer, and
                          Ms Pamela Logan

Duration: 2 Years

Funds: 2000($): 196,124
                  2001($): 85,115
                  2002($): Carried forward

Description:

This study, looking at communication systems in the New South Wales health system, was endorsed by the Department of Health Clinical Systems Steering Committee in May, 2000 and work in the study commenced in January, 2001.

The projects will develop and disseminate the communication behaviour study methodology successfully piloted in an earlier study of Accident and Emergency Departments, as well as extend the data collection and analysis to other sectors of the health system. This effectively builds on the earlier work to develop a strong skill set for the sustainable evaluation and improvement of communication systems within the NSW health sector.

Project 1: Analysis of communication behaviour data

Aims: Project 1 aims to collect of a new set of observations to allow a detailed analysis of clinical communication behaviour.

Current status: Completed. In 2001, 20 hours of observational data were collected from an urban Emergency Department. Comparison with a previous data set collected from the same department has been completed. A more detailed role-based analysis of the 2001 data was undertaken to inform Project 3 which aimed to identify interventions that could potentially improve hospital communication processes.

Project 2: Development and dissemination of observational methodology

Aims: Project 2 aims to develop, refine and test the Communication Observation Method (COM), which measures communication patterns in clinical settings. The overall aim of Project

2 is to produce detailed documentation of the validated methods in order to facilitate the use of the methodology by other researchers.

Current status: Completed. The project aims were achieved through: the collection and analysis of a new observational data set to allow comparison with previous data (Project 1); refinement and development of communication event and attribute definitions to provide a more comprehensive coding system; conducting reliability studies on the observational techniques and coding processes; design of a data entry system and analysis process; and the production of a detailed manual describing the COM.

These tools can now be used more widely by NSW Health to measure communication processes in clinical settings and assess the benefits and impact of the use of the developed method in these settings. This refinement has also improved the efficiency of the data collection and analysis processes. The project leverages investment in existing methodology and allows transfer to other NSW institutions and researchers.

Project 3: Development of interventions to improve communication
Aims: Based upon the user needs identified within Project 1 and earlier studies, Project 3 aims to identify interventions that could potentially improve hospital communication processes.

Current status: Completed. The project aims were achieved through undertaking: a more detailed role-based analysis of the 2001 data (Project 1); conducting focus groups with clinical staff; reviewing related literature. Both quantitative and qualitative analysis methods were employed to examine communication practices and generate rich descriptions of communication patterns in clinical settings. A detailed report was produced which outlined communication patterns, issues, and potential interventions to support communication in an emergency department setting.

All three projects contributed to identifying communication and information requirements of clinical teams from complex clinical environments. Armed with this knowledge, the most effective use of information technology could be identified and effort channeled to developing clinical systems tailored to clinician's preferred processes.

Decision Support Research Stream

1) ARC SPIRT 2002 (Quick Clinical)

Funding Source: ARC SPIRT Grant (No.: C00107730; RO ref: 0112320) Industry
Partner: Merck Sharp and Dohme Pty Ltd

Investigators: Professor Enrico Coiera & A/Prof. Nigel Lovell

Duration: 3 Years

		ARC	Partner
Funds:	2001($):	139,000	350,000
	2002($):	146,958	605,000
	2003($):	91,068	400,000

Description:

Work in this ARC SPIRT Grant (No.: C00107730; RO ref: 0112320) commenced in early 2001.
The "Quick Clinical" project is developing an experimental on-line information retrieval system
for use in the clinical setting. Quick Clinical is designed around the specific information needs
that arise within the clinical context, and is designed to operate under the resource constraints of
clinical work. The Quick Clinical research project aims to:

- Understand evidence needs of GPs;
- Understand how to deliver evidence in a clinical setting;
- Develop core IT innovations needed to access and integrate multiple evidence sources to simplify clinical access; and
- Develop a prototype on-line and just-in- time system for clinical trial with GPs.

Following the development of QC version 3.0 in October 2002, a national field trial with 193
GPs was completed during a four-week trial run in November 2002. GPs who had a computer
with Internet access in their consulting room were recruited. The study examined the frequency
and purpose of system use from data collected via automatically generated computer log files
and self-reports via online user feedback. The trial was recognised by the RACGP's QA&CPD
(Quality Assurance and Continuing Professional Development) Program. GPs who completed
both surveys were eligible for 10(Group 2) QA&CPD points.

One hundred and ninety-three participants conducted 1680 searches over the four-week trial.
The number of searches ranged from 1-74 (mean = 8.7 and mode = 1). The use of the system
varied over the week with 22.5% of searches on Wednesdays. Some use also occurred over

weekends. Searches were conducted both during and after practice hours. Seventy-nine percent were performed between 9am-7pm and 62% were initiated in consulting rooms, suggesting that the system integrated into day-to-day workflow and was used during consultations.

The most frequent questions related to diagnosis (37%) and treatment (32%). Search subjects included a broad spectrum of diseases, including common conditions such as asthma, diabetes and heart disease.

The relevance of search results was assessed using a randomly assigned feedback prompt to users following search results. GPs reported that in 73% of specific queries reviewed the results obtained online were important or very important to the care of their patient.

The technical feasibility of the QC system was also shown in the study. The system was able to support 193 GPs over four weeks. The study indicates that QC can support evidence-based decision-making in general practice.

2) Electronic Decision Support Systems (EDSS)

Funding source: Commonwealth Department of Health and Ageing

Investigators: Dr Vitali Sintchenko, A/Professor Johanna Westbrook,
                        Mr Steven Tipper, Ms Merryn Mathie, Professor Enrico Coiera

Duration: 1 Year

Funds: 2002($): $139,552

Description:

This project was commissioned by the National Electronic Decision Support Taskforce in June 2002 with the main objectives to:

- Detail the current status of electronic decision support implementation world-wide and the evidence of its impact on clinical outcomes

- Prepare an inventory of significant electronic decision support activities in Australia and a literature review to identify enablers and barriers to the successful implementation of decision support systems that need to be addressed in the Australian context.

A literature review of the current status of electronic decision support implementation was conducted and an inventory of existing decision support systems projects in Australia was undertaken. Interviews of 127 individuals representing a broad range of public and private health care organisations, professional bodies, the academic sector and medical software industry had identified 35 electronic decision support systems in routine use in this country.

A detailed literature review and analysis of the inventory evidence have demonstrated substantial work in developing electronic decision support systems in Australia. However, much of it has been fragmented and uncoordinated, leading to problems with accessibility, scalability, duplication and lack of integration with existing clinical systems. The project identified likely benefits of a national coordinated approach to the development of electronic decision support systems in the areas of evaluation, quality and safety engineering, and capacity development and electronic decision support research. Evidence collected during the study provided the basis for specific recommendations to the governing bodies. These recommendations have been included into the National Electronic Decision Support Taskforce report to Health Ministers in November 2002. The study results have been published as a part of Electronic Decision Support for Australia's Health Sector Report in January 2003. The report is publicly available on-line at http://www.health.gov.au/healthonline/docs/nedsrept.pdf

Home Telecare Research Stream

1) Adding a health dimension to integrated automation solutions for intelligent homes

Funding Source: ARC Linkage Program LP0347193

Investigators: Professor Branko Celler & A/Professor Nigel Lovell

Duration: 5 Years

		ARC	**Partner (HPM)**
Funds (Cash):	2003($):	170,000	50,000
	2004($):	215,000	50,000
	2005($):	250,000	50,000
	2006($):	196,374	50,000
	2007($):	209,854	50,000

Industry Partner(s): HPM Industries Pty. Ltd.

Iris Australia, trading as Argus Solutions Ltd.

Description:

We present a vision for the implementation of intelligent health care technology in the home of the future, focusing on areas of research that have the highest potential payoff over the next ten years for the community, the government and our industry partners. By "intelligent health care technology" we mean smart devices and systems that are aware of their context and can therefore assimilate information to support care decisions. We aim to integrate these systems into existing home automation systems designed and marketed by our industrial collaborators. Outcomes will be underpinned by new knowledge acquisition and knowledge based decision systems.

2) A comprehensive framework for interactive home telehealth research

Funding Source: ARC Discovery Grant DP0345179

Investigators: Professor Branko Celler & A/Professor Nigel Lovell

Duration: 5 Years

Funding: 2003($): 140,000

2004($): 115,000

2005($): 120,000

2006($): 120,000

2007($): 120,000

Description:

We propose the development of a comprehensive research framework for the next generation of home telecare technology. The framework will support the unattended recording of patient physiological data and allow for patient management and information review by health professionals. It will include knowledge management tools to support clinical decision making. Research will also be conducted into the development of mobile community networks and ambulatory monitoring technologies based around Bluetooth piconets. The long-term outcomes of this research will be improved patient health outcomes in the chronically ill and a decreased overall health care expenditure by reducing hospital admissions.

Small grants and non-research consultancies

Customer Company	Service by	Service completion date	Invoice Amount incl GST	REVENUE $ (no GST)	Service Provided
GeneWorks Pty Ltd	S.Tipper	4th Feb 2002	772.20	702.00	Hire of SAM210 Teaching Laboratory
IBC Conferences Pty Ltd (The Australian Financial Review Conference	E.Coiera	27/02/2002	550.00	500.00	Speaker Fee: 3rd Annual Health Congress, 13-16 Feb-2001, Sydney Hilton)
Unisearch Ltd	N.Lovell	1/12/2001	4,118.40	3,744.00	Centralised Monitoring System (Job No 40962) @ negotiated hourly rate in 2000
National Drug and Alcohol Research Centre	H Garsden	26/06/2002	N/A	4,900.00	Programming project Stage 1 & 2
Australian Pharmaceutical Manufacturers Association	H.Garsden	23/07/2002	825.00	750.00	Programming and Data collection as per Quote ref:HG/APMA/01-2002 dated 17-July-2002
NSW Health Department (Information Management & Clinical Systems Branch)	J.Westbrook	18/09/2002	1,100.00	1,000.00	100 copies of Stage 3 Report on CIAP Evaluation
St George Division of General Practice Inc	S.Tipper	29/08/2002	165.00	150.00	Presentation, includes bookmarks set use on Internet site for a period of ONE YEAR to 30th August 2003
Royal College of Surgeons of Edinburgh	E.Coiera	26/09/2002	N/A	8,774.00	E.Coiera for travel airfare England (HCMMII Oct 02)
2002 TOTAL REVENUE $				**$20,520.00**	

Comparison: 2001 revenue received on a similar basis was $32,631.54

CHI Financials

Consolidated financial reports by Operating Unit

Centre for Health Informatics - Medical Informatics Laboratory
(Faculty of Medicine)

Statement of Financial Performance

for the Year Ended 31 December 2002	2002	2001
Income	$	$
(i) External Funds	1,059,577.64	908,377.48
(ii) UNSW Contribution	0.00	40,000.00
(iii) Other income	12,400.00	0.00
Total Income	1,071,977.64	948,377.48
Expenses		
(iv) Payroll	621,111.81	442,656.34
Equipment	39,558.18	84,051.06
(v) Materials	181,938.91	158,265.62
Travel	18,524.24	29,715.24
Total Expenses	861,133.14	714,688.26
Operating result	210,844.50	233,689.22
Surplus(Deficit) Bfwd from Prior Year	233,689.22	0.00
Accumulated Funds Surplus(Deficit)	444,533.72	233,689.22
(i) Includes debtors (unpaid invoices at 31-December)	304,292.97	228,827.70

Notes to the Statement of Financial Performance:
Major debtors at year-end include $220,00 (in 2001) and $250,000 (in 2002) for ARC Project owed as two invoices from Novemebr & December each year by industry partner Merck Sharp & Dohme (Australasia) Ltd; $8,774 for Prof E.Coiera travel to England (HCMMIConf, Royal College of Surgeons Edinburgh) in 2002
CHTMIL - PSW2155 received internal UNSW Infrastructure funds in 2001 from IR002 appropriation transfer from PSW2153 of $40,000. No UNSW infrastructure grant in 2002.
WHO Fellowship ($10,400) & University of Sydney 2001 project ($2,000) services by journal transfers from other UNSW units.
NHMRC PhD Scholarship Stipend (PSM4125) included in Payroll expenses
Materials expenses in UNSW financial system includes $554,767.78 internal contributions transfers (account 6921) from MEDSI projects to administrative infrastructure accounts (PSW2155) & internal transfer of $225,000 to Accumulation Fund (PS02670) which are NOT included in total as zero net effect.

Signed by Director: Prof Enrico Coiera   Signed Business Manager, Mr Steven Tipper

Centre for Health Informatics - Biomedical Systems Laboratory
(Faculty of Engineering)

Statement of Financial Performance

for the Year Ended 31 December 2002	2002	2001
	$	$
Income		
(i) External Funds	300,100.33	203,025.91
(ii) UNSW Contribution	100,000.00	40,000.00
Other income		47,851.00
Total Income	400,100.33	243,025.91
Expenses		
(iii) Payroll	212,093.24	369,334.86
Equipment	8,304.26	26,896.66
(iv) Materials	19,300.29	157,615.57
Travel	19,017.39	34,862.74
Total Expenses	258,715.18	588,709.83
Operating result	141,385.15	-345,683.92
Surplus(Deficit) Bfwd from Prior Year	-334,469.64	11,214.28
Accumulated Funds Surplus(Deficit)	-193,084.49	-334,469.64
(i) Excludes debtors (unpaid invoices)	0.00	0.00

Notes to the Statement of Financial Performance:
Excludes debtors (unpaid invoices) at 31 December annually
CHTBSL - PSW2154 received internal UNSW Infrastructure funds in 2001 from IR002 appropriation
transfer from PSW2153 of $40,000 + $47,851 from refunded Research Office levies against project
RM00102
Payroll includes Scholarship stipend expenses of $29,516.63 in 2001 against PSW2154
Significant paper-error occurred in 2001 with repeated end-of-year rollover processing of journal
adjustments: investigation results not reported to CI by mid 2002. Additional errors in 2002 UNSW
accounts processing included Lab Consumables (& 'income' c/fwd) of $20,207,369.92 (ie, >$20M) in
adjustment for a currency conversion error. This amount is unrealised and does not reflect the activity in
the acccount in 2002. Materials & Maintenance in 2001 includes $47,851 Infrastructure Exp - Grants later
refunded (shown in UNSW income above).

Signed by Director: Professor Branko Celler   Signed by Business Manager: Mr Steven Tipper

Centre for Health Informatics - Centre Secretariat

Statement of Financial Performance

for the Year Ended 31 December 2002		2002	2001
		$	$
Income			
(i)	External Funds	2,575.68	9,621.25
(ii)	UNSW Contribution	260,000.00	220,760.00
(iii)	Other income	9,610.00	
	Total Income	272,185.68	230,381.25
Expenses			
	Payroll	190,985.80	167,895.80
	Equipment	4,417.03	25,223.71
	Materials	19,940.66	38,163.00
	Travel	4,138.76	3,249.93
	Total Expenses	219,482.25	234,532.44
Operating result		52,703.43	-4,151.19
Surplus(Deficit) Bfwd from Prior Year		-5,688.42	-1,537.23
Accumulated Funds Surplus(Deficit)		47,015.01	-5,688.42
(i) Includes debtors (unpaid invoices)		0.00	431.20

Predominantly fees for small consults and cost recoveries from external entitites
Includes Centre internal transfers in 2001 of $300,000 from UNSW Central Allocation Funds of which
$40,000 was distributed to each laboratory (MIL & BSL) i.e., $220,000 net plus small internal transfers
(charges) of other UNSW bodies.
Services provided paid by journal transfers from NDARC ($8,090 excl GST) + hire of SAM 210 ($760.00)
other UNSW units

Signed by Directors:

Professor Enrico COIERA   Professor Branko CELLER

Signed by Business Manager: Mr Steven TIPPER

CHI Staff

Professor Branko Celler

DIRECTOR, BIOMEDICAL SYSTEMS LAB

Head of the School of Electrical Engineering and Telecommunications, Director of the Biomedical Systems Laboratory, and Co-Director of the Centre for Health Informatics at UNSW.

Branko G. Celler received his BSc in Computer Science and Physics in 1969, BE (Hons) in Electrical Engineering in 1972 and PhD in Biomedical Engineering in 1978, from the University of New South Wales, Australia. From 1977 to 1980 he was a Postdoctoral Fellow working at the John Hopkins School of Medicine in Baltimore, USA. He returned to UNSW in 1981 as a Lecturer, where he was appointed Associate Professor in 1991 and Professor in January 1997. At the present time he is Head of the School of Electrical Engineering and Telecommunications, Director of the Biomedical Systems Laboratory, and Co-Director of the Centre for Health Informatics at UNSW.

Research interests include biomedical instrumentation; signal processing and medical expert systems. Over the last 8-10 years Prof Celler has been actively involved in R&D on the application of information and communications technology in primary health care and he has a particular interest in home telecare and the remote monitoring of health status of the elderly at home.

Professional & Scientific Memberships

- Churchill Fellowship Selection Committee, NSW Chapter- Professional Category
- *Editorial Board* Journal of Telemedicine and Telecare – British Medical Association
- IEEE Transactions on Information Technology in Medicine.
- International Journal of Biomedical Measurement, Informatics and Control
- Imperial College / MIT International Consortium on Medical Imaging
- Technology (ICMIT)
- Technical Committee on Biomedical Engineering and Control
- IFAC, International Federation of Automatic Control
- Institute of Electrical and Electronics Engineers (IEEE)

Fellow

- Institute of Engineers Australia

- Australian Institution of Radio and Electronics Engineers (IREE)

President

- Bioelectronics Group of the IREE (1984-1986)

Membership on Academic Boards

- Computer Engineering Management Committee (1993-)

- Faculty Executive Committee, Faculty of Engineering University of N.S.W. (1992-)

- Head of School Advisory Committee School of Electrical Engineering (1985-1990)

- Electrical Engineering Careers Committee (1996-), Chair

Recent Competitive Funding

- ARC Linkage: Celler, Lovell: Adding a health dimension to integrated automation solutions for intelligent home. Total Funds $ 485,000

- ARC Discovery: Celler, Lovell: A comprehensive framework for interactive home telehealth research. Total Funds $ 183,000

- NICTA Program Grant: Celler, Lovell: Pervasive Bluetooth Networking with Applications in Remote Health Monitoring. Total Funds $ 100,000

Professor Enrico Coiera

DIRECTOR, MEDICAL INFORMATICS LAB

Professor Coiera is the Foundation Chair in Medical Informatics, Faculty of Medicine, UNSW. Director of the Medical Informatics Laboratory, and Co-Director of the Centre for Health Informatics at UNSW.

Dr. Coiera received his medical degree from the University of Sydney in 1982 and a PhD in computer science from the University of New South Wales in 1989. Between 1990-1998 he worked at Hewlett-Packard's Research Laboratory in Bristol as a senior research scientist and manager. In 1999 he was the first Australian elected as a Fellow of the American College for Medical Informatics. He is an Adjunct Professor in Computer Science at the University of New South Wales. He became the founding President of the Australian College of Health Informatics in 2002.

He is the author of *The Guide to Medical Informatics*, now used as the basis for many courses in health informatics. His research publications have focused on highlighting the importance of communication processes for informatics research, on informing the clinical community about the importance of new technologies like the Internet, and on technical aspects of artificial intelligence techniques for patient monitoring.

His current research centres on developing a richer understanding of the role communication processes play in clinical information tasks and his interest in interaction design has lead him to focus on economic-inspired models of information transactions. Hewlett-Packard twice has been granted worldwide patents arising out of his work, specifically in the areas of guideline-based information systems, and role-based communication services for clinical communication systems.

He has been invited to speak or give keynote addresses internationally on over 30 occasions, including at the Institute of Electrical Engineers, the Royal College of Physicians, the Royal Society of Medicine, the Commission of the European Communities, and one of the four cornerstone addresses at the 1999 AMIA Autumn symposium.

Current Research Funding, Grants and Awards

Australian Research Council

- SPIRT: Coiera, Lovell: Intelligent search engine for Continuing Medical Education, Industry Partner Merck Sharpe and Dome. Total Funds $ **1.72 million**

- Linkage: Westbrook, Gosling, Iedema, Braithwaite, Ayres, Mathieson, Coiera**.** Evaluation of the impact of information and communication technologies on organisational processes and outcomes: A multi-method approach. **$1.04 million**

NSW Department of Health

- Evaluation of the Clinical Information Access Project. 2000-2002: **$500,000**

- Communication behaviours in the health system. 2000-2002: **$310,000**

National Institute of Clinical Studies

- *Coiera, Westbrook, Gosling:* Comparison of effectiveness of online bibliographic and clinically focused evidence access to answer clinical questions 2002: **$92,952**

Professional & Scientific Memberships

Editorial Boards

- HealthInsite

- 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

Professional memberships

- Fellow, American College of Medial Informatics

- Member, American Medical Informatics Association

- Member, British Medical Association

Other current appointments:

- NHMRC E-guidance working party

- NSW State Health Department - Member, Clinical Projects Planning Committee

- OpenClinical – Member Scientific Advisory Board

- HIC 2003 – Chair scientific committee

- Medinfo 2004 – Member Scientific Programme Committee

A/Prof Johanna Westbrook

Johanna Westbrook was appointed as Associate Professor in January 2001 and is also the Program Manager for the Evaluation Stream in the Medical Informatics Laboratory.

Associate Professor Westbrook joined CHI in 2001 as Evaluation Program Manager. Johanna is an epidemiologist and her expertise centres on the evaluation of health care and information systems. She holds qualifications in health information management (BAppSc (MRA) *Syd*), health services management (MHA *UNSW*) and epidemiology (GradDipAppEpid, PhD *Syd*). Johanna has held several senior positions within the health sector including, Quality Manager St. Vincent's Hospital Sydney, and Manager of the NSW Health Outcomes Program for the NSW Department of Health.

Prior to joining the Centre for Health Informatics, Johanna was Head of the School of Health Information Management at the University of Sydney. During her time at the University of Sydney Johanna designed and taught undergraduate and post-graduate subjects in health care evaluation, epidemiology, and research methods. She co-ordinated the development of the School's special courses for international students and led the design and development of Masters programs in Health Informatics (the first in Australia), Health Information Management and Clinical Data Management.

In 2000 she received the prestigious national Australian Society for Computers in Learning in Tertiary Education (ASCILITE) award for exemplary use of electronic technologies in teaching and learning in tertiary education for the design of the *Health Care Game*.

Her experience in evaluation is extensive and ranges from studies at an organisational level to the analysis of large health datasets to examine quality of care and health outcomes at state and national levels. She has conducted several large epidemiological studies including assessment of the prevalence of gastrointestinal conditions in the community and the long-term outcomes of patients with dyspepsia and gastro-oesophageal reflux. She has over 80 research publications. A/Prof Westbrook has applied her evaluation skills to the tertiary education sector with studies of the effectiveness of online education and evaluations of undergraduate and postgraduate degree programs. Her expertise in this area was recently acknowledged with an invitation to write a chapter on the use of the Internet for medical education to be published by Oxford University Press in 2002. In 2002 she led a successful $2.1M ARC grant application to evaluate

the impact of information and communication technologies on health care organisational processes and outcomes.

Competitive Funds Received 2002:

- **Westbrook JI**, Gosling, AS (2002), Evaluation Framework for point of care clinical systems, NSW Health Department: $68,000
- Coiera, EW, Sintchenko, V, **Westbrook, JI**, Tipper, S (2002), A review of electronic decision support activities in different healthcare settings in Australia, Commonwealth Department of Health & Ageing: $104,000
- **Westbrook JI**, Gosling AS, Iedema R, Braithwaite J, Ayres D, Mathieson T, Coiera EW (2003-2006), Evaluating the impact of information and communication technologies on organisational processes and outcomes: a multi-disciplinary, multi-method approach, Australian Research Council – Linkage project scheme, Industry partner NSW Health: $2,196,427 ($1.1M cash)

A/Prof Nigel Lovell

DEPUTY DIRECTOR (ENGINEERING)

Nigel is an Associate Professor in the Graduate School of Biomedical Engineering UNSW. He was appointed as Deputy-Director of the Centre on its formation in 1999.

Nigel Lovell received the BE (Hons) and PhD degrees from the University of New South Wales (UNSW), Sydney, Australia. He has worked at the University of Technology, Sydney and as a Visiting Professor in the Faculty of Medicine, Johns Hopkins Hospital. He is currently a Faculty member of the Graduate School of Biomedical Engineering and Deputy Director of the Centre for Health Informatics at UNSW. Prof Lovell has extensive commercial experience with database software, being the developer of the most popular physiotherapy practice management software in NSW.

Prof Lovell's research work has covered areas of expertise ranging from web-enabling technologies, biological signal processing, cardiac neurophysiology, visual prosthesis design and physiological modeling. He has published over 100 journal articles, books, patents abstracts and refereed conference proceedings, been awarded over $6 million in R&D and infrastructure funding, and been involved in organizing over 20 conferences and workshops. Over his career he has completed a similar number of industry and Government consultancies.

He serves on the Editorial Board for "Physiological Measurement" and as Associate Editor for "Transactions on Information Technology in Biomedicine". He is the Bid Convener and Vice-Chair of the Executive Committee for the "Joint World Congress on Medical Physics and Biomedical Engineering" in Sydney, August 24th - 29th, 2003.

Prof Lovell serves as an elected member of the Administrative Committee of the IEEE-EMBS, which is the largest international biomedical engineering professional society. He currently is the Vice President of the IEEE EMBS (2002 and 2003). In addition, he is currently the IEEE-EMBS web-master. For his major contributions to the IEEE in this and other areas, in 2000 he was awarded the prestigious Millennium medal.

Steven Tipper

BUSINESS MANAGER

Steven was appointed as Business Manager of the Centre for Health Informatics in February 2000.

Steven is the Business Manager, responsible for Centre administration and strategic planning support to the Directors for projects and research development. This includes human, financial & physical resources planning and day-to-day business management activities utilising central and project budgets. Steven holds a Bachelor of Applied Science (Biomedical Science) Degree from the NSW Institute of Technology (1979) and Master of Health Administration Degree from the University of New South Wales (1989), a Commission as an Officer in the Australian Army (served 1983-1986) and is a Fellow of the Australian College of Health Service Executives.

Steven has over 20 years experience in the public healthcare sector before joining the Centre to apply his scientific, academic and administrative skills. He is well known from his work as a Hospital Scientist (Clinical Microbiology, St. Vincent's Hospital Sydney 1979-1989) and a variety of positions over five years in hospital and Area-based health administration at Director of Administrative Services level or similar (South Western Sydney Area Health Service 1989-1995). He has also been a TAFE tutor/demonstrator (Biological Sciences, Granville 1996) before returning to St Vincent's as Manager of the New South Wales Medicines Information Centre (1997-2000) where he reformed practices in drug information services and provided consultancy on Commonwealth-funded projects in the area of health

information management (IT/IM) and polypharmacy national projects (eg, DiNCQUMGP, ADIN). He has an Adjunct Lecturer appointment in the Department of Physiology & Pharmacology, School of Medical Sciences, Faculty of Medicine, University of New South Wales. From mid-2001 to the present he has been an elected Board Member of the Health Informatics Society of Australia Ltd, continuing in 2002 as the Treasurer, and as an Executive Committee member of the HISA (NSW) Branch of the Society. Steven has actively promoted health informatics by presentations (n = 10) in the last year to a wide range of professional groups at workshops, seminars and conferences. In 2002 he also authored with Centre colleagues the Electronic Decision Support Taskforce Report.

Professional Memberships/Interests

Australian College of Health Service Executives (Fellow) FCHSE.CHE

Health Informatics Society of Australia, Board Member (Treasurer) and NSW Branch Executive Committee member

External Grants (independent research excluding Centre for Health Informatics streams)

- April – June 2002 total $136,000. Electronic Decision Support Taskforce Report Sintchenko V, Westbrook J, Tipper S, Mathie M, Coiera E *"Report on electronic decision support activities in different healthcare settings in Australia" In Electronic Decision Support for Australia's Health Sector, National Electronic Decision Support Taskforce, Commonwealth of Australia, (2003).* Response to the National Electronic Decision Support Taskforce (RFT 157-0102) completed June 2002, presented to the Health Ministers in their meeting of 29 November 2002 in Brisbane. NEDST report website: http://www.health.gov.au/healthonline/nedst.htm

Dr Sophie Gosling

RESEARCH SCIENTIST – EVALUATION

Sophie was appointed as a Research Scientist in the Evaluation Research Program in January 2001.

Dr Sophie Gosling joined the Centre for Health Informatics in January 2001, as research scientist in the evaluation research program. Sophie is a Clinical Psychologist. She received a first class degree in Psychology in 1989 from the University of Bristol. She qualified as a Clinical Psychologist in 1993, and received a Doctorate in Clinical Psychology in 2000, from the South Thames (Salomons) Clinical Psychology Training Programme and Canterbury Christ Church University College. She also holds a post-

graduate diploma in Systems, Organisations and Families from the Tavistock Clinic and University of East London.

She worked as a practicing clinical psychologist in London for seven years, specialising in paediatric and community services. As part of a multi-disciplinary team, she helped to establish and run a specialised mental health service for adolescents. She conducted a number of projects, including a client satisfaction survey, changes in attendance rates to clinic appointments, an analysis of service users and an evaluation of a children s group.

In 1998 she set up a new service for children and families with HIV. Her doctoral thesis was based on this work. She is a member of the Australian Psychological Society and is a NSW State registered psychologist. She is a foreign affiliate of the British Psychological Society.

As project officer in the Faculty of Pharmacy at the University of Sydney, she worked on research evaluating a specialised service in community pharmacy for people with diabetes.

Her research interests include health informatics evaluation, clinical decision making processes and use of information technology, paediatric psychology and HIV.

Competitive Funds Received 2002

- Westbrook JI, Gosling AS, Iedema R, Braithwaite J, Ayres D, Mathieson T, Coiera EW (2003-2006)Evaluating the impact of information and communication technologies on organisational processes and outcomes: a multi-disciplinary, multi-method approach Australian Research Council Linkage project scheme $2,196,427 ($1.1M cash) Industry partner NSW Health
- Westbrook JI, Gosling, AS (2002)Evaluation Framework for point of care clinical systems NSW Health Department $68,000

Nerida Creswick

Nerida is a Research Scientist, working part-time in the Evaluation research program since May 2002. Since February 2002, Nerida has also worked as a part-time research assistant at the School of Health Information Management at the University of Sydney. Nerida graduated with a Bachelor of Applied Science (Health Information Management) (Honours Class I) from the University of Sydney in 2002. Between 1999 and 2002 Nerida held a number of part-time positions including working as a research assistant for Laeta Pty Ltd and undertaking clinical data classification and entry at the Family Medicine Research Centre at the University of Sydney.

Rosemary Spencer

RESEARCH SCIENTIST – COMMUNICATION

Rose was appointed as a Research Scientist in the Communication Research Program in January 2001.

Rosemary joined the Centre for Health Informatics as a Research Scientist in the Communication Research Program in January 2001. Rosemary is a registered nurse who has worked in a variety of clinical settings including: psychiatry, diabetes education, and intensive care nursing. She received a first class honors Degree in Nursing from the Australian Catholic University, Sydney in 1995 and a postgraduate Diploma in Psychiatric Nursing from the University of Melbourne in 2000. She also obtained a Master of Arts (Cognitive Science) from the University of NSW in 1999.

Pamela Logan

RESEARCH SCIENTIST - COMMUNICATION

Pam was appointed as a Research Scientist in the Communication Research Program in August 2001.

Pamela is a Research Scientist with the Communication research program. Between 1989 and 1993 Pamela held a number of positions as registered nurse in a variety of clinical settings both in the UK and New Zealand. These areas included: trauma/orthopaedics at the Alexandra hospital, Redditch, UK; surgery/urology at Guys Hospital in London; elderly care/palliative care/young disabled at the Parklands Mercy Hospital, Auckland, New Zealand; maxillo/facial surgery, Guys Hospital, London. From 1993 nursing experience became more community focused, initially as a community nurse in Central London and then as a registered health visitor until moving to Sydney at the end of 2000.

Qualifications:

- 2000: Master of Science awarded distinction (Health Sciences) University of London, UK
- 2000: ENB Registered nurse prescriber, UK
- 1996: Diploma in Community Health Care (Health visiting) NESCOT/Open University, UK
- 1995: ENB 998 Teaching and Assessing in clinical Practice, UK
- 1993: ENB 934 Care of Patients with HIV/Aids, UK
- 1989: Certificate of Nursing (RGN) Mid-Worcestershire School of Nursing, UK

Hugh Garsden

<div style="background:navy;color:white;text-align:center;">

SENIOR SOFTWARE ENGINEER

</div>

Hugh was appointed as the Senior Software Engineer for the Centre for Health Informatics in January 2000

Hugh Garsden received his BSc in Physics in 1980 from the University of Queensland, and his BSc (Hons) in Computer Science in 1990 from the University of Adelaide. He also studied some psychology as an undergraduate. He has been working mostly in research and development in the fields of Software Development and Biomedical Science, applying his skill as a software engineer and as a scientist.

In 2000 he joined the Centre for Health Informatics as a software engineer and is also in charge of the Centre's web site. His work has spanned a wide range of programming methodologies within many varied domains. He has implemented and maintains the Web site for the member database of the IEEE EMB Society (worldwide). He has contributed to research in speech recognition, programming languages and health informatics.

Memberships
- Member, IEEE (incl. Engineering in Medicine and Biology Society)
- Member, Health Informatics Society of Australia

Qualifications:
- BSc. (Hons.) (Computer Science)

Research Interests
- WWW Software Development
- Smart+Wireless Internet
- Biomedical Signal Processing
- Software Project Management
- Artificial Intelligence, Cognitive Science
- Software Engineering for Scientific Applications

Dr Tatjana Zrimec

PROGRAM CO-ORDINATOR – HEALTH INFORMATICS

Tatjana was appointed as a Senior Lecturer in the School of Public Health and Community Medicine in January 2002. She is based in the Medical Informatics Laboratory.

Dr Tatjana Zrimec joined the Centre for Health Informatics, as a senior lecturer, in February 2002. Her main focus has been on developing a new Master of Health Informatics program. Tatjana is a computer scientist. She received her Bachelor of Computer Science in 1977, Master of electrical engineering in 1980 and Doctor of Philosophy degree in 1990 form the University of Ljubljana, Slovenia.

She worked as an academic since her graduation at the University of Ljubljana. In 1998 she was promoted to Associate Processor and worked at the same university until 2000. She moved to the University of Sydney in 2001 with a desire to continue research in Medical Imaging.

Her research career began in the Biocybernetics and Robotics Laboratory of the University of Ljubljana. She was involved in developing systems for computer control of experiments in biocybernetics. Later, with her appointment as an assistant professor, she moved to the Artificial Intelligence Laborator. She was interested in applying Artificial Intelligence in Medicine and she was involved in the development of several expert systems for medical applications.

After her PhD, she was awarded a Fellowship for Postdoctoral Study at The Turing Institute, Glasgow, UK, by The Royal Society. She worked in the robotics laboratory, investigating adaptive control. She also spent six months as a research fellow at the University of New South Wales. In 1993 she received two-year grant from the Digital Equipment Corporation and by the Slovenian Ministry of Science and Technology to begin work in Medical Imaging.

Her work in Medical Imaging was directed toward exploring new possibilities of image processing by using information from heterogeneous sources. This involved the modelling of anatomical organs, image fusion and computer graphics. In recognition of this work she was awarded a Best Paper prize for the paper "Knowledge representation for model-based image processing in medicine" by the International Society of Applied Intelligence in 1995.

Her research interests include Medical Imaging, Knowledge-based Image Processing, Visualisation, Knowledge Discovery and Data Mining, Robotics and Machine Learning.

Competitive Funds Received 2001

- Sowmya A, Zrimec T, Compton P, (2001) Learning Medical Image Knowledge, Australian Research Council, (Linkage – Project, 2002 - 2004 , $ 410 000)

Luis Chuquipiondo

PROJECT MANAGER – QUICK CLINICAL

Luis was appointed in June 2001 as Project Manager, Quick Clinical Project.

Luis Chuquipiondo received his Bachelor degree in Industrial Engineering from the University of Lima, Peru; his Graduate Management Certificates from the Australian Institute of Management and Deakin University, Australia and achieved AQF Level 5 in Project Management in 1999, CPMG. Currently, Luis is undertaking a MBA (Tech Management) course.

Luis' expertise expands beyond the IT Project Management arena to that of Management and Business Process Re-engineering. As [Senior] Project Manager/Director & Consultant, Luis has worked for large corporate and consulting organizations such as Peakhour, CSC, IBM, Australian Trade Commission, Woolworths and Telemovil (and IT&T operator in South America). The focus of Luis work has been on the delivery of high-tech IT solutions on behalf of his employers to clients such as NAB, Medibank Private, WorkCover South Australia, Shopfast.com, Aon Risks Services, Universal Music Group (UMG), Ultramere/Tee-Book, and MarchiFirst, amongst others.

Luis' consultative project management work has covered areas of expertise ranging from software development using web-enabling technologies to client-server applications and infrastructure implementation projects. Luis' current role within the Centre for Health Informatics covers the management of the Quick Clinical project, a three-year $1.7 million SPIRT funded project focused on the delivery of just in time medical information to General Practitioners. The project has met all its deliverables on time and under budget. Amongst other Luis' largest projects are the Y2K upgrade of over 7,000 workstations and 200 servers and peripherals for IBM Australia (a $30 million project with over 60 team members).

Memberships

- Reg PM, Australian Institute of Project Management (AIPM)
- Member of the Association of Professional Engineers, Scientists and Managers of Australia (APESMA)
- Member of the Institute of Engineers, Australia (IE)

Qualifications:

- Diploma in Project Management (AQF Level 5), CPMG, Australia
- Graduate Certificate Management (Tech Management), Deakin University, Australia
- Business Management Certificate, Australian Institute of Management (AIM)
- Bachelor Degree in Industrial Engineering, University of Lima, Peru
- Other seminars & courses in Leadership, Business and Technology

Martin Walther

SOFTWARE ENGINEER – QUICK CLINICAL

Martin was appointed in April 2001 as a Software Engineer.

Martin received his degree in Computer Science in 1994 from the Institute of Technology Brugg-Windisch, Switzerland. In 1995 and 1996 worked at ASCOM telecommunication Systems, where he developed real-time software for digital telephony systems. Later, in 1998 Martin obtained a Master's degree in Artificial Intelligence from the University of Edinburgh, UK. Presently he is involved in the research and development of an Evidence-based Decision Support System at the Centre for Health Informatics at UNSW.

Martin's research interests are in Artificial Intelligence, particularly Evolutionary Algorithms (e.g. Genetic Programming and Algorithms), Neural Networks and Machine Learning. Another area of interest is software engineering, specifically software architecture and modeling of large-scale complex systems.

Ken Nguyen

SOFTWARE ENGINEER – QUICK CLINICAL

Ken was appointed in January 2001 as a Software Engineer.

Kenneth Nguyen received his BE (Hons) in Computer Engineering from the University of New South Wales (UNSW) in 2000. He was invited to become an Associate Lecturer while still an undergraduate for the School of Computer Science and Engineering (CSE) at UNSW. Presently he is conducting research in the area of Evidence-based Decision Support with the Centre for Health Informatics at UNSW.

His research interests lies in Artificial Intelligence, in particular Multi-Agent Systems (MAS). His recent work has involved developing a team of agents to behave intelligently in a noisy, collaborative, adversarial, and real-time domain. His work has lead him to compete in the international competition, RoboCup, representing UNSW. Ken also likes to dabble in Machine Learning and Physics.

Victor Vickland

RESEARCH SCIENTIST – QUICK CLINICAL

Victor was appointed in September 2001 as a Research Scientist.

Victor Vickland received his first degree in clinical psychology (MPsych) from the University of Lodz Poland in 1978. He gained his early research experience in the field of neurophysiology. He also worked in R&D (medical instrumentation) and as a coordinator in the field patient care and rehabilitation. Victor received his second degree in health sciences (BHSc) from the University of Technology, Sydney in 2000.

He is interested in the application of computers in medicine, information retrieval systems and evidence-based medicine. Presently he is involved in the development of the decision support system for the general practice.

Farah Magbrabi

RESEARCH SCIENTIST – QUICK CLINICAL

Farah was appointed in May 2002 following completion of her PhD.

Farah Magrabi was appointed as a Research Scientist in the decision support stream of the Medical Informatics Laboratory in May 2002. In December of the same year she submitted a PhD in Biomedical Engineering. Her doctoral thesis proposes a framework for designing home telecare. This research was carried out in the Biomedical Systems Laboratory.

Between 1999 and 2002 Farah worked as a Casual Tutor for the Learning Centre at the University of New South Wales. She received a BE (Hons I) in Electrical and Electronics Engineering from the University of Auckland, New Zealand.

Her research interests include home telecare and, the design and evaluation of healthcare information and communications technologies.

Dr Adelle Coster

RESEARCH SCIENTIST – HOME TELECARE

Adelle Coster joined the Biomedical Systems Laboratory in 2002.

Adelle Coster recieved her BSc (Honours) in Physics in 1991 and PhD in 1998 from the University of New South Wales. She joined the Biomedical Systems Laboratory as a Vice-Chancellor's Postdoctoral Research Fellow in 2000. Previous to this she spent 2 years at the Niels Bohr Institute for Theoretical Physics in Copenhagen, Denmark. In 2001 she received the Young Biophysicist Award from the Australian Society for Biophysics.

Her research interests include the biophysical modelling of the dynamics of excitable tissues, particularly the sinoatrial node in the pacemaker of the heart. She is also involved in the extraction and classification of events from triaxial accelerometer data (in collaboration with Merryn Mathie), and modelling artificial neural network dynamics, learning systems, and expectation and conditioning phenomena in networks.

Dr Coster's research interests include the biophysical modelling of the dynamics of excitable tissues, particularly the sinoatrial node in the pacemaker of the heart. She is also involved in the extraction and classification of events from triaxial accelerometer data, artificial neural network dynamics, learning systems, and expectation and conditioning phenomena in networks.

Dr Jim Basilakis

CLINICAL PROJECT MANAGER – HOME TELECARE

Jim Basilakis was appointed in January 2001.

Jim uses his clinical skills as an emergency medicine physician in the Prince of Wales Hospital Sydney. Combined with an interest in medical technology development for the design, testing and implementation of a Home Telecare System developed at the University of New South Wales. In 2002, Jim was the Clinical

Project Manager conducting a pilot trial funded by the Commonwealth Department of Health and Aged Care for the remote monitoring of elderly patients in the community of Sydney and Wagga-Wagga, providing communication and liaison between medical and engineering staff involved in the Home Telecare project.

Key achievements:

- Successful completion of the trial demonstrating technical feasibility, usability and important clinical data for impacting on patient care using a Home Telecare system.
- Successfully integrating a new technology into the current health care system, linking patients to their General Practitioner, allied health staff and tertiary hospital.
- Assisting in securing continued government and commercial funding for further development of the Home Telecare system into a second phase of manufacturing, testing and commercialisation.

Stephen Ong

HARDWARE/SOFTWARE ENGINEER – HOME TELECARE

Stephen was appointed as Hardware/Software Engineer in August 2000.

Stephen Ong received his BSc in Physics and BE (Hons 1) in Electrical in 1997 from University of New South Wales. Since then he has been working in the development of a Real Time ECG diagnosis system.

In August 2000, Stephen started work in the Biomedical System Lab as Hardware/Software Engineer. He was involved in the development of the home telecare system. He was responsible for the development of the biomedical instrumentation of the system.

Professional interests includes:

- Digital Signal Processing
- Software engineering
- Electronics
- Artificial intelligence

Khang Hyung

<table>
<tr><td>**SOFTWARE ENGINEER – HOME TELECARE**</td></tr>
</table>

Khang was appointed in January 2000.

Khang Huynh was appointed as Software Engineer to the Biomedical Systems Laboratory in January 2000. He is a conscientious, professional and hard-working fellow responsible for most of the Home Telecare software creation. Now into his third year of the Home Telecare project his efforts are concentrated on further testing and enhancement of the Home Telecare software and its related information system.

Rudino Salleh

<table>
<tr><td>**HARDWARE ENGINEER – HOME TELECARE**</td></tr>
</table>

Rudino Salleh was appointed in January 2000.

Rudino's research interests include Home Telecare System, microchip micro-controllers application, assembly language & C++ programming, pc parallel/serial interfacing, remote control via the phone, IR sensors for human temperature measurement.

Qualifications:
 B.E. University of New South Wales

Mailis Wakeham

OFFICE ADMINISTRATOR

Mailis was appointed as the Office Administrator at the Centre for Health Informatics in May 2002

Mailis joined CHI in May on a one year contract to support the Business Manager of the Centre. Her background includes an undergraduate degree in Health Administration (UNSW) and five years work experience in an administrative capacity at UTS. Her work in the CHI Secretariat has involved supporting the Business Manager in general administration and finance, and assistance with the highly successful Home Telecare Launch in August 2002, which was attended by the Federal Minister for Health.

Keri Bell

PERSONAL ASSISTANT

Keri was appointed as Professor Enrico Coiera's Personal Assistant in May 2002.

Keri is responsible for providing assistance to Professor Coiera as a Director of the Centre and administrative support to all research staff in the Medical Informatics Laboratory. During the past year she has had significant commitments to the Electronic Decision Support Taskforce project, as well as providing administrative support to the National Institute of Clinical Studies project team.

PHD Students

Dr Vitali Sintchenko

VITALI SINTCHENKO

Supervisor: Professor Enrico Coiera

Thesis topic "The use of computer-assisted decision support improves the quality of antibiotic prescribing for hospitalised patients".

Background

Given the current proliferation of antibiotic resistance in hospital-acquired pathogens and the escalating cost of antibiotic prescribing, new methods to encourage rational antibiotic use need to be developed. While the uptake of clinical guidelines has been shown to be poor, computer-based decision-support systems demonstrate promise in influencing clinical behaviour. We focus on two distinct but interconnected tasks of cognitive assessment of physician's decision to prescribe antibiotics in critical care setting and its information support. We initially study clinicians prescribing behaviour and their information needs to ensure rational evidence-based prescribing. We then design, build and trial a computer-based decision support system (DSS) that contains capabilities to both present guidelines on prescribing and also to present data feedback on past decisions to support situation assessment.

Our *general hypothesis* is that the use of computer-assisted decision support improves the quality of antibiotic prescribing for hospitalised patients. This hypothesis is based upon the following sub-hypotheses: Variation observed in the use of antibiotics could be reduced if physicians could more fully utilise the predictive information on patterns of antibiotic resistance within their institution, obtained from microbiology laboratory tests.
Variation observed in the use of antibiotics could be reduced if physicians could modify their decision-making behaviour based on the results of a computer-assisted consultation permitting access to prescribing guidelines.

Aims of the study

The *general aim* of this project is to optimise antibiotic prescribing in the critical care setting so as to reduce or delay the emergence of increasing antibiotic resistance among nosocomial bacterial pathogens.

Specific aims are:

- To test the hypothesis that optimal antibiotic prescribing in the critical care setting can reduce or delay the emergence of increasing antibiotic resistance among nosocomial bacterial pathogens.
- To design and trial a computer-based clinical decision support system (DSS), incorporating data of local resistance and prescribing patterns as well as evidence-based algorithms for antibiotic use for specific clinical indications.
- To measure the effect of the DSS use on the quality of antibiotic prescribing in a critical care setting.

Projected time-points leading to submission

First year:

- Literature review.
- Survey of Australian intensive care and infectious disease practitioners.
- Cognitive task analysis of antibiotic prescribing in ICU. Collection of baseline data on antibiotic prescribing and specific bacterial resistance patterns in the intervention site (Westmead Hospital).
- Design of algorithms for prototype DSS to guide antibiotic use in critical care using user-centred design techniques.

Second year:

- Completion and analysis of survey on evidence-based antibiotic prescribing in critical care.
- Conducted a web experiment to study prescribing decision making and information use. Statistical analysis and paper preparation.
- Design and validation of hand-held computer based evidence adaptive decision support system for critical care antibiotic prescribing task.

Third year

- 'In vivo" clinical trial of hand-held computer based evidence adaptive decision support system for antibiotic prescribing at Westmead Hospital. Pre- and post-intervention comparison of antibiotic usage and trends in local antibiotic resistance. Analysis of the decision support system's log files.
- Follow-up survey of clinicians to evaluate the system acceptance and decision satisfaction.
- Preparation and submission of papers for publication in journals and dissemination of results and software.

Daoming Zhang

DAOMING ZHANG

Supervisor: Professor Branko Celler

Thesis topic "Ambulatory Monitoring and RF transmission of Physiological Parameters"

Daoming is investigating the cardiovascular responses to running when a runner's step rate is synchronized with his heart rate. A mathematical model of the cardiovascular system has been developed for simulating the cardiovascular responses to running exercise. A portable monitoring device has been designed to measure a runner's heart rate and step rate during running exercise and transmit the measured data to a PC wirelessly in real-time.

Annie Lau
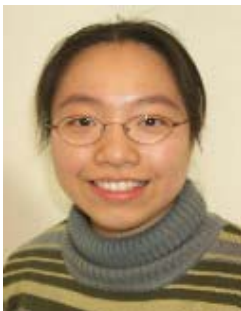
ANNIE LAU

Supervisors: Professor Enrico Coiera and A/ Prof Nigel Lovell

Thesis topic "Facilitating Evidence Based Medicine: Adaptive agent interaction for information searching – using knowledge of the individual user and the community of users"

Background

Evidence-based medicine is about integrating individual clinician's expertise with the best external evidence. There is growing pressure from policy bodies and patients to facilitate evidence-based medicine in general practice. However there are many barriers – one of them is the current lack of support for general practitioners (GPs) to obtain and use evidence-based medical knowledge, that is relevant and integrated into their work, at the point of care.

To support doctors in information searching, we suggest a computational agent approach that learns to identify, compose and apply search strategies in different circumstances. This search agent would interact with the doctor to facilitate information searching. However, how should a search agent adapt its interaction? Should an agent adapt to the individual user or to the community of users? For example: if

the user is using a query with many keywords and is getting zero results – is it better to enhance the query specification strategy, which is to provide a better version of a specified query; or is it better to suggest what other people usually do, which is to generalize the query?   Are there situations and tasks in which it is *better* to adapt to the individual or to the community of users? The areas of *agent interaction*, *information-seeking and searching*, and *individual and community adaptation* are areas I would like to explore in my PhD.

The working hypothesis is that there are circumstances in information searching in which community adaptation is better than individual adaptation, and there are also circumstances where the converse is true. The underlying assumption is that searching experience and outcome can be improved by enhancing the individual's action or by introducing how others in the community would approach the situation.

Aims and objectives

- To verify the assumption, and to test and investigate the limitations of the hypothesis
- To design and implement a prototype
- To trial the system and to understand how it impacts on GPs' information searching behaviour

Second year milestones:

- Understand community searching: identify common characteristics of successful searches, search actions and circumstances
- Understand individual searching: model individual doctor's searching patterns and habits
- Design and prototype an agent system that interacts with doctors and assists in information searching, using a community user and an individual user adaptation approach

Merryn Mathie

MERRYN MATHIE
Supervisor: Professor Branko Celler
Thesis topic "Using accelerometry for long-term home monitoring of subjects with chronic disease conditions"

Merryn's research examines accelerometry, which is a technique that allows body movement to be directly and continuously measured and quantified in a natural setting for the patient. The use of piezo-resistive accelerometers placed at the waist to measure parameters useful to long-term home monitoring of functional status in chronic disease is being investigated. The ageing of our population and the increasing

costs of hospital care have led to a renewed interest in alternative models for health care delivery. One such system is home telecare, in which the health of the subject is monitored remotely while the subject is at home.

For people living in the community with a chronic disease condition, for example, congestive heart failure, chronic obstructive pulmonary disease or a neuromuscular disorder, management of the condition so as to maximise quality of life is of primary importance. Measures of functional activity, metabolic energy expenditure and gait can provide useful information for the clinician. Parameters such as are traditionally assessed by interviewing the patient or their carer, or by utilising validated questionnaires.

It is hypothesized that accelerometric techniques, combined with intelligent signal processing, can be used to detect adverse events, such as falls, and also to provide an objective measure of clinically relevant parameters of movement in a low-cost, practical manner.

Dr Mohammadreza Rahimpour

MOHAMMADREZA RAHIMPOUR

Supervisor: Professor Branko Celler

PhD student of Biomedical Engineering (field of Home Telecare), Graduate School of Biomedical Engineering

Reza holds a Medical qualification (MBBS) from Tehran University Medical School, Iran, and commenced his PhD in 2002 to explore the consumer attitudes and preferences to introduction of modern technology. His research will develop the methodology for accessing psychological characteristics important in the design, development and deployment of home telecare systems.

Masters Students

Dr George Alvarez

GEORGE ALVAREZ

Supervisor: Professor Enrico Coiera

George commenced a Masters of Science at the Centre for Health Informatics in February 2002.

George is currently completing a Masters of Science degree by research at the Centre of Health Informatics. He is interested in the systematic cause of medical error, with a major interest in providing appropriate medical interventions based on his experience in Intensive Care. His specific area of study is the communication patterns of medical teams in the intensive care setting.

Qualifications:

- Medical school and physician training at the University of Manitoba, Winnipeg, Canada.
- Intensive Care Fellowship, University of Western Ontario, London, Canada.

Publications, Conferences and Presentations

Journals, Books and Book Chapters (2002)

B. Cesnik**, Coiera, E.W.,**, J. Davies, (2002) Commissioned report: Issues & Priorities in Electronic Decision Support, National Institute of Clinical Studies report to NHIMAC.

Braithwaite J, Hindle D, Iedema R, **Westbrook JI** (2002) Introducing soft systems methodology plus (SSM+): why we need it and what it can contribute. Australian Health Review, 25 (2): 195-202.

Celler, B.G, Lovell, N.H., Seneviratne, A. (2002). Evaluation of the State Wide Links (SWL) linked progressive jackpot system for the Department of Gaming and Racing, pp. 18.

Coiera, E.W.,, R. Jayasuriya, J. Hardy, A. Bannan, M. Thorpe, (2002) Communication loads on clinicians in the Emergency Department, Medical Journal of Australia 176 (9), 415-418.

Coiera, E.W.,, (2002) Update: Medical Informatics, Medical Journal of Australia:176(1):20

Coiera, E.W.,, (2002) When Conversation is Better than Computation, Yearbook of Medical Informatics. 2002; Springer.

Duggan AE, **Westbrook JI** (2002) Reducing community dyspepsia drug costs. Gut [letter] 51,613.

Duggan JM, **Westbrook JI.** (2002) Does vigorous resuscitation promote bleeding in haematemesis patients? www.GastroHep.com January 2002.

Gosling, AS and Westbrook, JI (2002) "Clinicians' awareness and use of online resources: A survey of 5,511 clinicians' use of the Clinical Information Access Program (CIAP)." Kensington: Centre for Health Informatics, University of NSW, p1-19. ISBN 0 7334 1965 8

Gosling, AS and Westbrook, JI (2002) "The influence of professional and organisational factors on health professionals' use of online evidence- An evaluation of the Clinical Information Access Program (CIAP)." Centre for Health Informatics, University of NSW, p1-80. ISBN 0 7334 1888 0

Kerdraon, Y., Downie, J., Suaning, G.S., Capon, M., Coroneo, M., **Lovell, N.H.** (2002). Development and surgical implantation of a vision prosthesis model into the ovine eye. Clin. Exp. Ophthalmol. 30(1):36

Sintchenko V, Westbrook JI, Tipper S, Mathie M, Coiera, E.W., (2002) Electronic decision support activities in different healthcare settings in Australia. Centre for Health Informatics University of New South Wales (pp1-156)

Sintchenko V, Gilbert GL, **Coiera E,** Dwyer DE. (2002) Treat or test first? Decision analysis of empirical antiviral treatment of influenza virus infection versus treatment based on rapid test results. J Clin Virol; 25:15

Sintchenko V. (2002) Advancing Pathology Informatics, Imaging and the Internet (APIII 2001). Scientific Session Abstracts. Arch Pathol Lab Med 2002; 126:786.

Spencer, R., Logan, P., Coiera, E.W.,., (2002) Communication Observation Manual. Centre for Health Informatics, University of New South Wales, ISBN 0 7334 1930 5.

Spencer, R., Logan, P., Coiera, E.W.,., (2002) Refinement and validation of observational and data analysis techniques to measure communication patterns in clinical settings. Report to the New South Wales Department of Health. Centre for Health Informatics, University of New South Wales, 2002, ISBN 0 7334 1929 1.

Westbrook JI (2002) Trends in the utilisation of diagnostic upper gastrointestinal endoscopy 1988-1999. Gastrointestinal Endoscopy, 55,847-853..

Westbrook JI, Talley NJ, Westbrook MT. (2002) Gender differences in the symptoms and health status of dyspeptics: A population based study. Quality of Life Research, 11(3), 283-291

Westbrook JI, Talley NJ. (2002) Empiric clustering of dyspepsia into symptom subgroups: a population-based study. Scandinavian Journal of Gastroenterology, 37, 917-923.

Westbrook JI (2002) Using the Internet for medical undergraduate education. In McKenzie, BC (editor) Medicine and the Internet, 3rd edition, Oxford: Oxford University Press, p141-153.

Journal Articles – under editorial review (2002)

Lovell, N.H., Williamson, A., Feyer, A.M. (2002, submitted). Design of a Cognitive Performance Test Battery Based on Human Information Processing for Use in Occupational Settings. Behavior Research Methods, Instruments, & Computers.

Mathie, M, Coster, A., Celler,B.G., Lovell, N.H. (2002, submitted). A theoretical and experimental foundation for the interpretation of signals from triaxial accelerometers. IEEE Transactions on Neural Systems and Rehabilitation Engineering.

Saxena, P., **Lovell, N.H**., Downe, L. (2002, submitted). Achieving Adequate Humidification of nCPAP Gases. Submitted to Australasian Journal of Physical and Engineering Sciences in Medicine.

Sintchenko V, Coiera, E.W., Iredell J, Gilbert GL. (2002 submitted). The impact of decision support on antibiotic prescribing decisions: an interactive web experiment. J Am Assoc Med Inform.

Conferences and Presentations (2002)

Bolton, P., Kirkpatrick, V., Tasker J., **Tipper, S.** (2002) "A peer educator intervention: Researching the future of GP-consumer management of polypharmacy". Conference Proceedings: National Medicines Symposium 2002, National Convention Centre, Canberra, 20-24th March.

Celler, B.G., Lovell, N.H. (2002) "E-Telehealth and Home Telecare as new community outreach programs of the modern hospital" EU Health Property Network, Dublin, 19-20th March.

Cloherty, S.L., **Lovell, N.H**., Dokos, S., **Celler, B.G.** (2002) Action potential heterogeneity assists frequency entrainment in the intact cardiac pacemaker. Proc. EMBS-BMES 2002 joint conference ISBN 0-7803-7612-9, 23rd-26th October, Houston, USA., 2 pages.

Coiera, E.W., (2002) Communication in the Emergency Department, 19th Annual Scientific Meeting Australian College for Emergency Medicine 2002, 19th November.

Coiera, E.W., (2002) The Future of Health Informatics, delivered to: Graduation residential, Royal College of Surgeons Edinburgh, Faculty of Health Informatics, 23rd October.

Coiera, E.W., (2002) The Future of Health Informatics, delivered to: Health Care Meets Medical Informatics & Innovation, Edinburgh, 22nd October.

Coiera, E.W., (2002) The Future of Health Informatics, delivered to: First Middle East Conference on Healthcare Informatics, Dubai, 21st October.

Coiera, E.W., (2002) Design of consumer consent mechanisms in an electronic environment, Electronic Consent Symposium 2002, Canberra, 16-17th July.

Coiera, E.W., (2002) Interaction Design, Invited address: IMIA Working Conference on Health Information Systems (HIS) Heidelberg, Germany, 8-10th April.

Coiera, E.W., (2002) Can communication systems improve clinical outcomes? Financial Review 4th Annual Health Congress, Sydney, February.

Coster, A.C.F., Celler, B.G., (2002) The Effects of Environment and Coupling on the Dynamics of Model Sinoatrial Node Cells. Proceedings of the European Medical and Engineering Conference EMBEC'02, Vienna, 4th – 8th December, Volume 2, pages 1178-1179.

Gosling, AS, Westbrook, JI (2002) Evaluation of the CIAP. NSW HISA Branch meeting, Sydney.

Lau, A.Y.S., Coiera, E.W., Lovell, N.H. (2002) The need for evidence-based knowledge at the point of care: what problems do general practitioners have? HIC 2002, 4th- 6th August, Melbourne, Australia, 4 pages.

Lovell, N.H., Suaning, G.J. (2002) "An electronic implant for vision", Melbourne, Australia, Retina Australia National Congress, 16-17th November.

Lovell, N.H., Coiera, E.W., Walther, M., Nguyen, K., Garsden, H., Vickland, V., Chuquipiondo, L. (2002). Quick clinical: an architecture for online decision-support in general practice medicine. EPSM Conference, 14-18th November, Rotorua, NZ.

Lovell, N. H., Celler, B. G., Basilakis, J., Magrabi, F., Huynh, K., Mathie, M., Garsden, H., Salleh, R. (2002). Managing Chronic Disease with Home Telecare: A System Architecture and Case Study, Proceedings of the 24th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Houston.

Lovell, N.H., Suaning, G.J. (2002) "Vision prosthesis: the Australian experience". Fully funded invited presentation at the Eye and Chip Congress, Detroit, USA, 6-8th June.

Lovell, N. H., Coiera, E., Walther, M., Nguyen, K., Garsden, H., Vickland, V., Magrabi, F., Chuquipiondo, L. (2002) Quick Clinical: An Architecture for Online Decision-Support in General Practice Medicine, Poster Presentation at the Engineering and Physical Sciences in Medicine Conference, Rotorua, NZ.

Lovell, N.H., Suaning, G.J. (2002) "An electronic implant for vision", Melbourne, Australia, Retina Australia National Congress, 16th-17th November, 2002.

Lovell, N.H., Suaning, G.J. (2002) "Vision prosthesis: the Australian experience". Fully funded invited presentation at the Eye and Chip Congress, Detroit, USA, 6-8th June.

Mathie, M.J., Lovell, N.H. Coster, A.C.F., Celler, B.G. (2002) Determining activity using a triaxial accelerometer. Proc. EMBS-BMES 2002 joint conference ISBN 0-7803-7612-9, 23rd-26th October, Houston, USA, 2 pages.

Mathie, M.J., Lovell, N.H. Coster, A.C.F., Celler, B.G. (2002) Determining activity using a triaxial accelerometer. Proceedings of the European Medical and Biological Engineering Conference EMBEC'02, Vienna, 4–8th December, Volume 1, pages 820-821.

Sintchenko V, Coiera E. (2002) Which clinical decisions benefit from automation? A task complexity approach. In: Health Data in the Information Society. Proceedings of the Congress of European Federation of Medical Informatics. Surjan D, Engelbrecht, McNair P. (eds). Budapest 2002. IOS Press. PP. 639-643.

Sintchenko V, Garsden H. (2002) Clinical decision support: New approach to usability study. In: Improving quality by lowering barriers. Ribbons RM, Dall V & Webb R (Eds). Proceedings of the 10th National Health Informatics Conference. Melbourne, 4-6th August, P.14-15.

Sintchenko, V. and Garsden, H. (2002). Clinical Decision Support: New Approaches To Usability Study, HIC 2002 Conference, Melbourne.

Sintchenko V. (2002) Do pathology results matter? A web experiment to assess the impact of pathology reports on clinical decisions. HIC 2002 Conference, Melbourne.

Spencer, R., Logan, P. (2002) Role-based Communication Patterns Within an Emergency Department Setting, Proc. HIC, 2002, Melbourne.

Suaning, G.J., **Lovell, N.H**., Kerdraon, Y. (2002) Evoked Cortical Potentials From a CMOS Neurostimulation Circuit in Retinal Stimulation. ARVO2002, 5th-10th May, Ft. Lauderdale, FL, USA.

Suaning, G.J., **Lovell, N.H**., Kerdraon, Y. (2002) Trans-retinal electrical stimulation using a neuroprosthesis: the effects of damage to the r-membrane. Proc. EMBS-BMES 2002 joint conference ISBN 0-7803-7612-9, 23rd-26th October, Houston, USA, 2 pages.

Suaning, G.J., **Lovell, N.H**., Kwok, C.Y. (2002) Fabrication of platinum spherical electrodes in an intra-ocular prosthesis using high-energy electrical discharge. Presented at Proc. Pacific Rim Workshop on Transducers and Micro/Nano Technologies, 22nd-24th July, Xiamen, China, 4 pages.

Tipper, S. (2002) HISA National Board meeting, Health Informatics Society of Australia (HISA), 15th February.

Tipper, S. (2002) *"MSIA Round Table meeting"* Hollywood Inn, Sydney Airport [organised by Medical Software Industry Association of Australia (MSIA)], 19th February.

Tipper, S. (2002) Presentation to Medical Undergraduates on *"The Australian Healthcare System"*, Society and Health Pilot: UNSW Medical Undergraduates, Matthews Theatre 3, UNSW, 24th July.

Tipper, S. (2002) *"Impact of Health Technology on Facilities Planning"* Centre for Health Informatics, UNSW Internal Seminar Series, 16th August.

Tipper, S. (2002) Invited Presentation: *"Quality Use of (Internet) Information in EBM Practice"* for St George Division of General Practice, St George Private Hospital, Sydney, 28th August.

Tipper, S. (2002) *CHI Home Telecare Launch* (Tyree Room, Scientia, UNSW) Launch of Home Telecare system & Centre research stream by Senator the Hon. Kay Patterson, Minister for Health & Ageing, 30th August.

Tipper, S. (2002) Invited presentation *"Health Informatics: Development Update on Healthcare IT and IM"* for ACHSE NSW Branch to Illawarra Area Health Service Finance & Administration executives, 18th September.

Tipper, S. (2002) Invited Presentation and Panel Member at session on *"Healthcare Technology supporting Aged care: Home Telecare R&D"* 3rd Aged care Building Conference, Melbourne Park Function Centre for Aged Care Services Australia, 31st October – 1st November.

Tipper, S. (2002) Workshop Presentation *"Quality Use of (Internet) Health Information for GPS"* for National Prescribing Service Program Officer, South Eastern Sydney Division of General Practice at Centre for Health Informatics, Teaching Laboratory (SAM210), Level 2 Samuels Building (F25), UNSW, 12th November.

Tipper, S. (2002) Workshop participant "Health Call Centres Meta-evaluation National Stakeholder Workshop", Hilton Hotel, Sydney for Health Services Division, Commonwealth Dept of Health & Ageing, 22nd November.

Tipper, S. (2002) Workshop participant *"HCC Standards Development Study Workshop"*, Novotel Hotel, Darling Harbour, Sydney for Health Services Division, Commonwealth Dept of Health & Ageing, 10th December.

Walther, M., Nguyen, K., Garsden, H., Coiera, E.W., Lovell, N.H. (2002) Architecture for an on-line and just-in-time decision-support for General Practice. HIC 2002, 4- 6th August, Melbourne, Australia, 4 pages.

Westbrook JI, Gosling AS (2002) Do clinicians use online evidence systems and do these systems result in improved patient care?: Results of the 2 year evaluation of the Clinical Information Access Program (CIAP). 3rd National Knowledge Resource Forum. Brisbane.

Westbrook JI, Gosling AS (2002) Health Professionals' use of online evidence. 7th NSW Telehealth Symposium. Sydney.

Westbrook, JI and Gosling, AS. (2002) Do clinicians use online evidence and do these systems result in improved patient care? Results of the 2 year evaluation of the Clinical Information Access Program (CIAP). 3rd National Knowledge Forum, Brisbane.

Westbrook, JI and Gosling, AS (2002) Do clinicians use online evidence systems and do these systems result in improved patient care? Results of the 2 year evaluation of the Clinical Information Access Program (CIAP). CIAP Librarians' User Group (CLUG), NSW Health.

Westbrook, JI (2002) Using evidence in service planning. Rural Health Planners' Workshop. NSW Health, Sydney.

Zhang D, Celler BG and Lovell NH (2002) The effects of heartbeat synchronised running on cardiovascular system. Proceedings of the 24th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, 23rd-26th October, Houston, USA

CENTRE FOR HEALTH INFORMATICS

Level 2, Samuels Building (F25)

The University of New South Wales

Sydney   NSW   2052

Telephone: (02) 9385 1270

Facsimile: (02) 9385 1813

Email:chi.secretary@unsw.edu.au

http://www.chi.unsw.edu.au