



Swedish Heart & Vascular Institute

Swedish Aortic Center: Aortic Care Patient Guide

Cardiac Surgery Clinic



Providence
SWEDISH

We are honored to partner with you in caring for your heart and vascular health. We combine advanced diagnostic tools, leading-edge treatments, and personalized care plans to ensure the best possible outcome for you and your family. Whether you need routine surveillance, medical management, or complex surgical intervention, you are in expert hands.

Please use this packet as a resource to learn more about your condition, understand your treatment options, and keep track of your care plan. We encourage you to ask questions, share your goals, and stay actively involved in your journey toward better health.

If you have any questions or need assistance, call us at 206-386-6181. We're here for you!

Swedish Heart & Vascular Institute – Aortic Center

T: 206-386-6181

F: 206-320-4698

www.swedish.org/aorta

Swedish Cherry Hill – Jefferson Tower Cardiac Surgery

1600 E. Jefferson St., Suite 110, Seattle, WA 98122

Cardiac Surgery Providers



Samuel
Youssef, M.D.
Co-Director



Roland
Hernandez,
M.D., J.D., MPH



Richard
Lee, M.D.



Eric
Lehr, M.D., PhD



Patrick
Ryan, M.D.



Jacquelyn
Calvin, ARNP

Swedish First Hill – Heath Building Vascular Surgery

801 Broadway, Suite 500, Seattle, WA 98122

Vascular Surgery Providers



Jose Trani, M.D.
Co-Director



Saideep
Bose, M.D.



P. Gregory
Hayes, M.D.



Megan
Penna, M.D.

Appointments are made at our Cardiac Surgery Clinic or our Vascular Surgery Clinic, depending on diagnosis.



Swedish Vascular Surgery – First Hill

Heath Building

801 Broadway, Suite 500, Seattle, WA 98122

Swedish Cardiac Surgery – Cherry Hill

Jefferson Tower

1600 E. Jefferson St., Suite 110, Seattle, WA 98122



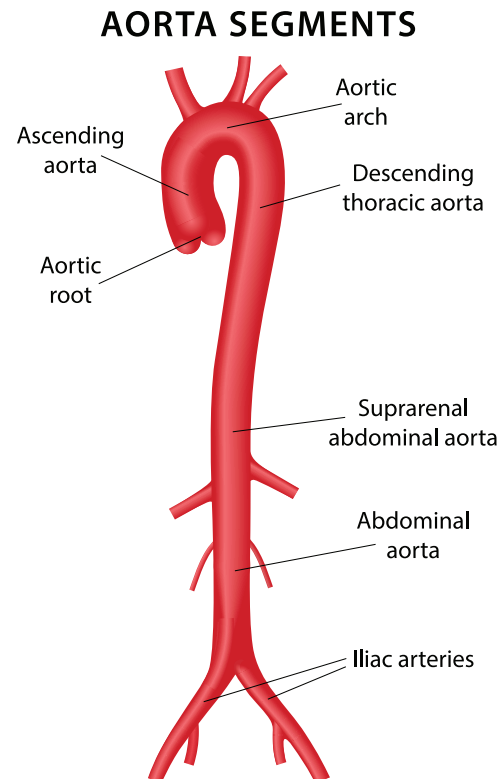
Visit us online at
www.swedish.org/aorta

Understanding the Aorta

The aorta is the body's largest artery (blood vessel) that carries oxygen-rich blood from the heart to the rest of the body. Its thick, triple-layered, elastic walls are specifically designed to withstand the high pressure of blood being pumped directly from the heart, ensuring efficient circulation throughout the body. When the aorta is damaged or diseased, it can lead to serious complications, including internal bleeding or even sudden cardiac death.

The aorta is shaped like a cane and is divided into several important sections:

- **Aortic valve:** functions as a one-way door, opening to allow blood to flow from the heart's lower chamber (left ventricle) into the aorta, and closing to prevent backward flow
- **Aortic root:** the section where the aorta connects to the heart, just above the aortic valve
- **Ascending aorta:** the section that rises upward from the heart into the curved segment known as the aortic arch
- **Aortic arch:** the curved section of the aorta that gives rise to three major branches supplying blood to the brain, head, and arms
- **Descending aorta:** the longest section extending through the chest (thoracic aorta) and abdomen (abdominal aorta). It has several major branches that supply blood to the chest wall, abdominal organs, and legs



Many aortic conditions develop quietly, without any warning signs. This is why regular checkups and imaging tests matter so much - they help catch issues early. Here, patients will find clear information, helpful guidance, and advanced treatment options all in one place, empowering them to feel informed and confident about their care.

What is an Aortic Aneurysm?

An **aortic aneurysm** occurs when a weakened area of the aorta starts to **bulge** outward. As this bulge grows, it can tear or rupture, resulting in a **life-threatening emergency**. Aortic aneurysms can develop anywhere along the aorta, including within the chest (**thoracic aorta**) and the abdomen (**abdominal aorta**).

The tricky part? Aneurysms often do not cause symptoms at first. Many are discovered by chance during imaging tests like X-rays or CT scans done for other reasons.

When an aortic aneurysm is found early, the Swedish Aortic Center uses advanced imaging and regular follow-up to monitor its size and growth rate, helping guide a personalized treatment plan.

Medications and, when needed, surgery can improve outcomes and lower the risk of serious complications. If an aneurysm becomes too large or grows quickly, surgery may be recommended to prevent a life-threatening rupture.

Types of aortic aneurysms

An **aortic root aneurysm** involves the section of the aorta closest to the heart, where it connects to the **aortic valve**. Certain genetic conditions – such as Marfan syndrome, Ehlers-Danlos, Loeys-Dietz, and Turner syndrome – as well as some autoimmune diseases, can increase the risk of developing this type of aneurysm.

When treatment is needed, an **aortic root replacement** may be performed. This surgery removes the weakened section and replaces it with a strong, durable graft. Whenever possible, the patient's own aortic valve is preserved (a **valve-sparing approach**). If the aortic valve is not functioning properly, the care team may recommend repairing or replacement.

An **ascending aortic aneurysm** involves the portion of the aorta that rises upward from the heart toward the aortic arch.

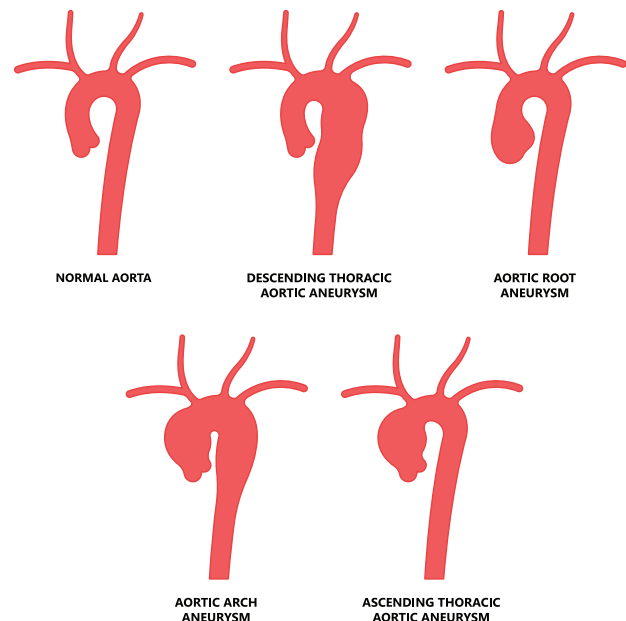
An **aortic arch aneurysm** involves the curved segment of the aorta that connects the ascending and descending portions.

A **descending thoracic aortic aneurysm** involves the segment within the chest, above the diaphragm. Treatment depends on the aneurysm's cause, size, location, and how quickly it is growing.

These aneurysms are less common and may go unnoticed until complications develop, which is why **regular imaging and monitoring** are especially important.

A **thoracoabdominal aortic aneurysm** affects the section that begins in the chest (thoracic aorta) and extends into the abdomen (abdominal aorta). Since it involves both areas, treatment often requires a coordinated approach between cardiac and vascular surgeons.

THORACIC AORTIC ANEURYSMS



Aneurysm Symptoms

Small thoracic aneurysms often do not cause symptoms at first. Depending on its location, as an aneurysm grows, it may press on nearby structures in the chest and cause:

- **Hoarse or weak voice, or persistent cough:** pressure on the windpipe (trachea) or vocal cords can lead to an ongoing cough or voice changes
- **Back, chest, or abdominal pain:** as the aneurysm grows, it may cause discomfort, pain, or throbbing in the back, chest, abdomen, or groin
- **Shortness of breath:** pressure on the airway may make breathing more difficult

Aneurysms can rupture, which is a life-threatening emergency.

Call 911 immediately
if you experience:

- **Sudden, severe chest, back, or abdominal pain**
- **Sudden drop in blood pressure**
- **Difficulty breathing or shortness of breath**
- **Fainting, dizziness, or feeling lightheaded**



Aortic Dissection

An aortic dissection is a **life-threatening emergency** that occurs when a tear develops in the inner layer of the aortic wall. This allows blood to flow between the layers of the aortic wall which splits (dissects) the layers apart. This can disrupt blood flow and lead to serious complications such as heart attack, stroke, or paralysis. If the dissection extends through the outer wall – called an aortic rupture – it can be fatal.

Early detection is critical to allow prompt medical or surgical treatment that can improve the chance of survival.

Aortic dissections are grouped into two main types:

Type A: involves the part of the aorta closest to the heart, including the arch, but can continue further down along the lower part of the aorta. Type A dissections usually require emergency surgery.

Type B: affects the section of the aorta farther down, through the chest or abdominal area. While still a medical emergency, Type B dissections may or may not require emergency surgery, depending on the location.

The treatment plan depends on where the tear is located and how severe it is. The care team will recommend the safest and most effective plan – whether surgery, medication, or both—based on the type and the patient's overall health.

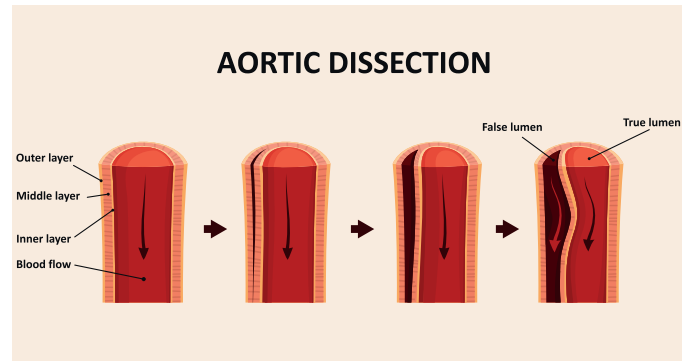
Aortic Dissection (continued)

What are the risk factors for an aortic dissection?

There are several risk factors that can weaken the aortic wall over time, increasing the risk of an aortic dissection.

Common causes

- **Age over 50:** the risk rises with age
- **Atherosclerosis:** buildup of plaque in the arteries can damage and weaken the blood vessel walls
- **Drug use:** stimulants like cocaine or amphetamines can sharply raise blood pressure and stress the aorta
- **Family history:** having close relatives with aortic disease increases risk
- **Genetic and connective tissue disorders:** conditions such as Marfan syndrome, Ehlers-Danlos syndrome, or a bicuspid aortic valve can make the aorta more fragile
- **High blood pressure:** persistent high pressure puts extra strain on the aortic wall
- **Medical conditions:** aortic conditions such as aneurysms have a higher risk of developing an aortic dissection
- **Pregnancy:** increased blood volume and pressure during pregnancy can add stress to the aorta for individuals with genetic risk
- **Strenuous physical activity:** heavy weightlifting or intense exertion can cause sudden spikes in blood pressure, which may trigger a tear
- **Trauma:** severe injuries can damage the aorta



Symptoms of an Aortic Dissection Require Immediate Medical Attention

- **Sudden severe, stabbing, or tearing pain in the chest, upper back pain, or abdomen**
- **Difficulty breathing**
- **A feeling of doom or anxiety**
- **Fainting or dizziness**
- **Pale skin**
- **Stroke-like symptoms such as weakness on one side of the body or trouble talking**
- **Sweating**
- **Vomiting**
- **A drop in blood pressure**
- **Rapid heart rate**

Call 911 or go to the nearest emergency room immediately if you experience:

- **Severe chest, back, or stomach pain**
- **Trouble breathing**
- **Fainting**
- **Any symptoms that feel life-threatening**

These can be signs of a rupture or dissection, which is a medical emergency.

Other Aortic Syndromes

At the Swedish Aortic Center, an experienced team specializes in both common and rare aortic conditions. Using advanced imaging technology and the latest treatment approaches, the team provides accurate diagnosis, timely intervention, and personalized long-term follow-up.

Acute Aortic Syndrome (AAS): a group of serious conditions that can cause sudden chest or back pain and require immediate medical attention. These include:

- **Penetrating aortic ulcers:** occur when atherosclerotic plaque wears down the inner lining of the aortic wall, creating an ulcer
- **Intramural hematomas:** develop when blood leaks into and collects within the inner layers of the aortic wall

Patients with AAS require urgent evaluation to stabilize their condition and prevent complications. Treatment may involve medication, surgery, or minimally invasive procedures. Ongoing follow-up and regular imaging are important to monitor aortic health and reduce the risk of future problems.

Congenital Aortic Conditions: structural abnormalities of the aorta that are present at birth and typically identified early in life. These include:

- **Kommerell's Diverticulum:** a small, bulging outpouch of the aorta
- **Double aortic arch:** a rare condition in which the aorta forms two arches
- **Aortic Coarctation:** a narrowing of the aorta that restricts blood flow. Treatment may include surgery or minimally invasive procedures, such as balloon angioplasty or stent placement, to improve circulation.

Although many congenital aortic conditions are diagnosed in childhood, some individuals may remain symptom-free and are not diagnosed until adulthood. The care team works closely with the patient to determine whether treatment or ongoing monitoring is the best approach.

Personalized care includes in-person or virtual appointments at the Cardiac Surgery Clinic at Cherry Hill or the Vascular Surgery Clinic at First Hill. Patients and their families are encouraged to take an active role in decision making, and share their goals, preferences, and priorities to help guide care and optimize quality of life.

Common Diagnostic Tests

A healthcare provider may recommend certain tests to help the care team better understand the patient's condition. The Swedish Aortic Center offers a range of services to support diagnosis and care.

Ultrasound-based Tests

Abdominal Ultrasound: a simple, painless test that uses sound waves (no radiation) to create pictures of the abdominal organs and blood vessels. It helps screen for conditions like an abdominal aortic aneurysm (AAA), evaluate blood flow, and monitor changes over time.

Carotid Artery Duplex Scan: a specialized ultrasound that checks the arteries in the neck that supply blood to the brain. It checks for narrowing or blockages that may increase stroke risk.

Echocardiogram (ECHO): an ultrasound of the heart that shows how the heart pumps and how well the valves are working.

Imaging

Computed Tomography (CTA): a CT scan focused on blood vessels. Contrast dye is given through an IV to make the blood vessels easier to see and identify problems, blockages, or aneurysms.

MRA (Magnetic Resonance Angiography): a type of MRI scan that looks at blood vessels without radiation. Sometimes contrast dye is used to make blood vessels easier to see.

Heart and Lung Tests

Electrocardiogram (ECG): a quick, painless test that records the heart's electrical activity using small stickers placed on the skin. It helps evaluate heart rhythm.

Pulmonary Function Tests (PFTs): measure how well the lungs work by checking how much and how quickly air is moved in and out of the lungs.

Sleep Study Test

Sleep Apnea Testing: an overnight study, usually done in a sleep lab, that checks for pauses in breathing during sleep. Untreated sleep apnea can lead to poor sleep, high blood pressure, and added strain on the heart and aorta. Treatment can improve both sleep and overall heart health.

Genetic Testing

Some inherited conditions can increase the risk of aortic disease. **Genetic testing** — performed with a quick, painless, inner cheek swab — can help guide personalized care.

Genetic test results can affect not only an individual's health, but also that of their family members. When an individual is found to have a genetic change linked to aortic disease, testing relatives can help determine whether others in the family may also be at risk for the same condition.

We offer genetic testing, and if positive, genetic counseling, and testing for family members at risk. To learn more, speak with your provider or call the Aortic Center at 206-386-6181.

Risk Factors

Aortic disease is often linked to common health conditions that can either increase the risk or make treatment more challenging. The good news? Many of these risks can be reduced with healthy lifestyle changes and medical care.

Modifiable Risk Factors (things that can change)

Atherosclerosis: plaque buildup narrows arteries and weakens blood vessel walls

High blood pressure (hypertension): ongoing pressure damages and weakens arteries

High cholesterol: too much “bad” cholesterol (LDL) contributes to plaque buildup inside the arteries which narrows and weakens their lining

Cigarette smoking: smoking damages blood vessels and greatly increases the risk of aneurysm growth and rupture. Chemicals in cigarette smoke cause inflammation and weaken artery walls, making them more likely to tear

Diabetes: high blood sugar stiffens and damages blood vessels over time. Regular screening and proper treatment of diabetes is essential to protect the arteries and overall health

Drugs and alcohol: heavy alcohol use and stimulants (eg: cocaine, amphetamines) raise blood pressure, weaken artery walls, and increase inflammation – putting extra strain on the aorta

Heavy weightlifting/straining: sudden spikes in blood pressure can stress a weakened aorta and increase risk of tear

Trauma and infections: serious injuries (eg: accidents or falls) and certain infections (syphilis) can weaken the aortic wall. Taking precautions to avoid injuries and treating infections promptly can help lower this risk

Non-modifiable Risk Factors (things that cannot change)

Age: risk increases with age, especially after 65

Bicuspid Aortic Valve: a valve with two flaps instead of three can increase the risk of aortic enlargement

Existing aortic disease: aneurysms increase the risk of dissection

Gender: men develop aneurysms more often, but women have a higher risk of rupture at smaller sizes

Genetic/connective tissue disorders: conditions such as Marfan, Ehlers-Danlos, and Loeys-Dietz can weaken the aorta

Family history: having a parent, sibling, or child with aortic disease

Pregnancy: increased blood volume and pressure can stress the aorta in those at risk

What Can Be Done?

Lifestyle Modifications

Cardiovascular Health: managing blood pressure and cholesterol through medication, healthy eating, regular exercise, and stress management helps protect the heart and aorta. Patients are encouraged to track their blood pressure and heart rate using the log provided in this booklet

Smoking: quitting smoking is one of the most important steps to reduce further damage and improve outcomes if an aneurysm is present. Swedish offers programs and support to help patients succeed

Drugs and alcohol: limiting alcohol and avoiding harmful substances can help protect blood vessels and reduce the risk of serious complications

Exercise: regular, moderate exercise is encouraged to support overall cardiovascular health. Activities such as walking, light cycling, or swimming are typically safe, while heavy lifting or high-intensity strain should be avoided, especially for those with an aneurysm. Patients should talk with their provider about what level of activity is safe for them.

Mental Health: an aneurysm diagnosis can cause anxiety, stress, or depression due to uncertainty and ongoing monitoring. Support options such as counseling, support groups, or stress management resources can help patients cope and improve quality of life. Patients are not alone - support is available.

Activity Guidance

Aerobic exercise: Light to moderate aerobic exercise is usually safe for people with an aortic aneurysm. This typically includes exercising 3-4 times a week for 30-45 minutes, while keeping blood pressure under control.

Exercise intensity should be increased gradually over time. Blood pressure should be checked during activity and should not rise above 160/100. It should return to normal levels after rest.

Blood pressure goals:
not above 160/100 during exercise
below 120/80 at rest

Weight lifting: Individuals with an aneurysm should avoid lifting with quick, sudden bursts of effort, as this can put extra strain on the body.

Movements should be slow and controlled, with steady breathing throughout.

Some individuals with weight training experience may be able to do more using proper technique and guidance. However, recommendations may vary depending on the individual's condition.

Activity should be personalized and discussed with a healthcare provider.

Lifting goal:
no more than 15-25 pounds

What's Next?

The Swedish Aortic Center team works closely with specialists across the Swedish Heart and Vascular Institute to monitor patients at risk for aneurysm-related complications. The team follows standardized surveillance protocols—before and after procedures, and for certain genetic conditions—to detect changes early and guide personalized treatment plans.

Clinical Surveillance

Once an aneurysm is diagnosed, regular imaging is needed to monitor its size and detect changes. For small, symptom-free aneurysms, regular follow-up visits are scheduled with a provider and may be done in-person or, at times, virtually.

Visits may occur more frequently if the aneurysm is growing quickly or if new symptoms develop.

During follow-up appointments, the care team will:

- Review the patient's medical history, family history, and current medications
- Review prior imaging results
- Perform a physical examination and order blood tests if needed
- Arrange additional imaging to better evaluate the aneurysm

Providers may also recommend medications and collaborate with other specialists within the Swedish Heart and Vascular Institute to help manage risk factors such as blood pressure, cholesterol, and smoking.

Genetic testing and counseling services are available if recommended by a healthcare professional.

Surgical Options

If surgery is needed, a highly experienced team of heart and vascular surgeons use the latest techniques—from traditional open surgery to minimally invasive procedures, such as stent grafting—to provide safe, effective, and personalized care.

Open Surgical Repair: involves an incision in the chest and/or the abdomen to access the aorta directly. The weakened section is removed and replaced with a synthetic graft to restore normal blood flow and prevent rupture.

Endovascular Aneurysm Repair (EVAR): a minimally invasive procedure performed through a small incision in the groin. A thin, flexible tube (catheter) is guided to the aneurysm, where a stent graft is placed to reinforce the aortic wall, seal off the aneurysm, and reduce the risk of rupture.

Hybrid Repair: combines open surgery and endovascular techniques. This approach is often used for complex aneurysms involving multiple areas of the aorta or when standard endovascular access is limited, allowing for a more customized treatment plan.

Redo aortic surgery: this may be needed when complications develop after a previous heart or aortic surgery. These may include valve re-replacement, repair of pseudoaneurysms, or treatment of progressive disease.

My Diagnostic Test Schedule

TEST NAME	DATE DONE	SCHEDULE	DATE DUE	DATE DONE	DATE DONE	DATE DONE	DATE DONE
Example: Ultrasound	January 2026 at Swedish Vascular Clinic	Every 3 months	April 2026 July 2026 Oct 2026 Jan 2027				
CT/CTA							
ECHO							
MRI/MRA							
Ultrasound							

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

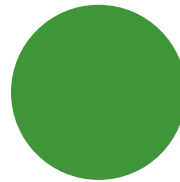
My Daily Heart Self-Care Log

My Blood Pressure Goal:

My Heart Rate Goal:

Instructions

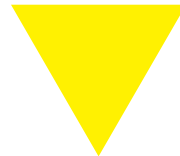
- Measure your blood pressure and heart rate daily in the morning about 30-60 minutes after taking your medications
- For best results, sit comfortably with both feet on the floor for at least five minutes before taking a measurement. Sit calmly and do not talk
- When taking your blood pressure, rest your arm on a table so the blood pressure cuff is at about the same height as your heart
- Record your blood pressure and heart rate on the opposite side of this sheet and show it to your health care professional at every visit
- Include any information about how you have been feeling or the activity you were doing prior to taking your blood pressure
- For more information, call the Swedish Aortic Center: 206-386-6181



GREAT! ALL IS WELL

Able to maintain daily activities

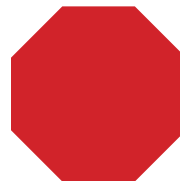
- ✓ No shortness of breath
- ✓ No chest, back or belly pain



CAUTION SIGNS! TIME TO ACT!

Call your doctor if you have:

- ✓ Coughing
- ✓ Shortness of breath
- ✓ Chest, back, or belly pain



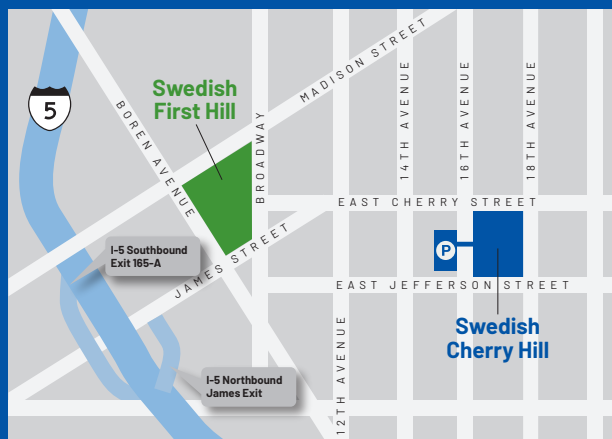
DANGER SIGNS!

Call 911 or your doctor immediately if you have:

- ✓ Unrelieved chest, back or belly pain
- ✓ Trouble breathing

My Daily Heart Self-Care Log

[illegible]



Swedish Vascular Surgery – First Hill

Heath Building

801 Broadway, Suite 500, Seattle, WA 98122

Swedish Cardiac Surgery – Cherry Hill

Jefferson Tower

1600 E. Jefferson St., Suite 110, Seattle, WA 98122



swedish.org/aorta