

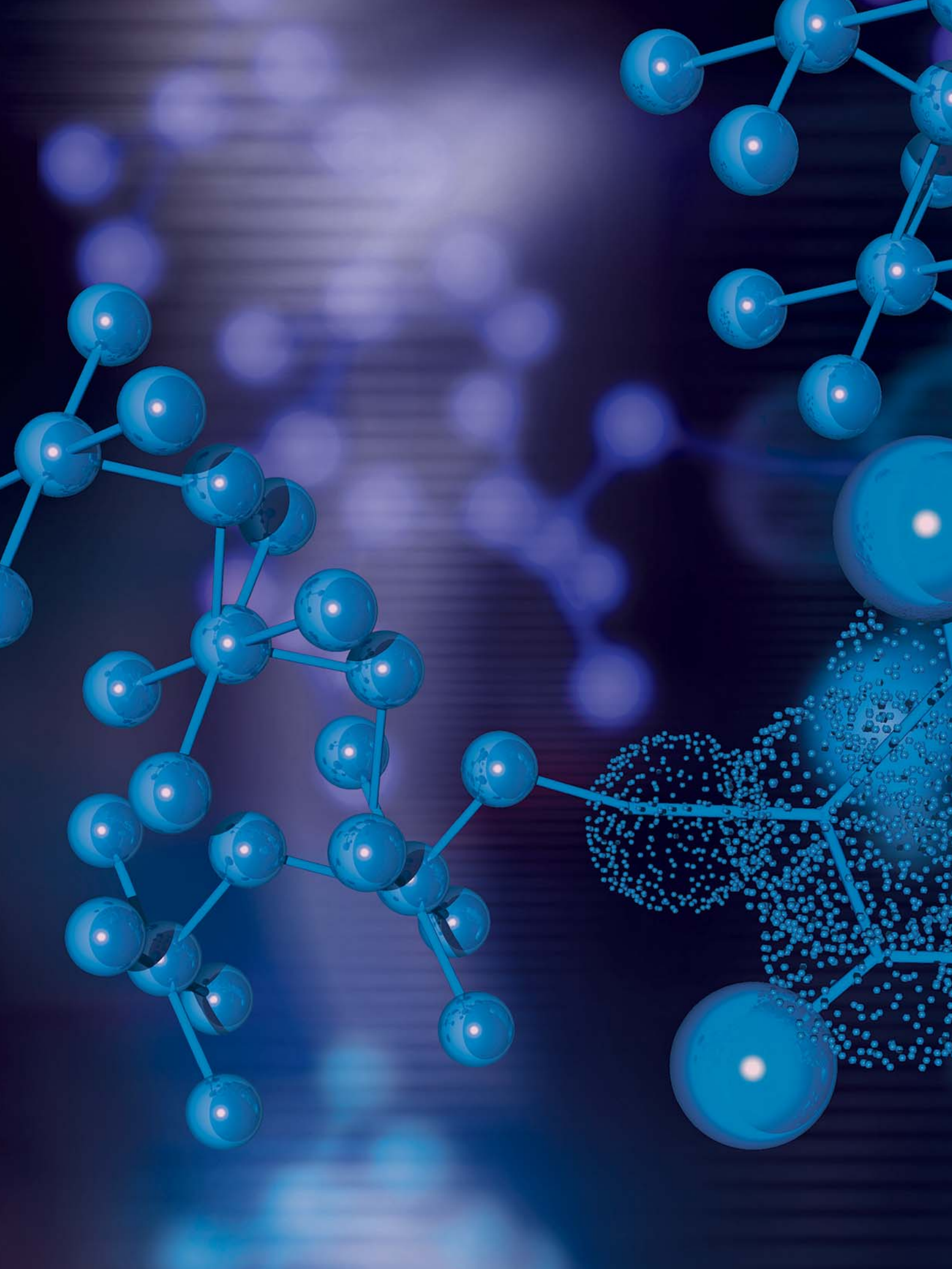
# Integrated Diagnostics

**Amy K. Erickson**

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# Integrated Diagnostics

## Advancing Personalized Medicine

The spotlight was on personalized medicine as radiologists, laboratorians, pathologists, IT experts, and healthcare executives came together at the second annual Molecular Summit. Through robust discussion and lively debate, they exchanged ideas about one of the industry's hottest trends – the integration of molecular imaging, molecular diagnostics, and healthcare informatics.

By Amy K. Erickson

The healthcare innovators participating in the 2009 Molecular Summit in Philadelphia, Pennsylvania, USA, in February had something especially exciting to talk about: The integration of diagnostics and imaging information, combined with a healthcare information technology (IT) platform, can dramatically improve the

way patients are treated. With the computerization of in vivo and in vitro diagnostics, stunning new medical insights and data are emerging. Participants shared their insights with *Medical Solutions*.

According to Jared Schwartz, MD, PhD, Pathology and Lab Medicine at Presby-

terian Healthcare in Charlotte, North Carolina, USA, molecular diagnostics integrated with therapeutics represents a major new opportunity in the era of personalized medicine. "To leverage this opportunity," he says, "the information from pathology and radiology sources needs to be combined into a single, com-

prehensible, understandable, and actionable report.”

“It is my belief that the integration of technology will be the factor that transforms healthcare,” says Don Rucker, MD, Chief Medical Officer of Siemens Healthcare in the USA. “This conference is about everyone learning best practices on how to combine the information from pathology and radiology. It’s very new, very fluid, and because it’s so fluid, it’s extraordinarily exciting.” Rucker notes that as these fields converge, they have the power to provide more accurate diagnoses and personalized patient care.

### A New Kind of Workflow

Overcoming the challenges of integration was a topic of much discussion at the Summit. “The practice of medicine is holistic,” says Ossama W. Tawfik, MD, PhD, Director of Anatomic and Surgical Pathology and Vice Chairman of the Department of Pathology and Lab Medicine at the University of Kansas Medical Center in Kansas City, Kansas, USA. “It’s not just pathology, and it’s not just radiology. There will be integration, and that could include a new kind of workflow.”

According to Mark L. Redick, MD, Assistant Professor of Radiology at the University of Kansas, a major challenge to integration is poor communication between siloed healthcare services. “Today, the clinical demands are so high that it inhibits us from being able to get out of our treatment suites or reading rooms,” he explains, noting that other factors to consider are cost and quality implications.

### A Pathology-Radiology Case Study

One forward-looking physician leader who attended the Summit is advancing the notion of integration from concept to practical implementation. Jonathan Braun, MD, PhD, Chair of the Department of Pathology and Laboratory Medicine at the David Geffen School of Medicine at UCLA, University of California, Los Angeles, California, USA, is developing a unique cancer center that brings together the university’s radiology and pathology



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Malvern, Pennsylvania, USA

departments. The UCLA Radiology Pathology Center is designed to use radiology (computed tomography, magnetic resonance imaging, and ultrasound) to isolate and sample suspicious lesions, and pathology to process and diagnose the specimens. The pathology information will be combined with the radiology information in an estimated 48- to 72-hour turnaround time to create a comprehensive single report for physicians. The

report will be accessible online for viewing by the entire healthcare team. Braun and his group launched the project about 18 months ago. “We are currently in the process of finalizing financials and funding transfers, completing the validation of integrated IT reporting mechanisms, and working on facility upgrades,” says Braun.

According to the Summit’s keynote speaker, George Poste, DVM, PhD, Chief Scientist, Complex Adaptive Systems Initiative, and Director of The Biodesign Institute of Arizona State University in Tempe, Arizona, USA, multimodality diagnostics will play an essential role in how healthcare evolves toward a proactive healthcare system organized to serve the needs of personalized medicine – and it will require the optimum use of costly resources. “This is a field in chaos to some extent,” says Poste. “Only when we can think beyond the siloed structure can we integrate across the entire spectrum of healthcare.”

Poste believes that there are three forces shaping the evolution of healthcare – molecular medicine and personalized medicine; access, cost, and quality of care; and the proficient use of information. “We live in an exciting time, where there is a dramatic acceleration of science and medicine,” says Poste. “We are entering an era of targeted care using new molecular diagnostics to expand individualized medicine.”

### Digitizing Anatomical Pathology

The digitization of information is essential to synchronizing pathology and radiology workflows and furthering an integrated model of care. A panel discussion at the Summit explored the healthcare industry’s progress toward digital images and digital pathology systems.

Bruce A. Friedman, MD, Professor Emeritus of Pathology at the University of Michigan Medical Center in Ann Arbor, Michigan, USA, served as the panel’s moderator. “In the radiology world, adoption of digital images is near 100 percent,” explains Friedman. “However, in



Among the 27 speakers at the Molecular Summit were Bruce A. Friedman, MD; George Poste, DVM, PhD; Mark L. Redick, MD, PhD; Jonathan Braun, MD, PhD; Ossama W. Tawfik, MD, PhD; Michael R. Descour, PhD; and Dirk Soenksen (from top left).



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Presbyterian Healthcare, Charlotte, North Carolina, USA

the pathology world, the percentage is much lower.” With that idea as a starting point, the other panelists weighed in on the progress toward digital pathology systems.

Dirk Soenksen, Chief Executive Officer of Aperio Technologies, Inc., in Vista, California, USA, has observed the adoption of digital technology in pathology routinely in Sweden, Japan, and other countries, but says there are many regulatory hurdles in the United States that still need to be overcome.

Michael R. Descour, PhD, Chairman of DMetrix, Inc., in Tucson, Arizona, USA, believes that in addition to regulatory issues, cost is also an obstacle that is impeding the widespread adoption of digital slides in pathology. According to Descour, there needs to be a certain level of cost savings in terms of dollars per slide in order for it to make sense financially.

Public necessity could become a main driver in advancing digital technology. Mohan Uttarwar, Cofounder and Chief Strategy Officer of Biomagene in Cupertino, California, USA, is convinced that it is not a question of whether digital pathology will happen, but when. He believes that once the adoption of digital slides becomes mainstream, all pathologists will jump on the bandwagon. Descour agrees. “The faster we can bridge the gap between glass and digital slides, the faster we can facilitate acceptance,” he says.

Even though the challenges are there, Friedman and his fellow panelists concluded that there is a very strong desire to pursue the goal of close collaboration between pathologists and radiologists in a digital environment. “The momentum is strong right now, and we have to find a way to lead the pack,” states Tawfik. “The breakthroughs in technology have the potential to bring the two practices together.”

### The Take-home Message

When the Summit came to a close after two days of spirited discussion, intelligent debate, and the sharing of ideas among

thought-leaders and experts in the fields of radiology and pathology, it was clear that the participants had reached a conclusion: The integration of technology is critical to advancing personalized medicine.

As the independent disciplines of laboratory diagnostics and medical imaging are bridged through IT solutions and collaborative efforts, healthcare is moving into a new era of streamlined workflows, improved clinical outcomes, and more affordable care. Vital information from multiple sources and multiple modalities will reside in one electronic patient report accessible by all physicians along the care continuum. The result will be earlier, quicker diagnoses and improved quality of life for patients.



The two days in Philadelphia were filled with lively discussions and interesting lecture sessions.

## Wired for Success

Susquehanna Health, located in North Central Pennsylvania, has an ambitious mission to create the healthiest region in the United States. It was named one of the nation's Most Wired Hospitals by *Hospital & Health Networks* magazine for eight consecutive years and partners with Siemens to help deliver high-quality care to its community.

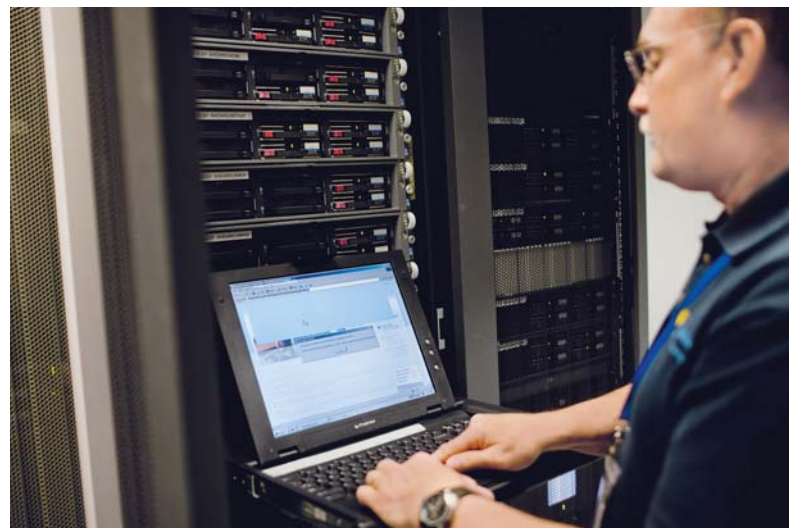
Susquehanna Health is a three-hospital health system comprising Divine Providence Hospital, Muncy Valley Hospital, and the Williamsport Hospital & Medical Center. Serving patients in an 11-county region, Susquehanna Health offers a broad array of services, including cardiovascular care and cancer treatment. From prevention and early detection to diagnosis, therapy, and follow-up care, Siemens technology is integrated throughout Susquehanna Health to offer patients a full spectrum of personalized care.

Susquehanna Health uses a strong health-care information technology (IT) platform to facilitate the integration of medical imaging with laboratory diagnostics throughout the facility. "Susquehanna has been a Siemens customer for over 30 years. We feel very strongly that Susquehanna should have one common platform for our IT, and Siemens was the vendor of choice for that whole endeavor," says Karen Armstrong, Senior Vice President and Chief Information Officer (CIO). "As the practice of medicine evolves and

becomes more complex, the need for a well-executed technology strategy is without question."

### The Power of Interoperability

As the first facility in the world to go live with both Soarian® Clinicals and Financials, Susquehanna Health realizes the power of interoperability to deliver advanced healthcare. According to George Manchester, MD, Executive Vice President and Chief Medical Officer (CMO) of Susquehanna Health, one of the primary



Results and reports from the imaging department (top) and the laboratory (middle) are stored and managed in the IT department (bottom) and made available to everybody involved in the patient-care process – when needed, where needed.

benefits of a hospital-wide integration of systems is the free flow of data and information between the different systems and components. "There are so many different data sources that you're looking at, and Siemens gives us the ability to access many different kinds of data and pull from many sources in an easily accessible manner," explains Manchester. Because Susquehanna Health houses a Siemens IT platform as well as Siemens imaging and lab technologies, having the Soarian workflow engine that can speak to all three of those applications really makes a huge difference, says Armstrong: "The workflows can help us with notifications to both physicians and nurses. It can create a lot of efficiencies and notifications throughout the entire system."

This integrated healthcare model allows physicians at Susquehanna Health to keep the patient at the center of care. "Healthcare is sometimes like a puzzle," says Manchester. "The IT infrastructure provided by Siemens allows us to put all the pieces on the table at one time and it gives us the best chance of coming up with the right picture."

### Measurable Results

Susquehanna Health was named one of the Best Places to Work in Pennsylvania for 2008. "We believe this honor is due in part to the implementation of Siemens technologies and we have the metrics to prove it," explains Armstrong. "We conduct regular physician surveys that show that with the implementation of technology applications, physicians' satisfaction with the hospital also increases." During the last three years, overall physician satisfaction with technology went from the 86<sup>th</sup> percentile to the 96<sup>th</sup> percentile, which directly corresponds to the installation of Siemens systems. Clinician access to lab/radiology information increased to 83 percent, compared to the industry average of 74 percent. According to Donald Leathers, MD, Medical Director of Laboratory Services and President of the Medical Staff at Susquehanna Health, "I know that the implementation and integration of these technologies has increased my ability to practice pathology

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Karen Armstrong, Senior Vice President,  
CIO, Susquehanna Health, Williamsport, Pennsylvania, USA





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Donald Leathers, MD, Medical Director of Laboratory Services,  
President of the Medical Staff,  
Susquehanna Health, Williamsport, Pennsylvania, USA

## Summary

### Challenge:

- Offer compassionate care that is tailored to each patient
- Increase physician satisfaction and productivity
- Aggregate data and images from multiple sources

### Solution:

- All-Siemens imaging, lab, and IT
- Create disease-specific workflows
- Notifications based on practice protocols and policies

### Result:

- Quality patient care
- Streamlined processes and lower operational costs
- Faster and easier clinician access to patient information

efficiently and accurately, because it’s easier to make accurate diagnoses when you have all the information you need.” Additionally, notes Armstrong, after the picture archiving and communication system (PACS) implementation, radiologist productivity increased by nearly 40 percent.

An additional link between technology integration and better patient care is the fact that Susquehanna Health carries the Gold Seal of Approval from the Joint Commission for Primary Stroke Centers.

“We received this award largely because Soarian and the SOMATOM® Definition CT [computed tomography] system allows our physicians to treat stroke patients very quickly and efficiently, and time is a crucial element when it comes to diagnosing and treating stroke patients,” says Armstrong.

“I think one of the trends in healthcare right now is to do more with less and do it at a higher quality,” says Leathers. “Our relationship with Siemens has made us much more efficient, while at the same time maintaining or exceeding the quality that we had before.”

Susquehanna Health is currently conducting a study to evaluate the impact of IT implementation in the emergency department. Hospital administrators are looking for additional opportunities to expedite diagnosis, particularly in heart attack and stroke patients, where quick decisions are critical to care. The impact of IT implementation on patient satisfaction and patient outcomes will also be studied.

### On the Horizon

Although this community hospital system is already well positioned to provide patients with superior care, Susquehanna Health, supported by Siemens, continues its goal of fully integrated healthcare. The hospital system is in the process of completely upgrading and automating its laboratory operations. There are also plans to completely renovate, modernize and expand capacity for Susquehanna’s cath labs, including the addition of electrophysiology services. Additionally, Susquehanna and Siemens are collaborating on the construction of a new hospital tower. Dubbed Project 2012, the



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new facility will include Siemens imaging equipment, healthcare IT, automation technologies, energy efficiency equipment, and more.

“Susquehanna and Siemens share a common goal of delivering the best possible care,” says Armstrong. “An integrated system gives our healthcare team the information they need, when they need it, allowing our patients to be treated with the highest quality at every point along the care continuum.”

*Amy K. Erickson is a health and medical journalist based in Chicago, Illinois, USA. Her work has been published in numerous magazines including CURE and Nature Medicine. This is her fourth article for Medical Solutions.*

### Further Information

[www.siemens.com/answersforlife](http://www.siemens.com/answersforlife)

## A Holistic Approach to Integrated Healthcare

Siemens is the primary provider for IT, medical imaging, and laboratory diagnostic solutions for Susquehanna Health. These solutions include:

### Healthcare IT

Soarian® Clinicals, Soarian Financials, Clinical Access, Common Clinicals, Clinical Team, Med Administration Check (MAK), Soarian Revenue Cycle, Patient Access, Soarian Scheduling, Computerized Physician Order Entry (CPOE), Soarian Cardiology, Soarian Critical Care, Soarian HIM, Data Warehouse, Soarian Portal, NextGen EMR, SIGNATURE Practice Management System, Remote Access, Siemens OPENLink Integration Engine, Biometric Identification and Sign-on, Document Imaging, HDX, Groupware

### Radiology

syngo® Suite, syngo Dynamics (Cardiology), AXIOM® Multix, MAGNETOM® Espree, MAMMOMAT® Novation<sup>DR</sup>, SOMATOM® Definition, SOMATOM Emotion, UROSKOP® Access

### Lab

Novius® Lab, RAPIDPoint® 405 Automated Blood Gas Analyzers, RAPIDComm® Data Management Solution, ADVIA® 1200 and 1800, ADVIA Centaur® CP and XP Immunoassay Systems, ADVIA LabCell® Automation Solution, CentralLink Data Management Solution

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