Catheterization and Cardiovascular Interventions 00:00–00 (2015)

Core Curriculum

SCAI Expert Consensus Statement: Evaluation, Management, and Special Considerations of Cardio-Oncology Patients in the Cardiac Catheterization Laboratory (Endorsed by the Cardiological Society of India, and Sociedad Latino Americana de Cardiologia Intervencionista)

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In the United States alone, there are currently approximately 14.5 million cancs
vors, and this number is expected to increase to 20 million by 2020. Cancer th
can cause significant injury to the vasculature, resulting in angina, acute coron
dromes (ACS), stroke, critical limb ischemia, arrhythmias, and heart failure, ins
ently from the direct myocardial or pericardial damage from the malignanc
Consequently, the need for invasive evaluation and management in the cardiac
terization laboratory (CCL) for such patients has been increasing. In recognitio
need for a document on special considerations for cancer patients in the CCL,
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sensus group to provide recommendations based on the published medical li
and on the expertise of operators with accumulated experience in the cardiac
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Key words: cardio-oncology; PCI; cancer; malignancy; stent thrombosis

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Conflict of interest: Nothing to report.

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"… In recognition of the need for a document on special considerations for cancer patients in the CCL, the Society for Cardiovascular Angiography and Interventions (SCAI) commissioned a writing committee to define the landscape and to provide recommendations (level of evidence C) based on published medical literature and expertise of operators with accumulated experience in the cardiac catheterization of cancer patients. …"

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Cardiac Catheterization and Coronary Angiography Recommendations

Coronary angiography is **indicated for symptomatic patients with a history of radiotherapy**, risk factors for RIHD, and noninvasive testing (i.e., stress MPI/echo/MRI, CCTA) that suggest a high likelihood of severe ischemic heart disease.
Coronary angiography is reasonable for the evaluation of LV systolic dysfunction after chest radiation and **to evaluate for radiation-induced ischemic heart disease**.
Right and left heart catheterization is reasonable to evaluate the **presence of pericardial constriction and restrictive cardiomyopathy** if noninvasive imaging (echocardiography, CT, MR) is insufficient to provide a diagnosis.
Right and/or left heart catheterization and coronary angiography is reasonable as **per ACC/AHA guidelines for preoperative planning for patients with severe RIHD.**

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Thrombocytopenia

There is **no minimum platelet count** to perform a **diagnostic coronary angiogram**.
Aspirin administration may be used when platelet counts are >10,000/mL.
DAPT with clopidogrel may be used when platelet counts 30,000–50,000/mL. Prasugrel, ticagrelor and IIB-IIIA inhibitors should not be used in patients with platelet counts <50,000.
If platelets are <50,000, the duration of DAPT may be restricted to 2 weeks following PTCA, 4 weeks after bare-metal stent (BMS), and 6 months after 2nd or 3rd generation drug-eluting stents (DES) if optimal stent expansion was confirmed by IVUS or OCT .
For platelet counts <30,000/mL, revascularization and DAPT should be decided after a preliminary multidisciplinary evaluation (interventional cardiology/oncology/hematology) and a risk/benefit analysis

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Thrombocytopenia

30–50 U/kg unfractionated heparin is the initial recommended dose for patients undergoing PCI who have platelets <50,000/mL. ACT should be monitored
Prophylactic platelet transfusion is not recommended in patients undergoing cardiac catheterization with thrombocytopenia, unless recommended by the oncology/hematology team for: 1. **Platelet count <20,000/mL and one of the following**: (a) high fever, (b) leukocytosis, (c) rapid fall in platelet count, (d) other coagulation abnormality, or 2. Platelet count <20,000/mL in solid tumor patients receiving therapy for bladder, gynecologic, or colorectal tumors, melanoma, or necrotic tumors
Therapeutic platelet transfusions are recommended in thrombocytopenic patients who develop **bleeding** during or after cardiac catheterization.
Repeat platelet counts are recommended after platelet transfusions.

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Access Considerations

For cancer patients who are excellent candidates for both access types, the **radial artery is preferred**. Femoral access is the preferred approach for cancer patients on hemodialysis, those with abnormal Allen's tests in both arms, multiple radial procedures or a-lines, bilateral mastectomy or when a complex intervention is anticipated.
The use of **smaller sheath sizes, prompt removal of sheaths and early ambulation** is recommended.
A lower dose of intra-arterial or intravenous unfractionated heparin at a dose of 50 U/kg or 3.000 units is recommended for cancer patients with thrombocytopenia and platelet count <50k undergoing cardiac catheterization via radial access.
A **femoral angiogram is recommended after transfemoral access** to promptly identify and address potential access complications.

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Special Considerations

Decision making regarding revascularization in patients with active cancer must take into consideration the **overall prognosis** of the patient.

For cancer patients with an acceptable prognosis, the general revascularization criteria for appropriate use must be carefully evaluated and only the most **appropriate indications** (scores 7 and above) should be considered.

For cancer patients with an expected survival <1 year, percutaneous revascularization may be considered for patients with acute STEMI and high-risk NSTEMI. For patients with stable angina, every effort must be made to maximally optimize medical therapy before resorting to an invasive strategy. This approach must include addressing other cancer-related comorbidities that potentially exacerbate ischemia, such as anemia, infection, hypoxia, etc. Should the patient continue to experience persistently severe angina (CCS Class III or IV), consideration may be given to percutaneous revascularization as a palliative option.

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Special Considerations

FFR is recommended before non-urgent PCI to justify the need for revascularization.
When invasive approach is indicated: a. Balloon angioplasty should be considered for cancer patients who are not candidates for DAPT (Platelets <30,000/mL) or when a non-cardiac procedure or surgery is necessary as soon as possible. b. BMS should be considered for patients with platelet counts >30,000/mL who need a non-cardiac procedure, surgery or chemotherapy which can be postponed for >4 weeks. c. Newer generation DES should be considered for patients with platelet counts >30,000/mL who are not in immediate need for a non-cardiac procedure, surgery or chemotherapy. d. Bivalirudin and/or radial approach should be considered to minimize the risk of bleeding.
Intravascular imaging such as IVUS or optical coherence tomography (OCT) is recommended after stent placement to ensure optimal expansion and an absence of complications given the potential for early DAPT interruption.

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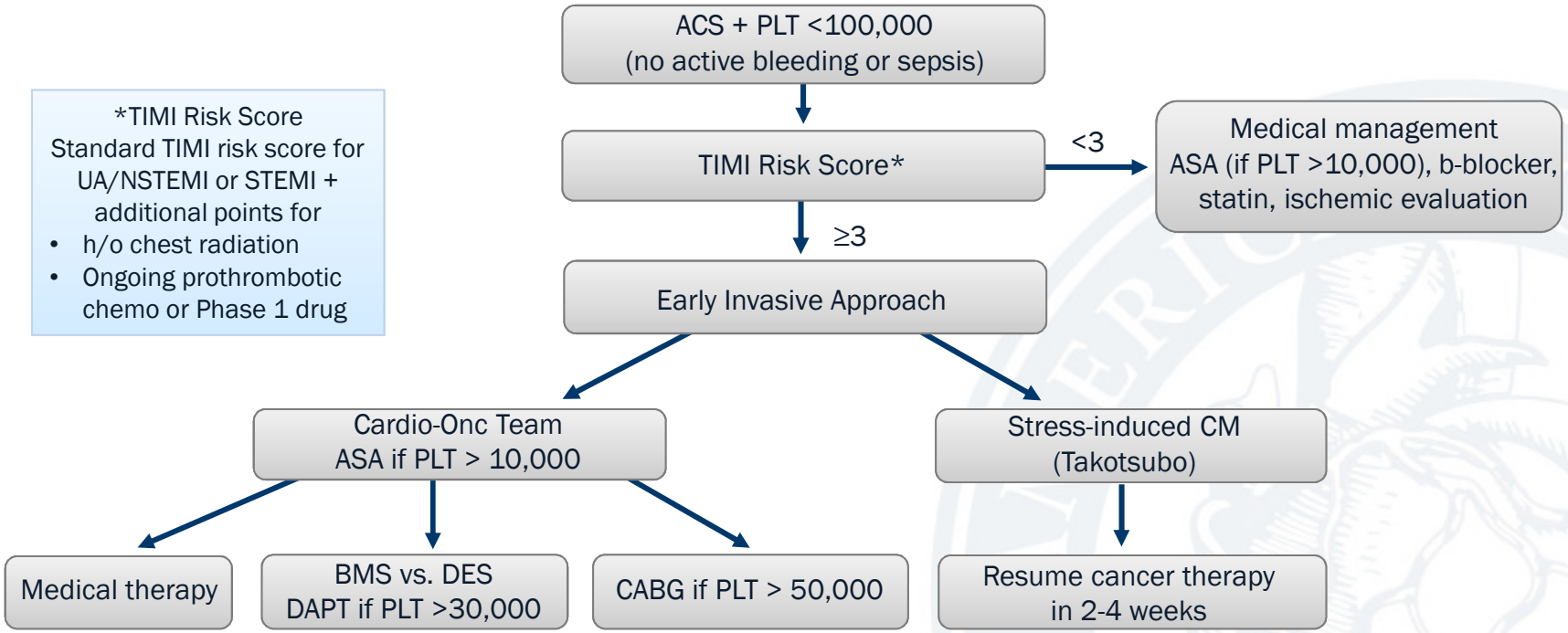
Management of Cancer Patients with ACS



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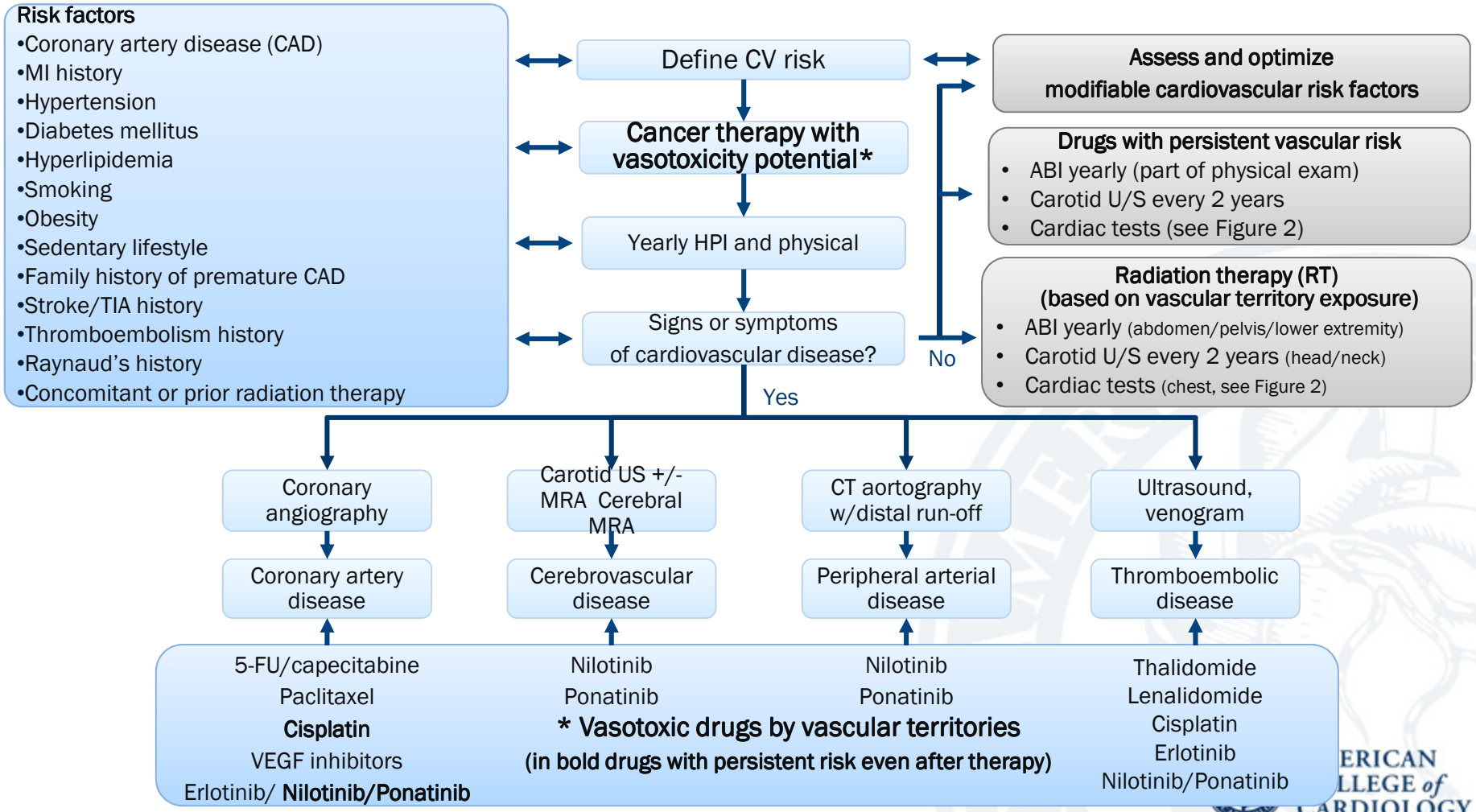

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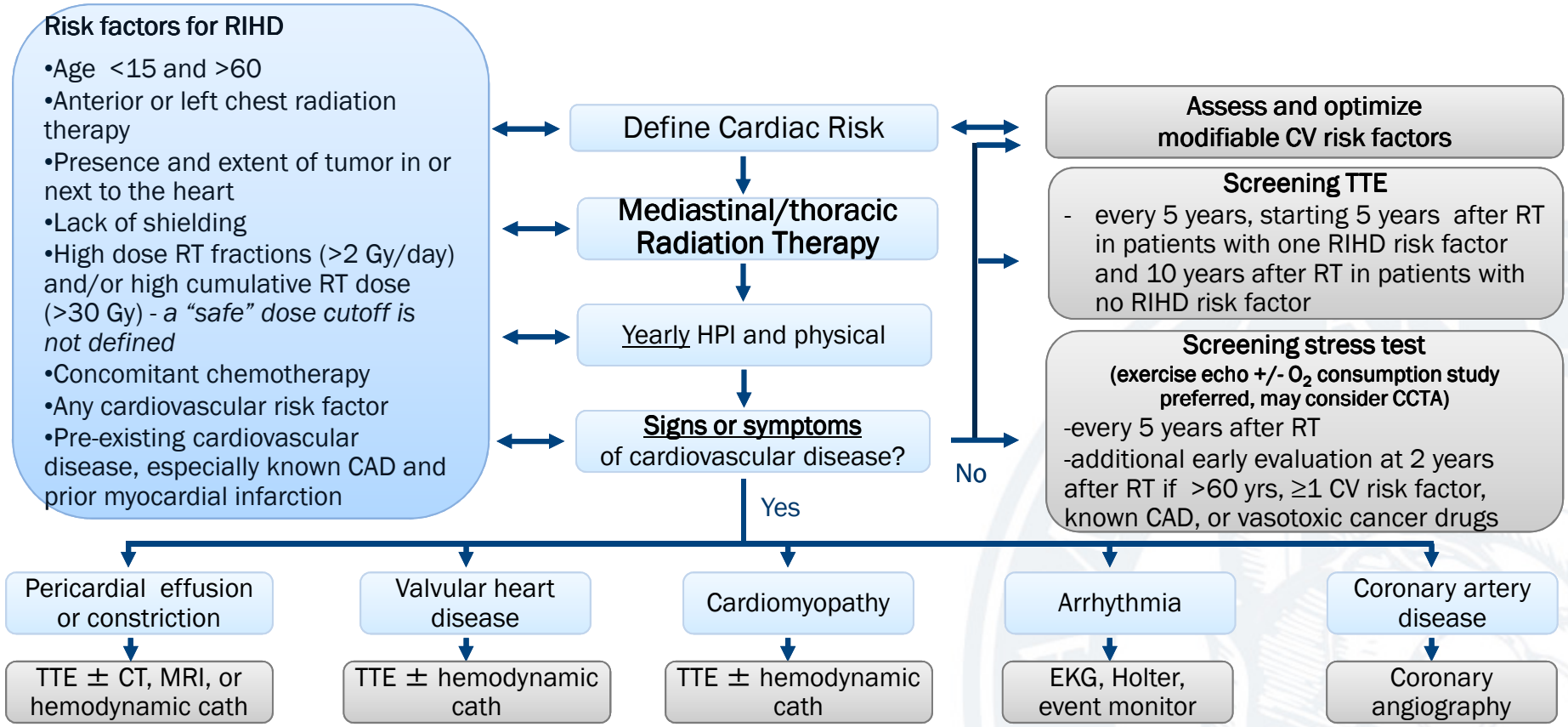

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