

ISCHEMIC HEART DISEASE IN THE CANCER PATIENT: CONSIDERATIONS BEYOND CONVENTIONAL ARTERIOSCLEROSIS

CARDIAC TOXICITIES ARISING FROM CANCER THERAPIES

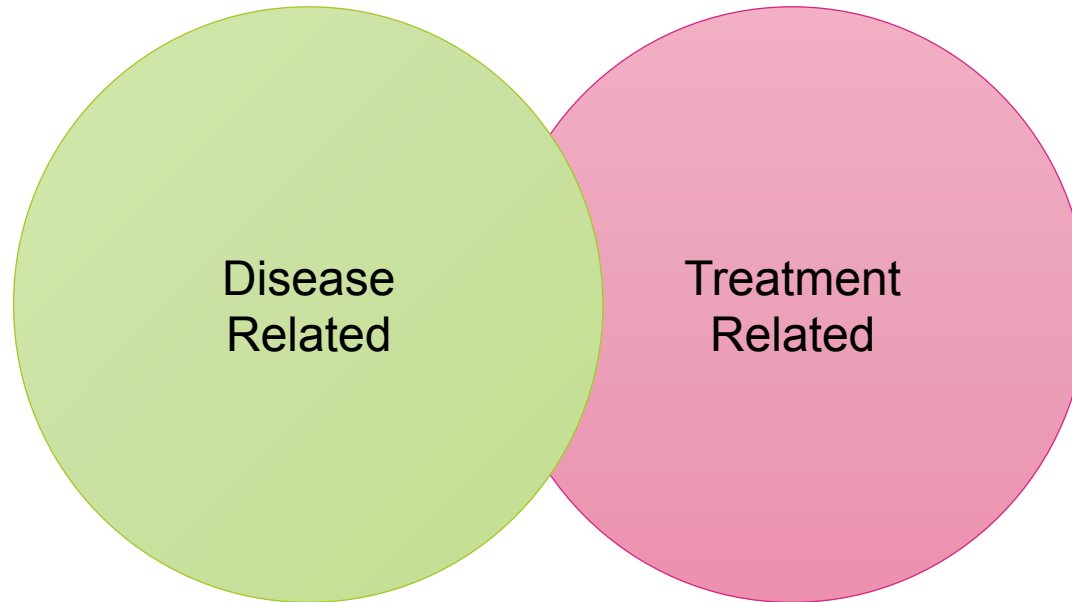
THOMAS M. SUTER MD
UNIVERSITY HOSPITAL BERN, SWITZERLAND

DECLARATION OF INTEREST

I have nothing to declare

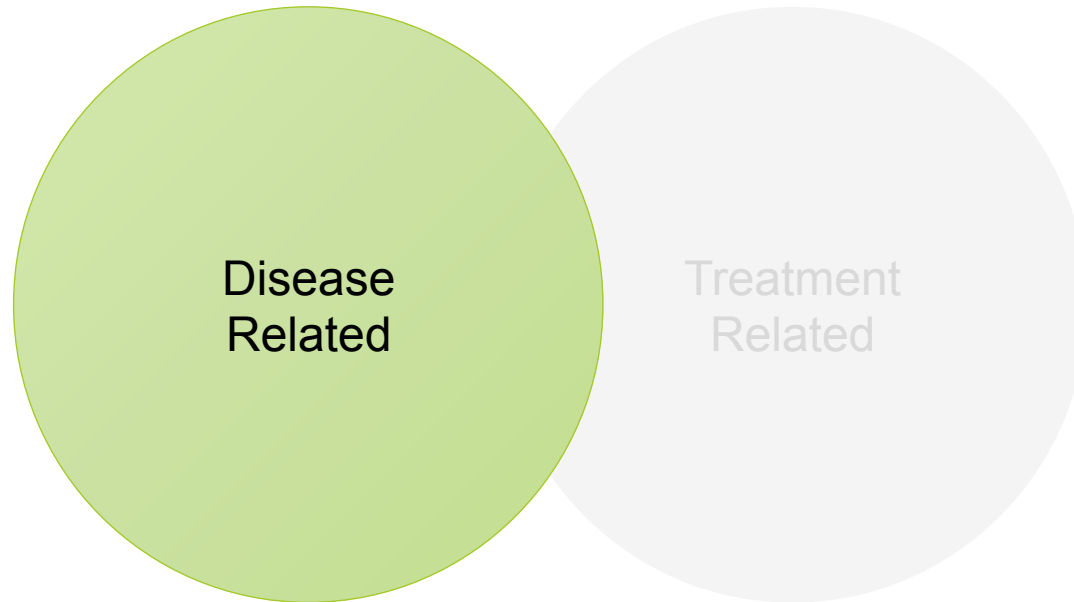
ISCHEMIC HEART DISEASE IN THE CANCER PATIENT: CONSIDERATIONS BEYOND CONVENTIONAL ARTERIOSCLEROSIS

MYOCARDIAL ISCHEMIA IN ONCOLOGY PATIENTS



ISCHEMIC HEART DISEASE IN THE CANCER PATIENT: CONSIDERATIONS BEYOND CONVENTIONAL ARTERIOSCLEROSIS

MYOCARDIAL ISCHEMIA IN ONCOLOGY PATIENTS



MYOCARDIAL ISCHEMIA IN ONCOLOGY PATIENTS DISEASE RELATED

Leukemia

- Acute myeloid leukemia(AML)
 - leukostasis, thrombotic abnormalities

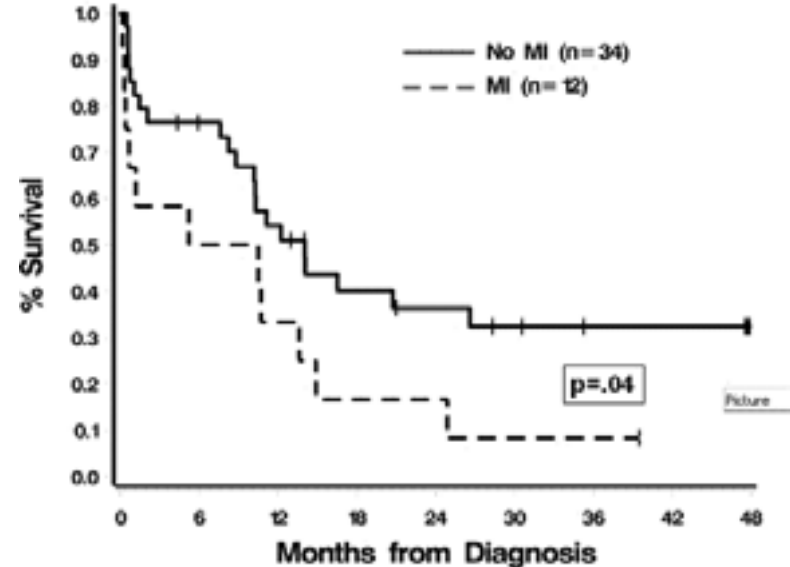
Squamous Cell Type Cancer

- Lung
- Head and Neck

Urothelial Tract Cancer

AML & Myocardial Infarction

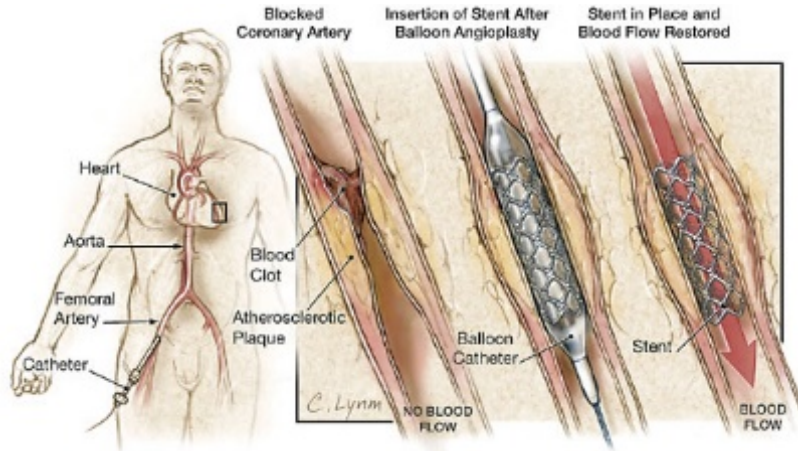
Survival of MI cases and matched controls



MYOCARDIAL ISCHEMIA IN ONCOLOGY PATIENTS DISEASE RELATED

Leukemia

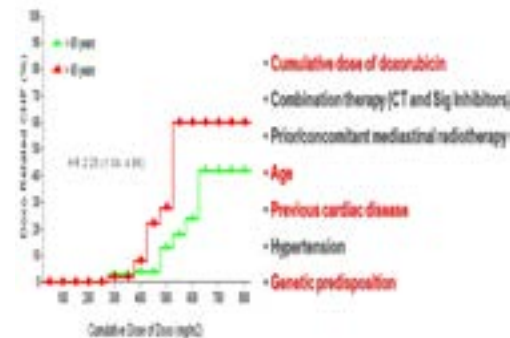
- Acute myeloid leukemia(AML)
 - leukostasis, thrombotic abnormalities



• Platelet Inhibition

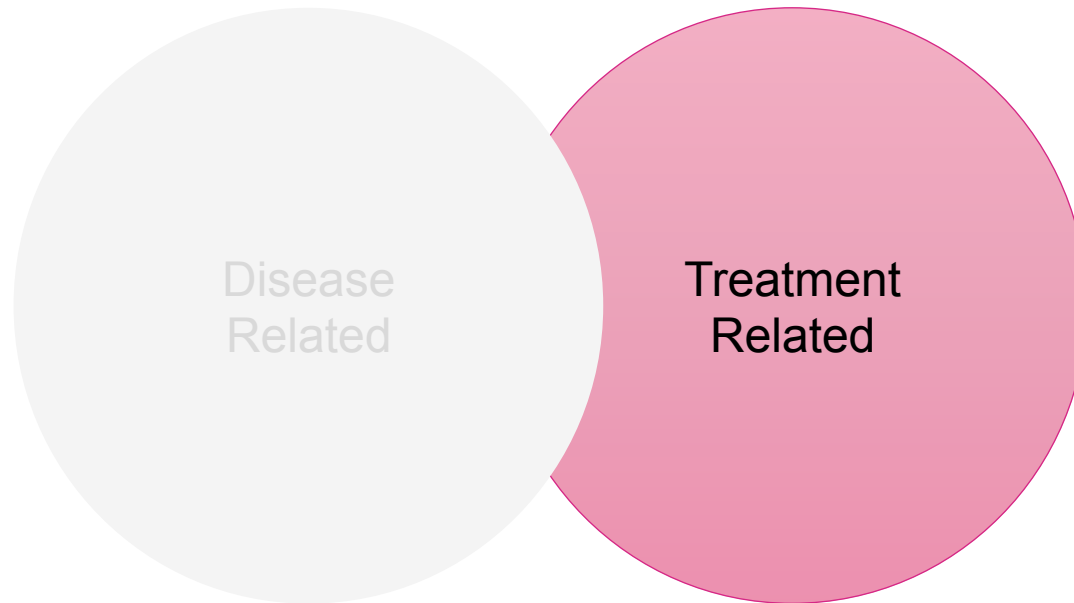


• Anthracycline Cardiotoxicity



ISCHEMIC HEART DISEASE IN THE CANCER PATIENT: CONSIDERATIONS BEYOND CONVENTIONAL ARTERIOSCLEROSIS

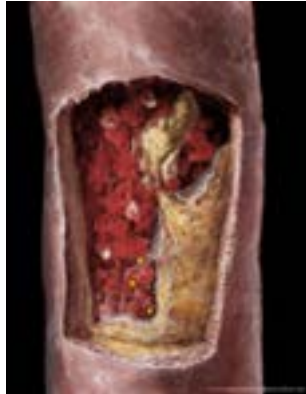
MYOCARDIAL ISCHEMIA IN ONCOLOGY PATIENTS



ISCHEMIC HEART DISEASE IN THE CANCER PATIENT

TREATMENT-RELATED MECHANISMS

- ARTERIOSCLEROSIS
- ENDOTHELIAL TOXICITY; ENDOTHELIAL DYSFUNCTION
- VASOSPASMS
- THROMBOSIS





European Heart Journal
doi:10.1093/eurheartj/ehw211

2016 ESC Position Paper and cardiovascular toxicities in the auspices of the ESC Co Guidelines

The Task Force for cancer treatment
the European Society of Cardiology

Authors/Task Force Members: Jo
Patrizio Lancellotti* (Co-Chair), Ricci
Victor Aboyans (France), Danie
Gilbert Habib (France), Lyon (UK), Ter
Alexander R. Lyon (UK), Massimo F. Piepoli (Italy), Thomas M. Suter (Switzerland)

ESC Committee for Practice Guidelines
Stephan Achenbach (Germany), Stefan
Helmut Baumgartner (Germany), Céline
Veronica Dean (France), Céline
Pavlos Kirshof (UK/Germany), Petros
Nikolaou (Poland), Adam Torbicki (Poland), Ar

Document Reviewers: Stef
Coordinator (Italy), Stef
(Italy), Scipione Careri (Italy),
Cetin Erol (Turkey), Mi
Dorina Fitzsimons (UK), Paul
McGale (UK), Pi

POSITION PAPER

Author Declaration
The authors of this document have read and approved the final document. They agree to be accountable for all aspects of the accuracy and integrity of the information provided in this document. The authors have read and approved the final document. They agree to be accountable for all aspects of the accuracy and integrity of the information provided in this document.

Financial disclosures
The authors have read and approved the final document. They agree to be accountable for all aspects of the accuracy and integrity of the information provided in this document.

ESC Pocket Guidelines Application
Free for all users worldwide

Changes to previous Cardio-onco-oncology guidelines

Section	Change
Chemotherapy
Targeted therapy
Immunotherapy
Radiotherapy
Supportive care

ESC Pocket Guidelines Application
Free for all users worldwide

SUMMARY CARD FOR GENERAL PRACTICE
Created by the Task Force
to improve the quality of clinical practice and patient care in Europe

CARDIO-ONCO
A HANDBOOK OF TREATMENT AND CARE FOR CANCER PATIENTS

Prevalence, epidemiology and risk factors

Management options for cardiotoxicity

Management option	Recommendation
...
...
...

Key points

Summary summary message

... ..

Recommendations

Key points

... ..

Pocket Guidelines
for Practice Guidelines
Clinical practice and patient care in Europe

CARDIO-ONCO
TREATMENT AND TOXICITY

EUROPEAN SOCIETY OF CARDIOLOGY

COMMON ROLES OF CARDIO-ONCOLOGY SERVICES



Prior RX

- **Preexisting CV Problems**
 - Identification
 - Optimization
 - Guideline-directed Therapy
- **Preoperative evaluation**
 - Risk Assessment
 - Optimization
- **Interdisciplinary Approach**
 - Optimized Cancer Therapy



During RX

- **Cancer Rx related CV Problems**
 - Identification
 - Treatment
- **Interdisciplinary Approach**
 - Interruption/Stop Cancer Rx



After RX

- **Cancer Survivor**
 - **CV Complications**
 - Surveillance/Identification
 - Preventive Therapy
 - Treatment
 - **Secondary Cancers**
 - CV Risk Assessment for Cancer Rx
 - CV Optimization for Cancer Rx
- **Multidisciplinary Approach**

MYOCARDIAL ISCHEMIA IN ONCOLOGY PATIENTS

Prior RX

- **Preexisting CV Problems**
 - Identification
 - Optimization
 - Guideline-directed Therapy
- **Preoperative evaluation**
 - Risk Assessment
 - Optimization
- **Interdisciplinary Approach**
 - Optimized Cancer Therapy

During RX

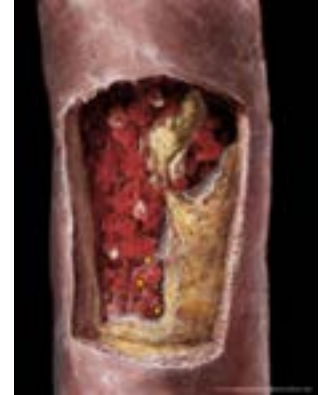
- **Cancer Rx related CV Problems**
 - Identification
 - Treatment
- **Interdisciplinary Approach**
 - Interruption/Stop Cancer Rx

After RX

- **Cancer Survivor**
 - **CV Complications**
 - Surveillance/Identification
 - Preventive Therapy
 - Treatment
 - **Secondary Cancers**
 - CV Risk Assessment for Cancer Rx
 - CV Optimization for Cancer Rx
- **Multidisciplinary Approach**

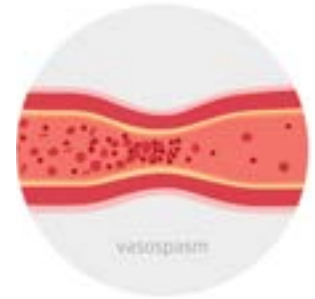
CANCER DRUGS WITH ENDOTHELIAL TOXICITY

Drug	Incidence	Prevention
Alkylating Agents - Cisplatin	2%	?
VEGF Inhibitors	Variabel	?
Fluoropyrimidines		



CANCER DRUGS - VASOSPASM

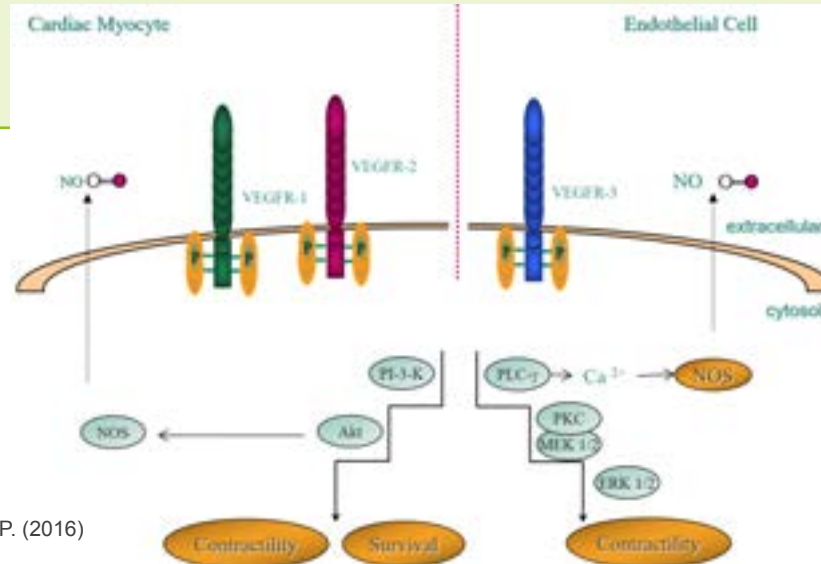
Drug	Incidence	Prevention
Fluoropyrimidines <ul style="list-style-type: none">- 5-fluorouracil (5-FU)- Capecitabine- Gemcitabine	Up to 10%	?



Zamorano, J. L., Suter T. M. et al. Guidelines, E. S. C. C. f. P. (2016)
Eur Heart J. doi:10.1093/eurheartj/ehw211

CANCER DRUGS WITH ENDOTHELIAL TOXICITY

Drug	Incidence	Prevention
VEGF Inhibitors	1.5 – 4%	?



Zamorano, J. L., Suter T. M. et al. Guidelines, E. S. C. C. f. P. (2016)
 Eur Heart J. doi:10.1093/eurheartj/ehw211

MYOCARDIAL ISCHEMIA IN ONCOLOGY PATIENTS



Prior RX

- **Preexisting CV Problems**
 - Identification
 - Optimization
 - Guideline-directed Therapy
- **Preoperative evaluation**
 - Risk Assessment
 - Optimization
- **Interdisciplinary Approach**
 - Optimized Cancer Therapy



During RX

- **Cancer Rx related CV Problems**
 - Identification
 - Treatment
- **Interdisciplinary Approach**
 - Interruption/Stop Cancer Rx



After RX

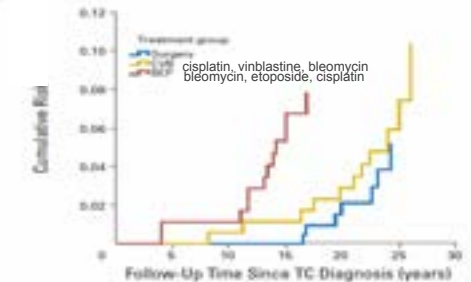
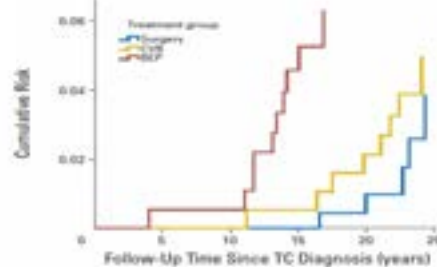
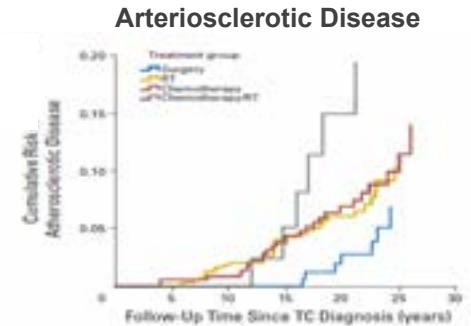
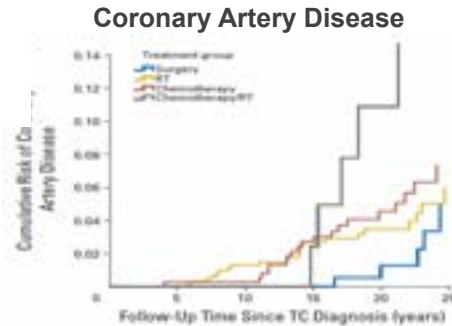
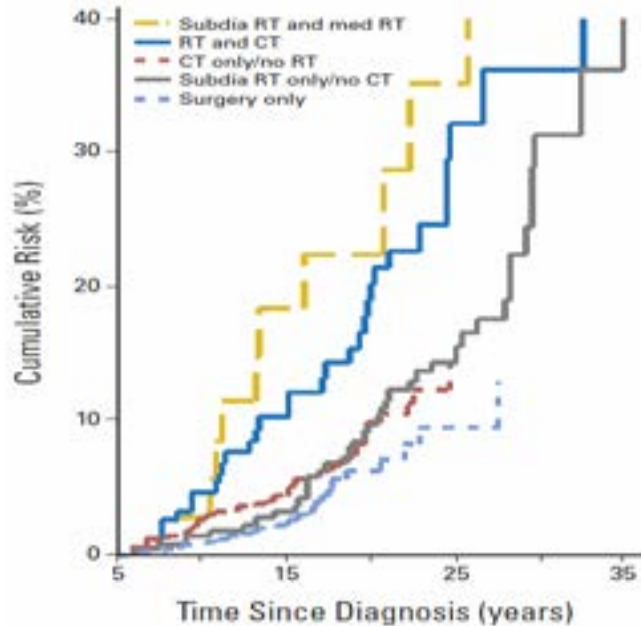
- **Cancer Survivor**
 - **CV Complications**
 - Surveillance/Identification
 - Preventive Therapy
 - Treatment
 - **Secondary Cancers**
 - CV Risk Assessment for Cancer Rx
 - CV Optimization for Cancer Rx
- **Multidisciplinary Approach**

MYOCARDIAL ISCHEMIA IN ONCOLOGY PATIENTS

Drug	Incidence	Prevention
Alkylating Agent - Cisplatin		Risk Factors



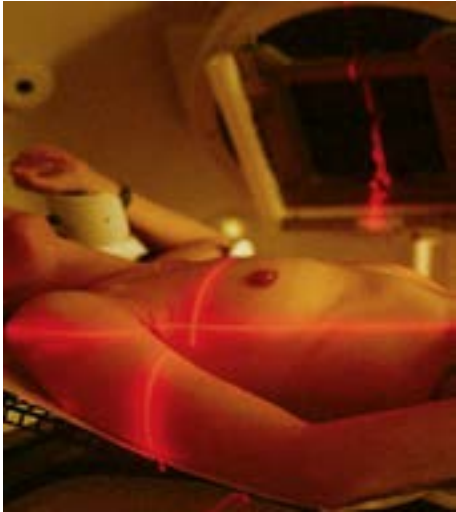
TESTICULAR CANCER – LONG-TERM CARDIOTOXICITY



van den Belt-Dusebout, A. W., R. de Wit, et al. 2007. J Clin Oncol 25:4370-4378

Haugnes, H. S., T. Wethal, et al. 2010. J Clin Oncol 28:4649-4657

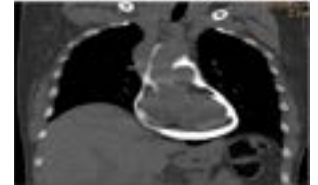
CARDIOVASCULAR SIDE EFFECTS OF RADIATION THERAPY



Valvular Disease



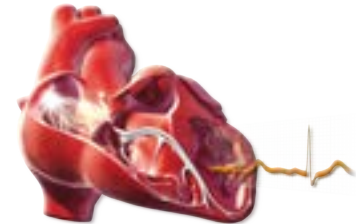
Cardiac Dysfunction



Pericardial Disease

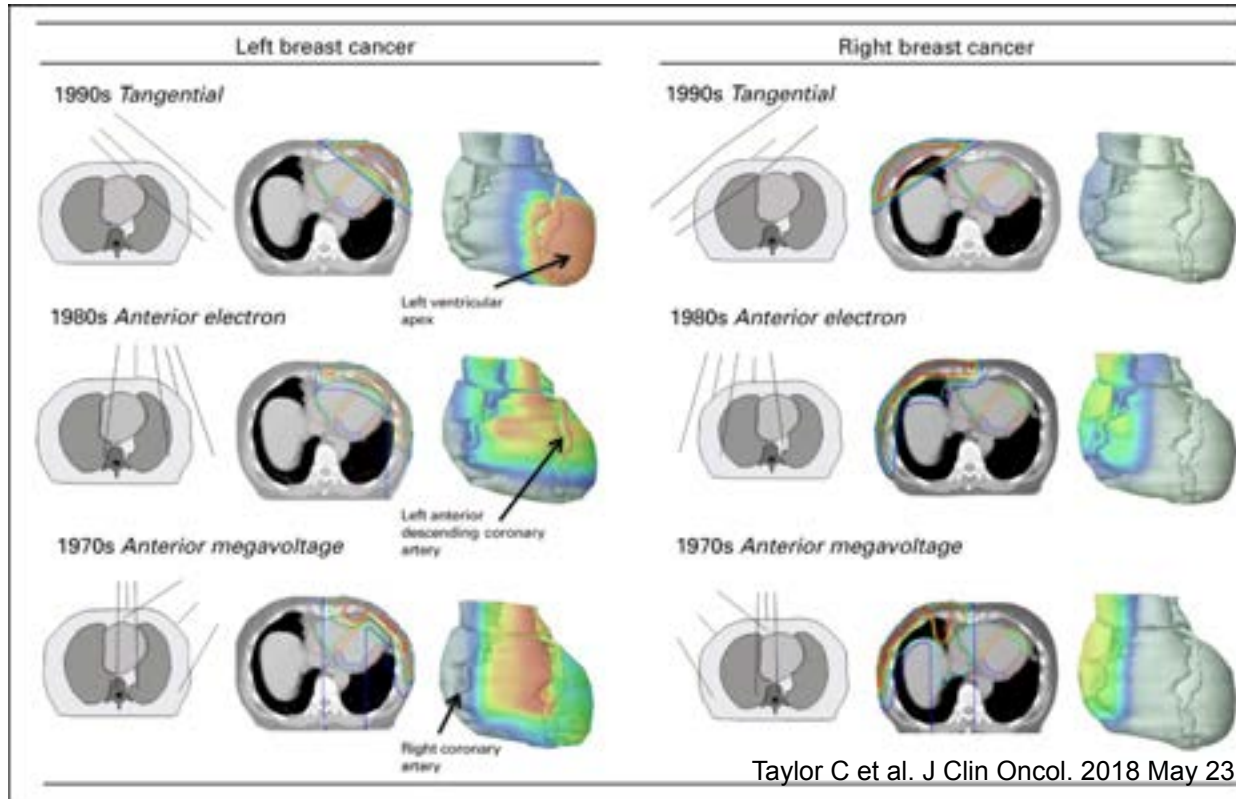


Coronary Artery Dz

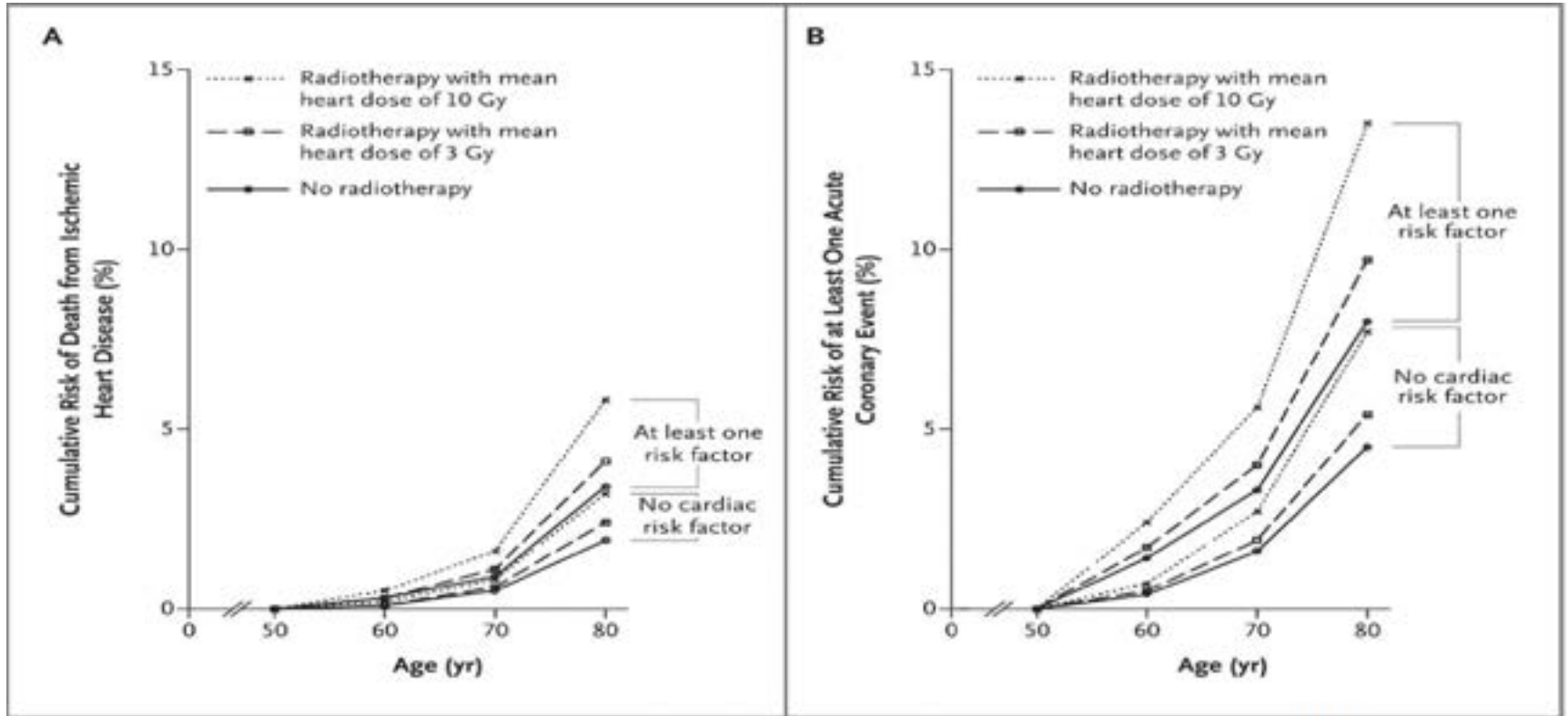


Conduction Disease

SPATIAL DISTRIBUTION OF RADIATION DOSE IN THE HEART FROM BREAST CANCER REGIMENS



BREAST CANCER - RISK OF ISCHEMIC HEART DISEASE



N Engl J Med 2013; 368: 987-998

HODGKIN DISEASE SURVIVORS – LONG-TERM RISK OF CARDIOVASCULAR DISEASE

Selected 5-Year Risks (%) of Heart Failure Among Lymphoma Survivors

Cumulative Incidence of Cardiovascular Diseases, %	Male						Female					
	No intrinsic heart disease (% by years of age)			Intrinsic heart disease (% by years of age)			No intrinsic heart disease (% by years of age)			Intrinsic heart disease (% by years of age)		
No. of CVRFs	50	60	70	50	60	70	50	60	70	50	60	70
0	2	4	8	6	11	19	1	3	5	4	7	12
≥ 2	6	11	20	16	28	46	4	7	13	10	18	32

Salz T et al. JCO 2017;35

HODGKIN SURVIVOR – LONG-TERM CARDIAC COMPLICATIONS



50 y/o male

Oncological History

- **1983 Hodgkin Lymphoma IIA**
- **06 - 10/1983 Radiation Therapy 46 Gy med & abdominal**
- **2014 Non-Hodgkin-Lymphoma I E**
- **07.14 - 02.15: 6 Zyklen R-CHOP and 2 x Rituximab mono**

Cardiac History

- **10/2002 AVR (AS), CABG x3, Pace Maker**
- **09-11 Endocarditis x2**
- **07/12 PTCA VG RCA**
- **04/14 Mitral Valve Valvuloplasty**
- **08/14 Moderate Mitral Stenosis**
- **12/14 Heart Failure Class IV; Severe MS, rest. CMP**
- **12/14 Transcatheter Mitral Valve Replacement**

ISCHEMIC HEART DISEASE IN THE CANCER PATIENT

Prior RX

- **Preexisting CV Problems**
 - Identification
 - Optimization
 - Guideline-directed Therapy
- **Preoperative evaluation**
 - Risk Assessment
 - Optimization

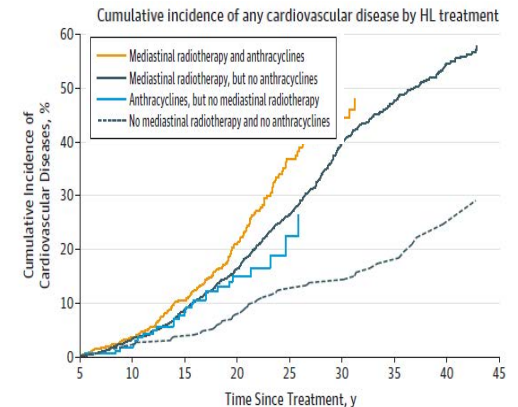
During RX

- **Disease Related**
 - Leukemia
- **Treatment Related**

Chemotherapeutics	Fluoropyrimidines (5-FU, Capecitabine, Gemcitabine)	up to 18%
	Platinum compounds (Cisplatin, etc.)	up to 8%
Targeted agents Biologics	Anti-VEGF (Bevacizumab, Sunitinib, Sorafenib, Pazopanib etc.)	up to 4%

After RX

- **Cancer Survivor**

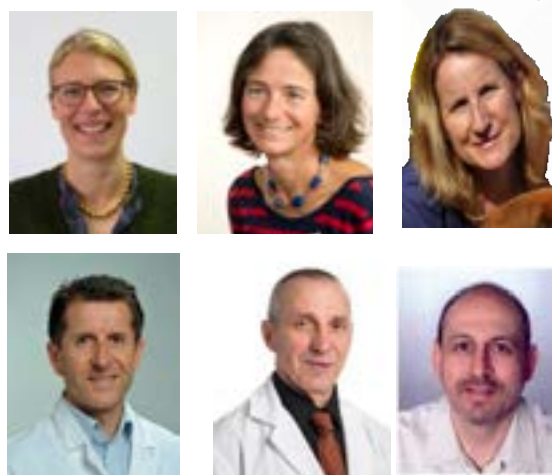


CARDIO-ONCOLOGY SERVICE UNIVERSITY HOSPITAL BERN

ADULT CARDIO-ONCOLOGY



PEDIATRIC CARDIO-ONCOLOGY CANCER SURVIVOR PROJECT



BASIC RESEARCH

