Heart attack and Angina

Learn about heart attacks

Use our educational resources to learn more about heart attacks:

- Heart attack warning signs infographic (PDF)
- Patient information sheets: heart attack
    - What is a heart attack?
    - How will I recover from my heart attack?
    - What are the warning signs of heart attack?
    - What is dual antiplatelet therapy (DAPT)?
- The details on cardiac rehabilitation
- Lasting change: Healthy for Good
- Watch, Learn and Live animations library
- For providers: acute myocardial infarction toolkit

Manage your condition with these tools:

Heart attack discharge worksheet English (PDF) | Spanish (PDF)

Cardiac rehabilitation referral card English (PDF) | Spanish (PDF)

Infographic: Five ways to lower your risk of a second heart attack English (PDF) | Spanish (PDF)

Downloadable medication tracker English (PDF)| Spanish (PDF)

About Heart Attacks

A heart attack is a frightening experience. If you have experienced a heart attack, or are close with someone who has, you should know this: You are not alone. In fact, tens of thousands of people survive heart attacks and go on to lead productive, enjoyable lives.

As you work toward recovery, the frequently asked questions below can help you better understand what has happened, and how your heart can heal. Knowledge is power. Arming yourself with this information can help you can live a healthier, longer life.

See how coronary artery damage leads to a heart attack.

Heart attack questions and answers

What is a heart attack?

Your heart muscle needs oxygen to survive. A heart attack occurs when the blood flow that brings oxygen to the heart muscle is severely reduced or cut off completely.

View an animation of blood flow between the heart and lungs.

This happens because coronary arteries that supply the heart muscle with blood flow can become narrowed from a buildup of fat, cholesterol and other substances that together are called plaque. This slow process is known as atherosclerosis.

When plaque within a heart artery breaks, a blood clot forms around the plaque. This blood clot can block the blood flow through the artery to the heart muscle.

Ischemia results when the heart muscle is starved for oxygen and nutrients. When damage or death of part of the heart muscle occurs as a result of ischemia, it's called a heart attack, or myocardial infarction (MI).

About every 40 seconds, someone in the United States has a heart attack.

Why didn't I have any warning?

The process of atherosclerosis has no symptoms. When a coronary artery narrows and constricts blood flow, other nearby blood vessels that serve the heart sometimes expand to compensate, which may explain why there are no warning signs.

Such a network of expanded nearby blood vessels is called collateral circulation, and it helps protect some people from heart attacks by delivering needed blood to the heart. Collateral circulation can also develop after a heart attack to help the heart muscle recover.

Is my heart permanently damaged?

When a heart attack occurs, the heart muscle that has lost blood supply begins to suffer injury. The amount of damage to the heart muscle depends on the size of the area supplied by the blocked artery and the time between injury and treatment.

Heart muscle damaged by a heart attack heals by forming scar tissue. It usually takes several weeks for your heart muscle to heal. The length of time depends on the extent of your injury and your own rate of healing.

The heart is a very tough organ. Even though a part of it may have been severely injured, the rest of the heart keeps working. But, because of the damage, your heart may be weakened, and unable to pump as much blood as usual.

With proper treatment and lifestyle changes after a heart attack, further damage can be limited or prevented.

Learn more about heart damage detection.

Will I recover from my heart attack?

The answer is most likely yes.

The heart muscle begins to heal soon after a heart attack. It usually takes about eight weeks to heal.

Scar tissue may form in the damaged area, and that scar tissue does not contract or pump as well as healthy muscle tissue. As a consequence, the extent of damage to the heart muscle can impact how well the heart pumps blood throughout the body.

How much pumping function is lost depends on the size and location of the scar tissue. Most heart attack survivors have some degree of coronary artery disease (CAD) and will have to make important lifestyle changes and possibly take medication to prevent a future heart attack. Taking these steps can help you lead a full, productive life.

Learn more about recovering from heart attack.

Is all chest pain a heart attack?

No. One very common type of chest pain is called angina. It's a recurring discomfort that usually lasts only a few minutes. Angina occurs when your heart muscle doesn't get the blood supply and oxygen that it needs.

The difference between angina and a heart attack is that angina attacks don't permanently damage the heart muscle.

There are different types of angina, including:

- Stable angina, or angina pectoris Stable angina often occurs during exercise or emotional stress when your heart rate and blood pressure increase, and your heart muscle needs more oxygen. Learn more about stable angina.
- Unstable angina, sometimes referred to as acute coronary syndrome Unstable angina occurs while you may be resting or sleeping, or with little physical exertion. It comes as a surprise. Unstable angina can lead to a heart attack and it should be treated as an emergency. Learn more about unstable angina.

What are the different medical terms for a heart attack?

Acute coronary syndrome (ACS): An umbrella term for situations where the blood supplied to the heart muscle is suddenly blocked. Learn more about ACS.

STEMI: A common name for ST-elevation myocardial infarction, a type of heart attack caused by a complete blockage in a coronary artery.

NSTEMI: A non-ST-elevated myocardial infarction, a type of heart attack in which an artery is partially blocked and severely reduces blood flow.

Myocardial infarction (MI): The damaging or death of an area of the heart muscle (myocardium) resulting from a blocked blood supply to that area. It's also the medical term for a heart attack.

Coronary thrombosis: Formation of a clot in one of the arteries that supply blood to the heart muscle. Also called coronary occlusion.

Coronary occlusion: An obstruction of a coronary artery that hinders blood flow to some part of the heart muscle. Coronary occlusion is a cause of heart attack.

Are there other causes of heart attack besides blockage?

Sometimes a coronary artery temporarily contracts or goes into spasm. When this happens the artery narrows, and blood flow to part of the heart muscle decreases or stops.

The causes of spasms are unclear. A spasm can occur in normal-appearing blood vessels as well as in vessels partly blocked by atherosclerosis. A severe spasm can cause a heart attack.

Another rare cause of heart attack is spontaneous coronary artery dissection, which is a spontaneous tearing of the coronary artery wall.

How is a heart attack different from cardiac arrest?

People often use these terms to mean the same thing, but they describe different events.

A heart attack is when blood flow to the heart is blocked. It's a circulation problem.

With sudden cardiac arrest (SCA), the heart malfunctions and suddenly stops beating unexpectedly. Sudden cardiac arrest is an electrical problem.

A heart attack can cause a cardiac arrest. In cardiac arrest (also called sudden cardiac death or SCD), death results when the heart suddenly stops working properly. This is caused by irregular heart rhythms called arrhythmias.

The most common arrhythmia in cardiac arrest is ventricular fibrillation. This is when the heart's lower chambers suddenly start beating chaotically and don't pump blood. Death occurs within minutes after the heart stops.

Cardiac arrest may be reversed if CPR (cardiopulmonary resuscitation) is performed and a defibrillator is used within minutes to shock the heart and restore a normal heart rhythm.

Learn more about the differences between heart attack and cardiac arrest.

Warning Signs of a Heart Attack

Catch the signs early

Don't wait to get help if you experience any of these heart attack warning signs. Some heart attacks are sudden and intense. But most start slowly, with mild pain or discomfort. Pay attention to your body and call 911 if you experience:

- **Chest discomfort.** Most heart attacks involve discomfort in the center of the chest that lasts more than a few minutes – or it may go away and then return. It can feel like uncomfortable pressure, squeezing, fullness or pain.
- **Discomfort in other areas of the upper body.** Symptoms can include pain or discomfort in one or both arms, the back, neck, jaw or stomach.
- **Shortness of breath.** This can occur with or without chest discomfort.
- **Other signs.** Other possible signs include breaking out in a cold sweat, nausea or lightheadedness.

Download the common heart attack warning signs infographic (JPEG) | (PDF)

Symptoms vary between men and women

As with men, women's most common heart attack symptom is chest pain (angina) or discomfort. But women are somewhat more likely than men to experience some of the other common symptoms, particularly shortness of breath, nausea/vomiting, and back or jaw pain.

Learn about the warning signs of heart attack in women.

Watch video: "Just A Little Heart Attack" – a short film directed by and starring Elizabeth Banks

Don't hesitate to call 112

Learn the signs for heart attack, and remember: Even if you're not sure it's a heart attack, have it checked out.

Minutes matter. Fast action can save lives - maybe your own.

Call 911 if you experience heart attack warning signs. Calling 911 is almost always the fastest way to get lifesaving treatment.

An emergency medical services (EMS) team can begin treatment when they arrive – up to an hour sooner than if someone gets to the hospital by car. EMS staff are also trained to revive someone whose heart has stopped. Patients with chest pain who arrive by ambulance usually receive faster treatment at the hospital, too.

For many reasons, it's best to call 911 so that an experienced EMS team can begin treatment and arrange rapid transport to the emergency room.

Watch an animation of a heart attack.

Angina (Chest Pain)

Angina is chest pain or discomfort caused when your heart muscle doesn't get enough oxygen-rich blood. It may feel like pressure or squeezing in your chest. The discomfort also can occur in your shoulders, arms, neck, jaw, or back. Angina pain may even feel like indigestion.

But, angina is not a disease. It is a symptom of an underlying heart problem, usually coronary heart disease (CHD).There are many types of angina, including microvascular angina, Prinzmetal's angina, stable angina, unstable angina and variant angina. View an animation of angina(link opens in new window).

This usually happens because one or more of the coronary arteries is narrowed or blocked, also called ischemia.

Angina can also be a symptom of coronary microvascular disease (MVD). This is heart disease that affects the heart's smallest coronary arteries and is more likely to affect women than men. Coronary MVD also is called cardiac syndrome X and non-obstructive CHD. Learn more about angina in women.

Depending on the type of angina you have, there are many factors that can trigger angina pain. The symptoms also vary based on the type of angina you have.

Types of Angina

Knowing the types of angina and how they differ is important.

- Stable Angina / Angina Pectoris
- Unstable Angina
- Variant (Prinzmetal) Angina
- Microvascular Angina

Understand Your Risk for Angina

If you're at risk for heart disease or coronary MVD, you're also at risk for angina. The major risk factors for heart disease and coronary MVD include:

- Unhealthy cholesterol levels
- High blood pressure
- Smoking
- Diabetes
- Overweight or obesity
- Metabolic syndrome
- Inactivity
- Unhealthy diet
- Older age (The risk increases for men after 45 years of age and for women after 55 years of age.)
- Family history of early heart disease

Diagnosis of Angina

All chest pain should be checked out by a healthcare provider. If you have chest pain, your doctor will want to find out whether it's angina and if it is, whether the angina is stable or unstable. If it's unstable, you may need emergency medical treatment to try to prevent a heart attack.

Your doctor will most likely perform a physical exam, ask about your symptoms, and ask about your risk factors for and your family history of heart disease and other cardiovascular conditions.

Talk to Your Doctor

Your doctor will probably ask you a series of questions to rule out the most critical or life-threatening possibilities. Think ahead so you can provide as much information as possible. Here are some questions you might be asked:

- How long have you had this condition?
- On a scale of 1 (mild) to 10 (critical), what is your level of discomfort?
- What behavior(s) provoke the pain? Physical activity? Eating?
- What relieves the discomfort?

Print our Angina Log to keep track of your angina symptoms.

Treatment of Angina

All chest pain should be checked by a doctor. If your doctor thinks that you have unstable angina or that your angina is related to a serious heart condition, they may recommend the following tests and procedures:

- EKG (Electrocardiogram)
- Stress Testing
- Blood Tests
- Chest X-Rays
- Coronary Angiography and Cardiac Catheterization
- Computed Tomography Angiography

Treatment of angina includes:

- Lifestyle changes
- Medicines
- Cardiac procedures
- Cardiac Rehab

These treatments will help reduce pain and discomfort and how often the angina pain occurs. They will also prevent or lower your risk for heart attack and death by treating whatever underlying cardiovascular condition you may have.

Not all chest pain is a sign of heart disease.

Other conditions also can cause chest pain, such as:

- Pulmonary embolism (a blockage in a lung artery)
- Aortic dissection (tearing of a major artery)
- A lung infection
- Aortic stenosis (narrowing of the heart's aortic valve)
- Hypertrophic cardiomyopathy (heart muscle disease)
- Pericarditis (inflammation in the tissues that surround the heart)
- A panic attack

Understand Your Risks to Prevent a Heart Attack

Knowledge is power. Understand the risks you face for heart attack.

Extensive research has identified factors that increase a person's risk for coronary heart disease in general and heart attack in particular.

The more risk factors you have, and the greater the degree of each risk factor, the higher your chance of developing coronary heart disease – a common term for the buildup of plaque in the heart's arteries that could lead to heart attack. Risk factors fall into three broad categories:

1. **Major risk factors –** Research has shown that these factors significantly increase the risk of heart and blood vessel (cardiovascular) disease.
2. **Modifiable risk factors –** Some major risk factors can be modified, treated or controlled through medications or lifestyle change.
3. **Contributing risk factors –** These factors are associated with increased risk of cardiovascular disease, but their significance and prevalence haven't yet been determined.

The American Heart Association recommends focusing on heart disease prevention early in life. To start, assess your risk factors and work to keep them low. The sooner you identify and manage your risk factors, the better your chances of leading a heart-healthy life.

The three categories of risk factors are detailed here: Major risk factors that can't be changed

You may be born with certain risk factors that cannot be changed. The more of these risk factors you have, the greater your chance of developing coronary heart disease. Since you can't do anything about these risk factors, it's even more important that you manage your risk factors that can be changed.

Increasing Age

The majority of people who die of coronary heart disease are 65 or older. While heart attacks can strike people of both sexes in old age, women are at greater risk of dying (within a few weeks).

Male gender
Men have a greater risk of heart attack than women do, and men have attacks earlier in life.

Even after women reach the age of menopause, when women's death rate from heart disease increases, women's risk for heart attack is less than that for men.

Heredity (including race)

Children of parents with heart disease are more likely to develop heart disease themselves.

African-Americans have more severe high blood pressure than Caucasians, and a higher risk of heart disease. Heart disease risk is also higher among Mexican-Americans, American Indians, native Hawaiians and some Asian-Americans. This is partly due to higher rates of obesity and diabetes.

Most people with a significant family history of heart disease have one or more other risk factors. Just as you can't control your age, sex and race, you can't control your family history. So, it's even more important to treat and control any other modifiable risk factors you have.

Major risk factors you can modify, treat or control

Tobacco smoke
The risk that smokers will develop coronary heart disease is much higher than that for nonsmokers.

Cigarette smoking is a powerful independent risk factor for sudden cardiac death in patients with coronary heart disease. Cigarette smoking also interacts with other risk factors to greatly increase the risk for coronary heart disease. Exposure to other people's smoke increases the risk of heart disease even for nonsmokers.

Learn about smoking and cardiovascular disease

High blood cholesterol
As your blood cholesterol rises, so does your risk of coronary heart disease. When other risk factors (such as high blood pressure and tobacco smoke) are also present, this risk increases even more. A person's cholesterol level is also affected by age, sex, heredity and diet. Here's the lowdown on:

- **Total cholesterol** Your total cholesterol score is calculated using the following equation: HDL + LDL + 20 percent of your triglyceride level.
- **Low-density-lipoprotein (LDL) cholesterol = "bad" cholesterol** A low LDL cholesterol level is considered good for your heart health. However, your LDL number should not be the main factor in guiding treatment to prevent heart attack and stroke, according to the latest guidelines from the American Heart Association. In addition, patients taking statins no longer need to get LDL cholesterol levels down to a specific target number. Lifestyle factors, such as a diet high in saturated and trans fats, can raise LDL cholesterol.
- **High-density-lipoprotein (HDL) cholesterol = "good" cholesterol** With HDL (good) cholesterol, higher levels are typically better. Low HDL cholesterol puts you at higher risk for heart disease. People with high blood triglycerides usually also have lower HDL cholesterol. Genetic factors, Type 2 diabetes, smoking, being overweight and being sedentary can all result in lower HDL cholesterol.

- **Triglycerides** Triglycerides are the most common type of fat in the body. Normal triglyceride levels vary by age and sex. A high triglyceride level combined with low HDL cholesterol or high LDL cholesterol is associated with atherosclerosis, which is the buildup of fatty deposits inside artery walls that increases the risk for heart attack and stroke.

Learn more about managing your cholesterol.

High blood pressure

High blood pressure increases the heart's workload, causing the heart muscle to thicken and become stiffer. This stiffening of the heart muscle is not normal and causes the heart to function abnormally. It also increases your risk of stroke, heart attack, kidney failure and congestive heart failure.

When high blood pressure is present alongside obesity, smoking, high blood cholesterol levels or diabetes, the risk of heart attack or stroke increases even more.

Learn more about managing your blood pressure.

Physical inactivity

An inactive lifestyle is a risk factor for coronary heart disease. Regular, moderate to vigorous physical activity helps reduce the risk of cardiovascular disease. Physical activity can help control blood cholesterol, diabetes and obesity. It can also help to lower blood pressure in some people.

Learn more about getting active.

Obesity and being overweight

People who have excess body fat – especially if a lot of it is at the waist – are more likely to develop heart disease and stroke, even if those same people have no other risk factors.

Overweight and obese adults with risk factors for cardiovascular disease such as high blood pressure, high cholesterol or high blood sugar can make lifestyle changes to lose weight and produce significant reductions in risk factors such as triglycerides, blood glucose, HbA1c and the risk of developing Type 2 diabetes.

Many people may have difficulty losing weight. But for those above a healthy weight, a sustained weight loss of 3 to 5 percent of your body weight may lead to significant reductions in some risk factors. Greater sustained weight losses can improve blood pressure, cholesterol and blood glucose.

Learn more about managing your weight.

Diabetes

Diabetes seriously increases your risk of developing cardiovascular disease.

Even when glucose levels are under control, diabetes increases the risk of heart disease and stroke. The risks are even greater if blood sugar is not well-controlled.

At least 68 percent of people with diabetes over 65 years of age die of some form of heart disease. Among that same group, 16 percent die of stroke.

If you have diabetes, be sure to work with your doctor to manage it, and control any other risk factors that you can. To help manage blood sugar, people with diabetes who are obese or overweight should make lifestyle changes, such as eating better or getting regular physical activity.

Learn more about managing your diabetes.

Other factors that contribute to heart disease risk

Stress

Individual response to stress may be a contributing factor for heart attacks.

Some scientists have noted a relationship between coronary heart disease risk and stress in a person's life, along with their health behaviors and socioeconomic status. These factors may affect established risk factors.

For example, people under stress may overeat, start smoking or smoke more than they otherwise would.

Get stress management tips and tools.

Alcohol

Drinking too much alcohol can raise blood pressure, and increase your risk for cardiomyopathy, stroke, cancer and other diseases. It can also contribute to high triglycerides, and produce irregular heartbeats. Additionally, excessive alcohol consumption contributes to obesity, alcoholism, suicide and accidents.

All that said, there is a protective benefit to moderate alcohol consumption.

If you drink, limit your alcohol consumption to no more than two drinks per day for men and no more than one drink per day for women. The National Institute on Alcohol Abuse and Alcoholism defines one drink as 1 1/2 fluid ounces (fl. oz.) of 80-proof spirits (such as bourbon, scotch, vodka, gin, etc.), 5 fl. oz. of wine or 12 fl. oz. of regular beer.

It is not recommended that nondrinkers start using alcohol or that drinkers increase the amount they drink.

Read our recommendation on alcohol and cardiovascular disease.

Diet and nutrition

A healthy diet is one of the best weapons you have to fight cardiovascular disease. What you eat (and how much) can affect other controllable risk factors, such as cholesterol, blood pressure, diabetes and being overweight.

Choose nutrient-rich foods, which have vitamins, minerals, fiber and other nutrients, but are lower in calories than nutrient-poor foods. Choose a diet that emphasizes vegetables, fruits and whole grains. A heart-healthy diet also includes low-fat dairy products, poultry, fish, legumes, nuts and nontropical vegetable oils. Be sure to limit your intake of sweets, sugar-sweetened beverages and red meats.

To maintain a healthy weight, coordinate your diet with your physical activity level so you're using up as many calories as you take in.

Learn more about healthy eating.

Preventing heart attacks

Too young to worry about heart attack?

A heart attack can occur at any age. You're never too young to start heart-healthy living. If you're over 40, or if you have multiple risk factors, work closely with your doctor to address your risk of developing cardiovascular disease.

Heart attack prevention is critical. It should begin early in life. Start with an assessment of your risk factors. Then develop a plan you can follow to maintain a low risk for heart attack.

For many people, their first heart attack is disabling or even fatal. Do everything you can to lower your risk.

Learn heart-health basics

Reducing your risk starts with smart choices.

- If you smoke, stop. The American Heart Association has tools to help you quit.
- Work with your doctor to manage your risk factors. These might include high blood pressure, high cholesterol and diabetes.
- An active lifestyle and good nutrition have also been shown to be helpful in preventing heart attack. See more lifestyle tips for heart attack prevention.
- Follow seven simple steps toward healthier living.
- View an animation of a heart attack. Learn how a heart attack affects your heart health.

Diagnosing a Heart Attack

Testing: what to expect

The hours following a heart attack can be scary and confusing. Your medical team may be incredibly busy and focused, and hard-pressed to explain everything that's happening.

You and your caregivers are sure to have questions. You may wonder about the tests and procedures that are being performed.

In the section below, you'll find descriptions of the kinds of diagnostic procedures you may encounter as your doctors strive to identify the underlying causes of your heart attack.

Heart attack types and diagnosis

A heart attack is also called a myocardial infarction, sometimes simply referred to as an "MI." A heart attack occurs when a blockage in one or more coronary arteries reduces or stops blood flow to the heart, which starves part of the heart muscle of oxygen.

The blood vessel blockage might be complete or partial:

- A complete blockage of a coronary artery means you suffered a STEMI heart attack – which stands for ST-elevation myocardial infarction.

- A partial blockage translates to an NSTEMI heart attack – a non-ST-elevation myocardial infarction.

Diagnostic steps differ for STEMI and NSTEMI heart attacks, although there can be some overlap.

Remember: Never try to diagnose yourself. **Always dial 112 if you think you might be having a heart attack.** The EMS crew in your ambulance will route you to the right hospital based on your location.

Heart attack testing: FAQ

Q: Why do I have to submit to a bunch of tests? A: Tests help the doctor determine if a heart attack occurred, how much your heart was damaged and what degree of coronary artery disease (CAD) you might have. The tests screen your heart and help the doctor determine what treatment and lifestyle changes will keep your heart healthy and prevent serious future medical events.

Q: What's the difference between "invasive" and "non-invasive" tests? A: Non-invasive cardiac tests measure your heart's activity through external imaging and electrocardiography. Invasive tests include drawing and testing samples of your blood, and inserting and threading a thin hollow tube called a catheter into a blood vessel to get an inside view.

Q: How can I learn more about the tests that may be performed? A: These diagnostic tests and procedures can reveal if you had a heart attack, how much damage was done and what degree of coronary artery disease (CAD) you have.

Q: What types of treatment will I get after the hospital diagnoses my heart attack? A: If you've had a heart attack, you may have already had undergone certain procedures to help you survive your heart attack. Those same procedures can help to diagnose your condition. Such procedures include:

- **Thrombolysis:** Many heart attack patients will undergo thrombolysis, a procedure that involves injecting a clot-dissolving agent to restore blood flow in a coronary artery. This procedure is administered within a few (usually three) hours of a heart attack.
- **Coronary angioplasty/coronary artery bypass graft surgery (CABG):** If thrombolysis treatment isn't administered immediately after a heart attack, many patients will need to undergo coronary angioplasty or coronary artery bypass graft surgery (CABG) later to improve blood supply to the heart muscle.

Learn more about the treatment of heart attack.

Additional questions for your doctor

Doctors are busy, but they really want to help you. You can help them do so by coming to each appointment prepared. Bring any questions you may have about your diagnosis, your treatment or other elements of your medical care.

Here are some examples of questions heart attack patients often have during the heart attack diagnosis process.

- What kind of heart attack did I have?
- Did it damage my heart permanently?

- Why did this happen to me?
- Am I at risk of having another one soon?
- Could you explain the treatments and medicines I'll need?
- Should I worry about how my medicines will interact or side effects?
- How long will I have to stay in the hospital?
- What physical limitations will I have while recovering?
- Will I be able to return to a normal life?
- What is "cardiac rehab"? When can I start?

Treatment of a Heart Attack

Understandably, treatment for those diagnosed with heart attack can be complex. But this section on heart attack treatments will help you talk with your doctors and healthcare providers.

As you learn about your treatment plan, don't be afraid to ask questions. Be sure to voice any concerns you may have.

Common heart attack types and treatments

The type of heart attack (also called myocardial infarction, or MI) you experienced determines the treatments that your medical team will recommend. A heart attack occurs when a blockage in one or more coronary arteries reduces or stops blood flow to the heart, which starves part of the heart muscle of oxygen.

The blockage might be complete or partial:

- A complete blockage of a coronary artery means you suffered a "STEMI" heart attack or ST-elevation myocardial infarction.
- A partial blockage is an "NSTEMI" heart attack or a non-ST-elevation myocardial infarction

Treatments differ for a STEMI versus NSTEMI heart attack, although there can be some overlap.

Hospitals commonly use techniques to restore blood flow to part of the heart muscle damaged during a heart attack:

- You might receive clot-dissolving drugs (thrombolysis), balloon angioplasty (PCI), surgery or a combination of treatments.
- About 36 percent of hospitals in the U.S. are equipped to use a procedure called percutaneous coronary intervention (PCI), a mechanical means of treating heart attack.

At a hospital equipped to administer PCI, you would likely be sent to a department that specializes in cardiac catheterization, sometimes called a "cath lab." There, a diagnostic angiogram can examine blood flow to your heart and reveal how well your heart is pumping. Depending on the results of that procedure, you may be routed to one of three treatments: medical therapy only, PCI or coronary artery bypass grafting (CABG).

A hospital that not equipped to perform PCI might transfer you to one that is. Or, your medical team may decide to administer drugs known as fibrinolytic agents to restore blood flow. You might be given an angiography (an imaging technique used to see inside your arteries, veins and heart chambers), possibly followed by an invasive procedure called revascularization to restore blood circulation in your heart.

If the hospital determines you had an NSTEMI heart attack, doctors typically use one of two treatment strategies. Both may involve a test called cardiac catheterization to examine the inside of your heart:

- The ischemia-guided strategy uses various drugs (antiplatelet agents and anticoagulants) to inhibit blood clot formation.
- The early invasive strategy will start with the use of various drugs (antiplatelet agents and anticoagulants) to inhibit blood clot formation, but might also proceed to a medical therapy, a PCI with stenting or coronary artery bypass grafting (CABG), followed by certain types of post-hospital care.

Your doctor and other members of your healthcare team can explain the approach to your heart attack treatment. They can answer any specific questions you might have.

Common heart attack treatments

You'll find many common heart attack treatments listed here. For more detailed explanations of these treatments, see our page devoted to cardiac procedures.

- **Angioplasty:** Special tubing with an attached deflated balloon is threaded up to the coronary arteries.
- **Angioplasty, Laser:** Similar to angioplasty except that the catheter has a laser tip that opens the blocked artery.
- **Artificial heart valve surgery:** Replaces an abnormal or diseased heart valve with a healthy one.
- **Atherectomy:** Similar to angioplasty except that the catheter has a rotating shaver on its tip to cut away plaque from the artery.
- **Bypass surgery:** Treats blocked heart arteries by creating new passages for blood to flow to your heart muscle.
- **Cardiomyoplasty:** An experimental procedure in which skeletal muscles are taken from a patient's back or abdomen.
- **Heart transplant:** Removes a diseased heart and replaces it with a donated healthy human heart.
- **Minimally invasive heart surgery:** An alternative to standard bypass surgery.
- **Radiofrequency ablation:** A catheter with an electrode at its tip is guided through the veins to the heart muscle to destroy carefully selected heart muscle cells in a very small area.
- **Stent procedure:** A stent is a wire mesh tube used to prop open an artery during angioplasty.
- **Transmyocardial revascularization (TMR):** A laser is used to drill a series of holes from the outside of the heart into the heart's pumping chamber.

In addition to the above treatments, you might hear about implantable medical devices being used to treat certain heart attacks.

Types of medications

Heart attack treatment involves a variety of drugs. The list below provides a quick overview of the common types. You can also learn about cardiac medications in more detail.

Your doctor will recommend the best combination of heart attack medications for your situation.

- **Anticoagulant:** Used to treat certain blood vessel, heart and lung conditions.
- **Antiplatelet agent:** Keeps blood clots from forming by preventing blood platelets from sticking together.
- **Angiotensin-converting enzyme (ACE) inhibitor:** Expands blood vessels and decreases resistance by lowering levels of angiotensin II. Allows blood to flow more easily and makes the heart's work easier or more efficient.
- **Angiotensin II receptor blocker:** Rather than lowering levels of angiotensin II (as ACE inhibitors do) angiotensin II receptor blockers prevent this chemical from having any effects on the heart and blood vessels. This keeps blood pressure from rising.
- **Angiotensin receptor neprilysin inhibitor:** Neprilysin is an enzyme that breaks down natural substances in the body that open narrowed arteries. By inhibiting neprilysin, those natural substances can have their normal effect. That improves artery opening and blood flow, reduces sodium (salt) retention and decreases strain on the heart.
- **Beta blocker:** Decreases the heart rate and cardiac output, which lowers blood pressure and makes the heart beat more slowly, with less force.
- **Combined alpha and beta blocker:** Combined alpha and beta blockers are used as an IV drip for those patients experiencing a hypertensive crisis. They may be prescribed for outpatient high blood pressure use if the patient is at risk for heart failure.
- **Calcium channel blocker:** Interrupts the movement of calcium into the cells of the heart and blood vessels. May decrease the heart's pumping strength and relax the blood vessels.
- **Cholesterol-lowering medications:** Various medications can lower blood cholesterol levels, but statins are the best first course of action. When statins prove ineffective, or if a patient experiences serious side effects from statin therapy, other drugs may be recommended.
- **Digitalis preparation:** Increases the force of the heart's contractions, which can be beneficial in heart failure and for irregular heartbeats.
- **Diuretics:** Cause the body to rid itself of excess fluids and sodium through urination. Help to relieve the heart's workload. Diuretics also decrease the buildup of fluid in the lungs and other parts of the body, such as the ankles and legs. Different diuretics remove fluid at varied rates and through different methods.
- **Vasodilator:** Relaxes blood vessels and increases the supply of blood and oxygen to the heart while reducing its workload. Available as pills to be swallowed, chewable tablets and as a topical application (cream).

Dual Antiplatelet Therapy (DAPT)

Some patients who have heart attacks, that have stents placed in their coronary arteries, or undergo coronary artery bypass graft surgery (CABG) are treated with two types of antiplatelet agents at the same time to prevent blood clotting. This is called dual antiplatelet therapy (DAPT).

One antiplatelet agent is aspirin. Almost everyone with coronary artery disease, including those who have had a heart attack, stent, or CABG are treated with aspirin for the rest of their lives. A second type of antiplatelet agent, called a $P2Y_{12}$ inhibitor, is usually prescribed for months or years in addition to the aspirin therapy.

The type of medication and the duration of your treatment will vary based on your condition and other risk factors. The risks and benefits of DAPT should be discussed with your health care provider.

If you had a heart attack and a coronary artery stent placed, or you are being treated with medical therapy (no stent, clot buster or surgery), in addition to aspirin, you should **also** be on

a $P2Y_{12}$ inhibitor for 6-12 months. In some cases, it may be advisable to be on DAPT longer. This will need to be discussed with your healthcare provider. The three $P2Y_{12}$ inhibitors currently available that could be prescribed are clopidogrel, prasugrel, and ticagrelor. Studies have shown that two of these drugs (ticagrelor, prasugrel) are "stronger" than clopidogrel, and are a little better at decreasing the complications of blood clots. These two stronger agents, however, slightly increase bleeding. One of these drugs (prasugrel) should not be used by patients who have had a stroke or a transient ischemic attack (TIA). You will be prescribed the drug that is best for you, based on your risk of blood clots and bleeding. For example, according to the FDA(link opens in new window), clopidogrel does decrease the risk of stroke and MI, but does not change the risk of death for specific patients. The choice of what type of medication, cost of the medication and duration of treatment will be determined in discussions with your health care provider.

Life After a Heart Attack

Explore and embrace your options

You had a heart attack. Now what?

It's no surprise that many people feel scared, confused and overwhelmed after a heart attack. A heart attack represents a life-changing event.

After your treatment for heart attack, you likely received instructions and a lot of information from your doctor. With time to reflect, you may be trying to understand what happened. You're sure to want to know what you can do to avoid heart problems in the future.

Navigating the road to recovery isn't easy. Questions, confusion, uncertainty and even fear are common. Get answers to your questions and learn more about what to expect.

5 ways to prevent another heart attack

Make prevention your priority

After a first heart attack, most people go on to live a long, productive life. However, around 20 percent of patients age 45 and older will have another heart attack within five years of their first.

Make preventing another heart attack your first priority. Here are five things you can do:

Take your medications as prescribed. Certain medicines can greatly lower your risk of another cardiac event. That's why it's important for you to understand your medicines and take them correctly. Learn about managing your medications.

Attend your follow-up appointments. Attending your follow-up appointments will help your doctors keep track of your condition and recovery. You can make the most of your time with your doctor by preparing for your appointment.

Participate in cardiac rehabilitation. Cardiac rehabilitation is a medically supervised program designed to help you recover after a heart attack. You should have received a referral to cardiac rehab when you were discharged from the hospital – if you didn't, ask your doctor about it. Learn more about cardiac rehab.

Get support. It's normal to feel scared, overwhelmed or confused after a heart attack. Getting support from loved ones or from people who have also experienced a heart attack can help you cope. Connect with other heart attack survivors and caregivers through our Support Network.

Manage your risk factors. After a heart attack, it's important to manage risk factors (such as high blood pressure, high cholesterol and diabetes) by taking medications, quitting smoking, eating healthy food and getting active. Find out more about managing your risk factors.

Learn about other lifestyle changes.

Heart Attack Tools and Resources

- What is a Heart Attack? (PDF)
- How Will I Recover? (PDF)
- Heart Attack Discharge Worksheet (PDF)
- Heart Attack Discharge Worksheet (Spanish) (PDF)
- 5 Ways to Lower Your Risk of a Second Heart Attack (PDF)
- 5 Ways to Lower Your Risk of a Second Heart Attack - Spanish (PDF)
- Cardiac Rehab Referral Card (PDF)
- Cardiac Rehab Referral Card (Spanish) (PDF)
- What Are the Warning Signs of Heart Attack? (PDF)
- Common Heart Attack Warning Signs (PDF)