

CLINICAL IT IN AGED CARE

INTERIM REPORT
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1 EXECUTIVE SUMMARY

The Clinical IT in Aged Care project (the project) is a three-year project funded by the Australian Department of Health and Ageing (the Department) that commenced in June 2002. It forms part of the Information Communication Technology (ICT) Strategic Plan for the Aged Care Sector.

The project aims to identify and test clinical IT systems to investigate how they can support and improve the consistency of care standards and the effective delivery of quality care resulting in better health outcomes for residents in aged care homes.

This document is an interim report and includes project background and context; reports on the preliminary research findings; identifies additional research to be undertaken and recommends the commencement of the second phase of the project, a series of product trials that will run in parallel with the continued research.

In order to link the delivery of aged care services with other health care delivery sectors, the project, as an element of the ICT Strategic Plan for the Aged Care Sector, needs to interact with and is influenced by a number of national agendas, projects and reviews. Currently these include:

- the *National Strategy for an Ageing Australia*¹;
- the *Paperwork Review* (formerly the *Resident Classification Scale (RCS) Review*);
- the *Pricing Review* currently occurring in the aged care sector;
- the national health information agenda for Australia: *Health Online*² and resulting national projects relating to:
 - electronic health records via *HealthConnect*;
 - electronic medication records via *MediConnect*;
 - evidence-based support for clinical decisions via the National Electronic Decision Support Taskforce; and the
 - consistent application of medical vocabularies and information technology standards via the National Health Information Standards Advisory Committee.

This environment of exploration and questioning provides an ideal opportunity to consider how information technology, when associated with workflow review, can act as a catalyst for change within the aged care sector.

Due to the paucity of Australian-based research in this area, the project has been developed around a number of assumptions. These are that the use of clinical IT systems or tools in aged care homes has the potential to:

1. Improve the safety and quality of healthcare through improved access to and accuracy of clinical information;
2. Support and improve the collection of and access to decision support information to support clinical decisions at the point of care;

¹ Department of Health and Ageing 2002, *National Strategy for an Ageing Australia*. 2nd Edition, DoHA, Canberra. http://www.health.gov.au/acc/ofoa/ageing_policy/nsaa/nsaa.htm

² Health Online <http://www.health.gov.au/healthonline>

3. Reduce the time spent by clinicians on documentation and increase the time available for patient care; and
4. Electronically link aged care homes with health care providers including GPs and medical specialists, hospitals, and allied health care workers.

These assumptions will be tested in Phase 2.

For the purpose of this project, Clinical IT systems are defined as IT systems or tools that capture and provide data related to a clinical event. Focussed on supporting clinical decision making at or near the point of care:

- systems may include medical records; clinical documentation such as care pathways, care plans, clinical protocols, guidelines and decision trees; online ordering of referrals, diagnostic tests and prescriptions; medication administration management; viewing of pathology and radiology results; and rules-based prompts and alerts; and
- tools are specific technologies that capture and provide access to clinical information at or close to the point of care and may include: handheld devices; automated alerts to pagers or phones; and sensors to assist with monitoring the well-being of individual residents.

Preliminary research has identified many of the IT applications and tools currently used in Australian and overseas aged care homes, plus a range of clinical tools used in acute, primary and community based settings.

The Clinical IT in Aged Care project includes two phases. The first involved preliminary research (Phase 1) with ongoing research continuing for the majority of the project. The second phase will involve a series of product trials (Phase 2) to investigate how clinical IT systems and tools can support and improve care standards and deliver better health outcomes for residents in aged care homes.

The final outcome of the project will be a detailed report including case studies of existing clinical IT projects, and evaluations of the impact of each product trial on care standards and the delivery of better health outcomes for residents in aged care homes based on the assumptions listed above.

The preliminary research involved:

1. A high level scan of clinical IT systems and tools by University students, and drew on public and software vendor information sources;
2. Discussions with a range of stakeholders including aged care homes, peak bodies for aged care, and Departmental staff and committees;
3. An overview of product capability and suitability to support clinical requirements in aged care (this area requires further focus in tandem with software vendors);
4. Limited informal discussions with IT software vendors (formalised approaches are included in the next stage).
5. Identification of health IT projects that relate to or could impact on the project; and
6. A preliminary literature review.

Preliminary research findings include:

- the identification of at least 18 Australian-based aged care products (not necessarily clinically-based);
- more than 20 clinical IT systems and tools used in settings other than aged care, some of which may have relevance to the project;
- at least two systems that have been developed by aged care homes to assist in the effective management of resident care;
- a series of isolated pilots of the same medication management product that may benefit in a pooling of knowledge and resources;
- some critical factors that need to be addressed prior to the broader use of clinical IT systems or tools in aged care homes;
- an increasing interest in and willingness to use information technology by staff in aged care homes (although IT skills vary widely); and
- a range of national agendas and projects that are likely to influence the environment within which this project will proceed; and that have the potential to link the delivery of aged care services with the broader delivery of health care in Australia.

Following a review of the preliminary research findings, this report recommends proceeding to the second phase of the project in parallel with further research. In order to do this it is recommended that:

- the Department establish a project steering committee and expert reference group;
- the Department continue to promote the project through relevant channels;
- the Department consider developing case studies based around current use of Clinical IT tools in aged care homes;
- evaluation and prioritisation of initial proposals for the first round of product trials commence as soon as possible;
- contact be made with a number of unique projects/companies to obtain updated information and gauge their interest in participating in product trials;
- formalised approaches to software vendors (in aged care and other sectors) be progressed;
- further research and review be undertaken on products and relevant projects as appropriate; and
- further consideration of relevant clinical vocabulary and messaging standards is undertaken as part of phase 2.

2 INTRODUCTION

The Australian Government is taking a leadership role by collaboratively developing a national framework to improve information access and to encourage the use of information technology in the aged care sector.

The vision is to create an enabling environment that leverages information technology to improve efficiency, quality of service and care delivered to older Australians.

To achieve this objective the Australian Department of Health and Ageing has commenced development of an Information Communications Technology (ICT) Strategic Plan for the Aged Care Sector from which a series of inter-related projects have been developed. Included within these is the Clinical IT in Aged Care project.

The objective of the Clinical IT in Aged Care project is to investigate how clinical IT applications and tools can support and improve care standards and deliver better health outcomes for individuals receiving aged care. Funded by the Australian Department of Health and Ageing (the Department), the project commenced in June 2002 and will run over three years.

The project involves two phases:

- **Phase 1** – Preliminary Research:
 - to identify clinical IT applications and tools which may have potential for use in aged care homes; and
 - to identify existing health IT projects that may have relevance to residential aged care.
- **Phase 2** – Product trials, associated projects, evaluation and ongoing research that will:
 - utilise and build on the findings from Phase 1; and
 - investigate how clinical IT applications and tools can support and improve care standards and deliver the health outcomes best suited to residents in aged care homes. It is expected that the second phase will commence in mid-2003 and continue until mid 2005.

The final outcome of the Clinical IT in Aged Care project will be a detailed report including case studies of existing clinical IT projects, electronic documentation systems and reviews of product trials demonstrating how they have impacted care standards and the delivery of better health outcomes for residents in aged care homes.

3 BACKGROUND

3.1 The National Strategy for an Ageing Australia

The Australian Government launched the National Strategy for an Ageing Australia³ (NSAA) in 2002. The purpose of the NSAA is to deliver the best outcomes for all Australians regardless of age. It creates a broad ranging framework that identifies the challenges and possible responses for Government, business, the community and individuals to meet the needs of Australians as they age. Issues such as healthy ageing, independence and self-provision, mature age works, world-class care and attitudes, lifestyle and community support are addressed.

*“An ageing population has much to gain from the harnessing of advances in information technology in the health and aged care system. Information technology has a crucial role to play in quality improvement through the management of information on care standards, complaints and consumer rights. It also has the potential to improve the management of patient care by improving the flow and linking of individual patient information.”*⁴

The NSAA identifies a series of actions to meet the goals of the strategy including a number that specifically relate to advancing the use of information technology in health care and improving access to information for the older person⁵. The specific actions in relation to this are:

- expanding the evidence base for the care of older people;
- harnessing the advances in medical and information technology and reforms in health and aged care service delivery to improve management and coordination of care for older people;
- providing information that enables older people and their carers to make informed choices about their care, and increasing opportunities for older people to be involved in decisions regarding the design and delivery of care services;
- removing the barriers and recognising the opportunities for coordination of care within and across sectors of the care system;
- encouraging innovation in the method and location of care delivery to maximise health outcomes for older people; and
- implementing strategies that manage cost drivers, improve the effectiveness and efficiency of resource use across the care system and manage future demand for care services.

These initiatives will have significant impact on the existing structure and processes of aged care homes in Australia and provide an opportunity to explore how information technology can facilitate change within the sector. It is within the context of these initiatives that the Department has commenced development of an Information Communications Technology

³ Department of Health and Ageing, 2002b, National Strategy for an Ageing Australia. Second edition, DoHA, Canberra. http://www.health.gov.au/acc/foa/ageing_policy/nsaa/nsaa.htm

⁴ Department of Health and Ageing, 2002b, National Strategy for an Ageing Australia. Second edition, DoHA, Canberra. http://www.health.gov.au/acc/foa/ageing_policy/nsaa/nsaa.htm

⁵ A full list of actions for this strategy is provided in Department of Health and Ageing, 2002b, National Strategy for an Ageing Australia. Second edition, DoHA, Canberra. http://www.health.gov.au/acc/foa/ageing_policy/nsaa/nsaa.htm

(ICT) Strategy for the Aged Care Sector. The Clinical IT in Aged Care project forms part of this Strategy.

3.2 The National Health Information Plan for Australia

The Department is also the lead agency delivering the *Health Online* initiative across the health and aged care sectors. *Health Online* aims:

*To improve the delivery of health care and achieve better quality of care and health outcomes through effective and innovative use of health information.*⁶

Health Online was developed by the National Health Information Management Advisory Council (NHIMAC), in collaboration with the Australian, State and Territory governments. The Australian Health Ministers endorsed the first edition of *Health Online* in August 1999 and the revised 2nd edition in September 2001. *Health Online* promotes new ways of delivering health services, by harnessing the enormous potential of new technologies.

Specifically, the Department is collaboratively developing a national health information agenda through a range of projects investigating:

- legal, data protection, security and privacy frameworks;
- national standards for IM and IT in healthcare;
- fostering health IT research, development and best practice;
- advancing the growth of the IT infrastructure within the health sector;
- increasing the focus and support for clinical care;
- facilitating the take up of e-commerce; and
- supporting the integration and collaboration of information across care settings.

Key national projects developed from the *Health Online* action plan include:

- *HealthConnect* – proposed development of a national electronic health information network to support the collection, storage and exchange of personal health information in a secure environment;
- *MediConnect* – proposed development of an electronic patient medication record, that would be updated with prescriptions and dispensed medications and would be available for download and updating from multiple points across a secure environment; and
- National Electronic Decision Taskforce – identifying a national work program and governance arrangements required to ensure the development of sustainable, nationally integrated electronic decision support systems.

3.3 Aged Care eConnect

The Clinical IT in Aged Care project is one of several projects being managed by the Australian Department of Health and Ageing under the ‘**Aged Care eConnect**’ banner.

⁶ Health Online <http://www.health.gov.au/healthonline/>

Other 'Aged Care eConnect' projects include:

Aged Care Payments Redevelopment - a business improvement initiative that is investigating options for redeveloping the Department's aged care payment systems. The project includes the provision of an e-commerce channel for the aged care sector to transact electronically with the Department.

Ageing and Aged Care Enterprise Architecture – developing an Enterprise Architecture framework for the Ageing and Aged Care Division (AACD) to increase consistency, reliability and efficiency of information management and information technology activities in the Division.

ICT Strategic Planning for the Aged Care Sector – development of an Information Communication Technology (ICT) Strategic Plan for the Aged Care Sector. A collaborative exercise between the Department and the aged care sector involving a range of stakeholders such as aged care providers, Aged Care Assessment Teams (ACATs) and software providers.

The vision for the Strategic Plan is to:

Create an enabling environment to leverage the use of information technology to improve efficiency, quality of services and care delivered to older Australians.

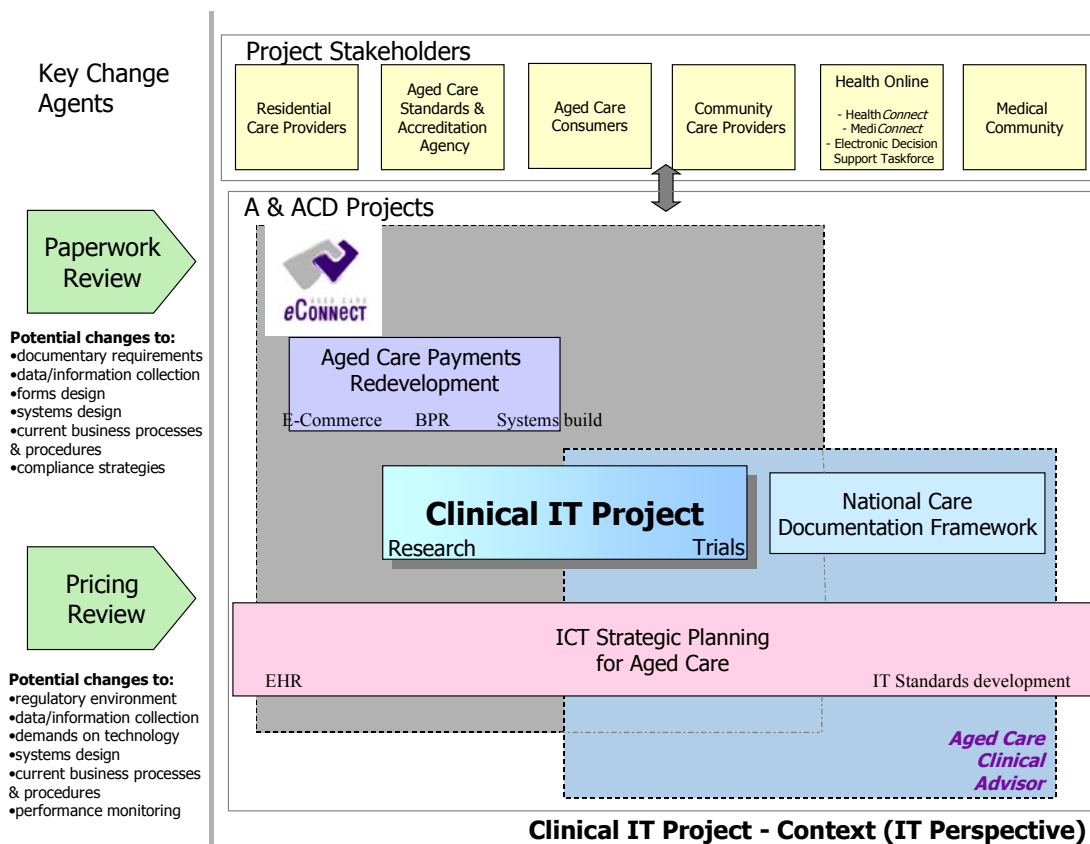


Figure 1: Describes how the Clinical IT in Aged Care Project fits together with other relevant projects in the Ageing and Aged Care Division.

Other **related** projects include:

Aged Care Evaluation (ACE) – development of software for use by ACAT teams to manage and record assessments. This project is a collaborative effort between NSW, VIC and WA State Governments. It is facilitated by the Department and involves the development of a system to support the collection of ACAP MDS v2 data and electronic transmission of the Aged Care Client Record (formerly known as the 2624 form).

Paperwork Review (formerly the Residential Classification Scale (RCS) Review) – Aged Care Evaluation and Management Advisers (ACEMA) were engaged by the Department to examine new funding models for the aged care sector to relieve the documentation burden on nurses. Further information about this project is available from the Department's Internet site at: <http://www.health.gov.au/acc/rcspage/rcsreview.htm>

National Framework for Documenting Care in Aged Care – development of a care planning documentation system for residents in aged care homes throughout Australia. A voluntary system that proposes inclusion of an assessment component, care profile, care management charts and progress notes. The system will incorporate cues for using validated clinical risk assessment instruments. A paper-based version is being trialed with aged care homes and it is expected that an electronic version will be trialed as part of the Clinical IT project.

Review of Pricing Arrangements in Residential Aged Care – develop recommendations on:

- the appropriate future public and private funding arrangements, including appropriate future indexation arrangements for the aged care sector;
- performance improvement in the aged care sector, including the appropriate use of performance indicators; and
- long-term financing of the aged care sector.⁷

Further information about this project is available from the Department's Internet site at: <http://www.health.gov.au/acc/rescare/acprtask.htm>

The Clinical IT in Aged Care project will run in conjunction with all of the above projects administered by the Department.

3.4 Clinical IT in Aged Care Project Objectives

The objective of the Clinical IT in Aged Care project is:

To investigate how clinical IT applications and tools can support and improve efficiency and quality of care for residents in aged care homes.

Quality of care for this purpose is “the extent to which a health care service or product produces a desired outcome”⁸. It is worth noting that the US Institute of Medicine defines

⁷ Department of Health and Ageing website, Review of Pricing Arrangements in Residential Aged Care page (<http://www.health.gov.au/acc/rescare/acprtask.htm>)

⁸ Australian Council for Safety and Quality in Health Care, Safety and Quality Council, Definitions Subgroup, Shared Meanings (<http://www.safetyandquality.org/definition/smsubgroupmembers.htm>)

quality of care as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge”⁹.

The aim of any quality healthcare system should be guided by six aims. At all times and for all people, the care system should be designed to be: safe, effective, timely, patient-centred (appropriate), efficient and equitable.

Safe – risk has been reduced to an acceptable level.

Effective – services based on scientific knowledge.

Patient-centred – care that is respectful of and responsive to individual patient preferences, needs and values. Patient values should guide all clinical decisions.

Timely – reduce waits and sometimes harmful delays for both those who receive and those who give care.

Efficient – avoid waste including waste of equipment, supplies, ideas and energy.

Equitable – care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location and socioeconomic status.¹⁰

Efficiency in aged care has been defined as a means to facilitate and encourage¹¹:

- *integration and coordination* – avoid fragmentation of care provision, address service gaps, allow a smooth transition between types of care and ensure that funding methodologies are, as far as possible, consistent across sectors; and
- *simplicity, transparency and accountability* – not unduly complex or obscure for consumers, providers or purchasers.

The project involves two phases:

- **Phase 1** – Preliminary Research:
 - to identify clinical IT applications and tools which may have potential for use in aged care homes; and
 - to identify existing health IT projects that may have relevance to residential aged care.
- **Phase 2** – Product trials, associated projects, evaluation and ongoing research that will:
 - utilise and build on the findings from Phase 1; and
 - investigate how clinical IT applications and tools can support and improve care standards and deliver health outcomes best suited to residents in aged care homes. It is expected that this second phase of the project will commence in mid-2003 and continue until mid 2005.

⁹ Institute of Medicine 1990, Medicare: A strategy for quality assurance. Vol1. National Academy Press, Washington.

¹⁰ Detmer, D 2001. A new health system and its quality agenda. *Frontiers of Health Services Management*, 18(1) pp3-30.

¹¹ Department of Health and Ageing, 2002. Review of pricing arrangements in residential aged care. The context of the review. Background Paper No. 1. DoHA, 2002.

The Clinical IT Preliminary Research phase (**Phase 1**) aims to identify and review existing clinical IT applications and tools, and to analyse their current use and/or potential for use in aged care homes. Although the key focus is on clinical requirements, it is crucial that information supporting the administrative/funding process is automatically captured as a by-product of care delivery.

The objectives of Phase 1 of the Clinical IT in Aged Care project are to conduct research that will:

- Identify current IT applications and tools used in Australian and overseas aged care homes in order to assess their capability and capacity to capture and exchange appropriate clinical information;
- Identify clinical information systems currently used in the broader health sector and assess their potential for application in aged care homes;
- Identify existing health IT projects and assess their potential for application or impact on aged care homes; and
- Identify state of the art IT implementations in aged care homes.

Based on the findings of the research in Phase 1, plus additional research as required, the Department will select and prioritise prospective products to trial and evaluate their ability to assist in the delivery of care for residents in aged care homes. A framework and evaluation process for the selection of projects to be considered by the Department is under development. Currently it is proposed that each project will be evaluated and prioritised against the following criteria:

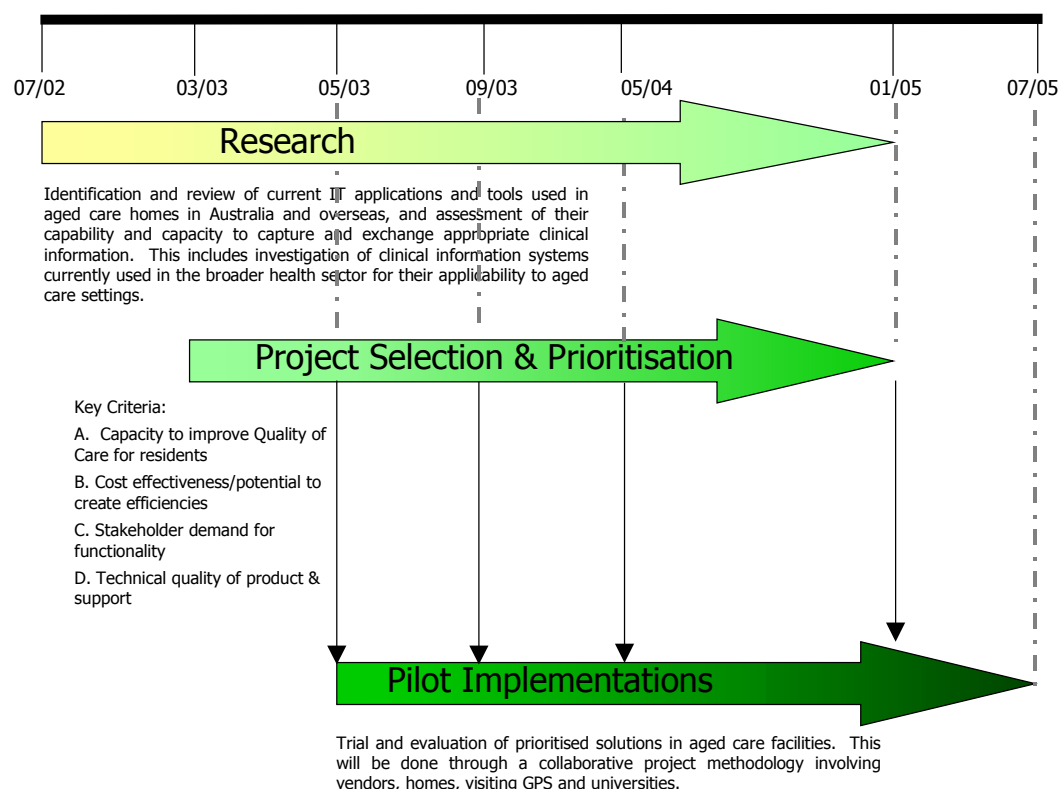
- Capacity to improve the delivery and quality of care for residents;
- Cost effectiveness, affordability and potential to create efficiencies;
- Stakeholder demand for the functionality and support for the project; and the
- Technical quality of the product/(s), and support.

Phase 2 of the project will involve the selection, trial and evaluation of prioritised projects. The product trials will be established using a collaborative project methodology involving aged care homes, IT software vendors, visiting clinicians (primarily GPs) and Universities. The Department proposes to extensively publicise the project and continue research in order to identify further products and other relevant projects for review. The Department also intends to enter into discussions with relevant IT software vendors with a view to commencing product trials during 2003.

Each product trial will be evaluated to assess its impact on residential aged care delivery and standards, and the improvement of quality of care provided to individual residents.

A detailed report will be compiled at the conclusion of the Clinical IT in Aged Care project which will collate the findings from research and report on the evaluation of the Phase 2 product trials and other relevant projects as appropriate.

3.5 Project Phasing



3.6 Project Definitions

In the context of this project, clinical IT systems or tools capture and provide data related to a clinical event. The key focus of such a system is to support clinical decision-making at the point of care. For example clinical systems may include medical record management, prescription writing and ordering, medication management, pathology and radiology results, diagnostic test ordering and reporting, and decision support systems such as care pathways, care plans, clinical protocols, guidelines and decision trees.

In an aged care home, a clinical IT system would electronically store and streamline information that is currently recorded as part of quality or continuous improvement processes. This includes functional and/or bio-psycho social assessment notes produced by the home, the information collected by the ACAT (Aged Care Assessment Team) and RCS (Resident Classification Scale) processes as well as care plans, treatment orders and multi-disciplinary notes (from medical, nursing, and allied care providers).

Information systems currently in use in aged care homes in Australia and overseas will be identified during Phase 1 of the project and reviewed for their application to support clinical information. Also, a range of clinical IT systems that have been developed and implemented in acute care (hospitals), community, and primary health care sectors in Australia will be reviewed for their potential application in aged care homes. At the same time the preliminary research phase will review existing health IT projects (in aged care homes and across the health sector generally), to assess their potential application in or impact on aged care homes.

4 DISCUSSION – CLINICAL IT IN AGED CARE

4.1 Assumptions

The Clinical IT in Aged Care project has been developed around a series of assumptions about the use of clinical IT systems in aged care homes in Australia. This approach has been taken due to the paucity of Australian based research.

The following set of assumptions has been formulated from initial consultations with aged care homes and IT vendors to the aged care sector, and a preliminary literature review. These assumptions will be tested and researched during the life of the project.

For the purposes of this project, it is assumed that clinical IT systems or tools used effectively in Australian aged care homes have the potential to:

Assumption 1 – Improve the safety and quality of health care delivery through improved access to and accuracy of clinical information;

Clinical information has traditionally been captured, stored and accessed using paper-based information systems in aged care homes. Paper-based information storage and retrieval systems have high failure rates¹² that can lead to duplication of service, delays in service or treatment, and increased risk of medical errors caused by missing or inaccessible data and inefficient manual processes. Recommendations from the US Institute of Medicine and more recently the Australian Council for Safety and Quality in Healthcare recommend the use of computer-based information systems to improve the safety and quality of healthcare.¹³ In aged care homes for example, poor access to accurate information on a resident's medication requirement can result in errors being made by the prescribers, the pharmacists or the carers dispensing the medication which can lead to adverse outcomes, including unnecessary hospitalisation for the resident.

Assumption 2 – Improve the collection of and access to clinical information in a manner that supports clinical decisions at or near the point of care;

As the medical information knowledge base continues to grow exponentially with new research findings, clinical practice guidelines, treatment modalities and pharmaceutical regimes it is virtually impossible for clinicians to keep abreast of the latest relevant information in their area of expertise. Information technology provides a key mechanism to collate and provide access to a range of evidence based and decision support information sources to answer specific clinical questions. This results in the provision of relevant, evidence-based information to support clinical decisions at the point of care. There is a lack of collated evidence based information for use in aged care homes however care guidelines

¹² Elson RB et al, An industrial process view of information delivery to support clinical decision making implications for systems design and process measures; Journal of American Medical Informatics Association, 4, 1997 p266-278.

¹³ Institute of Medicine, Crossing the Quality Chasm: A New health System for the 21st Century. 2001 <http://www4.nas.edu/onpi/webextra.nsf/web/chasm?OpenDocument>; Australian Council for Safety and Quality in Health Care, Safety Through Action — Improving Patient Safety in Australia, Third Report to the Australian Health Ministers' Conference 19 July 2002. <http://www.safetyandquality.org/index.cfm>

are being developed and increasingly being made available in electronic format¹⁴. Information technology has the potential to support the collection, dissemination and access to this information to support the clinical decision process.

Assumption 3 – Reduce the time spent by clinicians on documentation and increase the time available for patient care;

A large percentage of nursing time in aged care homes is spent on non-direct care tasks such as scheduling, documenting and communicating with other clinicians and ancillary health workers. It has been reported that documentation by nurses, including the care plan can take up to 15% of their work time¹⁵. Information technology has the potential to reduce the time spent on documentation or at least to make the documentation processes more efficient, accurate and accessible. A study which compared the use of written and computerised care plans in a long term care facility in the United States found that the users of computerised care plans increased the number of activities and interventions with a resident.

The study was not able to determine if this translated into improved patient care or if the amount of time allocated to documentation in general, and the care plan in particular, was reduced.¹⁶ The ability for visiting clinicians to electronically record their medical notes, prescribe, issue diagnostic orders or view diagnostic results at the point of care has the potential to significantly reduce their documentation time, improve the quality and consistency of their medical notes and diagnostic orders, reduce duplicate diagnostic orders, and improve the quality of the patients care by providing immediate access to medical histories and care requirements. Currently visiting clinicians who record details of care electronically are required to spend considerable time manually recording patient information at the point of care in aged care homes and to re-enter the information into their systems on return to their practice.

Assumption 4 – Electronically link aged care homes with health care providers and facilities including GPs and medical specialists, hospitals, and allied health care workers.

Clinical information systems have been developed for, and are being used to varying degrees within acute, community and primary care settings within Australia. Whilst these systems are generally more advanced than those in the Australian residential aged care sector, clinical information systems use in hospitals is not widespread and systems used in general practice are mainly focused on records management and prescribing. The move nationally (via projects such as HealthConnect and MediConnect) to maintain clinical information in electronic formats in all care settings is a major step towards linking care providers and improving appropriately authorised and secured information flows between care settings. It is therefore critical that clinical IT systems or tools developed in and used in aged care homes are able to securely share information with clinical information systems used by authorised health care providers that provide services to the residents in aged care homes.

In order to provide effective links, systems in Australian aged care homes will need to comply with commonly used standards such as HL7 version 2.4 moving to version 3.0 (for

¹⁴ For example the Online Wound Care Program at <http://www.pharmace.vic.edu.au> and the Falls Prevention Best Practice Guidelines at <http://www.safetyandquality.org> and the draft Australian Palliative Care Guidelines at <http://www.apacproject.org>

¹⁵ Miller P., Pastorino, C. 1990. Daily nursing documentation can be quick and thorough. Nursing Management, 21 (11) 47-49.

¹⁶ Daly J., Buckwater K., Maas M., 2002 Written and computerised care plans – Organisational processes and effect on patient outcomes. Journal of Gerontological Nursing September 2002 14-23.

clinical messaging and test results), DiCOM (for medical image transfer) and for relevant medical vocabulary and nursing terminology standards (once agreed). The use of ebXML (for e-commerce transactions) and XML (defining the business rules for each message) are currently being assessed. The National Health Information Standards Advisory Council (NHISAC)¹⁷ and Standards Australia¹⁸ are leading the debate and definition of standards and the development of guidelines to encourage consistent use of agreed standards. They also play a significant role in setting standards globally.

4.2 The Benefits

Based on the above assumptions, the perceived benefits for clinical IT systems in aged care homes are to improve the delivery of quality care by:

- expanding the decision support and evidence base for the care of older people;
- improving access to and the accuracy of clinical information available to nurses, carers, visiting health professionals including general practitioners and allied health workers;
- providing rules-based prompts and alerts to rapidly identify and effectively manage variations in an individual resident's care requirements; and
- improving the management, linkages and coordination of care for older people within aged care settings and across multiple care settings.

4.3 The Challenges

A series of challenges has been identified that will need to be addressed prior to clinical IT systems being more broadly implemented in aged care.

- Aged care homes generally have low level use of IT (although this is changing) and existing IT systems are primarily used for administration and accounting purposes¹⁹.
- Some clinical staff and carers working in aged care homes have limited IT skills and may be reluctant to embrace work practice change.
- While the incidence of computers in Australian aged care homes is uniformly high across all states, home types and size²⁰, existing IT infrastructure in most aged care homes is limited to one or two personal computers and at best a small network with a server that supports internal email communication and internet access. Computers are often located in the administration office and are rarely available at, or close to, the point of care.
- Residential aged care software has generally been developed to meet the requirements of the assessment and funding processes (both in Australian and international markets). The capture and subsequent use of clinical information has been added as

¹⁷ NHISAC Setting the Standards – a National Health Information Standards Plan for Australia <http://www.health.gov.au/healthonline/projects/nhisac.html>, NHISAC, February 2001.

¹⁸ Standards Australia – Health Informatics Committee IT-14 <http://committees.standards.com.au/COMMITTEES/IT-014/>

¹⁹ Department of Health and Ageing, Results of research into the residential aged care industry's use of computers and the internet. Albert Research. July 2002.

²⁰ Department of Health and Ageing, Results of research into the residential aged care industry's use of computers and the internet; Albert Research. July 2002.

an additional module from the funding/assessment perspective rather than being directed by the work processes required at the point of care.

- The aged care software market is historically fragmented and the current reviews of aged care sector funding and assessment processes is discouraging research and development in this sector.
- Many aged care homes do not have the financial or human resources, or the IT infrastructure to implement or support complex information systems in house.

4.4 The Business Processes

This project aims to provide a high level review of the potential for clinical IT systems or tools in aged care by implementing a number of trial applications in aged care homes. Each product trial will focus on meeting a particular business need.

Research has shown that while information technology can provide the tool and act as an impetus for business reforms in any setting, implementations that simply overlay existing processes with a new information system do not optimise information flows and often fail.²¹

Planning for each product trial will therefore identify existing workflows specific to the business need being addressed, and both staff and the aged care home's willingness to modify these workflows where required, will be a key criteria considered during selection of product trial sites.

Aged care clinical staff and carers working at the point of care currently follow established workflow processes. These include clinical assessment and care planning, diagnostic order placement and results reporting, prescribing and medication management, and admission/discharge and transfer between different types of healthcare facilities such as hospitals and other aged care homes.

The challenge the Clinical IT in Aged Care project addresses is the identification, trial and implementation of components of clinical information and other systems that are capable of supporting the delivery of quality care for residents. This needs to be accomplished in a low IT tolerance environment with pockets of advanced IT literacy. Where relevant, the systems will need to not only support quality care processes, but to integrate with the more administrative functions that keep the funding cycle in step with care delivery.

National strategic projects in aged care such as the *Pricing Review* and the *Paperwork Review* (formerly the *Resident Classification Scale Review*), are expected to result in changes to work processes that will also need to be considered and supported.

Aged care in Australia does not have a strong evidence-based culture and tools such as care pathways and variance reporting are not in common use. Based on the assumptions made earlier in this report, use of clinical IT systems or tools in aged care homes have the potential to improve access to and accuracy of clinical information.

²¹ Process improvement as a precursor to technology improvement. Douglas B. Felton. HIMSS proceedings February 2003

Systems and tools that are selected for trial in phase 2 of the Clinical IT in Aged Care project will need to be robust, flexible, and easy to use while requiring low on-site maintenance. This is a difficult, but not impossible task.

Implementation of such systems or components of systems will need to demonstrate a variety of quick, medium and long-term improvements in the health outcomes of residents.

4.5 Aged Versus Acute Care

The goals of residential aged care are complex and are often difficult to measure. They focus on supporting the care needs of an individual. This may include better health outcomes but is not a given. Acute care is generally episodic, focused on a specific condition, and with a primary goal of returning individuals to their previous functioning levels. In comparison, frail older people enter an aged care home when they need extra support and care in daily living for extended periods of time.

Aged care can include:

- assistance with personal care, housekeeping and accommodation;
- provision of physical and health care for a variable mix of chronic and acute conditions; and
- provision of a home-like environment that maintains rewarding social interaction and a sense of personal well-being and dignity.

For all residents there is the issue of safety. This is especially so for people with dementia. Research in acute and aged care settings has shown that information stored in electronic form reduces the potential for adverse events, specifically in the areas of prescribing and medication management, disease management, and patient safety.²²

The potential benefits of clinical information systems in acute care²³ can be grouped into three broad categories²⁴:

1. Improved quality, outcomes and safety;
2. Improved efficiency, productivity, and cost reduction; and
3. Improved service and satisfaction.

A specific Australian example is the clinical information system implementation at the Austin and Repatriation Medical Centre²⁵ in Melbourne which has noted that some of the immediate benefits were the:

- Improvement in quality and availability of clinical data;

²² See research from Australian Council for Safety and Quality in Health Care at <http://www.safetyandquality.org/index.cfm>; Clinical Information Systems: Achieving the Vision. Kaiser Permanente, February 2002; A health information network for Australia: report to health ministers by the national Electronic Health Taskforce, July 2000. <http://www.health.gov.au/healthconnect>

²³ Introducing a national Approach to Electronic Health Records in Australia: A Health Information Network for Australia <http://www.health.gov.au/healthconnect/publications/publications.html#other>

²⁴ Clinical Information Systems: Achieving the vision. Kaiser Permanente. February 2002

²⁵ Towards the Electronic Health Record. The Austin and Repatriation Medical Hospital Experience. V Moritz and D. Scordel. HIC 2002 Proceedings.

- Availability of access to important or urgent information for the appropriate clinical staff;
- Improved legibility of requests or progress notes;
- Improved communications with General Practitioners;
- Ability to easily generate lists and barcode labels for pathology or diagnostic requests;
- Ability to quickly access information which provides an overview of a patient;
- Improvement in patient confidentiality; and the
- Simplification of reporting requirements.

Although this example is sourced from an acute care setting it demonstrates the potential for systems specific to aged care environments to improve the timely and effective communication of prioritised, accurate, and relevant information to enable care providers to make informed clinical decisions.

Clinical information systems have been implemented in a range of acute and community care settings however these systems are relatively immature and the benefits in many cases are still to be proven.

A number of larger aged care homes have reviewed clinical information systems developed for the acute care sector. On the surface there appear to be similarities in the system requirements between acute and aged care clinical information systems, however the workflow process in aged care homes have different activity requirements and the volume and frequency of diagnostic tests and medical referrals is significantly less than in the acute sector.

Table 1²⁶ compares IT system requirements to support the clinical process in acute care and in aged care homes.

Table 1: Acute Versus Residential Aged Care IT System Requirements		
Clinical Process	Acute Care	Residential Aged Care
1. Assessment and Care Planning	• Clinical discipline-specific care plans or critical pathways • Case mix groups based on medical diagnosis • Focus on the arrest and control of medical symptoms and conditions • Focus predominantly on patient	• Interdisciplinary management of standardised care plan • Medical diagnoses likely to vary over period of care • Focus on functional activities of daily living • Focus on residents and family

²⁶ This table is an adaptation of a table published in Canada by Mariana Catz et al. An Ageing Population: Challenges to the Electronic Health Record Development, Electronic Healthcare Vol1 No 3 2002 p16-23.

Clinical Process	Acute Care	Residential Aged Care
2. Orders and Results Reporting	• Clinical order entry of pharmacy, laboratory, radiology tests and referrals to other clinical specialties • High-volume tests from multiple departments • Results required within short time span • Alert to abnormal results • Clinical departments are usually in-house	• Reliance on interdisciplinary orders • Orders may be placed from GP or specialist's rooms • Low-volume tests from one or two departments • Orders by exception require higher priority • Urgency of results varies. Can be completed over weeks, not hours in some cases • Alert to abnormal results • Clinical departments are outsourced or referred out
3. Admission, Discharge and Transfer	• Multiple across a variety of settings within a day • Resource utilisation statistics based on waiting lists, average length of stays, patient acuity, and complexity of co-morbidities • Bed management review highly optimised due to high turnover, high demand and scarcity of beds and staff • First come, first served in public settings • Elective and emergency encounters • General patient history • Health insurance eligibility checks	• Minimal and usually between fixed settings • Resource utilisation statistics focused on classification levels and the presence or absence of specific clinical entities eg disruptive behaviours, urinary incontinence • Priority-based waiting lists with ACAT referral tracking and criteria-based admission into some units • Periodic resident leave of absence while bed held • Detailed resident history and patterns • Contact information complex related to power of attorney, living wills, and financial issues • Funding and means-tested eligibility checks for financial charges
4. Billings and Accounts Receivable	• Medicare billing • Private Health Insurance Plans, Fee for Service, some private payments • Departmental charges, billing upon discharge • State funding, hospital specific cost allocation between departments	• Resident Entry Record • Resident Classification Scale (RCS) and government funding; some private payments • Monthly payments with some advance private pay • Prospective payment systems based on RCS status

4.6 Community Care

The community care sector delivers health services in the home and community settings over short episodic events or over extended periods of time. Clinical information systems that support the delivery of care in community settings tend to have an increased focus on Activities of Daily Living (ADLs) and preventative population health measures than their acute care counterparts. This may result in clinical IT systems developed for community settings being more relevant to aged care homes.

Several community care systems that are currently used in Australian settings were investigated. Examples include:

The Royal District Nursing Service (RDNS) in Victoria has implemented a system which supports client information for both clinical and management purposes, which includes:

- referral, admission, and transfer;
- financial and diagnostic coding;
- client visit and contact recording;
- client and debtor billing;
- staff or client rostering and scheduling; and
- reporting and data export .

Future plans for this system include incorporating assessment and clinical pathways functionality. The system can be accessed at some RDNS sites via handheld computers, thereby supporting staff who require access to information across multiple sites and locations.²⁷

Population Health Management System - a primary health care population health management system for the provision of planned health care to Australia's Indigenous population. Based on customisable, electronic care plans that have evolved to manage well person health checks and chronic disease management. It is installed in more than 56 Aboriginal Health Services and has the capacity to assist medical practitioners distribute the work associated with disease prevention and management to nurses and other health-workers in the community and could have application in aged care homes.

Northern Territory Community Care Project - a community case management system used by the NT Department of Health and Community Services to improve the delivery and overall management of primary health and community services to the Northern Territory's 200,000 residents. The Department operates five hospitals, 45 urban and rural community health clinics and approximately 50 work units providing specialist aged and disability, child welfare and mental health services to a client population spread over the entire Northern Territory. An electronic health record system allows authorised clinicians to document and access a complete health record from the point of care.

4.7 Building Blocks for Clinical IT in Aged Care

The Clinical IT in Aged Care project recognises that for clinical information systems to be developed and implemented successfully in aged care homes, a range of building blocks will need to be in place.

The preliminary stage of this project assumes that these building blocks will include:

- Access to IT infrastructure situated close to the point of care;
- A basic level of IT literacy for users will need to be established;

²⁷ RDNS Innovation http://www.rdns.com.au/innovation_03-frames.html

- User interfaces in IT systems will need to cater for a variety of expected IT literacy skills dependent on the expected user group;
- Agreed clinical terminology and vocabulary;
- Standardised documentation including care plans, evidence based guidelines, or agreed protocols and care pathways;
- Standardised Quality Indicators; and
- Agreed messaging standards.

5 THE PROJECT: PHASE 1 – RESEARCH

5.1 The Research Objectives

The objectives of Phase 1 were to conduct research to:

- Identify current IT applications and tools used in Australian and overseas aged care homes in order to assess their capability and capacity to capture and exchange appropriate clinical information;
- Identify clinical information systems currently used in the broader health sector and assess their potential for application in aged care environments;
- Identify existing health IT projects and assess their potential for application or impact on aged care homes; and
- Identify state of the art IT implementations in aged care homes.

5.2 Research Methodology

The following methodology has been developed to achieve the above research objectives:

1. Conduct a high level scan of clinical IT applications or tools, and aged care information systems that are currently on the market and from public information sources and to assess their potential for use in aged care homes;
2. Identify current health IT projects that have potential application for aged care homes;
3. A literature review to source state of the art IT applications in use in aged care homes.
4. Consult with aged care providers and clinicians working in aged care homes to ascertain their understanding of the benefits and issues in relation to implementing clinical information systems, and identify any related projects or implementations; and

While Phase 1 covered preliminary research, research will actually continue throughout the life of the project.

5.3 Project Team

The Clinical IT in Aged Care Project research team for the preliminary research project consisted of:

Project Manager:	Heather Grant – E-Commerce Strategy Unit, Aged and Community Care Division, Australian Department of Health and Ageing
Project Advisor:	Joanne Ramadge - Clinical Advisor in Aged Care, Aged and Community Care Division, Australian Department of Health and Ageing

Project Coordinators: Sarah Warner - Health IT Consultant, M&S Warner Pty Ltd
Sally Glass - Health IT Consultant, Patona Services Pty Ltd

5.4 The University Research Project

A university research project was conducted between June and November 2002 to identify existing clinical IT applications or tools. This research was conducted by students from the University of Wollongong and the University of Sydney.

The students used the same methodology to review health sector and aged care sector clinical IT applications so that the information obtained could be jointly compared.

5.4.1 University Research Project Team Composition

A research team was established comprising of:

- Information Technology 4th Year and Masters students from University of Wollongong;
- Staff of the Initiative for e-Health at the University of Wollongong; and
- Project Research Coordinators, Sarah Warner and Sally Glass who managed and mentored the University of Wollongong students during this research project and collated the results.

In addition the Project Research Coordinators liaised with the School of Health Informatics at the University of Sydney where this research project was included as coursework for the third year students completing the Health Information Management Degree. For ethical reasons the University of Sydney was not able to allow the Project Research Coordinators to directly brief or mentor these students through their project. As a result there were some misunderstandings in the research requirements that resulted in mixed research outcomes.

5.4.2 University Research Project Methodology

The University of Wollongong students were fully briefed by the Project Research Coordinators on the overall objectives and aims of this research project. The students then selected a specific area (or areas) for research. Some students chose to work individually and others in teams.

Each student or team of students submitted a research proposal that outlined:

- the selected research area;
- their research methodology, including their proposed method of assessment of the product/technology to improve quality of care in aged care homes; and
- a project plan detailing key milestones and deliverables.

A Project Selection Template (*Appendix B - Research Template A*) was provided to each student or team to assist with the development of their research proposal and plan.

Students were encouraged to propose innovative ideas for research over a broad-range of clinical IT products or a specific area or areas of expertise or a product. Suggested research areas were:

- aged care clinical information systems currently in use in Australia (including trials, pilots etc);
- aged care clinical information systems currently in use in USA, Canada, or UK; and
- existing clinical IT products / tools used within the broader health sector to support for example:
 - electronic health records
 - results reporting
 - prescriptions and medication management
 - decision support systems
 - bio-monitoring

The Associate Professor and the Project Research Coordinators reviewed each student research proposal. Amendments were made in discussion with the student(s). The Local Research Coordinator and the Project Research Coordinators provided mentoring to each student or project team as they progressed with their research project.

5.4.3 University Research Product Identification and Assessment

Each research student was required to obtain information and make a basic assessment of the product(s) potential capacity and capability to support and improve care standards and deliver better health outcomes in aged care. They were directed to source product information from company websites, product brochures, and interviews with the product developers and/or users of the system. Specifically the product(s) technology, components/functionality were identified using the Research Templates in *Appendix B*.

5.4.4 Shared Master Product Listing

A master list of IT software vendors/products has been developed and will be maintained during the life of the project. IT software vendors with clinical IT products were identified. Information about each company and its products were sourced by the students via web searches, trade magazines, directories, industry knowledge, etc. The list was a shared document across the research team and provides an ongoing resource that will be updated by the Project Research Coordinators during the life of the project.

5.4.5 Student Reports

Each research student was required to draft a report on their specific area or topic, evaluating products with potential capabilities for application in aged care and noting any product gaps or areas requiring further product development.

A key outcome from this research project was to identify a range of IT applications that have the potential to support and improve clinical care in aged care environments. A product evaluation template was developed to guide students through the evaluation process (see *Appendix B - Research Templates*). It was also expected that a standardised evaluation structure would facilitate the compilation and analysis of all the findings from the research project. Students were encouraged to adapt the evaluation template to suit their topic area as required. Students submitted final reports that included details of their research findings and discussions of their product evaluations. These reports were reviewed and assessed by a panel of Australian Department of Health and Ageing officers and the Research Project Coordinators incorporating expertise across clinical aged care, information communications, technology, and health research using an agreed assessment criteria (see *Appendix E*).

5.5 Research into Australian Health IT Projects/Products

This component of the research phase is being conducted by the Project Research Coordinators and involves the identification of current health IT projects or products that may have application or impact on aged care homes. This information was sourced directly from government departments, health providers and IT vendors.

5.6 Consultations with Residential Aged Care Providers and Clinicians

The Project Research Coordinators have commenced discussions with a range of aged care homes via telephone, email and site visits to identify aged care homes that have interesting IT application implementations specifically in relation to the use of clinical information. The Clinical IT in Aged Care Project has been marketed to aged care homes by the distribution of a flyer (see *Appendix D*) that provided an overview of the project and encouraged interested homes to make contact. This flyer and supporting information about the project was distributed in *Payment E\$entials* (a Australian Department of Health and Ageing newsletter for aged care homes) and by the Department's State Offices. The flyer was also distributed by the members of aged care industry associations, ANHECA and ACSA²⁸

5.7 Literature Review

A preliminary scan of current literature was conducted by the Project Team prior to a formal global literature search that will be completed during the project.

5.8 Limitations of the Research Methodology

Due to the number and variety of clinical information systems and tools on the market it will only be possible to conduct a high level scan of the industry to assess the potential of these applications for use in aged care homes and select potential products for the product trials.

It is not the intent of this project to conduct a detailed assessment of clinical information system requirements and business process design for aged care homes. Product trials will aim to address specific business issues relating to care delivery. Specific workflow processes will be reviewed during the trials, however it is expected that review of all processes will be required prior to any full-scale implementation.

²⁸ ANHECA <http://www.anheca.com.au> and ACSA <http://www.agedcare.org.au>

This is especially relevant due to the level of potential workflow change that may result from the *Pricing Review* and the *Paperwork Review* (formerly the *Resident Classification Scale Review*).

Therefore, the clinical information system product assessments will be based only on key functional component requirements and will be dependent on information being made available from the IT vendors.

6 SUMMARY OF STUDENT RESEARCH – Preliminary Findings

The student research findings provide the project with a preliminary base of information that identifies a range of products for further review. These preliminary research results should not be considered conclusive as many students experienced difficulties in collecting adequate product information and analysing its relevance to aged care homes.

Contributing factors included:

- the reluctance of software vendors to provide product information to students;
- the amount and tenor of product information provided on company websites and in sales brochures; and
- the range of backgrounds and understanding of healthcare requirements demonstrated by participating students.

Details of the research methodology and project teams are provided in the previous section.

The preliminary research findings provide a broad environmental scan of existing systems and tools and will form the basis for more focused and selected research.

6.1 Preliminary Research Project Findings – Product Identification

The preliminary research project findings can be grouped into the following categories:

- Australian aged care information systems.
- Overseas aged care information systems.
- Results reporting information systems.
- ePrescribing and medication management systems.
- General clinical systems.
- Barcoding and document scanning systems.
- Mobile technology devices.
- Bio-monitoring systems.

The Clinical IT in Aged Care project does not play a role in endorsing specific products, therefore information about IT companies has been treated as commercial in confidence and a generic summary of the key findings is provided below. It is emphasised that these findings are preliminary and require systematic review and follow up. Also information gathered for products within each category will require verification and further analysis.

Student recommendations where given, are provided for completeness but do not represent the views of the Department or the Clinical IT in Aged Care Project Coordinators.

6.2 Australian Aged Care Information Systems

Three Australian Aged Care Information Systems were reviewed.

All information provided requires validation as information gaps exist especially in regard to the nature and use of the care planning systems that were identified as a function in the three products.

Future product development strategies in the areas of results reporting, eprescribing / medication management, and decision support will also be required.

Formalised approaches to all Australian aged care software vendors will need to be made in Phase 2.

Student Recommendation: no recommendation.

6.3 Overseas Aged Care Information Systems

Student research into the overseas aged care information systems identified a few market leaders in aged care information systems in North America and United Kingdom. No product searches in the Scandinavian region or Japan were undertaken.

Further information is required about these products in order to be able to understand and assess their potential use and suitability for the Australian residential aged care sector.

Student Recommendation: further investigation of eight overseas products is warranted.

6.4 Result Reporting Information Systems

Research findings for result reporting systems included some useful technical information about a range of pathology and a few radiology ordering and reporting information systems. Unfortunately the relevance of these systems to the clinical context in aged care homes was not clearly identified.

Visiting GPs or specialists in aged care homes generally initiate the diagnostic test order and in many cases these orders may be made from the GP's surgery or the specialist consulting rooms.

The volume of diagnostic orders and results reporting directly by the GP or specialist from aged care homes is likely to be low, however the test results form an important component of a resident's clinical information, and efficient access and storage of the information is required. A system that links into for example, an existing GP results reporting information system would provide access to this information at the point of care.

As noted in section 3 of this report, the limited IT infrastructure in most aged care homes means that results reporting systems will more than likely need to be browser-based using standard messaging tools in order to communicate accurate and timely results between the pathology or radiology laboratory, the requesting GP or specialist and the aged care home. An Application Service Provider model may be the most cost-effective and practical delivery infrastructure to be considered. Most systems evaluated supported interface standards such as HL7, PIT, and XML. Many software products are moving away from PIT to HL7 or XML in line with national standards development paths.

Student recommendation: two browser-based products are worthy of further consideration. Both products interface with commonly used GP Clinical Desktop products.

6.5 ePrescribing and Medication Management Systems

The research conducted into ePrescribing and Medication Management products was the most comprehensive of the student research projects. The research highlights the importance of medication management for the aged and complexities of existing paper-based prescribing and medication information practices within aged care homes.

In addition to obtaining product information, staff at two aged care homes were interviewed by the students to provide a better understanding of the business processes, information flows, issues and requirements for prescribing and managing resident medications in aged care homes.

The importance of three-way linkage of medication information between the prescribing physician, the pharmacy and the aged care home was the key finding from this research. This will be a crucial component to successful use of prescribing and medication management systems in aged care and is a facet of the *MediConnect* project²⁹.

The ePrescribing segment of the clinical IT market is currently undergoing substantial activity with several product trials underway or due to commence. The need for significant development work on the decision support aspects of such systems was also identified in the National Electronic Decisions Support Taskforce's report in November 2002³⁰.

Verification of research data and further analysis of the relevance of products identified (and additional existing products) in aged care homes will be required.

Given the increased focus on clinical decision support generated through a mixture of market demand and the National Electronic Decisions Support Taskforce report, discussions regarding the development plans for ePrescribing and Medication Management products is required. Consideration of the Medication Management functionality (not covered by several ePrescribing packages) will need to be factored into further research undertaken.

Further research is required on all products and a scan to identify additional products for consideration is required.

Student Recommendation: further investigation of five products is warranted.

6.6 Acute Care and GP Clinical Information Systems

A range of findings resulted from this section of the research. In general, the demonstrated understanding of identified products was not matched by an understanding of clinical requirements in aged care homes. This led to limited analysis. Clinical information systems

²⁹ Previously called the Better Medication Management System (BMMS) further information on *MediConnect* is provided in section 8.2 of this report and is available at <http://www.medicconnect.gov.au>

³⁰ Electronic Decision Support for Australia's Health Sector: National Electronic Decision Support Taskforce, November 2002, <http://www.health.gov.au/healthonline/nedst.htm#report>

in use in community care were not reviewed by the students and have subsequently been identified as an area requiring research.

Significant differences in environment, process and level of activity between acute and aged care, together with the low level IT investment by the aged care sector is likely to have a major impact on the ability or advisability of implementing large-scale clinical information systems originally developed for the acute care sector. Some web-based products support relatively fast implementation timeframes but many rely on the existence of underlying departmental systems as an information source and/or repository. Many of the large-scale acute care clinical products require significant in-house maintenance and resources. Some of these products are supported over an Application Service Provider infrastructure although only limited examples of such implementations exist. The documentation of nursing diagnoses and support for activities of daily living assessment would need development in several instances.

A range of clinical systems used in General Practice settings were identified and assessed by the students. Several have similar functional capabilities. The sharing of information electronically between general practices and aged care homes was identified as a critical element in improving communications between service providers and further research to investigate the potential of GP clinical applications developed in residential aged care should be undertaken.

Other products identified that are worthy of noting for further research include:

- a web-based consumer or patient electronic record which has the potential to provide a cost-effective solution to providing an electronic health record based on the Application Service Provider model and paid on a per user or per resident basis;
- Community case management systems that incorporate many of the care planning functions required by aged care homes.

Finally an interesting assessment of a Wound Imaging System jointly developed by a large public hospital and a private research company was identified. This product could provide a potential solution for remote monitoring and care of wounds. The system operates in-house on a standalone PC using a low-speed Internet connection. Wounds are regularly photographed using a digital camera and the image stored allowing assessment (either within the aged care home or by remote consultation) of the type and adequacy of wound care provided. It includes wound image calibration tools and is capable of capturing wound information that could be included in a resident's clinical notes for later retrieval and review. This information is currently being used (in acute and community settings) to consult, manage and monitor the effectiveness of wound treatment regimes.

Student Recommendation: The standalone Wound Imaging System is recommended for further evaluation. The software appears to be a low-cost, relatively simple to implement product that could have a significant benefit in monitoring the effectiveness of treatment regimes for resident wounds in aged care homes, ensuring treatment is appropriate and timely.

6.7 Barcoding and Scanning Systems

Detailed information on a wide range of barcode and scanning products used in the healthcare sector was collated and analysed. The requirements for these products in aged care homes were not considered and if warranted, further research would be required to investigate the potential application of such products in aged care homes. The majority of products displayed document and forms scanning functionality with automated data capture.

Student Recommendation: further research of four products is warranted.

6.8 Mobile Devices and Bio-Monitoring Systems

Limited research into mobile devices and bio-monitoring systems was conducted and findings were inconclusive. A range of seventeen products from nine companies were identified.

As in other healthcare delivery settings, the potential for the use of robust portable devices to capture information during the delivery of care is high. It is recommended that further investigation of mobile devices be carried out.

In addition, the use and extent of bio monitoring systems (such as location and movement detectors, out of bed sensors, duress systems, etc) warrant further investigation.

7 DISCUSSIONS WITH AGED CARE HOMES

The following information on the status of IT systems and views on the value of clinical information systems for aged care homes are based on telephone conversations that the Research Project Coordinators held with a range of residential aged care homes. A number of aged care homes made contact with the Research Project Coordinators following a marketing campaign circulating a flyer with information about the project. In addition, the following groups were contacted directly by the Project Coordinators:

- members of the Transactions and Technology Reference Group (formerly the E-Commerce Reference Group);
- aged care homes identified by the Department's survey (see below) that were using some form of electronic care plans and were willing to be contacted;
- other aged care homes that were referred to the Project Coordinators as being of interest.

A wide range of residential aged care homes have provided information about the status and use of IT within their facility and expressed interest and support for the concept of the Clinical IT in Aged Care project. These homes have requested to be kept informed as the project develops and many have specifically noted their interest in being considered as a site for product trials.

The Australian Department of Health and Ageing's Aged Care eConnect project recently commissioned a survey investigating the use of computers and the internet in aged care homes.³¹ The survey focussed on the incidence of computing facilities in aged care homes and their use for administration purposes. It should be noted that it did not study the use of technology to support clinical or care processes. 2952 questionnaires were sent to homes on the Department database. Questionnaires were returned for 1548 homes, equating to a 52% response rate.

The key results from this survey are provided below to provide context for the status of IT within aged care homes that responded to the survey.

³¹ Department of Health and Ageing, Results of Research into the Residential Aged Care Industry's Use of Computers and the Internet. Albert Research, July 2002, <http://www.health.gov.au/acc/publicat/genpubs.htm>

Summary of Main Data

N = 1548 (all respondents)

Summary of Main Data	% of total respondents
Have at least 1 computer on site	98
Use computers for the monitoring of resident details	84
Are able to extract details from software for Department forms	39
'Very interested' or 'interested' in electronic transactions with the Department	91
Have Internet access on site	89
Have internet on site available to those who submit forms to the Department	81
Conduct electronic banking	48

Use of Software for Resident Management

N = (1293)

Common tasks performed using resident management software	% of respondents that use computers to manage resident details
Residential billing	70
Residents personal details	69
Residency occupancy details	56
Payment/reconciliation processes	56
Resident health records	25
Care plans	3
RCS assessment/resident classifications	2
Resident trust account management	2
Payroll/wages	2
Other mentions (1% or less)	4
Not answered	18

Notes: Figures total more than 100% due to multiple responses.

Source: Australian Department of Health and Ageing - Albert Research Report - July 2002

(<http://www.health.gov.au/acc/publicat/genpubs.htm>)

In summary, IT is increasingly being used within aged care homes however the focus of the above study was to assess the readiness of aged care homes to engage in e-commerce. Therefore it was completed primarily by administration managers and the financial controllers within aged care homes and did not assess the level of IT use by the clinicians and carers of the residents.

Discussions conducted with nursing staff, carers and managers of aged care homes identified the following:

- Installed computers are generally located in the administration or manager's offices and not at the nursing stations or point of care.
- In general aged care homes have only 1 PC or at best a few networked PC's across multiple sites (this number varies according to the size of the home).
- The installed software primarily supports administration, finance and care assessment processes. This is supported by the Department's survey findings as noted in the table above.

Clinical information is currently captured, stored and retrieved using manual paper based processes in most aged care homes. Interviews with a number of homes identified the use of document management systems as a part of quality assurance and accreditation processes. Documents included generally provide procedural information and are periodically updated. Most homes interviewed use paper-based care planning systems although the templates for these care plans are increasingly stored electronically and in a few cases the completed care plan is stored in the document management system with a printed paper copy used as the working copy at the point of care. The electronic copy is often only updated when the care plan is reviewed or the paper copy gets lost or becomes illegible.

At least 18 aged care software products were identified during discussions with aged care homes and via initial literature reviews for this project. It is recognised that this list is not comprehensive but represents the most commonly used aged care software products in Australia.

7.1 Key Issues for Aged Care Homes

During interviews conducted by the Research Project Coordinators, staff in aged care homes were asked to identify key issues that could affect the success of clinical applications in an aged care home. The following points were raised:

- The cost of most IT systems is prohibitive for aged care homes so any system must be clearly able to demonstrate significant cost-benefits and require limited capital, recurrent funds and infrastructure (this was specifically an issue for small, single site aged care homes);
- A limited number of PC's exist within aged care homes currently and most are based away from the point of care. Improved access to computers for nursing staff and carers is seen as a pre-requisite for the success of clinical application use;
- Many clinical staff in aged care homes have limited IT skills and will require significant time for training. In addition, many agency staff are used due to the uncertain nature of current funding. Concerns were expressed about where the time would be found to train staff and expected reluctance to allocate time for computer training;
- The location, size and type of care that a home provides will effect the requirements of the clinical applications. It is unlikely that one system will suit all requirements.

- Existing clinical systems are focused on acute care requirements and do not cater for some of the social and non-medical needs that have increased significance in aged care settings such as support for dementia and psychiatric disability.
- In relation to workflow the importance of using information documented within the care planning function to generate RCS reports was emphasised (rather than duplicating effort).
- Considerable concern was raised relating to perceptions that RCS assessors are not in favour of electronic care planning tools and the potential this may have on funding.

The research identified a number of aged care homes using or developing interesting clinical applications specifically for aged care homes. These included:

- Queensland Health's Moreton Bay Nursing Home in Brisbane, Queensland;
- Central Park Aged Care Facility in Melbourne, Victoria.

A brief summary of each implementation is provided below.

In addition discussions were held with a number of vendors currently developing potentially interesting products. Discussions with vendors will be formalised during the next phase.

7.2 Clinical Projects Developed in Australian Aged Care Homes

Moreton Bay Nursing Home

Following a 12 month selection period, Queensland Health purchased a software package for use in its 21 Queensland State Government owned nursing homes. Most of the homes previously used a DOS based hospital system. Now running for 12 months at the prime site and currently being implemented at the remaining facilities, the system includes four modules:

- A system for financial transactions and recording resident information;
- A system for receipt and withdrawal of monies;
- A human resource management system which has been adapted by Queensland Health for resident incident reporting; and
- A care planning system.

Using a centralised, low-maintenance implementation model, each of the nursing homes accesses the system across Queensland Health's Wide Area Network. In the longer term remote access to reports will be provided to authorised staff via an Intranet. The system complies with Queensland Health internal security and audit requirements.

The Care Planning Process:

The registered nurse (RN) completes a paper-based interim care plan on admission of a new resident. This is used until the 28 day assessment period has passed. During this period the relevant assessments and reporting in the progress notes are completed.

At the completion of this period the RN uses the care planning system to key in the care plan data. The care plan is not a decision support system. Clinical judgement is used to determine goals and interventions from diagnoses and observation of the resident's requirements.

Problems are not grouped according to the Resident Classification Scale (RCS), instead they are grouped under 7 Care Domains as developed by Queensland Health. For example the first care domain is Activities of Daily Living; all problems relating to hygiene, mobility and nutrition are found under this domain. The care plan prints at least one page per care domain, a low care resident may have approximately 3-5 pages, a high care resident between 5-8 pages.

Interventions and goals are grouped against each problem identified, not against each diagnosis. The RN who generated the initial care plan signs the plan and files it in the resident chart which is stored in the nurses station for appropriate staff to access. An abbreviated version of the plan using a checklist and graphic representation of daily care is produced by the RN on a proforma laminated sheet with permanent marker. This laminated sheet is placed inside the resident's cupboard to be used as a reference in conjunction with the full care plan by assistants in nursing (AIN) and enrolled nurses (EN) as they carry out the daily care.

At the end of each shift the AIN/ EN signs a Care Record to indicate that all listed interventions have been completed. All staff members report exceptions in the progress notes. The RN reviews, updates and signs off both versions of the care plan monthly. A complete reassessment is undertaken annually.

The system is currently being used in 9 Nursing Homes and will be rolled out to the other facilities during the remainder of 2003. A standardised set of validated assessment tools is currently being trialed for use in all 21 facilities. The long term plan is investigate the possibility of having these generated by the system, but completed tools will not be keyed into the system.

The majority of care plan users are RN's, however diversional therapist training is now being undertaken and speech therapists and physiotherapists use the system at the prime site. Material for the Human and Social Needs care domain is initially gathered through the use of a booklet "Caring Together" which is handed to prospective residents or their families when they attend an initial interview before being placed on the waiting list. The prospective resident and their family complete the booklet once they have been offered a place and bring the completed booklet with them when entering the home.

Training:

Each user is provided with training in basic Windows before training in the Care Plan system commences. The initial training in the new system takes 3-4 hours (depending on computer literacy levels). Training will become part of the mandatory induction program for new staff. Each site has a nominated "plan care facilitator" who works with users the first time they attempt to complete a care plan for a resident and is then the first reference point for users with problems before the Queensland Health Help desk is called.

Key Benefits:

- Provides a standardised care planning process, which uses technology to support clinical decisions, rather than replace clinical decision making.
- The system was developed to meet the resident care needs, not to meet the perceived requirements of the RCS.
- Combines information systems with simple, easy to use manual systems to support the daily routine (eg. the laminated daily care sheet placed in the resident's cupboard).

Central Park Aged Care Facility

Central Park Aged Care is a five-storey, 176 bed high care inner-city facility. A detailed review of their care planning processes and RCS tools and software available on the market was undertaken in 1999. Central Park management decided their key requirement was a tool to facilitate the process of care delivery, supporting and providing management, staff and residents with direct outcomes on a day-to-day basis. Central Park was disappointed to find that all systems reviewed focused predominantly on reporting requirements rather than workflows associated with care delivery.

The system

For a number of reasons Central Park decided to work with an existing provider of automated nurse call and dementia management systems to the home, and a local infrastructure provider to develop the care planning capabilities of these existing systems and to integrate staff rostering, attendance and physical security. A committee including the owners, senior management, clinical specialists and nurse educators managed the development process. The system has been in use for 18 months (as at October 2002). The next phase of the project – automated scheduling – is expected to be finished in December 2003.

The process

On a resident's entry to the home a 3-day care plan (initial care plan) is generated by a Residential Care Manager in association with the family and stored electronically with a photo of the resident. Appropriate assessments are scheduled and following their completion a fortnightly care plan is developed by the clinical specialist in consultation with a multidisciplinary team including medical, diversional and aromatherapy staff. This forms the ongoing care plan (care plan) which is reviewed at least six weekly. The resident's activity is unobtrusively monitored using sensors within the resident's room. Sensors include a pressure pad beside the bed and movement detectors within the room and ensuite (floor and ceiling) plus a wet bed sensor. Residents who wander and/or have the potential to cause harm to themselves and/or other residents wear an alert bracelet. A clear picture of each resident's normal behaviour and movement patterns are generated by staff observations and supported by the analysis of data captured by the system and the fortnightly care plan is modified accordingly by the RN.

A RN who forms part of the development team, converts each care plan into a series of tasks using the system and schedules them throughout the day. This is currently a complex manual procedure which is due to be fully automated by December 2003. Scheduling is based on the organisation's generic assessment of how long each task should take and can be modified per resident if it is shown that tasks consistently take longer than expected for some residents. Each carer (RNs and AINs) is allocated to a "group" of residents per shift. Tasks are timed appropriately to form a work list per staff member and this is automated via a telephone

paging module. Using the paging module the appropriate staff member is notified by telephone (text message with optional acknowledgement and confirmation that the task has been completed) as each task falls due. Telephones have been used for this purpose for 3 months and while some staff confirm by phone (records the date, time and ID into the system), others choose to print and verify that tasks were completed by signing the task list at the end of the shift.

RNs and AINs are issued with proximity cards used for physical security (access to the building), time and attendance logging and access to the computer network (with the additional security of a password). Agency or casual staff are assigned a proximity card for the shift based on the position they fill for that day.

Typical workflow

As the carer arrives for work they swipe a sensor at the nurses station. This brings up their allocation of residents for the day on a touch screen monitor and identifies which telephone they should use. They can view and/or print a copy of the care plan for each resident or a consolidated task list that requires their attention. Agency or casual staff are stepped through an introduction to the home including typical procedures and care parameters plus security procedures which they can refer to during the shift. Variances from the care plan are captured either by the carer notifying the system that a task has not been completed via telephone and recording the reason in the nursing notes (written) or are recorded only within the nursing notes.

Care plans are typically reviewed at least 6 weekly by the clinical specialist and revised as required in consultation with the staff and the written notes.

Although the process of alerting staff to care tasks is fairly regimented within the current system it is relatively early in its development cycle. The system appears to be well thought of by staff and is simple to use. It extends the functionality of an existing system (potentially a low cost alternative) and is capable of being supported remotely in an ASP model. Further research into the linkage between the system and RCS report generation needs to be carried out to determine any impact on the quality of care provided

7.3 ePrescribing and Medication Management Projects underway in Aged Care

In addition to the above projects a series of independent ePrescribing and basic medication management trials of the same product have been identified in four aged care homes.

The product tested is being used as a reporting tool between the general practitioner and the home or as a stand-alone prescribing and medication chart within the home.

8 RELATED HEALTH IT PROJECTS

Several health IT projects, some national, some location specific projects in early planning, implementation and testing phases are identified within this section.

These projects have been identified by the Project Research Coordinators as having the potential to interact with the Clinical IT in Aged Care project or as a model for consideration during the project's assessment phase.

8.1 HealthConnect

HealthConnect (<http://www.health.gov.au/healthconnect/index.html>) is Australia's proposed network of electronic health records that aims to improve the flow of information across the health sector. Currently in a 2 year research phase, if developed in full, it would allow consumer (including residents in aged care homes) health information to be collected electronically, safely stored and exchanged between authorised health care providers within strict privacy guidelines.

Governed by the HealthConnect Steering Committee and managed via a joint Australian / State staffed project office located within the Australian Department of Health and Ageing, this high profile project receives input from Consumer groups, State and Territory Health Departments, IT vendors, Private Hospitals, General Practice and Community groups.

The consumer health information could include clinical diagnoses, treatments, test results and prescribed medications. All information would be collected in an electronic format at the point of care subject to the consent of the consumer.

A series of trials is planned to test components of the network of which the first two commenced in September 2002 (Clarence district of Tasmania and Katherine in the Northern Territory). These proof-of-concept trials will test the concepts of collection, storage and exchange of health information and test specific components such as privacy, consent and event summaries rather than the entire network.

The project is working closely with the Better Medication Management System (see below) to effectively include medication related information.

Potential for HealthConnect linkage to Aged Care Clinical IT Product Trials

Any aged care clinical IT system included in the product trials should have the ability to:

- generate a summary of a health event in the required format and lodge it for access by authorised people (subject to consent of provider and resident or resident's representative). An example of an event may be admission to hospital from an aged care home; and
- request and receive a summary of a health event (for example, discharge from hospital back to an aged care home or to a different home).

8.2 MediConnect

MediConnect is formerly known as the Better Medication Management System (BMMS) (<http://www.medicconnect.gov.au/index.htm>). The MediConnect project aims to make a current medication record and medication history accessible for viewing and update by authorised people including prescribers, dispensers and consumers, subject to the consumer's consent. Working closely with the HealthConnect project (see above) the implementation of MediConnect is expected to provide improved levels of access to information about a consumer's medicines, reductions in medication related adverse outcomes, and reductions in hospitalisation related to medication problems.

Coordinated by the Australian Department of Health and Ageing, a broad range of organisations are closely involved in the project through the MediConnect Development Group (a Ministerial advisory body). Representation on this group includes Council on the Ageing but no specific aged care home representation.

MediConnect will undergo a 2-phased field test in Launceston and Ballarat commencing in 2003. The objective of the Field Test is to provide a base to encourage the confidence of the medical and pharmacy professions and consumers in the MediConnect processes and data. It will inform future discussion about policy options for the MediConnect legislation and processes, including the privacy framework and governance arrangements. Phase 1 of the Field Test will focus on technical testing ensuring that the core functionality operates successfully. Phase 2 will test the full functionality of the system. The involvement of aged care homes in Phase 2 of the Launceston and Ballarat Field Test is being discussed.

Potential for MediConnect Linkage to Aged Care Clinical IT Product Trials

Any medication management/prescription management system trialed as part of the Clinical IT in Aged Care project should have the ability to allow authorised people to:

- access a resident's current MediConnect medication summary*; and
- update the MediConnect summary*.

(* subject to the consent of the resident or the resident's representative)

8.3 Electronic Discharge / Referral System (NSW)

Hunter Area Health Service (based in Newcastle NSW) is the first of the potential NSW sites to install an Electronic Discharge / Referral System.

A web-based application, the product is expected to provide information to be drawn from core applications to provide fast and accurate discharge summaries and referrals as a component of NSW Health's HealthConnect strategies.

8.4 Population Health Management System

Predominantly used in indigenous health centres, the Population Health Management System is used in community settings to monitor and make decisions to improve the health of specific population groups.

The patient information and recall system identifies individuals who are due for health checks based on known parameters (eg age, gender, known disease state).

Queensland Health have trialed the System in the Torres Strait and Northern Peninsula regions and will be introducing it into 50 health centres in North Queensland and around 12 sites in central and southern Queensland over the next two and a half years. The product is also used in Western Sydney.

Opportunities for aged care

This product provides user friendly and innovative options to identify, schedule and review individual care and assessment requirements based on peer-reviewed protocols.

Discussions with the vendor to identify their interest in adapting the existing model for aged care homes are recommended.

8.5 Internet Access to Pathology Ordering and Results

The first of an expected series of trials to test secure ordering and receipt of pathology results across the Internet as part of the Pathology and General Practice Software Integration Project (PaGSIP) is occurring in Ballarat, Victoria.

The Australian Department of Health and Ageing, through the General Practice Computing Group, is commissioning these projects to accelerate the adoption of nationally endorsed standards in electronic health data exchanges, in support of patient related communications between health professionals in acute and primary care settings and care coordination.

In this trial a GP clinical desktop program is being integrated with the health messaging framework provided by the Collaborative Centre for eHealth (CceH) at the University of Ballarat.

Opportunities for aged care

This series of projects is in early stages and although not within the scope of the project, has the potential to provide pathology ordering and results reporting into aged care homes. It is recommended to monitor the progress of PaGSIP projects and assess their potential for incorporation into systems that may be trialed.

8.6 GP / Residential Aged Care Interface

Arising from discussions about after hours primary medical care, the Department's Victorian State Office has established a Sub-committee of the Victorian Advisory Committee on General Practice (VACGP) to examine issues regarding the interface between General Practice and aged care homes.

Consisting of representatives from Divisions of GP, AMA, Royal College of Nursing Australia, Pharmacy Guild, Consumers, Carers, State Health, Aged Care Provider Industry Peak bodies, DVA and Australian Department of Health and Ageing, the GP/Residential Aged Care Sub-committee aims to improve the access and coordination of primary medical care to residents of aged care homes in Victoria. The sub-committee has developed a workplan to address four priorities during 2003:

- GP issues.
- Medication Management Interface between GPs, pharmacists and aged care.
- Information Management / Information Technology.
- Promote the uptake of Enhanced Primary Care items.

It is believed that the sub-committee is considering pilot medication management implementations.

8.7 Falls Risk Assessment and Management System

This project (conducted by the University of Melbourne, Department of General Practice, Swinburne University and the National Institute of Ageing) developed, implemented and evaluated an evidence-based falls risk assessment and management system within the framework of the Australian General Practice Data Model and Core Data Set.³² Using the data model and term set developed from clinical, population health and professional development perspectives for falls prevention, the prototype system attempts to help clinicians identify and prevent falls in patients at risk. The falls prevention information can also be accessed using a pre-defined application program interface specification over an Internet connection in XML based message format. This provides software developers with an open platform to incorporate decision support for falls prevention within their clinical software.

Opportunities for aged care

This research project has resulted in an extensive collection of information and investigation into the workflow and decision support requirements for falls management in the elderly. A prototype decision support software knowledge base has been developed using a controlled vocabulary which has potential to link into to existing clinical decision support systems. The project is worth further investigation to see how the application could be further developed, tested and integrated with clinical software for use in aged care homes.

8.8 Integration of GP Managed Home Telecare with Established Clinical Services for Ambulatory Care

This project has been conducted by the University of NSW, Centre for Health Informatics³³ to establish, trial and evaluate an integrated disease management program for individuals with chronic diseases, aimed at providing cost effective, needs driven health advice, support and monitoring through home telecare. A home telecare system has been developed for the management of chronic disease at home. The system includes hospital in the home functions which were developed with the GP Research Centre at the South Western Sydney Area Health Service as part of their chronic disease management requirements, and was then trialed in an ambulatory care environment. The product was trialed in Sydney and in Wagga Wagga in 2001.

Opportunities for aged care

This project has potential application for monitoring chronic diseases in an aged care home and the software requires further evaluation.

³² <http://www.falls.unimelb.edu.au>

³³ <http://www.chi.unsw.edu.au/>

8.9 Department of Veterans' Affairs project - Central Coast NSW

The Department of Veterans' Affairs (DVA) is involved in a collaborative project on the Central Coast of NSW with the Brisbane Waters Private Hospital to make healthcare data from a central secure database available to DVA, the hospital and local GPs serving veterans³⁴. Discussions are underway to involve additional hospitals and GPs on the Central Coast.

Infrastructure and some software, plus secure storage facilities will be provided by a NSW software provider and the project is being monitored and evaluated by HealthConnect.

Given the significant numbers of aged care homes in the Central Coast region catering for veterans and veterans' families, it is recommended that this project be monitored for its relevance to the Clinical IT in Aged Care project. It is further recommended that liaison with DVA be maintained to explore mutual opportunities for the Australian Department of Health and Ageing and the Department of Veterans' Affairs.

³⁴Further information available at <http://www.dva.gov.au/health/ebiz/branch.htm#health> and <http://www.smarthealth.com.au/>

9 PRELIMINARY RESEARCH – CONCLUSIONS and RECOMMENDATIONS

Preliminary research has identified many of the IT applications and tools currently used in Australian and overseas aged care homes plus a range of clinical tools used in acute, primary and community based settings.

The research was gathered via the following processes:

- a high level scan of clinical IT products by University students, predominantly from publicly available information sources;
- discussions with a range of stakeholders including aged care homes, peak bodies for aged care, and Departmental staff and committees;
- an overview of product capability and suitability to support clinical requirements in aged care (this area requires further focus in tandem with software vendors);
- limited informal discussions with IT software vendors (formalised approaches are to be included in the next stage).
- identification of health IT projects that relate to or could impact on the project; and
- a preliminary literature review.

The preliminary research findings (described in sections 6-8) provide a sound basis for more detailed research and trial product implementations.

It is expected that the following processes that build on the preliminary research findings will be progressed in Phase 2 of the project:

1. Ongoing Research and product / project identification will occur through a number of channels including a public promotion of the Project to encourage and obtain information on new products and projects. This research is expected to involve:

- further examination of current clinical IT applications and tools used in Australian and overseas aged care homes and assessment of their capability and capacity to capture and exchange appropriate clinical information;
- further examination of clinically-related information systems currently used in the broader health sector and assessment of their potential for application in aged care homes;
- further examination of existing health IT projects, assessment of their potential for application or impact on aged care homes and establish project liaison where relevant;
- further examination of state of the art clinical IT project implementations in aged care homes. This will include discussions with aged care homes that have developed their own systems.

- a global literature review of aged care information systems with specific focus on state of the art information systems or tools used in North America, the UK, Europe especially the Scandinavian Countries, New Zealand, and Japan.
2. Evaluation of products for trial and other projects put forward for consideration:
 - will be based on a protocol that ensures a consistent framework is applied to assess and prioritise products and projects (endorsed by the Steering Committee);
 - will apply to submissions resulting from the public announcement as well as ad hoc proposals directly related to the project that are brought to the attention of the project team by other means; and
 - is expected to result in the Steering Committee endorsing the selection of a number of product trials and related projects.
 3. Implementation of product trials and other endorsed projects and evaluation of outcomes.

Recommendations

Whilst detailed research continues in the areas identified above, it is recommended that Phase 2 of the project be initiated.

In order to do this, it is recommended that:

1. The Department establish a project steering committee and expert reference group;
2. The Department continue to promote the project through relevant channels;
3. The Department consider developing case studies based around current use of Clinical IT tools in aged care homes;
4. Evaluation and prioritisation of initial proposals for the first round of product trials commence as soon as possible;
5. Contact be made with a number of unique projects/companies to obtain updated information and gauge their interest in participating in product trials;
6. Formalised approaches to software vendors (in aged care and other sectors) be progressed;
7. Further research and review be undertaken on products and relevant projects as appropriate.
8. Further consideration of relevant clinical vocabulary and messaging standards is undertaken as part of phase 2.

It should be noted that the Clinical IT in Aged Care project has the potential to link into projects such as those evolving from the *Health Online* action plan at some time in the future and not remain in isolation from the wider health sector. It is important that links with other projects continue to be established for maximum benefit to be achieved in the long term.

GLOSSARY OF ABBREVIATIONS

Abbreviation	Definition
ACSA	Aged Care Services Australia
AIN	Assistant in Nursing
ANHECA	Australian Nursing Homes and Extended Care Association
AMA	Australian Medical Association
ASP	Application Service Provider
BMMS	Better Medication Management System
CceH	Collaborative Centre for eHealth
CCOW	Clinical Context Object Workgroup
DVA	Department of Veterans' Affairs
EN	Enrolled Nurses
GP	General Practitioner
HL7	Health Level Seven
HTML	Hypertext Markup Language
ICT	Information Communications Technology
IT	Information Technology
ODBC	Open Database Connectivity
PaGPSIP	Pathology and General Practice Software Integration Project
PIT	Pathology Information Transfer
RCS	Resident Classification Scale
RDNS	Royal District Nursing Service (Victoria)
RN	Registered Nurse
SSL	Secure Socket Layer
SQL	Structured Query Language
XML	Extensible Markup Language

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APPENDIX A



Clinical IT in Aged Care

Research Brief



1 Project Objectives:

There are two objectives to this research project:

- To identify and review current IT applications and tools used in Australian and overseas residential aged care organisations in order to assess their capability and capacity to capture and exchange appropriate clinical information; and
- To identify and review clinical information systems currently used in the broader health sector for their applicability in aged care environments.

2 Project Background:

This research project is being conducted for the Department of Health & Ageing. It forms the first stage of a three year project which, through a series of pilot implementations, will investigate how clinical IT applications can support and improve care standards and deliver better health outcomes in residential aged care homes.

The Clinical IT project aims to identify clinical IT applications, their uses and potential for use in aged care settings. Although the key focus is on clinical IT requirements, it is crucial that information supporting the administrative/funding process is captured and used, where relevant, to generate effective, practical tools that assist in managing and delivering each individual resident's care requirements.

A clinical information system is a system that records and provides data related to a clinical event. The key focus of a clinical information system is to support clinical decision making at the point of care. For example clinical information systems can include medical records, prescription writing and ordering, medication management, pathology and radiology results ordering and reporting, and decision support systems such as care pathways, care plans, clinical protocols, guidelines and decision trees.

In residential aged care, a clinical information system would electronically store and streamline information that is currently recorded as part of quality or continuous improvement processes. This includes the functional assessment or bio-psycho social assessment notes produced by the home to support the ACAT (Aged Care Assessment Team) or RCS (Resident Classification Scale) processes as well as the nursing care plans, nursing notes and GP or other medical practitioner notes.

There are a number of commercial clinical information systems currently available on the market. These systems have to date been implemented in a range of health organisations but primarily in the acute care sector (hospitals). A few systems have been implemented in primary care notably at the GP level.

This project will run in conjunction with the Aged Care *eConnect* project, also administered by the Department of Health and Ageing. The Aged Care *eConnect* project is examining options for redeveloping Aged and Community Care Programme systems leveraging e-commerce platforms. One of the larger tasks currently undertaken by these systems is the payment of around \$3.9 billion in subsidies to providers of aged care on behalf of residents. A description of the process surrounding payment of these subsidies is contained at Appendix A.

3 Project Description (Phase 1)

The purpose of this research phase is to investigate clinical information systems and to assess their capability and capacity to meet the clinical information needs of the clinicians working in residential aged care homes.

Due to the range and diversity of clinical IT applications/tools that exist, the research phase of the project will be conducted by a team of university students from a number of Australian universities. Students from the health service, nursing and IT faculties are being invited to participate. Each student will be able to select an area or areas of research that they are interested in undertaking. Students may choose to deliver across the board research into clinical IT applications or they may select a specific area of expertise or a specific product. The results of this research will be collated into a report for presentation to the Department of Health and Ageing. The research will be conducted between July and October 2002 with a final report collating the findings submitted to the Department in November 2002 (see section 9 for Project Plan and Timelines).

The challenge this project addresses is the identification, trial and implementation of appropriate components of clinical information systems. These systems need to be capable of supporting the care process, utilising peer-reviewed guidelines and capturing variances from the norm by exception whilst also integrating with the more administrative functions required to keep the funding cycle in synch with care delivery.

Based on the findings of this research project, it is proposed that the Department of Health & Ageing will fund a series of pilot implementations to investigate how clinical IT applications can support and improve care standards and deliver better health outcomes in aged care. It is expected that this second phase of the project may involve the participating Universities in areas of software development, implementation, evaluation and assessment.

4 Research Methodology:

The same methodology will be used to review both the health sector and the aged care sector clinical IT applications so that the information obtained can be jointly compared and evaluated. The research process will be conducted as follows:

4.1 Team Composition

A research team will be established comprising of:

- Research students from a range of Australian universities;
- Local university Research Coordinators; and
- Project Research Coordinators, Sarah Warner and Sally Glass who will manage and mentor the students during this research project and collate results.

4.2 Research Selection Phase

University students will be fully briefed by the Project Research Coordinators on the overall objectives and aims of this research project and will then be requested to select a specific research area (or areas).

Each student will be required to submit a research proposal (approximately 1 page) to the Department of Health & Ageing outlining:

- the area they have selected to research;

- their research methodology, including their proposed method of assessment of the product/technology to improve quality of care in an aged care environment; and
- a project plan detailing key milestones and deliverables.

A Project Selection Template (*Research Template A*) will be provided to each student to assist them with the development of their research proposal and plan.

Students will be encouraged to propose innovative ideas for research which may cover a broad-range of clinical IT products or a specific area or areas of expertise or a product. Suggested research areas are listed below however ideas should not be limited to this list. Research areas could include:

- Aged care clinical information systems currently in use in Australia (including trials, pilots etc)
- Aged care clinical information systems currently in use USA, Canada, or UK.
- Existing clinical IT products / tools used within the broader health sector to support for example:
 - Electronic Health Records
 - Results Reporting
 - Prescriptions and medication management
 - Decision support systems
 - Bio-monitoring

The student research proposals will be reviewed by the Department of Health & Ageing, the Local Research Coordinator and the Project Research Coordinators. Amendments will be made in discussion with the student(s) and gaps identified for allocation of further research if necessary.

These individual research proposals will form the basis of the research plan for each student or group of students. The Local Research Coordinator and the Project Research Coordinators will monitor and assess each student based on this agreed research project plan.

4.3 Detailed Research Phase

Each research student will be required to obtain information, evaluate, and make an assessment of the product(s) capacity and capability to support and improve care standards and deliver better health outcomes in aged care. The product information will be sourced from company websites, product brochures, and interviews with the product developers and or users of the system. Specifically the product(s) technology, components/functionality will need to be evaluated and assessed. Examples of the technology, components/functionality of clinical IT systems are provided in Sections 5-7.

4.4 Shared Master Product Listing

A master list of IT companies/products will be developed and maintained during the life of the project. IT companies will be identified that have clinical IT products. Information on these companies/products will be sourced by all students during their research from web searches, trade magazines, directories, industry knowledge etc. This list will be a shared document across the research team and will be managed and updated by the Project Research Coordinators. *Research Template B* provides a guide for students to the information required for the Master Company and Product List.

4.5 Individual Research and Reporting Phase

Each research student will collate and draft a report on their specific area, identifying products with capabilities for application in aged care and identifying any product gaps or areas requiring further product development. In addition the research students will report to the Project Research Coordinators on any additional information or products outside of their specialist area that may have application and require further research.

A key outcome from this research project is to identify a range of IT applications that can support and improve clinical care in an aged care environment. It would be useful (subject to availability) to collate more detailed information about the company, the product development history and future development plans, product users and information about the general technical architecture of the product. It is not essential that information is obtained in all these areas for it to be considered in this project although some basic information about the use of the application will be required. A product evaluation template has been developed to guide students through the evaluation process (see *Research Template C*). This template will be further developed with the students to assist them with the evaluation of applications within their selected research topic area. A standardised evaluation structure will facilitate the compilation and analysis of all the findings from this research project.

4.6 Consolidation and Gap Analysis Phase

The Project Research Coordinators will merge and analyse all the data obtained from the individual research team members. Identified gaps will be addressed by allocation of additional tasks to research students or commissioning limited external research as required.

4.7 Final Reporting Phase

A final report collating all the research findings will be drafted by the Project Research Coordinators and provided to all research students and stakeholders to the process for review and comment. The Final Research Report will summarise the capability of existing clinical IT applications suitable for aged care, identifying market gaps and products that have the potential for future application subject to further development.

5 Additional Research – Australian Health IT Projects/Pilots

In addition to the main research project detailed above, additional research will be conducted by the Project Research Coordinators into Health IT projects/pilots in Australia that may have application or potential impact on aged care organisations. Project managers for identified National and State health IT projects will be contacted to discuss the impact or application their project/pilot may have to the aged care environment. A summary of these projects/pilots including commentary on their application to aged care will be included in the final report.

6 Final Report

A final report will be compiled which will collate and evaluate all the above research information. The final report will include:

- An Executive Summary
- Research Methodology
- Report on the functionality of existing IT products by category.
- Summarise current health IT projects/pilots and their potential application to aged care.
- Evaluate findings and summarise the status of IT products with the capability to support clinical information for aged care organisations. Make recommendations for the development of pilot projects.

7 Project Plan & Timeframes

Task	Start Date	Completion Date
Stage 1: Research Brief - First Draft - Second Draft - Presentation of Research Brief to Steering Committee & Circulate to Universities for comment - Draft 1 page research brief marketing flyer for students - Final Research Brief	3rd June 3 rd June 10 th June 14 th June 1 st July 1 st July	28th June 7 th June 14 th June 28 th June 5 th July 12 th July
Stage 2: Review of Clinical IT Applications - Identify Universities and make first contact - Circulate and receive comments on 2nd draft research brief - Present research brief to Students - Submission & review of student research proposals - Project Management & Mentoring students - Obtain final report from each University	3rd June 3 rd June 18 th June 22 nd July (date may vary depending on 2 nd Semester commencement dates) 2 nd August 23 rd August 21 st October 21 st October	31st October 7 th June 28 th June 9 th August 23 rd August 21 st October 31 st October
Stage 3: Review of Existing Health IT Projects - List known projects & contacts etc - Contact project managers - Report on findings	29th July 29 th July 12 th August 26 th August	30th August 9 th August 24 th August 30 th August
Stage 4: Final Report - First Draft of Report - Final Report	4th November 4 th November 18 th November	29th November 15 th November 29 th November

8 Contact Details

Project Research Coordinators:

Sarah Warner, Tel: 0407 808 499, email: mwarner@gil.com.au

Sally Glass, Tel: 0407 270 356, email: glass@monocles.com

Project Officer (Department)

Heather Grant, Tel: 02 6213 4944, email: heather.grant@health.gov.au

APPENDIX A:

The following administrative process is used to assess a client's eligibility for funding for either residential or community care:

1. **Aged Care Assessment Team (ACAT) Eligibility** – A State/Territory funded Aged Care Assessment Team (ACAT) assess the client's need for residential or community care upon referral by a medical practitioner. The ACAT form (also known as the 2624 Form) captures information about the client's health status and specific health needs. The completed form recommends community care, low dependency or high dependency residential care. Dependent on the ACAT recommendation and bed availability the client is then admitted to a residential aged care facility of their choice.
2. **The Residential Entry Record (RER)** - is completed by the residential care service provider for all new residents referred by ACAT. The RER captures information about the financial circumstances of the client (means testing) and is forwarded to Centrelink or the Department of Veteran's Affairs dependent on eligibility. By analysing the form, the resident's personal contribution to care costs is calculated.
3. **The Residential Classification Scale (RCS)** - is the process by which the client's care needs are assessed. Completed and submitted by the service provider within 28 days of admission, it is the tool used to classify the level of care requirement (from 1 high to 8 low) and directly correlates to the level of funding provided by the Department of Health & Ageing for that resident's care. As a resident's care requirements change or if two years have elapsed since the previous RCS was performed the RCS is resubmitted. Random audits of these forms are carried out by the Department of Health & Ageing.
4. **Claims** – each residential service provider submits a monthly claim on a per resident/day basis. Claims are paid in advance based on the previous 2 months' claims.
5. **Payment** – is made directly to the service provider's nominated bank account and a payment statement, new pre-populated claim form and transaction record are posted to the facility by the Department of Health & Ageing.

Some aged care homes have implemented electronic systems to support some or all of the above administration processes and the Department through the E-Commerce Strategy Unit is actively encouraging the use of e-commerce technology to support these processes.

As a result of the RCS process in particular, each resident's clinical information is collated at a very early stage of their entry into the aged care home. However, as the RCS is tied so closely to the funding stream, the level of manual documentation tends to be voluminous and in most cases does not provide a useful tool to plan, deliver and monitor care.

APPENDIX B

CLINICAL IT IN AGED CARE

RESEARCH TEMPLATES

Project Objective:

The purpose of the Clinical IT in Aged Care Research Project is to investigate clinical information systems in order to assess their capability and capacity to meet the clinical information needs of clinicians working in aged care homes. Specifically the project will identify and review:

- Current IT applications and tools used in residential aged care organisations in Australia and overseas in order to assess their capability and capacity to capture and exchange appropriate clinical information, and
- Clinical information systems currently used in the broader health sector for their applicability to residential aged care.

Further information on this project has been detailed in the Clinical IT in Aged Care: Research Brief

Research Templates:

These templates are provided as a guide to assist students plan and conduct their research project. A reasonable degree of consistency in approach is required by participating students to ensure that results can be collated, compared and gaps identified. Some aspects of the templates may not be applicable to all research topics, and products should not be excluded from evaluation because detailed information is difficult to obtain. The template is to be used only as a guide by students and variations are permitted provided that they are in keeping with the project objectives and they are discussed and approved by the Research Project Coordinators.

Three research templates have been developed:

- A. Project Selection Template:
- B. Master Company & Product List Template
- C. Product Evaluation Template

A Glossary of Terms is provided in Appendix A.

Final Report:

The final report should include the following:

- An executive summary (a one page summary of the research project and an outline of the key findings and recommendations).
- An introduction to the background of the project, project objectives including a definition of the topic area selected
- Outline of the methodology used and any comments on the success or failure of this methodology
- A list of companies and products selected for evaluation
- A set of completed templates
- Details of individual product evaluations including references to the source of information/contacts etc
- A comparison and analysis of the products reviewed and their application for residential aged care
- Conclusions and recommendation of selected products to be considered for further testing & development in a residential aged care environment

A. PROJECT SELECTION TEMPLATE

Prior to commencing research, a one-page research proposal is to be submitted by the students. Individual research proposals will be jointly reviewed by the Department of Health & Ageing, the University Research Coordinator and the Project Research Coordinators. The one page research proposal should include the following information.

Name:
Tel:
Qualifications:
University:
University Coordinator Name:
Tel:
Address:
Email:
University Course and Current Year Level:
Address:
Email:

Research Topic:

Provide a description of your proposed research topic including a clear definition of the topic areas to be included (or excluded). Students are encouraged to select their own research topic. The topics listed below are only provided as a guide and other topics will be considered. Examples of topic areas include:

- Aged care clinical information systems in use in Australia;
- Aged care clinical information systems in use in the UK, Canada or USA
- One or more specific Clinical IT Products/tools with application for:
 - Electronic Health Records
 - Results reporting
 - Prescriptions and medication management
 - Decision support systems
 - Bio-monitoring
 - Specific technology applications eg
 - Mobile technologies – eg handhelds
 - Bar-coding
 - Records scanning

Research Methodology:

Provide a description of your proposed research methodology specifically detailing how you plan to:

- identify companies/products;
- obtain detailed product information; and
- evaluate and compare products for their application in residential aged care.

Research Project Plan:

Provide a list of dates to meet the following key milestones. Note that the submission of the final report is due by 11th October 2002.

- Date for Submission of list of companies/products to be reviewed (see Template B – Master Company and Product List)
- Date for completion of Evaluation of products (see Template C – Product Evaluation)
- Date for submission of draft report (must be a minimum of 4 weeks prior to submission of final report)
- Submission of final report including product recommendations.

B. MASTER COMPANY & PRODUCT LIST TEMPLATE

On receipt of an approved research proposal students can start their scan for relevant companies/products. As companies/products are identified the student should record these details in the format provided below. This list can include any companies/products that the student identifies as being relevant to the project as a whole and should not be restricted specifically to their research topic area.

Company Name	Product (s)	Contact	Address	Telephone	Facsimile	Email and Website

C: PRODUCT EVALUATION TEMPLATE

In discussion with the Research Project Coordinators, students will confirm the companies/products that they will evaluate for their selected topic area. The student will be required to obtain more detailed information about each product either from company websites or by contact with the company or users of the product. The information required to assist with the evaluation will range from general company/product information to more specific technical and module functionality. An example of the range of information required for product evaluation and comparison is provided below. This list is not comprehensive and may need to be amended according to the topic area selected by the student. The Research Project Coordinators will discuss this with the student during the project selection phase and the template will be adapted to meet the student's specific area of interest.

C1 – Product Information

1. **Product name (and previous names where applicable):**

2. **Product ownership and development**

2a Who owns the product? (please detail all alliances/partners/joint venture arrangements)

2b Who develops the product?

2c Where is most of the development carried out?

2d Who maintains the product?

2e Where is the component serviced?

3 **Product Releases**

3a What was the product's first release date? _____

3b How many releases of this product have there been? _____

3c What is the current release version? _____

4. **Product Users**

In the table below:

- indicate which health organisation categories currently use the product
- within applicable categories, indicate key individual implementation sites
- insert the implementation date (actual or planned)

Organisation	Key Sites (including modules implemented where available)	Implementation Dates
Acute Health Organisations (eg public or private hospitals)		
Primary care		
Rehabilitation, Respite and/or Community Care Organisation		
Mental Health Organisations		
Aged Care Organisations		
Other (specify)		

5. **Product enhancements and future directions:** Detail any product enhancements under development and any new product directions anticipated. Investigate what is driving these changes (eg a business requirement, technology upgrade etc) and when they are expected to be implemented.

C2 – PRODUCT TECHNICAL ARCHITECTURE

6. What is the technical architecture of this product? (you may need to provide diagrams)

7 What are the currently supported platforms for this product:

7a Hardware?

7b Operating system?

7c DataBase Management System?

8. Does the software have any forced software dependencies i.e must it be used with specific systems such as resident or patient administration or financial system or other?

9. Is the system operated: (explanatory notes needed)

9a In house

9b In an Application Service Provider model

9c Via a mixture of the two (provide details)

10. What other software products does this software interface with e.g. resident or patient administration system, laboratory or radiology systems etc?

11. Which interfacing standards does the product use eg XML, HL7, UNEdifact, and do these operate in online or batch modes

12. What devices are used to provide access to this application eg monitors, touch screen, wireless applications or handhelds etc

13. What level of security and audit trail functions are supported by this product?

C3 – FUNCTIONAL MODULES OF THE PRODUCT

This list of functional modules is only provided as a guide and will be modified according to the research topic selected. It may not be possible to obtain detailed information about all areas of the product however students are encouraged to obtain as much detailed information as possible.

14. Which functional modules are included in the product?

Select all modules that are included and provide detailed information if available on key modules considered applicable to residential aged care.

Functionality Module		
Electronic Health Record		
Core Patient/Resident Information Data collected during first encounter ie Admission Information System eg Resident Demographic information (name, address etc)		
Health Assessment Information Includes all components required by ACAT eligibility form (input of health assessment information), RER & RCS so that information is collected once, is verified as required and can be retrieved in suitable format as required further details of this are provided in Appendix A		
Personal Medical History – ability to store additional information about personal and family medical history		
Event Summary Generation, Storage and Retrieval eg Hospital Admission, Discharge, Referral summaries		
Care Plan - generated by Health Assessment Process then updated over time. Does it include a needs reassessment trigger and last reviewed (when and by whom) eg continence management plans and charts, rehabilitation program, palliative care plan		
Variance Reporting Against Care Plan		
Incident Reporting and Actions Taken Records		
Appointment Scheduling (captured per resident but viewable by discipline across group of residents)		
Clinical Notes Capture, Retrieval and Review by discipline (eg nurse aid, sister, GP, physio, diversional therapy etc) eg progress notes and treatment sheets		
Chart Templates (Observation, ADLs, Fluid Balance, Mobility, Continence, Oxygen, Suction etc)		
Audit trail		

Results Reporting System		
Ability to request and receive diagnostic testing and treatment services electronically		
Pathology order		
Pathology results tracking		
Pathology results		
Pathology Results messaging standard used (eg HL7, PIT)		
Radiology order		
Radiology results tracking		
Radiology results		
Location of films		
Radiology Result standard used (eg DICOM)		
e-Prescribing		
Provide access to Resident's medication profile, medication history		
Prescription writing (capture details of resident (incl. Medicare#), prescriber, drug, dose, route, frequency, duration, special instructions, PBS/nonPBS, ANS#)		
Drug interaction checking against resident's current medication profile		
Provision of resident/staff information sheets (as required)		
Ability to print and sign prescription (in HIC compliant format)		
Ability to electronically sign and transmit prescription to designated pharmacy including (capture Prescriber's healthcare professional certificate, facility's location certificate, Pharmacist healthcare location certificate, pharmacy location certificate)		
Audit trail of Prescription transmission, receipt/acknowledgement, storage		

Medication Management		
Resident Medication Profile		
• Current medications		
• Medication history		
• Allergies (medication, food, other)		
• Special instructions		
Resident Medication Administration Chart with facility to:		
Manage online or Print		
Sign against medications given		
Indicate reason if medication not given		
Capture details of for each medication to be administered including:		
• Prescriber		
• Drug (brand and generic)		
• Dose		
• Route & Frequency		
• Duration		
• Special instructions		
• Review date		
Access to:		
• Standard Drug Lists / Formularies		
• PBS		
• Special Access Scheme Drugs and/or clinical trial drugs		

Decision Support Systems Decision support systems provide access to knowledge stored electronically to aid patients, carers, and service providers in making decisions on healthcare. (Electronic Decision Support Taskforce 2002 www.nicsl.com.au/pdf/html/index.html) Key components of decision support systems are that the information has to be created by an authoritative source, kept up to date and easily accessible in an electronic format. The information has to be able to be accessed or delivered when and where it is needed (ie not requiring the user to learn complex search techniques). It is important to note the source and creator of information and how frequently it is updated.		
Access to clinical information (to support evidence based medicine)		
- Medical Journals		
- Medical associations		
- Professional Groups		
- Bulletin Boards/topical discussion groups		
Clinical Guidelines		
Clinical Pathways		
Clinical Decision Trees		
Clinical Protocols/Alerts		
Peer Support Network contact details		
Bio-Monitoring eg		
Risk Assessment system		
Resident Location system		
Resident Position sensor (ie fall indicator)		
Resident Telemetry (remote monitoring)		

APPENDIX C

Are you looking for a research project??
Would you like to be paid for your research??
Are you interested in how IT can be used in clinical settings??

CLINICAL IT IN AGED CARE

“An innovative research project to evaluate and test clinical IT applications in residential aged care”

The Department of Health and Ageing is funding a three year project to investigate how clinical IT applications can support and improve the quality of care for residents in aged care homes.

The project provides an opportunity to:

- increase your knowledge of clinical IT applications
- learn how clinical IT applications can support health and aged care
- be involved in a real clinical IT project and trial

Financial incentives are being offered to students who wish to participate in the project and contribute to the quality of care for older Australians.

About the Research Project

During the first stage of this project, you can help us to identify and evaluate the capacity and capability of existing clinical IT applications for use in aged care homes. These applications may be currently used either in aged care or in the broader health sector.

Participating in the first stage of this project may provide you with an opportunity to become involved with the pilot implementation stage commencing in 2003.

Students can select their own research topic areas. These could be either a broad review of clinical IT systems in Australia or overseas, or may focus on specific applications that support electronic health records, results reporting, prescription and medication management systems, decision support systems or bio-monitoring devices to name a few.

*To obtain a copy of the research brief or to discuss the project in more detail, contact **Ms Sarah Warner** on 0407 808 499 or email mwarner@gil.com.au*



APPENDIX D

CLINICAL IT IN AGED CARE

“An innovative research project to evaluate and test clinical IT applications in residential aged care”

The Department of Health and Ageing is funding a three year project to investigate how clinical IT applications/tools can support and improve the quality of care for residents in aged care homes.

The first stage of the project is to be completed by December 2002. It involves investigating IT applications/tools to assess their capability and capacity to meet the clinical information needs of clinicians working in residential aged care homes.

This phase of the project will:

- Identify and review current IT applications and tools used in residential aged care homes in Australia and overseas to assess their capability and capacity to capture and exchange appropriate clinical information; and
- Identify and review clinical information systems currently used in the broader health sector for their applicability to residential aged care.

A clinical information system is a computer system that records and provides data related to a medical event. For example clinical information systems can include medical records, prescription writing and ordering, medication management, or decision support systems such as nursing care plans, nursing notes or medical practitioner notes. Clinical IT tools include technology applications that support clinical information systems such as mobile technologies, eg. handheld devices.

Based on the findings of this preliminary research the Department of Health & Ageing will fund a series of pilot implementations to investigate how clinical IT applications/tools can support and improve care standards and deliver better health outcomes in residential aged care.

How you can assist this research project:

1. The research for this first stage of the project is being conducted by a team of University students. Each student has selected a specific topic or area of research. Depending on their topic they will be contacting residential aged care providers or IT companies or both. Please assist the students with their enquiries so that they can obtain the information that they require to complete their research.
2. Forward any information about innovative clinical IT applications/tools or projects/implementations that you consider may be relevant to this project.

*To discuss the project in more detail or to forward any information relevant to this project, contact **Ms Sarah Warner** on 0407 808 499 or 07 3201 0553 or by email to mwarner@gil.com.au*



APPENDIX E

CLINICAL IT IN AGED CARE RESEARCH PROJECT

ACCEPTANCE CRITERIA

Project Objective:

The purpose of the Clinical IT in Aged Care Research Project is to investigate clinical information systems in order to assess their capability and capacity to meet the clinical information needs of clinicians working in aged care homes. Specifically the project will identify and review:

- Current IT applications and tools used in residential aged care organisations in Australia and overseas in order to assess their capability and capacity to capture and exchange appropriate clinical information, and
- Clinical information systems currently used in the broader health sector for their applicability to residential aged care.

Further information on this project has been detailed in the Clinical IT in Aged Care: Research Brief.

Research Methodology:

The research for this first stage of the project has been conducted by a team of University students. Each student or groups of students have selected a specific topic or area of research. Research templates were provided to assist the students plan and conduct their research project. A reasonable degree of consistency in approach is required by participating students to ensure that results can be collated, compared and gaps identified.

Final Report:

A final report will be submitted by each student or groups of students on each project topic and should include the following:

- An executive summary (a one page summary of the research project and an outline of the key findings and recommendations).
- An introduction to the background of the project, project objectives including a definition of the topic area selected
- Outline of the methodology used and any comments on the success or failure of this methodology
- A list of companies and products selected for evaluation
- A set of completed templates
- Details of individual product evaluations including references to the source of information/contacts etc
- A comparison and analysis of the products reviewed and their application for residential aged care
- Conclusions and recommendation of selected products to be considered for further testing & development in a residential aged care environment

Research Project Acceptance Criteria:

The students will submit one report for each project topic..

Each project report will be assessed and scored against a set of acceptance criteria (see next page).

ACCEPTANCE CRITERIA

The student(s) will submit one report for each project topic. Each project report will be assessed and scored against the following criteria:

Projects will be ranked by score and those that score 50 points or more will be provided with a financial reward of \$500. An increase amount may be made to high scoring projects that are considered exceptional and innovative. Any additional payments will be made at the discretion of the Project Manager following the project assessment.

Criterion	Score	Comments
1. Project Management & Research (30)	(30)	
Understanding of project objectives & research brief (10)	/10	
Innovation in approach /methodology & research skills (15) (<i>quality of project plan, professionalism in approach to companies, etc</i>)	/15	
Presentation & clarity of report (5)	/5	
2. Product Evaluation (45)	(45)	
Clinical elements (15) (<i>this will vary dependent on topic & product.</i>)	/15	
Technical elements (15) (<i>eg technology platform, standards etc</i>)	/15	
Usability elements(15) (<i>assessment of current uses of product, ease of use, maintenance, scalability etc</i>)	/15	
3. Product Comparison & Analysis (15) (<i>eg relevance/benefits/issues of implementing this product into RACs</i>)	/15	
4. Report Conclusions & Recommendations (10)	/10	
Totals	100	