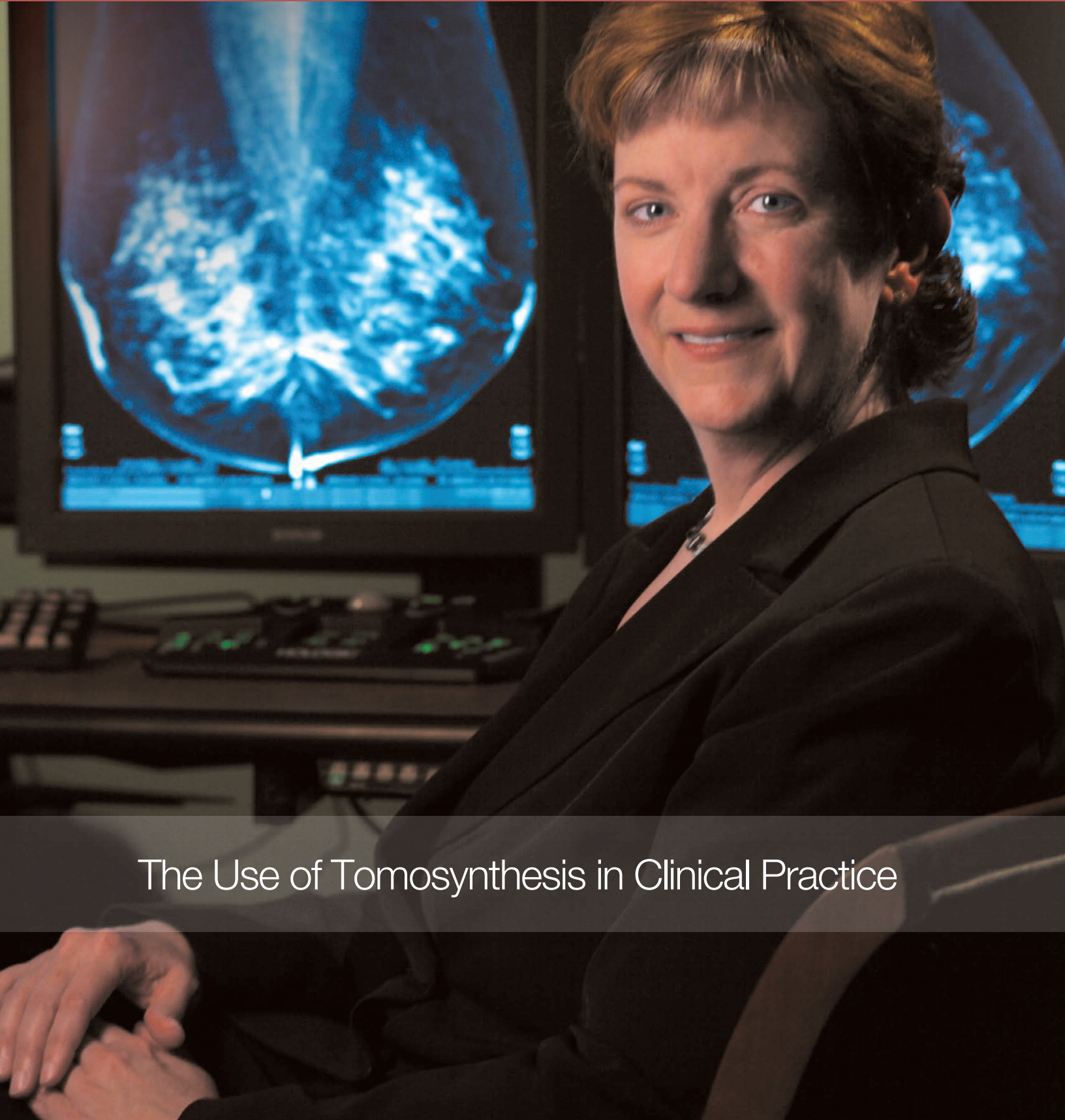


# images for life

PRACTICE INSIGHTS

FALL 2010

VOLUME NINE



The Use of Tomosynthesis in Clinical Practice

## The Use of Breast Tomosynthesis in Clinical Practice

Breast tomosynthesis is a three-dimensional imaging technology that involves acquiring images of a breast at multiple angles during a short scan. The individual images are then reconstructed into a series of thin high-resolution slices to provide topography of the anomaly – its size, its contours and its relationship with the surrounding breast tissue. The slices can be displayed individually or in a dynamic ciné mode. Tomosynthesis images are acquired in a single compression, and the examination takes only seconds longer than a conventional two-dimensional digital mammogram.

*Images for Life, Volume Nine*, focuses on clinical sites that have embraced tomosynthesis with the installation of Hologic’s Selenia® Dimensions® 2D/3D technology. These sites represent some of the finest in the field of cancer detection, and their radiologists willingly talk about their experiences in evaluating Hologic’s Selenia Dimensions tomosynthesis system and their reasons for adopting tomosynthesis technology – ease of use, efficient workflow, increased diagnostic confidence and exquisite image quality, to name a few.

These medical pioneers share a commitment to improving breast imaging performance by implementing cutting-edge radiology technologies. As early adopters of digital technology, they recognize that tomosynthesis is “the mammography of the future,” as Aron Belfer, M.D., CDB-Premium – Centro de Diagnósticos, Brasil, says in his article on page 4. Our goal in sharing these stories is to help other radiologists understand the impact that tomosynthesis – and specifically the Selenia Dimensions 3D system – is having on improving the early detection of breast cancer. As Johan Gosset, M.D., Head of the Breast Clinic at CHU Tivoli Hospital, so succinctly states on page 7: “Our radiologists prefer tomosynthesis to digital mammography because of the additional views. I prefer tomosynthesis because it wins time by finding cancer earlier.”

### IN THIS ISSUE

**Nine stories of hospitals and imaging centers—large and small, urban and rural, new and old—that share a passion for bringing the latest in breast cancer technology, diagnosis, and less invasive treatment to women.**

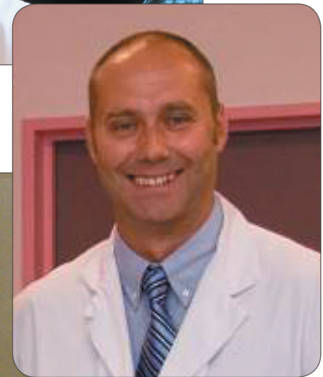
Magee-Womens Hospital, UPMC Pittsburgh, Pennsylvania	3
CDB-Premium, Centro de Diagnósticos, Brasil Sao Paulo, Brazil	4
Queen Sirikit Centre for Breast Cancer Bangkok, Thailand	6
CHU Tivoli Hospital La Louviere, Belgium	7
Hôpital Privé d’Antony Hauts-de-Seine, France	8
Hôpital Privé Jean Mermoz Lyon, France	9
Memorial Hermann City Medical Center and Rose Imaging Specialists, Houston, Texas	10
UZ Leuven University Hospitals Leuven, Belgium	11
Hôpital Privé Beaugard Marseilles, France	12



**Dr. Gignier**  
Hôpital Privé d’Antony



**Dr. Chatmara**  
Queen Sirikit Centre for Breast Cancer



**Dr. Gosset**  
CHU Tivoli Hospital

**Cover image:** Elizabeth A. Rafferty, M.D., Director of Breast Imaging, Avon Comprehensive Breast Center, Massachusetts General Hospital in Boston, has been a long-time advocate for using tomosynthesis technology for breast cancer screening and diagnoses.

The articles included in this publication are the opinions and personal stories of individual hospitals and breast centers and not necessarily those of Hologic.

# Digital Mammography Pioneer Looks to a Future with Tomosynthesis

Breast Imaging Department, Magee-Womens Hospital, UPMC  
Pittsburgh, Pennsylvania

The Breast Imaging Department of Magee-Womens Hospital of UPMC (University of Pittsburgh Medical Center) operates eight breast centers, providing far-reaching access to screening and diagnostic services for women in Western Pennsylvania. "Patients come here because we specialize in women's health. Within radiology we have 18 radiologists dedicated to women's imaging, and we perform 175,000 breast procedures annually," states Shireen Braner, Magee's Director of Breast Imaging.

Magee pioneered the use of digital mammography in 2000 when it became one of the first hospitals in the United States to install a clinical digital system. In 2006, Magee became one of the country's largest digital mammography centers when it converted its remaining analog systems to digital. The hospital has chosen to use Hologic technology in its breast imaging centers, including Hologic's Selenia® digital mammography system, MultiCare® Platinum stereotactic breast biopsy guidance system, ImageChecker® computer-aided detection, ATEC® MRI-guided breast biopsy and excision system, and Hologic's Discovery™ bone densitometry system.

"We like the performance and stability of Hologic equipment," states Braner. "The systems are easy to use, and the images are crisp. We were so impressed with image quality, we established Hologic's breast imaging systems as the standard in all 12 UPMC adult medical care hospitals in Western Pennsylvania."

And notes Dr. Jules Sumkin, Chief of Radiology, Magee-Womens Hospital: "Hologic was also one of the early developers of tomosynthesis. We were looking to partner with a company with an interest in tomosynthesis."

## Tomosynthesis – the Next Advance in Digital Imaging

In 2005, Magee installed a Hologic prototype digital tomosynthesis system as part of a research initiative to evaluate the technology. In 2009, the hospital installed a second tomosynthesis unit, Hologic's Selenia® Dimensions® system, expanding its research capabilities.

Since then, Magee-Womens Hospital has performed 1,500 breast exams using tomosynthesis. Dr. Sumkin believes tomosynthesis is the next great advancement in digital technology. "There's no question tomosynthesis will be most helpful in women with dense breast tissue. I think tomosynthesis will have a considerable impact as it becomes a standard screening tool. If we can diminish recall rates by 30 percent or so, it will have a tremendous effect on our practice's operation."

Dr. Margarita Zuley, Medical Director of Breast Imaging for Magee-Womens Hospital, points out the two potential advantages of tomosynthesis over two-dimensional mammography: improved sensitivity and the ability to characterize findings. "With standard mammography, we call back many patients because of overlapped normal tissue. In addition, we perform biopsies on many lesions, which are not cancerous. Tomosynthesis offers the potential of marked improvement on both those fronts."

As Dr. Zuley explains, "The real advantage of tomosynthesis is actually looking inside the breast through thin slices. Two-dimensional mammography provides two standard images that show the whole breast in a flat representation. Our minds have to convert these images into a three-dimensional breast. Because there's so much overlapping tissue or structural noise, we can miss lesions hiding in the breast. Tomosynthesis eliminates the overlapping tissue and has already been shown in research studies to offer the benefit of lower recall rates. Because we can see mass borders better as well, we are hopeful that tomosynthesis will help reduce biopsy rates of benign lesions."

In the diagnostic area, Dr. Sumkin notes that tomosynthesis may make a significant difference in how physicians work up patients. "When a standard mammogram raises a question, instead of doing multiple views as we do today, we will do a tomosynthesis, which will hopefully diminish the number of views and increase the efficiency of the work-up."

Hologic was one of the early developers of tomosynthesis. We were looking to partner with a company with an interest in tomosynthesis.

Hologic's Selenia Dimensions system enables radiologists to take two-dimensional and three-dimensional images in the same compression. Says Dr. Zuley: "The combo-mode is very helpful because the patient's position is identical to that of the 2D image. We can use that information to help in our understanding of the thin slices of tomosynthesis."

"Tomosynthesis gives me more confidence in understanding what's going on with the patient," continues Dr. Zuley. "I've found several cancers with tomosynthesis that we didn't see with 2D images, which is exciting."

"Hologic's dedication to women's healthcare is exemplary," concludes Braner. "They look at the whole woman and provide comprehensive solutions for women's imaging, which complements Magee's focus on women's healthcare. And, I can't sing the praises of Hologic's service engineers enough. They are accommodating, prompt and maintain our equipment, and have the same passion as we do for ensuring our patients get the exams they need."



Dr. Sumkin says there's no question tomosynthesis will be the most helpful in women with dense breast tissue. He thinks tomosynthesis will have a considerable impact as it becomes a standard screening tool.

# Tomosynthesis: The New Gold Standard

CDB-Premium – Centro de Diagnósticos, Brasil  
Sao Paulo, Brazil

Today, radiologists can detect and diagnose breast cancer better than ever before. Nowhere is that more true than at a leading diagnostic imaging center in Sao Paulo, Brazil, where radiologists have taken detection to the next step – with tomosynthesis.

CDB-Premium – Centro de Diagnósticos, Brasil, pioneered the adoption of 3D mammography when it acquired the Hologic Selenia® Dimensions® tomosynthesis system earlier this year. The news even made Brazilian television, when a journalist from SBT TV reported: “The first mammography unit in South America to perform 3D mammography was up and running in Sao Paulo.”

## The Promise of Tomosynthesis

Breast tomosynthesis is not only new to South America, but also new to the rest of the world. Today, it is cleared for sale in more than 40 countries including the United States.

## Vision and Perseverance

Pioneering the adoption of new technology first takes vision, then requires the perseverance to overcome obstacles to reach that vision. Aron Belfer, M.D., Radiologist, CDB-Premium, is the renowned radiologist who spearheaded the initiative at CDB-Premium to adopt tomosynthesis. He based his recommendation on published results from clinical experience, indicating: “Tomosynthesis in screening may offer improved subtle cancer detection and lower recall rates. The performance of tomosynthesis in denser breasts may address one of the limitations of conventional mammography, and the expected increase in cancer detection with breast tomosynthesis may further decrease mortality from breast cancer.”

The Center already had four Selenia systems when it decided to go fully digital with the purchase of the tomosynthesis system. As Dr. Belfer notes, he believes tomosynthesis is part of the normal evolution of mammography.

“Tomosynthesis is better digital mammography,” he says, and compares the development of mammography technology to the development of tomography for chest, which also progressed from analog to digital to tomography.

“When they came out with digital mammography, I thought the next step would be to work in slices,” recalls Dr. Belfer. “Tomography in any field has the advantage of avoiding overlapping tissue, and overlapping tissue is the biggest issue in mammography. Limited angle tomography is what we do with tomosynthesis.”

For now, radiologists at CDB-Premium are acquiring tomosynthesis images on the Selenia Dimensions system as an adjunct to 2D digital mammograms, which is also referred to as the “combo.” The standard 2D views help in the transition to 3D because the 2D views – the current gold standard – help in the comparison with priors. This has produced some surprising results.



Dr. Belfer says that in his first few cases, he found a lesion using tomosynthesis that he didn't see in 2D mammography

## Improved Cancer Detection

Within the first three months of using the Selenia Dimensions system, Dr. Belfer noticed tomosynthesis had definitively improved cancer detection. “You don't have overlapping tissue on the different slices, which is why you can see better,” he explains.

To date, the radiologists at CDB-Premium have completed over 600 studies. Dr. Belfer and his colleagues presented the results of the first 160 studies at a mammography symposium in Sao Paulo, during which they highlighted two important observations.

“We saw cancer that was detected only on tomosynthesis. In addition, some cancers that might have been missed due to observation problems are easily seen on tomosynthesis,” says Dr. Belfer. “Of course, if you do a second look at the 2D images, you'll find most of the lesions that even the most experienced radiologists missed on the first look.”

When the clinic uses tomosynthesis, 33 percent of the time it's for diagnostic purposes and 66 percent for screening. “While I use tomosynthesis for diagnostic and screening mammography, I think it will have an important role in screening,” indicates Vivian Schivartche, M.D., Women's Imaging Specialist at Sao Paulo, CDB-Premium. “I think if we put it in a large screening environment, we will find more cancers than we find with 2D. There are a few trials that are starting to do this.”

The Center's radiologists also say tomosynthesis provides better characterization of most lesions. “You can see the entire boundary of the lesion better – whether it's round, oval or spiculated,” notes Dr. Schivartche. This had led them to identify seven lesions seen only on tomosynthesis, of which two were malignant. Of the seven lesions, only five were identified on the ultrasound.

Tomosynthesis has enhanced the visualization of masses and their borders, which helps the radiologists determine whether a biopsy is needed. "Getting better characterization of lesions helps us either avoid biopsies or helps us decide that we really need to get one done," notes Dr. Belfer.

While women with dense heterogeneous breasts are expected to benefit most, tomosynthesis is making a difference in breast tissues where lesions are typically easy to detect. "Better characterization enhances detection even in fatty breasts," says Dr. Belfer. "We had one patient with very fatty breasts and insignificant asymmetric density. When we did tomosynthesis, the borders were suspicious, and the biopsy confirmed cancer."

### Fewer Reviews, Faster Workflows

In Brazil, it is rare to recall a mammography patient because radiologists are usually on site to give an initial impression. If necessary, they can do additional compressions right on the spot. This is called an extra view.

"We don't have what you call a recall rate, but we have extra views," Dr. Belfer explains. "Tomosynthesis helped reduce the number of extra views by more than half." This has helped enhance workflow, which is particularly important when adopting new technology.

"With tomosynthesis, you need fewer extra views," says Dr. Belfer. "So if you do the combo, very often, you avoid the extra views, and you can complete the study much faster, reducing patient anxiety or the need for the patient to return to the mammography room."

"We saw cancer that was detected only on tomosynthesis. In addition, some cancers that might have been missed due to observation problems are easily seen on tomosynthesis."



Dr. Schivartche believes that tomosynthesis in a screening environment would not only significantly decrease patient recall rates, but also radiologists would find more cancers than they do with just 2D.

### Retraining the Eye

There are always new challenges inherent in learning a new technology. One of those in tomosynthesis is interpreting images.

As Dr. Belfer explains, "In the beginning it seems easy, but then you start to look at smaller lesions. In particular, you see very small architectural distortions. It's hard to tell if it's pathology or just normal variants. So training is more important than we had thought."

CDB-Premium is sending one of its radiologists to a Hologic training session in Europe. As Dr. Belfer sees it, it's like retraining the eye. "The best way of looking at tomosynthesis and the whole series of images is on ciné mode, and then to pick up the images that have an abnormality," he says. "The method of training needs to be adapted to this new technology."

Training is critical for another reason. As Dr. Belfer explains, handling a larger image data set creates a bottleneck in workflow.

"When we do tomosynthesis, we do the combo, so there are images of both breasts, and both views are in 2D and tomosynthesis. Radiologists now have to look at a few hundred images, instead of just four images with 2D. If you have a breast 40-mm thick, you get four times 40 images, thus 160 images to review," he says.

Radiologists at CDB-Premium can attest to the value of training, which has enabled them to cut the amount of time it takes to read full tomosynthesis data in half – from 10 minutes to just 5. Dr. Schivartche is confident that as more radiologists are trained on tomosynthesis, reading time performance and the quality of interpretations will further improve. "Training radiologists is very important because we are used to seeing 2D images," she says, and adds: "As more radiologists sit together and discuss cases, we will find out how to best use tomosynthesis."

### The New Gold Standard

The big question is, Will tomosynthesis replace 2D digital mammography? According to Dr. Belfer, there's a good chance it will. However, he says, a computer-aided detection (CAD) solution for tomosynthesis needs to be developed to facilitate reads. "Since you need more reading time, CAD is very important; in my opinion, it is even more important than CAD for 2D mammography."

Nonetheless, in just a few months, tomosynthesis has shown promise, leading Dr. Belfer to believe it could eventually become the mammography tool of choice. As he predicts, "Tomosynthesis will be the mammography of the future."

# Bringing State-of-the-art Breast Care to the Women of Thailand

The Queen Sirikit Centre for Breast Cancer, Bangkok, Thailand

Eighteen years ago when Dr. Kris Chatamra returned to his native Thailand, he made a commitment to provide the women of Thailand with the same world-class breast cancer services available to women in Europe and America. With over 30 years of experience as a breast surgeon and oncologist in the United Kingdom, Dr. Chatamra envisioned a “Center of Excellence” that would bring together in one place the best breast cancer diagnostic technologies and breast cancer treatments in the world and dramatically change the outcomes for breast cancer patients throughout Thailand.

Under the auspices of the Thai Red Cross Society, the King Chulalongkorn Memorial Hospital developed a plan to make Dr. Chatamra’s dream a reality. Already serving as the President of the Thai Red Cross Society, Her Majesty Queen Sirikit volunteered to put the project under Royal Patronage and made a generous personal donation to get the “sanctuary for women in need” up and running. Her Majesty also lent her good name to the Centre.

The Queen Sirikit Centre for Breast Cancer (QSCBC) – the only dedicated breast cancer centre of its kind in Thailand – opened in Bangkok in 2005. The 10-story facility offers state-of-the-art diagnostic examinations, including digital mammography, tomosynthesis, ultrasound and stereotactic biopsies, as well as chemotherapy, radiotherapy and surgery. Located on the grounds of the King Chulalongkorn Memorial Hospital, it has access to the country’s best breast cancer specialists. In addition, the QSCBC is renowned for its clinical research, and its education and awareness campaigns.

## World-class Diagnostic Technologies Change Outcomes

Asian women tend to have dense breasts, posing a challenge for diagnostic radiologists. As a result, Dr. Chatamra insists that all patients have digital mammograms and routine ultrasounds.

For most, two-dimensional digital mammography is an excellent diagnostic tool, but as Dr. Chatamra notes, it does not provide a clear diagnosis for at least five percent of its patient population. This issue drove the QSCBC to become the first centre in Thailand to install a Hologic Selenia® Dimensions® 3D breast tomosynthesis system.

As Dr. Chatamra notes, tomosynthesis is helping radiologists see smaller lesions with greater confidence. “We have found cancers with tomosynthesis that we didn’t see with digital mammography. The 3D tomosynthesis images are helping us decide how to best treat patients.”

The QSCBC also uses tomosynthesis as a routine test for post-operative screenings. “Our philosophy is to preserve the breast whenever possible,” states Dr. Chatamra. “These patients will benefit greatly from tomosynthesis for follow-up diagnostics.

“Up to now digital mammography and ultrasound were our primary breast cancer screening tools,” continues Dr. Chatamra. “To be a Centre of Excellence, you can’t just stop with bread and butter; you must go beyond. For us that extra step is tomosynthesis,” he says.

In addition to the tomosynthesis system, the Centre currently has two Hologic Selenia digital mammography screening and diagnostic systems, and a Hologic digital StereoLoc® II system and Hologic MultiCare® Platinum stereotactic breast biopsy guidance system. “I selected Hologic’s products because they are really good quality, and I like Hologic’s scientists,” says Dr. Chatamra. “But, even more importantly, if we have a problem, I pick up the phone and talk directly to Hologic. From the Chairman of the Board and CEO on down, we can call and get a good response.”

## A Commitment to All Women in Thailand

An aggressive outreach program takes the Centre’s message of breast health to underprivileged women throughout Thailand. Volunteers from the Centre seek out women in need by offering free breast cancer examinations and healthcare education. If a

woman should need a diagnostic examination, she can come to the Centre and receive the same state-of-the-art mammography and ultrasound exams, regardless of her ability to pay. The Centre is also currently raising donations to build a hospice village for terminally ill cancer patients on 50 acres in the Minburi district of Bangkok.

“Our mission was to build the best breast cancer centre in Asia and open it to women of all status, the rich and the poor,” concludes Dr. Chatamra. “Today, the Queen Sirikit Centre for Breast Cancer is the best in Thailand and one of the best breast centers in the world.”

“To be a Centre of Excellence, you can’t just stop with bread and butter; you must go beyond. For us that extra step is tomosynthesis.”



Dr. Kris Chatamra, Founder of the Queen Sirikit Centre for Breast Cancer, credits state-of-the-art diagnostic technologies like digital breast tomosynthesis and a cohesive approach to life-saving breast cancer treatments, with making the Centre the best breast cancer diagnosis and treatment facility in Thailand and one of the best in the world.

# Smaller Cancers Detected Earlier with Tomosynthesis

CHU Tivoli Hospital, La Louviere, Belgium

The Breast Clinic at CHU Tivoli Hospital knows that effective screening and early diagnosis of breast cancer can save lives. A pioneer in the use of leading-edge technologies for the early detection of cancer, the hospital began offering digital tomosynthesis at its breast clinic two years ago with the installation of a Hologic Selenia® Dimensions® digital tomosynthesis system. "I see abnormalities better with tomosynthesis than with two-dimensional mammography, and I am finding smaller cancers earlier," explains radiologist Johan Gosset, M.D., Head of the Breast Clinic. "Three years ago I only found three or four architectural distortions in a year. Now I find 50 in a year. Tomosynthesis is a great benefit."

A teaching hospital located in La Louviere in the Central Region of Belgium, CHU Tivoli is the third largest hospital in the region and the only hospital in the area to offer tomosynthesis. The hospital's four dedicated breast imaging radiologists perform 7,000 screening and diagnostic mammograms each year, in addition to offering MRI, ultrasound and stereotactic biopsies.

CHU Tivoli has used Hologic's breast imaging technology for more than 10 years. It also uses the Hologic MultiCare® Platinum stereotactic breast biopsy guidance system. In 2006, the Breast Clinic transitioned from conventional screen-film to digital mammography, installing a Hologic Selenia digital mammography system.

## More Views, More Precise Views

The hospital notes that 9,000 women are diagnosed with breast cancer in Belgium each year, with a 76 percent survival rate for all grades (from IARC references in 2006). While digital mammography has greatly improved the detection of breast cancer, dense breasts or overlapping breast tissue make it difficult to correctly identify lesions. "Our radiologists prefer tomosynthesis to digital mammography because of the additional views," states Dr. Gosset. "I prefer tomosynthesis because it wins time by finding cancer earlier."

"Tomosynthesis allows us to obtain a more precise view of lesions," states Dr. Gosset. "It improves the visibility of masses and architectural distortions; I can see the margins and determine if an abnormality is a possible small cancer. And with tomosynthesis I can see anomalies that I don't see with two-dimensional mammography and can catch much smaller cancers with tomosynthesis."

Initially, the Clinic used tomosynthesis as a diagnostic tool for abnormalities, as well as for the localization of microcalcifications. Today, after two years of experience, it uses the modality for

regular screening mammograms for all patients.

Dr. Gosset uses tomosynthesis with two views for all patients and finds Hologic's unique 2D + 3D imaging a valuable tool. "I see more abnormalities with tomosynthesis' multi-view than in four views of digital mammography. In the beginning, it was very important to have 2D + 3D on one system because tomosynthesis was a new technique and we needed to prove its advantage. Now, I use combo 2D + 3D with all patients. With tomosynthesis for certain breast types, I see 50 percent more cancer. It's a great tool in the department."

Each week, Dr. Gosset and his team of breast radiologists meet with oncologists and breast surgeons to consult on the care and treatment of patients diagnosed with breast cancer. The hospital's two Hologic SecurView® diagnostic workstations are an integral part of the meetings, enabling Dr. Gosset to organize and present images. With SecurView, the radiologists can quickly access patient images and view images from other modalities, including ultrasound and MRI, side-by-side, providing the multi-disciplinary team with the information it needs to decide on treatment options.

Tomosynthesis is helping CHU Tivoli keep its commitment to provide cutting-edge technology that will improve patient outcomes and their quality of life. In conclusion, Dr. Gosset says: "In the end, the greatest benefit of tomosynthesis is time for the patient and the doctor."

"Three years ago I only found three or four architectural distortions in a year. Now I find 50 in a year."



CHU Tivoli Hospital radiologists say they can see abnormalities better with tomosynthesis than with two-dimensional mammography, and they are finding smaller cancers earlier.

# Tomosynthesis Increases Diagnostic Confidence in Routine Screenings; Enhances Workflow

Hôpital Privé d'Antony, Hauts-de-Seine, France

Located in Hauts-de-Seine, just outside of Paris, the Medical Imaging Center at the Hôpital Privé d'Antony serves residents in the Île-de-France region, providing the full range of breast services, including mammograms, stereotactic biopsies and ultrasounds. In June 2009, the hospital became the first breast imaging site in the region to install a Hologic Selenia® Dimensions® tomosynthesis system.

"Tomosynthesis allows us to be more confident in our diagnosis," notes Radiologist Pierre Gignier, M.D. "And our workflow is more efficient because we have almost eliminated the need for spot views."

The Medical Imaging Center at the private 400-bed Hôpital Privé d'Antony has a Selenia Dimensions 2D/3D system, a Hologic ImageChecker® computer-aided detection system and an add-on biopsy system for stereotactic and echo-guided biopsies. Images are stored on a hospital-wide PACS system. In the first year of operation, the Center performed 5,000 exams using the Selenia Dimensions 2D + 3D system.

Dr. Gignier, a breast imaging specialist, is responsible for selecting the Center's new technologies. "We are constantly implementing state-of-the-art technology to improve our imaging performance," states Dr. Gignier.

## Tomosynthesis Reduces False Positives Caused by Tissue Superposition

Tomosynthesis is a three-dimensional imaging technology that reduces the problem of false positives caused by tissue superposition. An x-ray tube rotates in a small arc across the breast, taking 15 images in a single compression. In seconds, the system software reconstructs the breast in a series of 1 mm slices from skin line to skin line. The images can be examined individually or in ciné mode, allowing the radiologists to identify abnormalities that may be hidden by dense or overlapping tissue.

According to Dr. Gignier, patients with ACR BI-RADS® Category 2 and 3 breast density will see the greatest benefit from

Dr. Gignier says he always uses the Selenia Dimensions in combination mode, taking 2D and 3D images in a single compression. He believes 2D imaging, as well as 3D imaging, offers good visualization of micro-calcifications, while tomosynthesis gives a better view of masses and distortions and is better for detecting multifocal cancer.

tomosynthesis screening mammograms. "Tomosynthesis enables us to eliminate a false image made by tissue overlap. We have found cancers with our three-dimensional tomosynthesis images that were not visible with our two-dimensional images."

Dr. Gignier chose the Hologic Selenia Dimensions system because it provides both 2D and 3D functionality on the same system.

"Hologic's Selenia Dimensions system is the only product on the market that allows us to use 2D + 3D imaging as a routine tool," states Dr. Gignier. For a normal breast tomosynthesis exam, Dr. Gignier uses tomosynthesis on both views. "We always use the Selenia Dimensions in combination mode, taking 2D and 3D images in a single compression." Dr. Gignier has found that 2D imaging, as well as 3D imaging, offers good visualization of micro-calcifications, while

tomosynthesis gives a better view of masses and distortions and is better for detecting multi focal cancers.

## System Reduces Need for Spot Views; Improves Workflow

Tomosynthesis is helping the Medical Imaging Center improve its workflow by reducing the need for additional views. "Even though tomosynthesis provides more images with greater detail, it doesn't take any longer to read 2D + 3D images than it took when we had to often read additional spot views. Tomosynthesis helps answer questions raised by convergent images, so that we no longer need to ask for additional spot views, which actually improves our workflow," states Dr. Gignier. "Reducing spot views means the technologists can spend the time getting the best positioning and improving the overall quality of the breast exam."

## Biopsying Suspicious Lesions

Being able to biopsy suspicious lesions was another critical consideration in Dr. Gignier's selection of Hologic's Selenia Dimensions 3D system. "I was looking to work with a partner and a company that was ready to help me develop a biopsy device for use with tomosynthesis," declares Dr. Gignier. "Finding a suspicious lesion with tomosynthesis that we did not see on 2D, but then not being able to biopsy the lesion, would not work for me. That's why choosing Hologic was so important."

The doctor performs macro biopsies under tomosynthesis and finds tomosynthesis helps with guided ultrasound exams on areas of interest revealed by tomosynthesis. "It is very easy to biopsy masses, distortions and microcalcifications using the tomosynthesis system," says Dr. Gignier. "We have done more than 100 procedures to date. Tomosynthesis helps me biopsy lesions that I would not have seen on two-dimensional images.

"I believe in tomosynthesis," concludes Dr. Gignier. "The more I use it, the more I believe in it."



"Tomosynthesis allows us to be more confident in our diagnosis," notes Dr. Gignier, "and our workflow is more efficient because we have almost eliminated the need for spot views."

# High-volume French Breast Imaging Center Uses Tomosynthesis for Routine Screening

Hôpital Privé Jean Mermoz, Lyon, France

Rated by *LePoint Magazine* as the eighth best breast center in France, Hôpital Privé Jean Mermoz has a reputation for developing clusters of excellence by combining medical and surgical expertise. This includes its radiology department, which offers a multidisciplinary approach to cancer diagnosis, treatment and support.

In 2003, the hospital began transitioning from conventional film-screen to digital mammography, with the addition of a digital mammography system integrated with its PACS system. However, as Dr. Christophe Tourasse, Head of the Breast Imaging Center, notes, "Digital mammography is one of the best techniques for detecting breast cancer, but it is not completely effective for women with dense breast tissue."

To help alleviate this issue, the Center added a Hologic Selenia® Dimensions® 3D tomosynthesis system in 2009, becoming the fifth hospital in France to implement this state-of-the-art technology. "I chose Selenia Dimensions because its performance in 2D imaging is one of the best, if not the best, on the market," Dr. Tourasse states.

## Valuable for Routine Mammography

Tomosynthesis builds on the image quality of digital by providing three-dimensional views. An x-ray tube rotates around the breast, taking 15 images from numerous angles to enable doctors to identify abnormalities potentially hidden by dense or overlapping tissue.

"Hologic's Selenia Dimensions system is so easy to use, we can include tomosynthesis in our workflow for routine mammograms," says Dr. Tourasse. "This was a key element in my decision to implement this technology. While the patient doesn't notice any difference from conventional mammography, the technology increases our diagnostic confidence. In fact, I've had some cases in which cancer was not visible in conventional views and diagnosed solely because of tomosynthesis."

Dr. Tourasse really appreciates the ability to acquire two- and three-dimensional images during the same breast compression. "The Selenia Dimensions system provides a correlation of planes between 2D and 3D, which is key in identifying small lesions between the planes," he says.

## Greater Clarity Improves Confidence

According to Dr. Tourasse, tomosynthesis improves the clarity of a suspicious image caused by overlapping tissue on women with dense breasts. "We can see the overlapping tissue when we go through tomosynthesis slices. It increases the specificity and allows us to take fewer spot views," he explains.

"We are very interested in detecting masses, as these masses

– when cancerous – are linked to convergent architectural abnormalities much better seen in tomosynthesis," he continues. "Tomosynthesis also helps detect microcalcifications in dense breasts, giving us a better idea of their spatial distribution."

More than 5,000 of the Center's patients have benefited from breast tomosynthesis during the past six months. Dr. Tourasse believes patients with BI-RADS® Category 3 mammographic density, heterogeneously dense breasts can benefit most from tomosynthesis. "For these patients, superimposed glandular structures create artifacts or false images that may mask real cancer," he explains.

Dr. Tourasse adds that tomosynthesis is also valuable for diagnostics because it helps explain difficult-to-read images. "Because we rarely need additional spot views, tomosynthesis helps enhance workflow. It gives us an exact localization of a breast lesion and also helps guide us when doing breast ultrasound, specifically for lesions with weak echographic contrast."

In conclusion, says Dr. Tourasse, "Tomosynthesis gives us more confidence in our readings, which leads to a lower recall rate. In most cases, cancer not seen on 2D can be identified on a second reading with tomosynthesis."

"Hologic's Selenia Dimensions system is easy to use, we can include tomosynthesis in our workflow for routine mammograms."



Dr. Tourasse uses tomosynthesis to provide better clarity of a suspicious image caused by overlapping tissue on women with dense breasts.

# 2D+3D Combo Mode in One System Offers Big Benefits for Houston Practice

Memorial Hermann City Medical Center  
and Rose Imaging Specialists, Houston, Texas

Stephen L. Rose, M.D., knows that experienced breast radiologists paired with state-of-the-art equipment can make a life-saving difference in the early detection and diagnosis of breast cancer. A board-certified breast radiologist, Dr. Rose has been a big believer in the potential of tomosynthesis technology for over five years. In 2009, he worked with Houston's Memorial Hermann City Medical Center to install Hologic's Selenia® Dimensions® digital tomosynthesis system, joining the national clinical trial to evaluate this three-dimensional imaging technology, which enables radiologists to see "inside" the breast.

"I think tomosynthesis is going to revolutionize the way we screen for breast cancer," declares Dr. Rose. "The ability to peel away layers with tomosynthesis is a tremendous advance and will help us greatly improve what we're doing in breast screening. Tomosynthesis makes a huge difference in the end result," he notes.

Dr. Rose chose the Selenia Dimensions system because of its unique implementation of the technology. "I see Hologic as the leader in tomosynthesis," states Dr. Rose. "I thoroughly researched the technology prior to obtaining the system. I really like Hologic's approach to tomosynthesis – combining 2D and 3D imaging on a single system, which gives us the flexibility to use both imaging modes. No other vendor offers this combination in one system."

## Dedicated Specialists Plus Advanced Technology Equals Fewer Callbacks

President and Founder of Rose Imaging Specialists, Dr. Rose has spent the past two decades focusing on the needs of breast patients. The practice's 13 breast radiologists serve eight major hospitals in the Houston area, providing the full range of imaging services. "We have helped revolutionize the way breast imaging is done in Houston," says Dr. Rose. "We perform between 65,000 and 75,000 screening mammograms annually, and each is done by a breast imaging specialist."

In addition to the Hologic Selenia Dimensions 3D system, Dr. Rose's practice purchased 16 Hologic Selenia Dimensions 2D systems, which are configured to convert easily to 3D breast imaging. "We believe the cost of tomosynthesis won't be much different than digital mammography, yet it will enable us to reduce our callback rate significantly and increase our ability to find smaller breast cancers. It appears to be a win-win situation, which very few new technologies provide."

To date, Dr. Rose and his staff have performed almost 400 mammograms using tomosynthesis. "Tomosynthesis is the biggest thing to happen to breast imaging in a long time. It's a much more



Dr. Rose says tomosynthesis is the most exciting tool he has seen in his professional career. He believes this technology will help find cancers earlier with fewer call backs needed for additional studies.

powerful and practical solution because unlike some modalities, tomosynthesis is easy to use and efficient, enabling us to screen almost everyone," declares Dr. Rose.

## Greatly Improved Specificity

"Tomosynthesis allows us to see questionable areas more clearly and put to rest our concerns, instead of banging our heads against the wall trying to decide if there was something or not," continues Dr. Rose. "With tomosynthesis it's obvious whether it's just breast tissue or something more significant. Tomosynthesis also allows us to see the margins of cysts and put those concerns to rest as well."

Initially, Dr. Rose looked to tomosynthesis to screen women with dense breast tissue, but he's found that it's also valuable for screening women with fatty breast tissue. "I had a case recently in which I did a digital mammogram and was concerned about an area. I brought the patient back in for an ultrasound. She also agreed to a tomosynthesis mammogram, which clearly showed cancer. So even with fatty tissue, there are cases in which we find very small tumors that we otherwise may have missed."

Looking towards the future, Dr. Rose sees a real benefit to having both 2D and 3D imaging on a single mammography system. "There are some cases where you might need to take a two-dimensional mammogram, such as for patients with large breasts or with implants. I like having the capability to do both with all my systems, so that tomosynthesis is available for every patient.

"Tomosynthesis is the most exciting tool I've seen in my professional career," concludes Dr. Rose. "This technology will help us find cancers earlier with fewer call backs needed for additional studies."

"I think tomosynthesis is the biggest thing to happen to breast imaging in a long time."

# Belgium Hospital Finds Tomosynthesis Beneficial in Detecting Spiculated Masses

UZ Leuven University Hospitals, Leuven, Belgium

As a teaching and research institution, Leuven University Hospitals – one of the largest hospital groups in Belgium – has access to the latest technologies, enabling the groups to provide the highest level of patient care, while conducting clinical studies to optimize the performance and application of its equipment. So when tomosynthesis was approved for use in Europe, the hospitals naturally decided to implement the technology, installing a Hologic Selenia® Dimensions® digital tomosynthesis system in 2009. According to Radiologist Dr. Chantal Van Ongeval, Leuven University Hospitals is often one of the first medical institutions in Europe to implement such cutting-edge radiology technologies.

Even though it is still in the data collection phase, Dr. Van Ongeval and her team have begun to identify some of the benefits of tomosynthesis. “I agree with opinions expressed in many professional articles, presentations and seminars: tomosynthesis is beneficial for the detection of spiculated masses,” states Dr. Van Ongeval, who also notes that tomosynthesis helps with diagnostic work and pre-operative evaluations.

“We use tomosynthesis as an additional modality for our diagnostic examinations,” she adds. “It is difficult to differentiate dense breast tissue from small stellate dense lesions, but tomosynthesis makes it much easier.”

## 2D + 3D in One Compression

The Leuven University Hospitals began transitioning from analog to digital in 2004 and today, it has four digital mammography systems, including a Hologic Selenia digital mammography system and a Hologic Selenia Dimensions 2D/3D mammography system, which provides two and three-dimensional views of the breast. “Selenia Dimensions is very fluent and very fast,” says Dr. Van Ongeval. “The patient is not aware we are taking multiple images because it is all done in one compression.”

Dr. Van Ongeval and her team routinely take both 2D and 3D views for diagnostic mammograms. “I’m still learning and don’t feel comfortable with just 3D views, so I also take 2D views. The specificity is better with tomosynthesis because we know what we are seeing. Using 3D imaging, we have found small lesions in dense breasts that are difficult to find on 2D imaging.”

Using Hologic’s SecurView® breast imaging workstation, the radiologists are able to view both 2D and 3D images simultaneously.

“The SecurView workstation allows us to see 2D and 3D images immediately, and it’s very easy to go back and forth between them,” notes Dr. Van Ongeval. “If you view the tomosynthesis image, it gives you the place in the Mediolateral-oblique (MLO). You can then go from this to the Cranio-caudal (CC), which helps with localization of the lesion.”



Dr. Van Ongeval notes that tomosynthesis is particularly useful in evaluating breasts with different densities due to glandular tissues; that is, if you see some distortion and you’re not sure if it is a lesion, and for multifocal lesions where you need to see extensions.

Dr. Van Ongeval is also impressed with image quality. “You can discriminate small stellate lesions from glandular tissue. This is helpful in a screening environment because it’s important to have a high specificity of mammography at the lowest dose possible,” she explains.

“Selenia Dimensions is very fluent and very fast. The patient is not aware we are taking multiple images because it is all done in one compression.”

## Training Leads to Greater Comfort Using Tomosynthesis

As a leading supplier of tomosynthesis technology, Hologic established an extensive training program in collaboration with leading tomosynthesis centers across Europe. Dr. Van Ongeval and her team took the training course and now feel more comfortable reading the images. “Even if you have years of experience with digital mammography, it’s not enough because you see very different things with tomosynthesis. The course helped us to use the system properly,” she concludes.

# Tomosynthesis Improves Diagnosis and Localization of Tumors

Hôpital Privé Beauregard, Marseilles, France

The Hôpital Privé Beauregard in Marseilles is recognized throughout France as a center of expertise in mammography. The *Nouvel Observateur* recently rated it one of the top five hospitals in France for the management of breast disease. The private 320-bed hospital is part of Generale de Sante, the largest private hospital group in Europe, providing services to more than one million patients each year.

For the past 10 years, the hospital's Breast Imaging Center has set the standard for the detection of breast cancer by proactively offering screening mammograms. In 2009, the hospital again led the way with the addition of a Hologic Selenia® Dimensions® 3D digital tomosynthesis system, becoming one of only a handful of hospitals in France to implement this state-of-the-art technology.

"Tomosynthesis provides better visibility of the margins of a mass and increases our confidence in the diagnosis of benign images," reports Radiologist Brigitte Seradour, M.D., Head of the hospital's Breast Imaging Center and Coordinator of the National Screening Program for Breast Cancer (INCa). "Tomosynthesis will benefit women who have heterogeneous dense breasts with an opacity not typically well seen in two-dimensional imaging. It will help us detect masses in these patients because tomosynthesis slices are similar to histological sections of paraffin tissue, providing better visualization of cancerous tumors, particularly spiculated areas."

Managing the department that takes care of the second readings for all screening examinations is one of Dr. Seradour's many responsibilities. This position allows her to monitor the evolution of mammography image quality from screen-film to different digital mammography solutions.

"Tomosynthesis provides better visibility of the margins of a mass and increases our confidence in the diagnosis of benign images."

Dr. Seradour says excellent image quality and ease of use were key factors in the hospital's choice of the Hologic tomosynthesis system. The system's combined 2D + 3D functionality also played a critical role. "The Selenia Dimensions is the only tomosynthesis system that enables technicians to take both two-dimensional and three-dimensional images in a single acquisition with a single compression," states Dr. Seradour.

## Tomosynthesis Enables 3D Reconstruction of the Breast

"Tomosynthesis deals easily with the superposition of breast tissue, so we are able to decrease the number of spot views we take by 80 percent." The Hôpital Privé Beauregard performs 8,000 mammograms annually using CR and Hologic Selenia and Selenia Dimensions systems. Since implementing tomosynthesis, the Breast Imaging Center has performed 6,000 mammograms using the unique 2D + 3D functionality of the Hologic system. Dr. Seradour and her staff use tomosynthesis as an additional modality to two-dimensional imaging.

Dr. Seradour reports that the three-dimensional tomosynthesis images have helped detect eight cancers that would not have been seen with two-dimensional mammography. "The tomosynthesis system removes overlays that can hide small cancers, especially if the breast is very dense and opaque." For patients and technicians there is little difference in the examination or workflow. "Our patients don't see any difference with the tomosynthesis mammogram; they are just curious and ask why the tube is rotating," says Dr. Seradour. "Our workflow hasn't changed either. It doesn't take any longer to read cases."

In conclusion, she says: "I think tomosynthesis has an important impact in screening mammograms. It detects multifocality better and will avoid a lot of false negatives; we can see more, so opacity will not be wrongly classified as benign."

## HOLOGIC®

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