Assessing Artificial intelligence in Breast Imaging: Insights from Breast Radiologists

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Introduction

Artificial intelligence (AI) is rapidly transforming medical imaging, offering new opportunities to enhance diagnostic accuracy, efficiency, and workflow optimization. In breast imaging, AI-based tools such as computer-aided detection (AI-CAD) are increasingly integrated into clinical practice, yet their perceived value, usability, and limitations remain incompletely understood.

To better characterize breast radiologists' perspectives on AI, we conducted a national survey of members of the Society of Breast Imaging (SBI). Our goal was to assess current usage patterns, perceived benefits and drawbacks, barriers to adoption, and anticipated future impact. These insights are critical to guiding the development, implementation, and refinement of AI technologies tailored to the specific needs of breast imagers.

Methods

An anonymous, IRB-exempt electronic survey was distributed to members of the Society of Breast Imaging (SBI) to assess breast radiologists' experiences and perspectives on artificial intelligence (AI) in clinical practice. The survey included 25 questions covering practice demographics, current AI use, perceived benefits and drawbacks, and anticipated impacts on workflow and patient care. Responses were collected over a four-week period from January to February 2024. Descriptive statistics were used to analyze the data.

Survey Respondees

The survey received 162 responses from 2,264 distributed surveys, yielding a response rate of 7.2%. Respondents represented a diverse range of educational backgrounds and work environments, with 43% in private practice and 34% in academic settings. A majority of participants (59%) reported over 10 years in practice, indicating a highly experienced cohort. Additionally, 81% of respondents dedicated more than 50% of their clinical time to breast imaging.

Select Survey Results

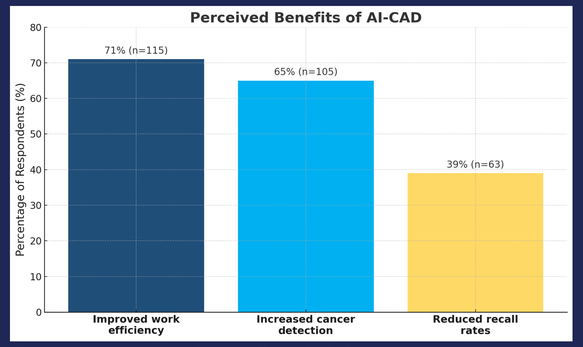


Figure 1. Perceived Benefits of AI-CAD
Most breast radiologists reported that AI-CAD improves work efficiency (71%), cancer detection (65%), and reduces recall rates (39%).

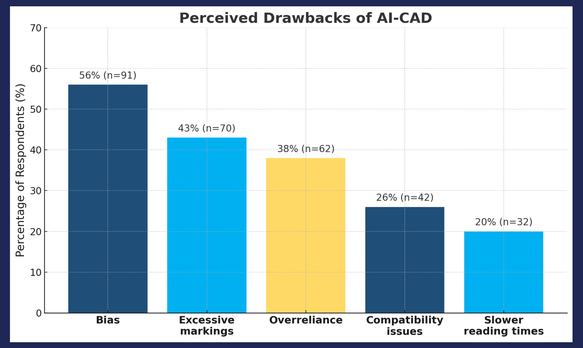


Figure 2. Perceived Drawbacks of AI-CAD
The most cited concerns with AI-CAD were bias (56%), excessive markings (43%), overreliance (38%), compatibility issues (26%), and slower reading times (20%).

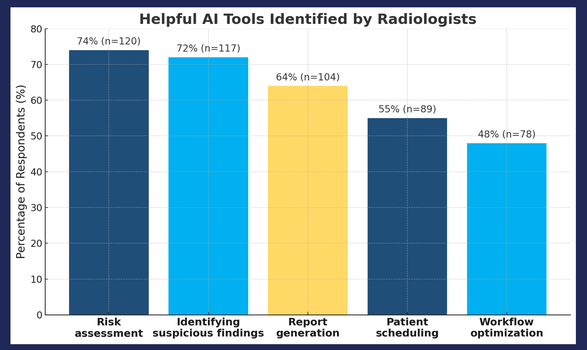


Figure 3. Helpful AI Tools Identified by Radiologists
Radiologists most frequently identified breast cancer risk assessment (74%), identifying suspicious findings (72%), report generation (64%), patient scheduling (55%), and workflow optimization (48%) as helpful AI tools.

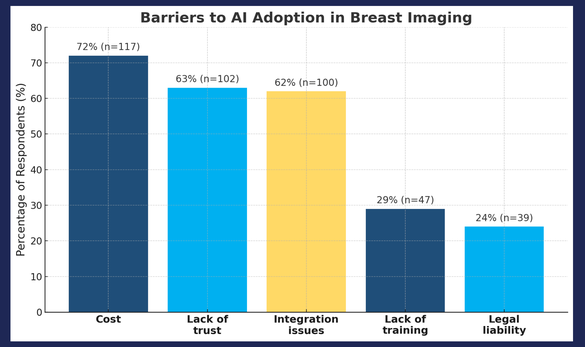


Figure 4. Barriers to AI Adoption in Breast Imaging
Top barriers cited were cost (72%), lack of trust (63%), integration issues (62%), lack of training (29%), and legal liability (24%).

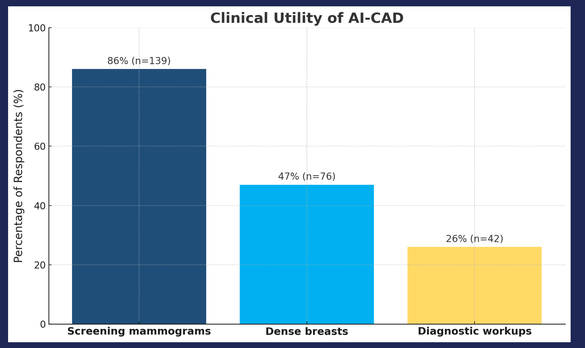


Figure 5. Clinical Utility of AI-CAD
AI-CAD was reported as most useful for screening mammograms (86%) and dense breasts (47%), but less helpful in diagnostic workups (26%).

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Additional Notable Results

- Only 55% of respondents supported storing AI-CAD markings in PACS, reflecting concerns about documentation, permanence, and legal implications.
- AI-CAD was perceived as most effective at detecting calcifications (62%) and architectural distortion (44%), underscoring its potential role in subtle pattern recognition.
- False positives were most commonly attributed to post-surgical scars (76%) and benign calcifications (69%), suggesting areas for algorithm refinement.
- A significant 43% of respondents reported currently using an AI-CAD system, and 43% said they would feel comfortable using it within 6 months, indicating growing adoption momentum.
- Only 28% of respondents felt that AI poses a threat to job security, suggesting general confidence in the augmentation—not replacement—of radiologist roles.

Conclusion

Most breast radiologists believe AI enhances cancer detection and workflow efficiency, with greatest utility in screening mammography and dense breast evaluation. However, concerns about false positives—especially in post-surgical scars and benign findings—limit diagnostic reliability. Barriers such as cost, integration, and trust remain significant, though adoption is steadily rising. Ongoing algorithm refinement and thoughtful implementation strategies are essential to maximize the clinical impact of AI in breast imaging.

References

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