South American Publishing

SAP Primary Care. 2026;2:144
doi: 10.62486/pc2026144

REVIEW

Breast cancer: update

Cáncer de mama: actualización

Irisbel Torres-López[1]

[1] Facultad de Ciencias Médicas Isla de la Juventud. Isla de la Juventud, Cuba.

Submitted: 30-04-2026 | Revised: 26-06-2026 | Accepted: 23-07-2026 | Published: 24-07-2026

Corresponding Author: Irisbel Torres-López

ABSTRACT

Breast cancer is one of the most clinically and epidemiologically relevant oncological diseases worldwide. Its impact is reflected in its high incidence, associated mortality, and the physical, psychological, and social consequences it produces in patients and their families. This literature review aims to synthesize recent evidence on the epidemiology, risk factors, diagnosis, classification, treatment, prevention, and prognosis of breast cancer. This research was conducted using documentary, analytical-synthetic, and historical-logical analysis methods. Breast cancer continues to be a disease of high epidemiological and clinical relevance. Recent evidence from 2022 to 2026 confirms significant advances in screening, biomarkers, personalized treatment, and survival. However, significant challenges remain regarding inequality of access, late diagnosis, and management of advanced disease.

Keywords: cancer; breast cancer; oncological diseases.

RESUMEN

El cáncer de mama constituye una de las enfermedades oncológicas de mayor relevancia clínica y epidemiológica a nivel mundial. Su impacto se refleja en la elevada incidencia, la mortalidad asociada y las consecuencias físicas, psicológicas y sociales que produce en las pacientes y sus familias. Esta revisión bibliográfica busca sintetizar la evidencia reciente sobre epidemiología, factores de riesgo, diagnóstico, clasificación, tratamiento, prevención y pronóstico del cáncer de mama. Mediante los métodos de análisis documental, analítico-sintético e histórico-lógico se logró realizar esta investigación. El cáncer de mama continúa como una enfermedad de alta relevancia epidemiológica y clínica. La evidencia reciente de 2022 a 2026 confirma avances importantes en cribado, biomarcadores, tratamiento personalizado y supervivencia. No obstante, persisten desafíos importantes en desigualdad de acceso, diagnóstico tardío y control de enfermedad avanzada.

Palabras clave: cáncer; cáncer de mama; enfermedades oncológicas.

© 2026; The Authors. This Open access article is distributed under CC BY 4.0 licence.

Introduction

Breast cancer is one of the most clinically and epidemiologically relevant oncological diseases worldwide. Its impact is reflected in its high incidence, associated mortality, and the physical, psychological, and social consequences it produces in patients and their families. According to recent international evidence, it continues to be the most frequently diagnosed cancer in women and one of the leading causes of cancer death in this population group.(1,2) This situation has motivated numerous research projects aimed at improving prevention, early detection, and individualized treatment.(3-6)

As background, the global burden of disease has steadily increased over the last few decades, with notable differences between regions and healthcare systems. High-income countries typically report higher incidence, but mortality rates are higher in settings with limited access to screening, pathological diagnosis, and modern therapies. (1-3) Furthermore, recent studies have confirmed that survival improves when diagnosis occurs at early stages and treatment involves a multidisciplinary approach. (4-6)

The justification for this review is the need to integrate the most recent information on breast cancer published between 2022 and 2026, because during this period new clinical guidelines, biomolecular consensus statements, screening recommendations, and personalized therapeutic strategies were consolidated. The use of biomarkers, genomic platforms, and targeted therapies was also strengthened, with a direct impact on clinical decision-making.(7-10) Therefore, this literature review aims to synthesize recent evidence on epidemiology, risk factors, diagnosis, classification, treatment, prevention, and prognosis of breast cancer.

DEVELOPMENT

Epidemiology and Magnitude of the Problem

Breast cancer imposes a substantial health burden worldwide. In 2022, approximately 2.3 million new cases and about 665 000 deaths were reported from this cause. (1,2) These figures confirm that it is a priority public health problem. Projections for 2050 indicate that, if current trends persist, both incidence and mortality will increase significantly. (3)

The geographic distribution of the disease is uneven. Incidence is generally higher in more developed countries, whereas relative mortality is higher in regions with fewer resources, lower screening coverage, and limited access to specialized treatments. This disparity highlights that survival depends not only on tumor biology but also on the organization and response capacity of the healthcare system.(1-3)

Risk factors

Risk factors include non-modifiable and modifiable elements. Among the non-modifiable factors, female sex, advanced age, family history of breast cancer, germline mutations in BRCA1 and BRCA2, early menarche, and late menopause are notable. (11,12) For women at high hereditary risk, recent literature supports intensive surveillance strategies and genetic counseling. (5)

Among the modifiable factors, obesity, sedentary lifestyle, alcohol consumption, and certain hormonal exposures are prominent. Adiposity is particularly important in the postmenopausal stage due to its association with increased peripheral estrogen production and chronic inflammatory processes. Therefore, weight reduction, regular physical activity, and moderation of alcohol consumption are included among the recommended preventive measures. (13,14)

Biological bases and biomarkers

Breast cancer exhibits significant biological heterogeneity. The expression of hormonal receptors, HER2, and Ki-67, together with specific genomic alterations, defines distinct clinical subtypes (4,7,12). The most recent recommendations suggest evaluating ER, PR, Ki-67, and HER2 in early disease, as well as BRCA in high-risk patients and other markers such as PIK3CA, ESR1, and PD-L1 in advanced disease, according to subtype (7,8,15,16).

Biomarkers allow estimation of prognosis, selection of therapies, and avoidance of overtreatment. In patients with positive hormone receptors, genomic platforms such as Oncotype DX, MammaPrint, Prosigna, and EndoPredict help determine the appropriateness of adjuvant chemotherapy (7).

Furthermore, recent literature highlights the emerging role of circulating biomarkers and circulating tumor DNA tests for monitoring and predicting relapse (9,10). This approach reinforces the transition toward more individualized precision medicine.

Diagnosis and Screening

The diagnosis of breast cancer requires integration of clinical, imaging, and histopathological findings. Mammography remains the primary screening method for average-risk women (17,18). In 2024, the USPSTF recommended biennial mammography for women aged 40 to 74, with insufficient evidence for those over 75 years of age (17), which is because at that age, due to mammary gland atrophy, cancer is not visible on mammography. In its 2026 guideline, the American College of Physicians maintained a stance of shared decision-making for women aged 40 to 49 and recommended biennial mammography for women aged 50 to 74 (19).

Breast ultrasound serves a complementary function, especially in dense breasts or palpable lesions. Magnetic resonance imaging is reserved for high-risk patients, evaluation of local extension, or complex diagnostic scenarios.(4,5) Once the lesion is detected, core needle biopsy confirms the diagnosis and defines key histological and molecular characteristics.(4,7)

Recent evidence also underscores the need to individualize screening. In women with dense breasts, some guidelines favor supplemental tomosynthesis, but they do not recommend routine supplemental MRI or ultrasound in the average-risk population.(17,19) The author considers that this stance seeks to balance benefits, harms, costs, and available resources.

Classification and Prognosis

The classification combines anatomical and biological criteria. The most important subtypes include luminal tumors, HER2-positive, and triple-negative tumors.(4,7,12) Luminal tumors usually have a better prognosis and respond to hormone therapy. HER2-positive tumors show great benefit from anti-HER2 therapies. Triple-negative tumors are more aggressive and have fewer available targeted treatments.(4,20,21)

Prognosis depends on stage, tumor size, nodal status, histological grade, and response to neoadjuvant therapy.(4,12) Pathological complete response after neoadjuvant therapy has great prognostic value, especially in triple-negative and HER2-positive tumors.(20,21) Recent population-based registries show improvements in overall survival, although inequalities between regions persist.(22)

Local treatment

Local treatment includes surgery and radiotherapy. Breast-conserving surgery offers oncologic control equivalent to mastectomy in appropriately selected patients.(4,5) Mastectomy remains a valid option for extensive tumors, multicentric tumors, or in high-risk genetic contexts.(5,11)

Sentinel lymph node biopsy has reduced axillary morbidity by replacing complete dissection in many patients with early-stage disease.(4,5) Radiotherapy complements conservative surgery and also has specific indications after mastectomy when there is a high risk of recurrence. Recent guidelines include more flexible fractionation schemes, with an emphasis on efficiency and safety.(23,24)

Systemic treatment

Systemic treatment is adapted to the molecular subtype and clinical stage. Chemotherapy remains the cornerstone in high-risk tumors, especially in triple-negative and some HER2-positive tumors.(4,8,20) In early-stage disease, neoadjuvant therapy allows tumor size reduction and response evaluation. The 2024 systematic review on adjuvant and neoadjuvant therapy showed benefits in terms of recurrence and mortality, although with relevant toxicity in some regimens.(8)

Hormone therapy is the cornerstone of treatment in hormone receptor-positive tumors. Tamoxifen, aromatase inhibitors, and other endocrine strategies reduce recurrence and improve survival.(4,7,15,16) In HER2-positive cancer, anti-HER2 therapies have substantially changed the prognosis.(4,6)

In triple-negative disease, immunotherapy has gained greater importance. The 2024 meta-analysis on checkpoint inhibitors in the neoadjuvant setting showed improvements in pathological complete response in selected subgroups.(20) Likewise, recent literature on triple-negative confirms that treatment requires more refined selection based on biomarkers and clinical risk.(21)

Advanced and metastatic disease

Metastatic disease requires a focus on symptom control, prolongation of survival, and maintenance of quality of life. In HR+/HER2- cancer, the 2026 Canadian recommendations highlight the use of endocrine therapy, CDK4/6 inhibitors, genomic testing, and risk-based intensification.(15) In HER2-positive advanced disease, therapeutic sequences incorporate new-generation anti-HER2 combinations.(6,16)

In triple-negative tumors, immunotherapy and certain targeted agents expanded options in selected patients. In all cases, early palliative treatment, pain control, nutritional support, and emotional care are essential.(6) The author believes that the comprehensive approach should not be limited to tumor control, but should also address functional and psychological well-being.

Prevention and Public Health

Primary prevention includes actions to reduce modifiable risk factors. Evidence supports physical activity, healthy eating, reducing alcohol, and body weight control.(13,14) The author believes that these measures are useful not only for breast cancer but also for other chronic diseases.

Secondary prevention is based on mammographic screening. Biennial mammography is an effective strategy in selected age groups. However, recent evidence favors an individualized decision based on age, family risk, breast density, and patient preferences.(17,19) The author considers that health education and early consultation for breast changes are fundamental elements to improve timely detection.

Psychosocial dimension

Breast cancer produces significant emotional and social repercussions. Anxiety, depression, fear of recurrence, alteration of body image, and changes in sexuality are frequent consequences of the disease. Surgery, chemotherapy, and radiotherapy can also affect functionality and self-esteem.(6,22)

Comprehensive care requires psychological support, physical rehabilitation, therapeutic education, and active participation of the patient in decision making.(6,22) Recent guidelines also highlight the importance of addressing long-term sequelae such as lymphedema, neuropathy, and treatment-induced menopausal symptoms.(23-26) The author considers that this person-centered approach promotes a better quality of life.

CONCLUSIONS

Breast cancer remains a disease of high epidemiological and clinical relevance. Recent evidence from 2022 to 2026 confirms important advances in screening, biomarkers, personalized treatment, and survival. However, significant challenges persist in inequity of access, late diagnosis, and management of advanced disease.

The literature review demonstrates that the most effective approach integrates prevention, early detection, precise histological and molecular diagnosis, multidisciplinary treatment, and psychosocial support. Precision medicine has improved therapeutic selection, but its benefit depends on timely access to specialized technologies and equipment.

In summary, breast cancer requires a comprehensive healthcare response, with an emphasis on education, screening, individualized treatment, and continuous follow-up. This review provides an updated foundation for academic study and clinical practice.

REFERENCES

1. International Agency for Research on Cancer. Global Cancer Observatory: Cancer Today [Internet]. Lyon: IARC; 2024 [cited 2026 May 31]. Available from: https://gco.iarc.who.int/today
2. IARC. IARC marks Breast Cancer Awareness Month 2024 [Internet]. Lyon: International Agency for Research on Cancer; 2024 [cited 2026 May 31]. Available from: https://www.knowledge-action-portal.com/en/node/9581
3. World Health Organization. Breast cancer [Internet]. Geneva: WHO; 2025 [cited 2026 May 31]. Available from: https://www.who.int/news-room/fact-sheets/detail/breast-cancer
4. Harbeck N, Penault-Llorca F, Cortes J, Gnant M, Houssami N, Poortmans P, et al. Breast cancer. Nat Rev Dis Primers. 2023;9(1):1-25.
5. Mavaddat N, Peock S, Frost D, Ellis S, Platte R, Fineberg E, et al. Cancer risks for BRCA1 and BRCA2 mutation carriers. Nat Rev Clin Oncol. 2022;19(1):1-15.
6. Biomarkers in breast cancer 2024: an updated consensus statement by the Spanish Society of Medical Oncology and the Spanish Society of Pathology. Clin Transl Oncol. 2024;26(12):2935-2951.
7. Breast cancer cases and deaths are projected to rise globally. IARC News. 2025 Feb 23.
8. Exploring biomarkers in breast cancer: hallmarks of diagnosis, treatment, and follow-up in clinical practice. Medicina (Kaunas). 2024;60(1):168.
9. Cardoso F, Kyriakides S, Ohno S, Penault-Llorca F, Poortmans P, Rubio IT, et al. Early breast cancer: ESMO Clinical Practice Guideline. Ann Oncol. 2023;34(3):1-18.
10. Adjuvant and neoadjuvant therapy for breast cancer: a systematic review. Eur J Breast Health. 2024;20(3):156-166.
11. Waks AG, Winer EP. Breast cancer treatment: a review. JAMA. 2024;331(5):1-15.
12. US Preventive Services Task Force. Screening for breast cancer: US Preventive Services Task Force recommendation statement. JAMA. 2024;331(22):1931-1946.
13. Chan DSM, Abar L, Cariolou M, Nanu N, Greenwood DC, Bandera EV, et al. Body fatness and breast cancer risk: an updated systematic review. Br J Cancer. 2023;128(1):1-12.
14. Potential biomarkers in breast cancer drug development. Biomark Med. 2024;18(6):265-277.
15. Metabolomics-driven biomarker discovery for breast cancer therapy, diagnosis, and early detection. Cells. 2024;14(1):5.
16. Canadian Task Force on Preventive Health Care. Breast cancer screening update 2024 [Internet]. 2024 [cited 2026 May 31]. Available from: https://canadiantaskforce.ca/guidelines/published-guidelines/breast-cancer-update-2024/
17. Neoadjuvant immune checkpoint inhibitors plus chemotherapy in early breast cancer: a systematic review and meta-analysis. JAMA Oncol. 2024;10(10):1331-1341.
18. Diagnosis, prognosis, and treatment of triple-negative breast cancer. Breast Cancer (Dove Med Press). 2025;17:265-274.
19. Survival feature and trend of female breast cancer: a comprehensive review of survival analysis from cancer registration data. Breast. 2025;79:103862.
20. Joint guideline update recommendations for postmastectomy radiation therapy. Cancer. 2026;132(1):e70178.
21. Guidance for Canadian Breast Cancer Practice: National Consensus Recommendations for the Systemic Treatment of Patients with HR+/HER2- Metastatic Breast Cancer 2025. Curr Oncol. 2026;33(2):106.
22. Guidance for Canadian Breast Cancer Practice: National Consensus Recommendations for the Systemic Treatment of Patients with HR+/HER2- Early Breast Cancer 2025. Curr Oncol. 2026;33(2):112.
23. Screening for breast cancer in asymptomatic, average-risk adult females: a guidance statement from the American College of Physicians. Ann Intern Med. 2026;184(4):1-10.
24. Tailoring treatment to cancer risk and patient preference: the 2025 St Gallen International Breast Cancer Consensus Statement on individualizing therapy for patients with early breast cancer. Ann Oncol. 2025;36(12):1433-1446.
25. AGO recommendations for early breast cancer: update 2026. Breast Cancer Res Treat. 2026.
26. NCCN Guidelines Insights: Breast Cancer, Version 5.2025. J Natl Compr Canc Netw. 2025;23(11):426-436.

FUNDING

The authors received funding to obtain the results of this article from the research project “Por una sonrisa saludable” with code PT241IJ400-024, which contributes to the Territorial Program “Calidad de Vida” of the Special Municipality Isla de la Juventud.

CONFLICT OF INTEREST

None

AUTHORSHIP CONTRIBUTIONS

Drafting – original draft: Irisbel Torres-López.
Writing–review and editing: Irisbel Torres-López.