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# Artificial intelligence in breast cancer detection and screening: an integrative review

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**Objective:** To investigate advanced technologies for improving the accuracy and efficiency of breast cancer detection and screening. **Methods:** An integrative review was performed on the databases PubMed, LILACS, and Embase (2001–February 2024), using MeSH/Emtree terms: "breast neoplasms", "artificial intelligence", and "mass screening". Inclusion criteria encompassed studies on breast cancer detection/diagnosis employing artificial intelligence (AI), irrespective of language. After duplicate removal (Rayyan software; n=31), 144 articles were screened, with 66 meeting eligibility for final analysis. **Results:** AI technologies have progressed from early wavelet-based models to sophisticated deep learning systems, such as Transpara® and Lunit INSIGHT MMG, enhancing diagnostic accuracy and alleviating radiologists' workload. Commercial tools like Transpara® demonstrated a 15% reduction in false negatives, while Lunit INSIGHT MMG increased early detection rates by 22%. Hybrid AI-radiologist models achieved the highest sensitivity (94%), outperforming individual human assessments. Challenges include persistent false positives (8–12%) and scalability barriers. Emerging approaches integrating genetic/demographic data highlight AI's potential for personalized screening. **Conclusion:** AI-driven tools like Transpara® and Lunit INSIGHT MMG demonstrate enhanced accuracy in breast cancer detection through deep learning, yet challenges such as false positives (8–12%) and scalability persist. Personalized approaches integrating genetic/demographic data show promise for tailored screening. AI-human collaboration optimizes diagnostic accuracy; however, further validation and standardized clinical protocols are essential for widespread implementation.

**Keywords:** artificial intelligence; mass screening; breast neoplasms.