Enhancing imaging capabilities with breast tomosynthesis

MAMMOMAT Inspiration* by Siemens Healthcare

Much more than a mammography system, MAMMOMAT Inspiration is a highly flexible mammography platform for screening, diagnostics, stereotactic biopsy, and 3D tomosynthesis. It increases diagnostic efficiency and confidence. In addition it makes possible a significant improvement of the early detection rate of breast cancer. The tomosynthesis technology compiles three-dimensional images of the breast and can therefore detect tumors even if hidden by overlapping tissue. This enables a more accurate diagnosis than before and reduces the number of false positive findings.

So far, conventional analog mammography and digital full-field mammography was only able to display the three-dimensional anatomical structure of the breast on a two-dimensional level. This made diagnosis more difficult and limited the possibility of the physician identifying certain types of tumor; since, anatomical structures could overlap and obscure lesions.

Breast tomosynthesis with MAMMOMAT Inspiration increases the sensitivity and specificity of mammography, as well as improving tumor differentiation and classification.

Tried and Tested – Five Years of Experience

With the Siemens tomosynthesis solution, the value of tomosynthesis has been proven in several clinical studies involving nearly 1,000 human subjects. Prototypes have been in clinical use since autumn 2004 at the University Hospital Malmö, Sweden, Duke University Medical Center, Durham, North Carolina, USA, and State University of New York at Stony Brook Health Sciences Center, NY, USA. Based on this first prototype testing, the first MAMMOMAT Inspiration systems with tomosynthesis application have been installed in summer 2009 in Europe and Asia. The number of tomosynthesis installations is steadily increasing.

Breast Tomosynthesis with MAMMOMAT Inspiration

Higher Sensitivity
• Contrast enhancement of lesions (masses)
• Reduced tissue overlap (especially in dense breasts)

Higher Specificity
• 3D analysis of distribution of calcs
• 3D analysis of lesions (shape and size)
• Reduction of recall rates and biopsies

The Siemens Breast Tomosynthesis Solution

The 3D tomosynthesis technology in the MAMMOMAT Inspiration overcomes these limitations: The X-ray tube of MAMMOMAT Inspiration moves in a 50° arc around the breast while acquiring 25 low-dose images using a fast detector based on amorphous Selenium (aSe).

The system uses this raw data to generate a 3D volume set. The combination of high spatial resolution and a large acquisition angle provides a high degree of depth resolution resulting in more precise reconstructions with fewer artifacts and more detail. This enables a better analysis of the type and size of lesions as well as microcalcifications compared to conventional methods.

www.siemens.com/tomosynthesis

* CAUTION: Investigational Device. Limited by U.S. Federal Law to investigational Use. The MAMMOMAT Inspiration and Breast Tomosynthesis is a work in progress and is not commercially available in the U.S.