

A Worldwide Challenge

Diana Smith

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SIEMENS

A Worldwide Challenge

Diverse imaging solutions and advanced, integrated technology are providing a new level of care for breast cancer patients. For a global view, *Medical Solutions* interviewed three imaging experts around the world:



Gladys Lo, MD, Chief Radiologist, Department of Diagnostic and Interventional Radiology, Hong Kong Sanatorium and Hospital, Hong Kong, China

John F. Nelson, MD, Medical Director, Battlefield Imaging, Battlefield Auxiliary Breast Center, Ringgold, Georgia, U.S.

Karsten Ridder, MD, Radiological Group Practice, Outpatient Clinic Professor Dr. Uhlenbrock and Partners, Diagnostic Breast Center, St. Josefs-Hospital, Dortmund-Hoerde, Germany

Thank you for finding time to talk to us across many time zones. All of you provide state-of-the-art breast cancer care with integrated imaging systems from Siemens that optimize clinical, operational, and financial workflow. Let's discuss how diagnosis and treatment of breast cancer has changed since you started in the field.

NELSON: I have been practicing for about 20 years, so I've seen quite a few



changes. Technologically, we've obviously seen huge strides in screening mammography just in the ability to see and pick up lesions. In recent years, most of us in the U.S. and across the world have probably transitioned to digital mammography. I think probably everyone on this panel would agree the improved screenings have saved lives. So, that has really changed the way I practice. Secondly, of course, the different modalities we use to evaluate patients diagnosed with suspected breast cancer also have ballooned. Ultrasound is no longer something that we do occasionally – it's some-

thing we do all the time. Additionally, advanced techniques like breast MRI [magnetic resonance imaging] have revolutionized what I do as a diagnostician.

RIDDER: Changing from analog to digital mammography is like the invention of rubber for the wheel. It is much faster and more precise than before, especially when you are looking at workflow. CAD [computer-aided diagnosis] is a helpful support in managing the workload of a screening center such as ours. But this is only one advantage. On the other hand, digital systems help the radiologist and surgeon communicate with the pathologist.

LO: The incidence of breast cancer in Hong Kong has increased to one in 23, and digital mammography is fantastic because Chinese women have very dense breasts. So, advanced digital mammography has really helped to look through the breast tissue, and also in picking up the microcalcifications.

How can ultrasound or other modalities improve the ability to detect cancers?

LO: Ultrasound has always been popular in Hong Kong because of the very dense breasts the women have here. We've always found it to be very useful and complimentary to mammography. MRI, of course, I think is a breakthrough. Like Dr. Ridder, we also have a multidisciplinary approach in our hospital. We communicate very closely with the breast surgeons, pathologists, radiation therapists, and oncologists.

Why is it important to be an early adopter of technology? What are the benefits to patients? To the hospital?

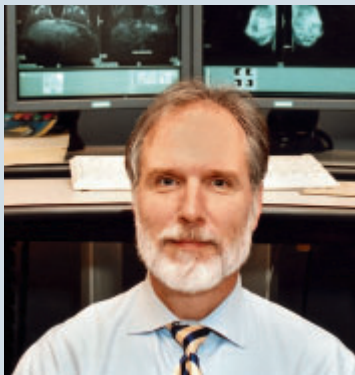
RIDDER: Here in Dortmund, where we are located, we are a city of 1.5 million. We are part of the hospital's Radiology Institute, and we have the pressure of the free market. Women are free to decide which institute they want to go to. Having better technology gives us a competitive advantage. The second thing is that with the new techniques, it is bet-

ter for the patients. With our advanced radiology equipment, we get the most sensitivity and specificity we can. Mammography is only one small part of all the basic things that have to be offered along with the other modalities. LO: Our hospital is a private hospital and actually prides itself in getting the best machines. We have a 3 Tesla MRI breast unit, and we've been doing a special sequence called diffusion to look at the breast tissue and had some very good preliminary results that will be published in *JCAT [Journal of Computer Assisted Tomography]* next year and were presented in Toronto at the ISMRM [International Society for Magnetic Resonance in Medicine] this year [2008] in May.

You had a special case as a result of the diffusion study. Can you tell us about that?

LO: One of my patients is a scientist and is aware of what we are doing. Previously, she had standard mammography, but it was not diagnostic because her breasts were very dense. So, we decided she should have the diffusion examination because it doesn't involve any ionizing radiation, there's no injection, and it's very quick. What happened was that the diffusion study unexpectedly turned out to be abnormal. So, this was followed with a complete contrast-enhanced MRI scan, of course, and at the site where the diffusion abnormality was seen, there was actually a bilobulated rim-enhancing mass with type three signal intensity time graph, quite diagnostic like a BI-RADS [Breast Imaging Reporting and Data System]¹ five lesion, and this turned out to be DCIS [ductal carcinoma in situ]. After the MRI was done, I suggested doing an ultrasound as well and we saw the lesion again. I also persuaded her to do mammography again because I was afraid she might have an area of DCIS

¹ BI-RADS is a quality assurance tool originally designed for use with mammography. The system is a collaborative effort of many health groups but is published and trademarked by the American College of Radiology.



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John F. Nelson, MD, Medical Director,
Battlefield Imaging, Battlefield Auxiliary Breast
Center, Ringgold, GA, USA

that’s only shown with microcalcifications. Both the MRI and the ultrasound may not show a certain percentage of DCIS cases that present with microcalcifications. Indeed, her tumor was at eight o’clock, but on the mammography at ten o’clock, there was a stipulated area that had some microcalcifications in it.

NELSON: Was the diagnostic MRI also negative?

LO: No, it wasn’t. It was an irregularly marginated mass, but it had a type one graph. So it was indeterminate. It was like a BI-RADS four at the ten o’clock lesion, which was seen on mammography, and a BI-RADS five lesion that was not seen on mammography for the eight o’clock.

How are you using other methods of molecular medicine such as PET-CT [positron emission tomography/computed tomography], SPECT-CT [single photon emission computed tomography/computed tomography], or biomarkers?

NELSON: At our institution, we really reserve PET-CT for women with suspected extensive disease. For most of our women with locally advanced disease, we evaluate with breast MRI, and I bet that is

true for the other two physicians. We’ve actually experimented at our institution with Bruce Porter’s techniques², and what we’re doing now is a lot more whole-body MRI for staging and the chest and abdomen for screening, along with our breast MRI.

RIDDER: PET-CT is also promising in other cancers, like ovarian cancer or lymphatic cancer. Where we use these PET techniques is also for extended breast cancer and the staging of treatment.

How does an integrated diagnostic strategy affect your patients and your facility’s success?

LO: Patients who all of a sudden find out they have some abnormality want to find out the exact extent of the abnormality and what it is right away. If you send them to all different types of places to get it and they have to wait, that’s tremendously stressful on the patient. We are lucky that we have everything in one place, including the hospital.

NELSON: In fact, that’s really why our facility was built. We are actually in a breast center, so every modality, including breast MRI, is available. We even offer Saturday morning service. We’re also in a very competitive environment here. We are motivated at our center to place the patient at the center of the wheel and all the spokes go out, but the patient shouldn’t have to move. It’s our job to provide all the services that go along with breast cancer evaluation.

RIDDER: I think my colleagues will agree, everyone is short of time, and so the time pressure is extreme. Also, women need to get their results in a short time.

Why did you choose women’s health and breast cancer as your field of expertise?

RIDDER: Honestly, I think it’s one of the most exciting fields in radiology, with all the new techniques that have been

² Refer to, e.g., Beatty, J., Porter, B: Contrast-enhanced breast magnetic resonance imaging: the surgical perspective. *Am J Surg* 193; 5:600-605.

Smith J.P., Hanson J., Dawson J., Porter B., Tickman R.J.: emerging technologies in surgical planning for breast cancer. *Am J Surg* 184; 4:377-9.

developed in the last ten, 20 years, and are still being developed. Maybe only comparable to cardiac MRI or multislice computed tomography.

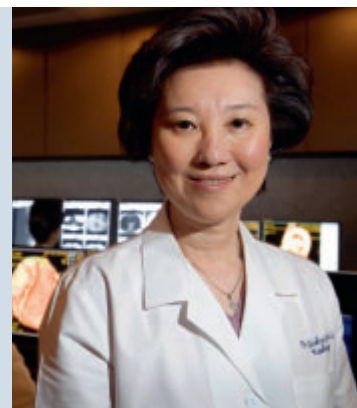
NELSON: For me, it was a calling. My sister was diagnosed with breast cancer back when I was still in medical school. She had two kids. I saw how breast cancer affects the patients, their loved ones and families, and changes the course of life for everybody. So when I got to the point of choosing my area of specialization, it was just natural.

And why did you choose Siemens equipment for your work?

NELSON: Battlefield Imaging was a brand-new center built from scratch alongside

“We are lucky that we have everything in one place.”

Gladys Lo, MD, Chief Radiologist,
Department of Diagnostic and Interventional
Radiology, Hong Kong Sanatorium and Hospital,
Hong Kong, China



“Having better technology gives us a competitive advantage.”

Karsten Ridder, MD, Radiological
Group Practice, Outpatient Clinic
Prof. Dr. Uhlenbrock and Partners,
Diagnostic Breast Center,
St. Josefs-Hospital,
Dortmund-Hoerde, Germany

the rest of our medical facilities about five years ago. We wanted to go completely digital at our center – no film. We weren’t building space for film. I actually flew to Dortmund to look at the digital mammography system they had in place there. We’ve had a long-standing relationship with Siemens, and we have extremely good Siemens service. A lot of what drove my interest in Siemens was that relationship. When I saw the system and compared it with the other two systems available at the time, I just didn’t feel comfortable that either of the others could provide me with the image quality or the back-up service that I knew would be necessary. The same is true for MRI. At that time, the Espree [MAGNETOM® Espree Open Bore MRI system with Tim® technology] was just coming on the market. We have a relatively large patient population; many of our patients are overweight or obese. The Espree just fit perfectly with what we were trying to provide. It was really the first full-field, high-end machine that offered those sort of facilities for the patients. Siemens really had the technology that worked well for us.

RIDDER: It’s the whole package you get from Siemens, not limited to just the image quality. For example, we have a

different machine that is supposed to have the same detector as the mammography system from Siemens, but there is no comparison between the two images. I’m also using our MRI for heart examinations and work with other Siemens systems as well. Thanks to the common *syngo*® user interface, it is easy to switch between the modalities.

LO: Prior to getting our Siemens digital mammography unit, we had one from a different vendor. We have images from patients who come for follow-up. The old images are from the other vendor and the new images are Siemens, and it’s like night and day. The new Siemens unit is seeing so much more, and I’m very pleased with that.

NELSON: I would add that the Siemens digital unit had several filter combinations, some of which use a considerably lower dose. Compared to our screen film, we were seeing 30 to 40 percent lower doses. We have marketed that very strongly in our community, and it has been very well received.

Are you excited about any new trends or innovative leading-edge imaging solutions for the future?

RIDDER: We have just started with ultrasound automated breast volume

scanning [ABVS]³. We haven't used the technology for a very long time, but what I can say now is that we are looking at a very promising technique that holds a huge potential for breast imaging in the future.

NELSON: I would echo that there are some other things on the horizon. I think all of us are interested to see if breast tomosynthesis⁴ is really going to take off.

³ The information about this product is being provided for planning purposes. The product is pending 510(k) review, and is not yet commercially available in the U.S.

⁴ Caution: Investigational Device. Limited by U.S. Federal Law to investigational use. The information about Digital Breast Tomosynthesis is preliminary. This product is under development and not commercially available in the U.S., and its future availability cannot be assured.

Certainly, we've found elasticity imaging in ultrasound very useful. And I'm really excited about diffusion imaging on MRI. There are a lot of tools out there that we can parlay into what we are currently doing to add diagnostic capabilities.

Diana Smith is a freelance writer based in Liberty Hill, TX, USA.

Further Information

www.siemens.com/breastcare
www.siemens.com/news-breastcare

Breast Cancer: Where are we – and where are we heading?

Challenge:

"It was easy, and I was out of the scanner in five minutes," says the scientist. "As I came out, I saw the stricken face of the radiologist and knew something was wrong." Working on MRI diffusion, a promising breakthrough imaging technique for the breast, a scientist unexpectedly discovers her own disease. One chance test completely changed her life, but that was just the beginning of an arduous emotional and physical journey.

Solution:

Today, physicians and clinicians are using an arsenal of integrated diagnostics that have revolutionized the management of breast cancer. "I think probably everyone would agree that improved screenings have saved lives," says John F. Nelson, MD, Medical Director of Battlefield Auxiliary Breast Center in Ringgold, Georgia, U.S. "That has really changed the way I practice."

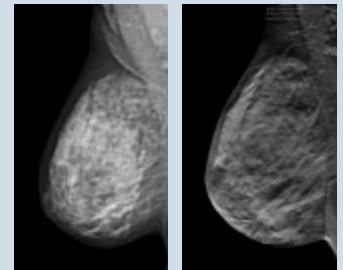
Integrated diagnostics have other benefits, including improved workflow and patient convenience. Gladys Lo, MD, Chief Radiologist at Hong Kong Sanatorium, emphasizes how new approaches to diagnosis and treatment have positive emotional ramifications. "For patients who all of the sudden find out they have some abnormality, they would like to find out the exact extent of what it is right away. If you send them to all different types of places and they have to wait, that's tremendously stressful on them."

Result:

Technologically, huge strides have been made in the imaging field in the last two decades. Integrating laboratory diagnostics, advanced imaging, and information technologies can improve a patient's outcome at every stage of care. In addition, integrated technology affects workflow. "It is much faster and more precise than before," says Dr. Karsten Ridder of St. Josefs-Hospital, Dortmund, Germany. The journey of detecting, coping with, and beating breast cancer resulted in an enlightened new perspective for the scientist. Now, this survivor gives real advice, not only on early detection and treatment, but also because of her background, specifically on what to look for in hospital imaging equipment and how the level of technology may make a difference in a person's life. All scanners are not created equally.



The ACUSON S2000 ABVS Automated Breast Volume Scanner reduces operator dependence and variability.



Patient with a 2.8-centimeter, grade 3, invasive ductal carcinoma in the right breast imaged with digital mammography (left) and breast tomosynthesis. The medio-lateral oblique (MLO) digital mammography view shows dense breast tissue with subtle distortion in the lower breast. The MLO tomosynthesis slice shows a spiculated mass in the lower breast.



MAGNETOM Espree – Pink is a dedicated MR Breast Scanner with a 70-centimeter Open Bore at 1.5T and an ultra-short 125-centimeter system length.

Diverse Imaging Solutions

In a multipronged, comprehensive approach, Siemens combines laboratory diagnostics, advanced imaging, and information technologies to help physicians detect, diagnose, and treat breast cancer earlier, faster, and with greater precision. New technology offers a range of breast care solutions – all designed to contribute to successful disease management.

MAGNETOM Espree – Pink

Siemens announced the latest innovation in breast MRI, MAGNETOM® Espree – Pink, the new dedicated MRI Breast Scanner with a 70-centimeter Open Bore at 1.5 Tesla and an ultra-short 125-centimeter system length. Both the 70-centimeter Open Bore scanner and the new breast coil (Sentinelle Vanguard for Siemens) offer an enhanced level of patient comfort, especially for obese and claustrophobic patients. The system has the capability to position the patient feet-first or head-first and provides excellent access to perform biopsies. Sentinelle Vanguard for Siemens offers excellent image quality and optimized biopsy access for higher accuracy in intervention and faster examination time. The dedicated workplace includes *syngo*® BreVis¹ for flexible reading and reporting and *syngo* BreVis Biopsy¹ for fast and accurate MR breast biopsy workflow with automatic calculation of target coordinates.

ACUSON S2000 ABVS Automated Breast Volume Scanner

The ACUSON S2000™ ABVS Automated Breast Volume Scanner² streamlines workflow and reduces operator dependence and variability by quickly and comfortably surveying and acquiring full-field sonographic volumes for comprehensive review and

diagnosis of the breast. ACUSON S2000 ABVS features an integrated room suite design that combines the advanced ACUSON S2000 ultrasound system and a column stand with an arm assembly, which holds a transducer pod specially designed for automated ultrasound breast imaging. It supports a high patient load with 250 to 400 single images acquired in one scan to calculate the volumes, which are sent to a dedicated ABVS Workplace for analysis and manipulation. The system features the anatomical coronal plane, which is not available using conventional ultrasound and includes semi-automated reporting features and comprehensive BI-RADS report capabilities.

Breast Tomosynthesis

The latest technology now under development in full-field mammography, breast tomosynthesis³, is a 3D imaging technology that acquires 2D projection images of a compressed breast at multiple angles during a sweep of the X-ray tube. Poised to enhance mammography, the new technology will take the two-dimensional images and reconstruct them to reveal depth – the third dimension of anatomy. Tomosynthesis slices have the potential to show tumors that remain invisible in individual images.

¹ This information about this product is preliminary. The product is under development and not commercially available in the U.S., and its future availability cannot be ensured.

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Global Siemens Headquarters

Siemens AG
Wittelsbacherplatz 2
D-80333 Munich
Germany

Global Siemens Healthcare Headquarters

Siemens AG
Healthcare Sector
Henkestraße 127
D-91052 Erlangen
Germany
Telephone: +49 9131 84 - 0
www.siemens.com/healthcare

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Local Contact Information

Asia/Pacific:

Siemens Medical Solutions
Asia Pacific Headquarters
The Siemens Center
60 MacPherson Road
Singapore 348615
Telephone: +65 9622-2026

Canada:

Siemens Canada Limited
Medical Solutions
2185 Derry Road West
Mississauga ON L5N 7A6
Canada
Telephone: +1 905 819-5800

Europe/Africa/Middle East:

Siemens AG, Medical Solutions
Henkestr. 127,
91052 Erlangen
Germany
Telephone: +49 9131 84-0

Latin America:

Siemens S.A., Medical Solutions
Avenida de Pte. Julio A. Roca No 516,
Piso 7
C1067ABN Buenos Aires
Argentina
Telephone: +54 11 4340-8400

USA:

Siemens Medical Solutions U.S.A., Inc.
51 Valley Stream Parkway
Malvern, PA 19355-1406
USA
Telephone: +1 888 826-9702