



Prevention and management of cardiovascular disease in adults with cancer: an International Cardio-Oncology Society (IC-OS) and Multinational Association of Supportive Care in Cancer (MASCC) clinical practice statement

Susan Dent · Michelle B. Nadler · Anne Blaes · Ahamed Iqbal · Hannah Naa Gogwe Ayettey · Jose Alvarez-Cardona, et al. *[full author details at the end of the article]*

Received: 9 March 2026 / Accepted: 6 April 2026 / Published online: 29 May 2026
© The Author(s) 2026, modified publication 2026

Abstract

Purpose Cardiovascular (CV) toxicity is prevalent in cancer survivors due to shared risk factors, direct CV injury from cancer therapy (CT), and development/exacerbation of CV risk factors during treatment. Succinct guidance on the minimum standard of CV care required of cancer care providers (CCPs) can improve outcomes for survivors. This clinical practice statement (CPS) is aimed at CCPs focused on identification, prevention, and management of CVD in individuals with cancer.

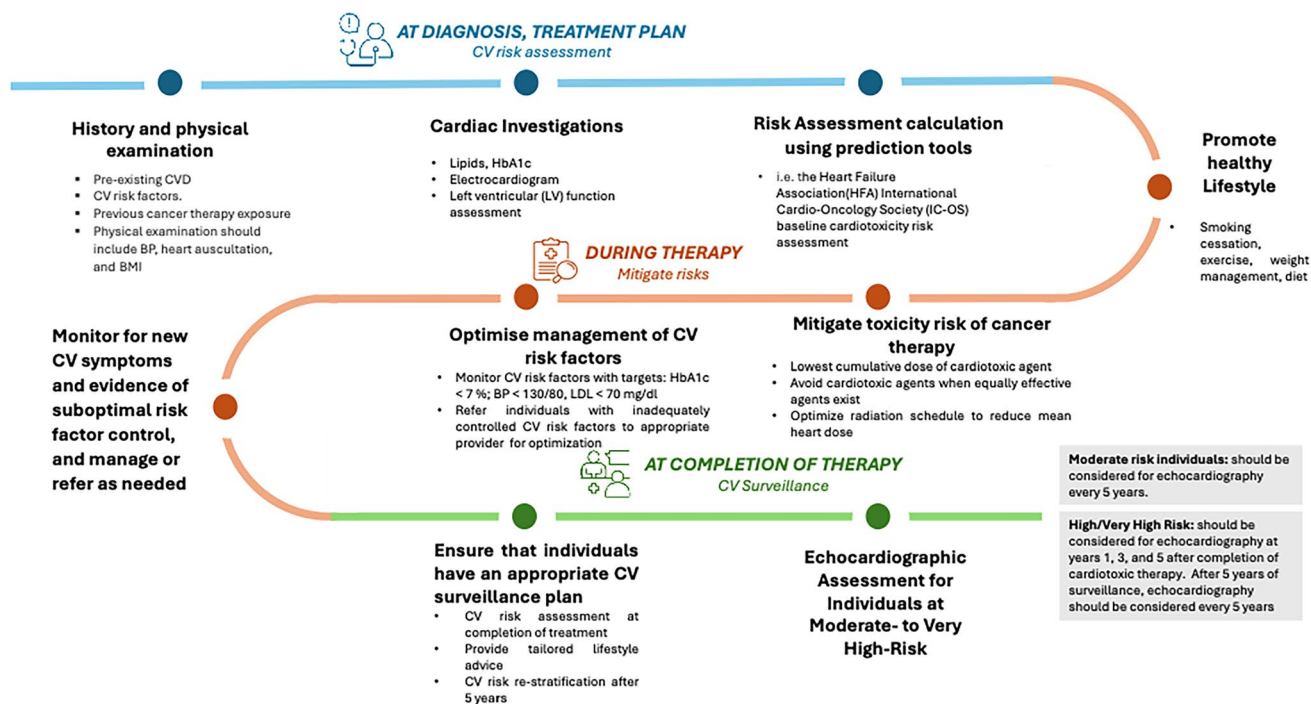
Methods The International Cardio-Oncology Society and Multinational Association of Supportive Care in Cancer identified members with expertise across oncology, cardiology, and cancer survivorship. Key questions/areas of practice recommendations related to CV risk and CVD were identified across the cancer trajectory. Working groups performed targeted literature reviews and consensus was reached for all recommendations.

Results 5 over-arching clinical practice recommendations for CCPs were identified: (1) perform a CV risk assessment prior to starting CT (2) identify and facilitate CV-related care during CT; (3) ensure measures are taken to mitigate the risk of cancer therapy related CV toxicity (CTR-CVT) prior to and during CT; (4) monitor CV status and risk factors during therapy and refer to the appropriate health care provider if CV risk factors are uncontrolled or new signs/symptoms develop; and (5) re-assess CV risk following completion of CT (periodically for those with advanced disease on life long treatment) and develop a CV surveillance plan.

Conclusions CCPs play a pivotal role in identifying and addressing CTR-CVT. This CPS provides specific, succinct, and actionable behaviours that can be readily implemented in cancer care globally.

This publication was approved by both the International Cardio-Oncology Society and the Multinational Association of Supportive Care in Cancer and it has been peer-reviewed. It is published simultaneously in Supportive Care in Cancer (<https://doi.org/10.1007/s00520-026-10741-8>) and Cardio-Oncology (<https://doi.org/10.1007/s00520-026-10741-8>).

Graphical Abstract



Keywords Cancer survivorship · Cardiovascular toxicity · Prevention · Management · Multidisciplinary care

Disclaimer

The Multinational Association of Supportive Care in Cancer (MASCC) and International Cardio-Oncology Society (IC-OS) Clinical Practice Statement (CPS) has been developed to facilitate expert-opinion-based recommendations, for cancer care professionals, on the minimum standard of care for cardiovascular risk assessment and management in individuals with cancer. Clinicians should use their judgment when making treatment decisions for individual patients. Statements made by the authors and the MASCC/ICOS organizations do not guarantee clinical outcomes in individual patients.

Introduction

Cardiovascular (CV) disease is a major competing cause of mortality and morbidity in cancer survivors [1, 2] given the improvements seen in survivorship largely due to early detection and improved cancer therapies [3, 4]. CV toxicity can occur due to the direct impact of cancer therapy on the CV system or indirectly by negatively impacting risk factors for CVD [5, 6]. Furthermore, identification,

attention to, and management of risk factors for cardiovascular disease (CVD) may be given less priority during cancer treatment by patients and their health care providers [7]. The combination of direct and indirect CV toxicity and inattention to CVD risk factors leads to increased CV morbidity and premature mortality [3, 8]. In individuals with cancer, management of CV risk factors and CVD is an important aspect of cancer survivorship.

Several professional organizations have published expert opinions and guidelines on the CV care of individuals with cancer, including the European Society of Cardiology, American College of Cardiology, Canadian Cardiovascular Society, American Society of Clinical Oncology, and the European Society of Medical Oncology [3, 4, 6, 9, 10]. However, these documents have largely focused on recommendations for cardiology providers rather than cancer care providers, and they have not considered unique resource constraints with regards to provision of cardio-oncology care around the globe. While comprehensive, the most robust recommendations for cardiovascular care of individuals with cancer may be overlooked given the multitude of recommendations. This may lead to sub-optimal adoption of evidence based recommendations in clinical practice.

While current guidelines in cardio-oncology highlight the importance of collaboration between oncologists, cardiologists and allied health care professionals, there is limited discussion on the specific role of cancer care providers in contributing to the cardiovascular care of individuals with cancer at risk of CV toxicity or with pre-existing CVD [6, 11]. Cancer care providers are well positioned to assess individuals at risk of cancer therapy related CV toxicity; however, they often have competing priorities [7]. Oncology visits, from consultation, initiation and follow-up of therapy, and post-treatment visits, all have critical oncology-based priorities centred around staging, prognosis, treatment decisions, toxicity management, and surveillance/survivorship planning. Thus the necessary attention to CVD is likely to be impacted by competing priorities and time constraints. It is therefore critical that cancer care providers are aware of what is a realistic minimal standard of care for assessment and management of CV risk/CVD and what components of care should be appropriately referred to cardiologist/cardio-oncologists or other health care providers with expertise in this field.

This joint effort by two international organizations focused on supportive and clinical care, the International Cardio-Oncology Society (ICOS) and the Multinational Association of Supportive Care in Cancer (MASCC), aims to address this gap by developing a clinical practice statement (CPS) – a brief, clinically focused set of recommendations aimed at cancer care professionals addressing the minimum standard of care for cancer care providers in the prevention and management of CVD in individuals with cancer, taking into account competing priorities and variation in resources globally.

Methods

This CPS was developed collaboratively by members of ICOS and MASCC with expertise in oncology, cardiovascular disease, and cancer survivorship representing diverse professional disciplines and international geographic locations. The authorship group met virtually to identify and

agree upon several key questions to address the assessment of cancer therapy related CV toxicity risk and management during an individual's cancer disease trajectory - initial assessment, during treatment, and in follow-up. Multidisciplinary working groups were formed to work on a targeted literature review and proposed recommendations. The 2022 European Society of Cardiology Cardio-Oncology guideline [6] was used as a comprehensive source for literature review. Additional literature was sourced through searches of the authors' own files, with the final reference list generated from items most relevant to the broad scope of this review.

The recommendations were reviewed by all authors, and any differences of opinion were resolved by consensus with key practice recommendations summarised as clinical practice statements (CPS). The overarching purpose and principles of the CPS are summarised in Table 1.

CPS 1. Cancer care providers play a critical role in identifying pre-existing CV risk factors and CVD in individuals with cancer. Cancer care providers should be aware of how these may impact the selection of cancer treatment and how cancer treatment may affect underlying CV risk factors/CVD. These considerations should be integrated into the overall cancer care plan, with input from other members of the multidisciplinary team as required

Cancer care is inherently multidisciplinary with input from diverse oncology disciplines, allied health care providers, and other specialised and primary care providers with cancer care providers frequently involved in ensuring coordinated, integrated care. Cancer care providers should be aware of an individual's pre-existing CVD, the presence of CV risk factors, and how these may impact the selection of cancer treatment [3, 6, 11]. It is important to consider that assessment of CVD risk is taking place in the context of broad considerations of an individual's cancer specific circumstances including assessment of cancer stage, prognosis, treatment options and unique physical, psychosocial and practical supportive care needs in the

Table 1 Clinical Practice Statement (CPS) Purpose and Principles

Purpose: practical, clinical advice on minimal standard of care for prevention and management of cardiovascular risk/disease and cardiovascular toxicity in individuals with cancer.
Target audience: cancer care professionals (doctors, nurses, pharmacists, nurse practitioners and allied health care providers)
Target population: adult cancer survivors from the time of diagnosis (adult survivors of pediatric cancers are not included)
Overarching principles: CVD management needs to address an individual's CV risks in the context of their cancer, their cancer treatment goals, and long term health outcomes. Cancer care professionals are uniquely positioned to identify individuals at risk of CVD and develop and initiate a plan for multidisciplinary management with input from other providers.
The model of care delivery should be evidence based, utilizing resources available in the relevant setting, including supported self management, primary care, community care, and specialist care when required.

context of limited time available for a comprehensive assessment.

It is a minimal standard of care that cancer care providers consider pertinent CVD considerations sufficient to identify areas of concerns that (a) may impact selection of cancer therapies, (b) may be impacted by cancer therapies, or (c) may warrant referral to a specialist health care provider for appropriate cardiovascular management. Referrals may include a cardio-oncologist, cardiologist, internist or primary care providers with expertise in chronic disease management or appropriate allied health provider (i.e. exercise physiologist, dietitian, or psychologist) to manage CV risk factors or cardiovascular disease accordingly. The specific thresholds for referral will depend on unique patient considerations and availability of services within each clinical location [3, 6, 11].

Management of risk for cancer therapy related cardiovascular toxicity (CTR-CVT) is only one aspect of the care that needs to be effectively integrated into the overall care of individuals with cancer to optimize their health outcomes and minimize cost, time demands, and duplications. Careful care planning that takes into account individual preferences is key as is effective multidisciplinary management that involves oncology, primary care, pharmacy, allied health providers and specialized services. Shared care models may be beneficial involving primary care providers and specialists [6].

Care planning needs to consider unique resource constraints applicable to cancer and non-cancer workforces around the globe [3]. Access to cancer care is limited in

many places around the world as is access to specialized cardiology, cardio-oncology, and primary care resources that are critical in the management of CV risk factors and CVD. Careful consideration of existing resources to plan tailored care delivery is needed. In a setting where resources are limited, care planning should emphasize lifestyle modification to optimize CVD risk factors and utilization of primary care resources and community health workers for risk reduction and follow-up.

CPS 2. Cancer care providers should undertake a CV risk assessment for all individuals prior to commencement of cancer therapy

Prior to commencing treatment, the cancer care team should ensure that all individuals with cancer are assessed for risk of CV toxicity [3, 6, 11]. This includes identifying pre-existing CV disease and CV risk factors, documenting prior exposure to cardiotoxic cancer therapy, performing and/or gathering relevant cardiovascular related investigations, and performing a baseline risk assessment [3, 6, 11].

Cancer care providers should undertake a thorough history, physical examination, and gather/perform relevant cardiac investigations [6] (Table 2). Baseline investigations should include HbA1c and lipids (LDL, HDL, and total cholesterol) in those undergoing systemic therapy [6]. Left ventricular (LV) function assessment should be performed at baseline for all individuals treated with cancer drugs associated with LV dysfunction (e.g. anthracyclines) [6]. Transthoracic echocardiography (TTE), with global

Table 2 Pre-treatment (baseline) CV risk assessment

A) Identify pre-existing CVD and CV risk factors via history and physical examination:	
■	Pre-existing CVD (e.g., coronary artery disease, heart failure, arrhythmias).
■	CV risk factors (hypertension, diabetes, hyperlipidemia, smoking, obesity, physical inactivity).
■	Previous cancer therapy exposure (radiotherapy, anthracyclines, tyrosine kinase inhibitors, immune checkpoint inhibitors, HER-2 targeted agents).§ Physical examination should include BP, heart auscultation, and BMI.
B) Perform relevant cardiac investigations:	
■	Lipids (HDL, LDL, and total cholesterol), HbA1c (within 6 months) for those undergoing systemic therapy
■	Electrocardiogram (ECG/EKG) for individuals with cancer with pre-existing CV risk factors or CVD, planned to receive cancer therapy known to cause arrhythmias, or at risk of CV toxicity
■	Left ventricular (LV) function assessment for individuals treated with cancer drugs associated with LV dysfunction. Transthoracic echocardiography (TTE) with global longitudinal strain (GLS) if available (gold standard). Cardiac Magnetic Resonance (CMR) imaging if echocardiogram is of poor quality. Multi-gated Acquisition (MUGA) Scan if TTE not available, or not feasible due to patient discomfort (ie chest wall surgery) or when acoustic windows are poor.
C) Calculate Risk Assessment calculation using an available prediction tools:	
■	The Heart Failure Association(HFA) International Cardio-Oncology Society (IC-OS) baseline cardiotoxicity risk assessment (preferred for individuals with cancer for risk stratification)
■	The Framingham Risk Score and ASCVD risk calculator (less desirable)
■	Individuals at high/very high baseline risk of CTR-CVT:
○	Consider the addition of baseline cardiac biomarkers (troponin and B-type natriuretic peptide - BNP)
○	Should be referred to a cardio-oncologist, cardiologist, or health care provider with experience in cardio-oncology.
○	Multidisciplinary discussion to discuss the risk/benefits of the proposed cancer therapy should take place.

longitudinal strain (GLS) if available, is considered the gold standard [12–14]. An electrocardiogram (ECG/EKG) should be performed prior to initiation of systemic therapy for individuals with pre-existing CV risk factors or CVD and for individuals being considered for treatment with cancer therapies associated with a high risk of arrhythmias or CV toxicity [4, 6, 15, 16].

All individuals with cancer should have a baseline assessment for risk of CTR-CVT. While general population CV risk tools may be applicable in individuals with cancer [17], specific tools for this population are available which classify individuals into low, medium, and high-risk groups for CTR-CVT. The HFA-ICOS risk stratification tool (www.mdcalc.com) provides an estimate of risk of cardiotoxicity in the setting of seven different classes of potentially cardiototoxic drugs (e.g. anthracyclines, HER-2 targeted therapies). Applying this tool prior to initiation of cancer therapy allows clinicians to stratify individuals with cancer prior to starting treatment into low risk (< 10%), medium risk (10–19%), or high risk ($\geq$ 20%) of cardiovascular complications [11]. Risk stratification can also help guide CV monitoring and determine which individuals may benefit from a cardiology/cardio-oncology referral [11] (Table 2). Individuals who are considered low and medium risk should be followed by their cancer care providers as per institutional practice and referred to cardiology/cardio-oncology if they develop signs or symptoms of cardiovascular toxicity. For all individuals at high/very high baseline risk, consider the addition of baseline cardiac biomarkers (troponin, B-type natriuretic peptide - BNP) and refer to a cardio-oncologist, cardiologist, or health care provider with experience in cardio-oncology ideally prior to beginning cancer therapy (or as soon as possible at initiation of

therapy) [6, 11]. A multidisciplinary discussion to discuss the risk/benefits of the proposed cancer therapy should take place for all individuals who are at high/very high risk of CV toxicity [11]. Individuals with complex care needs (for example those who are pregnant or those with prior exposure to cardiotoxic agents) may benefit from a referral to a specialist cardio-oncologist or other appropriate care provider to ensure appropriate management [6].

CPS 3. Cancer care providers should ensure that measures are taken to mitigate the risk of CTR-CVT prior to and during cancer therapy

Measures should be implemented either by the cancer care team or by an appropriate specialist to mitigate the risk of CTR-CVT (Table 3). This includes recommending and supporting lifestyle modifications, managing comorbid CVD, addressing poorly controlled modifiable CV risk factors, and selecting appropriate cancer therapies to decrease CTR-CVT in high/very-high risk individuals [3, 6, 18]. Immediately prior to and during cancer therapy can be a difficult time to optimize CVD/CV risk factors; however, care should be taken to address any of these poorly controlled co-morbidities to facilitate safe delivery of cancer therapies and to mitigate the risk of future CTR-CVT [18].

Cancer care providers should counsel all individuals on and/or arrange for an appropriate referral for lifestyle modifications including heart healthy diet, smoking cessation, weight management, and exercise [19, 20]. These lifestyle behaviors are beneficial in improving treatment tolerance and cancer outcomes including prevention of recurrence and prolongation of survival [21, 22]. Further, cancer care providers should ensure an appropriate health care provider

Table 3 Measures to mitigate the risk of CTR-CVT prior to and during cancer therapy

A) Promote healthy Lifestyle

- smoking cessation, regular exercise, weight management, and a heart-healthy diet.

B) Mitigate toxicity risk of cancer therapy

- Educate patients on potential cardiac side effects of cancer therapy and advise prompt reporting of any new cardiovascular symptoms to the cancer care team.
- Use the lowest effective cumulative dose of cardiotoxic agents
- Avoid cardiotoxic cancer agents when equally effective alternatives exist especially in patients considered to be at high/very high risk of CTR-CVT.
- In patients receiving high-dose anthracyclines (e.g. cumulative dose doxorubicin $\geq$ 250 mg/m² or equivalent) or those with pre-existing cardiomyopathy, consider liposomal formulations of anthracyclines or use of dexrazoxane if available.
- Optimize the total radiation dose and fractionation schedules for patients receiving thoracic (including mediastinal, left breast and chest wall) radiation. Reduce mean heart dose through techniques such as deep inspiration breath-hold.

C) Optimise CV risk factor management

- Refer Individuals with identified pre-existing CV conditions (see CPS2) that are inadequately controlled to an appropriate provider to optimize these conditions to facilitate safe delivery of cancer therapies and to mitigate the risk of future CTR-CVT.
- Monitor CV risk factors with the following targets: HbA1c <7%, BP <130/80, and LDL <70 mg/dL
- Immediately prior to and during cancer therapy can be a difficult time to optimize these targets. It is reasonable to balance strict management of these conditions, when focusing on active cancer therapy, and to prioritize achieving these targets post-therapy (see CPS5).

is managing comorbid CVD and addressing modifiable CV risk factors such as hypertension [18–20].

The key strategy for reducing risk of CTR-CVT remains minimizing exposure to cardiotoxic agents by limiting cumulative doses of systemic therapy and/or radiation known to cause CV toxicity [23]. Cardioprotective agents such as dexrazoxane should be considered in individuals at high risk of CV toxicity such as those with prior exposure to cardiotoxic agents (e.g. anthracyclines) where further therapy with cardiotoxic agents (e.g. anthracyclines ≥ 250 mg/m² life time dose) is warranted [23–25]. For individuals at risk of CV toxicity, radiation therapy intensity-modulated radiation therapy (IMRT) or proton therapy should be considered if resources are available [6, 26–28]. Optimize the total radiation dose and fractionation schedules for individuals receiving thoracic (including mediastinal, left breast and chest wall) radiation. Reduce mean heart dose through techniques such as deep inspiration breath-hold [29].

Multiple studies have evaluated the cardioprotective potential of neurohormonal antagonists and statins; however, current evidence does not support their routine use for primary prevention of CTR-CVT [23, 30]. These agents may be considered for patients with cancer at high/very-risk of cardiovascular toxicity in consultation with cardiology or cardio-oncology specialists [6]. SGLT-2 inhibitors have demonstrated clinical benefits in heart failure management, but existing data in oncology are largely observational and limited to individuals with diabetes [31].

CPS 4. Cancer care providers should monitor individuals for the development of new symptoms of CV toxicity or poorly controlled CV risk factors with referral to the cardio-oncology/cardiology team as required

The cancer care team should assess patients during active cancer treatment for signs and symptoms concerning for new and/or progressive CVD or poorly controlled CV risk factors, and refer as appropriate [6, 11]. Re-assessment should occur at major transition points in care (new therapies, change in therapy), when new clinical symptoms arise, when there is a sustained change in vital signs, and when drugs that are known to exacerbate CV risk factors are used (i.e. steroids causing hyperglycemia and hypertension) [6, 11]. The cancer care team should follow drug specific recommendations for cardiac monitoring [6, 32, 33]. While the threshold for referral to cardiology may vary according to the capacity and experience of oncology and cardiology/cardio-oncology services in each setting, potential indications for referral should include new cardiovascular disease which has developed while on treatment, deterioration of ejection fraction (e.g. LVEF $< 53\%$ and/or global longitudinal strain drop $> 15\%$), development of new onset arrhythmias (e.g. atrial fibrillation), poorly controlled or

exacerbation of pre-existing CV risk factors (e.g. hypertension), and concern for drug-drug interactions [6].

CPS 5. At completion of treatment, cancer care providers should ensure that individuals have a CV surveillance plan and recommendations for prevention of CTR-CVT

Cancer care providers should reassess CV status and risk at the end of cancer treatment(s), or for those individuals on life-long therapy due to advanced disease, periodically during treatment, based on CV risk (Table 4). There is limited data on the optimal frequency of cardiac imaging in this population [3]. CV toxicity may not develop for 5–10 years following completion of cancer treatment and some toxicities such as valvular disease develop after 10 years [6, 34]. As survivors age, they are also at higher risk of ischaemic heart disease, peripheral vascular disease, and stroke [6, 27, 35, 36]. It is important that cancer care providers educate individuals and their primary health care providers on the potential long term cardiovascular toxicities associated with systemic and/or radiation therapy.

Guidance for all cancer survivors

Cancer care providers should provide tailored lifestyle advice to all cancer survivors. This includes healthy diet, regular physical activity, avoidance of tobacco use, reduction in alcohol usage, and maintaining healthy body weight. There is strong evidence to support the benefits of exercise to mitigate the effects of treatment and emerging evidence of cardiovascular benefit [37, 38]. A recent white paper from the International Cardio-Oncology Society (IC-OS) highlights the importance of cardio-oncology rehabilitation and exercise (CORE) to improve the CV health of cancer survivors. The *Challenge* prospective randomized trial demonstrated improved physical fitness and cancer survival in the exercise group compared to the health-education group [21, 39]. Other complimentary modalities such as nutrition counselling, psychosocial support and rehabilitation referrals may be appropriate for those individuals who are at risk of CV toxicity. In all individuals exposed to cancer therapies (regardless of post-therapy risk), if CV risk factors are present, they should be aggressively managed to recommended targets.

Guidance for surveillance based on risk of CTR-CVT

All individuals who have received cancer therapy should be provided with recommendations for annual CV risk assessment (including history of cardiac symptoms and measurement of CV risk factors) by their routine health care team (e.g. primary care provider, nurse practitioner or

Table 4 CV Surveillance and post treatment recommendations in Asymptomatic Cancer Survivors after completion of cancer therapy**All Asymptomatic Individuals after completion of cancer therapy**

- Education of individuals and primary healthcare providers on potential long term CV toxicities associated with systemic and/or radiation therapy
- Provide tailored lifestyle advice, including avoidance of tobacco, reduction in alcohol use, healthy diet, regular physical activity, and maintaining a health body weight
- CV risk assessment after their last cancer treatment to develop a cardiovascular surveillance plan.
- Annual CV risk assessment including a) assessment for new cardiovascular symptoms, and b) assessment for CV risk factors including diabetes, hypertension, and dyslipidemia
 - Cardiology/cardio-oncology referral if new CV symptoms develop (at any time)
- Echocardiogram at 12 months post-therapy for those treated with HER-2 targeted therapy or cumulative dose of doxorubicin $\geq 250\text{mg/m}^2$ or equivalent
- Manage CV risk factors to target (HbA1c $<7\%$, BP $<130/80$ mmHg, and LDL <70 mg/dL)
- CV toxicity risk re-stratification after 5 years.

Moderate risk

- Asymptomatic individuals at moderate risk post-cancer therapy should be considered for echocardiography every 5 years (class IIb recommendation; level of evidence C)

High/Very High Risk

- Asymptomatic individuals at high/very risk post-cancer therapy should have echocardiography at years 1, 3, and 5 after completion of cardio-toxic therapy and every 5 years thereafter (class IIa recommendation; level of evidence C)
- After 5 years of surveillance, echocardiography should be considered every 5 years

oncology provider based on local health care resources) [6, 40, 41]. An echocardiogram at 12 months is recommended for those individuals treated with HER-2 targeted therapy and for individuals with early stage cancer treated with curative intent who have received a cumulative dose of $\geq 250 \text{ mg/m}^2$ of doxorubicin or equivalent as per the ESC cardio-oncology guidelines (class I recommendation; level of evidence B) [6].

Individuals considered to be at moderate risk of CV toxicity maybe considered for repeat transthoracic echocardiogram every 5 years (class IIb recommendation; level of evidence C); however, there is minimal data to support this recommendation [6]. The health care team should consider referral to a cardiologist/cardio-oncologist if new cardiac symptoms develop. If resources are available, it is reasonable for individuals at high/very high risk to be referred to a cardio-oncologist, cardiologist, or internist with expertise in caring for this population (if not already). Individuals should be followed regularly by a multidisciplinary team for cardiac surveillance and consideration of cardioprotection strategies based on individualized risk [6] (Table 4).

Cardio-oncology or cardiology (if no cardio-oncology expertise available) follow-up is recommended for all patients with CV toxicities that are directly related to cancer therapy such as development of tyrosine kinase inhibitor (TKI)-mediated hypertension, anthracycline or HER-2 targeted LV dysfunction, vascular toxicities, QT prolongation, or immune checkpoint inhibitor myocarditis. Follow-up may also be appropriate for individuals with complex needs such as those who are planning pregnancy in the setting of prior exposure to cardiotoxic cancer therapy [6].

Cancer survivors who develop heart failure or CVD at any time following a cancer diagnosis should be referred to a cardiac rehabilitation program if the resources are available [42].

Cardiovascular care for individuals with advanced cancer

There is limited evidence to support routine cardiovascular investigations (e.g. echocardiograms) in adults with metastatic cancer who remain on lifelong cancer therapy (unless required for the specific cancer therapy), particularly in the absence of known CVD or CV risk factors; however cardiac surveillance may be reasonable based on need for optimization of cancer treatment and cardiovascular needs.

Conclusion

Cardiovascular disease is a major cause of mortality and morbidity among cancer survivors. Cancer care providers play an important role in cardiovascular risk assessment, risk reduction, and follow-up of cardiovascular health in individuals with cancer as part of a multidisciplinary approach that prioritizes early intervention and behavioural modification that can be beneficial for both CVD and cancer.

Acknowledgements Acknowledgements: We would like to acknowledge Stephen Casselli and Karine Ronan for their support in the development of this clinical practice statement.

Authors' contributions All authors wrote the main manuscript text. All authors reviewed and approved the text. B.K. and S.D. prepared the central illustration.

Funding Open Access funding enabled and organized by CAUL and its Member Institutions.

Data availability No datasets were generated or analysed during the current study.

Declarations

Competing interests The authors declare no competing interests.

Conflicts of Interest The authors have no relevant financial or non-financial interests to disclose.

Open Access This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Tonorezos E, et al. Prevalence of cancer survivors in the United States. *JNCI: J Natl Cancer Inst.* 2024;116(11):1784–90.
2. De Angelis R, et al. Complete cancer prevalence in Europe in 2020 by disease duration and country (EUROCare-6): a population-based study. *Lancet Oncol.* 2024;25(3):293–307.
3. Armenian SH, et al. Prevention and Monitoring of Cardiac Dysfunction in Survivors of Adult Cancers: American Society of Clinical Oncology Clinical Practice Guideline. *J Clin Oncol.* 2017;35(8):893–911.
4. Ganatra S et al (2026) Diagnosis and management of cardiovascular adverse effects of targeted oncology therapies: Bruton's Tyrosine Kinase, immune checkpoint, and vascular endothelial growth factor inhibitors: 2025 ACC Concise clinical guidance: a report of the american college of cardiology solution set oversight committee. *JACC* 87(5):654–682
5. Ganatra S, Neilan TG. Immune Checkpoint Inhibitor-Associated Myocarditis. *Oncologist.* 2018;23(8):879–86.
6. Lyon AR, et al. 2022 ESC Guidelines on cardio-oncology developed in collaboration with the European Hematology Association (EHA), the European Society for Therapeutic Radiology and Oncology (ESTRO) and the International Cardio-Oncology Society (IC-OS): Developed by the task force on cardio-oncology of the European Society of Cardiology (ESC). *Eur Heart J.* 2022;43(41):4229–361.
7. Knowles R, et al. Reducing the impact of cardiovascular disease in older people with cancer: a qualitative study of healthcare providers. *J Cancer Surviv.* 2024;18(3):818–27.
8. Fidler MM, et al. Population-Based Long-Term Cardiac-Specific Mortality Among 34 489 Five-Year Survivors of Childhood Cancer in Great Britain. *Circulation.* 2017;135(10):951–63.
9. Virani SA, et al. Canadian Cardiovascular Society Guidelines for Evaluation and Management of Cardiovascular Complications of Cancer Therapy. *Can J Cardiol.* 2016;32(7):831–41.
10. Curigliano G, et al. Management of cardiac disease in cancer patients throughout oncological treatment: ESMO consensus recommendations. *Ann Oncol.* 2020;31(2):171–90.
11. Lyon AR, et al. Baseline cardiovascular risk assessment in cancer patients scheduled to receive cardiotoxic cancer therapies: a position statement and new risk assessment tools from the Cardio-Oncology Study Group of the Heart Failure Association of the European Society of Cardiology in collaboration with the International Cardio-Oncology Society. *Eur J Heart Fail.* 2020;22(11):1945–60.
12. Plana JC, et al. Expert consensus for multimodality imaging evaluation of adult patients during and after cancer therapy: a report from the American Society of Echocardiography and the European Association of Cardiovascular Imaging. *Eur Heart J Cardiovasc Imaging.* 2014;15(10):1063–93.
13. Cocco LD, et al. Global Longitudinal Strain for the Early Detection of Chemotherapy-Induced Cardiotoxicity: A Systematic Review and Meta-analysis. *Clin Oncol (R Coll Radiol).* 2022;34(8):514–25.
14. Thavendiranathan P, et al. Use of myocardial strain imaging by echocardiography for the early detection of cardiotoxicity in patients during and after cancer chemotherapy: a systematic review. *J Am Coll Cardiol.* 2014;63(25 Pt A):2751–68.
15. Shanafelt TD, et al. Atrial fibrillation in patients with chronic lymphocytic leukemia (CLL). *Leuk Lymphoma.* 2017;58(7):1630–9.
16. Fradley MG et al (2021) Recognition, prevention, and management of arrhythmias and autonomic disorders in cardio-oncology: a scientific statement from the American Heart Association. *Circulation* 144(3):e41-55
17. Tawfiq E, et al. Performance of cardiovascular disease risk prediction equations in more than 14 000 survivors of cancer in New Zealand primary care: a validation study. *Lancet.* 2023;401(10374):357–65.
18. Cohen JB et al (2023) Cancer therapy-related hypertension: A scientific statement from the American Heart Association. *Hypertension* 80(3):e46-57
19. Marvel FA, Whelton SP, Blumenthal RS. A Cardio-Oncology Cardiovascular Prevention Framework. *JACC CardioOncol.* 2019;1(2):252–5.
20. Altena R, et al. Evidence-based prediction and prevention of cardiovascular morbidity in adults treated for cancer. *Cardiooncology.* 2021;7(1):20.
21. Courneya KS, et al. Structured Exercise after Adjuvant Chemotherapy for Colon Cancer. *N Engl J Med.* 2025;393(1):13–25.
22. Schmitz KH, et al. Exercise and Nutrition to Improve Cancer Treatment-Related Outcomes (ENICTO). *JNCI: J Natl Cancer Inst.* 2024;117(1):9–19.
23. Raisi-Estabragh Z et al (2024) Cardiovascular considerations before cancer therapy. Gaps in Evidence and JACC: cardioOncology expert panel recommendations. *JACC CardioOncol* 6(5):631–654
24. Macedo AVS et al (2019) Efficacy of Dexrazoxane in preventing anthracycline cardiotoxicity in breast cancer. *JACC CardioOncol* 1(1):68–79
25. *Zinecard® (dexrazoxane for injection).* 2014 [cited January 2026; Available from: https://www.accessdata.fda.gov/drugsatfda_docs/label/2012/020212s013lbl.pdf
26. Birch S, Otton J. Cardio-oncology and radiation oncology: How collaboration between cardiologists and oncologists can be realised in radiation oncology. *J Med Imaging Radiat Oncol.* 2024;68(8):962–73.
27. Mitchell JD, et al. Cardiovascular Manifestations From Therapeutic Radiation: A Multidisciplinary Expert Consensus Statement From the International Cardio-Oncology Society. *JACC CardioOncol.* 2021;3(3):360–80.

28. Banfill K, et al. Cardiac Toxicity of Thoracic Radiotherapy: Existing Evidence and Future Directions. *J Thorac Oncol*. 2021;16(2):216–27.
29. Aznar MC et al (2023) ESTRO-ACROP guideline: recommendations on implementation of breath-hold techniques in radiotherapy. *Radiother Oncol* 185:109734
30. Dent SF et al (2020) Optimizing cardiovascular health in patients with cancer: a practical review of risk assessment, monitoring, and prevention of cancer treatment–related cardiovascular toxicity. *Am Soc Clin Oncol Educ Book* 40:501–515
31. Bhalraam U et al (2026) Impact of sodium-glucose cotransporter-2 inhibitors on heart failure outcomes in cancer patients and survivors: a systematic review and meta-analysis. *Eur J Prev Cardiol* 33(2):214–226
32. Čelutkienė J, et al. Role of cardiovascular imaging in cancer patients receiving cardiotoxic therapies: a position statement on behalf of the Heart Failure Association (HFA), the European Association of Cardiovascular Imaging (EACVI) and the Cardio-Oncology Council of the European Society of Cardiology (ESC). *Eur J Heart Fail*. 2020;22(9):1504–24.
33. Pudil R, et al. Role of serum biomarkers in cancer patients receiving cardiotoxic cancer therapies: a position statement from the Cardio-Oncology Study Group of the Heart Failure Association and the Cardio-Oncology Council of the European Society of Cardiology. *Eur J Heart Fail*. 2020;22(11):1966–83.
34. Gujral DM, Lloyd G, Bhattacharyya S. Radiation-induced valvular heart disease. *Heart*. 2016;102(4):269–76.
35. Lenneman CG, Sawyer DB. Cardio-Oncology: An Update on Cardio-toxicity of Cancer-Related Treatment. *Circ Res*. 2016;118(6):1008–20.
36. Haugnes HS, et al. Cardiovascular risk factors and morbidity in long-term survivors of testicular cancer: a 20-year follow-up study. *J Clin Oncol*. 2010;28(30):4649–57.
37. Dillon HT, et al. Preventing Allogeneic Stem Cell Transplant–Related Cardiovascular Dysfunction: ALLO-Active Trial. *Circulation*. 2025;151(4):292–308.
38. Foulkes SJ, et al. Exercise for the Prevention of Anthracycline-Induced Functional Disability and Cardiac Dysfunction: The BREXIT Study. *Circulation*. 2023;147(7):532–45.
39. Adams SC, et al. Cardio-oncology rehabilitation and exercise: evidence, priorities, and research standards from the ICOS-CORE working group. *Eur Heart J*. 2025;46(29):2847–65.
40. Armstrong GT, et al. Modifiable risk factors and major cardiac events among adult survivors of childhood cancer. *J Clin Oncol*. 2013;31(29):3673–80.
41. Armenian SH, et al. Cardiovascular risk factors in hematopoietic cell transplantation survivors: role in development of subsequent cardiovascular disease. *Blood*. 2012;120(23):4505–12.
42. Gilchrist SC et al (2019) Cardio-Oncology rehabilitation to manage cardiovascular outcomes in cancer patients and survivors: a scientific statement from the American Heart Association. *Circulation* 139(21):e997–1012

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Authors and Affiliations

Susan Dent¹  · Michelle B. Nadler²  · Anne Blaes³  · Ahamed Iqbal⁴  · Hannah Naa Gogwe Ayettey⁵ · Jose Alvarez-Cardona⁶  · Alexandre Chan⁷  · Eng-Siew Koh⁸  · Raul Cordoba Mascunano⁹ · Mridula George¹⁰  · Naa Adorkor Aryeetey⁵ · Erin J. Howden¹¹  · Sase Kazuhiro¹² · Nida Latif¹³  · Aya F. Ozaki¹⁴  · Cherith J. Semple¹⁵  · Sivatharshini Ramalingam¹⁶  · Neil M. Iyenger¹⁷  · Hope S. Rugo¹⁸  · Bogda Koczwara¹⁹ 

✉ Susan Dent
susan_dent@urmc.rochester.edu

✉ Bogda Koczwara
b.koczwara@unsw.edu.au

¹ Wilmot Cancer Institute, University of Rochester, Rochester, NY, USA

² Princess Margaret Cancer Center, University Health Network and University of Toronto, Toronto, ON, Canada

³ University of Minnesota, Minneapolis, USA

⁴ Teaching Hospital, Ministry of Health, Batticaloa, Sri Lanka, Sri Lanka

⁵ National Radiotherapy Oncology and Nuclear Medicine Centre, KorleBu Hospital, Accra, Ghana

⁶ Leon H Charney Division of Cardiology, Department of Medicine, NYU Grossman School of Medicine, New York, NY, USA

⁷ Department of Clinical Pharmacy Practice, School of Pharmacy & Pharmaceutical Sciences, University of California, Irvine, USA

⁸ Department of Radiation Oncology, Liverpool Hospital, Liverpool South Wales, Australia, South West Sydney Clinical School, University of South Wales, Sydney, Australia

⁹ Fundacion Jimenez Diaz University Hospital, Madrid, Spain

¹⁰ Rutgers Cancer Institute, New Brunswick, NJ, USA

¹¹ School of Health Sciences, University of New South Wales, Sydney, Australia

¹² Clinical Pharmacy and Pharmacology an Regulatory Science, Juntendo University, Tokyo, Japan

¹³ Section of Cardiovascular Medicine, Department of Internal Medicine, Yale School of Medicine, New Haven, CT, USA

¹⁴ Department of Clinical Pharmacy Practice, School of Pharmacy & Pharmaceutical Sciences, University of California, Irvine, USA

¹⁵ Institute of Nursing and Health Research, Ulster University/Cancer Services, South Eastern Health and Social Care Trust, Belfast, UK

¹⁶ Cardio-Oncology Center of Excellence, Royal Brompton Hospital, London, UK

¹⁷ Winship Cancer Institute, Emory University, Atlanta, Georgia, USA

¹⁸ City of Hope Comprehensive Cancer Center, Duarte, CA, USA

¹⁹ Australian Research Centre for Cancer Survivorship, College of Medicine and Public Health, University of New South Wales, Flinders University, Sydney, Adelaide, Australia