

Norma Melchor Heart & Vascular Institute

Mountain View Campus

Transcatheter Aortic Valve Replacement (TAVR): A Handbook for Patients



Getting the Most from Your TAVR Procedure

At El Camino Health, we provide all the information you need to understand and prepare for your heart care procedure. For the best possible outcome:

- Please take time to read this handbook to understand your heart valve condition and the procedure that will correct it.
- Make note of any questions you have for our team. We're available to talk with you at any point — before or after your procedure.
- Follow your doctors' directives closely for the best possible recovery.

Our cardiovascular expertise and dedication to our patients have earned us accolades, but our greatest accomplishment is helping people achieve optimal health.

Your TAVR Is Scheduled

Date and time: _____.

Please arrive at El Camino Health's Mountain View campus, 2500 Grant Road, at (time):
_____.

NOTE: Sometimes surgery schedules change at short notice.
If your time or date is moved, we will notify you as soon as possible.

Before Your Procedure

Stop taking these medications: _____

on (date): _____.

Stop taking this blood thinner medication: _____

on (date): _____.

Start taking these medications: _____

on (date): _____.

The Night Before Your Procedure

Do not eat or drink anything (including water) after midnight.

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What Is Aortic Valve Disease?

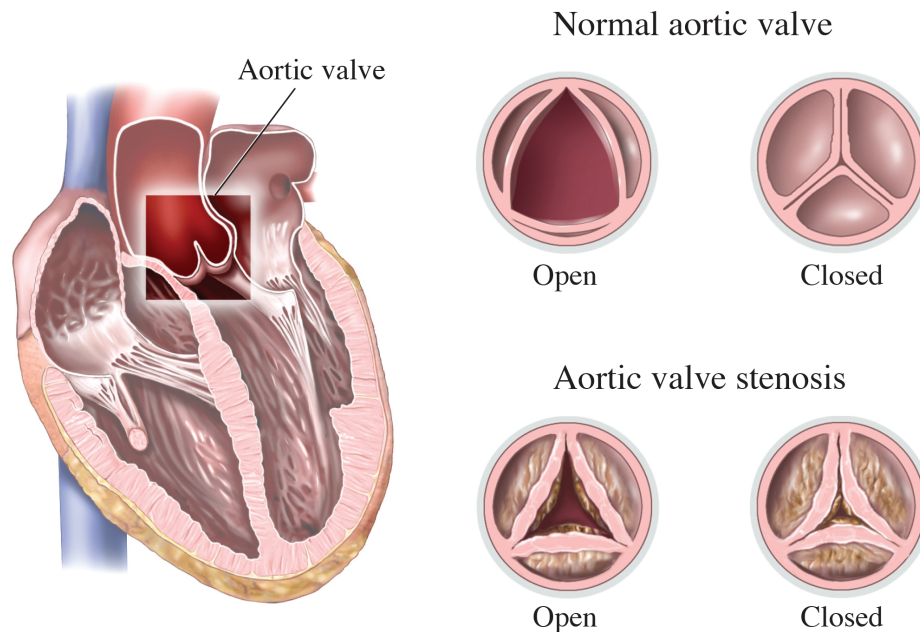
First, let's review how your heart works when it's healthy. The heart's two lower chambers are called right and left ventricles. The left ventricle is the chamber responsible for pumping oxygen-rich blood out to the body. That's the one we're concerned with.

Blood leaves the left chamber through a portal called the aortic valve. The valve is made of three strong, thin flaps of tissue, called leaflets. They

open and close in perfect time to regulate blood flow.

With aortic valve disease (aortic stenosis), the valve stops working effectively and prevents blood from flowing properly to the body. Symptoms of aortic stenosis can include shortness of breath during exercise, chest pain, fatigue, palpitations and fainting. Without treatment, about half of those who experience symptoms will die within two years.

Aortic Valve, open and closed, healthy and stenosed



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Glossary: Learn the Medical Terms

aortic stenosis – A calcified and stiff heart valve that does not open all the way to allow adequate blood flow out of the heart

catheter – A thin, flexible tube inserted into the body during medical procedures

echocardiogram – Ultrasound of your heart that makes moving pictures so your doctor can see the heart muscle and valves working

electrocardiogram – Test that checks your heart's rhythm and electrical activity using sensors attached to your skin

femoral artery – A large artery in the upper leg or groin

TAVR – Transcatheter aortic valve replacement, a minimally invasive procedure to replace a diseased aortic heart valve

transfemoral – Access through a femoral artery located in the groin

What Causes Aortic Valve Disease?

Aortic valve disease can be due to a birth defect where two of the three leaflets are fused together at birth. This causes blood to leak back into the heart during pumping, a condition called bicuspid aortic valve disease.

But it's most commonly caused by age-related changes to the heart that result from a buildup of calcium on the aortic valve's leaflets. The leaflets thicken and become stiff. They can't open and close fully, causing the portal to narrow and reduce blood flow.

How TAVR Treats Aortic Valve Disease

Transcatheter aortic valve replacement (TAVR) replaces a diseased aortic valve with a bio-prosthetic heart valve. "Bio-prosthetic" means a prosthesis containing animal tissue. The valves can be made from cow tissue (bovine) or pig tissue (porcine). The procedure is called "transcatheter" because your surgeon first inserts a thin, flexible tube called a catheter in the femoral artery in your groin and guides it to your heart. The replacement valve is then inserted through the catheter. The new heart valve expands, pushing the diseased valve leaflets out of the way. It begins working right away to regulate blood flow.

Bio-Prosthetic Heart Valves: Two Choices

You will undergo a special imaging scan (computed tomography, or CT scan) prior to your appointment. This will allow your doctor to evaluate your anatomy and decide which bio-prosthetic valve is best for you.

There are two types commercially available:

- **Edwards SAPIEN 3 transcatheter heart valve.** The frame is made from a chromium-cobalt-nickel alloy. The leaflets are from tissue taken from the heart of a cow.



Edwards Lifesciences LLC, Irvine, CA

- **Medtronic Evolut transcatheter heart valve.** The leaflets are made of natural tissue taken from a pig's heart. The leaflets are secured to a flexible, self-expanding nickel-titanium frame for support.



Benefits and Risks of TAVR

With TAVR, there is no need for open-heart surgery and therefore usually no need for general anesthesia. Instead, your anesthesiologist administers conscious sedation, which relieves anxiety and discomfort but maintains consciousness. This less invasive approach means you'll recover from the procedure sooner.

Benefits of TAVR Include:

- No need for open-heart surgery or sternal (breastbone) incision
- No need for a heart-lung bypass machine (a machine that temporarily takes over the functions of the heart and lungs during traditional surgery)
- Less need for general anesthesia
- Shorter hospital stay
- Faster recovery period

It's always wise to discuss the risks of any procedure with your doctor. TAVR is considered safe and effective, but like all procedures it carries some risks. These include stroke, bleeding from the incision site, damage to the artery or blood vessels, slow heart rhythm requiring a pacemaker, infection, and very rarely, death.

Your TAVR doctors will discuss your individual risks during your Multidisciplinary Valve Clinic consultation.

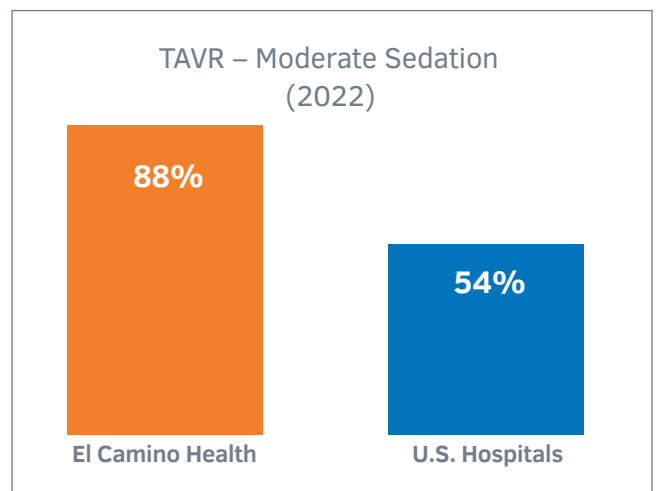
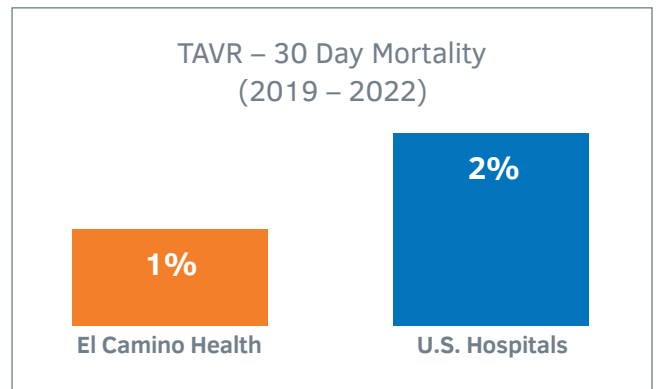
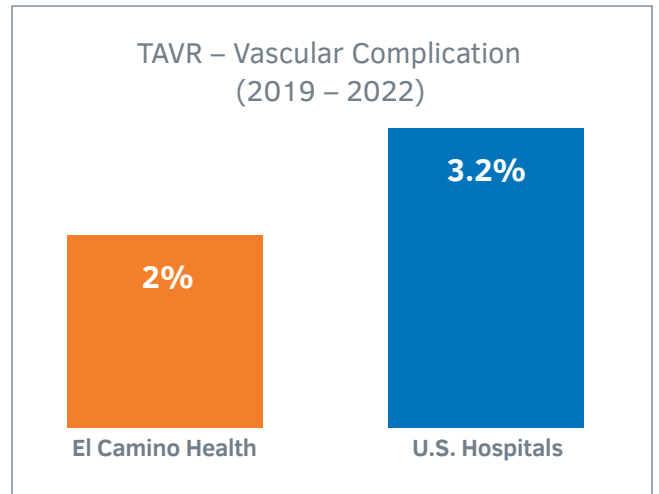


Experience Counts: Quality and Safety Data

El Camino Health has always been at the forefront of TAVR innovation. In 2010, Medtronic chose our Mountain View hospital as one of the first in the country to participate in early research for the Medtronic CoreValve U.S. Pivotal Trial. Our work contributed to the commercial approval of the revolutionary CoreValve device in early 2014.

We have now performed over over 900 commercial and research procedures. As a result, our cardiovascular specialists have extensive experience with this cutting-edge treatment. When it comes to patient outcomes for valve replacement, we are consistently superior to the national benchmarks as compared to the outcomes from all patients across the U.S. tracked by the Society of Thoracic Surgeons and the American College of Cardiology's national Transcatheter Valve Therapy (TVT) Registry.

El Camino Health was the first in California to earn the Transcatheter Valve Certification™ from the American College of Cardiology, reflecting an operational model that merges the latest science and process improvement methodologies. We also recently became re-certified.



Multidisciplinary Heart Valve Clinic

Every patient interested in TAVR must attend our valve clinic. It's how we decide on the best treatment for you. At the valve clinic, you will be carefully evaluated by an interventional cardiologist and a cardiac surgeon with special experience in heart valve treatments. They will:

- Review your medical records and test results.
- Listen carefully to your questions, concerns and hopes.

We will only move forward with TAVR if it is indeed the very best option for you.

Meet Your Medical Team

At the valve clinic, you will meet the two highly trained doctors with vast experience in treating heart valve disease who will perform your TAVR procedure. They will discuss the options of TAVR, cardiac surgery, continued medical therapy or more testing.

Members of your care team also include:

- Cardiology physician assistant (PA)
- Structural heart clinical nurse specialist
- Medical assistants

Learn More: Educational Resources

For more details about what happens during the TAVR procedure, visit the Medtronic website and watch this animation:

<https://www.medtronic.com/en-us/l/patients/treatments-therapies/transcatheter-aortic-valve-replacement.html>

The Edwards Lifesciences website features information about valve design for Sapien 3 and Sapien 3 Ultra as well as videos about valve placement:

treatheartvalvefailure.com

How to Prepare for Your TAVR Procedure

Careful preparation on your part helps ensure a successful procedure and smooth recovery.

One Month Before Procedure

Stop smoking.

Smoking prevents your body from receiving the oxygen it needs. If you continue smoking, it may take longer for you to recover from your procedure. Quitting may be difficult, but you must do it. Talk to your doctor if you need help managing nicotine cravings and withdrawal symptoms.

Report new health problems.

Stay in the best health possible. If you develop any new health problems in the month leading up to the procedure, let your doctor know as soon as possible. This includes a fever, cough, sore throat, cold, urinary tract infection, or if a doctor or dentist has started you on an antibiotic.

Dental procedures should be completed prior to your TAVR procedure. Otherwise, you will need to wait until six months after the TAVR procedure to schedule a dental procedure.

The Week Before Procedure

Stop taking medications as instructed by your doctor.

Continue taking antiplatelet medications such as:

- Aspirin (Ecotrin®)
- Clopidogrel (Plavix®)
- Prasugrel (Effient®)
- Ticagrelor (Brilinta®)

One Day Before Procedure

Pack your hospital bag. Wear comfortable clothing to the hospital. You can wear the same outfit on your return home. Please pack lightly as storage is minimal. See “What to Pack.”

Stop food and drink at midnight. Do not eat or drink anything (including water) after midnight the night before your procedure.

Remove all jewelry, makeup and nail polish. These may interfere with the procedure and any tests you need.

What to Pack: Travel Light

At the hospital, you will receive a gown, pajama bottoms and a pair of non-skid slipper socks. Bring only:

Toiletries

- Dental care items
- Shaving items
- Lip balm
- Hairbrush or comb

Clothing

- Change of underclothing
- Bathrobe, if desired
- Non-skid slippers

Personal Items

- Dentures
- Glasses
- CPAP (continuous positive airway pressure) mask
- Hearing aids with extra batteries

Do not bring jewelry, valuables or personal medications.

About Your Hospital Stay

On the Morning of Your TAVR

Come directly to El Camino Health's Mountain View campus as instructed. Family members may wait with you in the pre/post-procedure room. You will be there for about an hour. While you are there:

- A nurse will review your medical information, start an intravenous (IV) line in your arm, draw blood and give you an aspirin.
- You will undergo an echocardiogram (ultrasound of your heart that makes moving pictures so your doctor can see the heart muscle and valves working) and an electrocardiogram (checks your heart's rhythm and electrical activity using sensors attached to your skin).
- A surgical technician will trim your body hair from chest to groin.
- The anesthesiologist will answer any questions you may have.

During the Procedure

- In the procedure room, a nurse will greet you, check the name on your wrist band and review vital information.
- Your anesthesiologist will give you a mild sedative. You will be relaxed and sleepy. Your doctor will give you instructions as needed.
- The cardiologist will insert catheters in both your left and right groin area.
- You will be in the procedure room approximately one hour, but time varies by patient. Your team will keep you, your loved ones and caregivers informed of any delays.



After the Procedure

- Nurses will take you back to the post-procedure room, attached to a cardiac monitor and IV. They will frequently check your blood pressure, mental state and the pulses in your legs.
- Technicians will do another electrocardiogram.
- Your heart rhythm will be continuously monitored.
- About two hours later, you will be moved to your hospital room.
- To reduce any chance of bleeding from the incision site in your groin, you will be required to lie flat for four to six hours.
- After four to six hours, a nurse will assist you out of bed and encourage you to walk as part of your recovery.
- You will resume your normal medication.

Before You Go Home

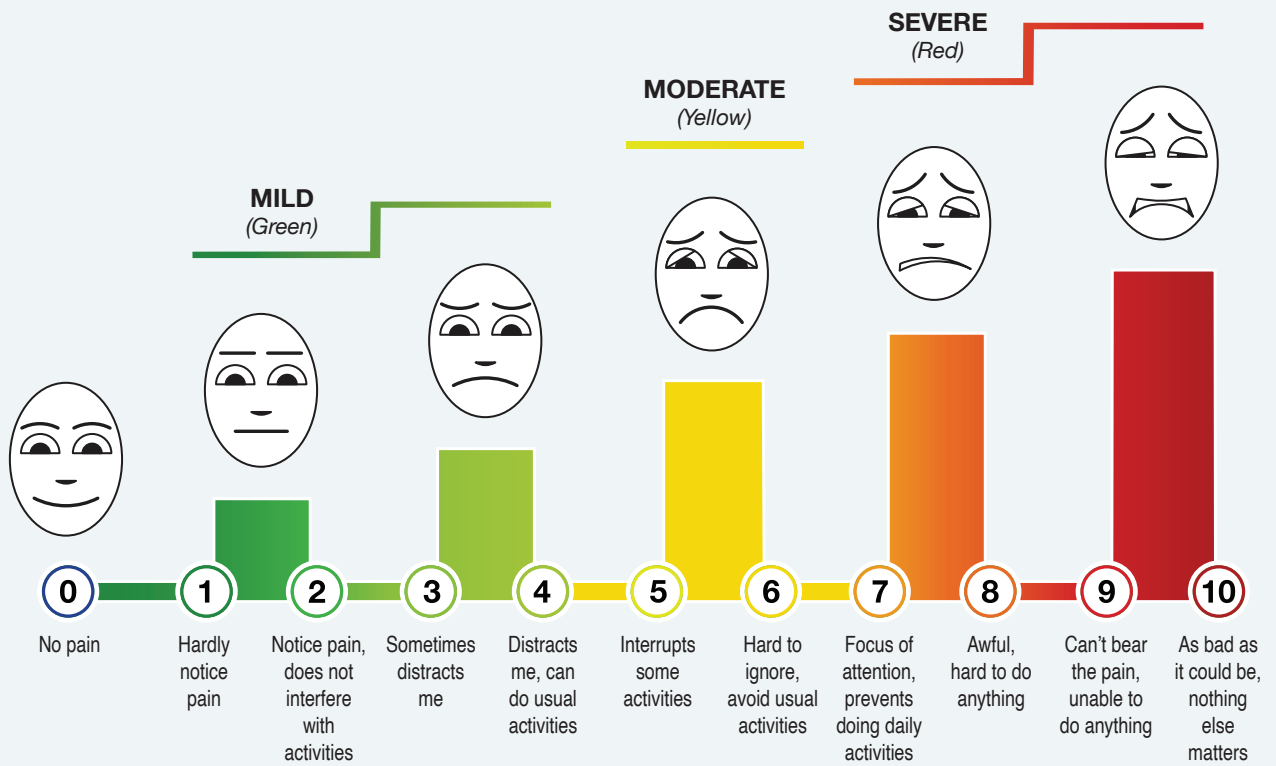
Patients are usually discharged one to two days after the procedure. Before you return home:

- Your care team will provide you with a list of discharge medications.
- Our clinic staff will contact you to arrange a one month follow up appointment and include an echocardiogram, labs, and an ECG.
- Following this appointment, you will return to the care of your primary cardiologist.
- You will be referred to a local cardiac rehabilitation program.

Pain Management

While pain and discomfort are minimal following a TAVR procedure, the experience is different for every patient. Your nurse will ask you to describe any discomfort using the Pain Assessment Scale. Our goal for your pain management is to keep your pain at a comfort level that allows you to do activities that are important to your recovery and quality of your life.

PAIN ASSESSMENT SCALE



DVPRS Pain Scale

v 2.0

Taking Care of Yourself at Home

Watch for Danger Signs

You may experience mild discomfort at the incision (puncture) sites in your groin. However, if you experience any of the following signs or symptoms, call your doctor:

- Bloody drainage from the incisions. If this occurs, first apply manual pressure over the site for 10 minutes. If drainage does not stop after 10 minutes, call your doctor.
- Chest pain or angina symptoms not relieved by rest — angina symptoms include pain in your arms, neck, jaw, shoulder or back.
- Dizziness or faintness.
- Numbness, tingling or cold feeling in feet or legs.
- Rapid or irregular heart rate.
- Shortness of breath not relieved by rest.
- Signs of infection (that is, running a fever greater than 101°F).
- Swelling or increased bruising near the incision sites in your groin.
- Weight gain of more than 2 pounds in 24 hours or more than 5 pounds in a week.

Eat a Healthy Diet

Healthy food and beverages will help you recover more quickly. Aim for meals that are low in saturated fat and high in fiber. Avoid adding salt. Enjoy alcohol and coffee in moderation.

Take Your Medication

Know your medications and take them as prescribed.

Exercise as Much as You're Able

Gradually return to routine activities. Walk as much as you can. As you recover, adopt a regular walking or fitness program for heart-disease prevention. Take advantage of your cardiac rehabilitation referral.

Restrictions on Activity

Bathing. Use caution with hot water because it can make you feel lightheaded. Shower using warm water and mild soap. Do not scrub or apply pressure to the incision areas. Pat those areas dry with a towel — do not rub. Do not submerge your incisions in water. Do not take a bath, swim in a pool or soak in a hot tub until you are completely healed.

Driving. 48 hours after your procedure, you may drive a car.

Lifting. Avoid strenuous activity and do not lift anything heavier than 10 pounds for one week.

Sex. You may resume sexual activity within seven to 10 days.

Working. In one week, you may return to work.

Prevent Infection

People who have had a heart valve replaced are at risk for developing bacterial endocarditis, an infection that causes destruction or scarring of the heart valves. It may occur as a result of dental work, skin infections or surgery.

- Please avoid any dental procedures, including cleaning, for six months after your TAVR.
- To prevent infection from dental work or surgery beyond six months, request a prescription from your doctor for the appropriate antibiotic.
- Inform your doctor of any skin conditions, cuts or abrasions that could become infected.

Keep Up With Your Cholesterol Tests

Checking your cholesterol and talking with your doctor about your health profile are essential to avoiding further risk for heart disease.

TAVR: Frequently Asked Questions

1. **How long does the TAVR procedure take?**
The TAVR procedure takes about 45 minutes to one hour.
2. **How long is the recovery period?**
Patients must lie flat for four to six hours directly after the procedure. Recovery takes about two to three days for most patients.
3. **How long is the hospital stay?**
Patients are typically discharged after one or two days.
4. **What restrictions should I expect?**
 - No driving for at least 48 hours.
 - No lifting anything heavier than a gallon of milk (or about 10 pounds) for one week.
 - No exercise that engages the abdomen for one week.
5. **Should I fast before the procedure?**
The day before the procedure, patients should not eat or drink anything after midnight.
6. **Do I need to stop my medications?**
You will be given specific instructions during your valve clinic.
7. **When may I start exercising again?**
We encourage you to walk as much as you are able during your recovery. Please ask your doctor when it is safe to resume more strenuous exercise.
8. **Will I need cardiac rehabilitation?**
We refer all our patients to cardiac rehabilitation. Our physicians strongly encourage you to join a program after your one-month appointment.
9. **Will I be awake for the procedure?**
Yes, but you will be sleepy and not in pain. The procedure is done with moderate (conscious) sedation.
10. **When will the new heart valve begin to work?**
Your new valve will begin to work immediately upon placement.
11. **Who will perform the procedure?**
TAVR is performed jointly by the interventional cardiologist and a cardiac surgeon.
12. **What are the major complications related to the procedure?**
Your doctor will discuss your personal risks related to the procedure. Generally, your risks include:
 - Bleeding
 - Stroke
 - Death
 - Needing a pacemaker
 - Irregular heart rhythm
 - Injury to the blood vessels
13. **When do I follow up with the doctor after discharge?**
A 30-day follow-up appointment and an echocardiogram will also be arranged with your TAVR cardiologist.
14. **What are the risks for needing a pacemaker after the procedure?**
Patients with heart rhythm issues are at a higher risk for needing a pacemaker. Your doctor will discuss your personal risk during your valve clinic.
15. **Will my pacemaker be turned off during the TAVR procedure?**
No, your pacemaker will remain on.
16. **After the procedure, will I need antibiotics before going to the dentist?**
We recommend that you do not have any dental work, including cleaning, for six months after the procedure. After that, yes, you will need to take antibiotics prior to any dental work.
17. **Will I need help at home after the procedure?**
We recommend that you have someone spend the first night at home with you.
18. **Can I get an MRI with my new aortic valve?**
Yes, you can safely have an MRI with both the Edwards and Medtronic aortic valves.
19. **Will my valve set off alarms at the airport?**
Your valve will not cause problems with airport security.

At-a-Glance Summary of Your TAVR Journey

Attend the Multidisciplinary Heart Valve Clinic

- **An interventional cardiologist and cardiac surgeon evaluate** your echocardiogram and CT scan results. They discuss your aortic valve treatment options with you.
- **Nurses educate** you about TAVR.
- **If TAVR is right for you**, the clinic staff schedules your procedure.



Undergo the Procedure at El Camino Health's Mountain View Campus

- **One to two hours before procedure**, you see your TAVR cardiologist who will perform your procedure.
- **Your TAVR team performs the procedure** which takes about one hour.
- **You rest in the recovery area** for about one hour.
- **Your TAVR cardiologist sees you** in the recovery area.
- **You stay in the hospital one to two days** for monitoring.
- **The day after the procedure**, you are evaluated by the TAVR cardiologist and the cardiology physician assistant (PA).
- **After one to two days**, your TAVR cardiologist and PA discharge you.

Visit Your Doctors for Follow-Ups

- **One month after**, you follow up with your TAVR doctor and have another echocardiogram.
- **Following your one-month-after TAVR appointment**, you visit your regular cardiologist, the one who referred you to us for treatment.

Notes

About El Camino Health

El Camino Health provides a personalized healthcare experience at two not-for-profit hospitals as well as primary care, multi-specialty care, and urgent care locations across Santa Clara County.

Bringing together the best in technology and advanced medicine, our network of physicians and care teams delivers high-quality, compassionate care.



Mountain View Campus

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Heart & Vascular Institute

elcaminohealth.org/heart

