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Depression and cardiovascular disease



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ABSTRACT

There is a wealth of evidence linking depression to increased risk for cardiovascular disease (CVD) and worse outcomes among patients with known CVD. In addition, there are safe and effective treatments for depression. Despite this, depression remains under-recognized and undertreated in patients at risk for or living with CVD. In this review, we first summarize the evidence linking depression to increased risk of CVD and worse patient outcomes. We then review the mechanisms by which depression may contribute to cardiovascular risk and poor cardiovascular outcomes. We then summarize prior studies of depression treatment on cardiovascular outcomes. Finally, we offer guidance in the identification and management of depression among CVD populations. Given that 1 in 4 CVD patients has concurrent depression, application of these best-practices will assist providers in achieving optimal outcomes for their CVD patients.

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Introduction

More than 1 in 10 general medical patients has major depression, making the disorder among the most common chronic conditions encountered in general practice [1]. Furthermore, the prevalence of depression in patients with cardiovascular disease (CVD) is double that of general medical populations [2]. As such, depression is exceptionally common in patients at risk for or with known CVD. Depression results in worse quality of life, functional status, and increased mortality. The mechanisms by which depression contributes to worse patient outcomes include an increased risk of incident CVD and poor outcomes among patients with known CVD. As such, identification and appropriate management of depression is critical to optimal CVD outcomes. Yet, most cases of depression remain unrecognized or

undertreated. In this review article, we analyze the epidemiologic evidence linking depression to increased CVD risk and worse CVD outcomes, proposed mechanisms by which depression contributes to CVD risk and outcomes, and optimal approaches to the diagnosis and management of depression in CVD patients.

The relationship between depression and cardiovascular risk

A number of studies have demonstrated that depression increases the risk of incident coronary artery disease (CAD) by at least 1.5 times that of otherwise physically healthy individuals [3–11]. Among the largest of these studies was a prospective evaluation of 20,000 patients without prior

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heart disease that found patients with depression were 2.7 times more likely to die from ischemic heart disease over a median follow-up of 8.5 years [11]. In addition to ischemic heart disease, depression has been associated with an increased risk of stroke and peripheral arterial disease [12,13].

The implications of depression on cardiovascular risk and global health are far from minor. In a comparative risk assessment conducted by Charlson et al. [14], the authors estimated that depression accounts for 3% of worldwide disability-adjusted life years due to ischemic heart disease. Thus, depression may account for 3.5 million years of life lost and 250,000 years of life lived with disability due to ischemic heart disease alone. These findings suggest significant promise in reducing the global burden of CVD by addressing the role of depression in cardiovascular risk.

The relationship between depression and cardiovascular outcomes

In addition to increasing CV risk, depression is highly prevalent in patients with underlying CVD. While depression exists as a comorbid condition in less than 10% of general medical patients, depression is found in 20–30% of cardiovascular patients (Fig.) [2]. Given that depression is twice as common in cardiovascular populations as the general medical population, the impact of depression on cardiovascular outcomes is all the more pertinent.

A large number of studies have shown that depression predicts worse outcomes following hospitalization for cardiovascular events. One of the first studies to demonstrate this relationship evaluated outcomes following an acute myocardial infarction (MI) in depressed and non-depressed patients. Among patients with major depression, the 6-month mortality following an MI was 17% as compared with 3% among non-depressed patients, corresponding to a risk-adjusted hazard ratio of 3.44 (95% confidence interval, 2.25–4.63) [15]. Subsequent studies have demonstrated similar findings in larger cohorts of MI and ACS patients [16,17], in evaluation of

longer term outcomes [18], as it relates to cardiac-specific mortality [19], and in other ischemic heart disease patient cohorts (i.e., stable ischemic heart disease, post-CABG, and post-PCI) [20,21]. Furthermore, a dose-response relationship has been observed between the severity of depression and cardiovascular outcomes. After hospital discharge for MI, Lespérance et al. [18] found a stepwise relationship between the severity of depression and mortality outcomes. Although not all published studies suggest depression is associated with worse outcomes after ACS, the preponderance of evidence has led to a scientific statement from the American Heart Association supporting depression as a formal risk factor for adverse outcomes in patients with ACS [22]. Depression is also associated with an increased risk of recurrent and fatal stroke among patients with prior stroke [12] and an increased risk of heart failure readmission and death among CHF patients [23–25].

In addition to being associated with worse survival and an increased risk of recurrent cardiovascular events, depression is strongly associated with worse patient health status (i.e., symptom burden, functional status, and quality of life). Among patients with stable ischemic heart disease, Ruo et al. [26] found that more severe depression is associated with worse measures of ischemic heart disease-specific health status as assessed by the Seattle Angina Questionnaire. Similar results have been observed in post-ACS [27] and post-MI [28] patient populations. In addition to being associated with worse cardiovascular-specific health status measures, depression has been shown to predict declines in health status. In a study of 460 outpatients with a history of heart failure and left ventricular ejection fraction <0.40, depression was the strongest predictor of decline in health status over a 6-week period of follow-up [29]. These findings are consistent with a study by Vaccarino et al. [30] that found a graded relation between the severity of depressive symptoms and a combined end-point of functional decline or death among heart failure patients.

Finally, a number of studies have demonstrated that depression is associated with higher costs of care. In a cohort of patients with acute MI, Frasure-Smith et al. [31] demonstrated that 1-year post-MI costs were 41% higher for patients

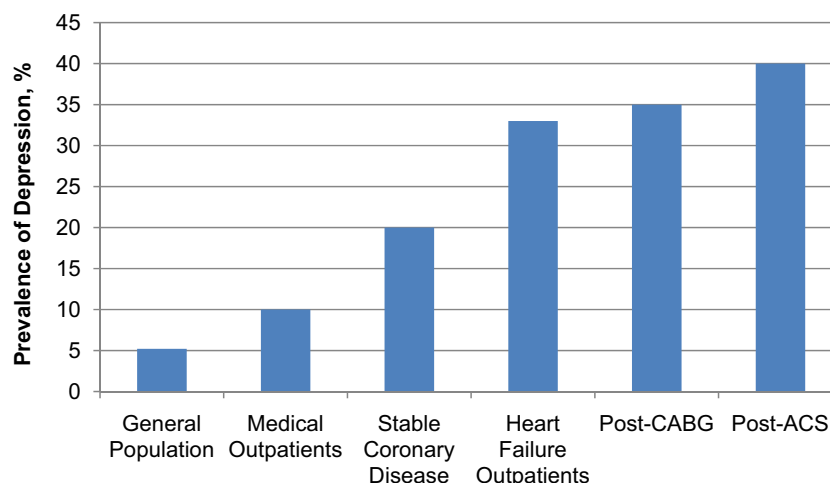


Fig – The prevalence of depression across the patient spectrum. Prevalence estimates taken from Whooley [2].

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