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## Is Exercise a Viable Treatment for Depression?

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### Abstract

Depression is a common disorder that is associated with compromised quality of life, increased health care costs, and greater risk for a variety of medical conditions, particularly coronary heart disease. This review examines methods for assessing depression and discusses current treatment approaches. Traditional treatments include psychotherapy and antidepressant medications, but such treatments are not effective for all patients and alternative approaches have recently received increased attention, especially the use of aerobic exercise. This review examines evidence that exercise is effective in improving depressive symptoms among patients with major depression and offers practical suggestions for helping patients initiate and maintain exercise in their daily lives.

### Keywords

Aerobic exercise; physical activity; cardiovascular disease; myocardial infarction; depression; major depressive disorder

### What Is Depression?

Depression is a term that refers both to a transient mood state and a clinical syndrome or disorder. Depression as a mood state is characterized by feeling sad, discouraged, or unhappy, while depression as a clinical condition is a psychiatric disorder in which diagnostic criteria require five or more depressive symptoms, one of which must include either depressed mood or loss of interest or pleasure along with at least four other depressive symptoms including significant weight loss, sleep disturbance, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or excessive guilt, diminished ability to think or concentrate, and recurrent thoughts of death. Major depressive disorder (MDD) is distinguished from transient feelings of depression by both the severity and duration of symptoms: symptoms of depression must be present for all or most days of the week for at least 2 weeks, represent a *change* from a previous level of functioning, and be accompanied by somatic, cognitive, or affective symptoms (1) (insert Figure 1 about here).

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## Epidemiology of Major Depressive Disorder

It has been estimated that more than one in five of adults suffer from MDD at some point in their lifetimes, and depression may be twice as likely to occur in women compared to men. As many as one in four adolescents may suffer from depression, and young adults who experience depression in adolescence are at twice the risk of experiencing another depressive episode as adults compared to adolescents who do not experience MDD.

Depression is also commonly observed to co-occur with many medical conditions, including obesity, diabetes, and cardiovascular disease. Indeed, approximately 20% of patients with coronary heart disease (CHD) experience depression, and an additional 20% may experience elevated depressive symptoms without meeting diagnostic criteria for MDD.

## Assessment of Depression

MDD is diagnosed by psychiatric interview, of which several validated versions are available. In addition to interviews, a number of self-report questionnaires have been used to assess the severity of depressive symptoms (Table 1). It should be noted that while questionnaires may have established “cut-points” to identify persons who *may* be clinically depressed, such instruments are not diagnostic tools but rather measures of the presence and severity of depressive symptomatology. Two of the most widely used self-report instruments are the Beck Depression Inventory (BDI) and the Patient Health Questionnaire-9 (PHQ-9). A recent scientific advisory panel commissioned by the American Heart Association (AHA) (11) suggested that the PHQ-9 be considered as a potential instrument for identifying persons who may be clinically depressed. The 2-item PHQ-2 was suggested as possible brief screen, followed by the full PHQ-9 for patients who screen ‘positive’ on the PHQ-2 (Table 2). An algorithm for screening for depression that could be used in clinical practice is displayed in Figure 2.

## Clinical significance of Depression

MDD is associated with poorer quality of life and increased medical expenditures and healthcare utilization. In addition, depression is one of the leading sources of disability in the United States and is associated with significantly increased missed time at work. According to the World Health Organization, depression is the second leading cause of disability adjusted life years following CHD.

There also is a mounting literature that has documented the association of depression with adverse health outcomes in both healthy individuals and patients with CHD. Many studies of patients with a variety of cardiac conditions have reported that depression is associated with a two to four-fold increase in risk of adverse health outcomes, including patients post-myocardial infarction, coronary bypass surgery, stable and unstable angina, and chronic heart failure (4, 16). In addition, many studies have shown that CHD patients who have elevated depressive symptoms, i.e., who obtain BDI scores > 10 without necessarily meeting criteria for MDD, are at increased risk for death or other adverse cardiac events, suggesting that increased depressive symptoms may worsen prognosis, even if patients are not clinically depressed.

## Conventional treatments for depression

### Pharmacotherapy

MDD is most commonly treated with antidepressant medication (14). Many randomized clinical trials (RCTs) have examined the effectiveness of various pharmacological compounds on depression outcomes. The current recommendations for depression treatment

typically involve pharmacologic treatment, usually with a selective serotonin reuptake inhibitor (SSRI), although treatments with tricyclic antidepressants, benzodiazepines, and combined therapies are also common (for most frequently prescribed antidepressant, see Table 3). It has been estimated that approximately 50% of patients will have a clinical ‘response’ to treatment (i.e., a 50% reduction in symptoms), whereas many individuals will require augmented treatment with more than one antidepressant agent. However, many patients do not respond to antidepressant medications or experience untoward side effects. In addition, results of placebo controlled trials in which research participants receive either a placebo (i.e., sugar) pill or active antidepressant medication yield mixed results, and evidence generally suggests that antidepressants may be especially effective for patients with more severe depression (8) (see Figure 3).

### Psychotherapy

There are many varieties of psychotherapy (i.e., “talk” therapy). Psychotherapy involves individual or group counseling over 4-6 months or longer. The American Psychological Association recognizes several “empirically validated” treatments, i.e., therapies that have been demonstrated to be effective compared to a control group by two or more investigative teams. The most effective treatments for MDD include cognitive behavioral therapy (CBT), behavior therapy (BT), and interpersonal psychotherapy (IPT). CBT focuses on identifying and modifying maladaptive thought patterns, while IPT emphasizes the social context in which depression occurs and focuses on improving communication skills. BT emphasizes increasing engagement in positive daily activities, decreasing negative life experiences, and improving social skills and adaptive behaviors (see Table 4). Psychotherapy has been shown to be one of the most effective long-term treatments of depression and is often used in conjunction with pharmacotherapy among individuals with more severe depression.

### Exercise as a Treatment for depression

The effects of exercise on individuals with elevated depressive symptoms have been examined in over two dozen RCTs and has been the topic of several meta-analyses and systematic reviews, including one Cochrane review (12). Existing studies have varied substantially in size, type of control group, methodological rigor, length of follow-up, and even the type of exercise modality. Randomized trials of exercise have generally ranged in length from six weeks to four months and typically emphasize aerobic exercise although some studies of resistance training also have been reported. Although multiple trials have been conducted among adults with MDD, few studies have utilized high quality methodologies in which treatment allocation is concealed, intention-to-treat analyses are used, a control group is included in the design, and depression is assessed by clinical interview in which the assessor is blinded to treatment group.

In a landmark review, Lawlor and Hopker (10) conducted a meta-regression of randomized trials of aerobic exercise and depression among published, randomized trials conducted among adults. Their literature search yielded 14 studies for inclusion, incorporating data from approximately 850 individuals. Using the BDI as their outcome measure, the authors reported that exercise reduced depressive symptoms by  $-7.3$  points (95% confidence interval  $-10.0$  to  $-4.6$ ), and that this effect was greater in trials with shorter follow-up periods. Despite the findings of improved depressive symptoms, the authors concluded that the effectiveness of exercise in treating depression could not be determined due to a lack of good quality research in clinical populations and a lack of appropriate follow-up assessments.

In a subsequent review, Mead and colleagues (12) conducted a comprehensive literature search of randomized controlled trials in adults in which exercise was compared to a

standard treatment, no treatment, or a placebo control. Their search yielded 28 studies that met their inclusion criteria. Methodological quality varied substantially across studies, with a minority of studies adequately concealing treatment, using intention to treat analyses, and using objective measures of depressive symptoms. Approximately half of the studies included used a two-arm design, comparing exercise with controls only. Other studies utilized a three-arm design, comparing exercise with one other treatment modality (e.g. pharmacotherapy, cognitive therapy, or a different intensity exercise group) and a control group. Most studies used jogging/running as their treatment modality, but some used walking, aerobic training with an instructor, stationary cycling, or mixed exercise (e.g. resistance training and stretching).

In the Cochrane review, the primary analyses were limited to those trials comparing exercise treatment with no treatment or a control intervention ( $n = 25$ ) and found a large, clinically meaningful improvements associated with exercise in comparison with controls (standardized mean difference [SMD] =  $-0.82$  (95% CI  $-1.12$  to  $-0.51$ ). However, when the analyses were further limited to those trials using intention-to-treat analyses and blinded outcome assessment, the effect was slightly weaker, suggesting only a moderate antidepressant effect associated with exercise. In addition, when analyses were conducted among the five trials that collected long-term follow-up data, the effects of treatment were again slightly weaker, consistent with a moderate clinical improvement (SMD  $-0.44$ , 95% CI  $-0.71$  to  $-0.18$ ).

## Comparative Effectiveness of Exercise with Conventional Treatments

The Mead meta-analysis examined several of these comparative effectiveness analyses, conducting sensitivity analyses of those trials comparing established treatments with exercise. Comparison with exercise and CBT showed no difference between exercise and cognitive therapy (SMD =  $-0.17$  [95% CI  $-0.51$ ,  $0.18$ ]). An additional sensitivity analysis was conducted comparing the results of exercise compared with antidepressant medication. Only two studies, both from researchers at Duke University, compared the effectiveness of exercise with pharmacotherapy. No differences between exercise and antidepressant medication were noted (SMD =  $-0.04$  [95% CI  $-0.31$ ,  $0.24$ ]).

## The Duke SMILE Studies

Blumenthal and colleagues conducted several RCTs comparing the effects of aerobic exercise to antidepressant medication. In the first SMILE (Standard Medical Intervention versus Long-term Exercise) study (3), 156 older adults with MDD were randomized to four months of either aerobic exercise, sertraline, or a combined exercise and sertraline group. Participants in the exercise conditions exercised in a group setting three times per week at 70-85% of their heart rate reserve. Participants in the sertraline condition were titrated for therapeutic response on sertraline by a study psychiatrist (50-200mg), consistent with standard clinical treatment of depression. Following 16 weeks of treatment, groups did not differ in their level of depressive symptoms, suggesting that exercise and standard antidepressant treatments were equally effective. Interestingly, a follow-up examination of these participants conducted 10 months after the completion of the treatment period showed that participants in the exercise group showed lower rates of depression relapse in comparison with both the sertraline and combined groups. Moreover, participants who reported engaging in regular exercise during the follow-up period were more than 50% less likely to be depressed at their 10-month assessment compared to non-exercisers.

The Duke group (5) later extended these findings by including a placebo control group and by adding a group that exercised at home on their own, without the social interaction facilitated by group exercise that could contribute to the antidepressant effects of exercise.

Participants were randomized to either home-based or supervised aerobic exercise, sertraline, or placebo for a four-month period. Home-based exercisers were provided with the same exercise prescription as supervised participants and received an initial home visit to establish their exercise training routine, as well as instructions on how to monitor their heart rates accurately. Results revealed that participants in either exercise or sertraline groups tended to show greater improvement in comparison with placebo participants and these results became statistically significant when “early responders” (i.e. participants who experienced a self-reported improvement in depressive symptoms of > 50% within the first week of treatment), were eliminated from analyses.

In a recent follow-up analysis (2), participants’ depression was reassessed one year after their enrollment in the trial. Interestingly, neither group assignment nor antidepressant medication usage during the follow-up period were significant predictors of depression at this follow-up time-point. Instead, the only significant predictor was regular exercise during the follow-up period. In other words, regardless of initial treatment group assignment or background characteristics, those individuals who reported regular exercise following completion of the intervention were the least likely to be depressed at follow-up. Taken together, these data suggest that exercise is effective in reducing depression in patients with MDD and exercise may reduce the risk of relapse.

## Dosing of Exercise

To our knowledge, only one RCT has systematically examined the optimal “dose” of exercise needed to improve depression. Dunn and colleagues (7) randomized 80 sedentary adults diagnosed with MDD to 12 weeks of one of five aerobic exercise-training treatment conditions: low energy expenditure and three days of exercise training per week, high energy expenditure and three days of exercise training per week, low energy expenditure and five days of exercise training per week, high energy expenditure and five days of exercise training per week, or stretching and flexibility control. Results of the trial showed that exercise conducted at the high energy expenditure dose (consistent with public health recommendations) was effective in reducing depressive symptoms (47% from baseline measurement) over the 12 week treatment period. In contrast, although participants randomized to the low energy expenditure dose experienced some reduction in depression over the treatment period (30% decline from baseline), those participants did not respond any better than participants in the control condition did (29% decline from baseline). Regarding frequency of training, no significant difference in treatment response was found between those participants who exercised three days per week relative to those who exercised five days per week. The authors concluded that a higher energy expenditure was critical to remission of MDD.

In contrast, other studies, including the two SMILE studies described previously, reported that three sessions per week of 30-45 minutes per session was sufficient to reduce depression, and the follow-up of study participants suggested that 90 min/week was sufficient to reduce the risk of relapse. Similarly, in an observational study of 522 cardiac patients, Milani and Lavie (13) reported that aerobic exercise in the context of a comprehensive cardiac rehabilitation program (i.e., 3 times per week for 30 minutes for 3 months) was associated with significant reductions in depressive symptoms. Patients who showed no gain or a loss in aerobic capacity were less likely to benefit compared to those patients who showed improvement in aerobic capacity. However, patients were not randomized to different levels of exercise and the relation of exercise dose and improved depression and aerobic capacity was not examined. Therefore, there remains uncertainty about the optimal dose of exercise to improve depression, but clearly some exercise is better than no exercise.

## Exercise Adherence

Patients with MDD may find it difficult to initiate and sustain an exercise routine. Motivation for exercise may be affected by depressive symptoms such as fatigue, indecisiveness, low self-esteem, loss of interest and pleasure, and poor sleep. Depressed patients with higher levels of anxiety and lower levels of fitness may be at particular risk for exercise non adherence (6). Because the antidepressant affects of exercise are experienced by participants who maintain the exercise habit over time, strategies to sustain exercise are essential for patients to achieve the mental health benefits of exercise.

Exercise professionals who work with depressed patients may benefit from becoming familiar the principles of Motivational Interviewing (MI), a well-researched approach to promoting behavioral change (15). MI is a collaborate approach in which the health professional functions not as an expert who offers directions and prescriptions, but as a consultant who tries to understand a patient's goals and helps the patient to achieve his or her goals. The MI approach relies heavily on open-ended questions (e.g., "when if ever have you tried to start an exercise program?") and reflections (e.g., "you worry that you won't be able to stick with an exercise program, but you think it may be beneficial for you") in order to highlight *discrepancy*, elicit *change talk* and enhance *self-efficacy*. Discrepancy refers to differences between where the patient hopes to be and where they are now. Change talk is any expression of desire, reason, need, or commitment to exercise. Self-efficacy is the patient's belief that he or she has the ability to successfully implement an exercise program. An exercise professional who is using MI will help patients negotiate exercise goals that patients feel confident about, and will help patients to identify and overcome barriers. When problems arise, lapses are viewed as learning opportunities.

Exercise professionals would do well to remember that depression is often a cyclical disorder. Patients with an established exercise regimen can still be susceptible to future depressive episodes, which in turn can disrupt their exercise regimen. Helping patients anticipate barriers to maintenance of exercise, including recurrence of depression, can increase the likelihood of success (Table 5).

## Summary and Bottom Line

In summary, exercise appears to be an effective treatment for depression, improving depressive symptoms to a comparable extent as pharmacotherapy and psychotherapy. Observational studies suggest that active people are less likely to be depressed, and interventional studies suggest that exercise is beneficial in reducing depression. It appears that even modest levels of exercise are associated with improvements in depression, and while most studies to date have focused on aerobic exercise, several studies also have found evidence that resistance training also may be effective. While the optimal "dose" of exercise is unknown, clearly any exercise is better than no exercise. Getting patients to initiate exercise ---and sustain it -- is critical.

## Acknowledgments

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## Abbreviations

<b>CBT</b>	cognitive behavioral therapy
<b>HAM-D</b>	Hamilton Depression Rating Scale

<b>MDD</b>	major depressive disorder
<b>RCT</b>	randomized clinical trial
<b>SSRI</b>	selective serotonin reuptake inhibitor
<b>BDI</b>	Beck Depression Inventory
<b>DIS</b>	Diagnostic Interview Schedule

## REFERENCES

1. Task Force on DSM-IV Diagnostic and statistical manual of mental disorders (DSM-IV-TR). American Psychiatric Association; Washington DC: 2000.
2. Babyak M, Blumenthal JA, Herman S, Khatri P, Doraiswamy M, Moore K, et al. Exercise treatment for major depression: maintenance of therapeutic benefit at 10 months. *PsychosomMed*. 2000; 62(5):633–8.
3. Blumenthal JA, Babyak MA, Moore KA, Craighead WE, Herman S, Khatri P, et al. Effects of exercise training on older patients with major depression. *Arch Intern Med*. 1999; 159(19):2349–56. [PubMed: 10547175]
4. Blumenthal JA, Lett H, Babyak M, White W, Smith P, Mark D, et al. Depression as a risk factor for mortality following coronary artery bypass surgery. *Lancet*. 2003; 362:604–9. [PubMed: 12944059]
5. Blumenthal JA, Babyak MA, Doraiswamy PM, Watkins L, Hoffman BM, Barbour KA, et al. Exercise and pharmacotherapy in the treatment of major depressive disorder. *Psychosom Med*. 2007; 69(7):587–96. [PubMed: 17846259]
6. DiMatteo MR, Lepper HS, Croghan TW. Depression is a risk factor for noncompliance with medical treatment: meta-analysis of the effects of anxiety and depression on patient adherence. *Arch Intern Med*. 2000; 160(14):2101–7. [PubMed: 10904452]
7. Dunn AL, Trivedi MH, Kampert JB, Clark CG, Chambliss HO. Exercise treatment for depression: efficacy and dose response. *Am J Prev Med*. 2005; 28(1):1–8. [PubMed: 15626549]
8. Fournier JC, DeRubeis RJ, Hollon SD, Dimidjian S, Amsterdam JD, Shelton RC, et al. Antidepressant drug effects and depression severity: a patient-level meta-analysis. *JAMA : the journal of the American Medical Association*. 2010; 303(1):47–53. [PubMed: 20051569]
9. Kirsch I, Deacon BJ, Huedo-Medina TB, Scoboria A, Moore TJ, Johnson BT. Initial severity and antidepressant benefits: a meta-analysis of data submitted to the Food and Drug Administration. *PLoS Med*. 2008; 5(2):e45. [PubMed: 18303940]
10. Lawlor DA, Hopker SW. The effectiveness of exercise as an intervention in the management of depression: systematic review and meta-regression analysis of randomised controlled trials. *BMJ (Clinical research ed)*. 2001; 322(7289):763–7.
11. Lichtman JH, Bigger JT Jr, Blumenthal JA, Frasure-Smith N, Kaufmann PG, Lesperance F, et al. AHA science advisory. Depression and coronary heart disease. Recommendations for screening, referral, and treatment. A science advisory from the American Heart Association Prevention Committee to the Council on Cardiovascular Nursing, Council on Clinical Cardiology, Council on Epidemiology and Prevention, and Interdisciplinary Council on Quality of Care Outcomes Research. Endorsed by the American Psychiatric Association. *Prog Cardiovasc Nurs*. 2009; 24(1): 19–26. [PubMed: 19261139]
12. Mead GE, Morley W, Campbell P, Greig CA, McMurdo M, Lawlor DA. Exercise for depression. *CochraneDatabaseSystRev*. 2009; (3) CD004366.
13. Milani RV, Lavie CJ. Impact of cardiac rehabilitation on depression and its associated mortality. *Am J Med*. 2007; 120(9):799–806. [PubMed: 17765050]
14. Olfson M, Marcus SC, Druss B, Elinson L, Tanielian T, Pincus HA. National trends in the outpatient treatment of depression. *JAMA : the journal of the American Medical Association*. 2002; 287(2):203–9. [PubMed: 11779262]
15. Rollnick, SM.; W.R.; Butler, CC. *Motivational interviewing in health care: helping patients change behavior*. Guilford Press; New York, London: 2008.

16. Sherwood A, Blumenthal JA, Hinderliter AL, Koch GG, Adams KF Jr, Dupree CS, et al. Worsening depressive symptoms are associated with adverse clinical outcomes in patients with heart failure. *J Am Coll Cardiol.* 2011; 57(4):418–23. [PubMed: 21251581]

### **Learning Objectives**

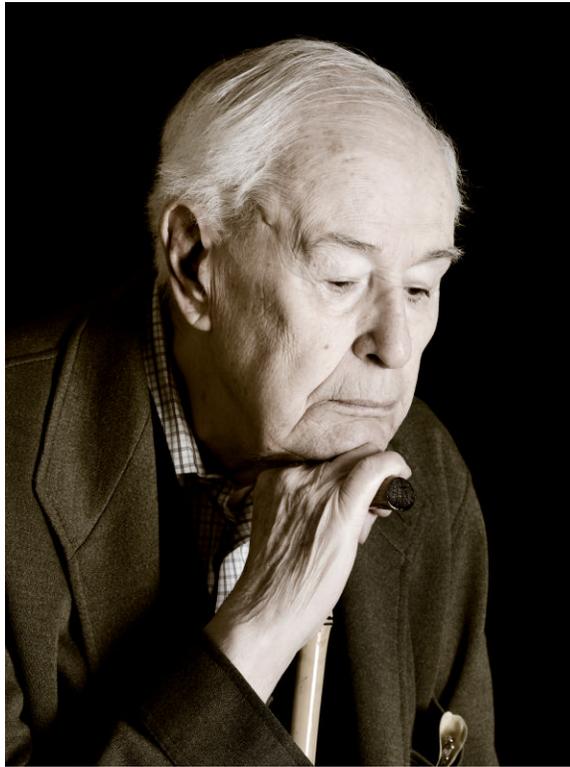
To be able to define depression, list common assessment instruments, describe traditional treatment approaches, and understand the effects of aerobic exercise on depression.

**Suggested Readings**

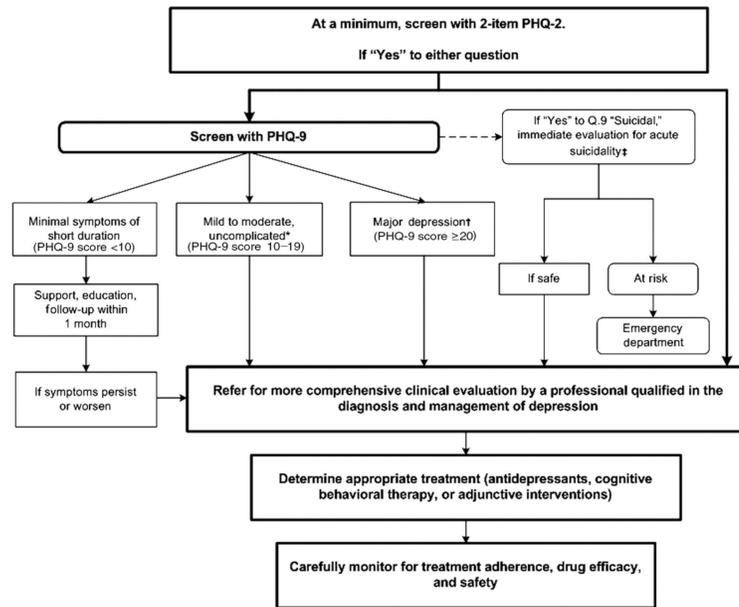
Ilardi SS. The Depression Cure. Da Capo Press, Cambridge, MA: 2009.  
Leith, L.M. Foundations of Exercise and Mental Health (2<sup>nd</sup> edition). Fitness Information Technology, Inc. Morgantown, WV: 2010.  
Ratey J. Spark: The Revolutionary New Science of Exercise and the Brain. Little, Brown and Company, New York, NY: 2008.  
Rollnick S, Miller WR., & Butler, CC. Motivational interviewing in health care: helping patients change behavior. The Guildford Press, New York, NY: 2008.

### Summary Statement

Depression is a common disorder that is associated with compromised quality of life, increased health care costs, and greater risk for a variety of medical conditions, particularly coronary heart disease. This review examines methods for assessing depression, discusses current treatment approaches, evaluates evidence that aerobic exercise is an effective treatment option for patients with major depression, and offers practical suggestions for helping patients initiate and maintain exercise in their daily lives.

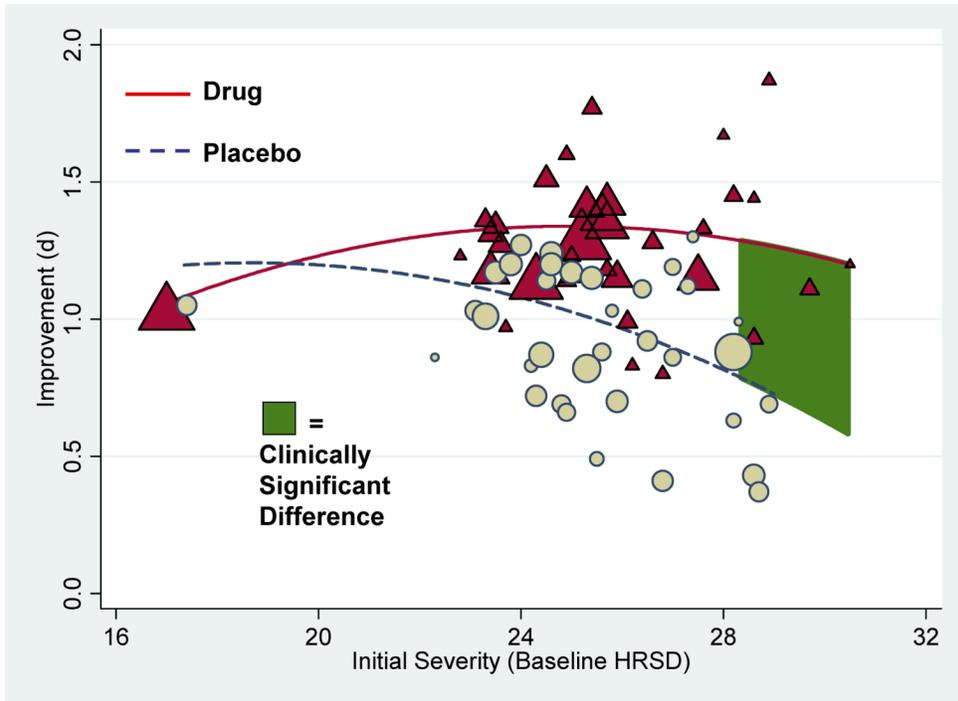


**Figure 1.**  
Picture of a depressed person



**Figure 2.**

Algorithm for using the PHQ as a screen for depression in patients with coronary heart disease. \*Meets diagnostic criteria for major depression, has a PHQ-9 score of 10–19, has had no more than 1 or 2 prior episodes of depression, and screens negative for bipolar disorder, suicidality, significant substance abuse, or other major psychiatric problems. †Meets the diagnostic criteria for major depression and 1) has a PHQ-9 score  $\geq 20$ ; or 2) has had 3 or more prior depressive episodes; or 3) screens positive for bipolar disorder, suicidality, significant substance abuse, or other major psychiatric problem. ‡If “Yes” to Q.9 “suicidal,” immediately evaluate for acute suicidality. If safe, refer for more comprehensive clinical evaluation; if at risk for suicide, escort the patient to the emergency department.



**Figure 3.** Mean Standardized Improvement as a Function of Initial Severity and Treatment Group. Drug improvement is portrayed as red triangles around their solid regression line and placebo improvement as blue circles around their blue regression line. The green shaded area represents the threshold at which comparisons of drug versus placebo are clinically and statistically different from each other (9).

**Table 1****Assessment Instruments for Depression**

Patient Health Questionnaire-9 (PHQ-9)	A 10-item self-report questionnaire designed to screen for the nine symptoms used to diagnose major depressive disorder. Respondents indicate how often they have been bothered by each symptom on a scale anchored by 0 = not at all and 3 = nearly every day. Symptom severity is captured by a tenth item.
Beck Depression Inventory-II	A 21-item self-report questionnaire designed to measure emotional and somatic symptoms of depression. Respondents are presented with a series of statements about symptom frequency and severity, ranging in value from 0 to 3.
Center for Epidemiologic Studies Depression Scale (CES-D)	A 20-item self-report questionnaire developed to measure symptoms of depression in community samples. Respondents rate symptom severity on a scale anchored by 0 = rarely or none of the time (less than 1 day) and 4 = most or all of the time (5-7 days).
The Hospital Anxiety and Depression Scale (HADS)	A 14-item self-report questionnaire developed to assess anxiety and depression in medical settings, without capturing somatic symptoms which could be secondary to physical ailment (e.g., fatigue, insomnia). Respondents rate symptom severity on a scale anchored by 0 = not at all and 3 = very often indeed.
Hamilton Rating Scale for Depression (HRSD)	A 17-item clinician-administered, structured interview developed to assess depression symptom severity. The instrument requires training to use, as the scoring system relies on clinical judgment.
Structured Clinical Interview for DSM Disorders (SCID)	A clinician-administered, structured interview developed for the purposes of diagnosing psychiatric disorders. The instrument requires training to use, as the scoring system relies on clinical judgment.

**Table 2**

## PHQ-2 and PHQ-9

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**PHQ-2** Over the past two weeks, how often have you been bothered by any of the following problems?

- 1 Little interest or pleasure in doing things.
- 2 Feeling down, depressed or hopeless.

If the answer is “yes” to either question, then do a follow-up clinical interview.

**PHQ-9** Over the past two weeks, how often have you been bothered by any of the following problems?

- 1 Little interest or pleasure in doing things.
- 2 Feeling down, depressed or hopeless.
- 3 Trouble falling asleep, staying asleep, or sleeping too much.
- 4 Feeling tired or having little energy.
- 5 Poor appetite or overeating.
- 6 Feeling bad about yourself, feeling that you are a failure, or feeling that you have let yourself or your family down.
- 7 Trouble concentrating on things such as reading the newspaper or watching television.
- 8 Moving or speaking so slowly that other people could have noticed. Or being so fidgety or restless that you have been moving around a lot more than usual.
- 9 Thinking that you would be better off dead or that you want to hurt yourself in some way.

Questions are scored 0-1 from ‘None at all,’ ‘Several days,’ ‘more than half the days,’ to ‘Nearly every day.’”

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**Table 3**

## Commonly Prescribed Antidepressant Medications

<b>Generic Name</b>	<b>Brand Name</b>
Bupropion	Wellbutrin
Citalopram	Celexa
Duloxetine	Cymbalta
Escitalpram	Lexapro
Fluoxetine	Prozac
Paroxetine	Paxil
Sertraline	Zoloft
Venlafaxine	Effexor
Mirtazapine	Remeron

**Table 4**

## Psychotherapy for Depression.

Cognitive Behavioral Therapy (CBT)	CBT emphasizes the important influence that negative thoughts have on emotion and behavior. For people with MDD, treatment focuses on modifying maladaptive thoughts as well as addressing deficits in behavior (e.g., unassertiveness, isolating oneself from others) that lead to and maintain depression. For example, a depressed patient undergoing CBT might be taught to identify cognitive distortions associated with her or his depression, to challenge those distortions, and to replace them with more realistic thoughts. Because patients with depression often lack motivation, another therapeutic exercise might involve planning a daily schedule of activities in which to engage. Following the schedule may result in decreased boredom and loneliness as well as increased motivation.
Behavioral Therapy (BT)	BT seeks to alter how we feel by changing what we do. Patients with depression often lack motivation, leading them to become less physically active and further worsening their depressive symptoms, creating a worsening cycle of depression and inactivity. A BT intervention might involve planning a daily schedule of activities in which to engage. Following the schedule may result in decreased boredom and loneliness as well as increased motivation.
Interpersonal Psychotherapy (IPT)	IPT is a structured and time-limited psychotherapy which emphasizes the interpersonal context in which depressive symptoms occur (e.g., social isolation, interpersonal conflicts, role transition, or loss of a loved one). The IPT therapist forms a supportive relationship with the depressed patient, helps the patient to identify interpersonal problems, and uses strategies to help the patient develop and adapt new interpersonal behaviors (e.g., assertive communication, reaching out for social support).

**Table 5****Seven Tips for Highly Effective Exercisers**

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- 1 Just do it. Choose an activity that you enjoy—and stick with it. Just because you “don’t feel like it” is not a reason not to exercise. Tell yourself that you’ll feel better afterwards.
  - 2 Don’t neglect your feet. Invest in a good pair of exercise sneakers. It’s an investment that you won’t regret!
  - 3 Timing is everything. Exercise at a time of day that is most convenient. Do not exercise on a full or empty stomach or just before you go to bed. People with depression often suffer from insomnia, and night time exercise can leave you feeling energized when you want to sleep. If possible, exercise during daylight hours to also benefit from sunlight.
  - 4 Watch out for barriers. Anticipate barriers to exercise, and develop strategies to make exercise as easy and simple as possible. Anticipate barriers—bad weather, work commitments, fatigue, and brainstorm potential solutions.
  - 5 Get a buddy. Some people who exercise with a partner enjoy it more and are more likely to stick with it. Also, the additional social support may have additional beneficial effects.
  - 6 Think positive. Praise your successes. View lapses in your exercise program as learning opportunities and don’t get discouraged if you miss a session.
  - 7 Enjoy the moment. Take a minute when you are finished with an exercise session to appreciate how you feel.
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