Establishing a Cardio-Oncology Program at an Academic Institution – A recipe for success!

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Objectives

• To discuss how to establish a successful cardio-oncology program at an academic institution
• To discuss the benefits of establishing a cardio-oncology program at an academic institution
• To discuss how to engage health care providers in this multidisciplinary approach
1. Establish the need for a cardio-oncology clinic/program
The big C
Drugs in development*, 2010

- Cancer
- Central nervous system
- Infections
- Pain and inflammation
- Cardiovascular
- Diabetes and metabolism
- Gastrointestinal
- Respiratory
- Blood disorders
- Dermatological

*Top ten therapeutic areas for the world’s big pharmaceutical firms, includes drugs in Phase I, II, III or awaiting FDA approval.

Source: Medco, R&D Directions

Estimated Number of Cancer Survivors in the US

Year

Malignancies, 0, 200, 400, 600, 800, 1,000

Projections

Cardiovascular Side Effects of Modern Cancer Therapy

- Arrhythmia
- Cardiac Dysfunction
  - Heart Failure
- Thromboembolism
- AP / MI
- Hypertension
Cardiovascular Disease:
Important cause of mortality in early breast cancer

Significant Impact of new cancer drugs on Cardiovascular Health

CML TKIs
- Imatinib
- Dasatinib/Nilotinib/
- Ponatinib:
  - PAH/Vascular/
  - Atherosclerosis

HDAC inhibitors
- Arrhythmia
  - PI3K Inhibitors
    - Hyperglycemia
    - Metabolic
      - ?Myocardial/
      - Arrhythmia

BTK Inhibitors
- Ibrutinib:
  - Arrhythmia/
  - Atrial Fibrillation

Cancer Immunotherapies
- Myocarditis

Drugs Affecting UPS
- Immunomodulators (IMiDs): thrombosis
- Proteasome inhibitors (e.g. bortezomib, carfilzomib): vascular

Anti-metabolites (5FU)
- Ischemia
- Vasospasm

VSP Inhibitors
- Hypertension
- Heart Failure
- Thrombosis

Her2 Targeted Therapies
- Cardiomyopathy

MEK/RAF TKI
- Cardiomyopathy

Anthracyclines
- Radiation
- Heart Failure
- CAD

Who is responsible for patient care?

The patient developed cardiac disease!

The cardiologist!
The patient has a cancer!

The oncologist!

Courtesy, Dr. Cardinale
The cardio-oncologist

Health care providers focused on the prevention, early detection, management and recovery of cardiovascular function potentially resulting from cancer therapies.

Courtesy, Dr. Cardinale
2. Seek Institutional Support for your Cardio-Oncology Clinic
Institutional Support for Cardio-Oncology Clinic

- Logistics
  - Location of clinic, close interaction between oncologists and cardiologists

- Resources
  - Access to space, imaging, $$

- Expertise
  - Cardiologist with imaging experience and knowledge of cancer therapies

- Allied Health Support
  - Support from other health care providers (nursing, pharmacy)

- Collaboration
  - Consistent communication between health care providers
Barriers and Obstacles

- lack of Institutional support from administration/university

- lack of academic and administrative mentorship – novelty of field, a shortage of evidence-based clinical standards

- few “champions” in your institution

- lack of opportunities for education and training

- limited awareness among oncology and cardiology specialists about the need for cardio-oncology services
A Successful Cardio-Oncology Program
3. Define the structure of the Cardio-Oncology Clinic
Organization of Cardio-Oncology Program

The various responsibilities of a cardio-oncologist are diagrammed, showing the constant feedback and interactive process to effect integrated patient care. Modified with permission from Okwuosa TM, Akhter N, Williams KA, DeCara JM. Building a cardio-oncology program in a small to medium-sized, nonprimary cancer center, academic hospital in the USA: challenges and pitfalls. Future Cardiol 2015;11:1-8.

Okwuosa and Barac, JACC 2015
Components of a Cardio-Oncology Program

**Education**
- Multidisciplinary Rounds
- Fellowship
- Medical education of health care providers
- Patients

**Research**
- Clinical outcomes
- Translational
- Optimal imaging strategies
- Biomarkers
- Database

**Clinical Care**
- Medical and radiation Oncologists/hematologists
- Cardiologists
- Pharmacists
- Nursing

**Cardio-Oncology Clinic**
- Cardio-Oncology Survivorship
4. Define the goals of the Cardio-Oncology Clinic
What does a clinic offer?

- Rapid access to cardiologists with an understanding of systemic/targeted therapies.
- Education of patients and health care providers.
- Resident/fellowship training.
- Preceptorship.
- Multidisciplinary rounds.
- Development of a collaborative research environment: basic/translational research and clinical/health outcomes research.
Clinical Care

- Define patient population – e.g. hematology, oncology, surgery
- All patients vs high risk
- Frequency of clinics
- Streamline referrals: urgent vs elective
- Survivorship?

- CARDIAC RISK FACTORS
- PREVENTION STRATEGIES
- EARLY DETECTION
- IMPROVE CLINICAL OUTCOMES
- PREDICTION
- COMPLETION OF CANCER TREATMENT

Canadian Cardiac Oncology Network
cardiaconcology.ca
Education

- Health care providers/patients
- Multidisciplinary rounds (accredited)
- CME presentations (allied HCP’s)
- Preceptorship programs
- Training - Residency/Fellowships
- Cardio-Oncology Meetings (ICOS, CCON, GCOS)
- Special education sessions – ASCO, SABCS
- Courses (ACC workshop)
RESEARCH

Onco-logist

Optimization of cardiac monitoring

Cardio-logist

Risk prediction of cardiotoxicity

Onco-logist

Biomarkers + imaging

HCP

International cardio-oncology registry

Early detection of cardiotoxicity using markers of apoptosis

SAFE study
Cardiac protection during cancer treatment

198 registered CT on diagnosis and treatment of cardiotoxicity clinical trials.gov

canadiancardiaconcology.ca
5. Measure Outcomes of the Cardio-Oncology Clinic
Benefits of a cardio-oncology clinic

Limited Supporting Data
Ottawa Cardio-Oncology Clinic

Journal of Oncology
Volume 2015 (2015), Article ID 671232, 5 pages
http://dx.doi.org/10.1155/2015/671232

Research Article
Clinical Experience of Patients Referred to a Multidisciplinary Cardiac Oncology Clinic: An Observational Study
Jeffrey Sulpher,1 Shrey Mathur,1 Nadine Graham,1 Freya Crawley,1 Michele Turek,2 Christopher Johnson,2 Ellamae Stadnick,2 Angeline Law,2 Jason Wentzell,3 and Susan Dent1

Cardiotoxicity in breast cancer patients: A single center, retrospective review

Moira Rushton, Freya Crawley, Jeffrey Sulpher, Christopher Johnson, Susan Dent

Progress in Pediatric Cardiology, 2015

Canadian Cardiac Oncology Network
The **SURVIVE** (cardiovaScUlaR toxicity in cancer and improVement In recoVEry) Registry.

- cancer patients who have received or are receiving CT, targeted agents, immunotherapy +/- radiation
- Collect serum, plasma, saliva at baseline, 6 months, 12 months then yearly for at least 3 years
- Cardiac imaging collected and analyzed by a core lab
6. Promote your Cardio-Oncology Clinic
7. Develop Collaborations and Partnerships
International Collaboration

- BCOS
- Poland
- China
- Italy
- India
- Israel
- Brazil
- Switzerland
- Argentina

International Collaboration

Canadian Cardiac Oncology Network

Cardio Oncology

International Collaboration

- Australia
- Brazil
- China
- India
- Italy
- Poland
- South Africa
- Switzerland
Developing a Cardiology-Oncology Partnership
Key Messages

• Establishment of cardio-oncology clinics/programs provides the framework for optimizing clinical care delivery, education and research.
• Development of cardio-oncology registries/data bases are needed to establish the benefits of this multi-disciplinary approach
• Cardio-oncology collaborations will continue to define best practices for cancer patients exposed to potential cardiotoxic cancer therapies and establish surveillance strategies for cancer survivors
Cardio-oncology resources


• Okwuosa T and Barac A. **Burgeoning Cardio-Oncology Programs.** JACC Vol 66 No. 10 2015 pg 1193-1196

• Barros-Gomes S et.al **Rationale for setting up a cardio-oncology unit: our experience at Mayo Clinic.** Cardio-Oncology Journal April 2016 2:5

• Lenihan D, **Cardio-Oncology Training:** A Proposal from the International CardiOncology Society and Canadian Cardiac Oncology Network for a new multidisciplinary specialty. Journal of Cardiac Failure, 2016 March 30.
Questions ?