

THE ROLE OF IMAGING IN WOMEN'S PREVENTIVE HEALTH



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May is designated as Women's Health Month, which provides a timely opportunity to consider the vital impact of disease prevention in the female population. This review highlights the essential role of imaging in the early detection of some of the most common and high-morbidity diseases that affect women.

Breast Cancer Screening

Breast cancer awareness is arguably one of the largest and most successful public health campaigns in the US over the past few decades, owing to its prevalence of an almost 13% average lifetime risk among the general female population. It remains the most common non-skin malignancy and the second leading cancer cause of death in women. There is well-established and trusted data supporting the efficacy of routine screening mammography in reducing breast cancer mortality. The American College of Radiology (ACR) recommends annual screening mammograms for women of average risk to begin at age 40 and to continue annually until age 80. 3D/tomosynthesis technology is the preferred modality and has been shown to improve the cancer detection rate and decrease the number of screening callbacks ¹.

Osteoporosis Screening

Osteoporosis affects about one in five women over age 50 in the US ², and 80% of the approximately ten million Americans with osteoporosis are women. In its recommendation statement, the USPSTF lists several risks associated with osteoporotic fractures, including psychological distress, subsequent fractures, loss of mobility and diminished performance of activities of daily living (ADLs), and death. Only 40–60% of patients who sustain an osteoporotic hip fracture will return to their pre-fracture level of mobility and ADLs ³.

DEXA (dual energy x-ray absorptiometry) is a very low-dose radiation exam that provides a patient's Bone Mineral Density (BMD).

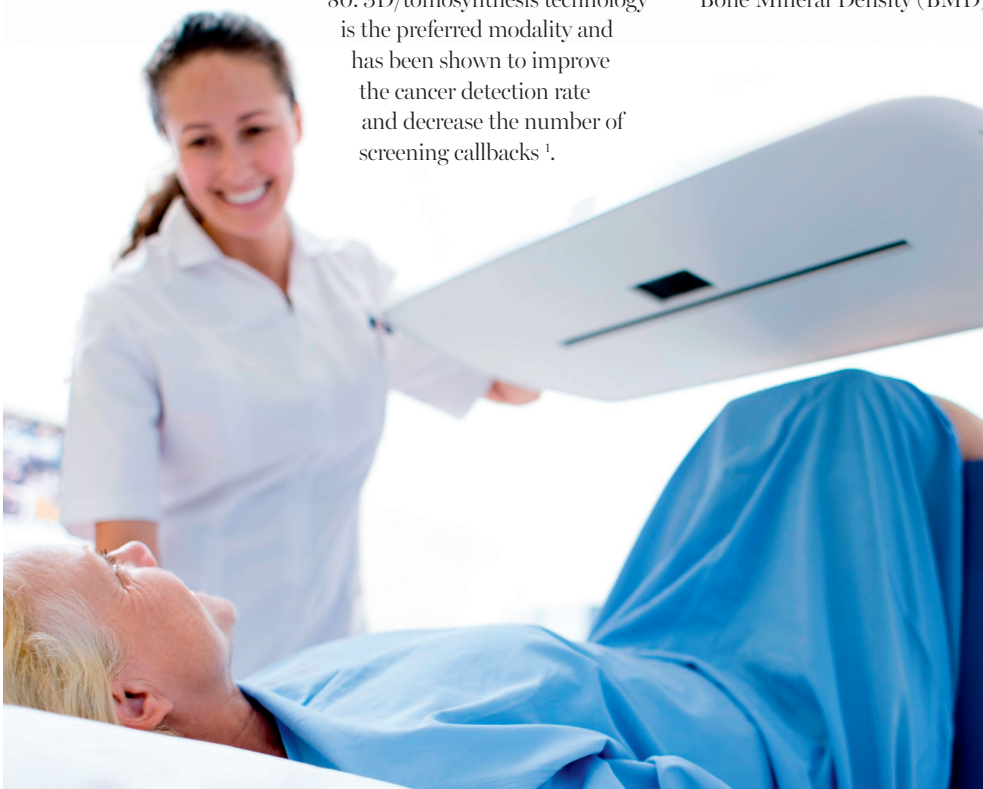
The study is typically performed on the hip or lumbar spine and takes less than 20 minutes to complete while the patient is lying supine.

Guidelines among several leading medical organizations advise performing bone density testing in all women 65 and older and sooner in women between 50–64 with at least one risk factor for osteoporosis. Such risk factors include menopause, low body weight, family history of a parent with an osteoporotic hip fracture, smoking, and excess alcohol intake ⁴. The recommended frequency of DEXA screening varies based on the patient's risk level, with high-risk patients performed every 2 years, moderate risk every 3–5 years, and those with low risk every 5–10 years (CDC).

Atherosclerotic Cardiovascular Disease Screening

Atherosclerotic cardiovascular disease (ACVD) is the leading cause of death in women, affecting more than 60 million women in the US alone ⁵. Standard ACVD screening guidelines advise assessing for traditional risk factors of hypertension, hyperlipidemia, diabetes, obesity, and sex-specific considerations, namely menopausal status.

Coronary artery calcium (CAC) is a very specific feature of coronary atherosclerosis. Multiple studies have demonstrated that the addition of CAC score to traditional risk algorithms and guidelines improves cardiovascular risk assessment and better informs clinical decision making, in particular, considerations for pharmacological interventions ⁶.



CAC scoring with CT has proven to be a readily available, consistent, and reproducible tool in assessing risk for major cardiovascular outcomes ⁷.

CAC-CT is a non-contrast CT of the chest performed with ECG gating and centered on the heart. A specific software application calculates the CAC score, most commonly utilizing the Agatston method. Newer generation CT scanners use lower radiation doses, which are comparable to a mammogram or lung screening chest CT.

Lung Cancer Screening

Lung cancer is the second most common non-skin cancer in women and the leading cause of cancer death. Tobacco smoking is by far the biggest risk

factor, and it is noteworthy that nearly 20% of all women in the US are current smokers ⁸. The estimated lifetime risk for a woman to develop lung cancer is 1 in 18, including both smokers and nonsmokers; this breaks down to a lifetime risk of 11.2% for current smokers, 5.8% for former smokers, and 1.3% for nonsmokers ⁹.

Leading national health organizations, like the American Cancer Society and the USPSTF, recommend annual low dose CT (LDCT) lung screening exams for patients at high risk of lung cancer (current or former smokers with 20 or greater pack per year history) between the ages 50–80 years. These guidelines were updated in 2023 and notably exclude

considering a former smoker's number of years since quitting.

LDCT lung screening is a non-contrast CT of the entire chest performed with low dose radiation, substantially lower than a routine chest CT and ambient background radiation ¹⁰.

All of these imaging screening exams are widely available in our community to provide convenient and essential preventive health services to the women we care for.

References:

1. Philpotts LE, Grewal JK, Horvath LJ, Giwerc MY, Staib L, Etesami M. Breast Cancers Detected during a Decade of Screening with Digital Breast Tomosynthesis: Comparison with Digital Mammography. *Radiology*. 2024 Sep;312(3):e232841. doi: 10.1148/radiol.232841. PMID: 39287520.
2. <https://www.nia.nih.gov/>

3. <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/osteoporosis-screening>
4. <https://www.bonehealthandosteoporosis.org/preventing-fractures/general-facts/what-women-need-to-know/#:~:text=Of%20the%20estimated%2010%20million,breast%2C%20uterine%20and%20ovarian%20cancer.>
5. <https://www.cdc.gov/heart-disease/about/women-and-heart-disease.html#:~:text=Key%20points,3>
6. <https://doi.org/10.1148/rg.210122>
7. Greenland, P, Blaha, M, Budoff, M. et al. Coronary Calcium Score and Cardiovascular Risk. *JACC*. 2018 Jul, 72 (4) 434–447. <https://doi.org/10.1016/j.jacc.2018.05.027>
8. <https://www.clinical-lung-cancer.com/article/S1525-7304%2823%2900212-7/fulltext>
9. Bruder C, Bulliard JL, Germann S, Konzelmann I, Bochud M, Leyvraz M, Chiolerio A. Estimating lifetime and 10-year risk of lung cancer. *Prev Med Rep*. 2018 Jun 18;11:125–130. doi: 10.1016/j.pmedr.2018.06.010. PMID: 29942733; PMCID: PMC6010924.
10. <https://acsjournals.onlinelibrary.wiley.com/action/showCitFormats?doi=10.3322%2Fcaac.21811>