Coronary Artery Bypass Surgery

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Surgery Overview

During a coronary artery bypass, the diseased sections of your coronary arteries are bypassed with healthy artery or vein grafts to increase blood flow to the heart muscle tissue. This procedure is also called coronary artery bypass grafting (CABG). Bypass typically requires open-chest surgery.

There are several newer, less invasive techniques for bypass surgery that can be used instead of open-chest surgery in some cases. In some procedures, the heart is slowed with medicine but is still beating during the procedure. For these types of surgery, a heart-lung bypass machine is not needed. (For open-chest surgery, a heart-lung machine may be used to circulate the blood and to add oxygen to it.) Other techniques use keyhole procedures or minimally invasive procedures instead of open-chest surgery. Keyhole procedures use several smaller openings in the chest and may or may not require a heart-lung machine. These techniques are still being studied and may not be available in all medical centers.

Open-chest surgery

You'll receive anesthesia before the surgery that will make you sleep. In most cases, bypass surgery is open-chest surgery. During the surgery, your chest will be open and your heart exposed. The surgeon makes a large cut, or incision, in the middle or side of your chest. He or she may cut through your breastbone and spread apart your rib cage.

The surgeon removes a healthy blood vessel—often from the leg—and attaches (grafts) it to the narrowed or blocked artery. The new blood vessel bypasses the diseased artery to increase blood flow to the heart. You may need just one bypass graft, or you may need more. Some people have as many as two, three, or even four (double, triple, or
quadruple bypass surgery). How many grafts you need depends on how many arteries are narrowed or blocked and where.

When the surgery is complete, the doctor may use wire to put your rib cage back together and stitches to close the incision. The surgery can take 3 to 6 hours. You will stay in the hospital at least 3 to 8 days after the surgery. It can take 4 to 6 weeks to recover at home. Most people are able to return to work within 1 to 2 months after surgery.

More information
- What can I expect when I arrive at the hospital for bypass surgery?
- Who participates in bypass surgery?
- How do surgeons perform bypass surgery?

What To Expect After Surgery

After surgery, there will be a short stay (1 to 2 days if there are no complications) in the intensive care unit (ICU). In the ICU, you will likely have:

- Continuous monitoring of your heart activity.
- A tube to temporarily help with breathing.
- A stomach tube, to remove stomach secretions until you start eating again.
- A tube (catheter) to drain the bladder and measure urine output.
- Tubes connected to veins in the arms (intravenous, or IV, lines) through which fluids, nutrition, and medicine can be given.
- An arterial line to measure blood pressure.
- Chest tubes, to drain the chest cavity of fluid and blood (which is temporary and normal) after surgery.

You will typically stay in the hospital from 3 to 8 days after open-chest bypass surgery. The amount of time you stay varies and will depend on your health before bypass surgery and whether complications develop from surgery.

After discharge, recovery at home takes 4 to 6 weeks. Exercise and driving may be resumed after about 2 to 3 weeks. People who are able to return to work can usually do so within 1 to 2 months, depending on the type of work they do.

Some people find that they experience heightened emotions (such as a greater tendency to cry or otherwise show emotion in ways that are unusual compared with before the procedure) for up to a year following surgery.

Cardiac rehabilitation

After your surgery, your doctor may suggest that you attend a cardiac rehabilitation program. In cardiac rehab, a team of health professionals provides education and
support to help you recover. Recovery includes physical therapy, respiratory therapy, occupational therapy, and diet counseling.

The rehab team can help you make new, healthy habits, such as eating right and getting more exercise.

**Lifestyle changes and medicines**

The success of bypass surgery also depends on you. You can do things that can help you stay healthy and prevent problems. You will take medicines, and you may need to make lifestyle changes. These things help your bypass grafts last and stay open longer.

If you smoke and don't quit, you won't get the most benefit from bypass surgery. You may need to make some other big changes, like eating right, getting regular exercise, and losing weight. A cardiac rehab program can help you make these lifestyle changes.

You will likely take medicines that prevent blood clots, lower cholesterol, and manage blood pressure. Along with lifestyle changes, these medicines can help you get the most benefit from bypass surgery.

Bypass surgery is not a cure for heart disease. That's why medicine and lifestyle changes are so important. Without them, you raise your risk of getting new places in your arteries that are narrowed or blocked. If this happens, you may need another surgery.

**More Information**

- How will I recover from bypass surgery?
- What will my first 24 hours of recovery be like?
- What will my recovery be like after the first 24 hours?
- What can I expect when I go home after surgery?
- What happens in a cardiac rehabilitation program?
- What can I do to help my recovery from bypass surgery?
- How can I help a loved one who has had bypass surgery?

**Why It Is Done**

Not everyone with coronary artery disease needs bypass surgery. Some people can be helped by angioplasty with stents. Others use medical therapy, which involves making lifestyle changes and taking medicines. Some people use both of those treatments. Your doctor is likely to recommend bypass surgery only if you will benefit from it and if those benefits are greater than the risks.

Your doctor may advise bypass surgery if:

- Your left main heart artery is very narrow.
• All three arteries of the heart are blocked or the amount of blood flowing through them is very low.
• Your doctor thinks that bypass surgery will be more successful than angioplasty with stents.
• You also need surgery to repair or replace a heart valve damaged by heart valve disease.
• You have diabetes and two or more narrowed or blocked arteries.
• Your heart is having trouble pumping. This is called a decreased ejection fraction.

Your choice may depend on the number of arteries that are affected or which arteries are affected. Talk with your doctor about the best treatment for you. The best treatment for you may also depend on your age, your health, and how much your angina is affecting your quality of life.

Heart Disease: Should I Have Bypass Surgery?

How Well It Works

Bypass surgery can:

• Relieve angina symptoms and improve quality of life. You may be able to do more of your daily activities.¹
• Help some people live longer. Whether it could help you live longer depends on several things. These include your overall health and which arteries need to be bypassed. For example, the surgery may raise your chances of living longer if you have diabetes and narrowing in your heart's larger arteries.² ³

Risks

Bypass surgery has been done for more than 40 years. In the United States, it is one of the most common major surgeries. But it has some risks.

The chances of having a serious problem with bypass surgery increase with age. Your risk is also higher if you have other problems such as diabetes, kidney disease, lung disease, or peripheral arterial disease. Your doctor can help you understand what your risk for problems is.

The risks during or soon after bypass surgery include:

• Infection.
• Kidney problems.
• Atrial fibrillation.
• Heart attack.
• Stroke.
• Short-term problems with thinking and memory. This is more common in older people. It tends to get better within several months of surgery.
• Death.

What To Think About

When bypass surgery is clearly needed, surgery improves symptoms and in some cases prolongs life. But in many situations, the reasons for doing bypass surgery instead of other treatments are less clear.

In each case, the cardiac surgeon or cardiologist should be able to clearly explain why bypass surgery is preferred over medicine or angioplasty. Sometimes, a second opinion can be helpful when it is not clear that surgery needs to be done.

Transmyocardial laser revascularization (TMR) is sometimes used along with bypass surgery. TMR uses a laser beam to improve blood flow to the heart and relieve angina. It is not common but may be done to reach areas of the heart where bypass grafting does not work as well. And it is not the right treatment for everyone.

Complete the surgery information form (PDF) to help you prepare for this surgery.

References

Citations


Other Works Consulted

• Fihn SD, et al. (2014). 2014 ACC/AHA/AATS/PCNA/SCAI/STS focused update of the guideline for the diagnosis and management of patients with


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