Cardio-Oncology Service Is an Integral Part of Cancer Survivorship Program –
Rabin Medical Center Experience

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“For cancer patients, cardiovascular outcomes do not matter as much”

Dr. B., 63y, oncologist

“When I got the news that I had heart failure, I was devastated having just survived breast cancer”

Ms. R, 51y, breast cancer survivor

“Cardiovascular surveillance in cancer survivors – not sure this is cost-effective, and who is going to pay for this anyway?”

Dr. L., 67y, hematologist

“I had no idea that cardiovascular disease could be/could have such a profound long-term impact”

Mr. A., 45y, Hodgkins lymphoma survivor

Source: Dr. Joerg Herrmann, USA
Communication Breakdown
Cardio-oncology Service

TEAM
Patient Centered Approach

Cancer Patient

- Dedicated Hospital beds
- Team Leader Medical Oncologist
- Social Workers
- Physiotherapists
- Consulting Services (Cardio-oncology, Neuro-oncology, etc.)
- Medical Imaging
- Surgical Team
- Palliative Care
- Hospice Care
- Dietitian
- Survivorship Clinic
- Nurses
- Laboratory Services
- Radio-oncology Services
Referral Criteria

- Patients with decreased EF and in need of cancer therapy.
- Cancer patients planned for potentially cardiotoxic agents and at increased risk of cardiotoxicity as perceived by the medical oncologist.
- Hemato-oncologic patients with cardiac involvement (amyloidosis, malignant infiltrative diseases of the heart).
- Candidates for bone-marrow transplantation and preceding cardiac problems.
- Childhood cancer survivors (more than 10 years after chemotherapy and chest radiotherapy).
- Patients with cardiac tumors.
- Cancer patients with heart rhythm disturbances.
- Patients with malignancies and pericardial effusion.
Investigations provided:

• Anamnesis with careful review of oncologic treatment
• Physical examination (incl BP/HR/weight/BMI)
• ECG with thorough monitoring of QT interval
• V-Scan® (GE) – useful extension to physical examination

**Stethoscope vs stethophone**  
(S. Koval, Ben-Gurion Universit 
Soroka Medical Center)

• 6 minute walk test for heart failure patients
• Non-invasive hemodynamic assessment (cardiac output, peripheral resistance, cardiac power index, fluid status) and follow-up at each visit (NiCAS™)
Investigations provided

- 2D echocardiography (serial) with increasing implementation of speckle tracking
- Troponin and BNP testing for ongoing chemotherapy patients
- MRI for cardiac amyloidosis or unclear cases of cardiotoxicity (different kinetics of LGE)
- Blood lipids, glucose, kidney functions, CBC, etc.
- Nurse-led follow-up clinic for cardiac drug titration and patient education
Incremental Use of Speckle Tracking > 200
Cardioncology Service

Outpatient Clinic

Inpatient 24/7 Consulting
Cardioncology Service in Numbers

The Outpatient Clinic

8 Days a Month
Running for the
Past 3.5 years (since May 2013)
A Total of >1500
Visits

Follows more than 1000 Patients

20 New Patients
A Month on Average
Rabin Cardio-Oncology Clinic

Number of pts: 161, 274, 386
Number of Visits: 250, 596, 781
Rabin Cardio-Oncology Clinic

N=571
Mean Age(SD) – 66.2(12.8)
Male N(%) – 290(51.9)
Distribution of Patients According to the Cancer Diagnosis

- **Breast cancer**: 17%
- **DLBCL**: 15%
- **CML**: 2%
- **BMT**: 2%
- **GU Tumors**: 10%
- **Others (Ovary, Thyroid, etc.)**: 16%
- **Heart Tumors**: 5%
- **MM**: 8%
- **Lung Cancer**: 7%
- **GIT**: 9%
- **Amyloidosis**: 9%
<table>
<thead>
<tr>
<th>Reason</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decreased LVEF</td>
<td>147</td>
</tr>
<tr>
<td>Pre-chemotherapy assessment</td>
<td>100</td>
</tr>
<tr>
<td>Arrhythmia</td>
<td>47</td>
</tr>
<tr>
<td>Hypertension (difficult to treat)</td>
<td>32</td>
</tr>
<tr>
<td>Heart failure symptomatic</td>
<td>40</td>
</tr>
<tr>
<td>Cardiomyopathy</td>
<td>55</td>
</tr>
<tr>
<td>Syncope</td>
<td>10</td>
</tr>
<tr>
<td>Palpitations</td>
<td>58</td>
</tr>
<tr>
<td>Dyspnea evaluation</td>
<td>82</td>
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</table>
## Cancer-Related Treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Number (%)</th>
</tr>
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<tbody>
<tr>
<td>All treatment</td>
<td>348 (100%)</td>
</tr>
<tr>
<td>Anthracyclines</td>
<td>118 (33.9)</td>
</tr>
<tr>
<td>Monoclonal antibodies</td>
<td>89 (25.6)</td>
</tr>
<tr>
<td>Tyrosine kinase inhibitors (TKIs)</td>
<td>52 (14.9)</td>
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<tr>
<td>Other cancer therapy (including chest radiotherapy = 72)</td>
<td>89 (25.6)</td>
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## Cardiac Risk Factors and Medications

<table>
<thead>
<tr>
<th>Risk factors</th>
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</thead>
<tbody>
<tr>
<td>Known coronary artery disease</td>
<td>76(16.2)</td>
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<tr>
<td>Hypertension</td>
<td>159(33.9)</td>
</tr>
<tr>
<td>Smoking</td>
<td>142(30.3)</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>162(34.6)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>65(13.9)</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>49(10.4)</td>
</tr>
<tr>
<td>Aspirin</td>
<td>73(15.6)</td>
</tr>
<tr>
<td>Other antiplatelets</td>
<td>48(10.2)</td>
</tr>
<tr>
<td>OAC</td>
<td>40(8.5)</td>
</tr>
<tr>
<td>ACEi/ARB</td>
<td>102(21.8)</td>
</tr>
<tr>
<td>Statins</td>
<td>65(13.9)</td>
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</table>
Outcomes

• Of 281 (62.4%) patients receiving chemotherapy at the time of referral to the cardio-oncology service, 222/281 (79.0%) successfully completed the treatment.

• In all cases of presumed cardiotoxicity anthracycline treatment was discontinued/finished before cardiotoxicity was diagnosed (8/16 cases of cardiotoxicity).

• LVEF decrease (cardiotoxicity) was observed in 8/23 (34.8%) of trastuzumab-treated patients with partial or complete recovery of LVEF in 7 of them.

• 3 cases of acute coronary syndrome (ACS) developed after receiving 5-fluorouracil.

• As of November 2015, 48 patients died (40 due to disease progression, 5 from cardiovascular reasons, 3 -other causes).
A Population-Based Study of Cardiovascular Mortality Following Early-Stage Breast Cancer

Husam Abdel-Qadir, MD; Peter C. Austin, PhD; Douglas S. Lee, MD, PhD; Eitan Amir, MB, ChB, PhD; Jack V. Tu, MD, PhD; Paaladinesh Thavendiranathan, MD, MSc; Kin Wah Fung, MSc; Geoffrey M. Anderson, MD, PhD

CONCLUSIONS AND RELEVANCE Cardiovascular death is an important competing risk for older women with early-stage breast cancer. This finding mandates adequate attention to cardiovascular preventive therapy after diagnosis of breast cancer.

Ontario Cancer Registry 1998-2012
N-98999 women with early stage breast cancer
<table>
<thead>
<tr>
<th>Source</th>
<th>Manage Blood Pressure</th>
<th>Control Cholesterol</th>
<th>Reduce Blood Sugar</th>
<th>Get Active</th>
<th>Eat Better</th>
<th>Lose Weight</th>
<th>Stop Smoking</th>
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<tbody>
<tr>
<td>JNC 8, 2014&lt;sup&gt;9&lt;/sup&gt;</td>
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<td>ACC/AHA Cholesterol Guidelines, 2013&lt;sup&gt;8&lt;/sup&gt;</td>
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<td>NCCN Guidelines Smoking Cessation, 2015&lt;sup&gt;10&lt;/sup&gt;</td>
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<td>ACC/AHA Lifestyle Mngmt Guidelines, 2013&lt;sup&gt;12&lt;/sup&gt;</td>
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<td>X</td>
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<td>American Diabetes Association, 2016&lt;sup&gt;12&lt;/sup&gt;</td>
<td>X</td>
<td></td>
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<td>X</td>
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<td>X</td>
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<td>Physical Activity Guidelines, 2008&lt;sup&gt;14&lt;/sup&gt;</td>
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<td></td>
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<tr>
<td>NCCN Survivorship, 2015&lt;sup&gt;7&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>ACS/ASCO Breast Cancer Survivors&lt;sup&gt;5&lt;/sup&gt;</td>
<td>X</td>
<td></td>
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<td>X</td>
<td>X</td>
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<td>X</td>
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<tr>
<td>ACS/ASCO Prostate Cancer Survivors&lt;sup&gt;5&lt;/sup&gt;</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
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</tbody>
</table>

JNC, Joint National Committee; ACC, American College of Cardiology; AHA, American Heart Association; NCCN, National Comprehensive Cancer Network; US, United States; Adv, advisory; Mngmt, management; ACS, American Cancer Society; ASCO, American Society of Clinical Oncology.
Patients with cancer in the Community Southern Cohort had a median of 3 healthy behaviors with only 0.9% achieving 6-7, compared with 1.7% in controls without cancer (p < 0.001).
Ideal cardiovascular health is inversely associated with incident cancer: the Atherosclerosis Risk In Communities study.

Rasmussen-Torvik LJ, Shay CM, Abramson JG, Friedrich CA, Nettleton JA, Prizment AE, Folsom AR.
Benefit of Adherence to Life’s Simple 7

• Extends beyond cardiovascular risk reduction
• May decrease the incidence of cancer
• Cancer and cardiovascular disease are not necessarily competing risks but are both driven by common risk factors
• Modifying these shared risk factors may jointly attenuate the top two causes of death in Western society.
Together What Does TEAM Achieve Stand For? More
The Team
Can two walk together, except they be agreed?

Amos 3:3
Advancing Cardiac Care for Cancer Patients
15-16 June, 2017, Tel-Aviv

SAVE THE DATE
www.cardionologycare.com