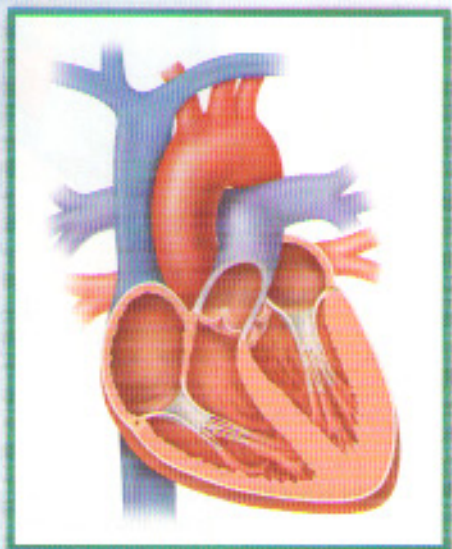


Understanding Heart Valve Surgery



- Understanding Valve Problems
- Repair and Replacement Procedures
- Taking Care of Yourself After Surgery



Trouble with a Heart Valve

Your heart's job is to pump blood through your body. That job starts with pumping blood through the heart itself. Inside your heart, blood passes through a series of one-way gates called **valves**. If a valve works poorly, not enough blood moves forward. This can make you sick. But surgery can often fix the problem. This booklet will help you understand valve problems and show you what to expect before, during, and after surgery.

Symptoms You Might Have

You can have a problem valve for decades yet have no symptoms. If you do have symptoms, they may come on so slowly that you barely notice them. In other cases, though, symptoms appear suddenly. You might have one or more of these symptoms:

- Problems breathing when you lie down, exert yourself, or get stressed emotionally
- Pain, pressure, tightness, or numbness in your chest, neck, back, or arms (angina)
- Feeling dizzy, faint, or lightheaded
- Tiredness, especially with activity or as the day goes on
- Waking up at night coughing or short of breath
- A fast, pounding, or irregular heartbeat
- A fluttering feeling in your chest
- Swollen ankles or feet



Waking up short of breath may be a symptom of a heart valve problem.

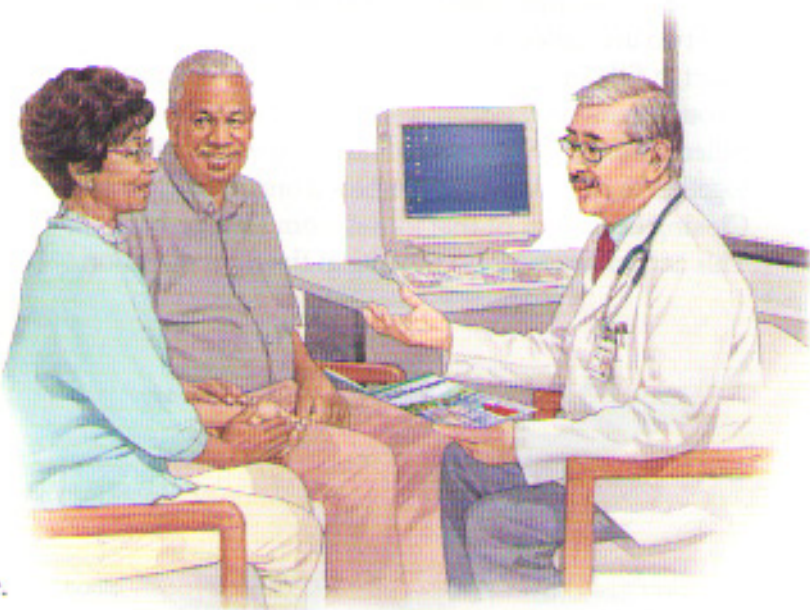
Causes of Valve Problems

Men and women of any age can have heart valve trouble. You may have been born with a problem valve. Or a valve may have worn out as you've aged. It may not be possible to pinpoint what caused your valve problem. But common causes include:

- Buildup of calcium or scar tissue on a valve
- Rheumatic fever and certain other infections and diseases
- High blood pressure
- Other heart problems, such as coronary artery disease

Surgery for Your Valve Problem

Your doctor will talk with you about surgery if it seems to be your best treatment option. During surgery, the problem valve will be either repaired or replaced. That decision will be based on many factors. These include your age, whether you are a woman of child-bearing age, the nature and location of the problem, and any other medical conditions you may have.



Your Heart After Surgery

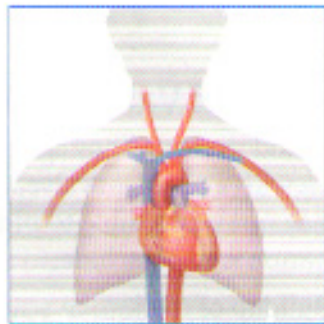
Valve surgery won't treat the problem that caused the damage. But it may strengthen your heart so you feel better. That way you can enjoy life more. After surgery you'll need to start some new habits to take care of yourself and your heart. These may include taking medications every day for the rest of your life and having regular follow-up tests.

Notes to Family and Friends

This booklet is not just for the patient. It is also for you as a friend or member of the patient's family. Look for boxes like this in the booklet. They will suggest ways you can help out during and after the surgery.

How a Healthy Heart Works

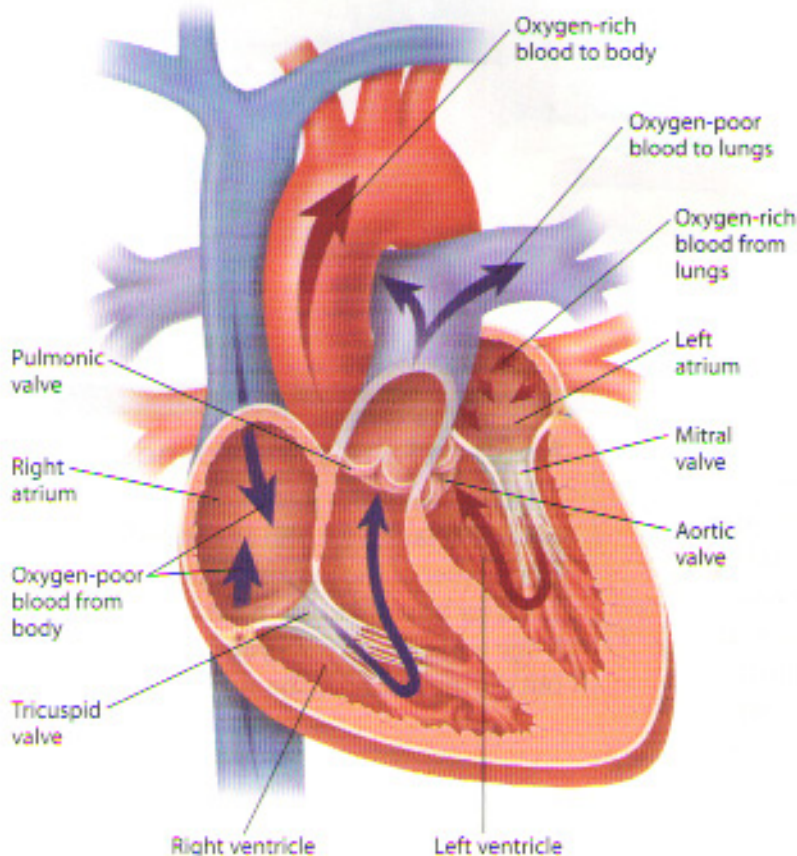
Your heart is a pump that keeps your body supplied with oxygen-rich blood. The right side of the heart receives oxygen-poor blood from the body and sends it out to the lungs. The lungs add oxygen to that blood. The newly oxygenated blood then flows into the left side of the heart. The left side pumps it out to the rest of the body.



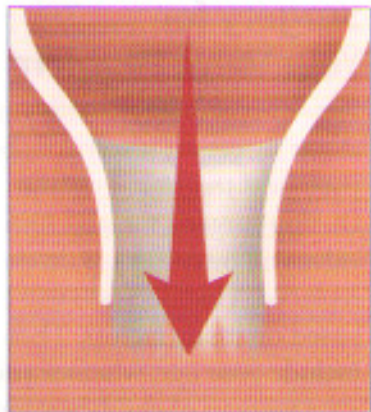
Your heart and lungs work together to keep the body supplied with oxygen.

Healthy Heart Valves

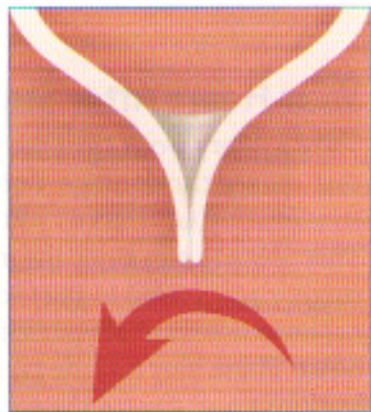
The heart has four chambers. Two are called **ventricles**, and two are called **atria**. As blood travels through the heart, it fills each chamber. It then exits each chamber through a one-way gate called a valve. Each valve has flaps called **leaflets**. They spread apart to open and then come together to close. Opening lets blood out of the chamber. Closing keeps any of that blood from leaking back in. This action keeps blood flowing in the right direction.



Healthy Valve



A healthy valve opens fully, so blood flows out of the chamber.

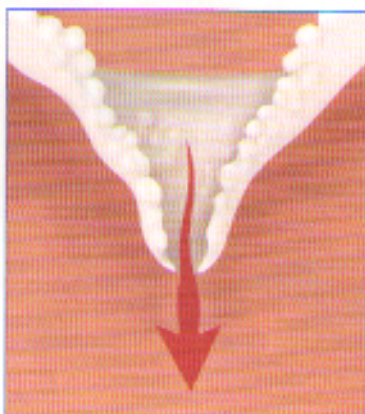


A healthy valve closes tightly, so blood cannot flow backward.

When a Valve Doesn't Work Right

A problem valve may not open wide enough, not close tightly enough, or both. In any case, not enough blood gets sent out to the body. This causes the symptoms you feel. The heart tries to make up for that shortage by working harder. But working harder helps for only a while. If the problem isn't fixed, that extra work will damage the heart further. This can lead to **heart failure**, the inability of the heart to pump enough blood to meet the body's needs.

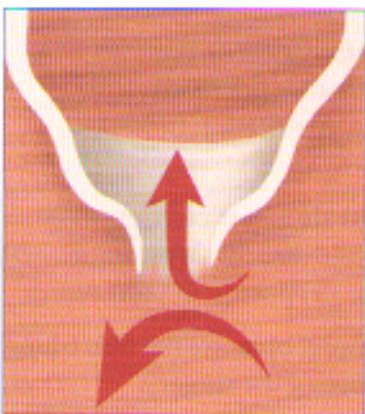
Problem Valve



With **stenosis**, a valve doesn't open all the way, so not enough blood gets through.

Problems Opening (Stenosis)

When a valve doesn't open all the way, the problem is called **stenosis**. The leaflets may be stuck together or too stiff to open fully. When the valve doesn't open fully, blood has to flow through a smaller opening. So the heart muscle has to work harder to push the blood through the valve.



With **regurgitation**, a valve doesn't close all the way, so some blood leaks backward.

Problems Closing (Regurgitation)

When a valve doesn't close tightly enough, the problem is called **regurgitation** or insufficiency. The valve itself may be described as leaky. Leaflets may fit together poorly. Or the structures that support them may be torn. Some blood leaks through the valve back into the chamber it just left. So the heart has to move that blood twice.

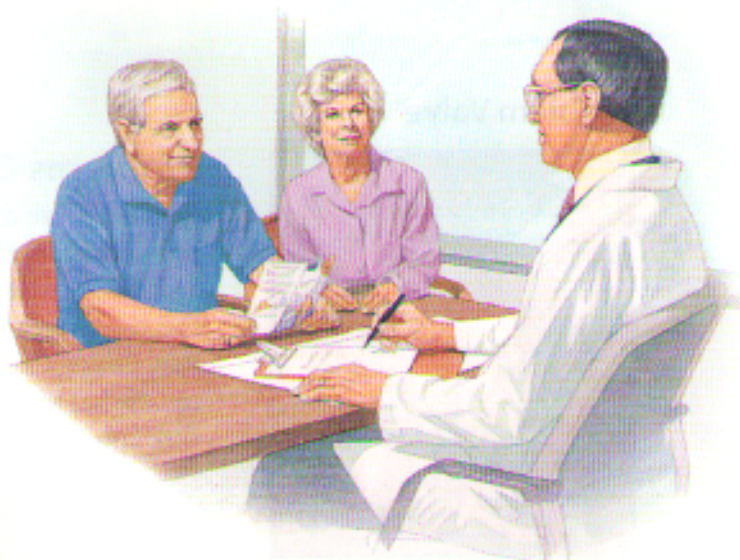
Preparing for Surgery

Once a valve problem has been diagnosed and surgery scheduled, you'll have some things to do. Some preparations will help make your surgery go smoothly. Some will help you get set up for your return home from the hospital. And others will help you feel more at ease. Your doctor will talk with you about the possible risks. Write down all your questions in advance so you don't forget to ask them.

Tests You Might Have Just Before Surgery

You have already had several tests just to diagnose your valve problem. You will most likely have a few more to assess your overall health before surgery. These may include:

- An **ECG (EKG)** to show the rhythm of your heart.
- A **chest x-ray** to give your doctor more information about your heart and lungs, such as whether there is fluid in your lungs.
- **Blood and urine tests** to check for kidney problems, blood sugar levels, and the blood's ability to clot.



Bring someone with you to doctor visits to help you remember what the doctor says.

Your Healthcare Team

You may meet only some members of your healthcare team before surgery. But each will have an important role in your care. They keep one another informed about what they have done for you, how you're doing, and what you need. Your team may include the following:

- A **primary care doctor** provides ongoing care; may be your cardiologist, internal medicine specialist, or general practitioner.
- A **surgeon** and surgical assistants perform the operation itself.
- **Nurses** each specialize in a different phase of your care, such as helping during the surgery or your recovery in the ICU.
- An **anesthesiologist** continuously monitors your anesthesia during surgery to help you sleep without pain.
- A **perfusionist** operates the heart-lung machine during the surgery.

To Do Before Surgery

Steps you take before your surgery can help make both the surgery and your recovery go better. Follow your doctor's instructions.

The Weeks Before

- ☐ Ask your doctor about scheduling any dental work you might need. Dental work may let bacteria into your bloodstream, which may cause infection on a new valve.
- ☐ Give your doctor a list of every medication you take, including supplements and over-the-counter products. Your doctor may have you stop taking some of them or start taking others before surgery.
- ☐ If you smoke, quit right away. You will do better during and after the surgery.
- ☐ Arrange for an adult family member or friend to drive you home from the hospital. Have a helper available for your first week or two at home.
- ☐ Prepare and freeze food or arrange to have food brought in while you recover.
- ☐ Make adjustments around your home to simplify movements, such as reducing the need to climb stairs.



Make a list of all your medications and dosages.

Risks and Complications

Most valve surgeries have an excellent outcome. But any major surgery carries risk. Valve surgery risks include:

- Bleeding; need for a transfusion
- Infection
- Blood clot
- Heart rhythm problems, stroke, heart attack, or death
- Problems in the lungs or kidneys
- Failure of the new or repaired valve
- Damage to the heart

The Day Before

- ☐ You may be asked to wash with special soap the night before surgery. The morning of surgery, don't use deodorant, lotion, or perfume.
- ☐ Don't eat or drink anything after midnight, the night before surgery.

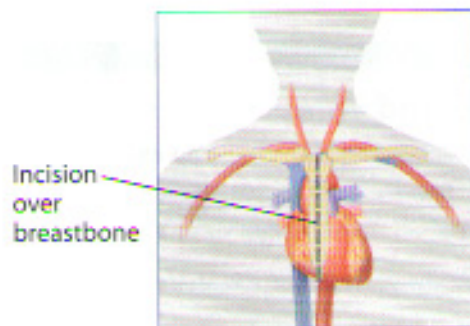
Your Surgery

You can feel confident knowing that a team of skilled experts is doing your valve surgery. Your surgeon will first gain access to your heart. Then he or she will either repair or replace the problem valve. If you have another heart problem, a second procedure may be done at the same time to take care of it, too. A heart-lung machine will oxygenate your blood so your heart and lungs can be still during the surgery.



Reaching Your Heart

To get to the heart, the surgeon usually makes an incision down the center of the chest. The **breastbone** (sternum) is then separated. After surgery, the breastbone is rejoined with wires. The incision is then closed. In many cases, the breastbone heals in 6 to 8 weeks. If your surgeon plans to reach your heart by a different means, he or she will discuss it with you.

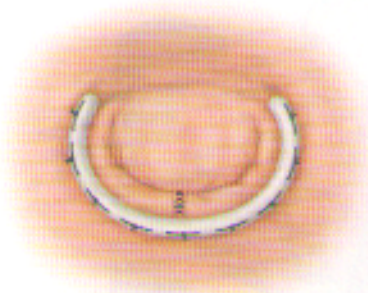


Notes to Family and Friends

- The entire surgery can take 4 to 6 hours. Plan some activities, such as card games or reading, to help you relax while you wait.
- Be sure at least one person is always in the waiting room to receive news.
- Remind yourself that your loved one is in good hands.

Three Ways to Treat Problem Valves

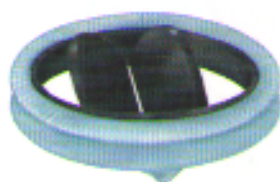
Different problems call for different treatments. Your doctor will talk with you in advance about the treatment that is best for you. In some cases, though, the plan may need to change once surgery has begun. The three basic ways to treat valve problems during surgery are:



A ring for one kind of repair

Repair of the Valve

Whenever they can, surgeons prefer to repair a valve rather than replace it. The most common kind of repair involves sewing a ring around the entrance to a valve to improve its size or shape. Another involves cutting tissue to let leaflets open or close better. When repair isn't possible, the valve will be replaced.



A mechanical valve

Replacement with a Mechanical Valve

Mechanical valves are made of metal or hard carbon. There are many designs. They can last for decades. But blood tends to stick to them, forming clots. So if you receive a mechanical valve, you have to take **Coumadin**, an **anticoagulant** medication, for life to prevent blood clots. See pages 14 and 15 to learn more about Coumadin.



A tissue valve

Replacement with a Tissue Valve

A tissue valve usually comes from a pig or a cow. Blood does not clot as easily on tissue valves. So patients getting tissue valves may need Coumadin for only a short time. Aspirin is sometimes used instead. Tissue valves may wear out faster than mechanical valves. So they may have to be replaced sooner.

Fixing Other Problems

If you have a valve problem, you may have some other heart problem, too. If so, there is no better time to fix it than while you are already in the operating room. So it is common for surgeons to plan to combine needed procedures. For instance, you might need a coronary artery bypass at the same time as valve surgery. Two procedures may mean more risk than one. If a second procedure is needed, your doctor can tell you more.

Recovering in the Hospital

After surgery, you'll spend at least a day in the intensive care unit (ICU). Highly trained nurses will monitor you closely. When you're ready, you will be moved to a general care room. You'll stay there for 2 to 8 days. While there, you'll recover further and prepare to go home.



In the ICU

When you first wake up after surgery, you may feel groggy, thirsty, or cold. You'll be connected through tubes and wires to several devices. A tube may be in your throat to help you breathe. You won't be able to talk while this tube is in place. Once it is removed, your nurses will teach you exercises to clear your lungs and get your breathing back to normal. If you feel pain, ask for more medication. Don't wait until the pain gets bad.

Beyond the ICU

The more you stand and walk, the better—even if doing so makes you tired. Walking improves your muscle strength, blood flow, and breathing. Before you go home, your doctor will check the dosages of your medications. You'll go home when you're able to, but don't expect to feel fully recovered. Have an adult family member or friend drive you home. Have someone stay with you for a week or two.

Notes to Family and Friends

- You may be able to visit your loved one briefly a few hours after surgery.
- Be prepared to see him or her groggy, pale, puffy, confused, and surrounded by tubes and monitors. This is normal after open heart surgery.
- Encourage him or her to accept pain medication as needed before the pain becomes severe.
- Encourage your loved one to get out of bed to stand and walk as much as he or she can.

Recovering at Home

You've just come through one of the major events of your life. So give yourself time to get better little by little. Expect good days and bad days. At first, you may tire easily. But being active will help you recover. Find your right balance between rest and activity.

Easing Back into Daily Activities

You'll gain a little more energy and strength each day. Start off easy with activities such as:

- **Walking.** One of the best ways to get stronger is simply to walk. Start with short walks inside your home, then out to the mailbox. Walk a little more each day. Take someone with you at first.
- **Showering.** You may feel weak the first few times you shower. Put a stool in the shower. Have someone nearby in case you need help. Avoid very hot water or tub baths, which can make you lightheaded.
- **Returning to work.** Ask your doctor when you can return to work. You may need to work part-time at first.



Caring for Your Incision

It is normal for your incision to be numb, bruised, itchy, or sore for a few weeks. Gently wash it daily with warm water and soap. Then pat it dry. To prevent infection, keep skin lotions and ointments off your incision.

When to Call Your Doctor

Call your doctor if any of the following occurs:

- You are short of breath while resting or after only a little exertion.
- Your heart seems to be beating fast or slow or is skipping beats (palpitations).
- Your legs swell or you gain more than 2 pounds in 1 day or 5 pounds in 1 week (retaining fluids).
- You feel dizzy or lightheaded.
- You have chills or fever of 100°F (37.7°C) or higher.
- Your incision changes for the worse, such as swelling, oozing, or getting red or tender. Call your surgeon.
- Pain in your chest or shoulder gets worse instead of better.
- Your breastbone clicks or grinds.

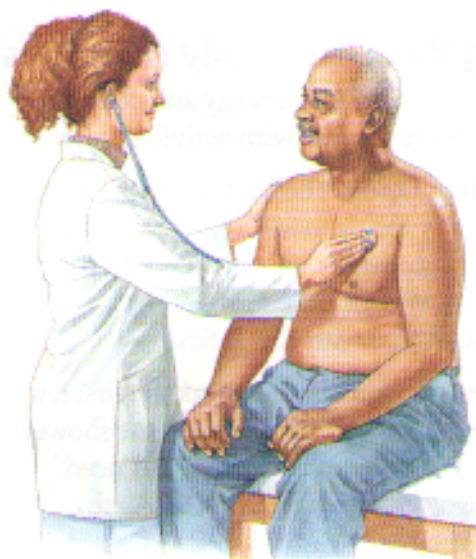
The Weeks and Years Ahead

Everyone recovers at a different rate. But expect to take about 6 to 8 weeks before you can get back to your routine. Giving your heart and chest time to heal properly will pay off in your future health. To keep feeling your best, you'll need regular checkups for the rest of your life.

Visiting Your Doctor

Follow-up visits with your doctor help make sure you're recovering well. You may have:

- Blood tests to track your progress and see if you need more or less medicine.
- Chest x-rays or echocardiograms to check how well your heart is working.
- ECGs to show if your heart's rhythm has changed.
- A monitored exercise and learning program to guide your recovery.



Regular checkups help keep your recovery on track.

Preventing Infection

Bacteria can damage your new heart valve. It can get into your bloodstream from routine dental work and some medical procedures. So before any such procedure, you'll need to take antibiotics. Tell all your doctors and dentists you've had valve surgery. Ask your cardiologist about any other guidelines.

Letting Your Breastbone Heal

For at least 4 to 6 weeks, avoid activities that put strain on your chest. For example, steering a car can make your breastbone hurt. So let others drive during this time. Also, don't lift, push, or pull anything that weighs more than 5 or 10 pounds, such as a grocery bag, vacuum, or mower. After a few weeks, you can do light housework such as dusting or minor household repairs. You can resume sex as soon as you feel comfortable. But avoid sex positions that put stress on your chest or arms.

Keeping Your Mood in Perspective

While getting over major surgery, many people feel depressed or frustrated. You might feel cheerful and full of energy one day, then cranky and tired the next. You may find it hard to concentrate or have trouble sleeping. These problems are common after major surgery and should go away. If they hang on longer than a few weeks, tell your doctor. Keep talking with your family and friends to support each other.

Forming New Habits

You may need to make changes in your lifestyle to protect your heart. These include:

- **Exercise.** Make walking and other exercise part of your routine. Start off easy, and do more little by little. Set a goal of someday walking 30 minutes a day. Check with your doctor before resuming any activity that could lead to injury, such as skiing or construction work.
- **Quit smoking.** Smoking is very bad for your heart and lungs. If you need help quitting, ask your healthcare provider.
- **Limit salt (sodium).** Salt makes fluid build up in your body. That makes your heart work harder and can lead to heart failure. Your doctor may advise you to replace salt with other seasonings.
- **Avoid alcohol.** Don't drink any alcohol during your first month after surgery. Some medications may require avoiding alcohol for as long as you take them.
- **Control weight.** If you need to lose weight, ask your doctor for advice.



Walk in a mall or other safe place with a smooth surface.

Monitoring Yourself

Keeping a few simple records will help you and your doctor track your progress.

- **Weight.** Weigh yourself daily and write your weight down. Call your doctor if you gain more than 2 pounds in a day or 5 pounds in a week.
- **Pulse and blood pressure.** Ask to be shown how to take your pulse and blood pressure. Take it regularly and track the numbers. Show your doctor this record at each visit.

Notes to Family and Friends

- Encourage your loved one to move steadily back into activity. Your support for each effort can boost his or her confidence.
- For 1 to 2 weeks, be close at hand most of the time. Check in often.
- You too may feel depressed or frustrated after your loved one's surgery. Talk to each other about your feelings.
- Try not to be overprotective. Let your loved one do what he or she feels able to do comfortably.

Preventing Blood Clots

Any foreign object placed in your heart will have tiny spaces where a blood clot could form. If a clot does form, it could travel to your brain or somewhere else in your body. That could cause a stroke or other severe problems, even death. If you are prescribed anticoagulant medication to prevent clots, these two pages are for you.

Medication to Prevent Clots

You will need aspirin or an anticoagulant pill called Coumadin (also called warfarin) to prevent blood clots. If you received a mechanical valve, you most likely will need to take Coumadin for the rest of your life. If you don't get a mechanical valve, you may need to take it for only a few months.

- Take Coumadin at the same time each day. If you miss a dose, take the next one at the normal time. Never take two doses at once.
- Check with your healthcare provider before taking any other medications (even aspirin) or vitamin or herbal supplements.
- With Coumadin, bleeding takes longer to stop. So avoid using sharp tools, going barefoot, and doing anything else that might cause bleeding. Always wear medical ID jewelry that says you're taking an anticoagulant.
- Go for your blood tests as often as directed. These tests are the only way to check if your Coumadin dosage is right. Ask your doctor whether you can use a home blood test product.



Risks of Anticoagulant Therapy

Long-term anticoagulant therapy has some risks. They include life-threatening bleeding and (when taken by a pregnant woman) birth defects. **CAUTION:** Taking aspirin, aspirin-containing medications, or ibuprofen while on anticoagulant therapy can be dangerous. Ask your doctor before taking any medication. Alcohol and certain foods can also affect how your anticoagulant works, so talk with your doctor.

The Role of Vitamin K

Vitamin K and Coumadin have opposite effects. Your body uses vitamin K to help blood form a clot. Coumadin makes it harder for your body to process vitamin K. So Coumadin slows down clotting. Your doctor must find the right balance between the amount of vitamin K you get and the amount of Coumadin to prescribe.

Keeping Your Diet Steady

Some foods are high in vitamin K. Whether you eat a lot or a little of those foods, eat the same amount of them every day. Avoid supplements that contain vitamin K. If you change your diet for any reason, such as to lose weight or due to travel, tell your doctor. Foods high in vitamin K include:

- Broccoli
- Cabbage and cole slaw
- Spinach
- Asparagus
- Avocado
- Lettuce
- Brussels sprouts
- Greens (collard, turnip, mustard, kale, Swiss chard)
- Seaweed



Every day, eat the same amount of foods that are high in vitamin K.

Two Numbers to Track

You'll need just the right amount of Coumadin—not too much, not too little. The amount you need may change over time. The right amount depends on how long your blood takes to clot. Regular blood tests measure that time with an “INR” and/or “PT” number. Keep a log of your INR numbers and know the target INR range your doctor has set for you. Keep all of your appointments for blood tests.



When to Call Your Doctor

If you take Coumadin and any of these occurs, call your doctor:

- You have any unexpected bruising or bleeding.
- You cut or injure yourself, and serious bleeding does not stop in 15 minutes.
- You have severe or frequent headaches.
- You have dark or tarry stools, your urine is dark or bloody, or you vomit blood.

Your Anticoagulant Record

If your doctor prescribed Coumadin to prevent blood clots, this page is for you. Photocopy this page or create your own notebook based on it. Fill in the spaces each time you have your blood checked. Share your record with any doctor you visit.

Target INR Range

Ask your doctor what yours is. Write it here:

Date

Target Range

Date	Coumadin dosage	INR	PT	Comments

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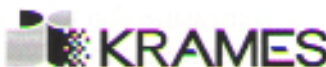
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