Revolutionizing Workflow in Pediatric Cardiology

Children's Hospital of Michigan in Detroit, MI, USA

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“Revolution is a strong word, but *syngo* Dynamics really has revolutionized how we work in the cath lab”

Revolutions aren’t always noisy. Some begin with the boom of cannons and the clash of swords, but others occur with the click-clack of a keyboard.

Dr. Thomas Forbes, points his cursor at a name on a computer screen in the catheterization lab of Children’s Hospital of Michigan in Detroit. Not long ago, the lab had one system for image archiving and another for reporting. Today, with the click of a mouse, Dr. Forbes can display evidence-based reporting on customizable templates alongside embedded, high-resolution images. In the background, he can view autopopulated hemodynamic variables. Another click, and he can see images of previous cath procedures of the same patient. A final click, and the report can be sent to the billing department and to referring physicians in outlying medical centers.

Dr. Thomas Forbes, Director of the hospital’s Cardiac Catheterization Laboratory

“Revolution is a strong word,” says Dr. Forbes, Director of the hospital’s Cardiac Catheterization Laboratory. “But *syngo* Dynamics really has revolutionized how we work in the cath lab.”

syngo® Dynamics is the multi-modality management and reporting system of the Siemens *syngo*® Suite, incorporating digital cine-angiographic, CT / MR and echocardiographic images and patient data into a flexible, evidence-based report. Since implementing the system, Children’s Hospital of Michigan’s pediatric cardiology department, one of the Midwest’s best, has improved reporting accuracy through the interface of imaging and hemodynamics while reaping unexpected workflow improvements in manpower and billing efficiencies.

And that may be just the beginning. Though the hospital is already on the cutting edge of imaging and reporting technology, doctors believe they’ve only scratched the surface of the benefits possible through *syngo* Dynamics.

The Challenge: Developing a state-of-the-art cardiac unit

Children’s Hospital of Michigan, part of the Detroit Medical Center complex, is the only freestanding children’s hospital in Michigan and is the state’s leading training center for pediatricians. The cardiac unit draws patients from around the world (5 percent of its young customers are from other countries) for treatment by the unit’s 13 full-time physicians and 70 employees. At the heart of the cardiac unit is one of the nation’s busiest pediatric catheterization labs, where about 1,800 procedures a year are performed in two bi-plane, flat-panel Siemens labs.

And yet although the doctors were world-class and the labs state-of-the-art, the reporting process presented much opportunity for improvement. Cath reports chewed up staff time. Doctors dictated two separate reports, one for referring physicians and another for medical records, recording the nuts and bolts of every image in case it was needed later for litigation. Both reports were then transcribed by staff, then proofed by the physicians. Hemodynamics recorded by hand during procedures were later copied into reports. Images were copied onto various media. Finally, a thick packet would be couriered or mailed to a referring physician – seven to ten business days after the procedure.

"About 60 percent of the time, the referring physicians would see their patients back in their offices for a follow-up exam before they got a dictated copy of the report," says Dr. Forbes. "It required us to talk to them on the phone before they received the report. If [the referring physician] were a pediatrician, catching up with them could be problematic."
Each reporting step added time and reduced accuracy. Measurements and procedures were lost in the transcription process. Images were filed away on videotapes and CDs that were cumbersome to use. "Patients were not able to get their own copy of their reports, which in this day and age is expected," explains Dr. Forbes. "People travel and move more. The key is not only to inform the physician, but to make the patients and their families as knowledgeable as they can be."

Physicians were resigned to the system's failings, believing there was no other choice. "That's just the way things worked," Dr. Forbes says. "It's kind of like typewriters. People say, 'How did you ever use typewriters?' But when that's all you had, you just did."

The Solution:
Evidence-based reporting

In 2005, physicians at Children's Hospital of Michigan were considering three imaging systems and four reporting systems to outfit a new cath lab.
"We ended up going with Siemens [for all]," Dr. Forbes says, "because they were committed to developing a pediatric cath lab, not only from an imaging standpoint but also from a reporting standpoint."
That's what caught the attention of physicians like Dr. Forbes. "Adult cath labs do 80 to 100 times more caths than we do," Dr. Forbes says. "There are four or five pediatric cath labs in Michigan, and we have five adult cath labs on this block."
Because of the vastly larger market size, most manufacturers focus on adult cath technology, leaving pediatric physicians to adopt adult technology to the specialized needs of pediatric cardiology as best as they can.

"For [most] makers of cath labs, pediatrics is an afterthought," explains Dr. Forbes. "Siemens was much more forward in working from the ground up."

Hospital profile
Children's Hospital of Michigan

General Information:

- No. of beds: approx. 228
- No. of employees: approx. 70 in the cardiac unit
- Patients per year (inpatient / outpatient): 27,000 / 10,000
- Approximately 650 cath lab patients per year
- Image data: approx. 1 TB for cath and 2 TB for echo

Installed Systems:

- *syngo* Dynamics v6
  - 3 *syngo* Dynamics workstations

Imaging Systems:

- Multiple Echocardiography Ultrasound systems
- Multiple Siemens Axiom Artis / Sensis Cathlabs

“From implementation to follow-up and support, the Siemens partnership has been seamless.”

"Siemens was much more forward in working from the ground up."

By the next time Dr. Forbes leaves the catheterization suite the patient's images, hemodynamic data and their associated diagnostic phrases will be waiting for him to verify and sign off the patient's report.

syngo Dynamics, the multi-modality PACS (Picture Archiving and Communication System) solution for imaging labs, allowed the hospital to create evidence-based reports that for the first time included both notes and images. At Children's Hospital of Michigan, the reports also included autopopulated hemodynamics.
The system went online at the Detroit facility in November 2006 and was updated in mid-2007. "From implementation to follow-up and support, the Siemens partnership has been seamless," says Paul Webster, Lead Cath Lab Technologist. "It's nice to know I can call one place for service, and not have to figure out which company to call for which product."

Within a week of implementation, doctors and physicians had figured out the basics of the reporting system. "It really wasn't a learning curve as much as a different mind-set," says Dr. Forbes. "It took changing some old work habits, but everyone is happier now."

The Success:
Efficient workflow and more time for patient care

The hospital could tell something special was happening by the change in phone calls. Before the new system, the cath lab regularly got angry messages from referring physicians asking why they hadn't yet received reports. After *syngo* Dynamics electronic reporting was installed, the calls were filled with praise. "The [referring] physicians noticed right away when we upgraded. They asked if we had a new cath lab. Actually we had gotten the new cath lab a year earlier, but they didn't notice the difference until we installed the *syngo* Dynamics reporting system. It was literally night and day," says Dr. Forbes. The results, while still early, have been dramatic. Whereas cath reports used to take seven to ten days to reach referring physicians, now 20 percent of the reports are completed, archived, faxed or emailed to referring physicians and sent to the hospital billing department before

"It took changing some old work habits, but everyone is happier now."

the patient leaves the lab. All reports are completed within a day. *syngo* Dynamics allows each hospital, and its individual physicians, to personalize the reporting templates to meet their needs. "Everything is here – patient history, the procedures, pressures, images – everything is templated," says Dr. Forbes, clicking

Paul Webster, RT(R), Lead Cath Lab Technologist

through a cath study in a room lined with computer monitors. "Angiograms used to be burned on a CD. It was problematic – no one had time for them. Now, the report is able to embed angiograms."

Dr. Dan Turner, Assistant Professor of Pediatrics at Wayne State University in Detroit

Dr. Dan Turner, Assistant Professor of Pediatrics at Wayne State University in Detroit and one of the physicians in Children's Hospital of Michigan's cath lab, had reservations about the point-and-click system. "I wasn't sure how user-friendly the system was going to be," says Dr. Turner. "Dictation was easy for me. But now I can sit down between cases, do a couple mouse clicks and be done with a report in five minutes. It's as close to real-time reporting as you can get. I'm spending less time doing all the chores we used to have, so there's more time to do other things."

Doctors are spending less time with patient paperwork and more time with patients. "The patient load hasn't changed yet, but the efficiencies in workflow have freed up physicians for patient care," says Webster. Outside referring physicians are getting studies faster, and the studies they get are more thorough. "We used to do two reports, one for referring physicians and a longer report for archives," says Dr. Forbes. "Now we do one report, and all the referring physicians prefer it – they get it all now, and it's all done electronically. It's all about customer care, not only for the patient, but for the referring doctor. Expediency, accuracy and imaging is what has impressed the referring doctors."

Happy referring physicians will likely lead to an increase in referrals, says Webster. Though patient load has not increased yet, *syngo* Dynamics is already having a positive economic effect on the hospital. One staff member used to spend 90 percent of her time transcribing dictation for cath reports. "Her job has basically been eliminated by this," says Dr. Forbes. "It's allowed her to do other things for us in the cath lab." Even the billing department has felt the ripple benefits of *syngo* Dynamics. Bills are not sent to insurance companies until a final report can be attached. Now, that can happen in hours instead of weeks, vastly improving billing turnaround time. "Insurance goes through these [bills] and says, did you really do all these angiograms? Now the angios are templated in there, so they can see them. There are many fewer rejections now because of consistent documentation."

The hospital feels it has only begun to realize the potential of the system. Dr. Forbes is excited about the future research possibilities of the system. "Complications in a cath lab are difficult to figure out." As Dr. Forbes explains: "Before [*syngo* Dynamics] you had a data sheet you filled out afterward, with all the details of the procedure. Now, when we're doing research on complications, 99 percent of the data is filled in during the procedure. In the year before we installed *syngo* Dynamics, we were able to track three cath complications. Since implementation, we've tracked 15. "Better tracking and more accurate reporting of procedures "will revolutionize research," says Dr. Forbes. "It improves verification, compliance and accuracy."

Children's Hospital of Michigan has had site visits from as far away as Australia looking at the Siemens imaging and reporting systems. A hospital that has always viewed itself as being on the cutting edge of medical practice now feels it is on the cutting edge of medical reporting. "How happy am I with the system?" Webster asks. "I'm ecstatic."

"There's a lot more we can do with it," adds Dr. Turner. "It grows with you. It's really only limited by the user."

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The Challenge

- Deploying a PACS based workflow solution that would fit the specific needs of pediatric cardiology

The Solution

- *syngo* Dynamics, the multi-modality Cardiac PACS solution for imaging labs, allowing evidence-based reporting including both notes and images
- Structured reporting
- Seamless collaboration for solution analysis, implementation, follow-up and support between the Children's Hospital of Michigan and Siemens teams

The Success

- Satisfied referring physicians due to prompt reporting – 20 percent of the reports are completed before patient leaves lab; all reports are completed the same day
- Customizable templates displaying patient history, procedures, hemodynamics, and cine-angiographic and static images
- Improved tracking and reporting
- Decrease in billing turnaround time
- Physicians spend less time moving through paperwork and more time with patients through optimized workflow

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Order No. A91001-M2040-G738-1-7600
Printed in Germany
CC IM 00001-10 WS 11072.

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