

# FROM DESIGN TO DELIVERY

## An inside look at Australia's first fully integrated digital hospital

Designing and building health facilities to cater for a growing and ageing population has become more complex in recent years, as new technologies such as electronic medical records (EMR) and telehealth are driving changes in the delivery of healthcare across Australia.

As a result, the sector is now faced with the question of how to design and build 21st century health facilities that are not only flexible, but also cater for new technologies which will deliver the best value for patients and staff.

**St Stephen's Hospital Hervey Bay** is Australia's first fully integrated digital hospital and a great example of how digital technology has been incorporated throughout all phases of a project.

Operated by UnitingCare Health (UCH), the \$96 million, 96 bed private hospital has been several years in the making and houses the country's first full EMR and digital patient management system, in addition to a digital drug dispensing facility and a capacity to monitor patients during surgeries.

Partly funded by a \$47 million federal government grant, everything in the facility from x-rays to equipment monitoring in theatres will be done electronically.

But the journey to becoming an Australian first in healthcare has not been without its challenges, with the project team having to work out very early how to design and build a hospital which caters for EMR.

Ahead of the Health Facilities Design and Development Conference, which is taking place in March 2015 as part of Australian Healthcare Week, **Richard Royle, Executive Director of UnitingCare Health** and **Bruce Wolfe, Project Director and CEO at Conrad Gargett Riddell Ancher Mortlock Woolley**, talk about the team's strategy behind designing and building Australia's first fully integrated digital hospital, exploring the different elements that need to be considered to design and deliver a facility which caters for new technologies.





## PROJECT OVERVIEW

**Richard:** Located across from the public hospital in Hervey Bay in Queensland, St Stephen's Private Hospital is a new build on a greenfield site consisting of 96 in-patient beds and five operating theatres.

It's the first site in the country where an EMR runs through an entire hospital, and also integrates a number of other components of the hospital's business as part of the IT platform.

A large proportion of funding for the project has been from the federal government, with \$21 million alone specifically for the eHealth, along with \$15.5 million from UCH and our main software vendor, Cerner.

As a national first, it is hoped this pilot will result in further digitisation of UnitingCare Health's other hospital assets, as well as other hospitals around Australia.

## CHOOSING THE RIGHT IT SYSTEM

**Richard:** In most cases around Australia, hospitals and facilities have taken a 'best of breed approach', which means they've picked the best IT system they like for an emergency department, for operating theatres, or for patient entertainment and then tried to interface them all into one system.

It's extraordinarily difficult to make the interfaces work seamlessly. A good example of this is the Fiona Stanley Hospital

in Western Australia, where the opening of the new hospital has been delayed by months, because they took a best of breed approach for interfaces and couldn't get it to work.

At St Stephen's we have done the opposite and minimised the IT interfaces from other systems by using the Cerner as one major platform, and there are minimal interfaces as a result. We have 29 Cerner applications being put up, which includes all of the clinical side and another 20 devices that link to it.

The Cerner applications include inpatient pharmacy, surgery, anaesthetics, PowerOrders and PowerChart, critical care, clinical documentation with Dragon dictation and mPages, ICU summary and mobile clinical review as well as pathology specimen management and the CareAware suite for medical device connectivity, alarm management and care team communication.

Cerner is also providing comprehensive barcode scanning and real-time location systems for both patients and equipment.

As a result, the closed loop EMM management system has mitigated our risk to ensure the system operates seamlessly in the eyes of the user.

Based on our research from other international examples, there are about a thousand hospitals around the world that have a full electronic medical record system in them and if implemented correctly these systems will not only save lives, but improve clinical quality and outcomes.



## CONCEPT FOR DESIGN: MEETING THE CLIENT BRIEF

**Bruce:** Ensuring the design intent and vision of UnitingCare Health were met was all about communication and quality of trust. From the early stages in the project, we ensured we were all on the same page and talking the same language. This enabled people to have confidence in us as architects and to trust us to get on with it with it and know what we are doing.

Evidence based design also gave weight and objective value to the design. We analysed evidence based design outcomes so that we can include things in the design that often do not end up in the brief.

For example, waiting areas and foyers often don't come with a detailed brief, but they have a role in reducing stress for patients. We put a lot of weight on those sorts of qualitative things that may not get incorporated into the initial design brief.

But in this case, it really was about a shared vision. UnitingCare Health was willing to go into bat for design because they related back to the vision.

So often in value management and cost cutting, things relating to design actually tend to evaporate.

But we had a client that understood the importance of the design to the operational effectiveness and the healing process, which made it a lot easier to stick to later down the track.

We also had lots of programmed user-group meetings – there were multiple user groups that met many times throughout the project life cycle. We saw that it was essential that everyone involved was heard. But at the same time, we also ensured that information was evaluated in terms of design and planning, before we took it back to UnitingCare Health to consider. So it's about weighting up different options to get an integrated and prioritised brief.

As a result of these meetings, we were also able to capture and retain a lot of information via a solid reporting system. This continued through the construction phase and we could adapt the design as more information was brought to the discussion.

## INTEGRATING TECHNOLOGY INTO DESIGN

**Richard:** Before this project, there was no such thing as a 'digital hospital' because there wasn't one that existed in Australia. We had to work out from scratch how to design a hospital to adapt to become fully electronic.

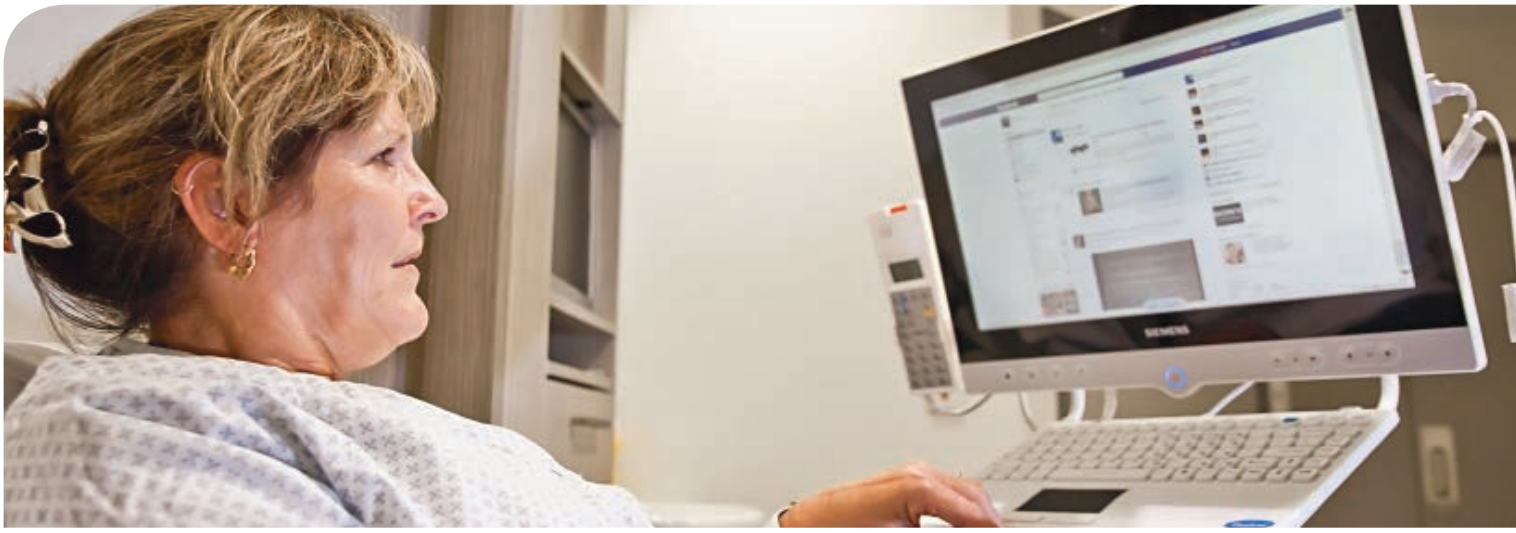
We worked with the architects to ensure certain design elements were built in which adapt to the requirements of a fully digital facility. For example, there are two data rooms in the hospital and one is a back up to the other. Each is very extensive and requires significant design in their own right, like additional air-conditioning in each room due to the heat that comes out of the mainframes.

We also had to design each hospital room to take account of the fact that there are two computers in every patient room. We've also had to design the pharmacy to adapt to a fully electronic system, which has never been done in this country before.

**Bruce:** We also built a virtual model of the building. We kept testing that through NavisWorks, software that enabled us to visually review what was going to be built and to make sure all the technology had a pathway to get there.

The entire design concept could therefore be seen in advance – all of the electrical panels, equipment and wiring could all be seen as a coordinated outcome before the building was even created. This allowed us to grasp how to best design buildings to fit and match the technology.





## INVOLVING STAFF IN THE JOURNEY

**Richard:** When you consider international experience in implementing these sorts of systems, it's apparent you need to bring staff and doctors along with you on the journey, rather than simply implement a fully integrated digital system and expect them to work with it.

We had eight 'work redesign teams' working for two years which comprised about 80 of our staff and 30 doctors who worked through the American-based software, Australianised it and adapted it to our requirements.

As a result, doctors and nurses now working in the hospital have taken ownership of the software because they were the ones who set up the framework for the new technology in the first place. These redesign teams were fundamental to getting the hospital set up and running.

We also employed Australia's first Chief Medical Information Officer (CMIO) who is the go between the IT people and the doctors to ensure everyone is speaking the same language.

We've also had to train and teach people how to work in a non paper environment, which is very foreign in the healthcare sector in this country. We're finding a lot of people are really interested and want to come and work at this hospital, because this is the future of healthcare in Australia.

## RESULTS SO FAR: EFFICIENCY IMPROVEMENTS

**Richard:** The hospital opened in early September 2014 and the benefits will be shown through our benefits realisation study which the government has commissioned as part of the grant we received for the project.

As part of the study we are measuring a total of 21 key performance indicators both before and after we've implemented the system in order to assess what the benefits are for Australia in the experience of Hervey Bay.

In the design and planning phase, we conducted a 'motion' of our nurses to see how much time they spent walking the floor to go back and forth to the nurses' station and walking around the hospital trying to find different bits of equipment like wheelchairs and intravenous poles.

Now as a result, every piece of equipment in the hospital is GPS tracked and a nurse can simply touch the computer screen to find out where the nearest wheelchair is and go straight to it. That's the first major benefit.

The other major bonus is that from a doctor's perspective, it's much more efficient because doctors don't have to keep coming into the hospital all the time. They can actually look at the patient's medical record on their own screen at home, or in their consulting room. They can even order drugs remotely. This improved overall efficiency and also the ability to get instant responses back from test results.

There is no waiting because everything is electronic and it's generated big savings in efficiency so far.

**Bruce:** From a design perspective, on a big project like this there are many aspirations in relation to the design of the facility from all stakeholders involved. So being able to deliver on all of those aspirations has been fantastic. The hospital hasn't been in operation that long, but so far it's pretty obvious going fully-digital does save money and time.

Being able to integrate the digital technology throughout the design and then see it in action has been one of the biggest highlights of working on the project so far.



# HEALTH FACILITIES DESIGN & DEVELOPMENT

Join Richard and Bruce at **Health Facilities Design & Development 2015** in March in Sydney where they will further explore the journey of designing and delivering Australia's first fully integrated digital hospital on time and within budget, including:

- UnitingCare Health's innovations and challenges in implementing eHealth capabilities
- Shared vision by the client and project team
- Construction challenges
- Highlights so far

For more information visit [www.austhealthweek.com.au/hfdd](http://www.austhealthweek.com.au/hfdd) or call **+61 2 9229 1000** or email [enquire@iqpc.com.au](mailto:enquire@iqpc.com.au).

