

THE EFFECTS OF STRESS

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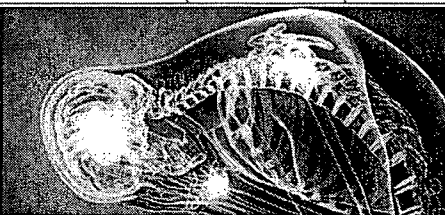
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Stress effects on the body



Musculoskeletal System

When the body is stressed, muscles tense up. Muscle tension is almost a reflex reaction to stress — the body's way of guarding against injury and pain.

With sudden onset stress, the muscles tense up all at once, and then release their tension when the stress passes. Chronic stress ([helpcenter/understanding-chronic-stress.aspx](#)) causes the muscles in the body to be in a more or less constant state of guardedness. When muscles are taut and tense for long periods of time, this may trigger other reactions of the body and even promote stress-related disorders. For example, both tension-type headache and migraine headache are associated with chronic muscle tension in the area of the shoulders, neck and head.

Millions of individuals suffer from chronic painful conditions secondary to musculoskeletal disorders. Often, but not always, there may be an injury that sets off the chronic painful state. What determines whether or not an injured person goes on to suffer from chronic pain is how they respond to the injury. Individuals who are fearful of pain and re-injury, and who seek only a physical cause and cure for the injury, generally have a worse recovery than individuals who maintain a certain level of moderate, physician-supervised activity. Muscle tension, and eventually, muscle atrophy due to disuse of the body, all promote chronic, stress-related musculoskeletal conditions.

Relaxation techniques have been shown to effectively reduce muscle tension, decrease the incidence of certain stress-related disorders, such as headache, and increase a sense of well-being.

Respiratory System

Stress can make you breathe harder. That's not a problem for most people, but for those with asthma or a lung disease such as emphysema, getting the oxygen you need to breathe easier can be difficult.

And some studies show that an acute stress — such as the death of a loved one — can actually trigger asthma attacks, in which the airway between the nose and the lungs constricts.

In addition, stress can cause the rapid breathing — or hyperventilation — that can bring on a panic attack in someone prone to panic attacks.

Working with a psychologist to develop relaxation and breathing strategies ([helpcenter/controlling-anger.aspx](#)) can help.

Cardiovascular

The heart and blood vessels comprise the two elements of the cardiovascular system that work together in providing nourishment and oxygen to the organs of the body. The activity of these two elements is also coordinated in the body's response to stress. Acute stress — stress that is momentary or short-term such as meeting deadlines, being stuck in traffic or suddenly slamming on the brakes to avoid an accident — causes an increase in heart rate and stronger contractions of the heart muscle, with the stress hormones — adrenaline, noradrenaline and cortisol — acting as messengers for these effects. In addition, the blood vessels that direct blood to the large muscles and the heart dilate, thereby increasing the amount of blood pumped to these parts of the body and elevating blood pressure. This is also known as the fight or flight response. Once the acute stress episode has passed, the body returns to its normal state.

Chronic stress, or a constant stress experienced over a prolonged period of time, can contribute to long-term problems for heart ([helpcenter/heart-disease.aspx](#)) and blood vessels. The consistent and ongoing increase in heart rate, and the elevated levels of stress hormones and of blood pressure, can take a toll on the body. This long-term ongoing stress can increase the risk for hypertension, heart attack or stroke.

Repeated acute stress and persistent chronic stress may also contribute to inflammation in the circulatory system, particularly in the coronary arteries, and this is one pathway that is thought to tie stress to heart attack. It also appears that how a person responds to stress can affect cholesterol levels.

The risk for heart disease associated with stress appears to differ for women, depending on whether the woman is pre- or post-menopausal. Levels of estrogen in pre-menopausal women appears to help blood vessels respond better during stress, thereby helping their bodies to better handle stress and protecting them against heart disease. Postmenopausal women lose this level of protection due to loss of estrogen, therefore putting them at greater risk for the effects of stress on heart disease.

Endocrine

When the body is stressed, the hypothalamus signals the autonomic nervous system and the pituitary gland and the process is started to produce epinephrine and cortisol, sometimes called the "stress hormones."

Adrenal Glands (near kidneys)

Stress signals from the hypothalamus cause the adrenal cortex to produce cortisol and the adrenal medulla to produce epinephrine. This starts the process that gives your body the energy to run from danger.

Liver

When cortisol and epinephrine are released, the liver produces more glucose, a blood sugar that would give you the energy for "fight or flight" in an emergency. For most of you, if you don't use all of that extra energy, the body is able to reabsorb the blood sugar, even if you're stressed again and again. But for some people — especially people vulnerable to Type 2 diabetes — that extra blood sugar can mean diabetes. Who's vulnerable? The obese and races more inclined to diabetes, such as Native Americans.

Studies show that if you learn how to manage stress, you can control your blood sugar level, sometimes nearly as much as with medication.

Gastrointestinal

Esophagus

When you're stressed, you may eat much more or much less than you usually do. If you eat more or different foods, or increase your use of alcohol or tobacco, you can experience heartburn or acid reflux. Stress or exhaustion can also increase the severity of heartburn pain.

Stomach

When you're stressed, your brain becomes more alert to sensations in your stomach. Your stomach can react with "butterflies" or even nausea or pain. You may vomit if the stress is severe enough. And, if the stress becomes chronic, you may develop ulcers or severe stomach pain even without ulcers.

Bowel

Stress can affect digestion, and what nutrients your intestines absorb. It can also affect how fast food moves through your body. You may find that you have either diarrhea or constipation.

Nervous System

The nervous system has several divisions: the central division involving the brain and spinal cord and the peripheral division consisting of the autonomic and somatic nervous systems. The autonomic nervous system (ANS) has a direct role in physical response to stress and is divided into the sympathetic nervous system (SNS), and the parasympathetic nervous system (PNS).

When the body is stressed, the SNS generates what is known as the "fight or flight" response. The body shifts all of its energy resources toward fighting off a life threat, or fleeing from an enemy. The SNS signals the adrenal glands to release hormones called adrenalin and cortisol. These hormones cause the heart to beat faster, respiration rate to increase, blood vessels in the arms and legs to dilate, digestive process to change and glucose levels (sugar energy) in the bloodstream to increase to deal with the emergency.

The SNS response is fairly sudden in order to prepare the body to respond to an emergency situation or acute stress, short term stressors. Once the crisis is over, the body usually returns to the pre-emergency, unstressed state.

Chronic stress, experiencing stressors over a prolonged period of time, can result in a long-term drain on the body. As the SNS continues to trigger physical reactions, it causes a wear-and-tear on the body. It's not so much what chronic stress does to the nervous system, but what continuous activation of the nervous system does to other bodily systems that become problematic.

Male Reproductive System

The male reproductive system is influenced by the nervous system. The parasympathetic part of the nervous system causes relaxation whereas the sympathetic part causes arousal. In the male anatomy, the autonomic nervous system, also known as the fight or flight response, produces testosterone and activates the sympathetic nervous system which creates arousal.

Stress causes the body to release the hormone cortisol, which is produced by the adrenal glands. Cortisol is important to blood pressure regulation and the normal functioning of several body systems including cardiovascular, circulatory and male reproduction. Excess amounts of cortisol can affect the normal biochemical functioning of the male reproductive system.

Chronic stress, ongoing stress over an extended period of time, can affect testosterone production, sperm production and maturation, and even cause erectile dysfunction or impotence.

Also, when stress affects the immune system, the body can become vulnerable to infection. In the male anatomy, infections to the testes, prostate gland and urethra, can affect normal male reproductive functioning.

Female Reproductive System

Menstruation

Stress may affect menstruation among adolescent girls and women in several ways. For example, high levels of stress may be associated with absent or irregular menstrual cycles, more painful periods and changes in the length of cycles.

Premenstrual Syndrome (PMS)

Stress may make premenstrual symptoms worse or more difficult to cope with and pre-menses symptoms may be stressful for many women. These symptoms include cramping, fluid retention and bloating, negative mood (feeling irritable and "blue") and mood swings.

Menopause

As menopause approaches, hormone levels fluctuate rapidly. These changes are associated with anxiety, mood swings and feelings of distress. Thus menopause can be a stressor in and of itself. Some of the physical changes associated with menopause, especially hot flashes, can be difficult to cope with. Furthermore, emotional distress may cause the physical symptoms to be worse. For example, women who are more anxious may experience an increased number of hot flashes and/or more severe or intense hot flashes.

Sexual Desire

Women juggle personal, family, professional, financial and a broad range of other demands across their life span. Stress, distraction, fatigue, etc., may reduce sexual desire — especially when women are simultaneously caring for young children or other ill family members, coping with chronic medical problems, feeling depressed, experiencing relationship difficulties or abuse,

dealing with work problems, etc.

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Stress: The different kinds of stress (/helpcenter/stress-kinds.aspx)

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Diabetes, Depression and Stress

October 2007 By Carol Watkins MD

Depression is not generally listed as a complication of diabetes. However, it can be one of the most common and dangerous complications. The rate of depression in diabetics is much higher than in the general population.

Diabetics with major depression have a very high rate of recurrent depressive episodes within the following five years. (Lustman et al 1977) A depressed person may not have the energy or motivation to maintain good diabetic management. Depression is frequently associated with unhealthy appetite changes. The suicidal diabetic adolescent has constant access to potentially lethal doses of insulin.

At this point in time, it is well accepted that psychological factors and psychiatric conditions can affect the course of medical illnesses. There is some suggestion that the stress of depression itself may lead to hyperglycemia in diabetics. The interaction between cardiovascular disorders (such as heart attack and high blood pressure) and depression has been extensively studied. Anxiety and depression can also affect other conditions including irritable bowel syndrome, headache and skin diseases. Treatment of anxiety and depression may lead to a better medical prognosis and well as a better quality of life.

For over three hundred years, physicians have suspected an interaction between the emotions and the course of diabetes mellitus. Studies have examined whether stressful events or psychiatric illness might precipitate either Type I (insulin-dependent) or Type II (Non-insulin dependent) diabetes. So far, study results are not conclusive.

Now that we have more accurate methods of measuring glucose control, it has become easier to measure both short-term and long-term effects of emotional factors on blood glucose level. One study found that children judged to have a "Type A" personality structure had an increased blood sugar elevation in response to stress. Children with a calmer disposition had a smaller glucose rise when stressed. (Stabler et al. 1987) A 1997 study suggested that Type I patients with a history of a psychiatric illness might be at increased risk for developing diabetic retinopathy. Those patients with a psychiatric history were found to have a higher average glycosylated hemoglobin. (a measure of long term diabetic control) (Cohen et al. 1997) Children whose relatives made more critical comments had significantly poorer glucose control. Interestingly enough, emotional overinvolvement between family members was not correlated with poor diabetic control. (Koenigsberg et al. 1993) Diabetic adolescents had a higher incidence of

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suicidal ideation than expected. Those with suicidal ideation took poorer care of themselves. Not living in a two-parent home was associated with poorer long-term diabetes control. (Goldston, et al. 1997)

Recent studies have suggested that effective treatment of depression can improve diabetic control. In a study by Lustman and colleagues, glucose levels were shown to improve as depression lifted. The better the improvement, the better the diabetic control. (Lustman et al. 1997a)

Being diagnosed with diabetes is a major life stress. It requires a large number of physical and mental accommodations. The individual must learn about a complex system of dietary and medical interventions. Lifestyle, work, and school schedules may have to be altered. This can consume a lot of energy for both the individual and his or her family. Just as important, are the psychological adjustments. One must adjust to a new view of oneself. For those who liked to see themselves as invincible, this may be particularly difficult.

Many newly diagnosed diabetics go through the typical stages of mourning. These are denial, anger, depression and acceptance.

- Denial: This can be one of the more dangerous stages of the grief process. It may not occur only once. Many individuals cycle back to this phase several times. The honeymoon phase, associated with early Type I diabetes, may reinforce denial. Denial is a common stance for adolescent diabetics.
- Anger: It really does seem unfair. The type II diabetic, trying to lose weight, may envy heavier people who seem to enjoy good health. One might erupt at someone who innocently offers a desert. Unfortunately, anger can drastically affect glucose levels.
- Depression: Mild depressive feelings are a normal part of grieving and adaptation. As long as they are not pervasive or prolonged, they may not be harmful. However, when the depression lasts a long time, becomes severe or interferes with diabetic management, one should seek prompt treatment.
- Acceptance: Individuals achieve different degrees of acceptance and inner peace. Some will need to experience the denial, anger and depression several times as they move through different phases of life and different stages of diabetes. Some people move through a chronic disease to a state of much greater self-knowledge. They may actually say that the diabetes was, in part, a blessing. Through their close attention to diet and exercise, and their close monitoring of stress levels, they have arrived at a deeper understanding of themselves and their relations to others. They realize that for all human beings, life is vulnerable and precious.

Often, individuals with depression do not realize that they are depressed. It is easy to attribute the symptoms of depression to the diabetes. This is particularly difficult since depressed diabetics may have poorer glucose control. Sometimes a spouse or close friend can give good feedback. However, medical professionals or mental health clinicians may be the best ones to determine what is the diabetes and what is due to depression. A psychiatrist has had medical training before specializing in mental health. He or she can sort out the diagnosis, communicate with your regular doctor and help coordinate the treatment of the depression with treatment of the diabetes.

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Symptoms of Depression:

These are based on the Diagnostic and Statistical Manual of the American Psychiatric Association, 4th Edition. (DSM-4)

- Depressed mood for most of the day
- Decreased pleasure in normal activities
- Difficulty sleeping or significantly increased need to sleep
- Weight loss or weight gain.
- Feelings of guilt or worthlessness
- Low energy level
- Difficulty making decisions or concentrating
- Suicidal thoughts

Treatment of Depression:

The most important starting point is an accurate diagnosis. There have been major advances in the treatment of depression. There are specific medications and specific psychotherapy techniques that have been shown to help depression. Often individuals do well with a combination of antidepressant treatment and psychotherapy. Be sure that your clinician is willing to take the time to communicate with your diabetes team. Ideally, the mental health clinician should be familiar with your type of diabetes.

Antidepressants: Today, we have a much wider variety of antidepressant medications than were available fifteen years ago. Because we have more medication choices, we can often minimize annoying side effects. The older tricyclic antidepressants can increase glucose levels in non-depressed diabetics. However, when depressed diabetics take them, diabetic control improves. (Lustman et al. 1996) Selective Serotonin Reuptake Inhibitors (SSRIs such as Prozac and Zoloft) are easier to administer and have fewer side effects, so they are more often used as the first line antidepressants. Sometimes they can cause decreased sexual desire. This may be a sensitive issue for some diabetics, especially those who have some sexual difficulty due to their diabetes. This is not a reason to avoid treatment. Keep an open dialogue with your psychiatrist. If the medication does affect sexual functioning, dose adjustment or a switch to another type of antidepressant can usually take care of the problem. Often, treatment of the depression can result in much better sexual functioning. Other types of antidepressants, such as Bupropion (Wellbutrin) or Venlafaxine (Effexor) add to our treatment options. Some people respond to the first medication. Other people may have to try several medications before they hit upon the right one.

Psychotherapy: Recently, researchers have made an effort to do good psychotherapy outcome studies. It turns out that several forms of psychotherapy really do work better than simple "tincture of time." Cognitive psychotherapy is one of the methods that has demonstrated good results for depression. In this type of therapy, the individual identifies thought patterns associated with a depressive, hopeless outlook. Frequently these thought patterns are based on erroneous assumptions about self and others. The therapist helps the patient monitor such thoughts and to replace them with more effective positive ways of thinking. Cognitive therapy can also be helpful in non-depressed individuals who are having trouble with their diabetic management.

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June 2000

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Anxiety and stress can also cause large jumps in blood glucose levels. Panic attacks may resemble hypoglycemic episodes and vice-versa. (When in doubt, treat it as hypoglycemia.) People respond differently to stressful situations. Given the same subjective level of stress, one diabetic may have a different glucose response from another. Because of this, one should monitor blood glucose more frequently during periods of stress. On the positive side, a conscientious diabetic may have a unique barometer of stress unavailable to the general population. There are a number of specific anxiety disorders that are treated differently. As with depression, there are specific medications and therapies that have been shown to work. If anxiety is severe, it is important to identify the specific type, so that one can embark on the right treatment. We will not cover all of these treatments in this article. The following are some general suggestions for dealing with stress and mild to moderate anxiety.

- Examine your lifestyle for sources of stress. Are there stressors that can be eliminated?
- Learn relaxation techniques. Yoga, meditation, prayer, and hypnosis may help.
- Make sure that you are getting enough sleep
- Exercise. The body's primitive stress response was designed to prepare the individual to fight or to run away. In our society, we do not usually respond to stress with physical activity. Exercise helps our bodies deal with the physiological results of stress.
- Make a list of the things that are worrying you. When you have a concrete list, the problems often look more manageable.

Many people do not like the idea that they may have emotional difficulties. Some find it easier to attribute everything to physical problems or life circumstances. However, good diabetic management is dependent on the development of self-knowledge. Many of the things that other people's bodies do automatically, diabetics must do consciously. This includes closer monitoring of both one's blood glucose and one's emotional state. Ultimately, the years of deliberately imitating nature's beautiful and complex feedback systems can lead to a greater understanding and appreciation of body and mind.

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More information on Diabetes: Diabetes at WebMD.com

No related posts.

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3 Herbs That Beat Anxiety

Doctors Reveal 1 Weird Compound to Calm Anxiety That May Surprise You.



Why Stress Turns Into Depression

How to prevent stress causing depression.

Post published by [Alice Boyes Ph.D.](#) on Mar 07, 2013 in [In Practice](#)



[Understanding \(/basics/empathy\) the psychological mechanisms of how stress \(<https://my.psychologytoday.com/blog/in-practice/201301/17-psychology-experts-share-their-best-stress-relief-tips>\) can lead to depression \(/conditions/depressive-disorders\)](#) can help you prevent it. This is especially important for people who have had a prior episode of [depression \(/basics/depression/depression-and-society\)](#) and would like to prevent relapse.

Direct Effects

[Stress \(/basics/stress\)](#) has direct effects on mood and early initial symptoms of lowered mood can include irritability, sleep disruption and [cognitive \(/basics/cognition\)](#) changes such as impaired [concentration \(/basics/attention\)](#). However, the indirect effects of stress are often what causes depression to take hold.

Indirect Effects

Stress Disrupts Person's Healthy Coping Strategies

When people experience stress, they often stop doing some of the healthy coping strategies that usually help keep their mood on track. Stress > lowered mood > person skips their typical types of healthy mood regulation strategies > more mood problems.

Example

- Stress at work > overworking > the person doesn't go to yoga class, go running, read before bed, or catch up with close friends as much.

~~Early Initial Low Mood Symptoms Consists Further Stress~~

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When a person is stressed and begins to experience some initial changes in their mood, these symptoms often generate further increased stress.

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Examples

- the person has an irritable outburst at work and gets a complaint, or
- impaired concentration results in a mistake (either major mistakes or just small mistakes like leaving something important at home and then needing to drive home to get it.)

Disrupted Relationships

Overworking, irritability, and withdrawal can all cause increased arguments. Someone who is absorbed by their own stress may become less emotionally available to their partner.

Especially when an individual has had problems with depression in the past, it can be frightening for partners to see signs that make them concerned that their loved one could be becoming depressed again. Sometimes partners start to think about leaving the relationship and then this becomes a major source of stress for the couple.



Increased Unhealthy Coping

Unhealthy coping can have direct effects on mood

e.g., excessive [alcohol \(/basics/alcohol\)](#) use > lower mood.

and/or indirect effects

e.g., excessive alcohol use > relationship problems > lower mood.

Avoidance coping increases both stress and anxiety. Learn more about [avoidance coping](#) (<http://www.psychologytoday.com/blog/in-practice/201303/why-avoidance-coping-is-the-most-important-factor-in-anxiety>) in this article. (<http://www.psychologytoday.com/blog/in-practice/201303/why-avoidance-coping-is-the-most-important-factor-in-anxiety>)

Disrupted Routines and Structure

Self-regulatory strength is like a mental muscle - using it helps keep it strong. Life stress and initial lowered mood often lead to people abandoning routines of eating and [sleeping \(/basics/sleep\)](#) at consistent times etc. This sometimes begins a slippery slope of under-regulation. Moreover, having consistent routines like regular eating helps regulate mood.

5 Practical Tips for Depression Prevention

- Become aware of what healthy coping strategies are important for maintaining your mood but tend to go out the window when you're stressed or overworking.
- Identify early warning signs that are a signal that you need to make some changes (such as noticing yourself getting irritable at work, or making repeated mistakes due to lack of concentration).
- Make a short list of things you could do when you notice the [early warning signs](#) (<http://www.aliceboves.com/plan-coping-with-low-mood-anxiety/>) (e.g., in response to noticing

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overworking you could start scheduling catch ups with friends for immediately after work so that you leave work on time).

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- Identify barriers to being able to implement your ideas when you're under stress. What could you do to overcome those barriers? e.g., "If I don't have money to go to dinner, I could arrange to meet friends for coffee."

- Your relationships are an important resource. What can you do to avoid straining them when you're stressed? (<https://my.psychologytoday.com/blog/in-practice/201301/17-psychology-experts-share-their-best-stress-relief-tips>)

Simple things can help e.g., making sure you say something positive before you say something negative when you first see your partner or roommates at the end of the day.

Having a therapist you can touch base with when your mood starts to go downhill can also help if your partner sometimes feels like they're the only one supporting you. If you book a booster session with your therapist, consider having your partner accompany you to the session so your therapist can get your partner's perspective.



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PubMed **Display Settings:** AbstractWorld J Biol Psychiatry. 2005;6 Suppl 2:5-22.**Can stress cause depression?**van Praag HM¹.**Author information****Abstract**

The central issue raised in this paper is: can stress cause depression? Phrased more precisely: can stress cause brain disturbances thought to underlie (certain forms of) depression or particular components of the depressive syndrome. Focussing on 5-HT and the stress hormones, this question was answered in the affirmative, based on the following two considerations: (1) changes in the 5-HT and stress hormone systems produced by sustained stress, mimic to a substantial extent the disturbances in these systems that may be observed in depression; (2) substantial evidence indicates that the 5-HT and stress hormone disturbances in depression are of pathophysiological significance and not merely a consequence of the depressed state or a product of stress generated by the depressed state. Furthermore, the question was raised whether a depression type could be identified particularly stress-inducible. This question, too, was answered in the affirmative. The depression type in question was named anxiety/aggression-driven depression and characterized on three levels: psychopathologically, biologically and psychologically. Preferential treatment of this depression type was discussed. In studying stress-inducible depression biological depression research should shift focus from depression per se to the neurobiological sequelae of stress. Treatment of stress-inducible depressions and particularly its prevention should be geared towards reduction of stress and stress sensitiveness, utilising both biological and psychological means.

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Stress and Depression

Can stress cause depression? WebMD looks at the link that exists between the two and helps you de-clutter your life to improve your stress level.

By Karen Bruno

WebMD Feature

Reviewed by Laura J. Martin, MD

WebMD Archive

Stress is good for you. It keeps you alert, motivated and primed to respond to danger. As anyone who has faced a work deadline or competed in a sport knows, stress mobilizes the body to respond, improving performance. Yet too much stress, or chronic stress may lead to major depression in susceptible people.

"Like email and email spam, a little stress is good but too much is bad; you'll need to shut down and reboot," says Esther Sternberg, MD, a leading stress researcher and the chief of neuroendocrine immunology and behavior at the National Institute of Mental Health.

Even positive events, such as getting married or beginning a new job, can be stressful and may lead to an episode of major depression. Yet about 10% of people suffer from depression without the trigger of a stressful event.

The Stress-Depression Connection

Stress -- whether chronic, such as taking care of a parent with Alzheimer's, or acute, such as losing a job or the death of a loved one -- can lead to major depression in susceptible people. Both types of stress lead to overactivity of the body's stress-response mechanism.

Sustained or chronic stress, in particular, leads to elevated hormones such as cortisol, the "stress hormone," and reduced serotonin and other neurotransmitters in the brain, including dopamine, which has been linked to depression. When these chemical systems are working normally, they regulate biological processes like sleep, appetite, energy, and sex drive, and permit expression of normal moods and emotions.

When the stress response fails to shut off and reset after a difficult situation has passed, it can lead to depression in susceptible people.

No one in life escapes event-related stress, such as death of a loved one, a job loss, divorce, a natural disaster such as an earthquake, or even a dramatic dip in your 401(k). A layoff -- an acute stressor -- may lead to chronic stress if a job search is prolonged.

Loss of any type is a major risk factor for depression. Grieving is considered a normal, healthy, response to loss, but if it goes on for too long it can trigger a depression. A serious illness, including depression itself, is considered a chronic stressor.

Stress and Depression: Lifestyle Factors

The connection between stress and depression is complex and circular. People who are stressed often neglect healthy lifestyle practices. They may smoke, drink more than normal, and neglect regular exercise. "Stress, or being stressed out, leads to behaviors and patterns that in turn can lead to a chronic stress burden and increase the risk of major depression," says Bruce McEwen, PhD, author of *The End of Stress as We Know It*.

Losing a job is not only a blow to self-esteem, but it results in the loss of social contacts that can buffer against depression.

Interestingly, many of the changes in the brain during an episode of depression resemble the effects of severe, prolonged, stress.

Stress and Depression: Building Resilience

Once someone is in the grip of major depression, it's usually not the best time to make lifestyle changes. But you can guard against a reoccurrence of depression or help protect against a first episode of depression by adopting lifestyle changes that modify the body's stress response. Building resilience is particularly important if you are experiencing chronic stress, such as unemployment.

The following lifestyle changes can help reduce stress levels and boost your resilience, reducing the risk of depression:

- 1. Exercise:** Experts recommend a half-hour of moderate exercise, such as walking or swimming five days a week. "Running a marathon is not what you want to do," says Sternberg. Exercise produces chemicals in the body that boost your mood and stimulate hormones and neurotransmitters, including endorphins, that can help reduce stress.

- 2. Strong, supportive relationships:** Isolation is a risk factor for depression, while community buffers people from the effects of adversity. Negative, critical relationships are harmful.
- 3. Yoga, meditation, prayer, psychotherapy:** Studies have shown that these practices can be helpful, "retraining your brain circuits," says Sternberg. "They have a positive effect on the emotional brain circuits."
- 4. Eating well and not drinking too much alcohol.** People who feel stressed may drink too much; alcohol is a known mood suppressor.
- 5. Making time for yourself.** Schedule some downtime to pursue creative pursuits or a hobby. Today's harried, multitasking life is stressful. If possible, schedule mini-vacations; longer breaks of at least 10 days have been shown to be more beneficial in reducing stress.

Stress and Depression: Building Resilience continued...

- 6. Sleep.** People who are working overtime, or juggling family and work, may not be getting eight hours of restful sleep.
- 7. Cognitive-behavioral therapy.** This type of therapy helps people reframe events in a more positive fashion. Negative attitudes and the tendency to worry can amplify the impact of stress.

"It's important that people suffering from depression not blame themselves -- it's partly your genetic makeup, partly your current environment, and partly your early environment that led to the depression," says Sternberg. "If you're depressed, seek help. You can't beat it on your own."

SOURCES:

Esther M. Sternberg, MD, chief, section on neuroendocrine immunology and behavior; director, Integrative Neural Immune Program, National Institute of Mental Health.

Bruce McEwen, PhD, Harold and Margaret Milliken Hatch Laboratory of Neuroendocrinology, the Rockefeller University.

Carmine M. Pariante, Institute of Psychiatry, King's College, Neuroendocrinology Briefings, "Depression, Stress and the Adrenal Axis."

The Dana Foundation, Washington, D.C.

www.abc.net.au: "The End Of Stress As We Know It."

Reviewed on April 12, 2011

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My Notes:

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Further Reading:

The Truth About
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Military Families & Autism:
Fun Activities for Autistic Kids

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What Is The Connection Between Stress And Anxiety Disorders?

Redford Williams, M.D., Professor of Medicine & Director, Behavioral Medicine Research Center, Duke University

Question: What is the connection between stress and anxiety disorders?

Answer: Yes. Stress can precipitate the development of anxiety disorders. The most extreme example is posttraumatic stress disorder. You know, a major stressor has hit -- 9/11 and you're in the building, but you get out; an automobile accident; a major medical event; a heart attack; an earthquake. Major events that happen to you that are very life threatening and would be traumatic for anyone can lead to an anxiety disorder called posttraumatic stress disorder.

And if you find yourself continuing to have flashbacks and memories of the event, if you find yourself becoming afraid to go out and in public, if you find yourself not able to sleep so well, if you find yourself feeling nervous every time you think about the event that happened, and that lasts for a long time -- more than two or three weeks, and continues -- then you have a very specific disorder known as posttraumatic stress disorder.

On the other hand, there are other anxiety disorders, generalized anxiety disorder, that affects many people which can be made worse by stress. But these are people who are just more sensitive to the daily stresses that we all experience.

And so, there are many anxiety disorders ranging from the very specific particular posttraumatic to the generalized anxiety disorder. And all of these are made worse by stress. In the case of the posttraumatic stress disorder, a major stressor actually causes it. In the case of other kinds of anxiety disorders, they are made worse by stress.

Next: [What Is The Connection Between Stress And Depression?](#)

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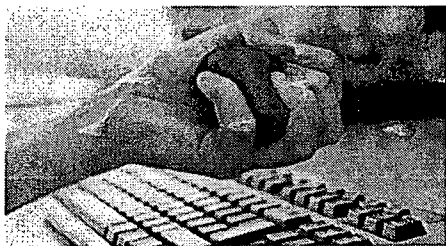
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Struggling with stress?

What is stress?

Stress is the feeling of being under too much mental or emotional pressure.

Pressure turns into stress when you feel unable to cope. People have different ways of reacting to stress, so a situation that feels stressful to one person may be motivating to someone else.



Many of life's demands can cause stress, particularly work, relationships and money problems. And, when you feel stressed, it can get in the way of sorting out these demands, or can even affect everything you do.

Stress can affect how you feel, think, behave and how your body works. In fact, common signs of stress include sleeping problems, sweating, loss of appetite and difficulty concentrating.

You may feel anxious, irritable or low in self esteem, and you may have racing thoughts, worry constantly or go over things in your head. You may notice that you lose your temper more easily, drink more or act unreasonably.

You may also experience headaches, muscle tension or pain, or dizziness.

Stress causes a surge of hormones in your body. These stress hormones are released to enable you to deal with pressures or threats – the so-called “fight or flight” response.

Once the pressure or threat has passed, your stress hormone levels will usually return to normal. However, if you're constantly under stress, these hormones will remain in your body, leading to the symptoms of stress.

Managing stress in daily life

Stress is not an illness itself, but it can cause serious illness if it isn't addressed. It's important to recognise the symptoms of stress early. Recognising the signs and symptoms of stress will help you figure out ways of coping and save you from adopting unhealthy coping methods, such as drinking or smoking.

Spotting the early signs of stress will also help prevent it getting worse and potentially causing serious complications, such as high blood pressure.

There is little you can do to prevent stress, but there are many things you can do to manage stress more effectively, such as learning how to relax, taking regular exercise and adopting good time-management techniques.

Studies have found that mindfulness courses, where participants are taught simple meditations across a series of weeks, can also help to reduce stress and improve mood.

Read more about mindfulness.

When to see your GP about your stress levels

If you've tried self-help techniques and they aren't working, you should go to see your GP. They may suggest other coping techniques for you to try or recommend some form of counselling or cognitive behavioural therapy.

If your stress is causing serious health problems, such as high blood pressure, you may need to take medication or further tests.

Mental health issues, including stress, anxiety and depression, are the reason for one-in-five visits to a GP.

Recognising your stress triggers

If you're not sure what's causing your stress, keep a diary and make a note of stressful episodes for two-to-four weeks. Then review it to spot the triggers.

Things you might want to write down include:

- the date, time and place of a stressful episode
- what you were doing
- who you were with

- how you felt emotionally
- what you were thinking
- what you started doing
- how you felt physically
- a stress rating (0-10 where 10 is the most stressed you could ever feel)

You can use the diary to:

- work out what triggers your stress
- work out how you operate under pressure
- develop better coping mechanisms

Doctors sometimes recommend keeping a stress diary to help them diagnose stress.

Take action to tackle stress

There's no quick-fix cure for stress, and no single method will work for everyone. However, there are simple things you can do to change the common life problems that can cause stress or make stress a problem. These include relaxation techniques, exercise and talking the issues through.

Find out more by checking out these [10 stress busters](#).

Get stress support

Because talking through the issues is one of the key ways to tackle stress, you may find it useful to attend a stress management group or class. These are sometimes run in doctors' surgeries or community centres. The classes help people identify the cause of their stress and develop effective coping techniques.

Ask [your GP](#) for more information if you're interested in attending a stress support group. You can also use the search directory to find emotional support services in your area.

Read how 'workaholic' Arvind learned to [deal with stress](#).

Page last reviewed: 17/07/2014

Next review due: 17/07/2016

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Stress

Stress results when something causes your body to

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behave as if it were under attack. Sources of stress can be physical, like injury or illness. Or they can be mental, like problems in your marriage, job, health, or finances.

When stress occurs, the body prepares to take action. This preparation is called the fight-or-flight response. In the fight-or-flight response, levels of many hormones shoot up. Their net effect is to make a lot of stored energy — glucose and fat — available to cells. These cells are then primed to help the body get away from danger.

In people who have diabetes, the fight-or-flight response does not work well. Insulin is not always able to let the extra energy into the cells, so glucose piles up in the blood.

How Stress Affects Diabetes

Many sources of stress are long-term threats. For example, it can take many months to recover from surgery. Stress hormones that are designed to deal with short-term danger stay turned on for a long time. As a result, long-term stress can cause long-term high blood glucose levels.

Many long-term sources of stress are mental. Your mind sometimes reacts to a harmless event as if it were a real threat. Like physical stress, mental stress can be short term: from taking a test to getting stuck in a traffic jam. It can also be long term: from working for a demanding boss to taking care of an aging parent. With mental stress, the body pumps out hormones to no avail. Neither fighting nor fleeing is any help when the "enemy" is your own mind.

In people with diabetes, stress can alter blood glucose levels in two ways:

People under stress may not take good care of themselves. They may drink more alcohol or exercise less. They may forget, or not have time, to check their glucose levels or plan good meals.

Stress hormones may also alter blood glucose levels directly.

Scientists have studied the effects of stress on glucose levels in animals and people. Diabetic mice under physical or mental stress have elevated glucose levels. The effects in people with type 1 diabetes are more mixed. While most people's glucose levels go up with mental stress, others' glucose levels can go down. In people with type 2 diabetes, mental stress often raises blood glucose levels. Physical stress, such as illness or injury, causes higher blood glucose levels in people with either type of diabetes.

It's easy to find out whether mental stress affects your glucose control. Before checking your glucose levels, write down a number rating your mental stress level on a scale of 1 to 10. Then write down your glucose level next to it. After a week or two, look for a pattern. Drawing a graph may help you see trends better. Do high stress levels often occur with high glucose levels, and low stress levels with low glucose levels? If so, stress may affect your glucose control.

Reducing Mental Stress

Making Changes

You may be able to get rid of some stresses of life. If traffic upsets you, for example, maybe you can find a new route to work or leave home early enough to miss the traffic jams. If your job drives you crazy, apply for a transfer if you can, or possibly discuss with your boss how to improve things. As a last resort, you can look for another job. If you are

at odds with a friend or relative, you can make the first move to patch things up. For such problems, stress may be a sign that something needs to change.

There are other ways to fight stress as well:

- Start an exercise program or join a sports team.

- Take dance lessons or join a dancing club.

- Start a new hobby or learn a new craft.

- Volunteer at a hospital or charity.

Coping Style

Something else that affects people's responses to stress is coping style. Coping style is how a person deals with stress. For example, some people have a problem-solving attitude. They say to themselves, "What can I do about this problem?" They try to change their situation to get rid of the stress.

Other people talk themselves into accepting the problem as okay. They say to themselves, "This problem really isn't so bad after all."

These two methods of coping are usually helpful. People who use them tend to have less blood glucose elevation in response to mental stress.

Learning to Relax

For some people with diabetes, controlling stress with relaxation therapy seems to help, though it is more likely to help people with type 2 diabetes than people with type 1 diabetes. This difference makes sense. Stress blocks the body from releasing insulin in people with type 2 diabetes, so cutting stress may be more helpful for these people. People with type 1 diabetes don't make insulin, so stress reduction doesn't have this effect. Some people with type 2 diabetes may also be more sensitive to some of the stress hormones. Relaxing can help by blunting this sensitivity.

There are many ways to help yourself relax:

Breathing exercises

Sit or lie down and uncross your legs and arms. Take in a deep breath. Then push out as much air as you can. Breathe in and out again, this time relaxing your muscles on purpose while breathing out. Keep breathing and relaxing for 5 to 20 minutes at a time. Do the breathing exercises at least once a day.

Progressive relaxation therapy

In this technique, which you can learn in a clinic or from an audio tape, you tense muscles, then relax them.

Exercise

Another way to relax your body is by moving it through a wide range of motion. Three ways to loosen up through movement are circling, stretching, and shaking parts of your body. To make this exercise more fun, move with music.

Replace bad thoughts with good ones

Each time you notice a bad thought, purposefully think of something that makes you happy or proud. Or memorize a poem, prayer, or quote and use it to replace a bad thought.

Whatever method you choose to relax, practice it. Just as it takes weeks or months of practice to learn a new sport, it takes practice to learn relaxation.

Dealing with Diabetes-Related Stress

Some sources of stress are never going to go away, no matter what you do. Having diabetes is one of those. Still, there are ways to reduce the stresses of living with diabetes. Support groups can help. Knowing other people in the same situation helps you feel less alone. You can also learn other people's hints for coping with problems. Making friends in a support group can lighten the burden of diabetes-related stresses.

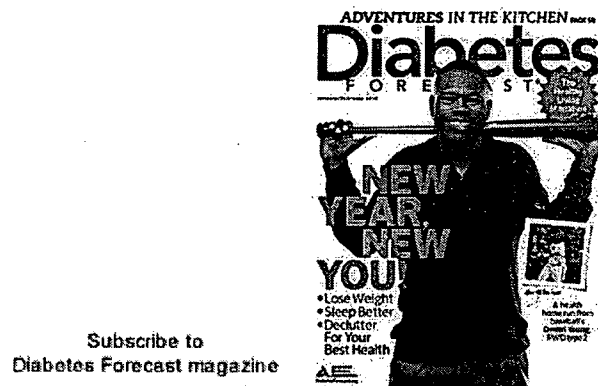
Dealing directly with diabetes care issues can also help. Think about the aspects of life with diabetes that are the most stressful for you. It might be taking your medication, or checking your blood glucose levels regularly, or exercising, or eating as you should.

If you need help with any of these issues, ask a member of your diabetes team for a referral. Sometimes stress can be so severe that you feel overwhelmed. Then, counseling or psychotherapy might help. Talking with a therapist may help you come to grips with your problems. You may learn new ways of coping or new ways of changing your behavior.

Last Reviewed: June 7, 2013

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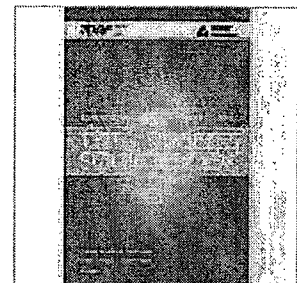
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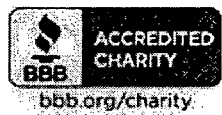
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Diseases and Conditions

Diabetes

Living with diabetes blog

Stress, illness and high blood sugar

By Nancy Klobassa Davidson, R.N. and Peggy Moreland, R.N. | April 3, 2013

A number of you have mentioned that your blood sugar runs higher when you are ill or under stress.

Illness or stress can trigger high blood sugars because hormones produced to combat illness or stress can also cause your blood sugar to rise.

People who do not have diabetes can make enough extra insulin to keep their blood sugar in a normal range during times of stress and illness. People with diabetes may need to take extra diabetes medication to keep their blood sugar near normal during times of illness or stress. If you haven't been given special instructions on how to manage your diabetes medications during illness, please contact your healthcare provider for advice.

Sometimes you may need to be a detective. Here are some possible causes of high blood sugars:

- Not enough insulin or oral diabetes medication
- Eating or drinking more carbohydrate than usual
- Less activity or exercise than usual
- Illness or infection (cold, urinary tract infection, heart attack)
- Injury or surgery
- Pain
- Positive stress (wedding or vacation) or negative stress (a death in the family)

- Any change in your normal daily routine
- Certain medications
- Poor absorption of insulin at injection sites
- Insulin pump, insulin pen or meter (device issues)
- Bad insulin (outdated insulin or insulin that has been exposed to extreme temperatures)

In rare incidences, stress can cause blood sugars to drop low.

Make sure you know the symptoms of high blood sugar.

Early signs/symptoms	Later signs/symptoms
Increased thirst	Fruity-smelling breath
Increased urination	Nausea and/or vomiting
Fatigue	Abdominal pain
Blurred vision	Rapid breathing
	Weakness
	Confusion
	Unconsciousness

When to contact your healthcare provider:

- You notice symptoms of high blood sugars
- Ongoing diarrhea or vomiting for more than 24 hours — or sooner if you're becoming dehydrated
- Fever that lasts more than 24 hours
- Blood sugar readings greater than 250 mg/dl (13.9 mmol/L) for more than 24 hours during illness
- If you have been instructed to check urine ketones and they are present (type 1 diabetes)

Call the emergency department if you experience any of the later signs and symptoms of high blood sugar.

Please share your experiences. Thanks.

- Nancy

With

Nancy Klobassa Davidson, R.N.

Peggy Moreland, R.N.

Apr. 03, 2013

Original article: <http://www.mayoclinic.org/diseases-conditions/diabetes/expert-blog/diabetes-blog/BGP-20056560>

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Stress and Diabetes

Stress, both physical and mental, can send your blood sugar out of whack. If you have diabetes, try these tips to keep stress under control.

WebMD Feature

Reviewed by Louise Chang, MD

WebMD Archive

It's hard to dispute that most of us live life at breakneck speed. It's the nature of a fast-paced society, where numerous family, social, and work obligations can easily overpower your precious time and resources. But for people with diabetes, both physical and emotional stress can take a greater toll on health.

When you're stressed, your blood sugar levels rise. Stress hormones like epinephrine and cortisol kick in since one of their major functions is to raise blood sugar to help boost energy when it's needed most. Think of the fight-or-flight response. You can't fight danger when your blood sugar is low, so it rises to help meet the challenge. Both physical and emotional stress can prompt an increase in these hormones, resulting in an increase in blood sugars.

People who aren't diabetic have compensatory mechanisms to keep blood sugar from swinging out of control. But in people with diabetes, those mechanisms are either lacking or blunted, so they can't keep a lid on blood sugar, says David Sledge, MD, medical director of diabetes management at The Ochsner Clinic Foundation in Baton Rouge, La. When blood sugar levels aren't controlled well through diet and/or medication, you're at higher risk for many health complications, including blindness, kidney problems, and nerve damage leading to foot numbness, which can lead to serious injury and hard-to-heal infections. Prolonged elevated blood sugar is also a predecessor to cardiovascular disease, which increase the risk of heart attacks and strokes.

Diabetic and On Insulin? Take a Quality of Life Quiz.

"In diabetes, because of either an absolute lack of insulin, such as type 1 diabetes, or a relative lack of insulin, such as type 2, there isn't enough insulin to cope with these hormones, so blood sugar levels rise," says Richard Surwit, PhD, vice chairman of the department of psychiatry and behavioral sciences at Duke University Medical Center and author of *The Mind Body Diabetes Revolution*.

Anything upsetting like going through a breakup or being laid off is certainly emotionally draining. Being down with the flu or suffering from a urinary tract infection places physical stress on the body. It's generally these longer-term stressors that tax your system and have much more effect on blood sugar levels.

The problem may be compounded because under these pressures, you may lose your appetite and skimp on eating, or reach for not-so healthy quick fixes like candy or chips. Some people actually "stress eat" (overeats during stressful periods). Others skip their daily workout because they're too strained or run down to keep it up, which can create a vicious cycle since exercise is an excellent way to lower blood sugar.

Stress-O-Meter

"The most important thing is to learn what it feels like when stress hormones are elevated," Sledge tells WebMD. For some diabetic people, prolonged illness or distress will keep their blood sugar levels up for lengthy periods of time. Often insulin will be needed or adjusted during this period, so recognizing periods of stress is crucial for people with diabetes.

Since stress has virtually become a way of life, you may not even notice you're frazzled. A lot of people will identify stressors such as an illness in the family (something large) but may not recognize the stress of the holidays or a hectic time at work (something smaller or shorter in duration). Being in tune to your stress level and how you feel when the going gets tense is important. One good gauge is writing down your stress level in a journal each time you check your blood sugar. Many glucose meters have the capability to enter personal notes and data when you perform checks, or jot it down in a stress journal. "Once you begin recording stress levels, most people with diabetes figure out pretty quickly what makes their blood sugar go up," says Surwit.

Learn to De-stress

"Stress plays a more direct role in the control of blood sugar than it does in any other disease," Surwit tells WebMD. People with diabetes should stay conscious of eating well and exercising regularly. It's a good idea to check blood glucose levels more frequently when you're ill or under stress and to drink plenty of fluids as so as not to get dehydrated.

"A lot of patients can easily tell if their sugar is up by the way they feel or how much pressure they're currently under," says Paula Butler, chief of endocrinology and head of the diabetes program at Mt. Sinai hospital in Chicago. Butler frequently hears patients explain why their blood sugar is high when they

come in for an appointment -- everything from a fight with a spouse to missing the bus that morning is fodder for a rise in the numbers.

Learn to De-stress continued...

Once you've pinpointed your stressors and notice which ones send your blood sugar levels soaring, you'll need to devise some ways to chill out. What helps keep stress under wraps? Anything that relaxes you.

- Take up yoga, meditation, or deep breathing.
- Try progressive relaxation therapy, in which you practice tensing and relaxing major muscle groups in sequence. A study published in the journal *Diabetes Care* showed that just five weekly sessions of a relaxation therapy can reduce blood sugar levels significantly.
- Learn cognitive behavior therapy. In addition to learning to relax, this therapy helps you re-evaluate what is worthy of your aggravation in the first place by helping you change your behavior and teaching you to view life through more appropriately colored glasses, says Surwit.
- Talk to a therapist. Talking about your problems is a reliable way to alleviate the stress that stems from them.
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Originally published Dec. 6, 2004.

Medically updated July 2006.

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Stress and Diabetes

Stress, both physical and mental, can send your blood sugar out of whack. If you have diabetes, try these tips to keep stress under control.

By Jennifer Nelson
WebMD Feature

Reviewed By Brunilda Nazario, MD

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Stress and Diabetes

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Topic Overview

When you have diabetes, stress can cause your blood glucose levels to change rapidly and unexpectedly.

Stress can affect your body's blood glucose levels in two ways.

- It changes the way your body handles insulin.
- It can cause you to change the way you take care of yourself.

Stress can be mental or physical. Each type of stress causes a similar chemical reaction in your body. For some people with diabetes, exercising can offer enough stress release that they do not need to take other steps. But other people need to try additional ways of managing their stress.

Controlling emotional stress

Many people have difficulty controlling emotional stress, which can be brought on by many situations, such as a fight with a loved one, taking care of an aging parent, worrying about the future, or a difficult job situation.

Develop coping strategies that allow you to control how "stressed out" you get. This can be accomplished in many ways.

- For some people, it helps to put the problem in perspective: Is this problem really that big a deal?
- For others, taking action to fix the problem can reduce stress.
- For still others, removing themselves from the stressful situation is the only way they can reduce it. This may mean transferring positions in a company or changing jobs.

Whatever your preferred method for controlling emotional stress, it may be helpful to seek the advice of professionals. Mental health professionals, including psychiatrists, clinical psychologists, licensed counselors, and social workers, can help you recognize the unhealthy ways that you deal with emotional stress and help you develop more constructive patterns.

Controlling physical stress

You cannot always avoid physical stress. At some point you are likely to be ill or experience some type of injury. In these cases, it is very important to either seek medical attention or monitor your condition closely. You should also take care not to overexert yourself.

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3 ways stress affects diabetes

Staying cool under pressure is an important part of managing your blood sugar. Here are three surprising ways stress affects diabetes, and how to keep it under control

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Eating right and getting your body in motion every day are pillars of any program for managing diabetes or losing weight. A third element that may be just as important is getting a handle on stress.

Research is now beginning to reveal just how important stress management is when it comes to diabetes. One study, at Duke University in Durham, North Carolina, found that when people used easy relaxation techniques, they dropped their A1C numbers

(an indication of blood sugar levels over a period of several months) significantly. In fact, about a third of the volunteers lowered their A1C levels by one percent or more after a year—an effect on a par with that of diabetes drugs. And those results were beyond what they gained through diet and exercise.

Here are three ways that stress can impact your diabetes, and how to keep it in check.

1. Stress hormones raise blood sugar

Why does taming tension bring blood sugar down? A number of factors appear to be at work. First, **when you're on edge, your body pumps out stress hormones, such as cortisol, to help you react to danger** (part of the "fight or flight" response). Among other things, these hormones make your heartbeat and breathing speed up. They also send glucose stores into the blood to make energy immediately available to your muscles. The result: higher blood sugar.

2. Stress contributes to insulin resistance

That's bad enough when you have diabetes, but there's more: **Stress hormones also make it more difficult for the pancreas to secrete the insulin that's needed to move glucose out of the blood.** Some of these hormones may also contribute to insulin resistance—a triple whammy.

3. Stress leads to weight gain

A major reason to keep chronic stress in check is that cortisol is known to increase appetite. **Yes, that's right: Stress makes you eat more.** It also encourages cells in your abdomen to conserve fat—in other words, it packs on the belly weight that seriously raises your risk of a heart attack. Regularly practicing our relaxation methods will help lower your levels of stress hormones to reverse this trend. It should also help you stick to your eating and exercise goals.

Think about it: When you're stressed, you're probably tempted to chow down on whatever fatty, high-calorie snacks are in reach. You're also less likely to stop and think about hitting the pavement for a nice, long walk when you're busy fretting over deadlines, family problems, or that fight with your spouse. **When you practice the art of relaxation, you'll step back and see the big picture, and your true priorities—including taking care of your body—will emerge.** Mastering stress has other beneficial "side effects." Specifically, it helps ward off emotional problems that are linked with poor blood sugar control, particularly depression and anger.

Track your sugar—and your stress level

7 tips for living well with diabetes
6 tips on travelling with diabetes
6 tips for exercising when you have diabetes

Studies find that stress affects blood sugar differently from one person to the next. How do your sugar levels change when you're all charged up? To find out, each time you check your glucose level, rate how stressed you feel at that moment on a scale of 1 to 10, with 1 being a sunny day at the beach and 10 being the worst day of your life. Write the number down next to your reading. After two weeks, look at the numbers together (plotting them on a graph can help) to see how much your blood sugar swings in response to various levels of stress.

Looking for more tips on managing your diabetes? Check out *All-New, All-Natural Approach to Beating Diabetes*, available now in the Best Health Store.
Excerpted from All-New, All-Natural Approach to Beating Diabetes

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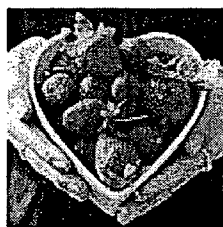
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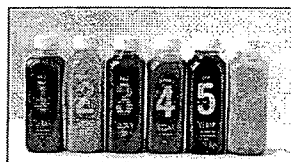


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How Stress Affects Blood Sugar Levels

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Two types of stress can change blood sugar levels:

- Physical stress
- Mental or emotional stress

Each type of stress affects blood sugar levels differently. Physical stress generally causes blood sugar levels to increase. Physical stress includes:

- Illness
- Surgery
- Injury

Mental or emotional stress has mixed effects, depending on the type of diabetes you have:

- **Type 1 diabetes:** Mental stress can increase or decrease blood sugar levels.
- **Type 2 diabetes:** Mental stress generally increases blood sugar levels.

Stress also can affect your blood sugar levels indirectly by causing you to forget about your regular diabetes care routine. When you're stressed out, you might:

- Exercise more or less
- Eat more or less
- Eat less healthy foods
- Not test your blood sugar level as often
- Forget or delay a dose of medication and/or insulin



Mental Stress Can Affect Your Blood Sugar Levels

Use your diabetes logbook to discover if mental stress affects your blood sugar levels, especially if you have type 2 diabetes. Some people with type 2 diabetes are very sensitive to stress. It causes the body to produce especially high levels of stress hormones, which drive blood sugar levels up.

Follow these steps to find out if your blood sugar levels are affected by mental stress:

1. Rate your stress level on a scale of 1 to 10, where 1 indicates the lowest stress level and 10 the highest; record your stress level in your logbook.
2. Test your glucose using your home monitor and enter the result.
3. After a week or two, study your results to see if there is a pattern or relationship between your stress level and your blood sugar levels.

3 Ways to Reduce Mental Stress

- Teach yourself to relax when under stress using deep-breathing exercises or techniques you learn in a stress-management class.
- Evaluate your schedule and determine if you can make changes to relieve stress.
- Exercise regularly



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Diabetes Quick Tip

Overeating between meals? Get active! Go for a walk, run an errand, or get involved in another activity that keeps your mind and body busy.



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How Stress Affects Blood Sugar Levels

Stress causes blood sugars to rise. This is due to the fact that hormones, such as epinephrine and cortisol, boost energy by raising blood sugars whenever the body requires extra exertion. Any stressor or stress-related event raises these hormones, thus causing blood sugars to rise as well.

Stress and Diabetics

In non-diabetics, the body is able to keep blood sugar levels from getting out of control. Diabetes prevent the body from counteracting dangerously high levels of blood sugar caused by stress. Stress can come from anywhere. Emotional distress and physical stress caused by illnesses or infections can raise the level of blood sugar in a diabetic. Long-term stressors, such as depression, though, have a far greater effect on diabetes, making it more difficult for a diabetic to manage her disease.

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Depression and Diabetes

Depression can actually be dangerous to diabetics because of its long-term effects in keeping stress levels high. According to Carol E. Watkins, M.D., depression is higher among diabetics than the general population. Watkins also notes, "There is some suggestion that the stress of depression itself may lead to hyperglycemia in diabetics." A number of studies, she suggests, point out the correlation between stress levels and diabetes, including a 1997 study that suggests that "Type I patients with a history of psychiatric illness might be at increased risk for developing diabetic retinopathy" and that patients with a psychiatric history have a higher than average glycosylated hemoglobin, which is "a measure of long-term diabetic control."

Effects of Stress on Diabetic's Lifestyle

The compacted effects of stress on diabetes are due to the emotional and psychological problems preventing diabetics from managing their illness more effectively. People who deal with short- and long-term stressors often have a loss of

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appetite or engage in unhealthy eating patterns, usually snacking on unhealthy foods or overeating to relieve stress or depression, and discontinue exercising. These lifestyle changes, along with the actual stressors, help raise blood sugar levels that seriously impact a diabetic's health.

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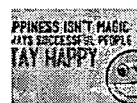
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How Does Stress Affect Diabetes?

Published February 21, 2012 | NewsCore

Diabetes can be stressful on its own, but as [luck](#) would have it, the stress itself may worsen your diabetes. Here is [a](#) guide to help you understand how stress can affect [your](#) diabetes.

Stress

According to the U.S. Department of Health and Human Services, some of the most common causes of stress include: the death of a loved one, divorce or marital separation, job loss, major injury or illness, marriage, pregnancy, retirement and incarceration. Many of these stressful events are major life changes that will affect almost everyone in the short or long run. Whether long-term or short-term, stress causes a number of physical reactions that can be harmful to your health, especially if you have diabetes.

Fight-or-flight response

When you are under any sort of stress, whether emotional or physical, you typically feel as if your body is under attack. As a result, your body starts getting ready for some action, and you will fight or flee to safety. Known as the fight-or-flight response, this prehistorical instinct is a natural response to perceived danger. When you feel forced into a corner, your hormone levels escalate and your entire body goes into overdrive. To support this exertion, your body accesses its energy stores of glucose and fat. For people who have diabetes, this sudden release of glucose can increase blood sugar levels and cause health complications.

Direct effects

By tapping into your glucose stores during the fight-or-flight response, stress can affect blood sugar directly. According to the American Diabetes Association (ADA), stress creates different responses between type 1 and type 2 diabetes. When faced with mental stress, people with type 2 diabetes typically see an increase in blood glucose levels. People with type 1 diabetes show more mixed responses, as some individuals see their blood glucose levels drop when feeling mental stress. In physically stressful situations, people with either type of diabetes will experience elevated blood glucose levels.

To examine the effects of mental stress on your blood sugar level, the ADA recommends performing a small test. Before performing your routine check for glucose levels, rate your mental stress level on a scale of one to 10. Record your glucose level alongside your mental stress rating. Keep an eye out for any emerging patterns. For example, if the numbers tend to both increase at the same time, a high level of mental stress may be causing higher blood glucose levels.

Peripheral effects

Stress can cause behavioral changes that affect your diabetes. Stress can distract you from taking care of your health. You may feel more forgetful, preoccupied or simply too busy to monitor your glucose levels closely. Some people who experience stress might drink alcohol or compulsively eat to cope, which can have serious effects on blood glucose levels. These effects can be particularly malevolent if long-term stress develops into depression. Stress may also affect other health conditions, including heart diseases, autoimmune disorders and digestive problems.

Coping with stress

Effective stress management is different for everyone. Daily exercises can help curb the immediate fight-or-flight response. Such exercises include meditation, breathing exercises and physical relaxation exercises. Progressive relaxation therapy is a popular technique for relieving stress. You simply tense individual muscle groups then release them, repeating the process for your whole body. Long-term stress relief might require large-scale lifestyle changes. Depending on the situation, chronic stress may be alleviated through counseling or therapy, changes in daily diet or a regular exercise routine.

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Stress and Diabetes

Stress and high blood sugar are connected, so your ability to manage stress plays a big role in managing your diabetes.

Sources of Stress

Our stress comes from two main places:

- External sources: such as demanding jobs, problematic relationships, negative people, and financial problems
- Internal sources: how we perceive and respond to these and other events. Let's take a closer look at both and see how these affect your ability to manage diabetes.

The Connection Between Stress and Blood Sugar

When you are under stress, your body works overtime to help you cope. One of the ways it does this is to release hormones, such as epinephrine and adrenaline, both which give you added energy and concentration. But, in addition to the hormones, your body also releases glucose (sugar) from your liver, muscles and stored fat reserves. This bodily response to stress is called the "fight or flight" response.

For example, if you needed to fight off or run away from a angry bear, these hormones and extra glucose would give you an enhanced ability to do so. In the process of running or fighting the bear you would use up the hormones and glucose and your body would quickly regain an internal balance.

But short, acute situations like the bear scenario are not our main source of stress. The stress that plagues most of us is chronic stress; the kind that goes on for days and weeks.

The same "fight or flight" stress response occurs with chronic stress as in acute stress. The difference is that we keep it turned on perpetually for long periods of time because we feel an ongoing anxiety about our finances, jobs, health and people we love. Chronic stress is not healthy for anyone but it is especially troublesome for people with diabetes because you do not need the additional glucose being continually released into your bloodstream. This glucose is in addition to what you take in from food.

What is Stress?

Stress is a response produced by your body when you are subjected to various types of demand, whether physically, mentally, or emotionally. Contrary to what most people believe, stress is not associated with the negative only since excessive positive emotions can result to stress as well. When something that takes place or is about to take place in the environment is producing stress in a person's body and you feel some of the symptoms of stress, it results into the release of certain chemicals into your bloodstream.

On the positive side, these chemicals can be utilized to produce more energy or added strength. This is helpful when the cause of your stress is something physical. But when you are dealing with emotional stress, it can cause a negative effect on your body since there is no outlet for releasing that extra boost of energy and strength. Therefore, stress results to various types of emotional or physical responses because each individual's body respond differently to the stimulus.

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Types and Causes of Stress

Whether you admit it or not, stress is a part of everyday life. Whether you are at school, at the office, or just about anywhere you are forced to deal with people and the environment. Hence, the types of stress is closely associated with its cause. And because your physical body is closely connected to your emotional and mental state, you will notice some connection to their effects when you begin to experience stress. This is also the reason why it is important to combat the cause of stress since it affects several vital aspects of your body in order to function.

Here are some of the most common sources of stress that must be dealt with on an everyday basis.

Internal Stress: There are times when you constantly worry about certain events without having enough control to determine its outcome. Internal stress is also one of those kinds of stress that needs to be addressed quickly. Most of the source of stress is rooted in the person's mind, which makes it difficult to manage and would entail more work to get rid of. Oftentimes, people suffering from internal stress subconsciously puts themselves in stressful situations or feel stressed out about things that aren't stressful to begin with.

Survival Stress: This type of stress deals with the danger, mostly physical, that an individual is subjected to. It can be prompted by an attack made by either human or animal that could potentially hurt you in the process. Therefore, your body releases this burst of energy that you need to utilize to respond quickly about the situation at hand whether to confront it or escape from it.

Environmental Stress: This type of stress is your body's way of responding to changes or activities in your environment that could produce stress, such as extreme levels of noise or pressure from work. As compared to the other types of stress already mentioned above, this one is a lot easier to deal with. The best way to get started combating this stress type is to determine the source. Once you have identified the source of environmental stress, find a way to avoid them.

Stress Due To Work and Fatigue: Another common type of stress and probably the most prevalent. This one though does not happen in an instant, but rather builds up over time. When you are spending too much time working or forced to deal with excessive amount of work, then it can take its toll on your body. To deal with work stress, you need to make sure you have enough rest and relaxation in between so your body can recover from the tremendous amount of work. There are relaxation methods that you can apply in order to find relief from stress.

Stress Management: Learn to Control What You Can

It's not realistic to think you can avoid stress completely. There are some things over which you don't have complete control: roofs occasionally leak, jobs can be a hassle, relationships can end and investments sometimes go down in value.

Worrying about things you have no or limited control over is not your best strategy for your overall health or for managing your diabetes. Instead, focus on managing your response to these kinds of events. You have the ability to control your attitude, help calm your bodily reactions to stress and make sound choices. The goal is to mobilize the available resources to help you cope with stress in a healthy manner.

In addition, ensure that you eat balanced meals such as the super meals. These types of meals will provide your body and its cells with the proper nutrients so that you can handle stress and prevent stress from causing damage to your body.

Here are some tips to help you handle stress in your life.

1. Manage What You Can Control

The all-important first step is to distinguish between those parts of your stress that you have some measure of control over and those you don't. You want to focus your energy on the areas over which you have some control.

For example, you cannot change the fact that your boss is a dimwit but you *can* choose how you respond to him. Spend your limited time and energy on trying to make the situation better instead of being anxious about the current state.

2. Examine Your Coping Style

Why does one person faced with diabetes rise to the challenge while another person struggles with continual feelings of failure? It often has a lot to do with coping style. Many people have what's called "learned helplessness." They respond to adversity in a passive manner believing that fate will inevitably have its way. But this coping style usually fails to see the many choices that are actually available. If you are prone to

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learned helplessness, start asking yourself what choices you have that could change your situation? Write them down. Be proactive. Diabetes doesn't have to control your life.

3. Choose to Enrich Your Life

In our fast-paced society, many people never give themselves a chance to fully recharge their physical, mental and emotional reserves. As a result, our minds and bodies stay tightly wound and increasingly stressed with each passing day. Instead of trying to distract yourself from these stressors by plopping in front of the television or going out to eat, do something that you find truly enriching.

Consider these ideas for starters:

- Help a friend
- Go for a ride or visit the mall
- Tour a museum
- Take a walk in nature
- Write in your journal
- Talk with a close friend
- Take a bubble bath
- Get a massage
- Read a good book like *Death to Diabetes* 😊

4. Use Exercise Techniques to Manage Your Stress

Regular practice of the following exercise disciplines will immediately help you reduce your stress level, and, over time, bring your glucose levels down as well:

- **Diaphragmatic breathing.** In a sitting or lying position, breathe in through your nose, pulling the air deeply into your lungs until you feel your lower abdomen begin to extend. Take in as much air as you can. Hold it for a count of five and then slowly exhale through your mouth. Do this several times.
- **Progressive relaxation.** In a lying position, tense one muscle group (calves, for example) for a slow count of 10 while keeping the rest of your body relaxed. Stop tensing that muscle and relax for a few seconds. Then move to the next muscle group (thighs) and repeat. Progressively work your way through the entire body. This exercise is great to help bleed out the tension in muscles before sleeping.
- **Exercise.** Find an aerobic activity (running, walking, swimming, cycling, water exercise, tai chi, dancing, etc.) that you enjoy and participate in it regularly. Exercise is one of the best ways to release tension and keep your blood sugar in check.

More Tips to Handle Stress

Here are some additional ways to handle the stress in your life:

- Identify a strong motive for getting healthy, e.g. financial, your children, family, quality of life, religious, disdain towards drugs, fear of a painful death. Ensure that your motive is strong enough to overcome the setbacks you're going to have during your journey.
- Embrace change and the adversity that you will face during your journey. Adversity will build your character or reveal it.
- Ensure you obtain at least 6-7 hours of quality deep sleep each night.
- Find quiet time for yourself each day, even if it's only 15 minutes.
- Avoid the emotional vampires and toxic relationships that drain your hope and your soul.
- Look for ways to use your talent and your passion to help your family and/or your community.
- Join an ADA-sponsored or church-sponsored diabetic support group as part of your support system.
- Read *Chapter 13* for more ideas about reducing stress and improving your emotional well-being.
- Laugh! Laugh! Laugh! Laughter is a wonderful stress-reducer. Laughter relieves muscular tension providing a discharge of nervous excitement. It improves breathing, regulates the heartbeat and pumps endorphins (the body's natural painkillers) into the bloodstream.
- Let go of the anger, jealousy, and envy in your life. These negative emotions trigger the release of stress hormones and weaken the immune system, making you more susceptible to disease.
- Listen to positive and powerful messages that will help to motivate you. Here's an example of a positive message that reminds me of my father, who convinced us that *'failure was for weak people and not an option for his kids'*. He felt that

you had to be *hōngry* if you wanted to succeed at something. This audio clip was a reminder of my father preachin' at us.



Food for Thought: There is a fine line between denial and faith: Denial is believing you can't win the battle against the disease because of all the facts. Faith is believing that you can win the battle despite all of the facts.

During the 1990s I volunteered as a math tutor for one of the local high schools. Because I had been blessed with a father who drilled mathematics into us, and great teachers who taught me the "patterns of mathematics", I was able to help many students and give them their hope back. During many of these tutoring sessions, I shared some inspirational quotes that I had come across over the years -- from people such as Bill Cosby, Oprah Winfrey, and Billy Graham. Maybe one of these quotes will help you.

Anti-Stress Foods

△ Khansari, D., Murgo, A., & Faith, R. (1990). Effects of stress on the immune system. *Immunology Today*, 11, 170-175. △ Graham, J., Christian, L. & Klecolt-Glaser, J. (2006). Stress, Age, and Immune Function: Toward a Lifespan Approach. *Journal of Behavioral Medicine*, 29, 389-400.

It is a known fact that stresses are among the factors that destroy our body and our health; and, cause our blood sugar to rise. The good news is that you can control your blood sugar and limit the damage to your body caused by living a stressful life. How? By simply embracing a superior nutritional program such as the Death to Diabetes Super Diet. Although this diet was designed to address your diabetes, it also reduces the impact of stress on your body.

There are some simple rules, like avoiding caffeine and alcohol, avoiding fried and fatty foods, and so on. Here are some foods that can you add to your daily diet to combat stress and relieve the effects of stresses.

Almonds. Other great sources of magnesium, zinc and the above mentioned vitamins. Have a little snack and eat a handful of almonds, but remember that eating more of this delicious natural foods is linked to increased risks of cardiovascular problems.

Asparagus. This amazing green vegetable is an excellent anti stress food, a natural source of folic acid, which is an important chemical that helps to balance your mood and block the hormones produced when we are stressed out.

Bananas. These natural foods are rich in vitamin B, an important nutrient to keep stress hormones and blood pressure levels under control even in the most stressful situations.

Blueberries. This great low calorie product is rich in antioxidants, fiber and vitamin C, can also effectively help us fight against stresses.

Dark chocolate. It is known as one of the best anti-stress foods which is packed with flavonoids with amazing relaxing properties. Phenethylamine is another very important natural substance which can be found in dark chocolate. This chemical enhances our mood and makes us feel relaxed too. In addition to this, studies have shown that regular consumption of dark chocolate in small doses is linked to lower levels of cortisol, known also as stress hormone.

High in flavonoids, which are lauded for their relaxing properties (Lemon Balm and chamomile tea – other excellent sources), chocolate also contains phenethylamine, a chemical that enhances your mood. The darker the chocolate, the more healthful substances you're being paid in your diet, so look for bars that are 70 percent cacao or privileged. Researchers found that eating the equivalent of one mean-sized dark chocolate candy bar (1.4

ounces) each day for two weeks reduced levels of the stress hormone cortisol as well as the "fight-or-flight" hormones known as catecholamines in vastly stressed people.

Bison/Beef. Rich in iron, vitamin B and zinc, beef and other types of red meat can be the best choice for the main course on a stressful day. However, remember that red meat has unhealthy saturated fat which is very harmful to your health.

Cantaloupe is an excellent source of vitamin C, which is crucial in combating stress. In fact, prolonged periods of stress deplete levels of vitamin C in the adrenal glands, so it's important to consume foods that contain high levels of it.

Cottage cheese. This type of cheese is very rich in proteins, calcium, as well as vitamins B2 and B12, which assist in banishing such symptoms of stresses as anxiety and restlessness.

Since cottage cheese is a good source of vitamins B2 and B12, mixing it with cantaloupe for breakfast or a midday snack will help you banish your feelings of anxiety.

Milk. A rich source of antioxidants, vitamins B 12 and B 2, raw milk (or goat's milk) can be used to block the activities of free radicals associated with stresses. A study has shown that the women who drinks lowfat milk on a regular basis displayed twice less symptoms of stresses in their PMS period.

Oatmeal. Carbs help you produce serotonin, a kind hormone that helps fight anxiety's negative things-which is doubtless why many of us crave them when we're stressed. Go with the appetite and choose healthful sources. The B vitamins in oats stimulate production of serotonin, a key neurotransmitter that sends soothing signals to your brain. Oatmeal is high in fiber, which means that your body will absorb it at a snail's pace. In one fell swoop, you'll prolong the serotonin boost, keeping physically feeling full for longer (and on less) and building sure your blood sugar's in check.

Oranges. Oranges have high vitamin-C content. Vitamin C is an antioxidant that fights the free radicals that get unhindered when you're stressed. It also lessens symptoms and shortens the duration of colds, which may be brought on by stress. Other excellent sources include kiwi fruit and strawberries.

Salmon. This is one of the best natural sources of Omega 3 fatty acids are reported to be an excellent food to slow down production of hormones adrenaline and cortisol, associated with increased levels of stresses. Also, good amounts of Omega 3 acids in our body can help boost serotonin levels making us feel more happy and content.

Research shows that omega-3 fatty acids-overflowing in fish like wild salmon-can help back stress symptoms by boosting serotonin levels, and that an omega-3-rich diet can also help suppress the production of the anxiety hormones cortisol and adrenaline.

Sunflower Seeds: A excellent fund of folate, which helps your body produce a pleasure-inducing brain chemical called dopamine. Low levels of zinc are common among those suffering from stress. It is elemental for boosting the immunologic and fighting infections.

Sushi. Aside from the benefits of fish described on the first page, the seaweed in maki (rolls) also has anxiety-fighting properties. It is packed with stress-relieving magnesium, as well as pantothenic acid and vitamin B2 (riboflavin).

Pantothenic acid is crucial, as it contributes to the health of the adrenal glands, which play a vital role in stress management. In times of stress, a deficiency in pantothenic acid can lead to feelings of anxiety and increased vulnerability to infection, illness and chronic fatigue.

Walnuts: They've been shown to help lower blood pressure, which is critical for those whose hearts are by now working overtime thanks to high adrenaline levels. In fact, research so strongly backs their health repayment that the U.S. Food and Drug Administration goes so far as to recommend 1-1/2 oz per day (Brilliant raw, organic walnuts, 1/4 cup daily but watch depression on thyroid function).

Breakfast. Almost every other person has a practice of regular skipping breakfasts. Why do we do this? Sometimes we sleep too long and have no time for having breakfast before leaving our house. Some people believe that skipping breakfasts can help in weight loss, but this idea is absolutely incorrect. Breakfast is the most important meal of the day and skipping breakfasts does not lead to anything positive.

But, you must eat a properly-balanced meal in order to reap the benefits of breakfast. So, follow a program such as the *Death to Diabetes Super Breakfast* protocol to ensure optimum health.

Moreover, according to famous British expert nutritionists Professor Tanya Byron and Amanda Ursell, who recently published their *Kingsmill Breakfast Report*, eating healthy breakfasts can help us to reduce negative effects of our daily stresses.

A research leaded by these two specialists showed that eating a good nutritious breakfast in the morning helps to boost our resistance to stresses and improve our mental functioning during the day.

Note: Skipping breakfast or eating a poor one leads to substantially heightened stress levels and given the understanding of the role of stress in the deterioration of thinking, problem solving, focus, concentration and behavior, has profound implications for everyone, adults and children alike."

For more details about stress, read Chapter 13 of the *Death to Diabetes* book or get the [How to Reduce Stress ebook](#).

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Heart Disease Health Center



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Heart Disease and Stress: What's the Link?

Having too much stress, for too long, is bad for your heart.

If you're often stressed, and you don't have good ways to manage it, you are more likely to have heart disease, high blood pressure, chest pain, or irregular heartbeats.

The stress itself can be a problem. It raises your blood pressure, and it's not good for your body to constantly be exposed to stress hormones. Studies also link stress to changes in the way blood clots, which makes a heart attack more likely.

The way you handle stress also matters. If you respond to it in unhealthy ways -- such as smoking, overeating, or not exercising -- that makes matters worse. On the other hand, if you exercise , connect with people, and find meaning despite the stress, that makes a difference in your emotions and in your body.

You may also want to:

- Change what you can to lower your stress.
- Accept that there are some things you cannot control.
- Before you agree to do something, consider whether you can really do it. It's OK to say "no" to requests that will add more stress to your life.
- Stay connected with people you love.
- Make it a point to relax every day. You could read a book, listen to music, meditate, pray, do yoga or tai chi, journal, or reflect on what is good in your life.
- Be active! When you exercise, you'll burn off some of your stress and be better prepared to handle problems.

Some people have a hard time with stress because they are depressed. If that's you, seek help from a doctor or counselor. Depression is linked to heart disease , and it can be treated.

If you're finding it hard to shift your way of handling stress, take a stress management class, read a book on managing stress , or sign up for a few sessions with a therapist. It's an investment in your health and the quality of your life, both now and for years to come.

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Reviewed by James Beckerman, MD, FACC on October 08, 2014

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Heart Disease Guide

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Tests and Procedures

Cholesterol test

By Mayo Clinic Staff

A complete cholesterol test — also called a lipid panel or lipid profile — is a blood test that can measure the amount of cholesterol and triglycerides in your blood. A cholesterol test can help determine your risk of the buildup of plaques in your arteries that can lead to narrowed or blocked arteries throughout your body (atherosclerosis). High cholesterol levels usually don't cause any signs or symptoms, so a cholesterol test is an important tool. High cholesterol levels often are a significant risk factor for heart disease.

High cholesterol by itself usually has no signs or symptoms. A complete cholesterol test is done to determine whether your cholesterol is high and estimate your risk of developing heart disease.

A complete cholesterol test, referred to as a lipid panel or lipid profile, includes the calculation of four types of fats (lipids) in your blood:

- **Total cholesterol.** This is a sum of your blood's cholesterol content.
- **High-density lipoprotein (HDL) cholesterol.** This is sometimes called the "good" cholesterol because it helps carry away LDL cholesterol, thus keeping arteries open and your blood flowing more freely.
- **Low-density lipoprotein (LDL) cholesterol.** This is sometimes called the "bad" cholesterol. Too much of it in your blood causes the buildup of fatty deposits (plaques) in your arteries (atherosclerosis), which reduces blood flow. These plaques sometimes rupture and can lead to a heart attack or stroke.
- **Triglycerides.** Triglycerides are a type of fat in the blood. When you eat, your body converts any calories it doesn't need into triglycerides, which are stored in fat cells. High triglyceride levels are associated with several factors, including being overweight, eating too many sweets or drinking too much alcohol, smoking, being sedentary, or having diabetes with elevated blood sugar levels.

Who should get a cholesterol test?

All adults age 20 or older should have a cholesterol test once every five years. Ideally, you should begin having your cholesterol checked during your early 20s. You should have your cholesterol measured when you're relatively healthy. An acute illness, a heart attack or severe stress can affect cholesterol levels.

Cholesterol testing is especially important if you:

- Have a family history of high cholesterol or heart disease
- Are overweight
- Are physically inactive
- Have diabetes
- Eat a high-fat diet
- Are a man older than 45 or a woman older than 55

These factors put you at increased risk of developing high cholesterol and heart disease.

If you have high cholesterol levels, your doctor may want you to get tested more often. Discuss with your doctor how often you should have a cholesterol test if your cholesterol levels are abnormal.

Also, if you have a strong family history of early heart disease, your doctor may want to test other risk factors, such as lipoproteins, that aren't part of the standard cholesterol profile.

Cholesterol is often high during pregnancy, so pregnant women should wait at least six weeks after giving birth to have their cholesterol measured. The same is true for people who've been ill or had a heart attack, surgery or an accident.

Some drugs are known to increase cholesterol levels, including anabolic steroids, beta blockers, epinephrine, oral contraceptives and vitamin D. Be sure the doctor who orders your tests is aware of all the drugs and supplements you're taking.

Children and cholesterol testing

Children as young as age 2 can have high cholesterol, but not all children need to be screened for high cholesterol. The American Academy of Pediatrics recommends a cholesterol test only for children between the ages of 2 and 10 who have a known family history of high cholesterol or premature coronary artery disease. Your child's doctor may recommend retesting if your child's first test shows he or she has abnormal cholesterol levels. If you have a family history of coronary artery disease that develops at a young age, your doctor may recommend more frequent cholesterol tests beyond the recommended screenings.

The American Academy of Pediatrics also recommends testing if the child's family history for high cholesterol is unknown, but the child has risk factors for high cholesterol, such as obesity, high blood pressure or diabetes.

There's little risk in getting a cholesterol test. You may have some soreness or tenderness around the site where your blood is drawn. Rarely, the site may become infected.

Generally you're required to fast, consuming no food or liquids other than water, for nine to 12 hours before the test. There is some evidence that fasting doesn't make much difference in cholesterol levels, but for now, most doctors will tell you to fast. You can drink water in the time leading up to the test, but avoid coffee, tea and other beverages.

Talk to your doctor about any other special requirements. Some medications, such as birth control pills, can increase your cholesterol levels. For this reason, if you take these or other medications, your doctor might want you to stop taking them for a few days before your test. However, in some cases, if you take a medication regularly, your doctor may want you to continue it to see the effect it has on your cholesterol levels.

A cholesterol test is a blood test, usually done in the morning since you'll need to fast for the most accurate results. Blood is drawn from a vein, usually from your arm. Before the needle is inserted, the puncture site is cleaned with antiseptic and an elastic band is wrapped around your upper arm. This causes the veins in your arm to fill with blood.

After the needle is inserted, a small amount of blood is collected into a vial or syringe. The band is then removed to restore circulation, and blood continues to flow into the vial. Once enough blood is collected, the needle is removed and the puncture site is covered with a bandage.

The entire procedure will likely last a couple of minutes. It's relatively painless.

After the procedure

There are no special precautions you need to take after your cholesterol test. You should be able to drive yourself home and do all your normal activities. You may want to bring a snack to eat after your cholesterol test is done, if you've been fasting.

It may take a few days to get your results. Your doctor should explain to you what the results of your test mean. It's likely your doctor will want to retest you in several weeks or months if your test shows your cholesterol levels are high. Before starting any treatment based on an abnormal cholesterol test, it's common to get several tests done over a period of time to ensure an accurate result.

In the United States, cholesterol levels are measured in milligrams (mg) of cholesterol per deciliter (dL) of blood. In Canada and many European countries, cholesterol levels

are measured in millimoles per liter (mmol/L). To interpret your test results, use these general guidelines.

Total cholesterol (U.S. and some other countries)	Total cholesterol* (Canada and most of Europe)	
Below 200 mg/dL	Below 5.2 mmol/L	Desirable
200-239 mg/dL	5.2-6.2 mmol/L	Borderline high
240 mg/dL and above	Above 6.2 mmol/L	High
LDL cholesterol (U.S. and some other countries)	LDL cholesterol* (Canada and most of Europe)	
Below 100 mg/dL	Below 2.6 mmol/L	Best for people at risk of heart disease. Below 70 (1.8 mmol/L) may be ideal for people who have heart disease.
Below 100 mg/dL	Below 2.6 mmol/L	Optimal for people at risk of heart disease
100-129 mg/dL	2.6-3.3 mmol/L	Near optimal
130-159 mg/dL	3.4-4.1 mmol/L	Borderline high
160-189 mg/dL	4.1-4.9 mmol/L	High
190 mg/dL and above	Above 4.9 mmol/L	Very high

HDL cholesterol (U.S. and some other countries)	HDL cholesterol* (Canada and most of Europe)	
Below 40 mg/dL (men) Below 50 mg/dL (women)	Below 1 mmol/L (men) Below 1.3 mmol/L (women)	Poor
50-59 mg/dL	1.3-1.5 mmol/L	Better
60 mg/dL and above	Above 1.5 mmol/L	Best
Triglycerides (U.S. and some other countries)	Triglycerides* (Canada and most of Europe)	
Below 150 mg/dL	Below 1.7 mmol/L	Desirable
150-199 mg/dL	1.7-2.2 mmol/L	Borderline high
200-499 mg/dL	2.3-5.6 mmol/L	High
500 mg/dL and above	Above 5.6 mmol/L	Very high

*Canadian and European guidelines differ slightly from U.S. guidelines. These conversions are based on U.S. guidelines.

The American Heart Association (AHA) recommends that a triglyceride level of 100 mg/dL (1.3 mmol/L) or lower is considered "optimal." The AHA says this optimal level would improve your heart health. However, the AHA doesn't recommend drug treatment to reach this level. Instead, for those trying to lower their triglycerides to this level, lifestyle changes such as diet, weight loss and physical activity are encouraged. That's because triglycerides usually respond well to dietary and lifestyle changes.

The four main categories — total cholesterol, LDL cholesterol, HDL cholesterol and triglycerides — are what are most commonly measured or calculated during a cholesterol test. Still, many doctors have begun examining other substances in the blood. Tests of these other substances in the blood are often done on the same sample of blood taken

during a cholesterol test and are meant to complement, not replace, a standard lipid panel or lipid profile cholesterol test.

If your results show that your cholesterol level is high, don't get discouraged. You may be able to lower your cholesterol with lifestyle changes, such as quitting smoking, exercising and eating a healthy diet. If lifestyle changes aren't enough, cholesterol-lowering medications also may help. Talk to your doctor about the best way for you to lower your cholesterol.

Women and cholesterol test results

The hormone estrogen tends to cause women to have higher levels of HDL (good) cholesterol and higher levels of triglycerides. If you have higher levels of triglycerides than normal, talk to your doctor. Many women who are at risk of heart disease and have high LDL cholesterol levels may benefit from cholesterol-lowering medications. With menopause, women's cholesterol levels can change. It's a good idea to have a repeat cholesterol test after you've stopped menstruating for good, since your cholesterol levels may change.

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Stress Management Health Center



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Coping With Stress Helps Cholesterol

Good Coping Skills May Raise 'Good' Cholesterol Levels

By Kathleen Doheny

WebMD Health News

Reviewed by Louise Chang, MD

WebMD News Archive

Aug. 20, 2007 -- The better you cope with stress, the better your "good" cholesterol level is likely to be, according to a new study.

"We know that stress and hostility affect cholesterol," says researcher Carolyn M. Aldwin, PhD, professor and chairwoman of the department of human development and family sciences at Oregon State University in Corvallis. There has been less research, however, on how coping skills can counteract the effects of stress, she says.

Good coping skills were associated with better levels of the so-called "good" cholesterol or high-density lipoprotein (HDL) in her study.

The study was released at the 115th annual convention of the American Psychological Association in San Francisco.

Stress and Cholesterol

Aldwin and her colleagues evaluated data from 716 men who participated in the Normative Aging Study. The researchers looked at the interplay of hostility, stress, coping, and the participants' cholesterol levels.

The average age of the participants was 65; most were white. They were evenly split between white-collar and blue-collar occupations.

The researchers assessed the men's hostility and asked them to describe their most stressful problem in the past week.

The men also completed a questionnaire that asked them to rate how often they used 26 different coping strategies when dealing with a stressful problem in the past month. Some were unhealthy strategies, such as socially isolating themselves when under stress or blaming themselves for the stress. Other strategies were healthy, such as making a plan of action to deal with the problem causing the stress.

The more hostile the men were, the more likely they were to look at problems as stressful. They were also more apt to use unhealthy coping skills to deal with that stress.

After fasting overnight, the men's blood was tested for HDL cholesterol, low-density lipoprotein (LDL) or "bad" cholesterol, and triglycerides.

Coping Skills Aid HDL Cholesterol

The results were a surprise, Aldwin tells WebMD. "What we were really expecting is that coping would mitigate the effects of stress on LDL," she says. But the researchers found that the good coping skills only helped the protective effect of the "good" HDL cholesterol.

Coping Skills Aid HDL Cholesterol continued...

"People who coped well had higher levels of HDL than people who didn't cope well," she says.

She cannot cite an exact improvement in HDL or an average HDL level among those who coped well. "This is simply a correlational study," she says, finding an association between good coping skills and better HDL levels.

The amount of stress you deal with isn't as important, they also found, as how you deal with it. "Stress doesn't matter nearly as much as how you cope with it," she says.

The more hostile the men were, the worse the LDL and triglyceride levels, the researchers also found.

While the study included only men, Aldwin says she would think the same findings would apply to women.

Perspective: Stress and Cholesterol

It's been known for years, Aldwin says, that stress affects LDL and makes it rise.

"Stress raises total cholesterol levels in general and it raises LDL levels," she says.

The results "are consistent" with research by Peter Vitaliano, PhD, professor of psychiatry and behavioral sciences, psychology, and health services at the University of Washington in Seattle. The new study, Vitaliano says, "adds to the body of research on how hostility relates to health, in particular heart disease."

Other research, he says, also found that "avoidance" coping, such as blaming oneself, is unhealthy and related to hostility and anger. "Both of those are related to blood pressure elevation and lower HDL," he says.

"Hostility is also associated with higher blood glucose levels in healthy people and in diabetics," he says, "and that raises the risk of heart disease."

Hostile people, he says, "often use emotion-focused coping," he says. "They use emotions like anger and avoidance instead of problem solving."

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SOURCES: Carolyn Aldwin, PhD, professor and chairwoman, department of human development and family sciences, Oregon State University, Corvallis. Peter Vitaliano, PhD, professor of psychiatry and behavioral sciences, psychology, and health services, University of Washington, Seattle. 115th annual convention, American Psychological Association, San Francisco, Aug. 17-20, 2007. American Heart Association web site.

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My Notes:



Diseases and Conditions

Coronary artery disease

By Mayo Clinic Staff

Coronary artery disease develops when your coronary arteries — the major blood vessels that supply your heart with blood, oxygen and nutrients — become damaged or diseased. Cholesterol-containing deposits (plaque) in your arteries and inflammation are usually to blame for coronary artery disease.

When plaques build up, they narrow your coronary arteries, decreasing blood flow to your heart. Eventually, the decreased blood flow may cause chest pain (angina), shortness of breath, or other coronary artery disease signs and symptoms. A complete blockage can cause a heart attack.

Because coronary artery disease often develops over decades, it can go unnoticed until you have a heart attack. But there's plenty you can do to prevent and treat coronary artery disease. Start by committing to a healthy lifestyle.

If your coronary arteries narrow, they can't supply enough oxygen-rich blood to your heart — especially when it's beating hard, such as during exercise. At first, the decreased blood flow may not cause any coronary artery disease symptoms. As the plaques continue to build up in your coronary arteries, however, you may develop coronary artery disease signs and symptoms, including:

- **Chest pain (angina).** You may feel pressure or tightness in your chest, as if someone were standing on your chest. The pain, referred to as angina, is usually triggered by physical or emotional stress. It typically goes away within minutes after stopping the stressful activity. In some people, especially women, this pain may be fleeting or sharp and felt in the abdomen, back or arm.
- **Shortness of breath.** If your heart can't pump enough blood to meet your body's needs, you may develop shortness of breath or extreme fatigue with exertion.

- **Heart attack.** A completely blocked coronary artery may cause a heart attack. The classic signs and symptoms of a heart attack include crushing pressure in your chest and pain in your shoulder or arm, sometimes with shortness of breath and sweating. Women are somewhat more likely than men are to experience less typical signs and symptoms of a heart attack, such as nausea and back or jaw pain. Sometimes a heart attack occurs without any apparent signs or symptoms.

When to see a doctor

If you suspect you're having a heart attack, immediately call 911 or your local emergency number. If you don't have access to emergency medical services, have someone drive you to the nearest hospital. Drive yourself only as a last resort.

If you have risk factors for coronary artery disease — such as high blood pressure, high cholesterol, tobacco use, diabetes or obesity — talk to your doctor. He or she may want to test you for the condition, especially if you have signs or symptoms of narrowed arteries. Even if you don't have evidence of coronary artery disease, your doctor may recommend aggressive treatment of your risk factors. Early diagnosis and treatment may stop progression of coronary artery disease and help prevent a heart attack.

Coronary artery disease is thought to begin with damage or injury to the inner layer of a coronary artery, sometimes as early as childhood. The damage may be caused by various factors, including:

- Smoking
- High blood pressure
- High cholesterol
- Diabetes or insulin resistance
- Radiation therapy to the chest, as used for certain types of cancer
- Sedentary lifestyle

Once the inner wall of an artery is damaged, fatty deposits (plaques) made of cholesterol and other cellular waste products tend to accumulate at the site of injury in a process called atherosclerosis. If the surface of these plaques breaks or ruptures, blood cells called platelets will clump at the site to try to repair the artery. This clump can block the artery, leading to a heart attack.

Risk factors for coronary artery disease include:

- **Age.** Simply getting older increases your risk of damaged and narrowed arteries.
- **Sex.** Men are generally at greater risk of coronary artery disease. However, the risk for women increases after menopause.

- **Family history.** A family history of heart disease is associated with a higher risk of coronary artery disease, especially if a close relative developed heart disease at an early age. Your risk is highest if your father or a brother was diagnosed with heart disease before age 55 or your mother or a sister developed it before age 65.
- **Smoking.** Nicotine constricts your blood vessels, and carbon monoxide can damage their inner lining, making them more susceptible to atherosclerosis. The incidence of heart attack in women who smoke at least 20 cigarettes a day is six times that of women who've never smoked. For men who smoke, the incidence is triple that of nonsmokers.
- **High blood pressure.** Uncontrolled high blood pressure can result in hardening and thickening of your arteries, narrowing the channel through which blood can flow.
- **High blood cholesterol levels.** High levels of cholesterol in your blood can increase the risk of formation of plaques and atherosclerosis. High cholesterol can be caused by a high level of low-density lipoprotein (LDL), known as the "bad" cholesterol. A low level of high-density lipoprotein (HDL), known as the "good" cholesterol, also can promote atherosclerosis.
- **Diabetes.** Diabetes is associated with an increased risk of coronary artery disease. Both conditions share similar risk factors, such as obesity and high blood pressure.
- **Obesity.** Excess weight typically worsens other risk factors.
- **Physical inactivity.** Lack of exercise also is associated with coronary artery disease and some of its risk factors, as well.
- **High stress.** Unrelieved stress in your life may damage your arteries as well as worsen other risk factors for coronary artery disease.

Risk factors often occur in clusters and may build on one another, such as obesity leading to diabetes and high blood pressure. When grouped together, certain risk factors put you at an even greater risk of coronary artery disease. For example, metabolic syndrome — a cluster of conditions that includes elevated blood pressure, high triglycerides, elevated insulin levels and excess body fat around the waist — increases the risk of coronary artery disease.

Sometimes coronary artery disease develops without any classic risk factors. Researchers are studying other possible factors, including:

- **Sleep apnea.** This disorder causes you to repeatedly stop and start breathing while you're sleeping. Sudden drops in blood oxygen levels that occur during sleep apnea increase blood pressure and strain the cardiovascular system, possibly leading to coronary artery disease.
- **C-reactive protein.** C-reactive protein (CRP) is a normal protein that appears in higher amounts when there's swelling somewhere in your body. High CRP levels may

be a risk factor for heart disease. It's thought that as coronary arteries narrow, you'll have more CRP in your blood.

- **High triglycerides.** This is a type of fat (lipid) in your blood. High levels may raise the risk of coronary artery disease, especially for women.
- **Homocysteine.** Homocysteine is an amino acid your body uses to make protein and to build and maintain tissue. But high levels of homocysteine may increase your risk of coronary artery disease.
- **Lipoprotein (a).** This substance forms when a low-density lipoprotein (LDL) particle attaches to a specific protein. Lipoprotein (a) may disrupt your body's ability to dissolve blood clots. High levels of lipoprotein (a) may be associated with an increased risk of cardiovascular disease, including coronary artery disease and heart attack.

Coronary artery disease can lead to:

- **Chest pain (angina).** When your coronary arteries narrow, your heart may not receive enough blood when demand is greatest — particularly during physical activity. This can cause chest pain (angina) or shortness of breath.
- **Heart attack.** If a cholesterol plaque ruptures and a blood clot forms, complete blockage of your heart artery may trigger a heart attack. The lack of blood flow to your heart may damage your heart muscle. The amount of damage depends in part on how quickly you receive treatment.
- **Heart failure.** If some areas of your heart are chronically deprived of oxygen and nutrients because of reduced blood flow, or if your heart has been damaged by a heart attack, your heart may become too weak to pump enough blood to meet your body's needs. This condition is known as heart failure.
- **Abnormal heart rhythm (arrhythmia).** Inadequate blood supply to the heart or damage to heart tissue can interfere with your heart's electrical impulses, causing abnormal heart rhythms.

Early-stage coronary artery disease often produces no symptoms, so you may not discover you're at risk of the condition until a routine checkup reveals you have high cholesterol or high blood pressure. So it's important to have regular checkups.

If you know you have symptoms of or risk factors for coronary artery disease, you're likely to see your primary care doctor or a general practitioner. Eventually, however, you may be referred to a heart specialist (cardiologist).

Here's some information to help you get ready for your appointment and to know what to expect from your doctor.

What you can do

- **Be aware of any pre-appointment restrictions.** When you make the appointment, ask if there's anything you need to do in advance, such as restrict your diet. For a cholesterol test, for example, you may need to fast for a time beforehand.
- **Write down any symptoms you're experiencing,** including any that may seem unrelated to coronary artery disease.
- **Write down your key medical information,** including other conditions with which you've been diagnosed, all medications and supplements you're taking, and family history of heart disease.
- **Find a family member or friend** who can come with you to the appointment, if possible. Someone who accompanies you can help remember what the doctor says.
- **Write down questions to ask** your doctor.

Questions to ask your doctor at your initial appointment include:

- What are the possible causes for my signs and symptoms?
- What tests do I need?
- Should I see a specialist?
- Should I follow any restrictions while I wait for my next appointment?
- What emergency signs and symptoms should prompt a call to 911 or emergency medical help?

Questions to ask if you are referred to a cardiologist include:

- What is my diagnosis?
- What is my risk of long-term complications from this condition?
- What treatment do you recommend?
- If you're recommending medications, what are the possible side effects?
- Am I a candidate for surgery? Why or why not?
- What diet and lifestyle changes should I make?
- What restrictions do I need to follow, if any?
- How frequently will you see me for follow-up visits?
- I have these other health problems. How can I best manage them together?

Don't hesitate to ask any other questions about your condition.

What to expect from your doctor

A doctor or cardiologist who sees you for heart-related signs and symptoms may ask:

- What are your symptoms?
- When did you begin experiencing symptoms?
- Have your symptoms gotten worse over time?
- Do you have chest pain?
- Have you had difficulty breathing?
- Does exercise or physical exertion make your symptoms worse?
- Are you aware of heart problems in your family?
- Have you been diagnosed with other health conditions?
- What medications are you taking?
- Have you ever been treated with radiation therapy?
- How much do you exercise in a typical week?
- What's your typical daily diet?
- Do you or did you smoke? How much? If you quit, when?
- Do you drink alcohol? How much?

What you can do in the meantime

It's never too early to make healthy lifestyle changes, such as quitting smoking, eating healthy foods and becoming more physically active. These are primary lines of defense against coronary artery disease and its complications, including heart attack and stroke.

The doctor will ask questions about your medical history, do a physical exam and order routine blood tests. He or she may suggest one or more diagnostic tests as well, including:

- **Electrocardiogram (ECG).** An electrocardiogram records electrical signals as they travel through your heart. An ECG can often reveal evidence of a previous heart attack or one that's in progress.

In other cases, Holter monitoring may be recommended. With this type of ECG, you wear a portable monitor for 24 hours as you go about your normal activities. Certain abnormalities may indicate inadequate blood flow to your heart.

- **Echocardiogram.** An echocardiogram uses sound waves to produce images of your heart. During an echocardiogram, your doctor can determine whether all parts of the heart wall are contributing normally to your heart's pumping activity. Parts that move weakly may have been damaged during a heart attack or be receiving too little oxygen. This may indicate coronary artery disease or various other conditions.
- **Stress test.** If your signs and symptoms occur most often during exercise, your doctor may ask you to walk on a treadmill or ride a stationary bike during an ECG.

This is known as an exercise stress test. In some cases, medication to stimulate your heart may be used instead of exercise.

Some stress tests are done using an echocardiogram. For example, your doctor may do an ultrasound before and after you exercise on a treadmill or bike. Or your doctor may use medication to stimulate your heart during an echocardiogram.

Another stress test known as a nuclear stress test helps measure blood flow to your heart muscle at rest and during stress. It's similar to a routine exercise stress test but with images in addition to an ECG. Trace amounts of radioactive material such as thallium are injected into your bloodstream. Special cameras can detect areas in your heart that receive less blood flow.

- **Cardiac catheterization or angiogram.** To view blood flow through your heart, your doctor may inject a special dye into your arteries (intravenously). This is known as an angiogram. The dye is injected into the arteries of the heart through a long, thin, flexible tube (catheter) that is threaded through an artery, usually in the leg, to the arteries in the heart.

This procedure is called cardiac catheterization. The dye outlines narrow spots and blockages on the X-ray images. If you have a blockage that requires treatment, a balloon can be pushed through the catheter and inflated to improve the blood flow in your coronary arteries. A mesh tube (stent) may then be used to keep the dilated artery open.

- **Heart scan.** Computerized tomography (CT) technologies can help your doctor see calcium deposits in your arteries that can narrow the arteries. If a substantial amount of calcium is discovered, coronary artery disease may be likely.

A CT coronary angiogram, in which you receive a contrast dye injected intravenously during a CT scan, also can generate images of your heart arteries.

- **Magnetic resonance angiography (MRA).** This procedure uses MRI technology, often combined with an injected contrast dye, to check for areas of narrowing or blockages — although the details may not be as clear as those provided by coronary catheterization.

Treatment for coronary artery disease usually involves lifestyle changes and, if necessary, drugs and certain medical procedures.

Lifestyle changes

Making a commitment to the following healthy lifestyle changes can go a long way toward promoting healthier arteries:

- Quit smoking.

- Eat healthy foods.
- Exercise regularly.
- Lose excess weight.
- Reduce stress.

Drugs

Various drugs can be used to treat coronary artery disease, including:

- **Cholesterol-modifying medications.** By decreasing the amount of cholesterol in the blood, especially low-density lipoprotein (LDL, or the "bad") cholesterol, these drugs decrease the primary material that deposits on the coronary arteries. Your doctor can choose from a range of medications, including statins, niacin, fibrates and bile acid sequestrants.
- **Aspirin.** Your doctor may recommend taking a daily aspirin or other blood thinner. This can reduce the tendency of your blood to clot, which may help prevent obstruction of your coronary arteries. If you've had a heart attack, aspirin can help prevent future attacks. There are some cases where aspirin isn't appropriate, such as if you have a bleeding disorder or you're already taking another blood thinner, so ask your doctor before starting to take aspirin.
- **Beta blockers.** These drugs slow your heart rate and decrease your blood pressure, which decreases your heart's demand for oxygen. If you've had a heart attack, beta blockers reduce the risk of future attacks.
- **Nitroglycerin.** Nitroglycerin tablets, sprays and patches can control chest pain by opening up your coronary arteries and reducing your heart's demand for blood.
- **Angiotensin-converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (ARBs).** These similar drugs decrease blood pressure and may help prevent progression of coronary artery disease. If you've had a heart attack, ACE inhibitors reduce the risk of future attacks.

Procedures to restore and improve blood flow

Sometimes more aggressive treatment is needed. Here are some options:

- **Angioplasty and stent placement (percutaneous coronary revascularization).** Your doctor inserts a long, thin tube (catheter) into the narrowed part of your artery. A wire with a deflated balloon is passed through the catheter to the narrowed area. The balloon is then inflated, compressing the deposits against your artery walls.

A stent is often left in the artery to help keep the artery open. Some stents slowly release medication to help keep the artery open.

- **Coronary artery bypass surgery.** A surgeon creates a graft to bypass blocked coronary arteries using a vessel from another part of your body. This allows blood to flow around the blocked or narrowed coronary artery. Because this requires open-heart surgery, it's most often reserved for cases of multiple narrowed coronary arteries.

Lifestyle changes can help you prevent or slow the progression of coronary artery disease.

- **Stop smoking.** Smoking is a major risk factor for coronary artery disease. Nicotine constricts blood vessels and forces your heart to work harder, and carbon monoxide reduces oxygen in your blood and damages the lining of your blood vessels. If you smoke, quitting is one of the best ways to reduce your risk of a heart attack.
- **Control your blood pressure.** Ask your doctor for a blood pressure measurement at least every two years. He or she may recommend more frequent measurements if your blood pressure is higher than normal or you have a history of heart disease. The ideal blood pressure is below 120 systolic and 80 diastolic, as measured in millimeters of mercury (mm Hg).
- **Check your cholesterol.** Ask your doctor for a baseline cholesterol test when you're in your 20s and at least every five years after. If your test results aren't within desirable ranges, your doctor may recommend more-frequent measurements. Most people should aim for an LDL level below 130 milligrams per deciliter (mg/dL), or 3.4 millimoles per liter (mmol/L). If you have other risk factors for heart disease, your target LDL may be below 100 mg/dL (2.6 mmol/L).
- **Keep diabetes under control.** If you have diabetes, tight blood sugar control can help reduce the risk of heart disease.
- **Get moving.** Exercise helps you achieve and maintain a healthy weight and control diabetes, elevated cholesterol and high blood pressure — all risk factors for coronary artery disease. With your doctor's OK, aim for 30 to 60 minutes of physical activity most or all days of the week.
- **Eat healthy foods.** A heart-healthy diet, such as the Mediterranean diet, that emphasizes plant-based foods, such as fruits, vegetables, whole grains, legumes and nuts — and is low in saturated fat, cholesterol and sodium — can help you control your weight, blood pressure and cholesterol. Eating one or two servings of fish a week also is beneficial.
- **Maintain a healthy weight.** Being overweight increases your risk of coronary artery disease. Losing even just a few pounds can help lower your blood pressure and reduce your risk of coronary artery disease.
- **Manage stress.** Reduce stress as much as possible. Practice healthy techniques for managing stress, such as muscle relaxation and deep breathing.

In addition to healthy lifestyle changes, remember the importance of regular medical checkups. Some of the main risk factors for coronary artery disease — high cholesterol, high blood pressure and diabetes — have no symptoms in the early stages. Early detection and treatment can set the stage for a lifetime of better heart health.

Also ask your doctor about a yearly flu vaccine. Coronary artery disease and other cardiovascular disorders increase the risk of complications from the flu.

Omega-3 fatty acids are a type of unsaturated fatty acid that's thought to reduce inflammation throughout the body, a contributing factor to coronary artery disease. However, recent studies have not shown them to be beneficial. More research is needed.

- **Fish and fish oil** are the most effective sources of omega-3 fatty acids. Fatty fish — such as salmon, herring and, to a lesser extent, tuna — contain the most omega-3 fatty acids and, therefore, the most benefit. Fish oil supplements may offer benefit, but the evidence is strongest for eating fish.
- **Flax and flaxseed oil** also contain beneficial omega-3 fatty acids, though studies have not found these sources to be as effective as fish. The shell on raw flaxseeds also contains soluble fiber, which can help lower blood cholesterol.
- **Other dietary sources of omega-3 fatty acids** include walnuts, canola oil, soybeans and soybean oil. These foods contain smaller amounts of omega-3 fatty acids than do fish and fish oil, and evidence for their benefit to heart health isn't as strong.

Other supplements may help reduce your blood pressure or cholesterol level, two contributing factors to coronary artery disease. These include:

- Alpha-linolenic acid (ALA)
- Artichoke
- Barley
- Beta-sitosterol (found in oral supplements and some margarines, such as Promise Activ)
- Blond psyllium
- Cocoa
- Coenzyme Q10
- Garlic
- Oat bran (found in oatmeal and whole oats)
- Sitostanol (found in oral supplements and some margarines, such as Benecol)

The same lifestyle habits that can help treat coronary artery disease can also help prevent it from developing in the first place. Leading a healthy lifestyle can help keep your arteries strong and clear of plaques. To improve your heart health, you can:

- Quit smoking
- Control conditions such as high blood pressure, high cholesterol and diabetes
- Stay physically active
- Eat a low-fat, low-salt diet that's rich in fruits, vegetables and whole grains
- Maintain a healthy weight
- Reduce and manage stress

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April 12, 2014

Original article: <http://www.mayoclinic.org/diseases-conditions/coronary-artery-disease/basics/risk-factors/con-20032038>

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Cholesterol & Triglycerides Health Center



Listen 

Cut Stress, Help Your Cholesterol

Stressed Out? Better Relax for Your Cholesterol's Sake, Study Shows

By Miranda Hitti

WebMD Health News

Reviewed by Louise Chang, MD

WebMD News Archive

Nov. 22, 2005 -- How you handle stress could affect your cholesterol levels, for better or worse, according to new research from London.

No one knows exactly how it works. But in a nutshell, the findings go like this:

If you melt down under pressure, letting stress run amok, your cholesterol may worsen more in a few years compared with people who don't get bent out of shape by stress.

The study by Andrew Steptoe, DSc, and colleagues from University College London appears in *Health Psychology*.

Stress Study

The study included nearly 200 middle-aged government workers in London.

Both men and women participated as part of a long-term health study. Virtually all were white. None had a history of coronary heart disease or high blood pressure.

First, participants gave blood samples and rated their stress level. Then, they took two stress tests.

One test mismatched words and colors. For instance, the word "blue" was written in yellow type. Participants had to name the color in which the words appeared (yellow, in our example).

In another test, participants were under a deadline to trace the outline of a star in a mirror. Accuracy was emphasized, but participants were told that on average, people traced the star five times per test.

Afterwards, participants gave more blood and rated their stress levels again. Three years later, another cholesterol check was done.

Cholesterol, Stress Link

Cholesterol rose for everyone, to some degree, immediately after the stress test and three years later.

Those with the biggest cholesterol increases after the stress tests tended to have the biggest rises in cholesterol after three years.

The researchers set high, medium, and low thresholds for total cholesterol at the three-year follow-up. Those hitting the high threshold included:

- 16% of participants who had initially shown little cholesterol reaction to the stress tests
- 22% of those who had initially shown moderate cholesterol reactions to the stress tests
- More than half (56%) of those with the biggest initial cholesterol reactions to the stress test

No differences were seen in results for men and women, the researchers report. They adjusted for factors including body mass index (BMI), smoking, hormone therapy, and alcohol use (but not diet).

Simulating Stress

The short stress tests showed how people -- and their cholesterol levels -- responded to stress.

"The cholesterol responses that we measured in the lab probably reflect the way people react to challenges in everyday life, as well," Steptoe says, in a news release.

"So, the larger cholesterol responders to stress tasks will be large responders to emotional situations in their lives," he continues.

"It is these responses in everyday life that accumulate to lead to an increase in fasting cholesterol or lipid levels three years later," Steptoe says. Lipids refer to fats in the blood.

"It appears that a person's reaction to stress is one mechanism through which higher lipid levels may develop," Steptoe says.

Handling Stress

Stress can wear different faces, such as coping with a chronic illness, making a big presentation at work, recovering from a loss, or juggling your time and budget during the holidays.

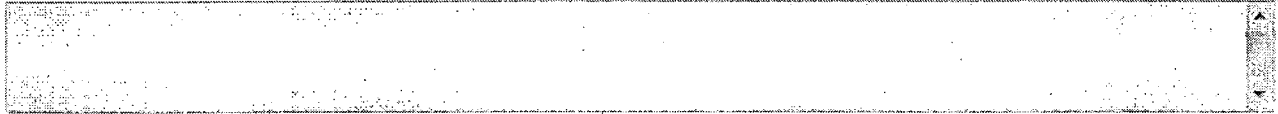
Stress can ebb and flow over time. Plus, people handle stress differently. What drives one person batty may be no big deal or an interesting challenge to another.

You probably can't rid your life of stress. But, you can learn to handle stress better. Exercise, meditation, and counseling are some resources you may want to explore.

SOURCES: Steptoe, A. *Health Psychology*, November 2005; vol 24: pp 601-607. News release, American Psychological Association. WebMD Medical Reference in collaboration with The Cleveland Clinic: "Managing Stress."

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My Notes:



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Written by Ann Pietrangelo | Published on August 19, 2014
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the Effects of Sleep Deprivation on the Body

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Sleep deprivation can cause damage to your body in the short term. Over time, it can lead to chronic health problems and negatively impact your quality of life.

Inadequate sleep raises your risk of accidental injury and death from all causes. [Read more.](#)

Without plenty of rest, your brain is unable to rest and renew, leaving you ill-prepared to face the day. [Read more.](#)

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If you are seriously sleep deprived, you might fall asleep for short periods without even knowing it. That can be very dangerous if you're behind the wheel of a car. [Read more.](#)

Lack of sleep can make you groggy and affect your balance and coordination, making you more prone to injury due to accident. [Read more.](#)

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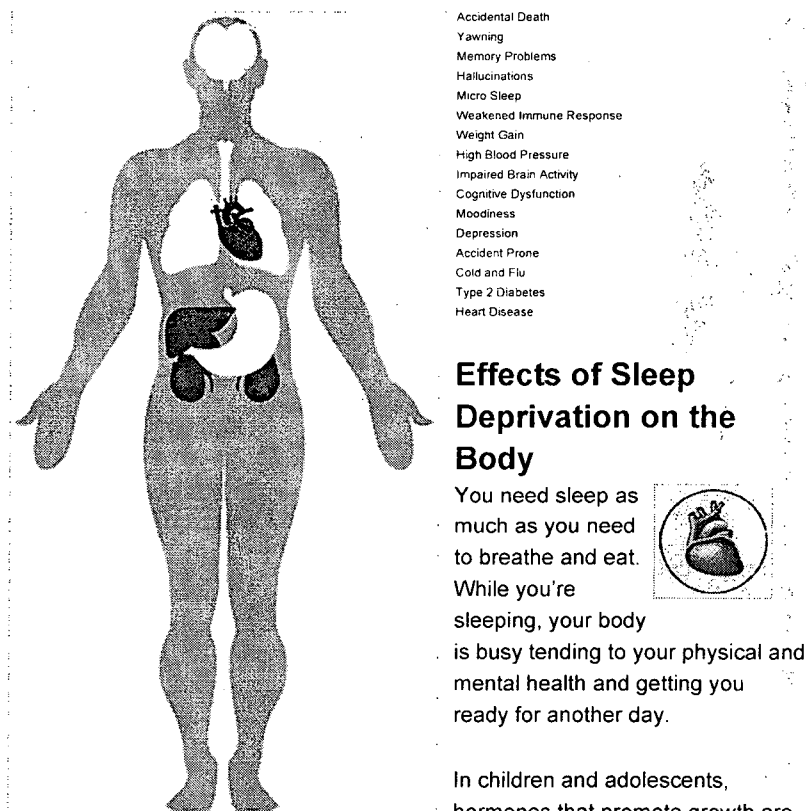
Lack of sleep weakens your defenses against viruses like the common cold and influenza. [Read more.](#)

Lack of sleep can actually increase your appetite, and your brain may not get the message that you've had enough to eat. [Read more.](#)

Lack of sleep affects the amount of insulin released after you eat, increasing your risk of developing type 2 diabetes. [Read more.](#)

If you have hypertension, a single night without adequate sleep can elevate your blood pressure for a whole day. [Read more.](#)

Sleep deprivation can lead to chronic cardiovascular problems like hypertension and heart disease. [Read more.](#)



When you're deprived of sleep, your brain can't function properly, affecting your cognitive abilities and emotional state. If it continues long enough, it can lower your body's defenses, putting you at risk of developing chronic illness. The more obvious signs of sleep deprivation are excessive sleepiness, yawning, and irritability. Chronic sleep deprivation can interfere with balance, coordination, and decision-making abilities. You're at risk falling asleep during the day, even if you fight it. Stimulants like caffeine are not able to override your body's profound need for sleep.

When you're sleep deprived, the effects of alcohol consumption are magnified, as is your risk of being involved in an accident. According to Harvard Medical School, studies show that sleeping less than five hours a night increases the risk of death from all causes by about 15 percent. Sleep deprivation is dangerous to your mental and physical health and can dramatically lower your quality of life.

Central Nervous System

Your central nervous system is the information highway of your body. Sleep is necessary to keep it functioning properly. During sleep, the brain rests busy neurons and forms new pathways so you're ready to face the world in the morning. In children and young adults, the brain releases growth hormones during sleep. While you're sleeping, your body is also producing proteins that help cells repair damage.



Sleep deprivation leaves the brain exhausted, so it can't perform its duties well. The most obvious effect is sleepiness. You may find yourself yawning a lot and feeling sluggish. Lack of sleep interferes with your ability to concentrate and learn new things. It can negatively impact both short-term and long-term memory. It gets in the way of your decision-making process and stifles creativity. Your emotions are also affected, making you more likely to have a short temper and mood swings. Overall cognitive function is impaired.

If sleep deprivation continues long enough, you're at increased risk of hallucinations, especially if you have narcolepsy or systemic lupus erythematosus. Lack of sleep can trigger mania in people who have manic depression. Other risks include impulsive behavior, depression, paranoia, and suicidal thoughts.

A side effect of sleep deprivation is micro sleep. That's when you're asleep for only a few seconds or a few minutes, but you don't realize it. If you're sleep deprived, micro sleep is out of your control and can be extremely dangerous if you're driving. It can also make you more prone to injury due to trips and falls. According to the National Heart, Lung, and Blood Institute, insufficient sleep has played a part in tragic accidents involving airplanes, ships, and even nuclear reactor meltdowns.

Immune System

When you're sleeping, your immune system produces protective cytokines and infection-fighting antibodies and cells. It uses these tools to fight off foreign substances like bacteria and viruses. These cytokines and other protective substances also help you sleep, giving the immune system more energy to defend against illness.



Sleep deprivation means your immune system doesn't have a chance to build up its forces. According to the Mayo Clinic, studies show that if you don't get enough sleep, it's more likely that your body won't be able to fend off invaders. It may also take you longer to recover from illness. Long-term sleep deprivation raises your risk of developing chronic illnesses like diabetes and cardiovascular diseases.

Respiratory System

Since sleep deprivation can weaken your immune system, you're more vulnerable to respiratory problems like the common cold



and influenza. If you already have a chronic lung disease, sleep deprivation is likely to make it worse.



Digestive System

According to Harvard Medical School, a few studies have found a link between lack of sleep and weight gain. Along with eating too much and not exercising, sleep deprivation is one of the risk factors for obesity.



Sleep deprivation increases production of the stress hormone cortisol. Lack of sleep lowers your levels of a hormone called leptin, which tells your brain that you've had enough to eat. In addition, it raises levels of a biochemical called ghrelin, which is an appetite stimulant.

Sleep deprivation prompts your body to release higher levels of insulin after you eat, promoting fat storage and increasing your risk of developing type 2 diabetes.

Cardiovascular System

Since you're more likely to gain weight if you're chronically sleep deprived, you're also at increased risk of problems with your cardiovascular system.



Sleep plays a vital role in your body's ability to heal and repair your blood vessels and heart. Sleep deprivation can lead to higher risk of chronic health problems like high blood pressure, heart disease, and stroke. According to Harvard Medical School, for people with hypertension, one night without enough sleep can cause elevated blood pressure all through the next day.

Recommended for You



Natural Sleep Remedies

Adequate rest is essential for a healthy body. A few simple behaviors can help you get the sleep you need to maintain good health.

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7 Tips for Better Sleep

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Sleep Disorders Health Center

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Tips to Reduce Stress and Sleep Better

In this article

What Are the Signs of Stress?

Tips for Managing Stress for Better Sleep

Stress is our response to daily life. It affects us emotionally, physically, and behaviorally. The right amount of stress can be a positive force that helps us to do our best and to keep alert and energetic. Too much stress, however, can make us tense and anxious and can cause sleep problems.

What Are the Signs of Stress?

Common signs of stress include depression, sleep  problems, tension, anxiety, work mistakes, poor concentration, and apathy, among many others. If high levels of unwanted stress are not properly managed, your health and sense of well-being can suffer. Therefore, it is important to learn how to manage stress.

Tips for Managing Stress for Better Sleep

These tips can help you ease stress and hopefully get a better night's sleep:

- **Assess what is stressful:** The first step in getting a handle on stress is to figure out what is causing it. Take a good look at your physical condition and your daily activities. Do you suffer from pain? Are you overloaded at work? Once you identify your stressors, you can take steps to reduce them.
- **Seek social support:** Spending time with family and friends is an important buffer against stress. It can be helpful to share your problems with people who care for you.
- **Practice thought management:** What we think, how we think, what we expect, and what we tell ourselves often determine how we feel and how well we manage rising stress levels. You can learn to change thought patterns that produce stress. Thoughts to watch out for include those concerning how things should be and those that overgeneralize sets of circumstances (for example, "I'm a failure at my whole job because I missed one deadline.") Many commercial audiotapes and books can help you learn thought management exercises.
- **Exercise:** Exercise  can help you blow off steam, thereby reducing stress. In addition, flexible, loose muscles are less likely to become tight and painful in response to stress. However, it's best to exercise at least 2 hours before bedtime so that your body temperature returns to normal. If you have a medical condition or are over age 50, it's best to check with your doctor before beginning an exercise regimen.

- **Eat a healthy diet:** Junk food and refined sugars low in nutritional value and high in calories can leave us feeling out of energy and sluggish. A healthy diet, low in sugar, caffeine, and alcohol, can promote health and reduce stress.
- **Get adequate sleep:** A good night's sleep makes you able to tackle the day's stress more easily. When you are tired, you are less patient and more easily agitated, which can increase stress. Most adults need 7-9 hours of sleep per night. Practicing good sleep hygiene along with stress-lowering tactics can help improve your quality of sleep.
- **Delegate responsibility:** Often, having too many responsibilities can lead to stress. Free up time and decrease stress by delegating responsibilities.

These steps can help many people sleep soundly through the night. However, if you have frequent sleep problems, talk to your doctor. Your doctor can assess you for possible sleep disorders and recommend safe and effective sleep medicine.

WebMD Medical Reference

SOURCE: The National Sleep Foundation.

Reviewed by David T. Derrer, MD on March 10, 2014

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Sleep Disorders Guide

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| 2 Sleep Problems | 5 Tests & Treatments |
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My Notes:

Further Reading:

Slideshow: Insomnia Myths and Facts

How to Sleep Better
Slideshow: 20 Tips to Reduce Your Sleep Problems

Insomnia Quiz: Test Your Smarts on Poor Sleep and How to Fix It

Top Picks

More Evidence That Exercise May Help Fight Depression

Hepatitis C Treatments on the Horizon

Abdominal Fullness or Bloating-Topic Overview

High Blood Pressure Symptoms

Is Anxiety or Stress Causing
Your Insomnia?

Video: Why Face Lifts for Men
Are Tricky

Your Attitude About Your
Bedroom Hurting Your Sleep?

Slideshow: a Visual Guide to
Understanding Fibromyalgia

Insomnia and Watching TV in
Bed: What's the Link?

What Your Sleep Position Says
About Your Personality

See All Insomnia Topics

Anxiety disorder

From Wikipedia, the free encyclopedia

Anxiety disorders are a category of mental disorders characterized by feelings of anxiety and fear,^[1] where anxiety is a worry about future events and fear is a reaction to current events.^[1] These feelings may cause physical symptoms, such as a racing heart and shakiness.^[1] There are various forms of anxiety disorders, including generalized anxiety disorder, a specific phobia, social anxiety disorder, and panic disorder. While each has its own characteristics and symptoms, they all include symptoms of anxiety.^[2]

Anxiety disorders are partly genetic but may also be due to drug use including alcohol and caffeine, as well as withdrawal from certain drugs. They often occur with other mental disorders, particularly major depressive disorder, bipolar disorder, certain personality disorders, and eating disorders. The term anxiety covers four aspects of experiences that an individual may have: mental

apprehension, physical tension, physical symptoms and dissociative anxiety.^[3] The emotions present in anxiety disorders range from simple nervousness to bouts of terror.^[4] There are other psychiatric and medical problems that may mimic the symptoms of an anxiety disorder, such as hyperthyroidism.

Common treatment options include lifestyle changes, therapy, and medications. Medications are typically recommended only if other measures are not effective.^[5] Anxiety disorders occur about twice as often in females as males, and generally begin during childhood.^[1] As many as 18% of Americans and 14% of Europeans may be affected by one or more anxiety disorders.^[6]

Anxiety disorder

Classification and external resources



The Scream (Norwegian: *Skrik*) an Expressionist painting by Norwegian artist Edvard Munch

ICD-10	F40 (http://apps.who.int/classifications/icd10/browse/2015/en#/F40) -F42 (http://apps.who.int/classifications/icd10/browse/2015/en#/F42)
ICD-9	300 (http://www.icd9data.com/getICD9Code.ashx?icd9=300)
DiseasesDB	787 (http://www.diseasesdatabase.com/ddb787.htm)
eMedicine	med/152 (http://www.emedicine.com/med/topic152.htm)
MeSH	D001008 (https://www.nlm.nih.gov/cgi/mesh/2014/MB_cgi?field=uid&term=D001008)

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Classification

Generalized

Generalized anxiety disorder (GAD) is a common, chronic disorder characterized by long-lasting anxiety that is not focused on any one object or situation. Those suffering from generalized anxiety disorder experience non-specific persistent fear and worry, and become overly concerned with everyday matters. According to Schacter, Gilbert, and Wegner's book *Psychology: Second Edition*, generalized anxiety disorder is "characterized by chronic excessive worry accompanied by three or more of the following symptoms: restlessness, fatigue, concentration problems, irritability, muscle tension, and sleep disturbance".^[7] Generalized anxiety disorder is the most common anxiety disorder to affect older adults.

^[8] Anxiety can be a symptom of a medical or substance abuse problem, and medical professionals must be aware of this. A diagnosis of GAD is made when a person has been excessively worried about an everyday problem for six months or more.^[4] A person may find that he/she has problems making daily decisions and remembering commitments as a result of lack of concentration/preoccupation with worry.

^[9] Appearance looks strained, with increased sweating from the hands, feet, and axillae, and he/she may be tearful, which can suggest depression.^[2] Before a diagnosis of anxiety disorder is made, physicians must rule out drug-induced anxiety and other medical causes.^[10]

In children GAD may be associated with headaches, restlessness, abdominal pain, and heart palpitations.

^[11] Typically it begins around 8 to 9 years of age.^[11]

Phobias

The single largest category of anxiety disorders is that of phobic disorders, which includes all cases in which fear and anxiety is triggered by a specific stimulus or situation. Between 5% and 12% of the population worldwide suffer from phobic disorders.^[4] Sufferers typically anticipate terrifying consequences from encountering the object of their fear, which can be anything from an animal to a location to a bodily fluid to a particular situation. Sufferers understand that their fear is not proportional to the actual potential danger but still are overwhelmed by it.^[12]

Panic disorder

With panic disorder, a person suffers from brief attacks of intense terror and apprehension, often marked by trembling, shaking, confusion, dizziness, nausea, and/or difficulty breathing. These panic attacks, defined by the APA as fear or discomfort that abruptly arises and peaks in less than ten minutes, can last for several hours. Attacks can be triggered by stress, fear, or even exercise; the specific cause is not always apparent.

In addition to recurrent unexpected panic attacks, a diagnosis of panic disorder requires that said attacks have chronic consequences: either worry over the attacks' potential implications, persistent fear of future attacks, or significant changes in behavior related to the attacks. As such, those suffering from panic disorder experience symptoms even outside specific panic episodes. Often, normal changes in heartbeat are noticed by a panic sufferer, leading them to think something is wrong with their heart or they are

about to have another panic attack. In some cases, a heightened awareness (hypervigilance) of body functioning occurs during panic attacks, wherein any perceived physiological change is interpreted as a possible life-threatening illness (i.e., extreme hypochondriasis).

Agoraphobia

Agoraphobia is the specific anxiety about being in a place or situation where escape is difficult or embarrassing or where help may be unavailable.^[13] Agoraphobia is strongly linked with panic disorder and is often precipitated by the fear of having a panic attack. A common manifestation involves needing to be in constant view of a door or other escape route. In addition to the fears themselves, the term agoraphobia is often used to refer to avoidance behaviors that sufferers often develop. For example, following a panic attack while driving, someone suffering from agoraphobia may develop anxiety over driving and will therefore avoid driving. These avoidance behaviors can often have serious consequences.

Social anxiety disorder

Social anxiety disorder (SAD; also known as social phobia) describes an intense fear and avoidance of negative public scrutiny, public embarrassment, humiliation, or social interaction. This fear can be specific to particular social situations (such as public speaking) or, more typically, is experienced in most (or all) social interactions. Social anxiety often manifests specific physical symptoms, including blushing, sweating, and difficulty speaking. As with all phobic disorders, those suffering from social anxiety often will attempt to avoid the source of their anxiety; in the case of social anxiety this is particularly problematic, and in severe cases can lead to complete social isolation.

Obsessive-compulsive disorder

Obsessive-compulsive disorder (OCD) is a type of anxiety disorder primarily characterized by repetitive obsessions (distressing, persistent, and intrusive thoughts or images) and compulsions (urges to perform specific acts or rituals). It affects roughly 3% of the population worldwide.^[4] The OCD thought pattern may be likened to superstitions insofar as it involves a belief in a causative relationship where, in reality, one does not exist. Often the process is entirely illogical; for example, the compulsion of walking in a certain pattern may be employed to alleviate the obsession of impending harm. And in many cases, the compulsion is entirely inexplicable, simply an urge to complete a ritual triggered by nervousness.

In a slight minority of cases, sufferers of OCD may only experience obsessions, with no overt compulsions; a much smaller number of sufferers experience only compulsions.^[14]

Post-traumatic stress disorder

Post-traumatic stress disorder (PTSD) is an anxiety disorder that results from a traumatic experience. Post-traumatic stress can result from an extreme situation, such as combat, natural disaster, rape, hostage situations, child abuse, bullying, or even a serious accident. It can also result from long term (chronic) exposure to a severe stressor,^[15] for example soldiers who endure individual battles but cannot cope with continuous combat. Common symptoms include hypervigilance, flashbacks, avoidant behaviors,

anxiety, anger and depression.^[14] There are a number of treatments that form the basis of the care plan for those suffering with PTSD. Such treatments include cognitive behavioral therapy (CBT), psychotherapy and support from family and friends.^[4]

Separation anxiety

Separation anxiety disorder (SepAD) is the feeling of excessive and inappropriate levels of anxiety over being separated from a person or place. Separation anxiety is a normal part of development in babies or children, and it is only when this feeling is excessive or inappropriate that it can be considered a disorder.^[16] Separation anxiety disorder affects roughly 7% of adults and 4% of children, but the childhood cases tend to be more severe; in some instances, even a brief separation can produce panic.^{[17][18]}

Situational anxiety

Situational anxiety is caused by new situations or changing events. It can also be caused by various events that make that particular individual uncomfortable. Its occurrence is very common. Often, an individual will experience panic attacks or extreme anxiety in specific situations. A situation that causes one individual to experience anxiety may not affect another individual, at all. For example, some people become uneasy in crowds or tight spaces, so standing in a tightly packed line, say at the bank or a store register, may cause them to experience extreme anxiety, possibly a panic attack.^[19] Others, however, may experience anxiety when major changes in life occur, such as entering college, getting married, having children, etc.

Children

Children experience anxiety disorders similar to adults.

A common anxiety disorder in children is school phobia, which in some cases can be a type of separation anxiety. Sometimes the anxiety has no obvious cause. In other instances, the child may experience bullying from classmates, or even a teacher. They could also be stressed from the workload they are given. School phobia may also be a form of social phobia, also known as social anxiety. Children with this disorder may avoid speaking in front of their classmates or meeting new people. Typically, social phobia in children is caused by some traumatic event, such as not knowing an answer when called on in class.^[20]

The symptoms for both disorders are the same in children as they are in adults. If a child has GAD, they may worry about anything, even if it is seemingly minor. They long for attention, approval, and encouragement from others. The only difference is they are more likely to worry about things that relate to them. Those things may include, grades, bullies, getting hurt, storms, etc. The symptoms of OCD include repetitive and/or compulsive behaviors.^[21]

Causes

Drugs

Anxiety and depression can be caused by alcohol abuse, which in most cases improves with prolonged abstinence. Even moderate, sustained alcohol use may increase anxiety levels in some individuals.^[22] Caffeine, alcohol and benzodiazepine dependence can worsen or cause anxiety and panic attacks.^[23] Anxiety commonly occurs during the acute withdrawal phase of alcohol and can persist for up to 2 years as part of a post-acute withdrawal syndrome, in about a quarter of people recovering from alcoholism.^[24] In one study in 1988–1990, illness in approximately half of patients attending mental health services at one British hospital psychiatric clinic, for conditions including anxiety disorders such as panic disorder or social phobia, was determined to be the result of alcohol or benzodiazepine dependence. In these patients, an initial increase in anxiety occurred during the withdrawal period followed by a cessation of their anxiety symptoms.^[25]

There is evidence that chronic exposure to organic solvents in the work environment can be associated with anxiety disorders. Painting, varnishing and carpet-laying are some of the jobs in which significant exposure to organic solvents may occur.^[26]

Ingestion of caffeine may cause or exacerbate anxiety disorders.^{[27][28]} A number of clinical studies have shown a positive association between caffeine and anxiogenic effects and/or panic disorder.^{[29][30][31]} Those with anxiety can have high caffeine sensitivity.^{[32][33]}

Stress

Anxiety disorders can arise in response to life stresses such as financial worries or chronic physical illness. Anxiety is also common among older people who have dementia. On the other hand, anxiety disorder is sometimes misdiagnosed among older adults when doctors misinterpret symptoms of a physical ailment (for instance, racing heartbeat due to cardiac arrhythmia) as signs of anxiety.^[8]

Genetics

GAD runs in families and is six times more common in the children of someone with the condition.^[5]

While anxiety arose as an adaptation, in modern times it is almost always thought of negatively in the context of anxiety disorders. People with these disorders have highly sensitive systems; hence, their systems tend to overreact to seemingly harmless stimuli. Sometimes anxiety disorders occur in those who have had traumatic youths, demonstrating an increased prevalence of anxiety when it appears a child will have a difficult future.^[34] In these cases, the disorder arises as a way to predict that the individual's environment will continue to pose threats.

Persistence of anxiety

At a low level, anxiety is not a bad thing. In fact, the hormonal response to anxiety has evolved as a benefit, as it helps humans react to dangers. Researchers in evolutionary medicine believe this adaptation allows humans to realize there is a potential threat and to act accordingly in order to ensure greatest possibility of protection. It has actually been shown that those with low levels of anxiety have a greater risk of death than those with average levels. This is because the absence of fear can lead to injury or death.^[34] Additionally, patients with both anxiety and depression were found to have lower morbidity than those with depression alone.^[35] The functional significance of the symptoms associated with anxiety includes: greater alertness, quicker preparation for action, and reduced probability of missing threats.^[35] In the wild, vulnerable individuals, for example those who are hurt or pregnant, have a lower threshold for anxiety response, making them more alert.^[35] This demonstrates a lengthy evolutionary history of the anxiety response.

Evolutionary mismatch

It has been theorized that high rates of anxiety are a reaction to how the social environment has changed from the Paleolithic era. For example, in the Stone Age there was greater skin-to-skin contact and more handling of babies by their mothers, both of which are strategies that reduce anxiety.^[34] Additionally, there is greater interaction with strangers in present times as opposed to interactions solely between close-knit tribes. Researchers posit that the lack of constant social interaction, especially in the formative years, is a driving cause of high rates of anxiety.

Many current cases are likely to have resulted from an evolutionary mismatch, which has been specifically been termed a “psychopathological mismatch.” In evolutionary terms, a mismatch occurs when an individual possesses traits that were adapted for an environment that differs from the individual’s current environment. For example, even though an anxiety reaction may have been evolved to help with life-threatening situations, for highly sensitized individuals in Westernized cultures simply hearing bad news can elicit a strong reaction.^[36]

An evolutionary perspective may provide insight into alternatives to current clinical treatment methods for anxiety disorders. Simply knowing some anxiety is beneficial may alleviate some of the panic associated with mild conditions. Some researchers believe that, in theory, anxiety can be mediated by reducing a patient’s feeling of vulnerability and then changing their appraisal of the situation.^[36]

Mechanisms

Biological

Low levels of GABA, a neurotransmitter that reduces activity in the central nervous system, contribute to anxiety. A number of anxiolytics achieve their effect by modulating the GABA receptors.^{[37][38][39]}

Selective serotonin reuptake inhibitors, the drugs most commonly used to treat depression, are frequently considered as a first line treatment for anxiety disorders.^[40]

People with obsessive-compulsive disorder (sometimes considered an anxiety disorder), have increased grey matter volumes in bilateral lenticular nuclei, extending to the caudate nuclei, while decreased grey matter volumes in bilateral dorsal medial frontal/anterior cingulate gyri.^{[41][42]} These findings contrast with those in people with other anxiety disorders, who have decreased (rather than increased) grey matter volumes in bilateral lenticular/caudate nuclei while also decreased grey matter volumes in bilateral dorsal medial frontal/anterior cingulate gyri.^[42] Alterations of circadian rhythms associated with obsessive-compulsive disorder have recently come into the focus of research.^[43]

Amygdala

The amygdala is central to the processing of fear and anxiety, and its function may be disrupted in anxiety disorders.^[44] Sensory information enters the amygdala through the nuclei of the basolateral complex (consisting of lateral, basal, and accessory basal nuclei). The basolateral complex processes sensory-related fear memories and communicates their threat importance to memory and sensory processing elsewhere in the brain, such as the medial prefrontal cortex and sensory cortices.

Another important area is the adjacent central nucleus of the amygdala, which controls species-specific fear responses, via connections to the brainstem, hypothalamus, and cerebellum areas. In those with general anxiety disorder, these connections functionally seem to be less distinct, with greater gray matter in the central nucleus. Another difference is that the amygdala areas have decreased connectivity with the insula and cingulate areas that control general stimulus salience, while having greater connectivity with the parietal cortex and prefrontal cortex circuits that underlie executive functions.^[44]

The latter suggests a compensation strategy for dysfunctional amygdala processing of anxiety. Researchers have noted "Amygdalofrontoparietal coupling in generalized anxiety disorder patients may ... reflect the habitual engagement of a cognitive control system to regulate excessive anxiety."^[44] This is consistent with cognitive theories that suggest the use in this disorder of attempts to reduce the involvement of emotions with compensatory cognitive strategies.

Clinical and animal studies suggest a correlation between anxiety disorders and difficulty in maintaining balance.^{[45][46][47][48]} A possible mechanism is malfunction in the parabrachial area, a brain structure that, among other functions, coordinates signals from the amygdala with input concerning balance.^[49]

Anxiety processing in the basolateral amygdala has been implicated with dendritic arborization of the amygdaloid neurons. SK2 potassium channels mediate inhibitory influence on action potentials and reduce arborization. By overexpressing SK2 in the basolateral amygdala, anxiety in experimental animals can be reduced together with general levels of stress-induced corticosterone secretion.^[50]

Prevention

Focus is increasing on prevention of anxiety disorders.^[51] There is tentative evidence to support the use of cognitive behavior therapy.^[51] As of 2014 there are no effective measures to prevent GAD in adults.^[5]

Diagnosis

Anxiety disorders are often severe chronic conditions, which can be present from an early age or begin suddenly after a triggering event. They are prone to flare up at times of high stress and are frequently accompanied by physiological symptoms such as headache, sweating, muscle spasms, tachycardia, palpitations, and hypertension, which in some cases lead to fatigue or exhaustion.

In casual discourse the words "anxiety" and "fear" are often used interchangeably; in clinical usage, they have distinct meanings: "anxiety" is defined as an unpleasant emotional state for which the cause is either not readily identified or perceived to be uncontrollable or unavoidable, whereas "fear" is an emotional and physiological response to a recognized external threat. The term "anxiety disorder" includes fears (phobias) as well as anxieties.

Standardized screening clinical questionnaires such as the Taylor Manifest Anxiety Scale or the Zung Self-Rating Anxiety Scale can be used to detect anxiety symptoms, and suggest the need for a formal diagnostic assessment of anxiety disorder.^[52]

Anxiety disorders often occur along with other mental disorders, in particular depression, which may occur in as many as 60% of people with anxiety disorders. The fact that there is considerable overlap between symptoms of anxiety and depression, and that the same environmental triggers can provoke symptoms in either condition, may help to explain this high rate of comorbidity.^[53]

Studies have also indicated that anxiety disorders are more likely among those with family history of anxiety disorders, especially certain types.^[54]

Sexual dysfunction often accompanies anxiety disorders, although it is difficult to determine whether anxiety causes the sexual dysfunction or whether they arise from a common cause. The most common manifestations in individuals with anxiety disorder are avoidance of intercourse, premature ejaculation or erectile dysfunction among men and pain during intercourse among women. Sexual dysfunction is particularly common among people affected by panic disorder (who may fear that a panic attack will occur during sexual arousal) and posttraumatic stress disorder.^[55]

Treatment

Treatment options available include lifestyle changes, therapy, and medications. Medication are only recommended if other measures are not effective.^[5] Stopping smoking has benefits in anxiety as large as or larger than those of medications.^[56]

Therapy

Cognitive behavioral therapy (CBT) is effective for anxiety disorders.^{[57][58]} CBT, as its name suggests, has two main components: cognitive and behavioral. In cases of social anxiety, the cognitive component can help the person question how they can be so sure that others are continually watching and harshly judging him or her. The behavioral component seeks to change people's reactions to anxiety-provoking situations.

CBT appears to be equally effective when carried out via the internet.^[59]

As such it serves as a logical extension of cognitive therapy, whereby people are shown proof in the real world that their dysfunctional thought processes are unrealistic. A key element of this component is gradual exposure, in which the patient is confronted by the things they fear in a structured, sensitive manner. Gradual exposure is an inherently unpleasant technique; ideally it involves exposure to a feared social situation that is anxiety provoking but bearable, for as long as possible, two to three times a week. Often, a hierarchy of feared steps is constructed and the patient is exposed to each step sequentially.

The aim is to learn from acting differently and observing reactions. This is intended to be done with support and guidance, and when the therapist and patient feel they are ready. Cognitive-behavioral therapy for social phobia also includes anxiety management training, which may include techniques such as deep breathing and muscle relaxation exercises, which may be practiced 'in-situ'. CBT can also be conducted partly in group sessions, facilitating the sharing of experiences, a sense of acceptance by others and undertaking behavioral challenges in a trusted environment (Heimberg).

Some studies have suggested social skills training can help with social anxiety.^[60] However, it is not clear whether specific social skills techniques and training are required, rather than just support with general social functioning and exposure to social situations.^[61] Additionally, a recent study has suggested that interpersonal therapy, a form of psychotherapy primarily used to treat depression, may also be effective in the treatment of social phobia.^[62]

In social phobia a specific form of short-term CBT, the central component being gradual exposure therapy. Self-help books can contribute to the treatment of people with anxiety disorders.^[63]

Medications

Medication are only indicated if other measures have not been found to be effective or a person is not interested in trying them.^[5] If medications are used SSRIs are recommended as first-line agents. Benzodiazepines are also sometimes indicated for short-term or "as needed" use. They are usually considered second-line due to disadvantages such as cognitive impairment and risks of dependence.^[64] MAOIs such as phenelzine and tranylcypromine are considered an effective treatment and are especially useful in treatment-resistant cases, however, dietary restrictions and medical interactions may limit their use.^{[65][66]} Pregabalin may be effective.^[67] In children and adolescents, when a medication option is warranted, antidepressants such as SSRIs, SNRIs as well as tricyclic antidepressants can be effective. Buspar is not effective in children and adolescents who have an anxiety disorder.^[68]

These medications need to be used with care among older adults, who are more likely to have side effects because of coexisting physical disorders. Adherence problems are more likely among elderly patients, who may have difficulty understanding, seeing, or remembering instructions.^[8]

The effectiveness and increased suicide risk of SSRIs has been subject to controversy. General side effects are common and may include headaches, nausea, insomnia, and changes in sexual behavior. Treatment safety during pregnancy has not been established.^[69] In late 2004 much media attention was

given to a proposed link between SSRI use and suicide. For this reason, the use of SSRIs in pediatric cases of depression is recognized by the Food and Drug Administration as warranting a cautionary statement to the parents of children who may be prescribed SSRIs.^[70]

Other drugs

The atypical antipsychotic quetiapine appears effective in generalized anxiety disorder, however rates of adverse effects is greater than that with SSRIs.^[71] Evidence for risperidone and olanzapine is not enough to make any comments.^[71] For OCD the evidence for risperidone and quetiapine is tentative with insufficient evidence for olanzapine.^[72]

Benzodiazepines are an alternative to SSRIs. These drugs are often used for short-term relief of severe, disabling anxiety.^[73] Although benzodiazepines are still sometimes prescribed for long-term everyday use, there is concern over the development of drug tolerance, dependency and recreational abuse. It has been recommended that benzodiazepines only be considered for individuals who fail to respond to safer medications.^[74] Effects usually begin to appear within minutes or hours. Benzodiazepines are not however, effective in the treatment of children and adolescents who have an anxiety disorder.^[68]

Some people with a form of social phobia called performance phobia have been helped by beta-blockers. Taken in low doses, they control the physical manifestation of anxiety and can be taken before a public performance.

Treatment controversy arises because while some studies indicate that a combination of medication and psychotherapy can be more effective than either one alone, others suggest pharmacological interventions are largely palliative, and can actually interfere with the mechanisms of successful therapy.^[75]

Psychotherapeutic interventions have better long-term efficacy compared to pharmacotherapy.^[76]

Caffeine

Caffeine can cause anxiety, along with more minor effects, such as muscle twitchings, hand tremors, and headaches. The best way to prevent caffeinism is to either wean off of caffeine completely or reduce consumption.^[77] For some people, anxiety can be reduced by coming off caffeine.^[78] Anxiety can temporarily increase during caffeine withdrawal.^{[79][80][81]}

Alternative medicine

Regular exercise^[82] and reducing caffeine^[83] are often useful in treating anxiety. There is tentative evidence that yoga may be effective.^[84] Evidence is insufficient regarding meditation to make any conclusions.^[85]

Many other remedies have been used for anxiety disorder. These include kava, where the potential for benefit seems greater than that for harm with short-term use in those with mild to moderate anxiety.

^{[86][87]} The American Academy of Family Physicians (AAFP) recommends use of kava for those with

mild to moderate anxiety disorders who are not using alcohol or taking other medicines metabolized by the liver, but who wish to use "natural" remedies.^[88] Side effects of kava in the clinical trials were rare and mild.

Inositol has been found to have modest effects in people with panic disorder or obsessive-compulsive disorder.^[89] There is insufficient evidence to support the use of St. John's wort, valerian or passionflower.^[89]

Children

Several methods of treatment have been found to be effective in treating childhood anxiety disorders. Like adults, children may undergo psychotherapy, cognitive-behavioral therapy, or counseling. They may still be given medication such as SSRIs, but in much smaller doses. However, administering potent medications like antidepressants to children is controversial. As a result, other forms of treatment have become increasingly popular. Family therapy is a form of treatment in which the child meets with a therapist together with the primary guardians and siblings. Each family member may attend individual therapy, but family therapy is typically a form of group therapy. Art and play therapy are also used. Art therapy is most commonly used when the child will not or cannot verbally communicate, due to trauma or a disability in which they are nonverbal. Participating in art activities allows the child to express what they otherwise may not be able to communicate to others.^[90] In play therapy, the child is allowed to play however they please as a therapist observes them. The therapist may intercede from time to time with a question, comment, or suggestion. This is often most effective when the family of the child plays a significant role in the treatment.^[91]

Prognosis

The prognosis varies on the severity of each case and utilization of treatment for each individual.^[92] It is the most common cause of disability in the workplace in the United States.^[93]

If these children are left untreated, they face risks such as poor results at school, avoidance of important social activities, and substance abuse. Children who have an anxiety disorder are likely to have other disorders such as depression, eating disorders, attention deficit disorders both hyperactive and inattentive.

Epidemiology

Globally as of 2010 approximately 273 million (4.5% of the population) had an anxiety disorder.^[94] It is more common in females (5.2%) than males (2.8%).^[94]

In Europe, Africa and Asia, lifetime rates of anxiety disorders are between 9 and 16%, and yearly rates are between 4 and 7%.^[95] In the United States, the lifetime prevalence of anxiety disorders is about 29%^[96] and between 11 and 18% of adults have the condition in a given year.^[95] This difference is affected

by the range of ways in which different cultures interpret anxiety symptoms and what they consider to be normative behavior.^{[97][98]} In general, anxiety disorders represent the most prevalent psychiatric condition in the United States, outside of substance use disorder.^[99]

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External links

- Support Group Providers for Anxiety disorder (https://www.dmoz.org/Health/Mental_Health/Disorders/Anxiety/Social_Anxiety/Support_Groups at DMOZ

Retrieved from "http://en.wikipedia.org/w/index.php?title=Anxiety_disorder&oldid=638217259"

Categories: Abnormal psychology | Anxiety disorders

Neurotic, stress-related and somatoform disorders | Psychiatric diagnosis

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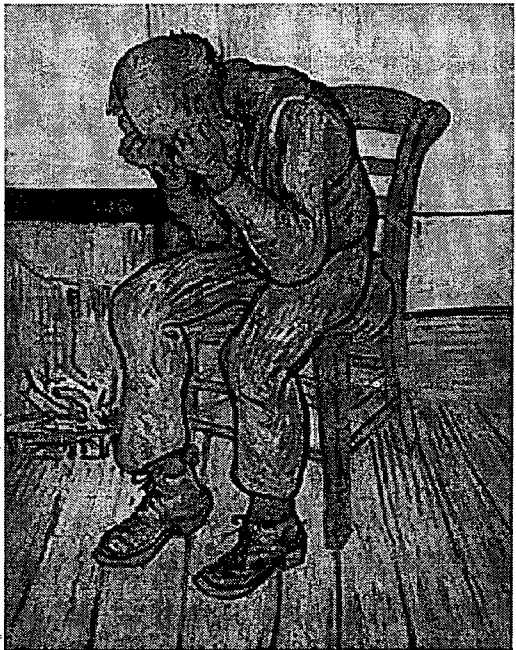
Major depressive disorder

From Wikipedia, the free encyclopedia

Major depressive disorder (MDD) (also known as **clinical depression**, **major depression**, **unipolar depression**, or **unipolar disorder**; or as **recurrent depression** in the case of repeated episodes) is a mental disorder characterized by a pervasive and persistent low mood that is accompanied by low self-esteem and by a loss of interest or pleasure in normally enjoyable activities. The term "depression" is used in a number of different ways. It is often used to mean this syndrome but may refer to other mood disorders or simply to a low mood. Major depressive disorder is a disabling condition that adversely affects a person's family, work or school life, sleeping and eating habits, and general health. In the United States, around 3.4% of people with major depression commit suicide, and up to 60% of people who commit suicide had depression or another mood disorder.^[1]

The diagnosis of major depressive disorder is based on the patient's self-reported experiences, behavior reported by relatives or friends, and a mental status examination. There is no laboratory test for major depression, although physicians generally request

Major depressive disorder



Vincent van Gogh's 1890 painting *Sorrowing old man ('At Eternity's Gate')*

Classification and external resources

ICD-10	F32 (http://apps.who.int/classifications/icd10/browse/2015/en#/F32), F33 (http://apps.who.int/classifications/icd10/browse/2015/en#/F33)
ICD-9	296.2 (http://www.icd9data.com/getICD9Code.ashx?icd9=296.2), 296.3 (http://www.icd9data.com/getICD9Code.ashx?icd9=296.3)
OMIM	608516 (http://omim.org/entry/608516)
DiseasesDB	3589 (http://www.diseasesdatabase.com/ddb3589.htm)
MedlinePlus	003213 (http://www.nlm.nih.gov/medlineplus/ency/article/003213.htm)
eMedicine	med/532 (http://www.emedicine.com/med/topic532.htm)
Patient UK	Major depressive disorder (http://www.patient.co.uk/doctor/depression-pro)
MeSH	D003865 (https://www.nlm.nih.gov/cgi/mesh/2015/MB_cgi?field=uid&term=D003865)

tests for physical conditions that may cause similar symptoms. The most common time of onset is between the ages of 20 and 30 years, with a later peak between 30 and 40 years.^[2]

Typically, people are treated with antidepressant medication and, in many cases, also receive counseling, particularly cognitive behavioral therapy (CBT).^[3] Medication appears to be effective, but the effect may only be significant in the most severely depressed.^{[4][5]} Hospitalization may be necessary in cases with associated self-neglect or a significant risk of harm to self or others. A minority are treated with electroconvulsive therapy (ECT). The course of the disorder varies widely, from one episode lasting weeks to a lifelong disorder with recurrent major depressive episodes. Depressed individuals have shorter life expectancies than those without depression, in part because of greater susceptibility to medical illnesses and suicide. It is unclear whether or not medications affect the risk of suicide. Current and former patients may be stigmatized.

The understanding of the nature and causes of depression has evolved over the centuries, though this understanding is incomplete and has left many aspects of depression as the subject of discussion and research. Proposed causes include psychological, psycho-social, hereditary, evolutionary and biological factors. Long-term substance abuse may cause or worsen depressive symptoms. Psychological treatments are based on theories of personality, interpersonal communication, and learning. Most biological theories focus on the monoamine chemicals serotonin, norepinephrine and dopamine, which are naturally present in the brain and assist communication between nerve cells. This cluster of symptoms (syndrome) was named, described and classified as one of the mood disorders in the 1980 edition of the American Psychiatric Association's diagnostic manual.

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Symptoms and signs

Major depression significantly affects a person's family and personal relationships, work or school life, sleeping and eating habits, and general health.^[6] Its impact on functioning and well-being has been compared to that of chronic medical conditions such as diabetes.^[7]

A person having a major depressive episode usually exhibits a very low mood, which pervades all aspects of life, and an inability to experience pleasure in activities that were formerly enjoyed. Depressed people may be preoccupied with, or ruminate over, thoughts and feelings of worthlessness, inappropriate guilt or regret, helplessness, hopelessness, and self-hatred.^[8] In severe cases, depressed people may have symptoms of psychosis. These symptoms include delusions or, less commonly, hallucinations, usually unpleasant.^[9] Other symptoms of depression include poor concentration and memory (especially in those with melancholic or psychotic features),^[10] withdrawal from social situations and activities, reduced sex drive, and thoughts of death or suicide. Insomnia is common among the depressed. In the typical pattern, a person wakes very early and cannot get back to sleep.^[11] Hypersomnia, or oversleeping, can also happen.^[11] Some antidepressants may also cause insomnia due to their stimulating effect.^[12]

A depressed person may report multiple physical symptoms such as fatigue, headaches, or digestive problems; physical complaints are the most common presenting problem in developing countries, according to the World Health Organization's criteria for depression.^[13] Appetite often decreases, with resulting weight loss, although increased appetite and weight gain occasionally occur.^[8] Family and friends may notice that the person's behavior is either agitated or lethargic.^[11] Older depressed people

may have cognitive symptoms of recent onset, such as forgetfulness,^[10] and a more noticeable slowing of movements.^[14] Depression often coexists with physical disorders common among the elderly, such as stroke, other cardiovascular diseases, Parkinson's disease, and chronic obstructive pulmonary disease.^[15]

Depressed children may often display an irritable mood rather than a depressed mood,^[8] and show varying symptoms depending on age and situation.^[16] Most lose interest in school and show a decline in academic performance. They may be described as clingy, demanding, dependent, or insecure.^[11]

Diagnosis may be delayed or missed when symptoms are interpreted as normal moodiness.^[8] Depression may also coexist with attention-deficit hyperactivity disorder (ADHD), complicating the diagnosis and treatment of both.^[17]

Comorbidity

Major depression frequently co-occurs with other psychiatric problems. The 1990–92 *National Comorbidity Survey* (US) reports that 51% of those with major depression also suffer from lifetime anxiety.^[18] Anxiety symptoms can have a major impact on the course of a depressive illness, with delayed recovery, increased risk of relapse, greater disability and increased suicide attempts.^[19] American neuroendocrinologist Robert Sapolsky similarly argues that the relationship between stress, anxiety, and depression could be measured and demonstrated biologically.^[20] There are increased rates of alcohol and drug abuse and particularly dependence,^[21] and around a third of individuals diagnosed with ADHD develop comorbid depression.^[22] Post-traumatic stress disorder and depression often co-occur.^[6]

Depression and pain often co-occur. One or more pain symptoms are present in 65% of depressed patients, and anywhere from 5 to 85% of patients with pain will be suffering from depression, depending on the setting; there is a lower prevalence in general practice, and higher in specialty clinics. The diagnosis of depression is often delayed or missed, and the outcome worsens. The outcome can also worsen if the depression is noticed but completely misunderstood.^[23]

Depression is also associated with a 1.5- to 2-fold increased risk of cardiovascular disease, independent of other known risk factors, and is itself linked directly or indirectly to risk factors such as smoking and obesity. People with major depression are less likely to follow medical recommendations for treating and preventing cardiovascular disorders, which further increases their risk of medical complications.^[24] In addition, cardiologists may not recognize underlying depression that complicates a cardiovascular problem under their care.^[25]

Causes

The biopsychosocial model proposes that biological, psychological, and social factors all play a role in causing depression.^[26] The diathesis–stress model specifies that depression results when a preexisting vulnerability, or diathesis, is activated by stressful life events. The preexisting vulnerability can be either genetic,^{[27][28]} implying an interaction between nature and nurture, or schematic, resulting from views of the world learned in childhood.^[29]

Depression may be directly caused by damage to the cerebellum as is seen in cerebellar cognitive affective syndrome.^{[30][31][32]}

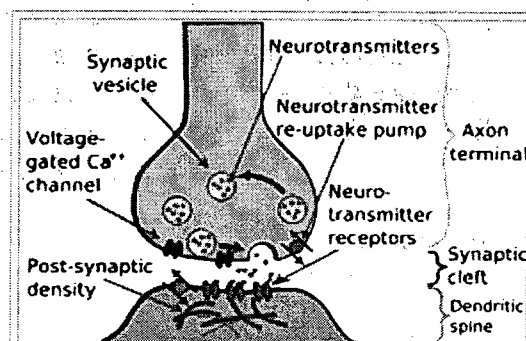
These interactive models have gained empirical support. For example, researchers in New Zealand took a prospective approach to studying depression, by documenting over time how depression emerged among an initially normal cohort of people. The researchers concluded that variation among the serotonin transporter (5-HTT) gene affects the chances that people who have dealt with very stressful life events will go on to experience depression. To be specific, depression may follow such events, but seems more likely to appear in people with one or two short alleles of the 5-HTT gene.^[27] In addition, a Swedish study estimated the heritability of depression—the degree to which individual differences in occurrence are associated with genetic differences—to be around 40% for women and 30% for men,^[33] and evolutionary psychologists have proposed that the genetic basis for depression lies deep in the history of naturally selected adaptations. A substance-induced mood disorder resembling major depression has been causally linked to long-term drug use or drug abuse, or to withdrawal from certain sedative and hypnotic drugs.^{[34][35]}

Biological

Monoamine hypothesis

Most antidepressant medications increase the levels of one or more of the monoamines—the neurotransmitters serotonin, norepinephrine and dopamine—in the synaptic cleft between neurons in the brain. Some medications affect the monoamine receptors directly.

Serotonin is hypothesized to regulate other neurotransmitter systems; decreased serotonin activity may allow these systems to act in unusual and erratic ways.^[36] According to this "permissive hypothesis", depression arises when low serotonin levels promote low levels of norepinephrine, another monoamine neurotransmitter.^[37] Some antidepressants enhance the levels of norepinephrine directly, whereas others raise the levels of dopamine, a third monoamine neurotransmitter. These observations gave rise to the monoamine hypothesis of depression. In its



contemporary formulation, the monoamine hypothesis postulates that a deficiency of certain neurotransmitters is responsible for the corresponding features of depression: "Norepinephrine may be related to alertness and energy as well as anxiety, attention, and interest in life; [lack of] serotonin to anxiety, obsessions, and compulsions; and dopamine to attention, motivation, pleasure, and reward, as well as interest in life."^[38] The proponents of this theory recommend the choice of an antidepressant with mechanism of action that impacts the most prominent symptoms. Anxious and irritable patients should be treated with SSRIs or norepinephrine reuptake inhibitors, and those experiencing a loss of energy and enjoyment of life with norepinephrine- and dopamine-enhancing drugs.^[38]

Of approx. 30 neurotransmitters that have been identified, researchers have discovered associations between clinical depression and the function of three major neurochemicals. These substances are serotonin, norepinephrine, and dopamine. Antidepressants influence the overall balance of these three neurotransmitters within structures of the brain that regulate emotion, reactions to stress, and the physical drives of sleep, appetite, and sexuality.

Besides the clinical observations that drugs that increase the amount of available monoamines are effective antidepressants, recent advances in psychiatric genetics indicate that phenotypic variation in central monoamine function may be marginally associated with vulnerability to depression. Despite these findings, the cause of depression is not simply monoamine deficiency.^[39] In the past two decades, research has revealed multiple limitations of the monoamine hypothesis, and its explanatory inadequacy has been highlighted within the psychiatric community.^[40] A counterargument is that the mood-enhancing effect of MAO inhibitors and SSRIs takes weeks of treatment to develop, even though the boost in available monoamines occurs within hours. Another counterargument is based on experiments with pharmacological agents that cause depletion of monoamines; while deliberate reduction in the concentration of centrally available monoamines may slightly lower the mood of unmedicated depressed patients, this reduction does not affect the mood of healthy people.^[39] The monoamine hypothesis, already limited, has been further oversimplified when presented to the general public as a mass marketing tool, usually phrased as a "chemical imbalance".^[41]

In 2003 a gene-environment interaction (GxE) was hypothesized to explain why life stress is a predictor for depressive episodes in some individuals, but not in others, depending on an allelic variation of the serotonin-transporter-linked promoter region (5-HTTLPR);^[42] a 2009 meta-analysis showed stressful life events were associated with depression, but found no evidence for an association with the 5-HTTLPR genotype.^[43] Another 2009 meta-analysis agreed with the latter finding.^[44] A 2010 review of studies in this area found a systematic relationship between the method used to assess environmental adversity and the results of the studies; this review also found that both 2009 meta-analyses were significantly biased toward negative studies, which used self-report measures of adversity.^[45]

Other hypotheses

MRI scans of patients with depression have revealed a number of differences in brain structure compared to those who are not depressed. Recent meta-analyses of neuroimaging studies in major depression reported that, compared to controls, depressed patients had increased volume of the lateral ventricles and adrenal gland and smaller volumes of the basal ganglia, thalamus, hippocampus, and

frontal lobe (including the orbitofrontal cortex and gyrus rectus).^{[46][47]} Hyperintensities have been associated with patients with a late age of onset, and have led to the development of the theory of vascular depression.^[48]

There may be a link between depression and neurogenesis of the hippocampus,^[49] a center for both mood and memory. Loss of hippocampal neurons is found in some depressed individuals and correlates with impaired memory and dysthymic mood. Drugs may increase serotonin levels in the brain, stimulating neurogenesis and thus increasing the total mass of the hippocampus. This increase may help to restore mood and memory.^{[50][51]} Similar relationships have been observed between depression and an area of the anterior cingulate cortex implicated in the modulation of emotional behavior.^[52] One of the neurotrophins responsible for neurogenesis is brain-derived neurotrophic factor (BDNF). The level of BDNF in the blood plasma of depressed subjects is drastically reduced (more than threefold) as compared to the norm. Antidepressant treatment increases the blood level of BDNF. Although decreased plasma BDNF levels have been found in many other disorders, there is some evidence that BDNF is involved in the cause of depression and the mechanism of action of antidepressants.^[53]

There is some evidence that major depression may be caused in part by an overactive hypothalamic-pituitary-adrenal axis (HPA axis) that results in an effect similar to the neuro-endocrine response to stress. Investigations reveal increased levels of the hormone cortisol and enlarged pituitary and adrenal glands, suggesting disturbances of the endocrine system may play a role in some psychiatric disorders, including major depression. Oversecretion of corticotropin-releasing hormone from the hypothalamus is thought to drive this, and is implicated in the cognitive and arousal symptoms.^[54]

The hormone estrogen has been implicated in depressive disorders due to the increase in risk of depressive episodes after puberty, the antenatal period, and reduced rates after menopause.^[55] On the converse, the premenstrual and postpartum periods of low estrogen levels are also associated with increased risk.^[55] Sudden withdrawal of, fluctuations in or periods of sustained low levels of estrogen have been linked to significant mood lowering. Clinical recovery from depression postpartum, perimenopause, and postmenopause was shown to be effective after levels of estrogen were stabilized or restored.^{[56][57]}

Other research has explored potential roles of molecules necessary for overall cellular functioning: cytokines. The symptoms of major depressive disorder are nearly identical to those of sickness behavior, the response of the body when the immune system is fighting an infection. This raises the possibility that depression can result from a maladaptive manifestation of sickness behavior as a result of abnormalities in circulating cytokines.^[58] The involvement of pro-inflammatory cytokines in depression is strongly suggested by a meta-analysis of the clinical literature showing higher blood concentrations of IL-6 and TNF- α in depressed subjects compared to controls.^[59] These immunological abnormalities may cause excessive prostaglandin E₂ production and likely excessive COX-2 expression. Abnormalities in how indoleamine 2,3-dioxygenase enzyme activates as well as the metabolism of tryptophan-kynurenine may lead to excessive metabolism of tryptophan-kynurenine and lead to increased production of the neurotoxin quinolinic acid, contributing to major depression. NMDA activation leading to excessive glutamatergic neurotransmission, may also contribute.^[60]

Psychological

Various aspects of personality and its development appear to be integral to the occurrence and persistence of depression,^[61] with negative emotionality as a common precursor.^[62] Although depressive episodes are strongly correlated with adverse events, a person's characteristic style of coping may be correlated with his or her resilience.^[63] In addition, low self-esteem and self-defeating or distorted thinking are related to depression. Depression is less likely to occur, as well as quicker to remit, among those who are religious.^{[64][65][66]} It is not always clear which factors are causes and which are effects of depression; however, depressed persons that are able to reflect upon and challenge their thinking patterns often show improved mood and self-esteem.^[67]

American psychiatrist Aaron T. Beck, following on from the earlier work of George Kelly and Albert Ellis, developed what is now known as a cognitive model of depression in the early 1960s. He proposed that three concepts underlie depression: a triad of negative thoughts composed of cognitive errors about oneself, one's world, and one's future; recurrent patterns of depressive thinking, or *schemas*; and distorted information processing.^[68] From these principles, he developed the structured technique of cognitive behavioral therapy (CBT).^[69] According to American psychologist Martin Seligman, depression in humans is similar to learned helplessness in laboratory animals, who remain in unpleasant situations when they are able to escape, but do not because they initially learned they had no control.^[70]

Attachment theory, which was developed by English psychiatrist John Bowlby in the 1960s, predicts a relationship between depressive disorder in adulthood and the quality of the earlier bond between the infant and the adult caregiver. In particular, it is thought that "the experiences of early loss, separation and rejection by the parent or caregiver (conveying the message that the child is unlovable) may all lead to insecure internal working models ... Internal cognitive representations of the self as unlovable and of attachment figures as unloving [or] untrustworthy would be consistent with parts of Beck's cognitive triad".^[71] While a wide variety of studies has upheld the basic tenets of attachment theory, research has been inconclusive as to whether self-reported early attachment and later depression are demonstrably related.^[71]

Depressed individuals often blame themselves for negative events,^[72] and, as shown in a 1993 study of hospitalized adolescents with self-reported depression, those who blame themselves for negative occurrences may not take credit for positive outcomes.^[73] This tendency is characteristic of a depressive attributional, or pessimistic explanatory style.^[72] According to Albert Bandura, a Canadian social psychologist associated with social cognitive theory, depressed individuals have negative beliefs about themselves, based on experiences of failure, observing the failure of social models, a lack of social persuasion that they can succeed, and their own somatic and emotional states including tension and stress. These influences may result in a negative self-concept and a lack of self-efficacy; that is, they do not believe they can influence events or achieve personal goals.^{[74][75]}

An examination of depression in women indicates that vulnerability factors—such as early maternal loss, lack of a confiding relationship, responsibility for the care of several young children at home, and unemployment—can interact with life stressors to increase the risk of depression.^[76] For older adults, the factors are often health problems, changes in relationships with a spouse or adult children due to the

transition to a care-giving or care-needing role, the death of a significant other, or a change in the availability or quality of social relationships with older friends because of their own health-related life changes.^[77]

The understanding of depression has also received contributions from the psychoanalytic and humanistic branches of psychology. From the classical psychoanalytic perspective of Austrian psychiatrist Sigmund Freud, depression, or *melancholia*, may be related to interpersonal loss^{[78][79]} and early life experiences.^[80] Existential therapists have connected depression to the lack of both meaning in the present^[81] and a vision of the future.^{[82][83]}

Social

Poverty and social isolation are associated with increased risk of mental health problems in general.^[61] Child abuse (physical, emotional, sexual, or neglect) is also associated with increased risk of developing depressive disorders later in life.^[84] Such a link has good face validity given that it is during the years of development that a child is learning how to become a social being. Abuse of the child by the caregiver is bound to distort the developing personality and create a much greater risk for depression and many other debilitating mental and emotional states. Disturbances in family functioning, such as parental (particularly maternal) depression, severe marital conflict or divorce, death of a parent, or other disturbances in parenting are additional risk factors.^[61] In adulthood, stressful life events are strongly associated with the onset of major depressive episodes.^[85] In this context, life events connected to social rejection appear to be particularly related to depression.^{[86][87]} Evidence that a first episode of depression is more likely to be immediately preceded by stressful life events than are recurrent ones is consistent with the hypothesis that people may become increasingly sensitized to life stress over successive recurrences of depression.^{[88][89]}

The relationship between stressful life events and social support has been a matter of some debate; the lack of social support may increase the likelihood that life stress will lead to depression, or the absence of social support may constitute a form of strain that leads to depression directly.^[90] There is evidence that neighborhood social disorder, for example, due to crime or illicit drugs, is a risk factor, and that a high neighborhood socioeconomic status, with better amenities, is a protective factor.^[91] Adverse conditions at work, particularly demanding jobs with little scope for decision-making, are associated with depression, although diversity and confounding factors make it difficult to confirm that the relationship is causal.^[92]

Depression can be caused by prejudice. This can occur when people hold negative self-stereotypes about themselves. This "deprejudice" can be related to a group membership (e.g., Me-Gay-Bad) or not (Me-Bad). If someone has prejudicial beliefs about a stigmatized group and then becomes a member of that group, they may internalize their prejudice and develop depression. For example, a boy growing up in the United States may learn the negative stereotype that gay men are immoral. When he grows up and realizes he is gay, he may direct this prejudice inward on himself and become depressed. People may also show prejudice internalization through self-stereotyping because of negative childhood experiences such as verbal and physical abuse.^[93]

Evolutionary

From the standpoint of evolutionary theory, major depression is hypothesized, in some instances, to increase an individual's reproductive fitness. Evolutionary approaches to depression and evolutionary psychology posit specific mechanisms by which depression may have been genetically incorporated into the human gene pool, accounting for the high heritability and prevalence of depression by proposing that certain components of depression are adaptations,^[94] such as the behaviors relating to attachment and social rank.^[95] Current behaviors can be explained as adaptations to regulate relationships or resources, although the result may be maladaptive in modern environments.^[96]

From another viewpoint, a counseling therapist may see depression not as a biochemical illness or disorder but as "a species-wide evolved suite of emotional programs that are mostly activated by a perception, almost always over-negative, of a major decline in personal usefulness, that can sometimes be linked to guilt, shame or perceived rejection".^[97] This suite may have manifested in aging hunters in humans' foraging past, who were marginalized by their declining skills, and may continue to appear in alienated members of today's society. The feelings of uselessness generated by such marginalization could in theory prompt support from friends and kin. In addition, in a manner analogous to that in which physical pain has evolved to hinder actions that may cause further injury, "psychic misery" may have evolved to prevent hasty and maladaptive reactions to distressing situations.^[98]

Drug and alcohol use

Very high levels of substance abuse occur in the psychiatric population, especially alcohol, sedatives and cannabis. Depression and other mental health problems can have a substance induced cause; making a differential or dual diagnosis regarding whether mental ill-health is substance related or not or co-occurring is an important part of a psychiatric evaluation.^[99] According to the DSM-IV, a diagnosis of mood disorder cannot be made if the cause is believed to be due to "the direct physiological effects of a substance"; when a syndrome resembling major depression is believed to be caused immediately by substance abuse or by an adverse drug reaction, it is referred to as, "substance-induced mood disturbance". Alcoholism or excessive alcohol consumption significantly increases the risk of developing major depression.^{[100][101]} Like alcohol, the benzodiazepines are central nervous system depressants; this class of medication is commonly used to treat insomnia, anxiety, and muscular spasms. Similar to alcohol, benzodiazepines increase the risk of developing major depression. This increased risk of depression may be due in part to the adverse or toxic effects of sedative-hypnotic drugs including alcohol on neurochemistry,^[101] such as decreased levels of serotonin and norepinephrine,^[35] or activation of immune mediated inflammatory pathways in the brain.^[102] Chronic use of benzodiazepines also can cause or worsen depression,^[103] or depression may be part of a protracted withdrawal syndrome.^{[104][105]} About a quarter of people recovering from alcoholism experience anxiety and depression, which can persist for up to 2 years.^[106] Methamphetamine abuse is also commonly associated with depression.^[107]

Diagnosis

Clinical assessment

A diagnostic assessment may be conducted by a suitably trained general practitioner, or by a psychiatrist or psychologist,^[6] who records the person's current circumstances, biographical history, current symptoms, and family history. The broad clinical aim is to formulate the relevant biological, psychological, and social factors that may be impacting on the individual's mood. The assessor may also discuss the person's current ways of regulating mood (healthy or otherwise) such as alcohol and drug use. The assessment also includes a mental state examination, which is an assessment of the person's current mood and thought content, in particular the presence of themes of hopelessness or pessimism, self-harm or suicide, and an absence of positive thoughts or plans.^[6] Specialist mental health services are rare in rural areas, and thus diagnosis and management is left largely to primary-care clinicians.^[108] This issue is even more marked in developing countries.^[109] The mental health examination may include the use of a rating scale such as the Hamilton Rating Scale for Depression^[110] or the Beck Depression Inventory.^[111] The score on a rating scale alone is insufficient to diagnose depression to the satisfaction of the DSM or ICD, but it provides an indication of the severity of symptoms for a time period, so a person who scores above a given cut-off point can be more thoroughly evaluated for a depressive disorder diagnosis.^[112] Several rating scales are used for this purpose.^[112] Screening programs have been advocated to improve detection of depression, but there is evidence that they do not improve detection rates, treatment, or outcome.^[113]

Primary-care physicians and other non-psychiatrist physicians have difficulty diagnosing depression, in part because they are trained to recognize and treat physical symptoms, and depression can cause myriad physical (psychosomatic) symptoms. Non-psychiatrists miss two-thirds of cases and unnecessarily treat other patients.^{[114][115]}

Before diagnosing a major depressive disorder, in general a doctor performs a medical examination and selected investigations to rule out other causes of symptoms. These include blood tests measuring TSH and thyroxine to exclude hypothyroidism; basic electrolytes and serum calcium to rule out a metabolic disturbance; and a full blood count including ESR to rule out a systemic infection or chronic disease.

^{[115][116]} Adverse affective reactions to medications or alcohol misuse are often ruled out, as well.

Testosterone levels may be evaluated to diagnose hypogonadism, a cause of depression in men.^[117]

Subjective cognitive complaints appear in older depressed people, but they can also be indicative of the onset of a dementing disorder, such as Alzheimer's disease.^{[118][119]} Cognitive testing and brain imaging can help distinguish depression from dementia.^[120] A CT scan can exclude brain pathology in those with psychotic, rapid-onset or otherwise unusual symptoms.^[121] In general, investigations are not repeated for a subsequent episode unless there is a medical indication.

No biological tests confirm major depression.^[122] Biomarkers of depression have been sought to provide an objective method of diagnosis. There are several potential biomarkers, including Brain-Derived Neurotrophic Factor and various functional MRI techniques. One study developed a decision tree model

of interpreting a series of fMRI scans taken during various activities. In their subjects, the authors of that study were able to achieve a sensitivity of 80% and a specificity of 87%, corresponding to a negative predictive value of 98% and a positive predictive value of 32% (positive and negative likelihood ratios were 6.15, 0.23, respectively). However, much more research is needed before these tests could be used clinically.^[123]

DSM-IV-TR and ICD-10 criteria

The most widely used criteria for diagnosing depressive conditions are found in the American Psychiatric Association's revised fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV-TR), and the World Health Organization's *International Statistical Classification of Diseases and Related Health Problems* (ICD-10), which uses the name *depressive episode* for a single episode and *recurrent depressive disorder* for repeated episodes.^[124] The latter system is typically used in European countries, while the former is used in the US and many other non-European nations,^[125] and the authors of both have worked towards conforming one with the other.^[126]

Both DSM-IV-TR and ICD-10 mark out typical (main) depressive symptoms.^[127] ICD-10 defines three typical depressive symptoms (depressed mood, anhedonia, and reduced energy), two of which should be present to determine depressive disorder diagnosis.^{[128][129]} According to DSM-IV-TR, there are two main depressive symptoms—depressed mood and anhedonia. At least one of these must be present to make a diagnosis of major depressive episode.^[130]

Major depressive disorder is classified as a mood disorder in DSM-IV-TR.^[131] The diagnosis hinges on the presence of single or recurrent major depressive episodes.^[8] Further qualifiers are used to classify both the episode itself and the course of the disorder. The category Depressive Disorder Not Otherwise Specified is diagnosed if the depressive episode's manifestation does not meet the criteria for a major depressive episode. The ICD-10 system does not use the term *major depressive disorder* but lists very similar criteria for the diagnosis of a depressive episode (mild, moderate or severe); the term *recurrent* may be added if there have been multiple episodes without mania.^[124]

Major depressive episode

A major depressive episode is characterized by the presence of a severely depressed mood that persists for at least two weeks.^[8] Episodes may be isolated or recurrent and are categorized as mild (few symptoms in excess of minimum criteria), moderate, or severe (marked impact on social or occupational functioning). An episode with psychotic features—commonly referred to as *psychotic depression*—is automatically rated as severe. If the patient has had an episode of mania or markedly elevated mood, a diagnosis of bipolar disorder is made instead.^[132] Depression without mania is sometimes referred to as *unipolar* because the mood remains at one emotional state or "pole".^[133]

DSM-IV-TR excludes cases where the symptoms are a result of bereavement, although it is possible for normal bereavement to evolve into a depressive episode if the mood persists and the characteristic features of a major depressive episode develop.^[134] The criteria have been criticized because they do not

take into account any other aspects of the personal and social context in which depression can occur.^[135] In addition, some studies have found little empirical support for the DSM-IV cut-off criteria, indicating they are a diagnostic convention imposed on a continuum of depressive symptoms of varying severity and duration.^[136] Excluded are a range of related diagnoses, including dysthymia, which involves a chronic but milder mood disturbance;^[137] recurrent brief depression, consisting of briefer depressive episodes;^{[138][139]} minor depressive disorder, whereby only some of the symptoms of major depression are present;^[140] and adjustment disorder with depressed mood, which denotes low mood resulting from a psychological response to an identifiable event or stressor.^[141]

Subtypes

The DSM-IV-TR recognizes five further subtypes of MDD, called *specifiers*, in addition to noting the length, severity and presence of psychotic features:

- **Melancholic depression** is characterized by a loss of pleasure in most or all activities, a failure of reactivity to pleasurable stimuli, a quality of depressed mood more pronounced than that of grief or loss, a worsening of symptoms in the morning hours, early-morning waking, psychomotor retardation, excessive weight loss (not to be confused with anorexia nervosa), or excessive guilt.^[142]

- **Atypical depression** is characterized by mood reactivity (paradoxical anhedonia) and positivity, significant weight gain or increased appetite (comfort eating), excessive sleep or sleepiness (hypersomnia), a sensation of heaviness in limbs known as leaden paralysis, and significant social impairment as a consequence of hypersensitivity to perceived interpersonal rejection.^[143]

- **Catatonic depression** is a rare and severe form of major depression involving disturbances of motor behavior and other symptoms. Here, the person is mute and almost stuporous, and either remains immobile or exhibits purposeless or even bizarre movements. Catatonic symptoms also occur in schizophrenia or in manic episodes, or may be caused by neuroleptic malignant syndrome.^[144]

- **Postpartum depression, or mental and behavioral disorders associated with the puerperium, not elsewhere classified,**^[124] refers to the intense, sustained and sometimes disabling depression experienced by women after giving birth. Postpartum depression has an incidence rate of 10–15% among new mothers. The DSM-IV mandates that, in order to qualify as postpartum depression, onset occur within one month of delivery. It has been said that postpartum depression can last as long as three months.^[145]

- **Seasonal affective disorder (SAD)** is a form of depression in which depressive episodes come on in the autumn or winter, and resolve in spring. The diagnosis is made if at least two episodes have occurred in colder months with none at other times, over a two-year period or longer.^[146]

Differential diagnoses

To confer major depressive disorder as the most likely diagnosis, other potential diagnoses must be considered, including dysthymia, adjustment disorder with depressed mood, or bipolar disorder. Dysthymia is a chronic, milder mood disturbance in which a person reports a low mood almost daily over a span of at least two years. The symptoms are not as severe as those for major depression, although people with dysthymia are vulnerable to secondary episodes of major depression (sometimes referred to as *double depression*).^[137] Adjustment disorder with depressed mood is a mood disturbance appearing as a psychological response to an identifiable event or stressor, in which the resulting emotional or behavioral symptoms are significant but do not meet the criteria for a major depressive episode.^[141] Bipolar disorder, also known as *manic-depressive disorder*, is a condition in which depressive phases alternate with periods of mania or hypomania. Although depression is currently categorized as a separate disorder, there is ongoing debate because individuals diagnosed with major depression often experience some hypomanic symptoms, indicating a mood disorder continuum.^[147]

Other disorders need to be ruled out before diagnosing major depressive disorder. They include depressions due to physical illness, medications, and substance abuse. Depression due to physical illness is diagnosed as a mood disorder due to a general medical condition. This condition is determined based on history, laboratory findings, or physical examination. When the depression is caused by a substance abused including a drug of abuse, a medication, or exposure to a toxin, it is then diagnosed as a substance-induced mood disorder.^[148]

Prevention

Behavioral interventions, such as interpersonal therapy and cognitive-behavioral therapy, are effective at preventing new onset depression.^{[149][150][151]} Because such interventions appear to be most effective when delivered to individuals or small groups, it has been suggested that they may be able to reach their large target audience most efficiently through the Internet.^[152]

However, an earlier meta-analysis found preventive programs with a competence-enhancing component to be superior to behavior-oriented programs overall, and found behavioral programs to be particularly unhelpful for older people, for whom social support programs were uniquely beneficial. In addition, the programs that best prevented depression comprised more than eight sessions, each lasting between 60 and 90 minutes, were provided by a combination of lay and professional workers, had a high-quality research design, reported attrition rates, and had a well-defined intervention.^[153]

The Netherlands mental health care system provides preventive interventions, such as the "Coping with Depression" course (CWD) for people with sub-threshold depression. The course is claimed to be the most successful of psychoeducational interventions for the treatment and prevention of depression (both for its adaptability to various populations and its results), with a risk reduction of 38% in major depression and an efficacy as a treatment comparing favorably to other psychotherapies.^{[149][154]}

Preventative efforts may result in a decreases in rates of the condition of between 22 and 38%.^[151] A stepped-care intervention (watchful waiting, Cognitive behavioral therapy (CBT) and medication for some) achieved a 50% lower incidence rate in a patient group aged 75 or older.^[155]

Management

The three most common treatments for depression are psychotherapy, medication, and electroconvulsive therapy. Psychotherapy is the treatment of choice (over medication) for people under 18. The UK National Institute for Health and Care Excellence (NICE) 2004 guidelines indicate that antidepressants should not be used for the initial treatment of mild depression, because the risk-benefit ratio is poor. The guidelines recommend that antidepressant treatment in combination with psychosocial interventions should be considered for:

- People with a past history of moderate or severe depression
- Those with mild depression that has been present for a long period
- As a second line treatment for mild depression that persists after other interventions
- As a first line treatment for moderate or severe depression.

The guidelines further note that antidepressant treatment should be continued for at least six months to reduce the risk of relapse, and that SSRIs are better tolerated than tricyclic antidepressants.^[156]

American Psychiatric Association treatment guidelines recommend that initial treatment should be individually tailored based on factors including severity of symptoms, co-existing disorders, prior treatment experience, and patient preference. Options may include pharmacotherapy, psychotherapy, electroconvulsive therapy (ECT), transcranial magnetic stimulation (TMS) or light therapy. Antidepressant medication is recommended as an initial treatment choice in people with mild, moderate, or severe major depression, and should be given to all patients with severe depression unless ECT is planned.^[157]

Treatment options are much more limited in developing countries, where access to mental health staff, medication, and psychotherapy is often difficult. Development of mental health services is minimal in many countries; depression is viewed as a phenomenon of the developed world despite evidence to the contrary, and not as an inherently life-threatening condition.^[158] A 2014 Cochrane review found insufficient evidence to determine the effectiveness of psychological versus medical therapy in children.^[159]

Psychotherapy

Psychotherapy can be delivered, to individuals, groups, or families by mental health professionals, including psychotherapists, psychiatrists, psychologists, clinical social workers, counselors, and suitably trained psychiatric nurses. With more complex and chronic forms of depression, a combination of medication and psychotherapy may be used.^{[160][161]} A 2012 review found psychotherapy to be better than no treatment but not other treatments.^[162]

Cognitive behavioral therapy (CBT) currently has the most research evidence for the treatment of depression in children and adolescents, and CBT and interpersonal psychotherapy (IPT) are preferred therapies for adolescent depression.^[163] In people under 18, according to the National Institute for Health and Clinical Excellence, medication should be offered only in conjunction with a psychological therapy, such as CBT, interpersonal therapy, or family therapy.^[164]

Psychotherapy has been shown to be effective in older people.^{[165][166]} Successful psychotherapy appears to reduce the recurrence of depression even after it has been terminated or replaced by occasional booster sessions.

The most-studied form of psychotherapy for depression is CBT, which teaches clients to challenge self-defeating, but enduring ways of thinking (cognitions) and change counter-productive behaviors. Research beginning in the mid-1990s suggested that CBT could perform as well or better than antidepressants in patients with moderate to severe depression.^{[167][168]} CBT may be effective in depressed adolescents,^[169] although its effects on severe episodes are not definitively known.^[170] Several variables predict success for cognitive behavioral therapy in adolescents: higher levels of rational thoughts, less hopelessness, fewer negative thoughts, and fewer cognitive distortions.^[171] CBT is particularly beneficial in preventing relapse.^{[172][173]} Several variants of cognitive behavior therapy have been used in those with depression, the most notable being rational emotive behavior therapy,^[174] and mindfulness-based cognitive therapy.^[175] Mindfulness-based stress reduction programs may reduce depression symptoms.^{[176][177]} Mindfulness programs also appear to be a promising intervention in youth.^[178]

Psychoanalysis is a school of thought, founded by Sigmund Freud, which emphasizes the resolution of unconscious mental conflicts.^[179] Psychoanalytic techniques are used by some practitioners to treat clients presenting with major depression.^[180] A more widely practiced, eclectic technique, called psychodynamic psychotherapy, is loosely based on psychoanalysis and has an additional social and interpersonal focus.^[181] In a meta-analysis of three controlled trials of Short Psychodynamic Supportive Psychotherapy, this modification was found to be as effective as medication for mild to moderate depression.^[182]

Logotherapy, a form of existential psychotherapy developed by Austrian psychiatrist Viktor Frankl, addresses the filling of an "existential vacuum" associated with feelings of futility and meaninglessness. It is posited that this type of psychotherapy may be useful for depression in older adolescents.^[183]

Antidepressants

Conflicting results have arisen from studies look at the effectiveness of antidepressants in people with acute mild to moderate depression. Stronger evidence supports the usefulness of antidepressants in the treatment of depression that is chronic (dysthymia) or severe.

Researchers Irving Kirsch and Thomas Moore have contested the pharmacological activity of antidepressants in the relief of depression, and state that the evidence is most consistent a role as active placebos.^[185] In a later publication, Kirsch concluded that the overall effect of new-generation antidepressant medication is below recommended criteria for clinical significance.^[186] Similar results were obtained in a meta analysis by Fournier.^[187]

A review commissioned by the National Institute for Health and Care Excellence concluded that there is strong evidence that SSRIs have greater efficacy than placebo on achieving a 50% reduction in depression scores in moderate and severe major depression, and that there is some evidence for a similar effect in mild depression.^[188] Similarly, a Cochrane systematic review of clinical trials of the generic antidepressant amitriptyline concluded that there is strong evidence that its efficacy is superior to placebo.^[189]

In 2014 the U.S. FDA published a systematic review of all antidepressant maintenance trials submitted to the agency between 1985 and 2012. The authors concluded that maintenance treatment reduced the risk of relapse by 52% compared to placebo, and that this effect was primarily due to recurrent depression in the placebo group rather than a drug withdrawal effect.^[187]

To find the most effective antidepressant medication with minimal side-effects, the dosages can be adjusted, and if necessary, combinations of different classes of antidepressants can be tried. Response rates to the first antidepressant administered range from 50–75%, and it can take at least six to eight weeks from the start of medication to remission.^[190] Antidepressant medication treatment is usually continued for 16 to 20 weeks after remission, to minimize the chance of recurrence,^[190] and even up to one year of continuation is recommended.^[191] People with chronic depression may need to take medication indefinitely to avoid relapse.^[6]

Selective serotonin reuptake inhibitors (SSRIs) are the primary medications prescribed, owing to their relatively mild side-effects, and because they are less toxic in overdose than other antidepressants.^[192] Patients who do not respond to one SSRI can be switched to another antidepressant, and this results in improvement in almost 50% of cases.^[193] Another option is to switch to the atypical antidepressant bupropion.^[194] Venlafaxine, an antidepressant with a different mechanism of action, may be modestly more effective than SSRIs.^[195] However, venlafaxine is not recommended in the UK as a first-line treatment because of evidence suggesting its risks may outweigh benefits,^[196] and it is specifically discouraged in children and adolescents.^{[197][198]}



Zoloft (sertraline) is used primarily to treat major depression in adult outpatients. In 2007, it was the most prescribed antidepressant on the U.S. retail market, with 29,652,000 prescriptions.^[184]

For adolescent depression, fluoxetine is recommended^[197] Antidepressants appear to have only slight benefit in children.^[199] There is also insufficient evidence to determine effectiveness in those with depression complicated by dementia.^[200] Any antidepressant can cause low serum sodium levels (also called hyponatremia);^[201] nevertheless, it has been reported more often with SSRIs.^[192] It is not uncommon for SSRIs to cause or worsen insomnia; the sedating antidepressant mirtazapine can be used in such cases.^{[202][203]}

Irreversible monoamine oxidase inhibitors, an older class of antidepressants, have been plagued by potentially life-threatening dietary and drug interactions. They are still used only rarely, although newer and better-tolerated agents of this class have been developed.^[204] The safety profile is different with reversible monoamine oxidase inhibitors such as moclobemide where the risk of serious dietary interactions is negligible and dietary restrictions are less strict.^[205]

For children, adolescents, and probably young adults between 18 and 24 years old, there is a higher risk of both suicidal ideations and suicidal behavior in those treated with SSRIs.^{[206][207]} For adults, it is unclear whether or not SSRIs affect the risk of suicidality.^[207] One review found no connection,^[208] another an increased risk,^[209] and a third no risk in those 25–65 years old and a decrease risk in those more than 65.^[210] A black box warning was introduced in the United States in 2007 on SSRI and other antidepressant medications due to increased risk of suicide in patients younger than 24 years old.^[211] Similar precautionary notice revisions were implemented by the Japanese Ministry of Health.^[212]

Other medications

There is some evidence that fish oil supplements containing high levels of eicosapentaenoic acid (EPA) to docosahexaenoic acid (DHA) may be effective in major depression,^[213] but other meta-analysis of the research conclude that positive effects may be due to publication bias.^[214] There is some preliminary evidence that COX-2 inhibitors have a beneficial effect on major depression.^[60] Lithium appears effective at lowering the risk of suicide in those with bipolar disorder and unipolar depression to nearly the same levels as the general population.^[215] There is a narrow range of effective and safe dosages of lithium thus close monitoring may be needed.^[216] Low-dose thyroid hormone may be added to existing antidepressants to treat persistent depression symptoms in people who have tried multiple courses of medication.^[217]

Electroconvulsive therapy

Electroconvulsive therapy (ECT) is a standard psychiatric treatment in which seizures are electrically induced in patients to provide relief from psychiatric illnesses.^{[218]:1880} ECT is used with informed consent^[219] as a last line of intervention for major depressive disorder.^[220]

A round of ECT is effective for about 50% of people with treatment-resistant major depressive disorder, whether it is unipolar or bipolar.^[221] Followup treatment is still poorly studied, but about half of people who respond, relapse with twelve months.^[222]

Aside from effects in the brain, the general physical risks of ECT are similar to those of brief general anesthesia.^[223]²⁵⁹ Immediately following treatment, the most common adverse effects are confusion and memory loss.^[220]^[224] ECT is considered one of the least harmful treatment options available for severely depressed pregnant women.^[225]

A usual course of ECT involves multiple administrations, typically given two or three times per week until the patient is no longer suffering symptoms. ECT is administered under anesthetic with a muscle relaxant.^[226] Electroconvulsive therapy can differ in its application in three ways: electrode placement, frequency of treatments, and the electrical waveform of the stimulus. These three forms of application have significant differences in both adverse side effects and symptom remission. After treatment, drug therapy is usually continued, and some patients receive maintenance ECT.^[220]

ECT appears to work in the short term via an anticonvulsant effect mostly in the frontal lobes, and longer term via neurotrophic effects primarily in the medial temporal lobe.^[227]

Other

Bright light therapy reduces depression symptom severity, with benefit was found for both seasonal affective disorder and for nonseasonal depression, and an effect similar to those for conventional antidepressants. For non-seasonal depression, adding light therapy to the standard antidepressant treatment was not effective.^[228] For non-seasonal depression where light was used mostly in combination with antidepressants or wake therapy a moderate effect was found, with response better than control treatment in high-quality studies, in studies that applied morning light treatment, and with people who respond to total or partial sleep deprivation.^[229] Both analyses noted poor quality, short duration, and small size of most of the reviewed studies.

There is a small amount of evidence that skipping a night's sleep may help.^[230] Physical exercise is recommended for management of mild depression,^[231] and has a moderate effect on symptoms.^[232] It is equivalent to the use of medications or psychological therapies in most people.^[232] In the older people it does appear to decrease depression.^[233] In unblinded, non-randomized observational studies Smoking cessation has benefits in depression as large as or larger than those of medications.^[234]

Prognosis

Major depressive episodes often resolve over time whether or not they are treated. Outpatients on a waiting list show a 10–15% reduction in symptoms within a few months, with approximately 20% no longer meeting the full criteria for a depressive disorder.^[235] The median duration of an episode has been estimated to be 23 weeks, with the highest rate of recovery in the first three months.^[236]

Studies have shown that 80% of those suffering from their first major depressive episode will suffer from at least 1 more during their life,^[237] with a lifetime average of 4 episodes.^[238] Other general population studies indicate that around half those who have an episode recover (whether treated or not) and remain well, while the other half will have at least one more, and around 15% of those experience chronic recurrence.^[239] Studies recruiting from selective inpatient sources suggest lower recovery and higher chronicity, while studies of mostly outpatients show that nearly all recover, with a median episode duration of 11 months. Around 90% of those with severe or psychotic depression, most of whom also meet criteria for other mental disorders, experience recurrence.^{[240][241]}

Recurrence is more likely if symptoms have not fully resolved with treatment. Current guidelines recommend continuing antidepressants for four to six months after remission to prevent relapse. Evidence from many randomized controlled trials indicates continuing antidepressant medications after recovery can reduce the chance of relapse by 70% (41% on placebo vs. 18% on antidepressant). The preventive effect probably lasts for at least the first 36 months of use.^[242]

Those people experiencing repeated episodes of depression require ongoing treatment in order to prevent more severe, long-term depression. In some cases, people must take medications for long periods of time or for the rest of their lives.^[243]

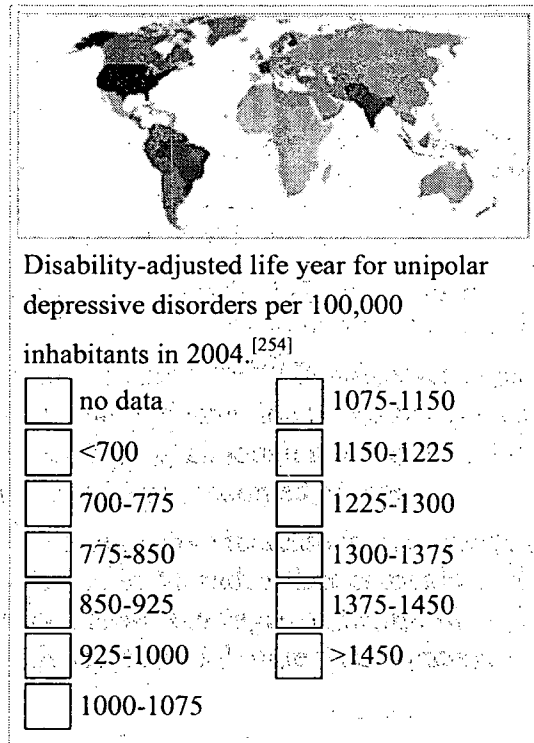
Cases when outcome is poor are associated with inappropriate treatment, severe initial symptoms that may include psychosis, early age of onset, more previous episodes, incomplete recovery after 1 year, pre-existing severe mental or medical disorder, and family dysfunction as well.^[244]

Depressed individuals have a shorter life expectancy than those without depression, in part because depressed patients are at risk of dying by suicide.^[245] However, they also have a higher rate of dying from other causes,^[246] being more susceptible to medical conditions such as heart disease.^[247] Up to 60% of people who commit suicide have a mood disorder such as major depression, and the risk is especially high if a person has a marked sense of hopelessness or has both depression and borderline personality disorder.^[1] The lifetime risk of suicide associated with a diagnosis of major depression in the US is estimated at 3.4%, which averages two highly disparate figures of almost 7% for men and 1% for women^[248] (although suicide attempts are more frequent in women).^[249] The estimate is substantially lower than a previously accepted figure of 15%, which had been derived from older studies of hospitalized patients.^[250]

Depression is often associated with unemployment and poverty.^[251] Major depression is currently the leading cause of disease burden in North America and other high-income countries, and the fourth-leading cause worldwide. In the year 2030, it is predicted to be the second-leading cause of disease burden worldwide after HIV, according to the World Health Organization.^[252] Delay or failure in seeking treatment after relapse, and the failure of health professionals to provide treatment, are two barriers to reducing disability.^[253]

Epidemiology

Depression is a major cause of morbidity worldwide.^[255] It is believed to currently affect approximately 298 million people as of 2010 (4.3% of the global population).^[256] Lifetime prevalence varies widely, from 3% in Japan to 17% in the US.^[257] In most countries the number of people who have depression during their lives falls within an 8–12% range.^[257] In North America, the probability of having a major depressive episode within a year-long period is 3–5% for males and 8–10% for females.^{[258][259]} Population studies have consistently shown major depression to be about twice as common in women as in men, although it is unclear why this is so, and whether factors unaccounted for are contributing to this.^[260] The relative increase in occurrence is related to pubertal development rather than chronological age, reaches adult ratios between the ages of 15 and 18, and appears associated with psychosocial more than hormonal factors.^[260]



People are most likely to suffer their first depressive episode between the ages of 30 and 40, and there is a second, smaller peak of incidence between ages 50 and 60.^[261] The risk of major depression is increased with neurological conditions such as stroke, Parkinson's disease, or multiple sclerosis, and during the first year after childbirth.^[262] It is also more common after cardiovascular illnesses, and is related more to a poor outcome than to a better one.^{[247][263]} Studies conflict on the prevalence of depression in the elderly, but most data suggest there is a reduction in this age group.^[264] Depressive disorders are more common to observe in urban than in rural population and the prevalence is in groups with stronger socioeconomic factors i.e. homelessness.^[265]

History

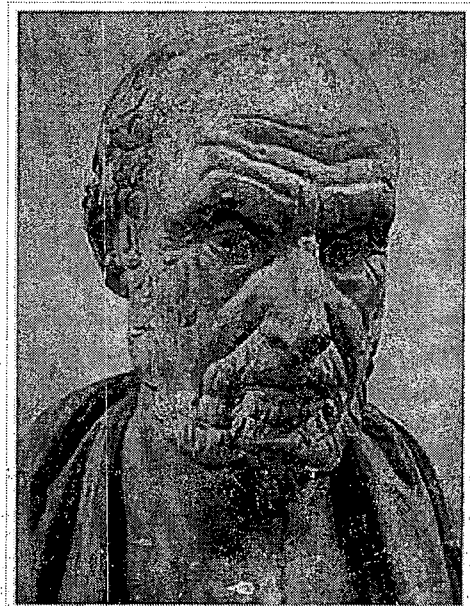
The Ancient Greek physician Hippocrates described a syndrome of melancholia as a distinct disease with particular mental and physical symptoms; he characterized all "fears and despondencies, if they last a long time" as being symptomatic of the ailment.^[266] It was a similar but far broader concept than today's depression; prominence was given to a clustering of the symptoms of sadness, dejection, and despondency, and often fear, anger, delusions and obsessions were included.^[80]

The term *depression* itself was derived from the Latin verb *deprimere*, "to press down".^[267] From the 14th century, "to depress" meant to subjugate or to bring down in spirits. It was used in 1665 in English author Richard Baker's *Chronicle* to refer to someone having "a great depression of spirit", and by English author Samuel Johnson in a similar sense in 1753.^[268] The term also came into use in physiology and economics. An early usage referring to a psychiatric symptom was by French psychiatrist Louis Delasiauve in 1856, and by the 1860s it was appearing in medical dictionaries to refer to a physiological and metaphorical lowering of emotional function.^[269] Since Aristotle, melancholia had been associated

with men of learning and intellectual brilliance, a hazard of contemplation and creativity. The newer concept abandoned these associations and through the 19th century, became more associated with women.^[80]

Although *melancholia* remained the dominant diagnostic term, *depression* gained increasing currency in medical treatises and was a synonym by the end of the century; German psychiatrist Emil Kraepelin may have been the first to use it as the overarching term, referring to different kinds of melancholia as *depressive states*.^[270]

Sigmund Freud likened the state of melancholia to mourning in his 1917 paper *Mourning and Melancholia*. He theorized that objective loss, such as the loss of a valued relationship through death or a romantic break-up, results in subjective loss as well; the depressed individual has identified with the object of affection through an unconscious, narcissistic process called the *libidinal cathexis* of the ego. Such loss results in severe melancholic symptoms more profound than mourning; not only is the outside world viewed negatively but the ego itself is compromised.^[78] The patient's decline of self-perception is revealed in his belief of his own blame, inferiority, and unworthiness.^[79] He also emphasized early life experiences as a predisposing factor.^[80] Meyer put forward a mixed social and biological framework emphasizing *reactions* in the context of an individual's life, and argued that the term *depression* should be used instead of *melancholia*.^[271] The first version of the DSM (DSM-I, 1952) contained *depressive reaction* and the DSM-II (1968) *depressive neurosis*, defined as an excessive reaction to internal conflict or an identifiable event, and also included a depressive type of manic-depressive psychosis within Major affective disorders.^[272]



Diagnoses of depression go back at least as far as Hippocrates

In the mid-20th century, researchers theorized that depression was caused by a chemical imbalance in neurotransmitters in the brain, a theory based on observations made in the 1950s of the effects of reserpine and isoniazid in altering monoamine neurotransmitter levels and affecting depressive symptoms.^[273]

The term "unipolar" (along with the related term "bipolar") was coined by the neurologist and psychiatrist Karl Kleist, and subsequently used by his disciples Edda Neele and Karl Leonhard.^[274]

The term *Major depressive disorder* was introduced by a group of US clinicians in the mid-1970s as part of proposals for diagnostic criteria based on patterns of symptoms (called the "Research Diagnostic Criteria", building on earlier Feighner Criteria),^[275] and was incorporated into the DSM-III in 1980.^[276] To maintain consistency the ICD-10 used the same criteria, with only minor alterations, but using the DSM diagnostic threshold to mark a *mild depressive episode*, adding higher threshold categories for moderate and severe episodes.^{[127][276]} The ancient idea of *melancholia* still survives in the notion of a melancholic subtype.

The new definitions of depression were widely accepted, albeit with some conflicting findings and views. There have been some continued empirically based arguments for a return to the diagnosis of melancholia.^{[277][278]} There has been some criticism of the expansion of coverage of the diagnosis, related to the development and promotion of antidepressants and the biological model since the late 1950s.^[279]

Society and culture

People's conceptualizations of depression vary widely, both within and among cultures. "Because of the lack of scientific certainty," one commentator has observed, "the debate over depression turns on questions of language. What we call it—'disease,' 'disorder,' 'state of mind'—affects how we view, diagnose, and treat it."^[281] There are cultural differences in the extent to which serious depression is considered an illness requiring personal professional treatment, or is an indicator of something else, such as the need to address social or moral problems, the result of biological imbalances, or a reflection of individual differences in the understanding of distress that may reinforce feelings of powerlessness, and emotional struggle.^{[282][283]}

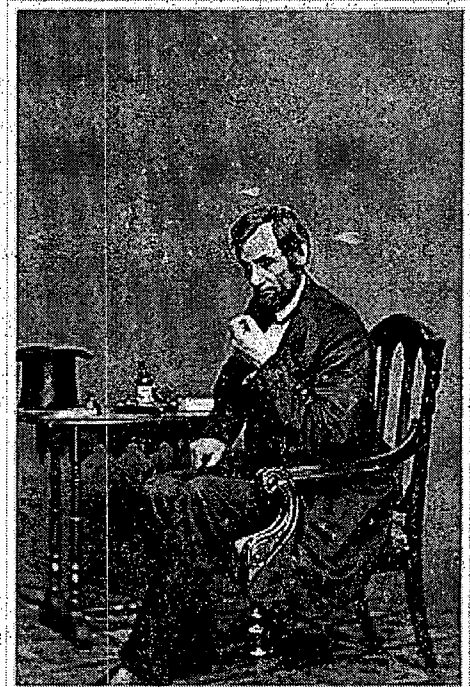
The diagnosis is less common in some countries, such as China. It has been argued that the Chinese traditionally deny or somatize emotional depression (although since the early 1980s, the

Chinese denial of depression may have modified drastically).^[284]

Alternatively, it may be that Western cultures reframe and elevate some expressions of human distress to disorder status. Australian professor Gordon Parker and others have argued that the Western concept of depression "medicalizes" sadness or misery.^{[285][286]} Similarly, Hungarian-American psychiatrist

Thomas Szasz and others argue that depression is a metaphorical illness that is inappropriately regarded as an actual disease.^[287] There has also been concern that the DSM, as well as the field of descriptive psychiatry that employs it, tends to reify abstract phenomena such as depression, which may in fact be social constructs.^[288] American archetypal psychologist James Hillman writes that depression can be healthy for the soul, insofar as "it brings refuge, limitation, focus, gravity, weight, and humble powerlessness."^[289] Hillman argues that therapeutic attempts to eliminate depression echo the Christian theme of resurrection, but have the unfortunate effect of demonizing a soulful state of being.

Historical figures were often reluctant to discuss or seek treatment for depression due to social stigma about the condition, or due to ignorance of diagnosis or treatments. Nevertheless, analysis or interpretation of letters, journals, artwork, writings, or statements of family and friends of some historical personalities has led to the presumption that they may have had some form of depression.



The 16th American president Abraham Lincoln suffered from "melancholy", a condition that now may be referred to as clinical depression.^[280]

People who may have had depression include English author Mary Shelley,^[290] American-British writer Henry James,^[291] and American president Abraham Lincoln.^[292] Some well-known contemporary people with possible depression include Canadian songwriter Leonard Cohen^[293] and American playwright and novelist Tennessee Williams.^[294] Some pioneering psychologists, such as Americans William James^{[295][296]} and John B. Watson,^[297] dealt with their own depression.

There has been a continuing discussion of whether neurological disorders and mood disorders may be linked to creativity, a discussion that goes back to Aristotelian times.^{[298][299]} British literature gives many examples of reflections on depression.^[300] English philosopher John Stuart Mill experienced a several-months-long period of what he called "a dull state of nerves", when one is "unsusceptible to enjoyment or pleasurable excitement; one of those moods when what is pleasure at other times, becomes insipid or indifferent". He quoted English poet Samuel Taylor Coleridge's "Dejection" as a perfect description of his case: "A grief without a pang, void, dark and drear, / A drowsy, stifled, unimpassioned grief, / Which finds no natural outlet or relief / In word, or sigh, or tear."^{[301][302]} English writer Samuel Johnson used the term "the black dog" in the 1780s to describe his own depression,^[303] and it was subsequently popularized by depression sufferer former British Prime Minister Sir Winston Churchill.^[303]

Social stigma of major depression is widespread, and contact with mental health services reduces this only slightly. Public opinions on treatment differ markedly to those of health professionals; alternative treatments are held to be more helpful than pharmacological ones, which are viewed poorly.^[304] In the UK, the Royal College of Psychiatrists and the Royal College of General Practitioners conducted a joint Five-year Defeat Depression campaign to educate and reduce stigma from 1992 to 1996,^[305] a MORI study conducted afterwards showed a small positive change in public attitudes to depression and treatment.^[306]

Other animals

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External links

- Depression (https://www.dmoz.org/Health/Mental_Health/Disorders/Mood/Depression) at DMOZ

Retrieved from "http://en.wikipedia.org/w/index.php?title=Major_depressive_disorder&oldid=645187666"

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