DURING AND AFTER TREATMENT

Chest Pain: Common Side Effect

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For chest pain, standards of care are based on emerging evidence-based practice.

Definition

- Angina (chest pain) is the feeling of pressure, fullness, burning, squeezing, or tightness in the chest, usually provoked by exertion and relieved by rest. The discomfort can occur in the shoulders, arms, neck, jaw, or back, and radiates to one or both arms.
- Women who experience acute myocardial infarction often present with atypical chest pain and other symptoms, such as dyspnea, weakness, and fatigue (Mehta et al., 2016).

Incidence

- The prevalence of chest pain in cancer survivors is similar to the general U.S. population (Faramand et al., 2021).
- Clinical manifestations of coronary artery disease may present several years after cancer treatment (as with radiation therapy).
- Relative risk of myocardial infarction or sudden death is 6.7% (based on Hodgkin lymphoma survivors followed for a mean period of 11 years after radiation) (van Nimwegen et al., 2016).

Pathophysiology

- Some chemotherapeutic agents have a direct effect on cardiomyocytes that can lead to acute coronary syndromes. This involves generation of excess reactive oxygen species, accumulation of metabolites that disrupt sarcomere structure and function, and mitochondrial dysfunction (Teske et al., 2018).
- Radiation therapy causes activation of an inflammatory cascade, which affects all of the structural components of the heart, including the pericardium, myocardium, heart valves, coronary arteries and capillaries, and conducting system (Jaworski et al., 2013).
- The effects of some cancer therapies can cause a higher risk of fatal cardiovascular events among cancer survivors as compared to the general population (Boyne et al., 2018).

Risk Factors

- Cardiovascular disease (CVD) is the most common cause of noncancer death for survivors of most cancer types (Zaorsky et al., 2017).
- Cancer and CVD share common risk factors (e.g., tobacco use, obesity, poor health behaviors) (Moslehi, 2013).
- CVD risk factors (e.g., hypertension, hyperlipidemia, diabetes) are more common in cancer than in noncancer populations (Meacham et al., 2010; Weaver et al., 2013).
- Years from cancer diagnosis is a risk factor for CVD, with most survivors at being greater risk more than five years after diagnosis and completion of curative therapy (Moslehi, 2013).
- Risk factors of CVD are related to the history and type of cancer treatment, including cytotoxic, hormonal, and targeted systemic cancer therapies (e.g., HER2-directed therapy, vascular endothelial growth factor–signaling pathway inhibitors, cisplatin, anthracyclines with or without taxanes, androgen-deprivation therapy) and radiation therapy (Darby et al., 2013; Dess et al., 2017; Ky et al., 2013; Li et al., 2015; Moslehi, 2016; O'Farrell et al., 2015; Schmid et al., 2016).

PROVIDER RESOURCES

Research Articles

Amsterdam, E.A., Wenger, N.K., Brindis, R.G., Casey, D.E., Ganiats, T.G., Holmes, D.R., Jr., . . . Zieman, S.J. (2014). AHA/ACC guideline for the management of patients with non–ST-elevation acute coronary syndromes: Executive summary: A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation*.
- https://doi.org/10.1161/CIR.0000000000000133

Arnett, D.K., Goodman, R.A., Halperin, J.L., Anderson, J.L., Parekh, A.K., & Zoghbi, W.A. (2014). AHA/ACC/HHS strategies to enhance application of clinical practice guidelines in patients with cardiovascular disease and comorbid conditions. *Journal of the American College of Cardiology*.
- https://doi.org/10.1016/j.jacc.2014.07.012

Collet, J.-P., Thiele, H., Barbato, E., Barthélémy, O., Bauersachs, J., Bhatt, D.L., . . . ESC Scientific Document Group. (2020). 2020 ESC guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. *European Heart Journal*.
- https://doi.org/10.1093/eurheartj/ehaa575

van Nimwegen, F.A., Schaapveld, M., Cutter, D.J., Janus, C.P., Krol, A.D., Hauptmann, M., . . . van Leeuwen, F.E. (2016). Radiation dose-response relationship for risk of coronary heart disease in survivors of Hodgkin lymphoma. *Journal of Clinical Oncology*.
- https://doi.org/10.1200/JCO.2015.63.4444