

CARDIOVASCULAR MEDICINE AND SOCIETY

The Cardiologist and the Cancer Patient

Challenges to Cardio-Oncology (or Onco-Cardiology) and Call to Action



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Beginning with known problems regarding adoption of an appropriate name for this subspecialty (cardio-oncology vs. onco-cardiology), this new and promising field is beset with some rectifiable challenges. A search on PubMed reveals that the first mention of cardio-oncology was in 1996 by Cardinale (1). In reality, the subspecialty of cardio-oncology was born much earlier with the recognition of daunorubicin-induced cardiotoxicity in 1967 (2). Doxorubicin, first produced in 1969 as an improved form of daunorubicin, and used for treatment of various malignancies by the 1970s (3), is the pivotal reason for the development of cardio-oncology as a field. Recognition of its cardiotoxic effects, associated risk factors, and possible preventive strategies are all factors that eventually led to the birth of this important discipline. Since then, cardiotoxic effects of other anticancer drugs, including trastuzumab, cyclophosphamide, cisplatin, and 5-fluorouracil, and even newer so-called targeted therapies such as tyrosine kinase inhibitors, checkpoint inhibitors, and chimeric artificial T cell receptor immunotherapies, have been described (4).

As cancer patients live longer with the development of improved treatments (including chemo-, radiation, endocrine, and targeted therapies), cardiovascular disease (CVD) is a major cause of short- and long-term morbidity and mortality, next to second malignancy (5). As such, the field of cardio-oncology is critical for the development of survivorship strategies after the application of successful

oncologic therapies, to assure something close to a usual life expectancy in cancer patients and survivors. The novelty of this field and its associated concepts, which unusually span 2 medical specialties, lends itself to administrative, clinical, research-related, and educational challenges that require attention in the near future as we continue to make progress in this field (Central Illustration). Herein, we discuss some of the challenges being tackled by small- to moderate-sized and some larger academic centers, particularly the cancer centers without National Cancer Institute designation.

1. Name. While a cardio-oncologist signifies an oncologist involved in care of cardiac patients (one may imagine an oncologist specializing in cardiac cancers); the name “onco-cardiologist” better defines the subspecialty in question—usually a cardiologist dedicated to managing cancer patients with heart disease. However, the name “cardio-oncology” has been attached to the field ever since it was first coined by an Italian researcher (1), and in the English language is often confusing to others encountering the term for the first time. Because the name is not self-explanatory, the typical onco-cardiologist often has to clarify the label “cardio-oncology,” with ready explanations for the terminology and the field. It is noteworthy that although cardio-oncology (with hundreds of citations in PubMed) was first mentioned in the literature in 1996, the



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CENTRAL ILLUSTRATION Challenges in Cardio-Oncology

Cardio vs. Oncology

- Location of practice
- Patient priorities
- Training/ancillary staff
- Cancer illness vs. cardio prevention

Lack of Formal Training/Guidelines

- Lack of ACGME training programs
- Lack of practice guidelines

Resources

- Difficulties with Insurance/care coverage
- Complexities of research funding
- Means for training

Wide-ranging Responsibilities

- New treatment modalities
- Evolving patient care plans
- Communication with oncology

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Various hurdles faced in advancing the field of cardio-oncology; including administrative, clinical, research related, and educational. ACGME = Accreditation Council for Graduate Medical Education.

term *onco-cardiology* (with only tens of citations) is not noted in PubMed until 12 years later in 2008.

2. **Billing.** Patients receiving high doses of chest radiation or chemotherapies with cardiotoxic effects have an increased lifetime risk of CVD, including coronary artery disease, heart failure, valvular heart disease, pericardial disease, and arrhythmias. The presentation and mechanism by which cancer therapies increase the risk of CVD in cancer patients differs from that of the general population, and is multifactorial. Thus, to prevent potential cardiovascular events, it is recommended that such patients be referred to cardio-oncology for specialized monitoring (6). Because chest radiotherapy (and some chemotherapy, such as paclitaxel) can cause neuropathy, these patients may experience very atypical or non-identifiable symptoms of CVD that may portend impending cardiovascular events (7). As such, regular interval monitoring is recommended to identify CVD in these patients before they occur (6). The difficulty lies in fathoming a billing code to use in, for example, the asymptomatic patient post-radiotherapy that requires coronary evaluation. Furthermore, data show that cancer survivors are still at risk for cardiovascular events, even with normal stress tests (8). As such, a

coronary computed tomography angiography (without invasive cardiac catheterization) would seem an appropriate tool for coronary screening in these patients, except that many insurance companies deny coverage of such a test without symptoms or prior stress testing. Even the need for serial echocardiograms in the patient receiving cardiotoxic chemotherapy can sometimes present challenges for coverage. Additionally, Medicare would cover screening tests such as B-type natriuretic peptide and troponin I—with very good data to support their use in screening for cardiomyopathy in patients receiving cardiotoxic chemotherapy—only if there is an associated heart failure diagnosis. The utility of these tests for screening are not recognized. Likewise, myocardial strain imaging by speckle tracking echocardiography (STE) has proven to be a valuable tool in screening for chemotherapy-associated cardiomyopathy, and predicts a decrease in left ventricular ejection fraction early in the process, thus allowing for early institution of appropriate cardiovascular therapy. Notably, acquisition of STE takes time and skill. Nonetheless, as valuable as it is, acquisition of STE imaging is not covered by most insurance companies. Therefore, most echo labs have to image with STE using their own time and resources.

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