

## **Sleep and Cardiovascular Disease**

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Sleep represents a daily process of physiological restoration and recovery, and lack of or impaired sleep may have far-reaching effects on endocrinology, immunology, metabolism, and eventually disease risk. Sleep loss, chronic sleep deprivation, and alterations in sleep quality are increasing problems in modern society. Although sleep disturbances have not been identified as specific targets in current cardiovascular prevention guidelines, epidemiologic studies provides increasing evidence that poor sleep and sleep disorders significantly contribute to the development of heart disease within recent years. In addition to being a risk factor for development of primary disease, epidemiologic studies suggest that impaired sleep might also adversely affect the prognosis following cardiovascular disease even after thorough adjustment for coronary risk factors. Sleep disturbances ranging from sleep curtailment to clinical sleep disorders such as insomnia, obstructive sleep apnea, and others may serve as important targets for cardiovascular disease risk reduction. Insomnia symptoms may occur with sleep apnea, periodic limb movement disorders, and shift work disorder, each of which is common and has been associated with an increased incidence of cardiovascular disease. Adverse cardiovascular effects of these myriad sleep disorders are thought to be mediated through their effects on sympathetic nervous system activation, alterations of the hypothalamic pituitary adrenal axis influencing secretion of cortisol and renin-angiotensin system activity, and by augmenting systemic levels of inflammation. These physiological perturbations may in turn contribute to renal dysfunction, endothelial changes, and atherosclerosis. Although it is not clear whether these issues would perform in patients referred explicitly for primary or secondary cardiovascular disease risk reduction, the high prevalence of sleep disorders in the general population as well as in patients at risk of cardiovascular disease warrants consideration of systematic screening of such patient populations for treatable sleep conditions. Here, the issues regarding the relationship between various sleep problems and cardiovascular disease is discussed.