AI-Enabled Cardiocare Pathway Improves Cardio-Oncology Across Ages

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The intersection of oncology and cardiology presents a complex clinical challenge, as cancer treatments frequently induce cardiovascular toxicities, necessitating vigilant monitoring and management. Current guidelines recommend multidisciplinary approaches, yet implementation varies, leading to suboptimal patient outcomes. The Cardiocare AI-enabled pathway, presented at ESC Cardio-Oncology 2026, aims to standardise and improve cardio-oncology care across diverse patient populations.

KEY TAKEAWAYS

- The Pivot: The Cardiocare pathway integrates AI for risk stratification and management recommendations in cardio-oncology, moving beyond traditional, resource-intensive manual assessments.
- The Data: The pathway demonstrated a 28% reduction in time to specialist cardiology referral for high-risk patients (p15% decrease in cardiovascular adverse events (p=0.003) compared to standard care.
- The Action: Clinicians should consider the potential of AI-driven tools like Cardiocare to enhance early detection and coordinated management of cardiovascular toxicities in oncology patients.

Cardio-oncology is a rapidly evolving subspecialty focused on preventing and managing cardiovascular complications arising from cancer therapies. The increasing survival rates for cancer patients mean a growing population is at risk of long-term cardiovascular sequelae, including heart failure, arrhythmias, and hypertension.1 Establishing efficient, evidence-based pathways for risk assessment, monitoring, and intervention is critical to mitigate these risks and improve overall patient prognosis. Traditional approaches often rely on manual risk stratification and reactive referrals, which can lead to delays in specialist input and potentially irreversible cardiac damage.2 The need for a more proactive, integrated system that can adapt to individual patient profiles and treatment regimens is evident. The prevalence of cardiovascular disease in cancer patients is substantial, with pre-existing conditions often exacerbated by cardiotoxic treatments. This complex interplay necessitates a multidisciplinary approach, yet coordination between oncology and cardiology teams can be challenging without structured pathways. AI-enabled solutions offer a promising avenue to bridge these gaps by providing real-time, data-driven insights.

What the study did

The Cardiocare pathway, presented at ESC Cardio-Oncology 2026, is an AI-enabled system designed to streamline cardio-oncology care. The pathway integrates patient demographic data, cancer diagnosis, planned and received oncological treatments, pre-existing cardiovascular comorbidities, and real-time cardiac monitoring parameters (e.g., echocardiography, cardiac biomarkers).3 The AI algorithm processes this information to generate a personalised

cardiovascular risk score and provides recommendations for monitoring frequency, prophylactic therapies, and specialist cardiology referral thresholds. The system was implemented in a prospective, multicentre study involving N=2,500 oncology patients across various age groups, from paediatric to geriatric, receiving cardiotoxic cancer therapies.3 Patients were randomised 1:1 to either the Cardiocare pathway group or a standard care group, which followed existing institutional guidelines for cardio-oncology management. The study enrolled patients undergoing treatment with anthracyclines, HER2-targeted therapies, and immune checkpoint inhibitors, all known for their potential cardiotoxicity. Baseline cardiovascular assessments, including electrocardiograms, echocardiograms, and cardiac biomarker measurements (e.g., troponin, natriuretic peptides), were performed for all participants. The AI algorithm's predictive model was trained on a large dataset of historical cardio-oncology patient outcomes to identify key risk factors and their interactions. The primary endpoints included time to specialist cardiology referral for high-risk patients and incidence of major cardiovascular adverse events (MACE), defined as cardiovascular death, hospitalisation for heart failure, or myocardial infarction. Secondary endpoints included changes in left ventricular ejection fraction (LVEF) and adherence to guideline-recommended monitoring.4

The study demonstrated that the Cardiocare AI-enabled pathway significantly reduced the time to specialist cardiology referral for patients identified as high-risk. The median time to referral in the Cardiocare group was 7 days (IQR 5-10 days) compared to 25 days (IQR 18-35 days) in the standard care group, representing a 28% reduction (P5 Furthermore, the incidence of MACE was lower in the Cardiocare group, with 8.5% of patients experiencing an event compared to 10.0% in the standard care group (Hazard Ratio [HR] 0.85; 95% CI 0.75-0.96; P=.003).5 Subgroup analysis revealed consistent benefits across different age cohorts, including paediatric and geriatric populations, suggesting broad applicability. For instance, in patients aged 70 years and older, the Cardiocare pathway was associated with a 12% reduction in MACE (HR 0.88; 95% CI 0.76-0.99; P=.04).6 Adherence to guideline-recommended cardiac monitoring protocols, such as serial echocardiograms and biomarker assessments, was also significantly higher in the Cardiocare group (88% vs 72%; P6 The mean change in LVEF from baseline to 12 months post-treatment was less pronounced in the Cardiocare group (-2.5% vs -4.1%; P=.008), indicating better preservation of cardiac function.7

While the Cardiocare pathway showed promising results, several limitations warrant consideration. The study was conducted in academic centres with established cardio-oncology programmes, which may not reflect implementation challenges in community settings with fewer resources.8 The generalisability of the AI algorithm to rare cancer types or highly complex patient presentations requires further validation. Additionally, the long-term impact of the pathway beyond 12 months on overall survival and quality of life was not assessed. The reliance on specific data inputs also means that data quality and completeness are crucial for the AI's accuracy, which can vary across different healthcare systems. Future research should focus on real-world implementation studies, cost-effectiveness analyses, and the integration of additional data streams, such as genetic predispositions and wearable device data, to further refine the AI algorithm.8

CLINICAL IMPLICATIONS

The Cardiocare pathway's ability to significantly reduce time to specialist referral and decrease cardiovascular adverse events in oncology patients is a compelling development. For clinicians managing cancer patients, this suggests a tangible improvement over current, often fragmented, care models. The consistent benefit across age groups, particularly in the vulnerable paediatric and geriatric populations, underscores the potential for

AI to standardise and elevate care where variability currently exists. This is not merely about efficiency; it is about preventing irreversible cardiac damage and improving long-term patient health.

The industry implications are clear: AI-driven solutions in cardio-oncology are moving from theoretical promise to demonstrable clinical utility. Companies developing these platforms will need to focus on seamless integration with existing electronic health records and demonstrate robust validation in diverse clinical environments. The challenge will be to ensure these tools augment, rather than replace, clinical judgment, providing decision support that is both precise and adaptable. Regulatory bodies will also need to establish clear frameworks for the approval and oversight of such complex AI systems, particularly concerning data privacy and algorithmic bias.

For patients, the prospect of an AI-enabled pathway means more proactive and personalised cardiovascular protection during cancer treatment. Reduced delays in specialist care and fewer cardiovascular complications translate directly into better quality of life and potentially improved long-term survival. This shift towards preventative, data-driven care represents a significant step forward in managing the often-overlooked cardiovascular burden of cancer therapy, offering a more integrated and reassuring experience for individuals navigating complex cancer journeys.

EDITORIAL & AI STANDARDS

AI tools are used to structure and summarise evidence from peer-reviewed primary sources. Articles that carry a signed Editor's take have been read in full by William Lopes. The others are not individually read by an editor, so check the cited source before relying on a figure.

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