

AbstractID: 7849 Title: New Developments in Digital Breast Tomosynthesis

Digital tomosynthesis is one of the most exciting recent developments in breast imaging. By modifying existing full field digital mammography systems, one can achieve this type of limited-angle cone-beam CT imaging which produces 3D slice images of the breast. Overlapping dense tissue in mammography is one of the most common causes for unnecessary callbacks as well as missed cancers. Since the 3D images remove such overlapping tissue, breast tomosynthesis can improve radiologists' specificity by obviating unnecessary callbacks. It can also improve sensitivity by allowing easier detection and characterization of breast cancers which might otherwise be obscured. Most remarkably, tomosynthesis can achieve all this with a scan that is comparable to the speed, resolution, cost, and dose of conventional mammography. For these reasons, tomosynthesis stands poised as the only imaging technique with the potential to completely replace the current role of mammography as the primary tool in breast cancer screening and diagnosis.

This presentation will cover both the hype and hope surrounding breast tomosynthesis. From a medical physics perspective, the latest results will be reviewed from recent studies to optimize radiographic techniques, acquisition modes, and reconstruction algorithms. In addition, emerging results will be surveyed from advanced applications including display/visualization, computer aided detection, and contrast enhanced tomosynthesis. Finally, the clinical promise and risks of this new technology will be discussed using initial clinical trial results.

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Educational Objectives:

1. Understand the difference between breast tomosynthesis and dedicated breast CT.
2. Appreciate the many medical physics issues involved in the development and optimization of breast tomosynthesis.
3. Understand the clinical promise and concerns of using breast tomosynthesis.