

## Digital Breast Tomosynthesis

Breast tomosynthesis is a type of mammogram that produces images of the breast in both two (2) and three (3) dimensions. During a breast tomosynthesis mammogram, the breast is positioned and compressed in the same way as for a digital mammogram and the breast is imaged by a series of low dose x-ray exposures. The images generate a standard two-dimensional (2-D) view and a series of images that provide information in three (3) dimensions of each breast. Breast tomosynthesis can be used for screening or diagnostic mammography.

The New York State Department of Health will make a determination whether or not to add this service to the Medicaid benefit package.

### **Dossier sources of evidence already submitted:**

The following evidence was recently submitted to the Department:

1. Alcusky M, Philpotts L, Bonafede M, Clarke J, Skoufalos A. The patient burden of screening mammography recall. *J Womens Health (Larchmt)*. Sep 2014; 23 Suppl 1:S11-19.
2. Bernardi D, Caumo F, Macaskill P. et al. Effect of integrating 3D-mammography (digital breast tomosynthesis) with 2D-mammography on radiologists' true-positive and false-positive detection in a population breast screening trial. *European Journal of Cancer*. 2014; 50(7): 1232-1238.
3. Bonafede MM, Kalra VB, Miller JD, Fajardo LL. Value analysis of digital breast tomosynthesis for breast cancer screening in a commercially-insured US population. *ClinicoEconomics and Outcomes Research*. Jan 2015; 7:53-63.
4. Caumo F, Bernardi D, Ciatto S, et al. Incremental effect from integrating 3D-mammography (tomosynthesis) with 2D-mammography: Increased breast cancer detection evident for screening centres in a population-base trial. *The Breast*. 2014; 23(1): 76-80.
5. Ciatto S, Houssami N, Bernardi D, et al. Integration of 3D digital mammography with tomosynthesis for population breast-cancer screening (STORM): a prospective comparison study. *The lancet oncology*. 2013; 14(7): 583-589.
6. Destounis S, Arieno A, Morgan R. Initial Experience with Combination Digital Breast Tomosynthesis Plus Full Field Digital Mammography or Full Field Digital Mammography Alone in the Screening Environment. *Journal of Clinical Imaging Science*. 2014; 4.
7. Durand MA, Haas BM, Yao X, et al. Early Clinical Experience with Digital Breast Tomosynthesis for Screening Mammography. *Radiology*. 2014.
8. Friedewald SM, Rafferty EA, Rose SL, et al. Breast cancer screening using tomosynthesis in combination with digital mammography. *JAMA*. 2014; 311(24): 2499-2507.
9. Gilbert FJ, Tucker L, Gilian MG, et al. Accuracy of Digital Breast Tomosynthesis for Depicting Breast Cancer Subgroups in a UK Retrospective Reading Study (TOMMY Trial). *Radiology*. Jul 15 2015: 142566.
10. Greenberg JS, Javitt MC, Katzen J, Michael S, Holland AE. Clinical Performance Metrics of 3D Digital Breast Tomosynthesis Compared with 2D Digital Mammography for Breast Cancer Screening in Community Practice. *American Journal of Roentgenology*. 2014; 203(3): 687-693.

11. Haas BM, Kalra V, Geisel J, Raghu M, Durand M, Philpotts LE. Comparison of tomosynthesis plus digital mammography and digital mammography alone for breast cancer screening. *Radiology*. 2013; 269(3): 694-700.
12. Houssami N, Macaskill P, Bernardi D, et al. Breast screening using 2D-mammography or integrating digital breast tomosynthesis (3D-mammography) for single-reading or double-reading-Evidence to guide future screening strategies. *European Journal of Cancer*. 2014; 50(10): 1799-1807.
13. Lång K, Andersson I, Rosso A, et al. Performance of one-view breast tomosynthesis as a stand-alone breast cancer screening modality: results from the Malmö Breast Tomosynthesis Screening Trial, a population-based study. *European Radiology*. 2015.
14. Lee CI, Cevik M, Alagoz O, et al. Comparative Effectiveness of Combined Digital Mammography and Tomosynthesis Screening for Women with Dense Breasts. *Radiology*. 2014.
15. Lourenco AP, Barry-Brooks M, Baird G, Tuttle A, Mainiero MB. Changes in Recall Type and Patient Treatment Following Implementation of Screening Digital Breast Tomosynthesis. *Radiology*. 2014.
16. Margolies L, Cohen A, Sonnenblick E, et al. Digital Breast Tomosynthesis Changes in Management in Patients Seen at a Tertiary Care Breast Center. *International Scholarly Research Notices*. 2014.
17. McCarthy AM, Kontos D, Synnestvedt M, et al. Screening Outcomes Following Implementation of Digital Breast Tomosynthesis in a General-Population Screening Program. *Journal of the National Cancer Institute*. 2014; 106(11): dju316.
18. Rafferty EA, Park JM, Philpotts LE, et al. Diagnostic Accuracy and Recall Rates for Digital Mammography and Digital Mammography Combined With One-View and Two-View Tomosynthesis: Results of an Enriched Reader Study. *American Journal of Roentgenology*. 2014; 202(2): 273-281.
19. Rose SL, Tidwell AL, Bujnoch LJ, Kushwaha AC, Nordmann AS, Sexton Jr R. Implementation of breast tomosynthesis in a routine screening practice: an observational study. *American Journal of Roentgenology*. 2013; 200(6): 1401-1408.
20. Rose SL, Tidwell AL, Ice MF, Nordmann AS, Sexton R, Song R. A Reader Study Comparing Prospective Tomosynthesis Interpretations with Retrospective Readings of the Corresponding FFDM Examinations. *Academic Radiology*. 2014; 21(9): 1204-1210.
21. Sharpe RE, Jr., Venkataraman S, Phillips J, et al. Increased Cancer Detection Rate and Variations in the Recall Rate Resulting from Implementation of 3D Digital Breast Tomosynthesis into a Population-based Screening Program. *Radiology*. Oct 9 2015: 142036.
22. Skaane P, Bandos AI, Eben EB, et al. Two-view digital breast tomosynthesis screening with synthetically reconstructed projection images: comparison with digital breast tomosynthesis with full-field digital mammography images. *Radiology*. 2014; 271(3): 655-663.
23. Skaane P, Bandos AI, Gullien R, et al. Comparison of Digital Mammography Alone and Digital Mammography Plus Tomosynthesis in a Population-based Screening Program. *Radiology*. 2013; 267(1): 47-56.

24. Skaane P, Bandos AI, Gullien R, et al. Prospective trial comparing full-field digital mammography (FFDM) versus combined FFDM and tomosynthesis in a population-based screening programme using independent double reading with arbitration. *European Radiology*. 2013; 23(8): 2061-2071.
25. Washington State Healthcare Authority, Health Technology Assessment, Appropriate Imaging for Breast Cancer Screening in Special Populations, Final Evidence Report, December 10, 2014:  
[http://www.hca.wa.gov/hta/Documents/breast\\_imaging\\_final\\_report\\_120814.pdf](http://www.hca.wa.gov/hta/Documents/breast_imaging_final_report_120814.pdf)

**Additional dossier sources of evidence submitted:**

The following evidence was submitted to the Department during the 30-day public review period:

1. Conant EF, Beaber EF, Sprague BL, et al. Breast cancer screening using tomosynthesis in combination with digital mammography compared to digital mammography alone: a cohort study within the PROSPR consortium. *Breast Cancer Res Treat*. 2016 Feb;156(1):109-16.
2. McDonald ES, Oustimov A, et al. Effectiveness of Digital Breast Tomosynthesis Compared With Digital Mammography Outcomes: Analysis From 3 Years of Breast Cancer Screening. *JAMA Oncol*. 2016 Feb 18.
3. Rafferty EA, Durand MA, Conant EF, et al. Breast Cancer Screening Using Tomosynthesis and Digital Mammography in Dense and Nondense Breasts. *JAMA*. 2016 Apr 26;315(16):1784-6.