Heart Health Guide
Summa Cardiovascular Institute is the region’s premier name for matters of the heart.

- Behavioral health support for heart patients
- Heart rhythm services
- Invasive and interventional cardiovascular medicine
- Noninvasive cardiovascular medicine
- Cardiothoracic surgery
- Vascular surgery

The Summa Cardiovascular Institute (SCI) team provides northeast Ohio residents with comprehensive, high-quality heart care.

Why choose Summa for heart care?

Patients who choose Summa receive the benefits of an integrated healthcare delivery system with:

- The lowest median door-to-balloon (D2B) time in the region. The national time target for door-to-balloon time is 90 minutes. Door-to-balloon time is defined as time measured from the moment a heart attack patient enters a hospital until the blocked artery is opened either through stenting or angioplasty. The median D2B is 43 minutes at Summa Akron City Hospital and 64 minutes at Summa Barberton Hospital - both of which are well below the 90-minute national standard. Quickier treatment means less heart muscle is damaged – which translates to better outcomes for patients.

- Nationally recognized heart care for heart attack patients. In 2012, Summa Akron City Hospital was the first Ohio hospital to receive the American Heart Association’s Mission: Lifeline® Heart Attack Receiving Center Accreditation. Being named an accredited Heart Attack Receiving Center means Summa Akron City Hospital has the equipment and expertise to quickly and effectively treat heart attack patients. Working together as a team with emergency medical services (EMS) and hospitals who do not have percutaneous coronary intervention (PCI) capabilities, Summa saves lives.

- Chest Pain Center accreditation. Summa Akron City Hospital is an accredited Chest Pain Center (CPC). CPC accreditation improves patient outcomes by ensuring hospitals use the latest evidence-based best practices in cardiac care and creates a collaborative, team approach to cardiac care treatment where hospital and EMS personnel work together to improve patient outcomes.

- Access to innovative clinical research trials. Noted cardiovascular researcher Marc S. Penn, M.D., Ph.D., FACC, leads the research programs at both Summa Health System and Northeast Ohio Medical University (NEOMED), where he also leads the Skirball Laboratory for Cardiovascular Cellular Therapeutics. Much of Dr. Penn’s research focuses on bringing innovative therapies from “bench-to-bedside,” meaning patients benefit from new developments in stem cell research and other therapies.

- Access to the latest technology and surgical techniques, including minimally-invasive, robotic-assisted cardiovascular surgery, which allows cardiothoracic surgeons to safely perform delicate and complex procedures. Minimally invasive techniques provide benefits to patients, including: less post-operative pain, faster recovery times, less bleeding and less scarring.

- Access to behavioral health services as part of cardiac care programs. The medical community recognizes behavioral health interventions can improve the physical well-being of patients diagnosed with heart disease. That’s why SCI added a behavioral health component to its heart care programs to address depression and other issues that can impact the physical health of patients.

- Demonstrated high patient satisfaction as measured by Press Ganey survey results. Summa Akron City Hospital has been recognized for “High Achievement” based on its Press Ganey survey results. In 2012, Summa Akron City Hospital’s patient satisfaction scores for “Overall Assessment” of Cardiovascular Services were at the 90th percentile as compared to other hospitals across the nation. Summa Akron City Hospital and Summa Barberton Hospital have consistently achieved high scores in the cardiac care core measures as defined by the Centers for Medicare and Medicaid.

As a result of the Institute’s comprehensive services and integrated healthcare delivery system, patients can get the right care, at the right time, at the right location, from the right provider – no matter where they choose to access care within Summa Health System.

Nationally Recognized Heart Care – Right Where You Need It

(800) 237-8662   summahealth.org/heart
SCI: Commitment – Compassion – Community

Hearing you may have a heart condition can be unsettling news. Uncertainty, confusion and fear are just a few of the emotions you may experience. Whether you’re the patient or a concerned family member, reassurance and understanding are vital.

At Summa Cardiovascular Institute (SCI), we know what you’re going through and we’re here to help.

This guide is a resource for you and your family and is designed to help you understand more about cardiovascular treatments, terminology and the services SCI provides. From diagnosis to treatment, SCI provides comprehensive heart and vascular services throughout the communities we serve in northeast Ohio.

The Institute brings together a multidisciplinary team of heart and vascular experts who work together to bring high-quality, coordinated care to their patients. We provide world-class care through our integrated healthcare delivery system, which includes the following hospitals:

- Summa Akron City Hospital
- Summa Barberton Hospital
- Summa Rehab Hospital
- Summa St. Thomas Hospital

With patient outcomes and satisfaction scores exceeding national averages, SCI’s inpatient volume continues to rise. With almost 10,000 annual cardiovascular admissions, SCI provides access to some of the highest quality, patient-centered cardiovascular care in the northeast Ohio region.
Behavioral Health

Cardiovascular disease (CVD) is the leading cause of death and a major cause of disability in the United States, with an estimated six million people having heart disease. Studies have shown depression is associated with increased risk of disease and death in patients with cardiovascular disease. In patients with heart disease, the prevalence of major depression is nearly 20 percent, with 27 percent of patients having minor depression.

Within the past 20 years, the medical community has increasingly recognized that behavioral health interventions can improve the physical well-being of patients diagnosed with heart disease.

That’s why Summa Cardiovascular Institute (SCI) added a new component to its heart care programs to address depression and other issues that can impact the physical health of patients. Led by a clinical psychologist, SCI’s behavioral health program offers heart patients and their families:

- Assistance with lifestyle changes (smoking cessation, diet, exercise regimen adherence, etc.)
- Treatment for symptoms related to depression, anxiety, post-traumatic stress disorder (PTSD) and social support stress
- Treatment for fear and anxiety symptoms related to an implantable cardiac device (pacemaker or defibrillator)
- Advice for caregivers and family members on how to prevent stress-related conditions

Psychologists use a combination of cognitive behavioral therapy (CBT), relaxation and mindfulness techniques to help patients learn how to cope with these and other issues. Mindfulness techniques encourage people to stay in the moment and avoid making judgments about what they are feeling or experiencing.

The program’s goals are to:
- Increase patient compliance with treatment regimens
- Lower stress levels for patients, caregivers and family members
- Improve patient outcomes

Patients may wish to include spouses or family members in treatment sessions. Caregivers also may opt to participate in individual or group sessions about how to manage the stresses involved with caring for a loved one with a chronic illness.

Invasive Cardiovascular Medicine

Cardiologists use advanced imaging equipment to look for possible blockages in coronary arteries (the arteries that supply blood to the heart) through the use of cardiac catheterization. Physicians also use catheterization techniques to examine other arteries in the body, such as in the arms, legs and neck.

These procedures require small, thin, flexible plastic tubes (catheters) to be inserted into the blood vessels and carefully threaded through arteries to assess them for blockages. By assessing coronary (heart) or peripheral arteries (in the neck, arms or legs), doctors can develop a treatment plan for the blocked blood vessels.

Cardiac Catheterization

This procedure is performed in a hospital. The goal is to get pictures of your heart muscle and arteries. You are given a sedative medication to help you relax. During the procedure, a catheter is inserted into a blood vessel in your groin or arm, where it is carefully guided through the vessel until it reaches your coronary arteries. Using a special X-ray machine to guide the movements of the catheter, your doctor advances the catheter into the arteries of the heart. X-ray dye is passed through the catheter into your arteries so your cardiologist can see how blood is flowing through your heart. Images of the dye flowing through the heart’s chambers, valves and vessels are displayed on a screen during the short procedure.

Angioplasty

An angioplasty is a procedure used to open narrowed coronary arteries and improve blood flow to the heart. It can either be performed during a diagnostic catheterization after a blockage has been found—or it may be scheduled after a catheterization has confirmed the diagnosis of significant coronary artery disease. During an angioplasty, a small

DID YOU KNOW?

Since 1984, more women than men have been diagnosed with heart disease. Women may experience different physical signs and symptoms of a heart attack than men. For example, symptoms like indigestion or gas-like pain, dizziness, nausea, weakness and fatigue, pain between the shoulder blades and a sense of anxiety are all more common signs of a heart attack in women. Symptoms may vary greatly from person to person. Not everyone has the classic “Hollywood heart attack” symptoms. If you suspect you or someone you know may be having a heart attack, don’t wait for the symptoms to go away—seek medical attention as soon as possible!

Different camera angles are used to get a complete picture of your coronary arteries. This diagnostic procedure normally lasts about 30 minutes. When the procedure is completed, the catheter is removed.

When it comes to a heart attack, “Time is Muscle.”

That’s why the national time target for door-to-balloon time is 90 minutes. Door-to-balloon time is defined as time measured from the moment a heart attack patient enters a hospital until the blocked artery is opened either through stenting or angioplasty.

Summa Akron City Hospital’s median door-to-balloon (D2B) time is 43 minutes and Summa Barberton Hospital’s median D2B time is 64 minutes—both of which are well below the 90-minute national standard.

Quicker treatment means less heart muscle is damaged. With a better functioning heart muscle, patients are better able to be active so they can return to work and to activities that they enjoy. Summa’s outstanding heart attack treatment team means world-class care is available—right in your own community.

(800) 237-8662 SUMMAHEALTH.ORG/HEART

2 Czajkowski, Ph.D, Corresponding Author, Effects of treating depression and low perceived social support on clinical events after myocardial infarction: The enhancing recovery in coronary heart disease patients (ENRICHD) randomized trial. JAMA, June 18, 2003, 289:23.
3 Ibid.
balloon-tipped catheter is inserted near the blocked area of the coronary artery. The balloon is inflated and deflated several times, which presses the fatty plaque deposit against the artery walls and dilates the vessel, allowing the blood to flow more easily through the heart. Almost all angioplasty procedures are followed by the implantation of a small, metal mesh tube called a stent, which aids in keeping the artery open. Once the procedure is completed, the catheter and balloon are removed.

Stenting

Once an angioplasty is completed, a small, metal mesh tube (stent) is mounted on a balloon-tipped catheter and is then inserted into the body and carefully guided to a blocked portion of the heart. Unless the blockage is eliminated quickly, the patient’s health and life are at serious risk. Percutaneous coronary intervention (PCI) is a mechanical means of treating heart attack patients by eliminating blockages in coronary veins and arteries. Although PCI is the preferred means of treating STEMI patients, only 25 percent of hospitals in the United States are equipped to do so, according to the American Heart Association. PCI-capable hospitals are called STEMI-receiving hospitals because they are well-equipped to receive and treat STEMI patients.

Being named an accredited Heart Attack Receiving Center means Summa Akron City Hospital has the equipment and expertise to quickly and effectively treat heart attack patients. Working together as a team with emergency medical services (EMS) and non-PCI hospitals, Summa saves lives.

CPC ACCREDITATION: BETTER OUTCOMES FOR PATIENTS
Summa Akron City Hospital is an accredited Chest Pain Center (CPC). CPC accreditation is important because it helps Summa:

- Improve patient outcomes by using the latest evidence-based best practices in cardiac care
- Create a team approach to cardiac care treatment with the most efficient use of resources
- Reinforce our commitment to high standards within our facility and within our community
- Make clinical decisions based on metrics (measures of quality)

1ST OHIO AHA-ACCREDITED HEART ATTACK RECEIVING CENTER

In 2012, Summa Akron City Hospital was the first Ohio hospital to receive the American Heart Association’s Mission: Lifeline® Heart Attack Receiving Center Accreditation.

Each year, hundreds of thousands of Americans have a type of heart attack known as ST-elevation myocardial infarction (STEMI), in which blood flow is completely blocked to a portion of the heart. Unless the blockage is eliminated quickly, the patient’s health and life are at serious risk. Percutaneous coronary intervention (PCI) is a mechanical means of treating heart attack patients by eliminating blockages in coronary veins and arteries. Although PCI is the preferred means of treating STEMI patients, only 25 percent of hospitals in the United States are equipped to do so, according to the American Heart Association. PCI-capable hospitals are called STEMI-receiving hospitals because they are well-equipped to receive and treat STEMI patients.

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Noninvasive Cardiovascular Medicine

Noninvasive cardiovascular medicine uses a variety of tests to record an image of the heart and see how the heart is functioning during both contraction and relaxation. These tests do not require catheters, tubes or needles to be inserted into the body. Instead, a combination of electronic sensors, pulse transducers, sonar devices, microphones and radioactive tracers are used to provide information to the cardiologist about how a patient’s heart is functioning.

The information derived from noninvasive tests can provide valuable information to your physician, including:
- Early discovery of heart disease before a patient has a cardiac event
- Detection of complications before symptoms appear
- Identification of patients who are at risk for a future heart attack
- Determination of the most effective dosage of drugs used in treatment
- Monitoring a patient’s progress during treatment
- Detect/treat possible complications before they become serious

Stress Testing

During a stress test, sticky pads and wires (electrodes) are attached to your arms, legs and chest so a machine can record your heart’s electrical activity. The pads are connected to a computer that measures the electrical impulses that cause your heart to beat and records it in a graphical form which is reviewed by your heart doctor (cardiologist). A resting electrocardiogram (ECG) is performed while you are sitting or lying down. A stress ECG is performed while you are walking on a treadmill. This test tells your physician how your heart is responding to stress and/or exercise.

Sometimes stress testing is ordered with nuclear imaging or echo imaging.

Patients with coronary artery blockages may have minimal or no symptoms during rest, but symptoms may be present when the patient exercises. During exercise, healthy coronary arteries dilate (open up) more than an artery with a blockage. This unequal dilation causes more blood to be delivered to the portion of the heart muscle supplied by the normal artery. In contrast, narrowed arteries supply less blood to that area of the heart. This reduced flow causes the heart muscle to “starve” during exercise. The “starvation” may produce symptoms (like chest discomfort or shortness of breath), ECG abnormalities and reduced movement of the heart muscle. Your cardiologist can detect this by examining the movement of the walls of the left ventricle (the major pumping chamber of the heart) during a stress test performed in conjunction with echo imaging (echocardiography).

A nuclear stress test measures the blood flow to your heart muscle while you are at rest and when the heart is stressed by exercise or medication administered through an IV (intravenous) line in your arm. Then a small amount of an inert tracer material is injected into your body. Areas of the heart receiving an adequate blood flow will absorb more of the tracer than the areas of the heart that are not receiving an adequate blood supply. By using special imaging equipment, your doctor can see which areas of the heart are not receiving enough blood flow due to a blockage.

Echocardiogram

An echocardiogram uses ultrasound (high-frequency sound waves) to evaluate the condition of your heart. A hand-held device is placed on your chest while a technician moves the device over your chest so images and sounds are produced. You might even be able to hear and see your heart on the monitor while the test is in progress. Your physician reads the results of the test to determine if there are any abnormalities of the heart muscle or valves.
Heart Rhythm Services

Heart rhythm services investigate the electrical issues within the heart, including abnormally slow, fast or irregular heartbeats. Treatments may include implanting permanent pacemakers or implantable cardiac defibrillators (ICDs), cardioversion and/or cardiac ablation.

DID YOU KNOW?
Peripheral Artery Disease (PAD) screening at SCI is designed to help with early detection and treatment of what is often called "the silent killer." PAD affects over 12 million Americans, many of whom do not know or recognize the symptoms when they occur. The narrowing of the blood vessels in the legs is caused by the buildup of fatty plaque. It is a strong predictor (marker) for heart disease. PAD may appear in leg arteries before there are any signs or symptoms. Patients diagnosed with PAD face an increased risk of stroke and heart disease. To make an appointment for a PAD screening, call (800) 237-8662.

Arterial Duplex Scan
An arterial duplex scan is a painless exam that uses high-frequency sound waves (ultrasound) to capture internal images of the major arteries in the arms, legs and neck. A special jelly-like substance is applied to the skin over the area being examined before a wand-like device (called a transducer) is passed lightly over the skin above the artery. Internal images of the artery are shown on a screen and are recorded by the technician as a video and/or printed as an image (picture). These images are examined later by your doctor.

Pulse Volume Recording (PVR)
Pulse volume recording (PVR) is part of a simple, painless, noninvasive test that measures blood flow within the blood vessels (arteries) in the legs or arms. If a PVR suggests that a patient has a blockage in one or more arteries, the physician may order additional tests to confirm a diagnosis of peripheral artery disease (PAD) and design an appropriate treatment plan.

Noninvasive Vascular Imaging

Noninvasive vascular testing consists of imaging technologies such as ultrasound and Doppler imaging to diagnose circulation problems in the arms, legs, arteries of the neck and in the abdomen that indicate a blockage caused by plaque or a blood clot.

Electrophysiology Testing
Electrophysiology studies help physicians pinpoint the location and type of heart rhythm disturbance present by showing how electrical impulses move through the heart.

ICAVL Accreditation: Quality patients can count on
The vascular testing labs at Summa Akron City and St. Thomas Hospitals, Summa Barberton Hospital and Robinson Memorial Hospital, an affiliate of Summa Health System, are accredited by the Intersocietal Commission of the Accreditation of Vascular Laboratories (ICAVL). All technologists are registered vascular technologists (RVTs) which demonstrates Summa Health System’s commitment to the performance of quality vascular testing through adherence to nationally recognized standards. Accreditation is granted only to those facilities which provide quality patient care in compliance with ICAVL Standards.

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Cardioversion
Cardioversion is a brief procedure where an electrical shock is delivered to the heart to convert an abnormal heart rhythm to a normal rhythm. Most elective (non-emergency) cardioversions are performed to treat atrial fibrillation or atrial flutter, which are heart rhythm disturbances originating in the upper chambers (atria) of the heart.

Ablation
Cardiac ablation is a procedure used to correct heart rhythm disorders where a specialized catheter (a long, flexible plastic tube) containing a wire and electrode is inserted into a vein in the groin and is carefully threaded through blood vessels and into the heart. Once in the heart, it emits heat/cold to scar or destroy the tissue responsible for causing the abnormal heart rhythm.

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Ablation is used to treat many heart rhythm disturbances, including:
- Atrial fibrillation (AF)
- Atrial flutter
- Atroventricular nodal reentrant tachycardia (AVNRT)
- Wolff-Parkinson-White syndrome
- Atrial tachycardia
- Ventricular tachycardia

Summa heart rhythm specialists (electrophysiologists) have extensive expertise in cardiac ablation and conduct the procedure using the most advanced technologies.

Atrial Fibrillation Program
Atrial fibrillation (AF) is a heart rhythm disorder characterized by disorganized, erratic electrical firing in the upper chambers of the heart (atria) causing quivering (fibrillation). When some of the disordered and rapid electrical signals reach the bottom chambers (ventricles) of the heart, the atria and ventricles do not work together to pump blood efficiently, which results in a rapid, irregular heartbeat. In fact, a patient’s heart rate can be as fast as 200 beats per minute. As a result, AF can severely impact a person’s quality of life, causing heart palpitations, shortness of breath, fatigue and/or pain.

Depending on other risk factors, AF also may increase a person’s risk for stroke. During the chaotic heart rhythm AF produces, blood may pool in the heart’s upper chambers (atria) and form clots. If a blood clot forms, it could dislodge from the heart and travel to the brain and result in a stroke.

Treatment focuses on reducing the risk of stroke and trying to eliminate symptoms associated with AF. Cardiologists typically first treat with noninvasive methods such as medication and cardioversion. However, if medication cannot effectively prevent AF, then ablation is a highly effective treatment strategy.

AF is a serious health issue and is estimated to be responsible for 88,000 deaths and $16 billion in healthcare costs in the U.S. Currently, AF affects about 2.5 million Americans, but as America’s population ages, that number is expected to increase to 5.6 million adults over the next 40 years. The risk of developing AF increases with age.

To meet this growing need, Summa Health System offers patients a comprehensive atrial fibrillation program staffed by specially trained electrophysiologists who can effectively treat and manage this condition.

Individualized Care
Atrial fibrillation can develop in an individual for a variety of reasons and may affect patients differently. Summa’s atrial fibrillation program is tailored to recognize and meet the individual needs of each patient through the use of a multidisciplinary team approach whose goal is to develop a personalized treatment strategy to effectively manage this condition.

Risk factors for the development of atrial fibrillation include:
- Age – The risk of developing AF increases with age.
- Heart disease – People with heart disease, including heart valve conditions, heart attack and heart surgery, have an increased risk of AF.
- High blood pressure – Having high blood pressure increases AF risk. The risk is even higher if blood pressure is not well-controlled through lifestyle changes (diet, exercise) or medication.
- Thyroid disease – Having thyroid disease increases risk for developing AF.
- Sleep apnea
- Alcohol use
- Family history of AF

Treatments and Procedures
Initial treatment for many patients includes medication to prevent strokes and reduce symptoms. Treatment also may include an electrophysiology study and a catheter ablation known as a pulmonary vein isolation (PVI) procedure.

PVI is a cardiac ablation where catheters are inserted through the veins in the groin and are advanced to the heart in order to electrically isolate the pulmonary veins from the rest of the heart.

About 95 percent of AF is triggered by cells and muscle fibers found in the pulmonary veins (PV). Isolating the PVs can greatly reduce the triggers responsible for causing AF and can eliminate or significantly reduce the symptoms associated with this condition.

Summa electrophysiologists perform the PVI procedure using advanced technologies, including:
- 3D electroanatomic mapping systems to pinpoint the areas of the heart causing AF
- Intracardiac echocardiography
- High resolution fluoroscopy
- Ablative strategies using either radiofrequency (heat) or cryoablation (cold) energy sources

Summa also offers the MAZE procedure, an open heart surgical procedure, for patients with valvular or ischemic heart disease and/or longstanding persistent atrial fibrillation.

Pacemakers
A pacemaker is a small, battery-powered device used to regulate the heart beat in cases where a patient’s heart beats too slowly (bradycardia). A pacemaker weighs only an ounce and is about the size of a large wrist watch. Pacemakers have two parts: the leads and a pulse generator.

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The leads are wires that are carefully threaded through the veins into the heart and touch the heart muscle. The pulse generator is implanted into the body just below the collarbone. When the pacemaker senses that the heart is beating too slowly, it delivers an electrical impulse to the heart muscle, causing it to contract—and the heart to beat faster.

Getting a pacemaker does not require open-heart surgery because the device is implanted in a small pocket made by the physician in the skin under the collarbone. Once implanted, routine monitoring and follow-up care are necessary to ensure the device continues to function properly.

Implantable Cardiac Defibrillator (ICD)

An implantable cardiac defibrillator (ICD) is a small, battery-powered device that can detect when a patient’s heart is beating dangerously fast and deliver a life-saving electrical shock to return the too rapid heart rate to a normal rhythm.

ICD devices are the size of a business card and are implanted under the skin just below the collarbone. Like pacemakers, ICDs contain a pulse generator which has a computer, battery and lead wires. The leads are in contact with the heart muscle on one end, while the other end is connected to the pulse generator.

ICDs are pre-programmed to send electrical signals to the heart. ICDs also can “communicate” with a special device which provides information about the patient’s heart rhythms and the overall condition of the ICD device. As with pacemakers, routine monitoring and follow-up care are necessary with an ICD to ensure the device continues to function properly.

Today, all ICDs also act as pacemakers and can prevent too slow heart rhythms by delivering pacing signals to the heart muscle. While pacing signals from the ICD are not felt by the patient, the life-saving shock signal delivered by an ICD is noticeable and has been described by patients as a “kick in the chest.”

Subcutaneous Implantable Cardiac Defibrillator (S-ICD)

A new technology, called a subcutaneous implantable cardiac defibrillator (S-ICD), provides life-saving intervention to patients without touching the patient’s heart. Unlike a regular ICD, there are no wires attached to the heart and the technique used to implant the device is also less invasive.

The device has obvious benefits for patients, including: increased lifestyle flexibility and a less complex surgery requiring a smaller incision to implant it.

The device is ideal for patients who are young and active, have congenital heart conditions or who are at risk for dislodging the wires of a traditional implantable defibrillator.

The S-ICD pulse generator is smaller than a roll of tape and is implanted under the skin and outside the rib cage at the patient’s left side. A small electrode is also implanted beneath the skin in the patient’s chest, running from the S-ICD to the center of the patient’s chest and up about five inches. No wires are threaded into the heart, and the device, being just under the skin, does not touch the heart muscle. The S-ICD also eliminates the need for follow-up surgery to replace or repair wires leading to the heart.

If the patient’s heart were to stop or experience a dangerous rhythm, the device would deliver an electrical signal to the heart with the goal of restoring the patient’s heart to normal rhythm and saving his/her life.

Summa Health System physicians implanted the first S-ICD in Ohio used outside of a clinical trial.

The new S-ICD manufactured by Boston Scientific gained FDA approval in 2012.

Pacemaker and Defibrillator Lead Extraction

Surgically implanted cardiac devices play an important role in the treatment of heart disease. Approximately 400,000 devices are implanted in patients each year in the United States, with more than three million patients implanted with these devices currently.4

One part of the device system is the pulse generator, a metal container which surrounds electrical circuits and a battery, which is usually placed under the skin on the chest wall beneath the patient’s collarbone. The device’s wires (or leads) run between the pulse generator and the heart. In a pacemaker, the leads allow the device to increase the patient’s heart rate by delivering small bursts of electrical energy to make the heart beat faster. In a defibrillator, the lead has special coils which deliver a high-energy shock to convert a dangerous heart rhythm (such as ventricular tachycardia or fibrillation) back to a normal heart rhythm.

In order to work correctly, the leads from a traditional cardiac device must be in contact with heart tissue. Most leads pass through a vein under the collarbone and into the right side of the heart (right atrium and right ventricle). To hold the lead in place inside of the heart, most leads have either a small screw or hooks at the end. Within a few months of implantation, the body forms scar tissue along the lead and at its tip, which helps keep it securely in place inside the patient’s body.

Leads usually last longer than device batteries, so existing leads can often be reconnected to each new pulse generator (battery) at the time of the replacement.

Although implantable cardiac devices are designed to be permanently implanted in the body, occasionally it is necessary to remove (extract) the leads. The most common reasons for lead extraction include: infection, a broken lead or a lead which is not functioning properly or (rarely) a mechanical lead failure which could prove dangerous to the patient, such as a protruding wire.

Sometimes a lead can be left inside the body, with a new lead implanted alongside it. However, veins can only contain a limited number of leads due to space constraints. As a result, sometimes nonfunctioning leads must be extracted in order to make space for a new lead.

Leads run a long course through the veins and into the heart. The scar tissue which forms along the leads can create strong attachments to the wall of a blood vessel or a chamber within the heart. Freeing a lead from these attachments requires considerable skill, training and experience on the part of the physician performing the lead extraction.

Leads can be extracted from the shoulder or the leg.

Typically, lead extraction procedures are performed with patients under general anesthesia. A team of medical professionals, including a cardiologist or cardiac surgeon, an anesthesiologist, nurses and technicians are required to perform this procedure.

Lead extractions usually take between two and six hours and patients are usually admitted to the hospital for a minimum of an overnight stay.

In the large published studies on lead extraction, the rate of major complications was 1.6 percent to 2 percent, or approximately 1 in 50 patients.5

Device Clinic

Summa’s Device Clinic is a collaborative effort of a team of heart rhythm specialists who care for patients with implantable cardiac devices. Team members include: electrophysiologists, cardiac advanced practice nurses, RNs and technologists who all work together as members of the Institute.

An electrophysiologist is a cardiologist with special training in how to evaluate and manage the care of patients before/after the implantation of a cardiac device (pacemaker, ICD, S-ICD, loop recorder) and during cardiac resynchronization therapy.

An electrophysiologist evaluates each patient to determine which device would most effectively treat the patient’s condition. Cardiac resynchronization therapy devices may be implanted for some heart failure patients.

Patients may receive follow-up care either during a visit to the clinic or via telephone monitoring from their home.

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Cardiothoracic and Vascular Surgery

Summa’s board-certified vascular surgeons repair and redirect diseased blood vessels. Our surgical team is expertly skilled in minimally invasive (endovascular) surgical techniques as well as traditional surgical techniques for conditions that are not treatable using less invasive strategies.

Some of these techniques include: angioplasty, stenting, endovascular stent grafting and atherectomy. Endovascular stent grafting is a minimally invasive surgical technique where a stent graft is placed inside an aneurysm without opening the tissue surrounding it. A stent graft is a fabric tube supported by a metal framework. Atherectomy is a minimally invasive surgical technique used to remove plaque from arteries.

One-stop post-op care for Barberton heart surgery patients
At Summa Barberton Hospital, patients have the advantage of “one-stop post-operative care,” meaning they go straight from surgery to the cardiac unit (no stop in a separate recovery room) where they remain for their entire hospital stay. This allows seamless coordinated care for cardiac patients and permits our staff to provide personal, one-to-one care and respond to the individual needs of the patient and his/her loved ones. Well received by patients and staff at Summa Barberton Hospital, one-stop post-op care for heart surgery patients will soon be the standard of care at Summa Akron City Hospital as well.

Advanced technology
SCI embraces the latest technology and was the first in the region to incorporate minimally invasive, robotic-assisted cardiac surgery.

With 3-D visualization of the surgical area, the surgeon is able to see millimeter-sized veins appear as large as pencils. For patients, this surgical option can mean less invasive procedures, a shorter hospital stay, fewer complications, decreased post-operative pain and a speedier recovery.

Coronary Artery Bypass Graft (CABG)
Coronary artery bypass grafts (CABG) deliver a new source of blood to regions of the heart served by blocked arteries. Surgeons use segments of the patient’s own veins or arteries to go around (or bypass) these blockages. A new, less invasive procedure used by SCI cardiothoracic surgeons (the off-pump method) eliminates the need for the surgeon to stop the heart and place the patient on bypass. Instead, the surgeon operates directly on the beating heart, reducing the risks associated with the on-pump procedure. Selection of an on- vs. off-pump procedure partly depends on the health of the individual patient.

Mitral Valve Repair
One of four valves in the human heart, the mitral valve connects the heart’s upper left chamber (atrium) to the lower chamber (ventricle). Sometimes the mitral valve does not close tightly and allows blood to flow back toward the lungs (mitral regurgitation). The causes of mitral valve regurgitation usually stem from damage to the valve structure from age-related changes, coronary artery disease or a congenital defect (an abnormality present from birth). If left untreated, the valve will become more damaged and can lead to other complications such as heart failure. In many cases, patients with this condition can be treated with medication – while others may require surgical intervention, often with Summa’s minimally invasive techniques.
Heart Failure Program

An estimated 5.8 million Americans are living with heart failure (HF) right now – and about 675,000 new cases are being diagnosed each year. As the U.S. population ages, these numbers are expected to increase.6

There is no cure for heart failure – but there are ways that you (and your doctor) can control your symptoms and improve your quality of life.

Recent studies show that patients who participate in a structured heart failure program have fewer complications and hospitalizations than patients who don’t opt to participate in a program. Learning how you can work with your doctor to manage your heart failure can make a big difference in your health.

That’s one reason why Summa Cardiovascular Institute (SCI) offers a heart failure program designed to improve your health by partnering with your primary care physician to offer extra support and ongoing monitoring of your heart failure status.

SCI’s heart failure program is designed to:
- Assist you (and your family) in becoming active partners in your treatment by educating you on how to manage your heart failure
- Improve your quality of life and life expectancy
- Help you understand the importance of following your treatment plan, including medications, dietary restrictions, weight monitoring, physical activity and keeping follow-up appointments
- Increase your awareness and understanding of the symptoms of worsening heart failure – and help you know when and how to seek medical help – before a situation turns critical
- Reduce your emergency room visits and hospital admissions

Family members are encouraged to accompany you on visits to the SCI heart failure program so they, too, can learn about your condition and how they can help you stick to your treatment plan.

After you have visited the SCI heart failure program, information about your care will be shared with your primary care physician.

If you have been diagnosed with heart failure, talk to your doctor about getting a referral to see one of the cardiologists at the SCI heart failure program, with two convenient locations at Summa Akron City Hospital (Summit County) and Robinson Memorial Hospital, an affiliate of Summa Health System, in Ravenna (Portage County).

Summa Anticoagulation Management Service (SAMS)

Anticoagulant therapy is a necessary step to prevent heart attack, stroke and other conditions. Although it does involve some risk, there are ways that anticoagulant therapy patients (and their physicians) can improve patients’ outcomes, minimize risk and improve their quality of life.

In recent studies, it has been shown that patients who participate in a structured anticoagulant therapy program have fewer bleeding and clotting complications and hospitalizations.

That’s why Summa Cardiovascular Institute (SCI) and Summa Pharmacy Services are partnering together to offer an anticoagulant management program known as the Summa Anticoagulation Management Service (SAMS). This clinic is designed to improve patient outcomes by partnering with your primary care physician to offer patients additional support and assistance during their course of anticoagulant therapy.

The SAMS clinic team meets these treatment goals by providing to patients (and their families):
- Provide comprehensive patient education about anticoagulant therapy
- Improve patients’ quality of life
- Improve patient adherence to treatment regimens, including medications, dietary restrictions and keeping follow-up appointments
- Increase patient awareness of the signs of a potential problem – and know when to seek help
- Reduce emergency room visits and hospital readmissions as a result of bleeding or clotting complications

The SAMS clinic team meets these treatment goals by providing to patients (and their families):
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- Provide comprehensive patient education about anticoagulant therapy
- Improve patients’ quality of life
- Improve patient adherence to treatment regimens, including medications, dietary restrictions and keeping follow-up appointments
- Increase patient awareness of the signs of a potential problem – and know when to seek help
- Reduce emergency room visits and hospital readmissions as a result of bleeding or clotting complications

The SAMS team understands that a key element of teamwork is effective communication.

That’s why the team is committed to providing timely updates to referring physicians at scheduled intervals throughout a patient’s course of treatment. Updates can include information about:
- The patient’s medical status
- The need for any medication adjustments
- Labs/diagnostic test/screening results
- Proposed treatment plan

After a patient has been enrolled in the program, information about their medical status will be shared with the referring physician at regular intervals.

If you have been prescribed an anticoagulation medication (such as Coumadin/Warfarin), talk to your doctor about getting a referral to the SAMS Clinic located at Summa Akron City Hospital.
Rehabilitation, Research and Education

Phase I Cardiac Rehabilitation – In the hospital
The Phase I Cardiac Rehabilitation program at Summa provides immediate assistance to the hospitalized heart patient who is recovering after a surgical or medical procedure. Many important activities are started by the Phase I staff to ensure a rapid recovery and return home. These activities include breathing exercises and progressive walking exercises, as well as learning about diet and medications. It is important for family members to take part in many of these initial Phase I Cardiac Rehabilitation activities to help ensure that the patient will continue these important activities after returning home.

Phase II Cardiac Rehabilitation – During recovery at home
The Phase II/Outpatient Cardiac Rehabilitation program begins with a physician’s referral into the program. After communicating with the cardiac rehabilitation staff, the patient’s doctor recommends a starting date for the patient to begin the Phase II program. This phase of cardiac rehabilitation is crucial because it helps the patient complete the process of recuperation that started at the hospital. Phase II also provides an opportunity to develop a personal heart disease prevention program with the help of the cardiac rehabilitation staff.

Phase III and IV Cardiac Rehabilitation – A lifelong commitment to exercise
Phase III and IV cardiac rehabilitation are combined at the Institute into a single program which encourages patients to make a lifelong commitment to regular exercise. It is initiated after completion of a Cardiac Rehabilitation Phase II program. It emphasizes exercise maintenance and continued cardiovascular fitness as well as the modification of risk factors for heart disease. All participants engage in a combination of cardiovascular and resistance training. Each participant’s exercise prescription is based on his/her individual diagnosis and current medical status. Being diagnosed with heart disease or having a cardiac event can be a concern not only to patients, but also to their families. We encourage family members to participate in the exercise sessions as well as free educational classes which promote cardiovascular health.

For information and registration, call (800) 237-8662.

Clinical Research and Education
Summa Health System is involved in multiple research projects to advance our knowledge on how to treat cardiovascular disease. Patients have the option of participating in clinical trial studies to evaluate new medical devices and prescription drugs.

We are also committed to the training and education of tomorrow’s doctors today. Summa Health System is actively involved in training resident physicians in our hospitals. We collaborate with faculty and graduate students at the University of Akron, Kent State University and the Northeastern Ohio Medical University (NEOMED).

To learn more about some of the research and education opportunities available at Summa Health System, please visit us on the web at: summahealth.org/research.

Support Groups and Education

AKRON
Mended Hearts
Mended Hearts is dedicated to “inspiring hope and improving the quality of life for heart patients and their families through ongoing peer-to-peer support.” Mended Hearts is a national and community-based non-profit organization which provides support for heart patients and their families through hospital visits conducted by Mended Hearts volunteers at Summa Akron City Hospital. Volunteers also provide ongoing support via online and phone visits.

BARBERTON
Caring Hearts Support Group
Caring Hearts is a free support group for heart failure (HF) patients and their families held at Summa Barberton Hospital.

Healthy Heart Lectures
The Healthy Heart Lecture series is a free program featuring area physicians and Summa Barberton Hospital clinical staff as speakers on cardiac issues.

Call (800) 237-8662 for more information.
# Heart Care Services

**Summa Cardiovascular Institute**

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**Hospital Services By Location**

- **Summa Akron City Hospital**
  - Cardiovascular Testing
  - Cardiac Catheterization Lab
  - Cardiology Diagnostic Test Scheduling
  - Cardiology Services, Holter Monitors, Event Recorders

- **Summa Barberton Hospital**
  - Cardiac Catheterization Lab
  - Cardiovascular and Pulmonary Rehabilitation
  - Cardiac Services, Holter Monitors, Event Recorders
  - Other Cardiac Testing
  - Stress Lab

- **Summa Wadsworth-Rittman Hospital**
  - Cardiac Testing/Holter Monitoring
  - Echocardiography
  - Cardiac Scheduling

- **Summa Western Reserve Hospital**
  - Cardiovascular Testing
  - Cardiovascular and Pulmonary Rehabilitation
  - Cardiology Services, Holter Monitors, Event Recorders
  - Cardiology Diagnostic Test Scheduling

- **Summa Phase III Cardiovascular Rehabilitation**
  - Summa Health Center at Anna Dean (Phase III), 28 Conservatory Drive, Barberton, OH 44203

**Heart Failure Clinic**

- **Cardiovascular and Pulmonary Rehabilitation**
- **Healthy Hearts Educational Lecture Series**
- **Support Groups**
  - Caring Hearts (CHF)
  - Healthy Heart
  - Mended Hearts
  - Respiratory Forum (COPD)
- **Stress Lab**

**Cardiosurgical Surgery**

- **Coronary Artery Bypass Graft**
- **Valve Surgery**
  - Aortic Replacement
  - Mitral Repair
  - Mitral Replacement

**Heart Rhythm Services (Electrophysiology)**

- **Ablation**
- **Electrophysiology Studies**
- **Implantable Cardiac Defibrillator (ICD)**
- **Subcutaneous Implantable Cardiac Defibrillator (S-ICD)**
- **Loop Recorder Implants**
- **Pacemaker Implantation**

**Invasive Cardiovascular Medicine**

- **Diagnostic Cardiac Catheterization**
- **Percutaneous Coronary Intervention (PCI)**

**Noninvasive Cardiac Medicine**

- **Cardioversion**
- **Device Clinic**
- **Renal Ultrasound**
- **AV Optimization**
- **ICD Evaluation**
- **Pacemaker Evaluation**
- **Echocardiogram**
  - 3-D Transesophageal Echo (TEE)
  - Transesophageal Echo (TEE)
  - Transesophageal Echo (TEE)

**Vascular Services**

- **Peripheral Angiography**
  - Carotid
  - Cerebral
- **Lower Extremity**
- **Renal**
- **Upper Extremity**

**Peripheral Interventional**

- Balloon Angioplasty
- Sterling
- Carotid Stenting
- Atherectomy
- Embolization
- IV Filter Placement

**Noninvasive Vascular Imaging**

- Arterial Ultrasound
- Carotid Ultrasound
- Meso-aortic Ultrasound
- Renal Ultrasound
- Venous Ultrasound
- AV Fistula Ultrasound

**Device Clinic**

- Cardiac Catheterization Lab
- Cardiology Diagnostic Test Scheduling
- Cardiology Services (Echo, noninvasive vascular, device clinic, stress testing)
- Cardiovascular & Pulmonary Rehabilitation
- Heart Failure Clinic

For more information, visit [summahealth.org/heart](http://summahealth.org/heart) or call (800) 237-8662.
Hospitals

- Summa Akron City Hospital
- Summa Barberton Hospital
- Summa St. Thomas Hospital
- Summa Wadsworth-Rittman Hospital
- Summa Western Reserve Hospital
- Robinson Memorial Hospital
Summa Cardiovascular Institute

SCI physicians provide nationally-recognized, comprehensive cardiovascular services to patients in northeast Ohio. With more than 50 cardiologists, cardiothoracic and vascular surgeons spanning seven Summa Health System hospitals, SCI has the largest cardiovascular team in the region and offers a comprehensive list of cardiovascular services. SCI physicians offer appointments at more than a dozen convenient office locations across Summit, Medina, Portage, Stark, Holmes, Tuscarawas and Carroll counties.

As a result, patients receive the right care, at the right time, from the right provider – no matter where they choose to receive care within our System.