

deLacy™: A CLINICAL INFORMATION SYSTEM FOR HOSPITALS



DEVELOPMENT AND USE AT ST VINCENT'S PRIVATE HOSPITAL

With an 18 year development and implementation history, this web-enabled clinical information system continues to provide substantial clinical benefits and business value.

INTRODUCTION

Delivering safe, effective and high quality patient care relies heavily on access to accurate and comprehensive information. The use of information and communication technologies (ICT) to record, store, manage and access information within health care offers vast opportunities to reduce clinical errors, to support health care professionals, to increase the efficiency of care and to improve the quality of patient care^[1]. Clinical information systems will increasingly become common place in health as health care providers and consumers realise the full potential of ICT to provide rapid and comprehensive access to information at the point of care.

This case study reports on the development and use of Emerging Health Solutions (EHS) Clinical Information System known as deLacy in-house at St Vincent's Private Hospital in Sydney, New South Wales.

THE HOSPITAL

Recognised as one of Australia's leading providers of private health care, St Vincent's Private Hospital is an acute medical and surgical hospital. Located in Darlinghurst Sydney, New South Wales, the hospital forms part of the Sisters of Charity Health Service, Australia's largest non-profit non-government health care provider.

St Vincent's Private provides a wide range of specialist services including cardiology, gynaecology, orthopaedics, neurosurgery and urology. Its facilities include inpatient facilities, day surgery and medical imaging. The hospital has 250 beds, 8 Inpatient Operating Theatres, 5 Day Surgery Theatres and 2 Cardiac Catheter

Laboratories. In 2010-11 the hospital admitted 22,528 patients and had a total of 81,863 bed days.

St Vincent's Private participates in research and education; invests in advanced medical technology; and is an affiliated teaching hospital of the University of New South Wales. The hospital employs 345 visiting medical officers and 1054 full time staff, of which 507 (or 660 FTE) are nursing staff.

HISTORY OF deLacy DEVELOPMENT

A recognition and appreciation of the value of technology within health care, as well as innovative and forward-thinking management and staff, led St Vincent's Private to embark on an in-house development of a point of care clinical information system in the early 1990s. Following several trials and considerable input from clinical staff, the deLacy system went live in October 1992, providing staff with access to a single relational database of clinical and related information. The implementation included infrastructure to enable access to deLacy from almost anywhere within the hospital. A wireless network was installed and personal computers were made mobile on the wards by placing them on specially designed trolleys.

Since its original implementation at St Vincent's Private, deLacy has undergone continual development and revision to ensure it continues to meet the evolving clinical and business needs of the organisation. In testament to St Vincent's commitment to investing in health IT, the infrastructure that supports deLacy has also been updated to utilise latest advances in technology.

[1] DW Bates, M Cohen, LL Leape, JM Overhage, MM Shabot, T Sheridan (2001) Reducing the frequency of errors in medicine using information technology. Journal of the American Medical Informatics Association, 8(4) 299-308.



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In 2002 St Vincent's Private teamed up with Emerging Systems, an experienced health IT developer, to web-enable deLacy and improve features and functionality. The result is the current version of deLacy - a web-enabled, multi-functional ward based clinical information system.

The system's namesake is Sister Mary Baptist deLacy, one of the five pioneer Sisters of Charity who came to Australia from Ireland in December 1838 and founded St Vincent's Hospital in Sydney. The deLacy product is named after this Sister of Charity in tribute to her legacy of giving, and the provision of patient care and help to those in need.

ABOUT deLacy

deLacy is a web-enabled clinical information system that can be accessed at the point of care. This patient-focused system enables health professionals to capture a raft of clinical information and to access this information in an appropriate and timely manner.

deLacy can be securely and reliably accessed from any St Vincent's computer with Internet access, allowing access within the hospital, on the wards, in doctors rooms and in administrative areas. The information is stored in a secure, auditable environment to assist clinicians in delivering effective and efficient quality health care. deLacy also has the capability for remote access.

The aims of using deLacy are to enable improvement:

- In the **quality** of care
 - In the **efficiency** of health care delivery
 - In the **communication** between clinicians
 - Of patient **safety**
-

The deLacy suite includes:

- Pre-Admission
- Medical History
- Risk Assessment
- Patient Care Guides
- Variance Tracking
- Management Reporting
- Order Entry
- Results
- Dependency & Rostering
- Observations
- Progress Notes
- Clinical Messaging
- Clinical Support Unit
- Discharge Summaries

A description of the features and functionality is included in the flowchart on the following page.

deLacy has been successfully implemented and in use within St Vincent's Private for 18 years.

KEY SUCCESS FACTORS

Key success factors for the successful implementation of deLacy at St Vincent's Private Hospital include:

- **Development of the system from a clinical perspective** involving clinicians at every stage. Nursing staff and other health professionals continue to have input into the functionality of deLacy. This has been vital in increasing staff ownership and commitment to the product and in promoting widespread acceptance and use. Clinician involvement has also ensured that deLacy is an effective, high quality system that meets the needs of its users.

As staff stated, *"We have a very interactive relationship with the developers and they respond quickly to requests for improvements. This approach is also good for the developers as it gives deLacy great credibility, to have **so much clinical input into a clinical system**"* and, *"A major benefit is that it has been written to our specifications, so it does exactly what we want it to do."*

- **Development of the system from an organisational perspective** ensuring the business needs of the organisation are met.
- **System reliability** - *"The system is so reliable. It has never really failed."*

"In my opinion the deLacy clinical information system leads the industry in care planning, risk assessment, monitoring and documenting our clinical services and this has played a big role in SVPH being a Magnet designated facility with exemplary practice noted during our ACHS accreditation and Magnet designation reviews.

With computers directly outside the patient rooms our nurses are closer to their patients ...if you tried to remove deLacy from this hospital, the nurses would be pretty upset!"

Jose Aguilera, Director of Nursing

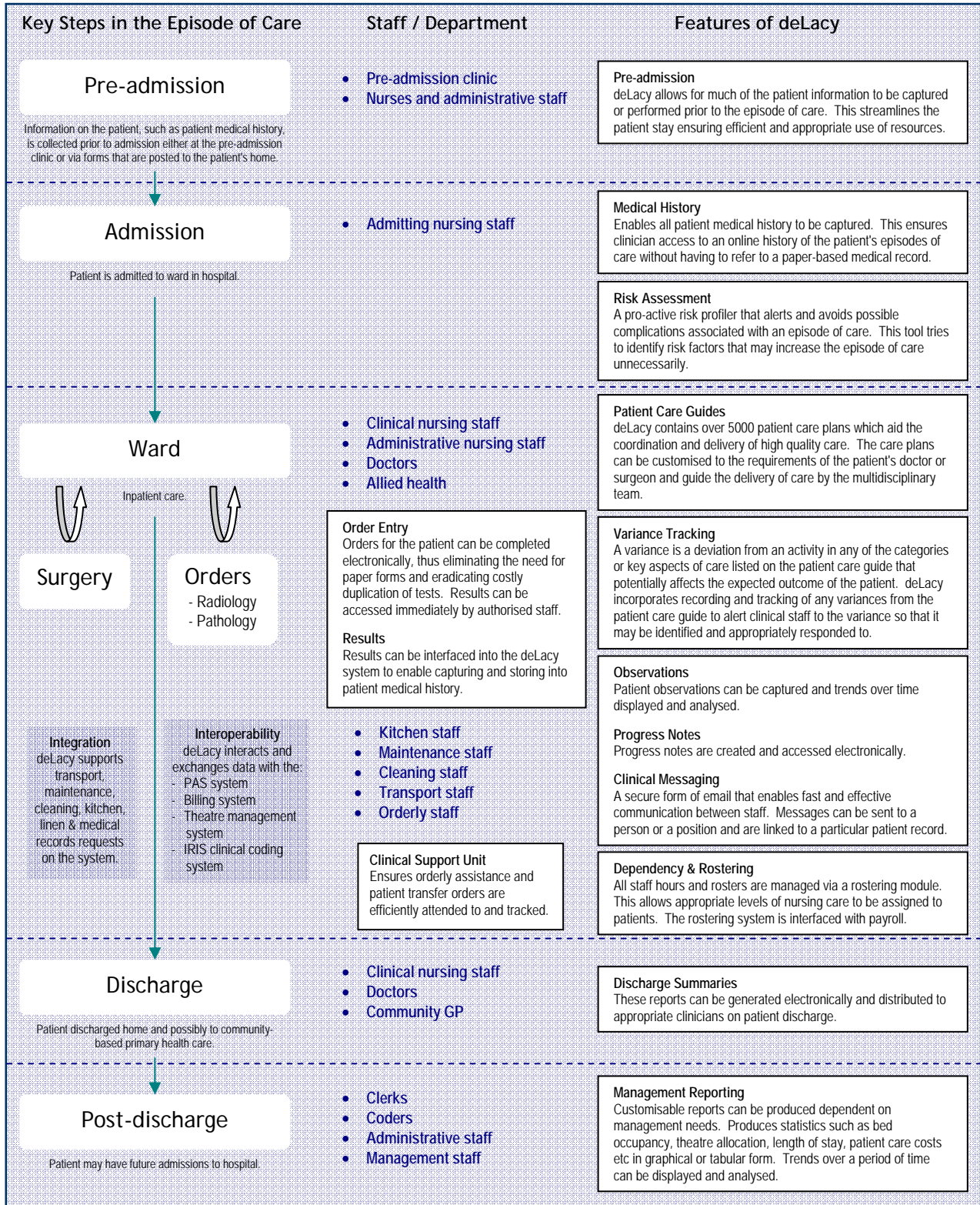
"We are very fond of deLacy. The hospital has a strategic imperative to be a leader in clinical information systems, as we believe in the benefits for patient care and for the business of running a hospital. That is what has driven us for over a decade."

Steven Rubic, CEO

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A JOURNEY THROUGH deLacy

Approximately 80,000 patients per year have their episode of care at St Vincent's Private recorded in deLacy. The following flowchart provides an example of a typical patient's 'journey' through St Vincent's and how this is reflected in deLacy.



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BENEFITS

The benefits of deLacy include:

User friendly and easy to learn

The essential features of deLacy can be learnt in 15 minutes (logging into the system, accessing patient list, view care guide, read patient history and progress notes and report on care provided). All staff receive 1 day training during their induction and agency nurses receive 15 mins - 1 hour of training.

Ease of access

Access by authorised personnel can be achieved from any PC within the hospital. Everything can be accessed from the one computer screen, without having to close or open different systems.

Comprehensive

The clinical and administrative information in deLacy is very comprehensive, as every area of the hospital contributes to the patient record - from preadmission to discharge. *"You've got all the information you need at your fingertips"*.

Legibility

Eliminates the need to decipher handwritten records and thus minimises the chance of errors due to misinterpretation of handwritten instructions.

Communication

deLacy aids timely communication between departments within the hospital. As soon as information is added to the patient record it is immediately available on that record to those with the access privileges to see it. Nurses can order patient transport, orderly assistance, cleaning, maintenance, plumbing, refrigeration and kitchen orders through deLacy which gets directed to the relevant personnel. The receiving staff member then alters the status of the order to record that they have attended to the problem, fixed it, are waiting on the arrival of a part etc. The record is date and time stamped so at a click of the mouse everyone knows the status of the order. Monthly summaries are also available. This helps communication enormously and ensures orders are attended to promptly. This is of particular value in **patient transfers** and ensures that an accurate record is kept of occupied and unoccupied beds, as well as patient location within the hospital.

Benefits for patients

Patients at St Vincent's receive many indirect benefits from the hospital's use of deLacy. These include avoiding repeated requests for the same information and eliminating unnecessary duplication of tests and procedures. Staff are also more informed about the patient's care needs due to deLacy's patient care guides. As the computer terminals are close to patient rooms, nurses are thus



physically closer to patients even when not in direct contact, as there is no need to return to a central location to complete documentation.

Rich information source

deLacy currently holds information on the episodes of care for approximately 250,000 patients. The richness and abundance of data held within deLacy is a useful information resource which can be used for administration, clinical, management and research purposes.

Information integrity & reliability

All information in deLacy becomes a permanent record and the technical setup maximises system availability and reliability.

Assists with patient flow and efficient resource utilisation

deLacy assists the continuum of care in the organisation from pre-admission to discharge by **improving efficiency** and communication.

Improved patient safety and quality of care

These outcomes are major drivers behind the use of deLacy at St Vincent's. A nurse on the ward commented that *"deLacy encourages the use of patient care guides and pre-determined clinical pathways more so than traditional paper-based records"*.

Complaints management / Legal matters

As stated by the Director of Nursing, Jose Aguilera, *"Occasionally, in response to a complaint or a legal matter, the hospital is required to investigate an incident and produce documented evidence on an episode of patient care. The benefit of having deLacy is immeasurable. It allows me to access (nursing) progress notes, medical imaging results, pathology results, patient history etc, so I can quickly and easily review all information related to that person. In legal cases, all notes are provided to external lawyers. What they particularly like is that they can read them, they also like the fact that the dates, the time of entry and the user are all automatically recorded, so it's very easy to track the personnel involved in the patient's care, the time that care was received and who was responsible for that patient."*

Business benefits

The use of deLacy at St Vincent's has financial benefits for the organisation. As Steven Rubic explains, *"The gains in efficiency throughout the hospital have a **significant financial benefit**. Having a standardised way of recording notes and therefore going back to and referring to or interpreting those notes saves hours of clinical time. Efficiencies related to being able to order an x-ray or a pathology test online and then see the results of*

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those tests online are great. The efficiency gains through using deLacy leads to hours saved in pre-admission, on the wards, in the operating theatre, in administrative areas and in tasks associated with rostering and patient billing."

Elizabeth English, Clinical Nursing Consultant Clinical Systems, believes that deLacy "helps with (nursing) **staff retention and recruitment**. Having deLacy shows that we are a progressive hospital, clearly into technology, change and new ways forward. It also makes their job easier, which also helps with retention."

Web-enabled

Allows access for authorised health care professionals from any computer with a secure Internet connection. This will allow, for example, a patient's GP to access the patient's records post-discharge to assist the continuum of care.

Patient care guides

deLacy currently contains in excess of 5000 patient care guides or clinical pathways. These aid the coordination and delivery of high quality care by outlining the care that needs to be provided, based on the surgeon or doctor's care protocol. This ensures that the same high level of care is delivered to the patient by all staff and is of particular benefit to agency nurses or casual staff. The patient care guides also assist in care planning.

Reporting functionality

Comprehensive, customisable reports ensure that the information entered into deLacy is used to meet the business needs of the hospital. "In terms of reporting we get terrific information from deLacy. Things such as admissions, theatre bookings, ward lists, length of stay by ward, DRGs, revenue, bed days by speciality, by doctor, by ward etc. I use the reports every day, as do our operational managers", Steven Rubic.

This is a view shared by Astiness Kalach, Health Information Manager, "A major benefit of deLacy is its reporting functions. deLacy enables us to produce and distribute our monthly reports to the Department of Health, the Cancer Council and to each health insurance fund automatically. It takes a matter of seconds, is really easy to do and is a huge time saver for us."

"I have been using deLacy for 18 years, since its inception to assist nurses at the bedside. I can't imagine how we would work without our computer system. Everything we do is integrated into deLacy, so its just part of how we do nursing business here. If we had to go back to a paper-based system then I think we would realise how cumbersome that way of working is."

Joan Bourke, Clinical Services Manager

CHALLENGES/BARRIERS

Key challenges and barriers faced by St Vincent's Private include:

Getting doctors to use deLacy - Most doctors are visiting medical officers, making it difficult to mandate their use of the system. This creates inefficiencies as paper records are still kept for those patients whose doctors don't enter information into their deLacy patient record. St Vincent's believe that the higher level of functionality and ease of use with web deLacy will motivate more doctors to use it.

Portability - DeLacy is accessible directly at the point of care. New advances in mobile technology such as personal digital assistants (PDA's) and Tablet PC's will continue to be supported, as a combination of technologies will provide most value.



LESSONS LEARNED

Staff at St Vincent's Private were asked what lessons they had learned from the process of developing deLacy and implementing it across the hospital.

Their responses were as follows and are provided here to assist other organisations in their implementations:

- **Management commitment** - is vital to ensure success.
- **Mandate use** - make use of the system mandatory for all staff and phase out the use of paper records.
- **Training and education** - is vital and needs to be **ongoing** for all staff.
- Once introduced, ensure deLacy is **imbedded into the practice of the hospital**.
- **Technical support** - Support on the wards is vital. Ensure the system is well supported by knowledgeable and friendly IT staff.

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EMERGING SYSTEMS

Emerging Systems provides a single point of contact for all software development, networking, security and integration needs for the health care sector. They have designed and developed a private health insurance eligibility checking system, document management systems, patient billing, health fund contract management systems and interfaces between clinical, finance and private health information systems. Their focus is on business outcomes through leveraging technology that is scalable and adaptable to meet ever-changing business needs.

Emerging Systems have worked closely with St Vincent's Private Hospital in the redevelopment of their clinical information system deLacy™ which is now being marketed under the Emerging Systems banner.

www.emerging.com.au

"I've been using deLacy for 8 years. As coders we use deLacy for coding, for tracking of records and for running reports for the next day's admissions. We are able to link into the patient record in deLacy and use the nurses' detailed notes, pathology reports etc to ensure our coding is as comprehensive as possible. Everyone I have trained has really adapted well to using the system because it's easy to read and easy to access everything with just the click of a button."

Astiness Kalach
Health Information Manager

LESSONS LEARNED

- **Set realistic timeframes** - To maintain credibility and aid successful implementation IT staff should ensure suggested changes are acted upon and give realistic timeframes for changes to be made.
- **Ongoing assessment and continual improvement** - set up user groups, listen and act on their feedback. One of the benefits from this process is that it will increase staff ownership of and commitment to deLacy.
- Have deLacy '**champions**' and **clinical educators** on each ward to provide a common point of contact.
- Need to thoroughly **plan and manage the transition** to deLacy and **test** it. Ensure current data is transferred into the new system and that deLacy is set up to interface with the hospital's other information systems.
- **Involve clinical staff** from the start.
- **Customise the reports** - Have reports written to your own specifications.
- **Keep patients informed** - by telling them that their records are kept electronically. Patients need to be aware that part of nurses' duties are to keep a record of the care that is given and that it is good nursing practice for nurses to be using computers for this purpose. (This will also help abate any concerns they may have that staff are 'surfing the Net' and not providing nursing care).

FUTURE DIRECTIONS

- deLacy is currently being implemented at St Vincent's Public Hospital and the Mater Hospital in North Sydney.
- Currently under development is **digital voice capture** and transcription of progress notes. deLacy will store the transcription as well as the digital voice file and enable voice activated input methods.
- St Vincent's Private Hospital will be trialling **mobile technologies** to assess which combination of technologies provides value.
- In the future **patient multimedia centres** will also provide deLacy functionality.

TECHNOLOGY	
Product Name	deLacy™
Vendor	Emerging Systems
Technology infrastructure	<ul style="list-style-type: none"> • Web browser on the client • Windows or Linux application server • MS SQL or Sybase database server
Interoperability	deLacy supports a full range of HL7 messages
Operating System	Windows or Linux
Security	<ul style="list-style-type: none"> • Complies with AS 17799 • Full audit trails of every read and write • All staff have unique individual logon IDs and strict access criteria based on their position. The screens on ward-based PCs black-out after 2 mins and lock out after 10 minutes.
Business Continuity	deLacy is designed to be robust, responsive and available to authorised users 24/7, wherever they may be. The St Vincent's Private implementation uses 5 web servers and two database servers running in redundant arrays to enable mission critical levels of service. The software is designed to provide clustered technology with optimal support.