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Valvular heart disease in patients with cancer: Pathophysiology, epidemiology, and multimodality cardio-oncology management with proportional Heart Team decisions. A narrative review

Valvulopatías en pacientes con cáncer: fisiopatología, epidemiología y manejo multimodal cardio-oncológico con decisiones valvulares proporcionales por Heart Team. Revisión narrativa

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ABSTRACT

Introduction: The increasing survival of patients with cancer has led to a higher prevalence of concomitant cardiovascular disease. Valvular heart disease is common and frequently underdiagnosed in oncologic patients, particularly following mediastinal radiotherapy or in the setting of therapy-related cardiotoxicity, with significant prognostic implications and potential interference with the continuity of oncologic treatment. **Objective:** To propose a structured clinical framework for the evaluation and management of valvular heart disease in patients with cancer, integrating pathophysiology, multimodality imaging, and proportional decision-making through a cardio-oncology Heart Team. **Materials and methods:** A narrative literature review was conducted using a PubMed/MEDLINE search between January 2000 and December 2025. MeSH terms and keywords related to valvular heart disease, neoplasms, cardio-oncology, radiotherapy, transcatheter valve interventions, and multimodality imaging were used. Articles were selected through title, abstract, and full-text review, complemented by a manual search of relevant references. **Results:** Clinical decision-making can be structured across four domains: evaluation of valvular severity and mechanism using multimodality imaging; estimation of net clinical benefit considering the oncologic trajectory; assessment of frailty, functional status, and patient preferences; and selection of proportional therapeutic strategies, prioritizing minimally invasive approaches when anatomy and prognosis allow. **Conclusions:** The management of valvular heart disease in patients with cancer requires a standardized approach based on multimodality imaging, comprehensive risk stratification, and Heart Team deliberation, avoiding undertreatment based solely on a history of cancer and prioritizing patient-centered clinical benefit.

Keywords: Cardio-oncology; valvular heart disease; neoplasms; diagnostic imaging; risk stratification; clinical decision-making.

RESUMEN

Introducción: El aumento de la supervivencia oncológica ha incrementado la prevalencia de enfermedad cardiovascular concomitante. Las valvulopatías son frecuentes y a menudo subdiagnosticadas en pacientes con cáncer, particularmente tras radioterapia mediastínica o en el contexto de cardiotoxicidad inducida por terapias antineoplásicas, con impacto pronóstico y potencial interferencia con la continuidad del tratamiento oncológico. **Objetivo:** Proponer un marco clínico estructurado para la evaluación y manejo de las valvulopatías en pacientes con cáncer, integrando fisiopatología, imágenes multimodales y toma de decisiones proporcionales mediante Heart Team cardio-oncológico. **Materiales y métodos:** Se realizó una revisión narrativa de la literatura mediante búsqueda en PubMed/MEDLINE entre enero del 2000 y diciembre del 2025, utilizando términos MeSH y palabras clave relacionados con valvulopatía, neoplasias, cardio-oncología, radioterapia, intervenciones valvulares transcatéter e imágenes multimodales. Los artículos se seleccionaron mediante revisión de título, resumen y texto completo, y se complementó con búsqueda manual de referencias relevantes. **Resultados:** La toma de decisiones puede estructurarse en cuatro dominios: evaluación de severidad y mecanismo valvular mediante imágenes

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multimodales; estimación del beneficio clínico neto considerando la trayectoria oncológica; valoración de fragilidad, estado funcional y preferencias del paciente; y selección de estrategias terapéuticas proporcionales, priorizando abordajes mínimamente invasivos cuando la anatomía y el pronóstico lo permiten. **Conclusiones:** El manejo de las valvulopatías en pacientes con cáncer requiere un enfoque estandarizado basado en imágenes multimodales, estratificación integral del riesgo y deliberación por Heart Team, que evite el subtratamiento asociado al antecedente oncológico y que priorice el beneficio clínico centrado en el paciente.

Palabras clave: cardio-oncología, valvulopatías, neoplasias, diagnóstico por imagen, estratificación del riesgo, toma de decisiones clínicas.

1. Introduction

The intersection between cancer and cardiovascular disease has emerged as a major determinant of morbidity and mortality in the era of prolonged cancer survival. This phenomenon is driven by increased life expectancy, the chronicity of many neoplasms, and cumulative exposure to therapies with cardiotoxic potential. As a result, a growing number of patients with active cancer or a history of malignancy present with cardiovascular symptoms require pre-treatment evaluation. They might also develop cardiac complications during follow-up. In this setting, valvular heart disease represents a major clinical challenge because it involves overlapping etiologies, nonspecific clinical presentation, and high-impact therapeutic decisions that may directly influence the continuity of antineoplastic treatment [1–3].

In the cardio-oncology context, valvular heart disease arises from multiple and often coexisting pathophysiological mechanisms. These include accelerated degenerative valvular disease associated with aging and comorbidities, late structural damage induced by mediastinal radiotherapy, secondary (functional) valvular dysfunction related to treatment-induced cardiomyopathy, and infectious or nonbacterial thrombotic entities, particularly in patients with active cancer, intravascular devices, and immunosuppression [1–3].

To address this complexity, complementary clinical guidelines are available. European cardio-oncology guidelines explicitly incorporate the management of coexisting cardiovascular disease, recommending longitudinal surveillance and integration of cardiovascular decisions within the oncologic treatment plan [1]. In parallel, European and North American valvular guidelines provide standardized criteria for severity assessment and indications for intervention [4,5]. However, in patients with cancer, direct application of these criteria has limitations, as it requires a broader interpretation that incorporates competing oncologic risk, frailty, hematologic status, urgency of treatment resumption, and patient-centered therapeutic goals [1,2,4,5].

The clinical relevance of this approach has been reinforced by contemporary evidence. Recent observational data and European scientific communications suggest that significant valvular heart disease in patients with cancer is associated with worse prognosis and that, in carefully selected patients, valvular interventions may provide meaningful clinical benefit. Nevertheless, most available evidence remains observational, with heterogeneity in both oncologic and cardiovascular definitions, highlighting the need for integrative and reproducible clinical frameworks.

In this context, the aim of this narrative review is to propose an operational, reproducible, and practice-oriented framework that enables: (a) identifying the main etiological phenotypes of valvular heart disease in patients with cancer; (b) integrating multimodality imaging for the characterization of severity, mechanism, and target-organ damage; (c) incorporating competing risk stratification and frailty into decision-making; and (d) selecting proportional therapeutic strategies coordinated by a cardio-oncology Heart Team [1,4–6].

Furthermore, recent European scientific communications have suggested that significant valvular heart disease in patients with cancer is common and associated with relevant prognostic impact, and that in carefully selected patients, valvular interventions may translate into clinical benefit, although these findings remain preliminary [7].

2. Materials and methods

A narrative literature review was conducted through a descriptive and qualitative approach, based on the critical analysis of relevant publications addressing valvular heart disease in patients with cancer.

A structured search was performed in PubMed/MEDLINE up to December 2025. MeSH terms and keywords were combined using Boolean operators, including: “heart valve diseases”, “valvular heart disease”, “neoplasms”, “cancer”, “cardio-oncology”, “cardiotoxicity”, “radiotherapy”, “diagnostic imaging”,

"echocardiography", "computed tomography", "magnetic resonance imaging", "risk assessment", "clinical decision-making", and "Heart Team".

Publications in English and Spanish involving adult populations with direct clinical applicability in cardio-oncology were included, particularly clinical practice guidelines, expert consensus documents, position papers, observational studies, multicenter registries, systematic reviews, and meta-analyses.

Case reports, small case series, letters to the editor, non–peer-reviewed editorials, pediatric studies, and publications without direct clinical relevance for decision-making in valvular heart disease in patients with cancer were excluded.

Studies were selected through title and abstract screening, followed by full-text evaluation of potentially eligible articles. The search was complemented by manual review of the reference lists of selected studies. Data on pathophysiological mechanisms, imaging findings, risk stratification, valvular interventions, and multidisciplinary decision-making models were extracted and organized.

Given the narrative nature of the study, no meta-analysis or formal assessment of risk of bias was performed.

3. Scope and operational definitions

3.1 Scope and operational definitions

To establish a common clinical language that facilitates multidisciplinary practice, the following operational definitions are proposed:

3.1.1 Active cancer

Oncologic disease under active treatment or with documented tumor activity, including cases with a planned need to initiate or resume therapy in the short term [1,2].

3.1.2 Cancer survivor

A patient with a history of cancer that has been cured or is in sustained remission, with no evidence of active disease. This group carries an increased risk of late cardiovascular complications, particularly after mediastinal radiotherapy [1,8–11].

3.1.3 Competing risk

The probability that death due to cancer progression or other non-cardiovascular causes may limit or negate the potential benefit of a cardiovascular intervention. This concept is a key modifier in determining the indication and proportionality of valvular treatments [1,2].

3.2 Implications of competing risk in clinical decision-making

Competing risk should not be understood as a dichotomous category, but rather as a clinical continuum that must be assessed in terms of time horizon, shared goals, and the likelihood of achieving net clinical benefit. A valvular intervention is clinically valuable if it alleviates symptoms, reduces hospitalizations, or enables the full administration of oncologic therapy with curative intent or long-term disease control, even when overall life expectancy is shorter than that of non-oncologic patients. Conversely, an intervention is considered disproportionate when it does not modify meaningful clinical outcomes or when the procedural burden clearly outweighs the expected benefit [1,2,6].

3.3 The cardio-oncology Heart Team as the standard for decision-making

Optimal management of valvular heart disease in patients with cancer requires a structured multidisciplinary approach. In this context, the cardio-oncology Heart Team represents the reference decision-making model, integrating clinical cardiology, cardiovascular imaging, structural cardiology, cardiovascular surgery, anesthesiology, and medical oncology. Depending on case complexity, this team may be expanded to include specialists in radiation oncology, hematology, infectious diseases, geriatrics, and palliative care [6].

Its role is threefold: to standardize high-impact decisions, to prevent a history of cancer from serving as an unjustified exclusion criterion for treatment, and to align valvular strategies with the goals and timeline of the oncologic care plan. Contemporary evidence supports the value of the Heart Team in improving the quality of decision-making, reducing interprofessional variability, and enhancing transparency in documenting therapeutic proportionality [6].

For operational implementation, a structured referral pathway is recommended in cases of suspected significant valvular disease, along with a minimum standardized dataset of clinical and imaging variables for comprehensive discussion, explicit documentation of the primary therapeutic objective, and a follow-up plan aligned with the oncologic trajectory [1,2,6].

4. Clinical presentation and diagnosis

4.1. Epidemiology, clinical presentation, and diagnostic challenges

The prevalence of valvular heart disease in patients with cancer is likely underestimated, largely due to the misattribution of cardiovascular symptoms to the underlying malignancy or to adverse effects of oncologic therapies. Symptoms such as dyspnea, fatigue, edema, or functional decline may overlap with anemia, pulmonary toxicity, or tumor progression, leading to delays in appropriate cardiovascular diagnosis [1,2].

In cancer survivors, the main challenge is temporal. Valvular disease associated with mediastinal radiotherapy may manifest years or even decades after exposure and remain unrecognized if a history of thoracic radiation is not systematically investigated, as it should be considered a major cardiovascular risk factor. Contemporary evidence consistently shows that radiation-induced valvular disease frequently coexists with coronary, pericardial, and aortic involvement, increasing both anatomical and therapeutic complexity.

Three clinical scenarios concentrate the highest risk of underdiagnosis or delayed treatment: (a) patients with active cancer in whom symptoms are attributed exclusively to the malignancy; (b) cancer survivors with prior mediastinal radiotherapy and insufficient cardiovascular surveillance; and (c) functional valvular disease in the context of cardiotoxicity, where severity may vary depending on hemodynamic status and ventricular function [1–5,12].

4.2 When to suspect and when to refer

In patients with active cancer, symptoms such as dyspnea, fatigue, edema, or functional deterioration should not be automatically attributed to anemia, pulmonary toxicity, or tumor progression. Early echocardiographic evaluation should be considered in the presence of a new murmur, unexplained congestive decompensation, unexpected intolerance to systemic therapy, prior mediastinal radiotherapy, embolic events, persistent fever, or bacteremia in patients with intravascular devices.

Early referral to a cardio-oncology Heart Team facilitates the selection of a proportional therapeutic strategy within a safe therapeutic window.

5. Pathophysiological mechanisms: from etiological phenotype to clinical strategy

Identification of the predominant etiological phenotype is the first step in defining a rational therapeutic strategy in patients with cancer and valvular heart disease. Beyond isolated severity, the underlying mechanism determines procedural risk, technical feasibility, and the proportionality of the intervention.

5.1 Radiation-associated valvular heart disease

Mediastinal radiotherapy is associated with late and progressive structural damage characterized by valvular and perivalvular fibrosis and calcification, predominantly affecting the aortic and mitral valves. This phenotype frequently coexists with coronary, pericardial, and aortic disease, resulting in a multiterritorial form of cardiovascular involvement [8–11].

Conventional surgery may be associated with increased risk due to mediastinal adhesions, extensive calcification, and tissue fragility. In this context, cardiac computed tomography plays a critical role in defining the extent of damage, vascular access, and anatomical feasibility. When anatomy is suitable and oncologic prognosis justifies intervention, transcatheter strategies may represent a proportional and less invasive therapeutic option [4,5,8–11].

5.2 Accelerated degenerative valvular heart disease

Many patients with cancer are older and present a high burden of cardiovascular comorbidities, favoring accelerated valvular degeneration that may coexist or overlap with other mechanisms. In these cases, classical criteria for severity assessment and indications for intervention should be maintained; however, the timing and modality of intervention must be tailored to competing risk and overall therapeutic goals [4,5].

5.3 Functional valvular disease secondary to cardiotoxicity

Ventricular dysfunction induced by systemic oncologic therapies may precipitate or worsen functional mitral or tricuspid regurgitation. This represents a dynamic mechanism in which severity may vary according to hemodynamic status, anemia, and ventricular function. Medical optimization is the mandatory first-line approach, followed by echocardiographic reassessment before considering structural interventions [1–5,12].

5.4 Endocarditis and cancer-specific entities

Active cancer represents a complex clinical setting characterized by immunosuppression, intravascular devices, and hypercoagulability that lead to an increased risk of both infective endocarditis and nonbacterial thrombotic endocarditis. In this context, transesophageal echocardiography plays a central role in diagnosis and therapeutic planning, and decision-making should be immediate and coordinated [1,2,4,12].

6. Multimodality imaging assessment

In oncologic patients with valvular heart disease, imaging assessment should extend beyond confirmation of severity to include definition of the underlying mechanism, quantification of target-organ damage, and anatomical evaluation to guide decision-making between medical therapy, transcatheter intervention, or surgery.

The main imaging modalities and their specific clinical contributions in the cardio-oncology setting are summarized in Table 1.

Table 1. Contribution of imaging modalities to the evaluation of valvular heart disease in patients with cancer

Modality (Reference)	What it best defines	When to escalate (Practical indications)	Key considerations in cardio-oncology
Transthoracic Echocardiography (TTE) [4,5,11]	· Valvular severity · Hemodynamic impact (PASP) · Biventricular function (LVEF/RVEF) · Chamber size and congestion	· First-line in all patients · Foundation for serial follow-up and comparability	· Prioritize reproducible measurements over time (same views, same methods). · Integrate assessment of target-organ damage and volume status within the clinical context.
Transesophageal Echocardiography (TEE) [4,11]	· Detailed mechanism of regurgitation · Detection of vegetations, thrombi, or abscesses · Valve anatomy for TEER/TTVR planning	· Suspected endocarditis · Suboptimal transthoracic windows · Pre-procedural planning for structural interventions	· Coordinate sedation strategy and infection risk in immunosuppressed patients. · Reduces uncertainty in Heart Team decision-making.
Cardiac Computed Tomography (CCT) [4,8–10]	· Quantification of valvular calcification and perivalvular disease · Anatomy for TAVI (annulus, vascular access) · Assessment of ascending aorta and mediastinum	· Low-flow, low-gradient aortic stenosis · Mandatory pre-TAVI planning · History of mediastinal radiotherapy	· In patients with prior radiotherapy: assess diffuse calcification (“porcelain aorta”), mitral annulus, and vascular access. · Essential for estimating surgical risk and guiding transcatheter strategies.
Cardiac Magnetic Resonance (CMR) [1,10]	· Myocardial substrate (fibrosis, edema, infiltration) · Reference ventricular volumes and function · Quantification of regurgitation in complex cases	· Etiologic uncertainty in ventricular dysfunction · Assessment of cardiotoxicity related to cancer therapy · Suspected infiltrative cardiomyopathies or myocarditis	· Highest value when myocardial tissue characterization influences primary management (myocardial vs valvular disease). · Helps differentiate treatment-related cardiomyopathy from other causes.

Abbreviations: PASP, pulmonary artery systolic pressure; LVEF/RVEF, left/right ventricular ejection fraction; TAVI, transcatheter aortic valve implantation; TEER, transcatheter edge-to-edge repair; TTVR, transcatheter tricuspid valve replacement; RT, radiotherapy.

6.1 Transthoracic echocardiography

Transthoracic echocardiography is the first-line tool for initial evaluation and follow-up. It enables assessing valvular severity, hemodynamic impact, biventricular function, and chamber remodeling. In cardio-oncology, its main strength lies in its reproducibility for longitudinal follow-up [1,12].

6.2 Transesophageal echocardiography

Transesophageal echocardiography plays a complementary role in cases of suboptimal acoustic windows, suspected endocarditis, and anatomical planning for transcatheter interventions. It is particularly useful in mitral or tricuspid edge-to-edge repair [4,12].

6.3 Cardiac Computed Tomography

Cardiac computed tomography is essential for advanced structural planning, particularly in transcatheter aortic valve implantation (TAVI). It provides detailed assessment of the aortic annulus, vascular access, valvular calcification, coronary height, and the precise anatomical sequelae of mediastinal radiotherapy [4,8–11].

6.4 Cardiac Magnetic Resonance

Cardiac magnetic resonance provides myocardial tissue characterization, quantification of ventricular volumes and function, and advanced assessment of valvular regurgitation in selected scenarios. It is particularly useful for differentiating primary myocardial disease from secondary valvular dysfunction [10].

The rational integration of these imaging modalities enables more reproducible and proportional clinical decision-making.

7. Results

7.1 Risk stratification: from surgical risk to net clinical benefit

Therapeutic decision-making should arise from the integration of four key domains: valvular lesion and target-organ damage, procedural feasibility and risk, oncologic trajectory, and overall patient condition. The unifying concept underlying this assessment is the expected net clinical benefit [1,2,4–6]. Therefore, it is proposed that the Heart Team discussion be structured around four key domains: (1) the valvular domain (severity, underlying mechanism, and target organ damage); (2) the anatomical–procedural domain (technical feasibility, surgical risk, and anatomical complexity); (3) the oncological domain (therapeutic intent, treatment response, projected life expectancy, and urgency of treatment resumption); and (4) the patient domain (frailty, functional status, cachexia, psychosocial support, and informed patient preferences).

An intervention provides positive net clinical benefit when it results in a clinically meaningful improvement aligned with patient goals, such as symptom relief, reduction in hospitalizations, or the ability to continue oncologic treatment. Conversely, no net benefit exists when the intervention does not modify these outcomes or when procedural burden outweighs the anticipated gain [1,2,6].

A minimum set of clinical, anatomical, and oncologic variables that should be systematically considered by the cardio-oncology Heart Team is presented in Table 2.

Table 2. Evaluation checklist for the cardio-oncology Heart Team

Domain (Reference)	Essential variables	Impact on clinical decision-making
Valvular (Lesion) [4,5,11]	· Type and severity of the lesion (guideline-based criteria) · Pathophysiological mechanism (degenerative, post-radiotherapy, functional, endocarditis) · Correlation between symptoms and imaging findings	Determines formal indication for intervention versus continuation of medical management.
Target-Organ Damage [4,5,11]	· Ventricular function (LVEF, RVEF) · Pulmonary artery systolic pressure (PASP) · Atrial dimensions and signs of congestion · Renal function	Defines expected benefit, urgency, and cardiovascular prognosis related to valvular disease.
Oncologic Trajectory [1,2]	· Active cancer vs. history of cancer · Stage, treatment response, and therapeutic intent (curative vs palliative) · Oncologic treatment plan and estimated survival horizon	Quantifies competing risk and guides temporal strategy: "valve-first" vs "cancer-first."
Hemostasis and Immunity [1,2]	· Platelet count and presence of anemia · Active bleeding or thrombotic risk · Anticoagulation/antiplatelet regimen · Neutropenia or active infection	Guides selection of interventional strategy (procedure type, access) and periprocedural antithrombotic management.
Procedure/ Anatomy [4,6,8–10]	· Anatomical feasibility for TAVI, TEER, or TTVR · Assessment of vascular access · History of mediastinal radiotherapy and its sequelae · Estimated surgical risk (global and procedure-specific)	Determines choice of approach: transcatheter versus conventional surgery.
Frailty/ Functional Status [1,6]	· Performance status (ECOG/ Karnofsky) · Frailty assessment (e.g., Fried criteria) · Presence of cachexia · Mobility and available social support	Predicts recovery capacity and is a key determinant of net clinical benefit.
Patient Goals [1,6]	· Informed patient preferences · Quality-of-life goals · Oncologic priorities within the patient's life plan	Ensures proportionality and acceptability of the overall therapeutic strategy, centered on patient value.

Abbreviations: RT, mediastinal radiotherapy; LVEF, left ventricular ejection fraction; RVEF, right ventricular ejection fraction; PASP, pulmonary artery systolic pressure; TAVI, transcatheter aortic valve implantation; TEER, transcatheter edge-to-edge repair; TTVR, transcatheter tricuspid valve replacement; ECOG, Eastern Cooperative Oncology Group performance status.

7.2 Interventional decision-making

7.2.1 General principles

Guideline-based indications for valvular intervention remain applicable in patients with cancer; however, they must be modulated according to competing risk and the continuity of oncologic treatment [4,5]. The objective is not to intervene less due to a history of cancer, but to intervene more appropriately, with greater therapeutic proportionality.

7.2.2 Severe aortic stenosis and TAVI

Symptomatic severe aortic stenosis constitutes a formal indication for intervention [4,5]. In patients with cancer, the choice between conventional surgery and transcatheter aortic valve implantation (TAVI) should particularly consider prior mediastinal radiotherapy, frailty, and the need to resume systemic therapy.

Available observational and meta-analytic evidence suggests that TAVI is feasible and safe in the short term in carefully selected patients with cancer, whereas mid-term mortality appears to be primarily driven by oncologic prognosis rather than the procedure itself [13–18].

7.2.3 Severe mitral regurgitation and Transcatheter Edge-to-Edge Repair (TEER)

In patients with severe mitral regurgitation and high surgical risk, transcatheter edge-to-edge repair (TEER) may be a reasonable therapeutic option [4,5]. Decision-making should be guided by the underlying mechanism of regurgitation and the predominant clinical objective.

Data from the Spanish M-TEER registry suggest that a history of cancer should not be considered an isolated exclusion criterion and that intermediate outcomes are acceptable in selected patients [19,20].

7.2.4 Severe tricuspid regurgitation

Severe functional tricuspid regurgitation should initially be managed with hemodynamic optimization. In refractory patients, transcatheter interventions may be considered in experienced centers following careful Heart Team selection [4,5].

Contemporary evidence, including the TRILUMINATE trial, supports their value particularly in terms of symptom improvement and quality of life [21,22].

7.3 Hemostatic and immunological considerations

Active cancer is associated with both thrombotic and bleeding risks, driven by thrombocytopenia, neutropenia, hypercoagulability, and the need for repeated procedures. An individualized risk assessment is recommended, along with selection of the least invasive effective strategy and close coordination with oncology to optimize the periprocedural window [1,2,6].

7.4 Longitudinal follow-up

Follow-up should be aligned with the oncologic trajectory and not limited to valvular surveillance. In the short term, clinical and echocardiographic reassessment is recommended to confirm therapeutic response and facilitate continuity of oncologic treatment.

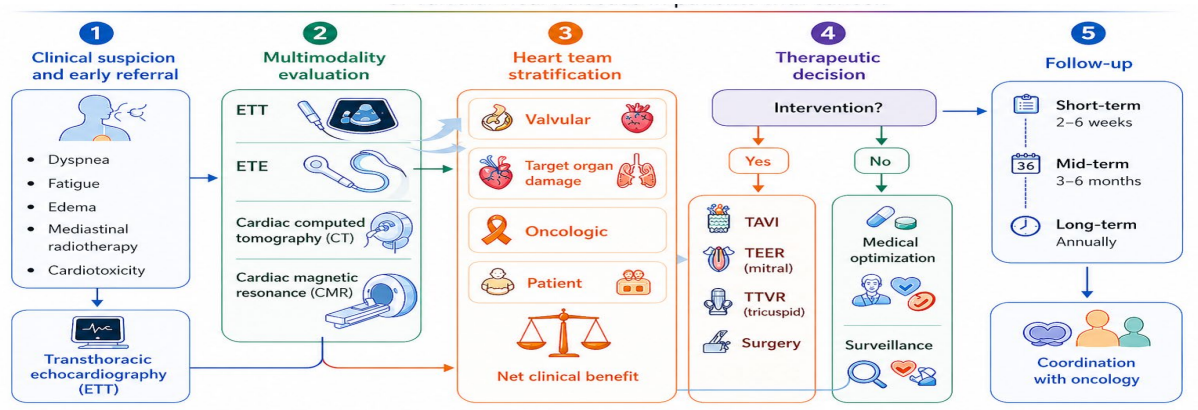
In the mid-term, reassessment should include residual valvular severity, ventricular function, and the need to redefine therapeutic strategy. In the long term, particularly in cancer survivors and previously irradiated patients, periodic surveillance is warranted to detect valvular progression or multiterritorial cardiovascular disease [1,4,23].

7.5 Proposed algorithm: Cardio-Onco Valve Pathway

The proposed evaluation and decision-making process is summarized in the Cardio-Onco Valve Pathway (Figure 1), which integrates diagnostic confirmation through imaging, assessment of competing oncologic risk, comprehensive patient evaluation, and selection of proportional therapeutic strategies through deliberation by the cardio-oncology Heart Team.

The diagram illustrates a structured approach to the assessment and management of valvular heart disease in oncologic patients, incorporating early clinical suspicion and timely referral, multimodality imaging evaluation, and Heart Team–based cardio-oncology discussion focused on net clinical benefit, followed by selection of optimal medical or interventional therapy, with longitudinal follow-up coordinated with oncology care.

Figure 1. Cardio-oncology pathway: a proposed framework for the evaluation and management of valvular heart disease in patients with cancer, based on international guideline concepts [1,4–6]



8. Conclusions

Valvular heart disease in cardio-oncology represents a growing clinical challenge that requires overcoming fragmentation across specialties and adopting an integrated, patient-centered approach focused on clinical value.

This review proposes an operational framework based on three core pillars: rigorous multimodality imaging assessment; a decision-making process centered on net clinical benefit through a cardio-oncology Heart Team; and the adoption of proportional therapeutic strategies, prioritizing transcatheter approaches when anatomy and prognosis allow for meaningful clinical benefit.

The systematic use of structured tools, such as the Cardio-Onco Valve Pathway and the Heart Team checklist, may facilitate more reproducible, transparent, and goal-aligned clinical decisions.

In this context, a history of cancer should not be considered an exclusion criterion for valvular intervention, but rather an indication for a structured, multidisciplinary, and well-documented cardio-oncology evaluation aimed at maximizing net clinical benefit.

8.1 Limitations of the evidence and research agenda

The proposed framework is based on the best available evidence; however, important limitations remain. Most data derive from observational studies, registries, and non-randomized meta-analyses, with inherent risks of selection bias, residual confounding, and tumor heterogeneity. In addition, there is limited standardization in key definitions such as active cancer, frailty, therapeutic intent, and net clinical benefit.

Future priorities include prospective cohorts with standardized oncologic and cardiovascular variables, longitudinal studies of radiation-associated valvular heart disease, and the development of integrated predictive tools to estimate net clinical benefit in specific patient subgroups.

9. Abbreviations

TTE: transthoracic echocardiography

TEE: transesophageal echocardiography

CCT: cardiac computed tomography

CMR: cardiac magnetic resonance

TAVI: transcatheter aortic valve implantation

TEER: transcatheter edge-to-edge mitral repair

TTVR: transcatheter tricuspid valve replacement.

10. Administrative information

10.1 Conflict of interest

The author declares no conflicts of interest.

10.2 Funding

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10.3 Disclaimer

The opinions expressed in this manuscript are solely those of the author and do not necessarily reflect the institutional positions of Sanatorio Modelo de Caseros or the organizations cited.

10.4 Supplementary material

Not applicable.

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10.6 Author contributions (CRediT Statement)

Paola Chong Velásquez: conceptualization, study design, manuscript drafting, and critical revision.

10.7 Data availability

Not applicable. This study is a narrative review based on previously published literature.

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