

Pediatric Cardiology Reporting Grows Up

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Since the arrival of *syngo* Dynamics in their specialized cardiac facilities, two top children's hospitals in the Midwest have quickly moved to the cutting edge of image management and reporting technology. However, doctors at both institutions believe they have only scratched the surface of the benefits possible with this pioneering technology – in pediatric care and beyond.

By Ron French

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

Thomas Forbes, MD, Director of the Cardiac Catheterization Laboratory, 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, Forbes can display evidence-based reporting on customizable templates alongside embedded, high-clarity images. In the background, he can view autopopulated, hemodynamic variables. Another click, and Forbes can see images of previous cath procedures of the same patient. Another click, and the report can be sent to the billing department and to referring physicians in outlying medical centers. "Revolution is a strong word," says Forbes, "but *syngo*® Dynamics really has revolutionized how we work in the cath lab."

Three hundred miles to the west in Milwaukee, Wisconsin, Michele Frommelt, MD, examines a fetal echogram on a computer screen at the pediatric echocardiography laboratory of the Herma Heart Center at Children's Hospital of

Wisconsin, digitally transferred from a hospital two hours away. Such studies used to be mailed or sent by courier. Reports would take days to be returned. "For our surgeons to be able to pull up a study almost instantaneously and for people to get feedback right away is a dramatic change," says Frommelt. "It helps us do our jobs better."

syngo Dynamics is the multimodality image management and reporting system of Siemens *syngo* Suite, incorporating cine angiographic, echocardiographic, and computed tomography (CT) and magnetic resonance (MR) digital images and patient data into a flexible, evidence-based report. Since installing the system, two of the Midwest's premier pediatric cardiology departments have increased their staff efficiency and patient throughput, while improving reporting accuracy through the interface of imaging and hemodynamics. And that may be just the beginning.

A New Rhythm in the Echo Lab

Children's Hospital of Wisconsin is a 236-bed, state-of-the-art facility with a 4,000-person staff caring for more than 22,000 admissions a year. The facility was recently named one of the top ten chil-

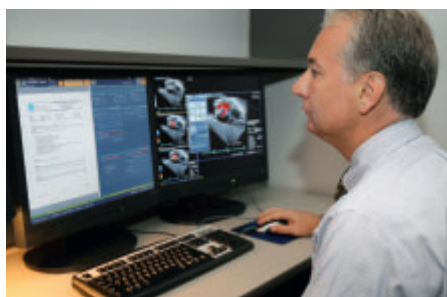
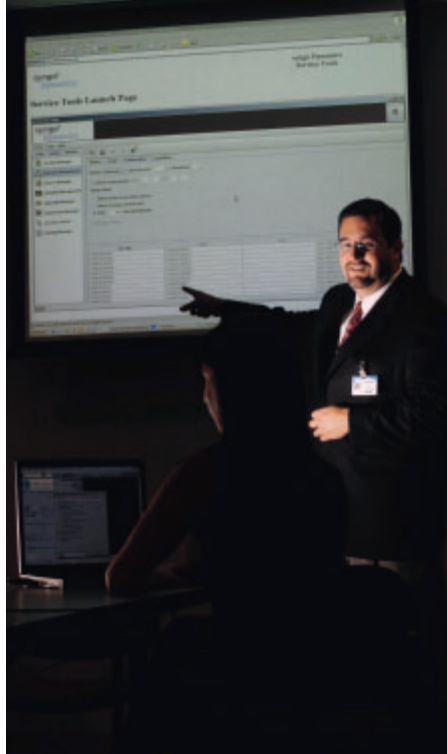
dren's hospitals in the country by *Child magazine*. The Herma Heart Center was rated the eighth best pediatric cardiology center in the USA, and it is easily one of the busiest. Drawing patients from a three-state area, the center performs about 750 surgeries, 450 catheterizations, and over 7,000 echocardiograms a year.

"Echocardiography is the nerve center for everything that happens in pediatric cardiology," says Peter Frommelt, MD, Director of the hospital's Pediatric Echocardiography Laboratory. "It defines anatomy, physiology, and hemodynamics for all patients. It's absolutely critical." Quick and accurate reporting of echo studies is vital in pediatric cardiology, where each heart is as distinct as the snowflakes that fall past the windows of the Milwaukee hospital every winter. "Adults deal with coronary artery disease, and so the heart anatomy is almost always the same," says Peter Frommelt. "In pediatric cardiology, no two hearts are the same. They all have different congenital abnormalities that require specialized imaging techniques to identify the abnormalities, and specialized surgical techniques to correct them."

In the late 1990s, the center became the first pediatric echo lab in the nation to



Children's Hospital of Wisconsin is a 236-bed, state-of-the-art facility with a 4,000-person staff caring for more than 22,000 admissions a year. On the right: David M. Organ (top), Dr. Peter Frommelt



upgrade its archives from analog videotape to digital computer storage. The switch offered a dramatic improvement in the quality of archived studies, but that improvement stopped at the door of the lab. Reports made to referring physicians were still produced the way they had been for decades, in a multi step process that often took days. Final reports sometimes didn't make it to the desks of referring physicians in surrounding cities for days. It was a frustrating half step forward. "If we know the information and nobody else does, it doesn't help anybody," says Peter Frommelt.

In Detroit, doctors in the pediatric cardiac catheterization lab were facing a similar problem. Children's Hospital of Michigan, part of the Detroit Medical Center complex, is the only freestanding children's hospital in Michigan and the state's leading training center for pediatricians. The cardiac unit draws patients from around the world (five percent of its young patients are from other countries) for treatment by the unit's 13 full-time phy-

sicians and 70 employees. At the center of the cardiac unit is one of the nation's busiest pediatric catheterization labs, where about 700 procedures a year are performed.

Until the arrival of *syngo* Dynamics, cath reports chewed up staff time. Doctors dictated two separate reports, both of which had to be transcribed and proofed. Hemodynamics written down during procedures were later copied into reports. Images were copied onto various media. Finally, a thick packet would be sent by courier 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 follow-up exams before they got a dictated copy of the report," says Thomas Forbes. Each reporting step added time and reduced accuracy. Physicians were resigned to the system's failings. "That's just the way things worked," 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."

Dramatic Timesaving Results

For Children's Hospital of Wisconsin, the road to the Siemens system was long and bumpy. "We started out early with a vendor who provided digital archiving but didn't have a good reporting tool," Peter Frommelt says. "Then we went to a different vendor who didn't even have a good image review system, let alone reporting. I knew from working with other people [at echo labs around the country] that Siemens had the Cadillac of review stations. I knew we'd be able to bring Siemens in and be able to review echo imaging seamlessly."

The hospital was able to transfer several years worth of archived digital images from the system of another vendor because *syngo* Dynamics is vendor-neutral – a huge relief for hospitals such as Wisconsin that are looking to switch systems. "The partnership has been very good," says David Organ, IT Project Leader for Children's Hospital of Wisconsin. "The tools we have that allow me to configure *syngo* Dynamics are far and away the best thing I've seen in the industry. With the last Picture and Archiving System (PACS) we had, every time I made a configuration change, I had to restart the server. With *syngo* Dynamics, I can just add devices as needed on the fly."

At about the same time, 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 both," says Forbes. "They were committed to developing a pediatric cath lab, not only from an imaging standpoint, but also from a reporting standpoint. Most makers of cath labs gear them for adults – pediatrics is an afterthought. Siemens was much more forward-thinking in working from the ground up."

syngo Dynamics allowed both hospitals to create evidence-based reports that included both notes and images for the first time. At Children's Hospital of Michigan, the reports also included auto-populated hemodynamics.

The results, while still early, have been dramatic. In Detroit, 20 percent* of the reports that used to take seven to ten

days to reach referring physicians are now completed, archived, faxed, or e-mailed to referring physicians and sent to billing before the patient leaves the lab. All reports are completed within one day. Each lab has personalized the reporting templates to meet their needs. "Everything is here – patient history, the procedures, pressures, pictures – everything is templated," says Forbes, clicking through a cath study in a room lined with computer monitors. "Angiograms used to be burned on a CD [compact disc]. It was problematic – no one had time for them. Now, the report is able to embed angiograms."

Dan Turner, MD, 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," Turner says. "Dictation was easy for me. But now I can sit down between cases, do a couple of 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."

The Ripple Benefits

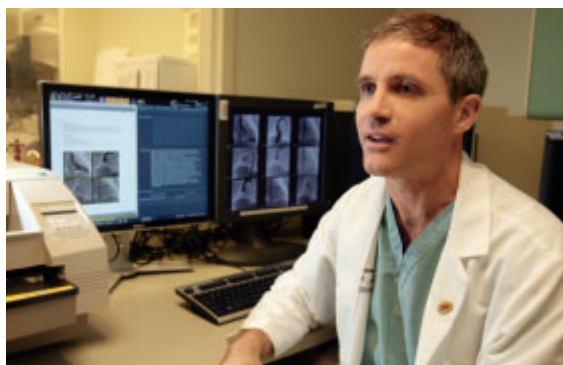
In Milwaukee, the echo lab completed a study comparing the last month of transcription-based reporting to the *syngo* Dynamics-templated system. "Our median time went from 24 hours to about an hour-and-a-half," Peter Frommelt says. "We don't have to do anything but click a button. We've gotten tremendous feedback from physicians saying they really appreciate the speed of the reports – which really helps in their ability to deliver care quickly. Not only did patient and referring physician satisfaction improve, but from a safety standpoint, I think it's a real advance." Doctors are spending less time generating reports, giving them more time for patient care. Sonographers can complete echo studies faster. "The time from when a patient came into the room until a final study was completed went from 31 min-

utes to 26 minutes. And that was despite increasing the list of images they needed to capture to complete a study," says Peter Frommelt. "We now take 85 different pictures just for a normal study."

Increasing throughput was a bonus that physicians at Children's Hospital of Wisconsin did not expect. The echo lab director believes the standardized template "triggers in (staff) an ability to organize their thoughts more quickly. Our time is under tremendous demand. We were very happy to see our time to complete a study had gone down."

In Detroit, 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," Forbes says. "Now we do one report, and all the referring physicians prefer it – they get it all now, and it's all done electronically."

Efficiencies created by *syngo* Dynamics have freed up staff for other tasks. At Children's Hospital of Michigan, one staff member used to spend 90 percent of



Children's Hospital of Michigan, part of the Detroit Medical Center, is the only freestanding children's hospital in Michigan and is the state's leading training center for pediatricians. On the left: Paul Webster (top), Dr. Thomas Forbes



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Summary

Challenge:

- Optimize communication between regional hospitals and referring physicians
- Need for quick and accurate reporting in pediatric cardiology
- Large catchments area and busy cath lab demanding workflow improvements
- Increase workflow efficiency, especially in the generation of cath lab reports

Solution:

- Flexible, evidence-based reporting on customizable templates with embedded, digital, high-clarity images
- Reports can include both notes and images, and can be completed, archived, faxed, or e-mailed within one day
- Immediate access to imaging studies and reports at diagnostic workstation
- Integrated patient digital imaging information

Results:

- Time to generate a report dramatically decreased
- One-click access to reports and ability to send to different departments and external parties
- Less time for reports, more time for patient care
- Revolutionary data research with improved verification, compliance and accuracy



Increasing throughput was a bonus that physicians did not expect.



Efficiencies created by syngo Dynamics have freed up staff for other important tasks.

her time transcribing dictation for cath reports. "Her original job has basically been eliminated by this," Forbes says, "but it has 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.

Unlimited Potential

Doctors at Children's Hospital of Wisconsin have noted improved consistency in reporting. "Each physician had his own style for describing a heart lesion in dictation. With the templates, because everything is structured, everyone is reporting things in a more uniform way," says Peter Frommelt. "There's no question that for the referring physician, it's easier to sort through the reports, because every report is set up in the same way." Uniform reporting also provides a better defense in case of litigation, Forbes says. "We may take for granted certain procedures that we always do, and we may sometimes forget to dictate them. Sometimes in the past, if you got busy, you may not have dictated for a day or two, and there was tremendous variation between physicians and even the same physicians doing the same procedure," says Forbes. "This system has helped improve the reporting accuracy of all our procedures." Both hospitals feel they are only beginning to realize the potential of the system. In Milwaukee, syngo Dynamics is driving referrals from outside hospitals and clinics. "Everybody has been happy with it – the physicians and the customers," Organ says. "They can send studies through VPN

[Virtual Private Network] connections with no loss of quality, and have our cardiologists read them immediately. If we make it easy for sites to bring us studies, volume will go up."

In Detroit, Forbes is excited about the research possibilities of the system. "It was difficult collecting data before," he says. "This will revolutionize research. It helps improve 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. "How happy am I with the system? I'm ecstatic," says Lead Cath Lab Technologist Paul Webster RT (R). "The Siemens collaboration has been seamless." "There's a lot more we can do with it," says Turner. "It grows with you. It's really only limited by the user." What is happening at Children's Hospital of Wisconsin and Children's Hospital of Michigan is so revolutionary that Peter Frommelt believes it will rewrite pediatric imaging standards. "I don't think there is anyone out there who can tell you how long it should take for a finalized echocardiogram report to be available in an electronic medical report to the referring doctor," he says. "But what we've found is that it shouldn't be days – it can be hours."

*Results may vary. Data on file.

Ron French is an award-winning reporter for the Detroit News.

Link

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