

Digital Mammography Proves Itself in Breast Cancer Screening

Statistics show that one in every ten women will develop breast cancer during her lifetime. Professor Detlev Uhlenbrock from St. Josefs-Hospital in Dortmund, explains how digital mammography helps to diagnose breast cancer at an early stage.

By Dr. Hildegard Kaulen

Any physician trying to diagnose breast cancer has to be able to accurately separate those affected by it from the healthy population. For this purpose, Siemens has developed MAMMOMAT Novation^{DR}, a system that functions digitally from acquisition, image post-processing and diagnosis up to image archiving. The system also allows stereotactic biopsy for verification of the initial diagnosis. "We are in the middle of a quality offensive," emphasized Professor Uhlenbrock. "In Germany we have thoroughly cleaned up the shortfalls we had in mammography up until only a few years ago. And that was certainly necessary." With more than 48 000 new cases of breast cancer in Germany every year, the disease is the most frequent cancer among women here. But chances of recover-

ing increase significantly with early tumor detection. Mammography allows the recognition of tiny, not yet palpable changes in breast tissue. For these reasons, two and a half years ago, the German parliament determined that all women between the ages of 50 and 69 years should be provided with quality-assured mammography screening for early breast cancer detection. Screening will be based on European guidelines and should be available by the end of this year.

Ambitious Goals

"Currently, technology and education are at high levels," says Uhlenbrock. "But we have to continue to enhance mammography for even earlier detection of tumors so that we can keep reducing the number of women



I DETLEV UHLENBROCK, M.D., PH.D., works with the digital mammography System MAMMOMAT Novation^{DR}.

who are given inconclusive diagnoses after their initial examinations, thus requiring additional tests. With digital mammography we have taken a huge step forward in reaching our objective. It took a long time to obtain the technical prerequisites for high-quality, digital mammography. Today's results are brilliant images with excellent resolution." The importance Uhlenbrock assigns to this technology is illustrated by the fact that he was one of the first in Germany to select the digital full-field system from Siemens.

The goal for Germany's national mammography screening is a very ambitious one: reduce the breast cancer mortality rate for women between 50 and 69 years of age by as much as one third. To reach this number, however, at least 70 percent of all women

entitled to a yearly early detection examination have to participate in the program. Considering that approximately six million women in Germany are entitled to a screening, four and a half million women need to be examined every year. As Uhlenbrock notes: "These figures underline the amount of work we have ahead of us. About 100 screening units have to be installed throughout the country. In my area alone, Westphalia Lippe, 10 units have been planned. The community of health insurance providers and the associations of the general practitioners in Westphalia-Lippe elected me to be the physician responsible for the program in the Dortmund-Hagen area. We have to provide screenings for approximately 20 000 to 30 000 women. As an added requirement, each X-ray image has

to be examined by at least two colleagues. This has been specified by the European Guidelines. If the examiners disagree on the findings, a "case conference" will take place. To ensure a smooth workflow, our processes and examinations have to be of ideal quality. A full solution that allows us to screen, biopsy, diagnose, and archive is highly beneficial."

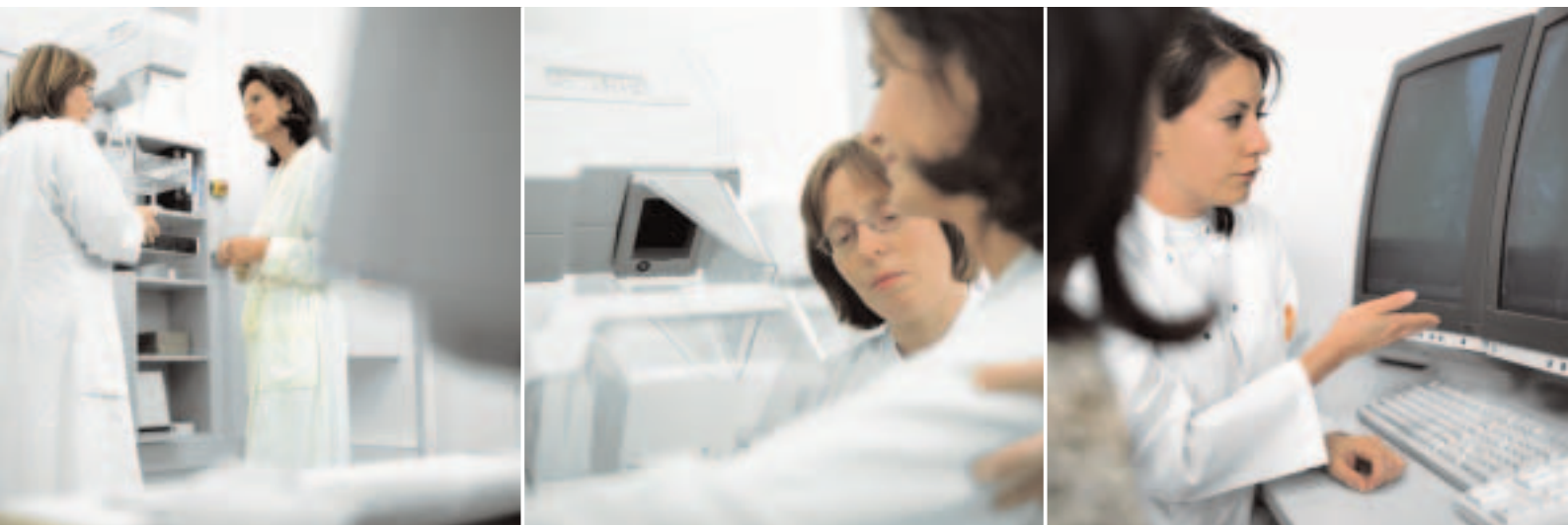
MAMMOMAT Novation^{DR} is a complete solution that meets these requirements. The digital full-field system works with new detector technology that converts X-rays directly, without intermediate steps into electrical signals – this makes conventional film exposures obsolete. The digital images are available quickly after the exposure. In addition to the detector unit, the system is equipped with an acquisition workstation to record patient data, as well as a reporting workstation. Both workstations operate with the *syngo* user interface developed by Siemens. In addition to digital mammography images, all other information and examination results can be selected at any time with a single mouse click. Uhlenbrock also sees advantages for consultations. Previous X-ray films were unique copies; that is, it was not

possible to view them at several locations simultaneously. Digital images, however, can be transmitted with ease. Within a few minutes, a second opinion can be obtained. This fact alone will be fundamental in streamlining the screening success.

The Focus is on Reporting

"The effects on workflow are especially amazing," summarizes Uhlenbrock while talking about his experiences with MAMMOMAT Novation^{DR}. "Both physicians and patients benefit from this." He continues: "The images always appear in the desired sequence on the monitor. There is no need to sort them. Also, the system wastes no time in reading tags. This may sound trivial, but it is extremely important for workflow and the quality of the clinical work provided. This means that the system can be adjusted to individual requirements as needed. The physician focuses fully on image reporting, not on any outside activities. As a result, this increases the physician's attention to reporting."

With MAMMOMAT Novation^{DR} and the dedicated Breast Care reporting workstation MammoReport^{PLUS}, the entire process, from



WITH MAMMOMAT NOVATION^{DR} and the dedicated breast care reporting workstation MammoReport^{PLUS}, the entire process – from image generation to image postprocessing and reporting – can be adjusted to the individual requirements of the physician.

image generation to image postprocessing and reporting, can be adjusted to the individual requirements of the physician.

One of the special features of the digital full-field system is the ability to immediately compare new images with old ones. Also, brightness and contrast can be changed on the computer or individual image sections can be magnified. As Uhlenbrock added: "I think that the risk of overlooking even the smallest of tumors decreases considerably with digital mammography. The technical and diagnostic superiority of the MAMMOMAT Novation^{DR} will prove itself soon enough."

Reduced Dose

Uhlenbrock is also convinced that digital mammography will increase the popularity of screenings. "The new technology offers women a number of advantages; for example, radiation exposure is decreased by 20 to 30 percent. Since screenings are to be repeated every two years, women have to agree to 10 examinations throughout all years of entitlement. It will make them feel more comfortable knowing that the radiation dose is exceptionally low." MAMMOMAT Novation^{DR} includes an exceptionally large detector. Even large breasts can be shown on a single image. A special compression plate ensures optimal positioning of the breast, which means optimal utilization of the detector. The examination is less stressful than before, because the compression plate compresses only to the point of optimal compression for maximum image quality.

Uhlenbrock concludes, "We in Dortmund/Hagen decided on a digital mammography screening system because we are convinced that this decision allows us to meet two important objectives: to provide women with excellent diagnostic performance and to ensure the highest level of comfort possible."

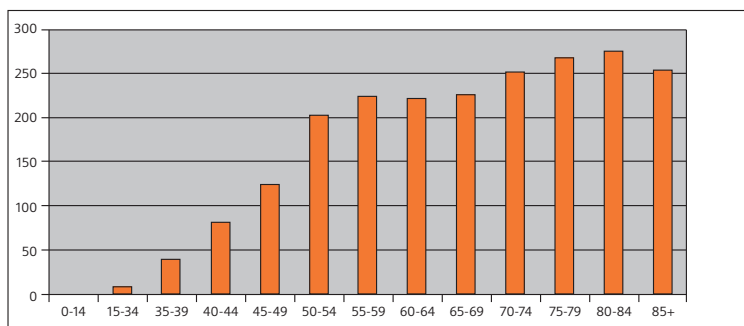
Author: Dr. Hildegard Kaulen is a molecular biologist. She was a research fellow at Rockefeller University in New York and Harvard Medical School in Boston. Since the mid-1990s, she has been a contributor to leading German scientific journals and newspapers.

»We have to continue to enhance breast cancer screening for even earlier cancer detection.«

Detlev Uhlenbrock, M.D., Ph.D.,
St. Josefs-Hospital, Dortmund, Germany

Estimate of Age-specific Incidences

Development of the disease per 100 000 by age groups



Professor Detlev Uhlenbrock, M.D., Ph.D.

Detlev Uhlenbrock owns the radiological group practice/outpatient clinic at St. Josefs-Hospital in Dortmund. He completed his medical degree at the University of Muenster, did his internship in radiology in Hamm and Dortmund, and received his Ph.D. in radiology in 1988 at the Ruhr University Bochum. Since 1995, he has been an adjunct professor at this institution. After earning his doctorate, he spent several years as chief physician at the St. Vincenz Hospital in Paderborn prior to opening his radiological group practice in 1997 at St. Josefs-Hospital. Uhlenbrock has published several books and is the author of numerous scientific publications. He is a member of several national and international associations. Several weeks ago he was elected the physician responsible for breast cancer screening in the Dortmund-Hagen area.