# Cardiovascular challenges in cancer patients treated with vascular endothelial growth inhibitor therapy

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Vascular endothelial growth factor (VEGF) is an endothelial cell-specific mitogen that plays an essential role in developmental angiogenesis but is also a mediator of pathological angiogenesis. Therefore, blockade of the VEGF pathway by humanized monoclonal antibodies that bind to circulating VEGF (bevacizumab and ramucirumab) and by small molecules that block tyrosine kinase (sunitinib, pazopanib, axitinib, neratinib, sorafenib, and dasatinib) is used to treat several types of tumors. Cardiovascular (CV) adverse events are quite common with this therapy and include high-grade arterial hypertension, thromboembolic events, and heart failure. The main mechanism of hypertension is a decrease in nitric oxide production in endothelial cells, leading to vasoconstriction and an increase in peripheral vascular resistance. Bevacizumab therapy can worsen arterial hypertension to the 3rd and 4th degree in about 17% of patients. Bevacizumab is also associated with an increased risk of thromboembolic events, such as acute myocardial infarction and cerebrovascular insult, with an incidence of thromboembolic events of 3.8%. Heart failure develops in about 2-4% of patients, usually due to uncontrolled hypertension. Sunitinib, a tyrosine kinase inhibitor that blocks VEGF, can also cause arterial hypertension, similar to that induced by bevacizumab. The incidence of arterial hypertension associated with sunitinib is 17-43%. In addition to arterial hypertension, another common complication is symptomatic heart failure, which develops in 2.7-15% of cases. Anti-VEGF therapy leads to improved survival in many tumors, but it is also associated with various CV side effects that present challenges in treatment. Patients treated with VEGF inhibitors should be assessed for CV risk and adequately monitored to detect and treat CV toxicity in time.[1-3] In this way, the risk of CV side effects is reduced, allowing effective oncological treatment to continue.

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## LITERATURE

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