



# Echocardiography unleashed

## Working more effectively with Philips Xcelera

The University of Chicago Medical Center enjoys robust image management, analysis and reporting with Xcelera for cardiovascular ultrasound

### Who/where

**Roberto M. Lang, MD**  
Professor of Medicine  
Director of Cardiac Non-Invasive Imaging Lab

**Kirk T. Spencer, MD**  
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### Challenge

Quickly and easily manage images, analysis and reporting of echocardiography studies for distribution across the enterprise

### Solution

Implement Xcelera for cardiovascular ultrasound

“Sometimes I think we ought to have our fellows read from videotape just so they can appreciate the advance we’ve made with Xcelera,” says Dr. Kirk T. Spencer, Professor of Medicine and Associate Director of the Cardiac Imaging Center at the University of Chicago Medical Center (UCMC).

Dr. Spencer and his colleagues at UCMC are now committed to same day reporting. As he explains, “We have, on average, a three hour turnaround from image acquisition to report signature. We never would have committed to that before Xcelera. It has unquestionably changed our doctors lives and helped our patients, no doubt about it.”

### The move to digital

UCMC took the leap to digital review of their echocardiography studies in 1998 when they purchased EnConcert, the predecessor to Xcelera. In 2002, Philips upgraded the system to the Xcelera cardiovascular information management solution. Since then, UCMC has seen Xcelera grow to the comprehensive system it is today.

“In ’98 it was brand new to us,” says Dr. Spencer, “the concept that we could look at any patient in any order that we

wanted to. We could look at any image in any order we wanted. We could pull up multiple cycles at one time. We could look at different views at different times. We could pull up a prior study and put the two side-by-side in seconds. As an ultrasound viewer, it was phenomenal.”

As a review tool, Xcelera helped UCMC ease the issue of having immediate access to prior studies as compared to video tapes which are not immediately available for proper study comparison. According to Dr. Spencer, “The most commonly used phrase before ’98 was ‘compared to prior study – images could not be located – no direct comparison could be made.’ The idea of clicking a button to find an old study and with two clicks getting the prior images was revolutionary.”

### Ever improving

“Xcelera is an evolving tool that is modified by Philips on an ongoing basis,” says Dr. Roberto M. Lang, Professor of Medicine and Director of the Cardiac Non-Invasive Imaging Lab.



Roberto M. Lang MD, Professor of Medicine and Director of the Cardiac Non-Invasive Imaging Lab

In its most current iteration, Dr. Lang identifies four areas where he believes Xcelera makes a significant difference:

- Comparative studies
- Powerful quantification
- Uniform reporting
- Connecting with the hospital information system (HIS) and electronic medical records (EMR)

Xcelera offers access to advanced clinical applications and to all information present in Xcelera from any internet-connected computer, at any time, resulting in fast workflow and simplified sharing of information. workspace, It helps instill diagnostic confidence among clinicians. UCMC uses Xcelera in conjunction with their Philips iE33 ultrasound imaging systems.

“As I see it,” says Dr. Lang. “Xcelera has evolved from a viewing tool to a reporting tool to a teaching tool to a research tool to a quantification tool.”

### Positive impact on workflow

UCMC has fifty-five Xcelera workstations spread throughout the adult lab, the pediatric lab and various conference rooms in the hospital. Twelve sonographers and many fellows/doctors, including Lang and Spencer, share the duties for review, analysis, and creation of echo reports. The team is able to complete up to 60 cases per day – imaged, signed, and submitted to the HIS.

“Xcelera makes taking of the measurements so easy for the physicians that we’ve changed the model in our labs,” says Dr. Spencer. “Docs now make a lot more measurements than they ever did because it’s so easy.”

Upon acquisition of the images, a sonographer will make initial measurements at the iE33. However, more advanced quantification is typically reserved for an Xcelera workstation, freeing the sonographer to move on to the next case.

While Dr. Spencer finds he spends one-third of his busy schedule attending to echo studies, Xcelera allows him to work quickly and efficiently. “With just a single click,” he says, “I can accept the sonographer’s measurement, make another measurement

and average it with the sonographer’s measurement, or I can make a measurement and get rid of the sonographer’s initial measurement. It’s my discretion.”

“Xcelera is also an extremely powerful teaching tool,” adds Dr. Lang. “We can have our fellows pre-read studies and then we can go over them to see where/how they’ve made their measurements and we can correct them.”

From a physician’s point of view Xcelera promotes a uniform reporting system. Finding codes are easily selected from a drop down menu, populating reports with familiar phrases. Due to this uniformity, referring physicians at UCMC, find they can’t tell the difference between reporting physicians, other than looking at the attached signature. “We all quantify in the same way and follow the guidelines of the American Society of Echocardiology for what is considered ‘mild’ and ‘moderate,’” notes Dr. Lang.

### Advanced quantification made easy

QLAB is Philips advanced cardiovascular quantification software. It assists with analysis of image data acquired on the Philips iE33, iU22, and CX50 ultrasound

“Xcelera has completely revolutionized the flow of images through our lab.”

Dr. Kirk T. Spencer



systems. QLAB features both 2D and 3D quantification and measurement, plus:

- Cardiac Motion/Mechanics Quantification (CMQ)
- Intima Media Thickness (IMT) Quantification
- Region of Interest (ROI) Quantification
- Strain Quantification (SQ)
- CMQ Stress
- Mitral Valve Quantification (MVQ)

UCMC has been using QLAB for several years. However, the recent interfacing with Xcelera has greatly increased its diagnostic value. “The original QLAB required a standalone workstation,” says Dr. Spencer. “It was under-utilized because it was not part of our typical workflow. That’s changed. Today, I can see that the image has native data and boom, with a single click, I can go into QLAB, do my analysis and send my measurements back to Xcelera.”

Dr. Lang, who does extensive research in echocardiography, finds QLAB an invaluable tool for his work. His research includes 3D imaging and quantification of the Left Ventricle (LV) and 3D imaging of the Mitral Valve with quantifiable analysis of the leaflets, annulus, and the surrounding structures

“The 3D program is superb,” insists Dr. Lang. “We know, for instance, through many studies that 3D echo is more accurate than 2D echo to quantify LV function. We’ve created a database of hundreds of these studies. Xcelera has made my research 100% more viable, because I have quick access to every one.”

He continues, “If I want to know how many African American patients with mitral valve stenosis and a mean gradient of ‘X’ we had in March of 2010, I can easily find



that information. This is very important for research and also for teaching. A lot of what we do is pattern recognition and showing more cases is a huge benefit.”

#### Customized to suit

Xcelera’s measurement configuration tool offers full flexibility over calculations and labeling of measurements to meet the reporting requirements of each unique facility. UCMC takes full advantage.

As a ‘super-user’ Dr. Spencer has mastered this technique. “I can literally come into Xcelera and create a new measurement, let’s call it the ‘Spencer Index.’ I define it and the next time I sit down to do an analysis, it’s right there. The analysis tool is limitless in its ability to customize new measurements.”

Carol Coupet, Business Systems Analyst, manages the IT aspect of Xcelera at UCMC and is also called upon to create new measurements for physicians. As she recounts, “One of the pediatric physicians wanted to modify some measurements associated with the fetal template. We sat down together and he mocked up what he wanted to see. I went into the measurement configuration tool, made a copy of the template and proceeded to edit it to fit his needs. Then I updated the fetal profile. Now

when he’s reading, he’s going to complete his study according to his preferences.”

Every customized measurement is automatically saved to the database and reflected in the final report.

“With Xcelera, Philips gives you a framework,” says Dr. Lang, “but it can be modified as we have modified the reporting system over more than ten years. We adapt it as echo changes. We didn’t have 3D echo ten years ago and now we can add that to our reporting. A couple of years ago we didn’t have Doppler tissue imaging and we didn’t regularly quantify systolic function. Now this is done in every study. We do that by creating new finding codes.”

Again, it’s Dr. Spencer who takes the lead. “I have a rule,” he says. “If I have to type something more than once, it needs to be a finding code. We have some 600-800 of our own phrases, making the Xcelera reporting package very robust. Every quarter, I sit down and create between three and twenty new codes. Then I send an email to everybody announcing that they are available. As a result, our reports are more consistent, more complete, more accurate.”

Dr. Lang has grown accustomed to the flexibility. "If I could not tailor the measurements and the reports, I would not use Xcelera. It's that simple."

### Sharing across the enterprise

One of the early challenges for UCMC's IT department was that the echo reports weren't getting to the HIS. "Our secretary spent much of her day faxing reports to different places in the hospital," says Dr. Spencer.

Interaction with UCMC's ADT/EMR/EPIC systems is now possible with Xcelera Connect. Xcelera Connect transfers information from these other hospital systems into the Xcelera workflow. Sharing information in this manner may help prevent unnecessary work, reduce mistakes, and disseminate studies.

"ADT data comes into our Xcelera Connect server," explains Coupet. "The sonographer simply selects the proper patient from a list. There is very little manual typing, which means fewer errors. The physician's order for an exam comes through and populates the worklist. The sonographer chooses the order, performs the exam, and sends the results to the Xcelera server."



Once the final report is signed, it is published to the HIS, recorded in the patient's EMR, and made available for review. "At the click of a button, a report can be found across the enterprise and over the web," says Dr. Spencer

According to Coupet, if a report is sitting in the near-line repository (cache), retrieval occurs within seconds. If it is sitting in the short-term archive, it takes approximately fifteen seconds. If it's a comparison study coming from UCMC's deep archives, within about one minute it is displayed on the screen.

Dr. Lang knows how valuable this can be. "Physicians have fast access to the echos of their patients from many points around the hospital. The can look at a study on a workstation in the ICU, or operating room, or at home via the Internet. As soon as a study is finished, our young doctors are reviewing for diagnosis. This is very beneficial to our patients."

### An indispensable tool

With Xcelera, institutions like UCMC move closer to the idea of autonomous healthcare - customizable, multi-modality, vendor-neutral clinical informatics. Philips designs a flexible image/data management system like Xcelera to promote operational efficiencies in an increasingly complex digital workplace. By simplifying review, analysis, and reporting of echo studies, the potential of echocardiography is more fully realized.

"What I like about Xcelera is that we have been able to put our own imprint on it," concludes Dr. Lang. "It is very dynamic. It's not just an off-the-shelf product, but one that allows us to develop our individual echocardiography program."

"I have Xcelera here on my desk in my office. It's the first thing I put on every day when I get in. I cannot imagine practicing echocardiography without having a system like this."

Dr. Spencer adds, "It's just good medicine."

Please visit [www.philips.com/xcelera](http://www.philips.com/xcelera)



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