



## Case Study

Enterprise Server  
Dual-Core Intel® Xeon®  
Processor 5110  
Healthcare  
Digital Integrated Hospital



National Heart  
Centre Singapore  
SingHealth

# Agfa HealthCare's IMPAX Cardiovascular Solutions play a central role in research, teaching and patient care in Singapore

The National Heart Centre (NHC) Singapore has seen improvements not just in patient care and satisfaction levels, but across the board since Agfa HealthCare's IMPAX Cardiovascular Solutions went live with clinical reporting in October 2007.

Part of the SingHealth cluster, and the main referral centre for cardiology in Singapore and the Asean region, every year the National Heart Centre Singapore sees 80,000 outpatients and performs between six and eight hundred coronary artery bypass grafting surgeries and over 2,000 coronary angioplasties. With over 50 heart and thoracic specialists offering a complete suite of cardiovascular testing modalities, the goal at NHC has always been to provide integrated care and a holistic approach to medicine and this was the rationale for seeking an integrated image, information and management system that takes advantage of the power and efficiency of today's computing systems.

"As a patient at NHC you would notice the improvement in speed we've had with Agfa HealthCare's IMPAX Cardiovascular Solutions. We can now visit a ward almost immediately after a study to show the patient the results."

Dr. Lim Soo Teik,  
Head of Senior Consultant  
Department of Cardiology,  
National Heart Centre Singapore

<b>Challenge</b>	<ul style="list-style-type: none"> <li>▪ <b>Improve healthcare capacity.</b> Deliver better return on investment (ROI) and lower communications costs.</li> </ul>
<b>Solution</b>	<ul style="list-style-type: none"> <li>▪ <b>Deploy Agfa HealthCare solution on Intel platform.</b> Implement Agfa HealthCare's IMPAX Cardiovascular Solutions that take advantage of the power and efficiency servers based on the Dual-Core Intel® Xeon® processor 5100 series.</li> </ul>
<b>Impact</b>	<ul style="list-style-type: none"> <li>▪ <b>Transformed medical processes.</b> Accelerated healthcare practices such as faster reporting, medical data availability to clinicians and for research and teaching purposes.</li> </ul>

# The Dual-Core Intel® Xeon® processor 5110 provided the perfect match for the Agfa solution to enable NHC extend the reach and capacity of its healthcare capabilities

Faced with the challenge of integrating a breadth of modalities found in very few hospitals in the world, NHC chose Agfa HealthCare's IMPAX™ Cardiovascular Solutions to meet its immediate needs for Cath and Echo lab imaging, reporting and scheduling, and the needs of the hospital and the changing clinical landscape long into the future. In the first nine months, NHC has benefited from major improvements in the quality of patient care, customer satisfaction and staff morale, and is poised to add Nuclear and Vascular testing to the system in the near future.

## Spotlight on National Heart Centre Singapore

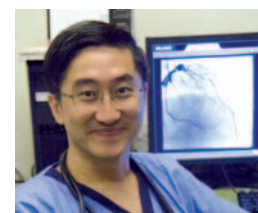
- National Heart Centre (NHC) Singapore is the national referral centre for cardiovascular disease in Singapore, providing comprehensive preventive, diagnostic, therapeutic and rehabilitative cardiac services to local and overseas patients.
- NHC has a 185-bed capacity, with more than 9,000 inpatient admissions annually. Its multi-disciplinary team of professionals carries out approximately 80,000 outpatient consultations, 80,000 cardiac investigative procedures and over 5,000 invasive procedures such as angioplasty, pacemaker implantation and open heart surgery annually.
- As an Agfa HealthCare Centre of Excellence, NHC is actively engaged in planning the features of upcoming Cardiovascular Solutions modules.
- NHC is a showcase example of hospital imaging and information management and regularly demonstrates Agfa HealthCare's IMPAX Cardiovascular Solutions system to other hospitals in the region.

## Improved clinical processes are directly linked with quality of patient care

Agfa HealthCare's IMPAX Cardiovascular Solutions represent the third generation of digital image, information and management systems at National Heart Centre (NHC) Singapore. The first generation used removable media, while the second generation used two separate server systems, with reporting only available on one of the systems.

Head of Senior Consultant Department of Cardiology, Dr. Lim Soo Teik, who headed the evaluation and implementation teams for the system, describes the importance of breaking through the barriers of clinical processes to achieve the centre's vision of excellence in patient care, "Users who are familiar with the system can now generate a report in five or ten minutes, and it can be started while the study is ongoing. The data are entered into the database while the report is being generated, so the new system cuts down on multiple steps. We can now give our patients professional, complete reports very quickly. We can immediately show a patient or family members what has been done. This is a massive leap forward in the quality of clinical care, and in the satisfaction of our patients."

Also contributing to this improvement in patient care is the Cardiovascular Solutions IMPAX Scheduling module, which allows NHC staff to allocate and schedule resources. Using IMPAX Scheduling, doctors are able to view scheduled cases in laboratories from any workstation, make immediate adjustments, and accurately schedule tests with their patients.



**"There are many issues in a complex installation like this. Agfa HealthCare is very responsive and the system has been robust."**

Dr. Lim Soo Teik,  
Head of Senior Consultant  
Department of Cardiology,  
National Heart Centre  
Singapore



## **The best available for current and changing needs of a wide range of users**

A multi-disciplinary team of biomedical engineering, IT, and clinical users evaluated five different systems on a wide range of criteria and found that Agfa HealthCare was able to provide both the features they were looking for and the ability to grow and adapt to meet the future needs of the hospital and changes in the clinical landscape, because it provides a modular system.

Agfa HealthCare's IMPAX Cardiovascular Solutions met NHC's requirements that the system be feature rich, integrated, user friendly, stable, widely accessible and supplier-neutral to integrate with their wide variety of input devices.

The system also needed to take full advantage of the power of the Intel® processor-based server platform it was installed on, and be able to efficiently utilize the processors for maximum performance.

Intel architecture-based platforms feature in many installations in the the medical field, with powerful processors designed to drive clinical software and health care systems that depend on the reliability and robust performance of the architecture.

Dr. Lim explains that they had clear goals for the system, "We viewed a new imaging and information management system as an important investment, and of course we wanted the best available to meet our current needs. We also looked carefully at longevity and the ability to adapt to changing hospital and clinical needs. A solution of this breadth is practically unique in the world. Agfa HealthCare is an enthusiastic supplier who recognizes and appreciates the great potential for future collaboration. As an Agfa HealthCare Centre For Excellence we are very active in providing Agfa HealthCare with input, feedback and feature enhancement requests."

One of the systems engineers who were intimately involved in the implementation displayed positive reviews on the choice of solution. "A Formula One race car is no good without a good driver," says Matt Zuchowski, lead systems engineer implementing the solution. "Similarly, having high-performance servers and processors wouldn't do us much good if the software solution couldn't take full advantage of all that power. I believe we made the correct choice with Agfa HealthCare IMPAX Cardiovascular Solutions and the Intel® architecture-based server platform."

## **Benefits that reach beyond the clinical process**

NHC is a teaching hospital, and in addition to patient care, it plays a leading role in cardiac research and education. Dr. Lim sees the benefits of IMPAX Cardiovascular Solutions extend into these areas in a number of ways. "Regarding patient care, I think like every hospital in the world we are trying to benefit as wide a population segment as possible with limited resources, so we need to maximize the benefits of our investments in this area. In the case of Agfa HealthCare's IMPAX Cardiovascular Solutions we have been able to save manpower, cost and time, while improving our quality of care and customer satisfaction. As a patient at NHC you would notice the improvement in speed we've had with Agfa HealthCare's IMPAX Cardiovascular Solutions. We can now visit a ward almost immediately after a study to show the patient the results. A typed cardiac study report at NHC could previously take 24 hours or more but with Cardiovascular Solutions it can now be available in ten minutes or less."

"Another benefit, perhaps not as obvious, is that it has improved the morale of staff. When the information you need is easily available and easily accessible, when you want it and where you want it, your job definitely becomes more pleasant," continues the doctor. "Agfa HealthCare's

IMPAX Cardiovascular Solutions have been an enormous benefit in our weekly cross modality case review meetings. We often need to review all the different studies for a particular patient and we have access to all that information, from the lecture theatre, immediately."

The Agfa HealthCare solution has also been very valuable to the NHC's research and teaching functions explains Dr. Lim, "Data previously on different systems are now available on one system, which has enormous benefits for research. We can also ring up images and case studies easily for teaching purposes, and IMPAX Cardiovascular even has a feature to make teaching slides. It is a wonderful system that not only helps speed up my work, but also aids in creating teaching materials that I can use to share my work with other doctors."

### Continually developing to meet the future

In the near future, the NHC ECG management system will be opened up to other hospitals, clinics and specialist centers in the SingHealth cluster, which comprises three hospitals, five national specialty centres and nine polyclinics, and reports will be available wherever they are needed.

Dr. Lim sees this as an opportunity to extend the benefits of Agfa HealthCare's IMPAX Cardiovascular Solutions beyond NHC itself, "Right now we're enjoying greatly improved accessibility because we can access information wherever there is a computer terminal in the hospital, or in fact anywhere we have connection to the Internet. Obviously putting medical information on a central server in the future will require strict security and access rights, and we have already put this into place."

The doctor concludes that future collaboration with Agfa HealthCare will continue to extend IMPAX Cardiovascular Solutions' power and functionality for better cardiac care, "In the field of cardiology in general, I think we will see the greater importance of non-invasive imaging in the future, and Agfa HealthCare is already developing modules such as the Coronary CT module to meet these needs."

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### Return on Investment

- The installed Agfa HealthCare IMPAX Cardiovascular Solutions and Dual-Core Intel® Xeon® 5110 processor based servers provides National Heart Centre Singapore with modular, scalable healthcare system that meets its immediate and future needs. The system locks in the Centre's investment at today's prices, and delivers better healthcare management and capability for the future.
- The deployment has extended the benefits of the system to other areas of the Centre, including cardiac research and education, enabling NHC to maximize on its investment to save manpower, cost and time, while improving quality of care.
- Medical processes have accelerated providing both doctors and patients with faster results, and hence faster access to needed medical care. For example, a typed cardiac study report at NHC could previously take 24 hours or more but with IMPAX Cardiovascular Solutions it can now be available in ten minutes or less.



Solution provided by:



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