

Case study: Prince of Wales Hospital, Hong Kong

In 2018, the Division of Cardiac Surgery at The Chinese University of Hong Kong, at the Prince of Wales Hospital (PWH), Shatin, New Territories, Hong Kong, published its 7th 'Cardiac Surgery Report', which reported that cardiac surgery is safe and effective and that the outcomes are comparable to against international standards.

The Division of Cardiothoracic Surgery is part of an acute regional hospital as well as the teaching hospital associated with the Chinese University of Hong Kong. It performs over 700 ultra-major cases per year and provides complete services within the specialty for a population of approximately 2.2 million people excluding paediatric cardiac surgery and transplantation. The Division provides clinical service for both cardiac and thoracic pathologies, and has developed a high quality service for the most complex of cardiac cases including multiple valvular surgeries, complex re-operative surgeries (12% of their workload) as well as routine revascularisation procedures.

"Since our first report in 2007, we have moved purposefully from basic outcome analysis to comprehensive 'international benchmarking'," said Professor Malcolm Underwood, Chief, Division of Cardiothoracic Surgery at the hospital. "We believe that presentation of our outcomes in an open and 'risk-adjusted' manner has become a fundamental professional responsibility. Continuous monitoring of outcomes and provision of high quality patient care in a demonstrable fashion will always have a high priority in our Department."

When Professor Underwood first arrived in Hong Kong in 2006, there was no database collecting outcomes data on cardiac surgery procedures at PWH. Having previously worked at the Bristol Heart Institute (1999-2005) during the aftermath of the Bristol heart scandal, he was fully aware of the importance of professional accountability and responsibility cardiac surgeons, in part by publishing outcomes data on their performance.

"Part of professionalism is understanding the outcomes of what you're doing and why. As a Senior Lecturer and then Consultant in Bristol I helped to implement changes to how surgical outcomes were collected and reported, and Dendrite Clinical Systems played a fundamental role in helping us to achieve that," he explained. "Therefore, when I arrived in Hong Kong one of my first undertakings was to convince the PWH administrators that we needed a cardiac surgery database system so that we could record and report our outcomes data to demonstrate our transparency and professionalism."

Working with Dendrite

Having previously worked with Dendrite, Professor Underwood said he had no hesitation in recommending Dendrite's hospital system to the PWH, citing their experience, outstanding technology and the dedication and technical understanding of their staff of the issues of data collection and reporting.

"At the time, there were multiple political and IT pathways to be forged, and Dendrite was very understanding of our unique requirements and fully supportive during the implementation processes," he added. "The result was a fully-computerised cardiac surgery database and outcome analysis system that enables the automatic uploading of patient demographic data into the cardiac database, therefore providing an audit trail, which in turn establishes the accuracy and validation of the data collected."

Crucially, the clinical management system also incorporates risk stratification algorithms including Bayes and logistic regression models, which allowed clinicians at the hospital to benchmark their

results against the UK's National Cardiac Surgical Database. As a result, surgeons at the hospital can verify the accuracy of the additive and logistic EuroSCORE in predicting outcomes for the patient population.

Cumulative data

“Using twelve years cumulative data from our seven published reports, we have shown that we are performing in line with international standards for all cardiac surgical activity and all operative sub-groups and exceeding expected survival in some categories,” he added. “We have recorded excellent outcomes for mitral and aortic valve operations, as well as documenting an increased activity in surgery for the aorta both conventional and endovascular, again outcomes comparable with the highest international standard.”

Dendrite's system has helped the department identify a continuous change over 12 consecutive years in overall surgical practice, with an increasing risk profile of patients when assessed using the logistic EuroSCORE for all patients and the Bayes Score for coronary patients. This has allowed the department to identify significant changes in the demographics of their coronary artery bypass graft population ie. which patients are now most likely to require urgent surgery.

“Last year we collaborated with colleagues from the other two Departments in Hong Kong which provide cardiac surgery, in a joint international benchmarking project of our coronary surgery activity and outcomes,” explained Professor Underwood. “We established a Hong Kong Registry in an attempt to establish standards of care in cardiac surgery across Hong Kong. This required us to seamlessly merge our data prior to extraction for independent analysis and feedback, this would not have been possible without the expert guidance of the Dendrite team.”

He added that running a database is not a static process, it continually evolves. For example, this year alone the Division of Cardiac Surgery has - with the help of Dendrite - expanded its basic cardiac database to add fields important to anaesthesia so they will now use their database to track specific outcomes.

“We have an ongoing programme with our IT colleagues to further enhance the integration of the Dendrite and hospital data base to allow more automated data access and working closely with dendrite we have just completed the first integrated cardiac surgical report for Hong Kong, a gold class example of how we use our partnership to enable international benchmarking and external validation of our outcomes.”

“Our underlying principle has always been that to have a usable database, fit for purpose, particularly for 'real time' monitoring and that the most accurate data is collected at the point of patient care,” he concluded. “Everyone at the hospital is aware that we are monitoring outcomes, which shows we care and helps maintain our standards. The Dendrite team understands this - they not only offer a software solution that work with seamless integration and superb support - to them it is not just a business, but a passion.”

A complete library of Cardiac Surgery Reports from the Division of Cardiac Surgery at PWH, including benchmarking with Europe and the UK is available online. Please click here (<http://www.surgery.cuhk.edu.hk/cardiothoracic/#publications>) to access the reports.