



Aortic Valve Diseases and Treatment

Your guide to:

- How the heart works and what the aortic valve does
- Aortic valve disease and Aortic Stenosis
- The aortic valve program at [TAVR Registered facilities](#) and treatment options
- Transcatheter aortic valve replacement (TAVR)
- What to expect before, day of and after your TAVR procedure.
- Frequently asked questions.

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TAVR Registered Facilities:

[Banner Heart Hospital:](#)

TAVR coordinator:
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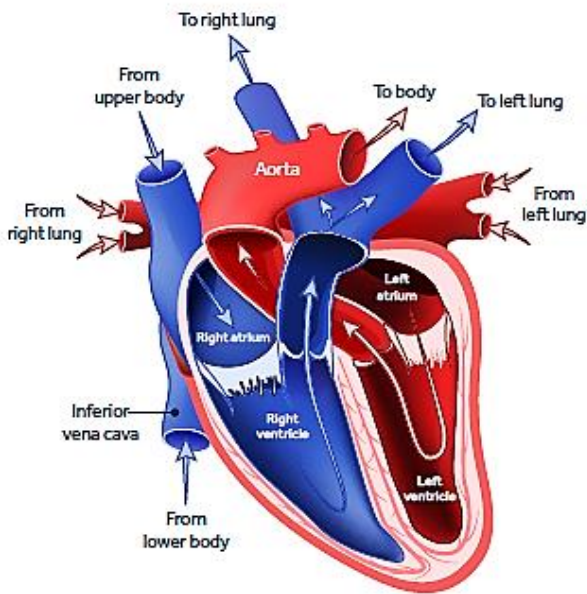
[Banner Desert Medical Center:](#)

TAVR coordinator:
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Your Heart and Aortic Valve



How does the heart work?

The heart is a strong muscle that pumps oxygenated blood (blood that is rich in oxygen) to the rest of the body. The heart is made of four hollow spaces called chambers working together to move oxygenated blood throughout the body:

- Two Atria on the top (Right atrium and left atrium) receive incoming blood
- Two Ventricles on the bottom pump blood out

Heart Valves serve as gates at the chamber openings. Blood moves through these chambers with the help of four valves.

- Tricuspid
- Pulmonic
- Mitral
- Aortic

These four valves ensure that blood moves quickly in a forward motion from one chamber to the next each time your heart beats.

What does the aortic valve do?

The aortic valve is the “door” between the left ventricle and the aorta and is the last valve oxygenated blood will encounter before it leaves the heart. The aortic valve is vitally important because as it opens and closes, it ensures blood flows in the right direction toward your aorta and to the rest of your body.

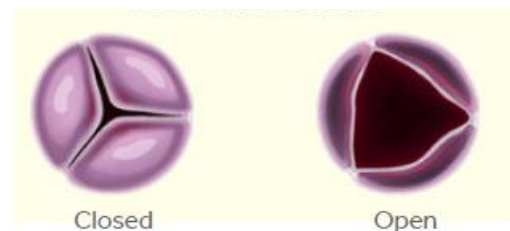
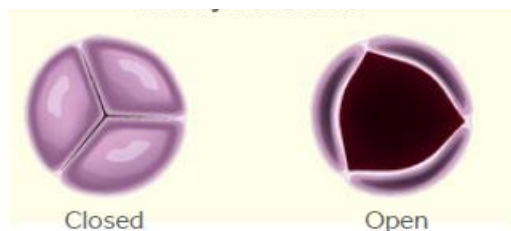
Aortic Valve Disease and Aortic Stenosis

What is aortic valve disease?

Aortic valve disease occurs when the heart’s aortic valve does not work properly. It can be present at birth or develop later in life. If severe and not treated, aortic valve disease can lead to heart failure.

They Types of aortic valve diseases are:

- (1) **Aortic Stenosis:** Results from calcium deposits in the leaflets of the aortic valve that restrict the opening of the valve and impair blood flow to vital organs.
- (2) **Aortic Insufficieny:** Reversal of blood flow resulting from aortic valve leaflets not closing completely after the blood is pumped out to the aorta overwhelming the left ventricle of the heart



Aortic Stenosis: Causes and Symptoms

What causes aortic stenosis?

Aortic stenosis (AS) can be congenital or develop during one's lifetime. The four primary causes of AS are:

(1) Age-related calcification: Scarring and calcium buildup in the valve leaflets

- Age-related AS usually begins after age 60 but often does not show symptoms until ages 70 or 80.
- According to the American Heart Association (AHA), 20% of older Americans have AS, and the number is increasing.

(2) Radiation therapy for cancer: Called radiation induced AS (RAS), can manifest as progressive AS 10 to 20 years after radiation treatment

- Most common when radiation therapy targets the chest, women are more likely to be affected by RAS possibly due to radiation treatment for breast cancer.

(3) Rheumatic fever in childhood

(4) Genetic/congenital condition

- Bicuspid aortic valve: A birth defect where only two cusps grow instead of the normal three
- Limited valve opening growth: When the valve opening doesn't grow along with the heart, making the heart work harder to pump blood to the restricted opening and causing the valve to become stiff and narrow because of calcium buildup over time

What are the symptoms aortic stenosis?

According to the AHA, symptoms of AS include:

- Chest pain
- Difficulty walking short distances
- Fatigue/decline in activity level or reduced ability to do normal activities
- Feeling dizzy or light-headed, even fainting
- Rapid, fluttering heartbeat
- Trouble breathing or feeling short of breath

Infants and children* who have AS due to a congenital defect may exhibit symptoms such as:

- Breathing problems
- Fatigue upon exertion
- Failure to gain weight
- Poor or inadequate feeding

Aortic Valve Program and AS treatment Options

The aortic valve program with Registered TAVR Facilities:

Aortic stenosis(AS) is a progressive disease of the aortic valve. While prescription medications may help manage your symptoms, these medications will not cure AS.

The multidisciplinary heart team at the Registered TAVR facility will partner with you to determine the best treatment

- Your referring cardiologist
- Interventional cardiologist
- Cardiothoracic Surgeon
- Anesthesiologist
- Radiologist
- Registered nurse valve coordinator
- Cardiac catheterization laboratory (Cath lab) technicians
- Cardiovascular operating room team

Treatment options for AS

If you have AS, your physician will order an echocardiogram (echo) to help determine treatment options.

Depending on the severity of your AS, treatment options may include:

- (1) **Transcatheter Aortic Valve Replacement (TAVR):** Also called transcatheter valve implantation (TAVI). Allows replacement of your aortic valve without having open heart surgery.
 - Less invasive procedure; faster recovery time
 - Performed by interventional cardiologist **AND** Cardiothoracic surgeon, bioprosthetic valve is inserted into your aortic valve
 - For patients with severe symptomatic AS
 - Newer technology approved by the Food and Drug Administration (FDA) in 2011.
- (2) **Surgical Aortic Valve Replacement (SAVR):** Open Heart surgery to remove diseased valve and replace with a mechanical or bioprosthetic valve through a chest wall incision**
 - Invasive procedure with longer recovery time
 - For patients with severe symptomatic or asymptomatic AS and may be more appropriate for patients:
 - Aged 75 or younger
 - With complex anatomy
 - Need treatment for multiple heart conditions such as coronary artery bypass or another valve repair or replacement
 - Performed by Cardiothoracic Surgeon, the standard treatment for AS for more than 50 years
- (3) **Medical management of palliative care:** Used when surgical intervention is not appropriate due to other conditions limiting life expectancy**
 - Medications to provide symptom relief

"Palliative care is a resource for anyone living with serious illness with the goal of providing relief of extreme symptoms and to improve quality of life."

- Center to Advance Palliative Care

***If you would like more information on SAVR or medical management treatment options, please consult your cardiac care specialist to discuss the most appropriate options for your condition.*

Transcatheter Aortic Valve Replacement (TAVR)

Are you a candidate for TAVR?

If your physician has diagnosed you with severe, symptomatic AS and is recommending intervention, you will need to complete a series of tests to evaluate if TAVR is right for you. Below is an overview of the consultation and testing process.

TAVR: Required Consults and Testing		
Appointment	Description	Purpose
Interventional cardiologist	<ul style="list-style-type: none"> • Specializes in valve disease • Assesses your symptoms • Discusses your diagnosis and treatment options 	<ul style="list-style-type: none"> • Establishes care with the physicians who will participate in TAVR procedure • Allows physicians to evaluate your clinical situation and understand your goals
Cardiothoracic surgeon	<ul style="list-style-type: none"> • A surgeon who specializes in valve disease • Assesses your symptoms • Discusses your diagnosis and treatment options 	
Cardiac catheterization	<ul style="list-style-type: none"> • Minimally invasive test conducted at the hospital or an outpatient surgery center • Under mild sedation, a long thin tube is inserted into the artery of your groin or wrist • The tube releases dye to show the vessels of the heart on X-ray 	<ul style="list-style-type: none"> • Evaluates for blockages in the arteries of the heart • If your physician finds blockages in your arteries, a stent may be placed during this procedure • Collects data on pressures on the inside of your heart to help your physician understand your valve disease
CT scan	<ul style="list-style-type: none"> • Conducted at the hospital • IV inserted in your arm and special dye injected • Dye allows the intricate parts of your heart's anatomy to be seen and measured • Also captures detailed pictures of your blood vessels throughout your body that our team will need during the procedure 	<ul style="list-style-type: none"> • Measures the size and shape of your valve • Allows heart team to understand which size valve to place in your heart

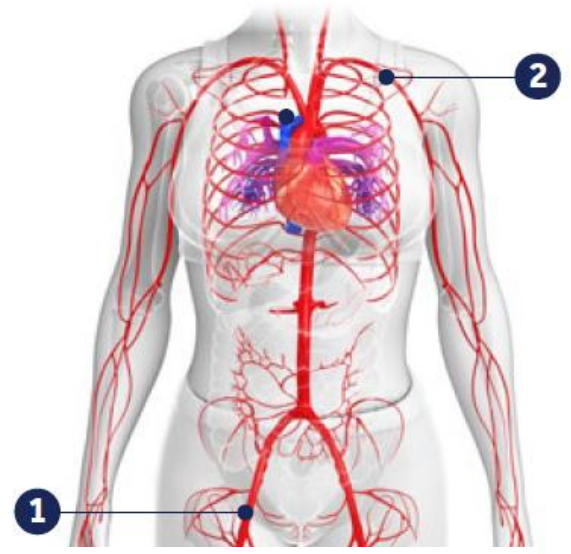
Additional Consults and Testing (only needed at physician discretion)		
Appointment	Description	Purpose
Carotid ultrasound	<ul style="list-style-type: none"> • Generates pictures of the arteries in your neck that deliver blood from your heart to your brain 	<ul style="list-style-type: none"> • Determines if you have blockages in the arteries
Pulmonary function tests (PFT)	<ul style="list-style-type: none"> • Conducted by a respiratory therapist 	<ul style="list-style-type: none"> • Assesses the overall health of your lungs

What happens during a TAVR procedure?

Using the detailed images from the CT scan, your TAVR Heart team will evaluate all major blood vessels in your body. Through this evaluation, the heart team will decide which blood vessels will provide the safest of the possible access points to your heart's aortic valve.

The possible arterial access points are:

- (1) **Femoral:** Arteries in the upper leg/groin.
 - Most common approach
 - Right or left side can be used
 - Mild anesthesia given
- (2) **Subclavian or carotid:** Arteries near the collarbone or in the neck
 - Incision made to access artery
 - Right or left side can be used
 - General Anesthesia / intubation



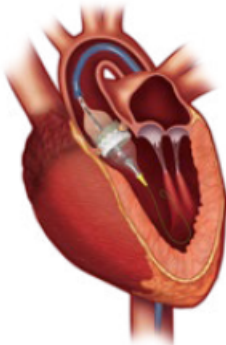
What is a TAVR Valve?

The heart team at Tri-City offers two FDA-approved TAVR valves. Using your CT scan, your heart team will determine which of the two TAVR Valves is best for you.



Edwards Sapien 3 Ultra Resilia™ valve:
A balloon-expandable valve made of bovine (cow) heart tissue with a cobalt chromium frame

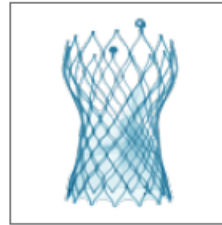
- Uses advanced technology to block the buildup of calcium
- How it is implanted and deployed:



More information:



Sapien 3 Ultra Resilia™ valve images courtesy of Edwards Lifesciences Corporation.



Medtronic Evolut™ FX+ valve: A self-expanding valve made of porcine (pig) heart tissue with a nickel and titanium frame

- Allows the frame to shape itself to your anatomy
- How it is implanted and deployed:



More information:



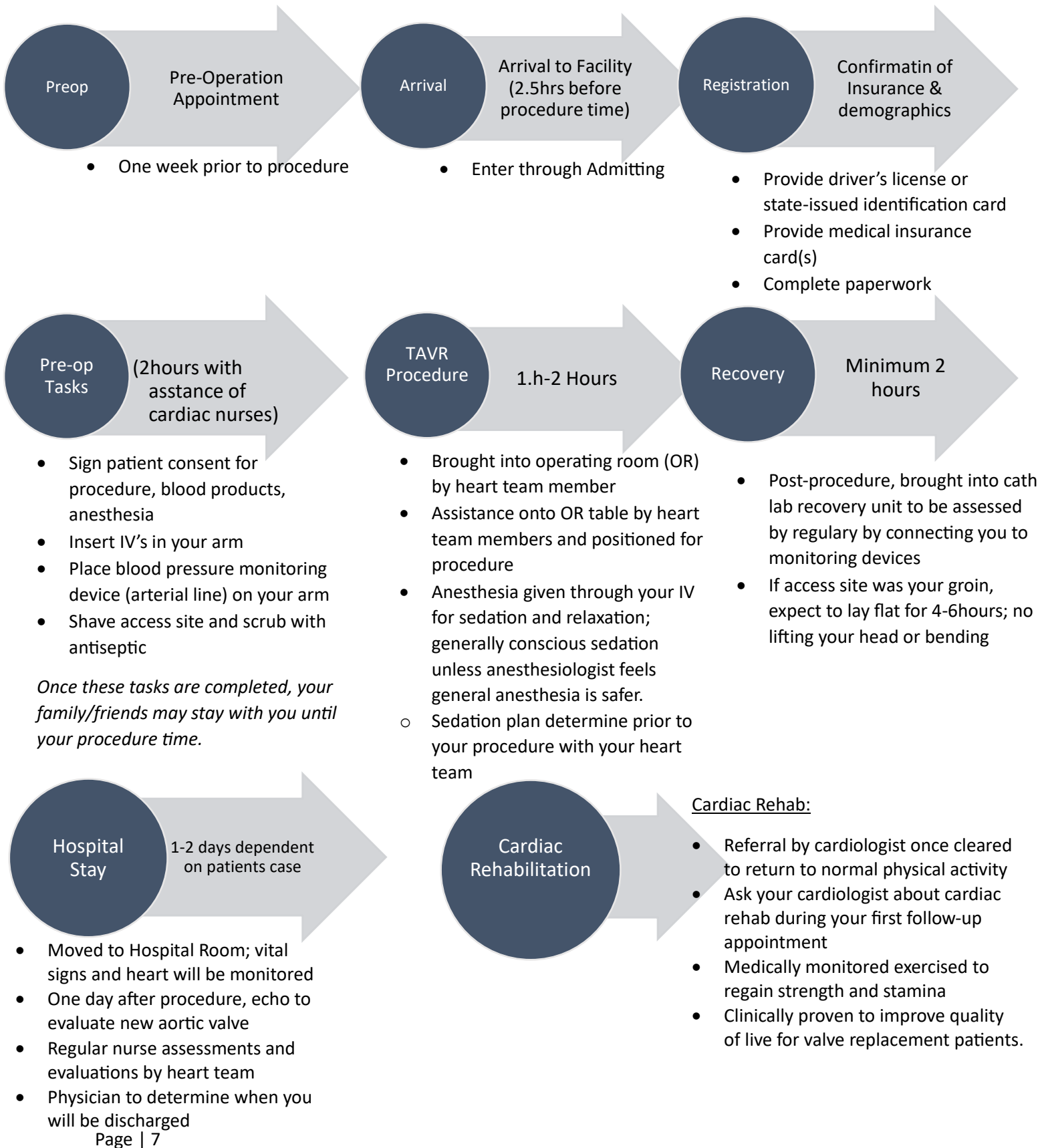
Evolut™ FX+ valve images courtesy of Medtronic.

What to Expect Before, Day of and After your TAVR procedure

Step by Step guide

Your TAVR procedure journey will include the steps below. More detail for some of these steps follows this section.

TAVR Procedure: Step by Step Guide



Preparation: before your procedure

Approximately one week prior to your scheduled TAVR procedure, you will have a pre-operation testing appointment at the Performing Facility. This appointment will take approximately 1 hour and include:

- Bloodwork
- Urine sample
- Chest X-ray
- Electrocardiogram (EKG): A test to record the electrical signals in the heart/ how your heart is beating

During this appointment, you will also meet with your valve coordinator if you have not received introduction phone call. This is to discuss medications, eating, and drinking prior to your TAVR procedure. You will be given specific instructions during this appointment; a general overview is below.

Bloodthinners/anticoagulation medications: If you take any of the follow medications, you will receive instructions on if or when to stop taking these medications prior to your procedure:

- Aspirin
- Coumadin®/Jantoven®/ Warfarin
- Eliquis®/Apixaban
- Plavix®/Clopidogrel
- Pradaxa®/ dabigatran etexilate
- Xarelto®/Rivaroxaban

Diabetes and/or weight loss medications:

- Glutides (GLP-1) inhibitor (for diabetes or weight loss: Stop taking 7 days prior to TAVR procedure
- Gliflozins (SGLT2) inhibitor(for diabetes or weight loss): Stop taking 3days prior to your TAVR procedure
- Metformin: During your appointment, you will be instructed as to how many days prior to your TAVR to stop this medication.
- Insulin: Please consult your prescribing physician (primary care provider or endocrinologist) for your insulin protocol when you are fasting prior to your TAVR procedure.

Eating and drinking:

- Do not eat or drink non-alcoholic beverages- including water – 8 hours prior to your TAVR procedure.
 - Consuming food or beverages, including water, can result in your procedure being cancelled.
- Do not drink alcoholic beverages 24hours prior to your TAVR procedure.

Showering:

- Please shower the night before and the morning of your TAVR procedure.
- Use an antibacterial soap such as Dial® antibacterial soap.
- Make sure to clean you access site well.

What to expect after your procedure

At discharge, you will receive instructions on what appointments you need to make, when to start medications, procedural site care, what activities are appropriate and when, and cardiac rehab. Below is some general information on each of these topics.

You will also be given a temporary valve ID card. A permanent valve ID card will be sent to you in the mail in 4-6 weeks. This ID card should always be with you.

Follow up appointments will be made by Our Structural Heart TAVR coordinator. Should you need to modify or reschedule contact 480-219-5415. Scheduling and attending these appointments with your cardiologist are critical to your recovery and long term heart health.

- 30day Follow up: You will have an Echo and share information about any symptoms you are experiencing and your quality of life.
- One Year Follow-up: You will have an echo and share updated information on your activity levels, quality of life and any symptoms you are experiencing.

Medications: Follow the medication directions in your discharge instructions; note that some changes may have occurred.

- Blood thinners: Expect to be on a blood thinner for several months following your TAVR procedure; your cardiologist will determine how long this medication is needed.
- You will need to take antibiotics prior to any dental work, including routine cleanings. Let your dentist know well in advance of your appointment that you have a bioprosthetic heart valve.

Activity: Your activities will be limited following your discharge from hospital.

- Do not drive for 48hours.
- Do not squat, bare down or lift more than 10 pounds for one week.
- Walking is encouraged as you need to move.
- Consult your cardiologist as to when you can start cardiac rehab and go as prescribed.

Sitecare/Showering:

- Do not submerge in water (bathtub, pool, hot tub/Jacuzzi®, lake or river) for one week after you get home.

Showering: You may shower once you are home.

- Remove the dressings on puncture sites before you shower.
- Wash puncture sites gently with antibacterial soap and water.

Puncture site care: Change dressings on puncture sites daily until the sites have closed; a Band-aid® may be adequate.

- Do not put lotions, powder, alcohol or other medications or products on the puncture sites.

Sneezing/coughing: If your puncture sites are in your groins, hold pressure on both groins if you cough or sneeze for one week.

Signs of infection: Watch for signs of infection at your puncture sites. Call your cardiologist if you experience:

- Spreading redness and warmth
- Drainage at the puncture sites
- Sudden spike in fever over 100 degrees

Signs of emergency: Lay down hold pressure on your groin and call 911 if you have:

- A sudden, sharp pain in the groin
- Swelling of the groin
- A large, painful lump
- Bright red bleeding

TAVR procedure: Frequently Asked Questions

What should I bring with me to the hospital on the day of my procedure?

You should bring the following items with you to the hospital:

- Drivers license or state issued ID card
- Medical insurance card(s)
- An overnight bag
- Your CPAP machine (if applicable; for patients diagnosed with obstructive sleep apnea)
- Prescription glasses, if applicable
- Mobile phone and charger

Do NOT bring anything of value with you as you will move through different departments before you reach your hospital room. Remove and leave jewelry at home.

What time are visiting hours at facilities:

Visiting Hours are 6am-10pm. Your guest should enter in the Main lobby to confirm room and verify visiting hours. Some facilities may only allow 2 visitors at a time.

May someone stay with me overnight at the hospital?

Should you need or prefer someone to stay with you overnight while you are in the hospital, please let the nursing staff know when you arrive to your hospital room. Some cots (depending on facility) are available, but they are given to guests on a first come, first served basis. Hospital rooms are equipped with recliners as well. Certain units, like the ICU, may have restrictions on over night guests.

Does the hospital provide interpreters?

The Performing facilities we utilize do provide these services. If you need an interpreter, please notify the hospital staff, and they will accommodate you.

What time will I go home on discharge day?

Discharge is determined after the cardiologist reads your echo report, establishes that you are progressing as expected, and does not feel you need closer monitoring due to a change in medications or heart rhythm. Discharge usually occurs in the afternoon.

Nationally Registered Hospital for:
TAVR
TEER(Mitraclip/Triclip)
PFO Closure
Watchman

Banner Heart Hospital
6750 E. Baywood Ave
Mesa, Az 85206
Located on Baywood Ave & Power Rd
Check in: 2hrs prior
Phone: 480-854-5000



Nationally Registered Hospital for:
TAVR
Watchman

Banner Desert Medical Center
1400 S. Dobson Road
Mesa, Az 85202
Located on N. 60 US highway & Dobson
Check in: 2hrs prior
Phone: 480-412-3205

Nationally Registered Hospital for:
TAVR
TEER(Mitraclip)
Watchman

Chandler Regional Medical Center
1955 W. Frye Road
Chandler, AZ 85224
Located on: Dobson Rd & Frye Rd
Check in: 2hrs prior
Phone: 480-728-3000

