

GE Healthcare

Senographe digital mammography enhances workflow and diagnostic quality

Bethesda Women's Health Center
Boynton Beach, FL





Carol Adami, M.D.

Carol Adami, M.D., reads breast studies more efficiently and thoroughly since Bethesda Women's Health Center added an advanced workstation to its all-digital mammography system.

The Seno Advantage workstation from GE Healthcare makes it easy to call up prior studies, compare them with current screening exams,

and locate areas of concern noted previously by radiologists, says Adami, medical director and chief mammographer at the Health Center, part of Bethesda Memorial Hospital in Boynton Beach, FL. In addition, special viewing features help Adami and colleagues closely examine suspicious areas and, in some cases, find pathologies that would be difficult to see or would not show at all on analog films.

The workstation's benefits augment the workflow advantages of the center's two Senographe® 2000D full-field digital mammography systems from GE Healthcare. Soon after installing those systems in 2003, the health center increased its mammography volume to 80 to 90 cases per day, from the 30 to 40 cases performed on two analog units.

"Since I became accustomed to the digital environment, I can read cases just as rapidly as I did with film screen studies – and do a more thorough job," Adami says. "I definitely do a better analysis of digital images than I did with analog films. The ability to change contrast and magnify the digital image allows for more accurate interpretations."

Set up for service

Bethesda Memorial Hospital is a 390-bed not-for-profit community hospital with 500 physicians in more than 40 specialties and a staff of more than 2,000. The Women's Health Center is an outpatient facility that offers a full range of services including ultrasound imaging, bone density testing, and wellness education, in addition to breast cancer screening and diagnosis. Besides digital mammography, the center provides vacuum-assisted ultrasound, MRI and stereotactic guided breast biopsies, and breast MRI on a 1.5T magnet, as well as body and 4D obstetrical ultrasound with a Voluson® system from GE Healthcare.

The center, accredited by the American College of Radiology, maintains high quality standards and emphasizes patient comfort and convenience. The center is staffed to give patients personal attention. On a given day, five technologists rotate on the two Senographe systems. When not performing exams, they usher patients to well-appointed dressing rooms, go over their histories, and help them complete a questionnaire.

"Our technologists have time to dedicate to each patient and develop a rapport with them so that the experience is less intimidating," Adami says. "They're trained to answer basic questions a patient may have, or they can refer them to our health navigator nurse or our nurse practitioner who offers risk assessment, genetic counseling and physical exams. If the patient needs to speak to a radiologist, we're glad to accommodate them. I believe our approach is key to patient satisfaction and compliance."

Digital efficiency

Digital workflow helps the Women's Center efficiently manage growing demand for its services. Routine mammograms are scheduled in 15-minute slots with each exam taking approximately five minutes. Both patients and physicians get results in 24 to 72 hours. Conversely, analog exams took 30 minutes, according to Donna Lewis, chief technologist.

Digital mammography helped the technologists easily handle the increase in daily volume. "You might assume that going from 30 to 90 cases per day would be exhausting, but it really was quite simple," Lewis says. "You no longer have to pick up the film cassettes and load them in and out of the bucky, and go into the darkroom. All that takes a lot of time."

In four-view mammograms, the technologist can make an exposure, then immediately start positioning the patient for the next exposure without waiting for the image to display on the screen. "You have the computer right there at your fingertips," Lewis observes. Also, the ergonomic design reduces stress on technologists. "You don't have heavy equipment to deal with. You press a button and it moves for you. The buttons are positioned conveniently. You don't have to press them hard, and yet they're not overly sensitive, so you don't make mistakes, either," says Lewis.

“Now, with digital imaging, we just press a button and CAD is immediately applied to the image. You see exactly where the calcifications or spiculations are right on your screen, on the full-size image.”

– Carol Adami, M.D.

Retakes are rare in all types of cases. “The photo timing is very accurate,” Lewis says. “Because it’s so fast, you don’t have problems with patient motion. The image detector is nice and small, so it’s comfortable for the patients. If there is a need to retake an image, I know immediately. And with the images on the screen, I can show the patient why I need to take it again.”

Benefits for reading

The Seno Advantage workstation brings even more efficiency. In reviewing analog films, Adami had to look back and forth between current and prior cases hung on a viewer. Sometimes she had to grab a magnifying glass and stand up to check a detail on a film.

Now, Adami looks at current and previous exams on two large side-by-side monitors. Each day, technologists use a Centricity® RA600 DICOM system to fetch patients’ prior digital exams from the archive and send them to the workstation. Digital folders containing the previous studies are arranged in a toolbar on the bottom of one screen.

“Unless you’ve actually done this, it’s hard to appreciate what a great advantage it is for the radiologist. Suppose you’re reviewing an analog study and the film librarian didn’t hang the prior images you need to see. You would have to locate the patient’s jacket from a stack and go through up to 40 films searching the labels for dates to find and pull the ones you wanted. Then you had to hang them on the viewer to do your comparison. It was very time-consuming, and often you couldn’t even find the films in the jacket. Now I just look at those thumbnails organized in folder format and pick out the one I want. It’s always there. It is just amazing.”

Easy comparison

With the touch of a button, Adami can change from one previous year’s study to another. She can select a full-screen breast image or display quadrants. In toggling through images, the current and prior study change simultaneously so that corresponding images appear side by side for quick, easy comparison. Plus, the system can be easily customized to each radiologist’s reading preference. Dr. Adami says she is “extremely impressed with how intuitive the system is to program.

“It has file folders with dates of previous studies available for that patient,” Adami says. “If the patient has three years of exams, you’ll see all the files, and you can open any file with the click of a button. It shows you all the images in a thumbnail format. You can grab any image and drag and drop it on any screen – a much more efficient procedure than with previous analog studies.”

On finding a suspicious area, a radiologist can circle it and save a screen capture to ensure that the area in question is checked in future studies. “The patient’s folder of prior exams includes screen captures showing anything that a radiologist in past years felt was suspicious,” Adami says. “When I see those screen captures in a folder, I know that’s a colleague telling me, ‘Recheck this area more carefully.’

“That’s a benefit that can’t be duplicated in any other reading environment. You don’t miss what someone else may have thought was suspicious because they’ve saved it in the system. Even if they didn’t screen-capture it, all the thumbnail images are labeled, so I can tell which are magnified or spot views that deserve closer attention.”

The workstation also facilitates comparison of digital and analog studies. A tissue equalization algorithm lets the reader easily adjust the digital image to the look and feel of film. Adami has a multi-view alternator for films set up at 90 degrees to the digital workstation. “In the morning, a member of our staff hangs all the cases for the day,” she says. “Of course, as we build our digital library, digital-to-analog comparisons become less frequent.”

Diagnostic benefits

With workflow improvements come diagnostic advantages. Adami prefers to examine digital images in Premium View, a Seno Advantage feature that optimizes the local contrast in breast structures and improves visualization in dense areas of the breast.

“Premium View is the way I think most radiologists would prefer to look at images,” Adami says. “It’s almost like going from a blurry photograph to a very sharp photograph, and it allows you to see all the way out to the skin line.”

In one case, Premium View enabled Adami to detect a cancer by observing a skin thickening. “The skin changes were the only abnormality on the mammogram,” Adami says. “With tissue equalization, I didn’t appreciate much of anything, but I knew that the patient was having pain in one breast. When I hit the Premium View button, I found subtle skin thickening in the painful breast. Although the subsequent ultrasound was negative, the skin thickening was suspicious enough to prompt me to recommend an MRI that detected a small enhancing mass. Biopsy confirmed an invasive cancer. Our digital technology probably saved this woman’s life.”

Computer-Aided Detection (CAD) also supports quick, effective diagnosis, comments Adami. In the analog workflow, films were run through a CAD device in a batch. Images with suspicious areas marked were then displayed on a small screen, making it difficult to locate the corresponding areas on the full-sized images.

“It wasn’t a very efficient or accurate process,” Adami says. “Now, with digital imaging, we just press a button and CAD is immediately applied to the image. You see exactly where the calcifications or spiculations are, right on your screen, on the full-size image. Then you can magnify those areas or change the contrast setting. You can compare the area to last year’s film and manipulate that image to see if there has been any change.”

GE Healthcare
3000 North Grandview
Waukesha, WI 53188
U.S.A.

www.gehealthcare.com



Better consultations

Digital workflow also enhances the process of diagnostic exams when technologists find suspicious areas in screening mammograms. They send the images to Adami’s workstation for review. “By the time I walk from the mammography room to her office, the images are there,” Lewis says. “I show her the area of concern, and she can ask for magnifications or laterals or whatever is necessary. While I’m in her office, another technologist can bring the next patient into the mammography room and do another screening mammogram.”

When a patient comes in for a consultation, Adami displays the person’s images on the monitor. “I can find the patient’s images instantly, focus in on the area of concern and magnify it so the patient sees with her own eyes what I am talking to her about. Patients are universally impressed with the system, and they feel confident that we are using cutting-edge technology to care for them,” she says. “In this fast-paced, litigious society, it is important that patients know we care and are doing the very best we can.”

A special keypad with the workstation lets Adami perform all the basic functions easily while maintaining eye contact either with the image during interpretation or with the patient during consultation. “I know exactly where the keys are; I don’t even have to look down,” she says. “It’s superbly user-friendly.” The workstation also lets Adami access multi-modality images from the hospital PACS including ultrasound, CT, PET and MRI images.

“With this technology, I know I do a much better, more thorough job,” Adami says. “Because of the image quality, the ability to manipulate the images, and the efficient ease to make accurate comparisons, we can find breast cancer earlier, and earlier detection translates into decreased mortality.”

For Bethesda Women’s Health Center, digital mammography enables high workflow efficiency, top-quality patient service, and improved diagnostic confidence.

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