



EKOS Therapy Success for Patients with Pulmonary Embolisms

A pulmonary embolism (PE) is a serious condition that requires prompt treatment. PEs are the third most common cause of cardiovascular deaths worldwide with nearly 300,000 deaths per year in the United States alone. For over a year, Licking Memorial Hospital (LMH) has been successfully improving the outcome of patients diagnosed with PE by using the EkoSonic Endovascular System (EKOS) therapy as a treatment option.

The EKOS therapy is a minimally invasive procedure that consists of an infusion catheter, an ultrasound core wire and a control unit. This technology uses high-frequency, low-power ultrasound energy in combination with a thrombolytic agent to dissolve the blood clot. The ultrasound causes the fibrin strands within the clot to loosen, which allows the clot-busting drug to break down and dissolve the clot quickly and efficiently. The benefit of using the EKOS system is that it allows for smaller doses of the thrombolytic drug, which reduces the risk of bleeding. Shorter treatment time, reduction of strain on the right side of the heart, improved symptoms and decreased recovery time also are advantages to using the system.

A pulmonary embolism (PE) occurs when a blood clot travels to the lungs from a deep vein in the lower extremities known as deep vein thrombosis (DVT). Left untreated, a PE can cause heart or lung damage and possibly death. Symptoms of a PE include sudden shortness of breath, sharp chest pain, sudden

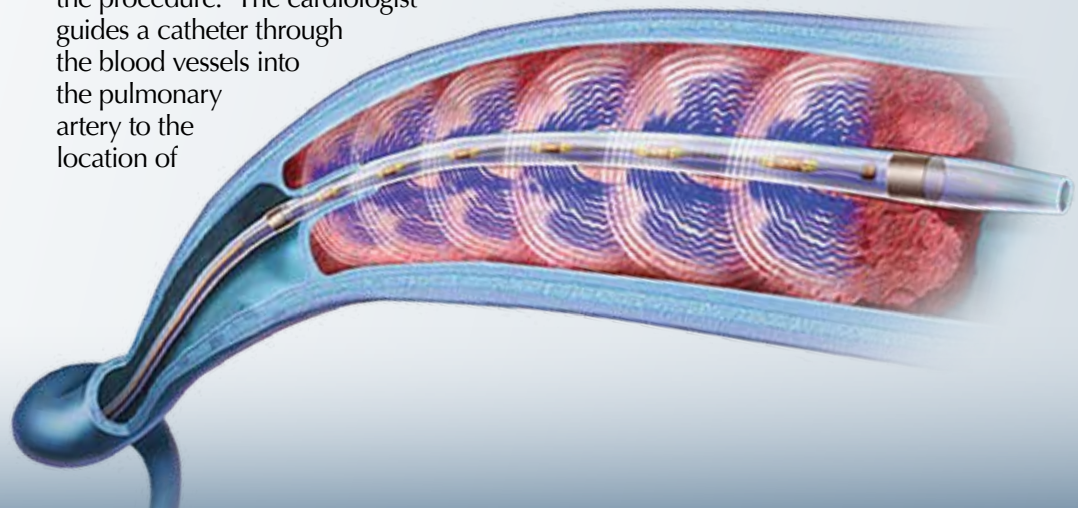
cough, lightheadedness or fainting and rapid heartbeat. Individuals experiencing these symptoms should immediately seek treatment at the LMH Emergency Department (ED).

When a patient presents in the ED with acute pulmonary embolism, their vital signs, lab work and imaging are evaluated. A patient is considered having a submassive PE if their blood pressure and heart rate are stable, but there is evidence of right-sided heart strain. The patient is assessed to determine if they are a candidate for the EKOS therapy, and their history is reviewed to ensure that there are no known contraindications to the clot-busting drug therapy. A pulmonologist is consulted and discusses the case with an interventional cardiologist who will perform the procedure.

The patient is transported to the catheterization lab where they are sedated but remain awake throughout the procedure. The cardiologist guides a catheter through the blood vessels into the pulmonary artery to the location of

the clot, where the ultrasound waves are turned on and the thrombolytic agent is infused. The procedure typically takes 1 to 1.5 hours to complete. The patient is then taken to the Intensive Care Unit (ICU) for monitoring as the clot-busting drug continues to infuse through the catheters for 6 more hours. The catheters are then removed and the patient is started on anticoagulation medication.

Most patients who receive the EKOS therapy for a PE experience significant improvement in their symptoms overnight and their recovery is faster than patients who are treated with traditional anticoagulation treatment. A follow-up visit is recommended two weeks after patients have undergone the EKOS therapy to assess their condition for any recurrent symptoms and to determine the necessary anticoagulation medication type and dosage.





Patient Story – Anthony “Tony” Shonebarger

As an assistant baseball coach at Newark High School, Anthony “Tony” Shonebarger was satisfied with his physical condition as he neared his 50th birthday. Born and raised in Licking County, Tony had participated in sports in high school and college. He currently serves as an underwriting supervisor at State Farm Insurance and remains very active. After becoming a father, he shared his love of baseball with his three children by coaching little league for his sons, Alex and Bryce, and softball for his daughter, Brooklyn (Brooke). He enjoys every opportunity to encourage his children as they exercise and participate in various sports.

In June 2020, Tony began feeling pain in his chest while out jogging with his youngest son, Bryce. “It felt like someone had put a stake through my heart, and then put an anvil on top of my chest,” he said. Tony, who is certified in first aid, was aware of the symptoms of a heart attack. “I knew it was possible that I was experiencing a cardiac event, but I kept making excuses. I had spent the weekend at a softball tournament, and it had been hot. I thought maybe I was dehydrated.” Tony called his daughter, Brooke, to come and take him and Bryce home. The pain continued at home, and Tony decided he needed medical attention when he noticed his arm was numb.

Tony did not feel well enough to drive himself to Licking Memorial Hospital (LMH), so he asked Alex to drive him to the LMH Emergency Department (ED) as fast as he could. When the two arrived at LMH, staff members quickly responded to Tony’s symptoms by ordering an electrocardiogram (EKG) and having it interpreted by an ED physician within minutes. “The nurse on duty took immediate action and suggested I call my wife, Julie, and let her know what was happening,” Tony said. “The entire staff was amazing. They offer excellent patient care in all they do, and you can tell they enjoy their jobs.” Ten minutes after his arrival, he was diagnosed with a ST-elevation myocardial infarction (STEMI) – a heart

attack caused by the complete blockage of a heart artery.

When a person experiences a STEMI heart attack, an unstable plaque built up on the wall in a heart artery suddenly ruptures. In response, the blood builds up a clot in an attempt to heal the rupture. However, the clot formation can result in a total blockage of the artery leading to the loss of blood supply to the heart beyond the blockage. The heart muscle stops working within minutes and could stop functioning all together unless the artery can be reopened. For this reason, every minute from the onset of a heart attack is absolutely critical. LMH has a STEMI team that always is ready for such alerts and works quickly to open blocked arteries by using angioplasty or stent placement.

When the STEMI alert was sounded, the STEMI team, including Licking Memorial Cardiologist Hassan Rajjoub, M.D., prepared Tony for the cardiac cath and began the process to unblock the clogged artery. Dr. Rajjoub placed four stents in his heart and Tony was taken to recovery. Julie and Brooke were brought into his room where they found him talking to the staff. “I really do not remember what happened after I went in for the procedure. Julie told me I seemed fine,” Tony shared. However, Tony’s body continued to produce clots and his heart stopped several more times. “My wife told me, while the scenario was frightening, the LMH staff responded with true professionalism. She said they moved in military-like precision. Everyone had a task to perform, and they quickly reacted to resuscitate and stabilize me.” Tony then was taken to a Columbus hospital for a more intense heart surgery.

Tony was released from the Columbus hospital during the first week of July and began participating in the LMH Cardiac Rehabilitation Program in August. The program focuses on complete cardiac patient care, including the development of an individualized health and fitness plan to restore and enhance both physical and psychological wellness. The LMH Cardiac Rehabilitation Program is certified by the American Association of Cardiovascular and Pulmonary Rehabilitation and has met quality standards required by the Association to ensure the highest level of patient care.

Tony visited the Cardiac Rehabilitation Clinic three times a week where he was provided with the tools needed to safely establish and maintain a healthy lifestyle. He attended educational sessions and exercise classes, where a mobile device was used to monitor his heart rate and oxygen levels. “The monitor was comforting, and I felt more secure about exercising because I knew the Clinic staff would not let me overexert myself.” Thanks to the assistance of the staff and with Dr. Rajjoub’s clearance, Tony was able to jog on a treadmill by the end of his 12-week program.

With a sense of humor and faith, Tony is accepting and sharing the lessons learned from his situation. “One of the exercise physiologists said that you cannot out-exercise a bad diet. That was my downfall. I knew I was eating unhealthy, but I thought I was active enough to get away with it. This has been a blessing in disguise, because I would still be eating the same way,” Tony reflected. Tony also knew he had high cholesterol and now suggests to others that they know their numbers, listen to the physician’s advice and act on it. Another lesson that Tony learned is not to wait for treatment. “My friends and family are in disbelief that after my jog I actually took a shower before going to the ED. I am lucky to have survived delaying the needed surgery as long as I did.” Tony praises the attitude of the LMH staff, from the ED to the Cardiac Rehabilitation Clinic. “I was treated like a member of their own family. The staff at the Clinic are motivational, energizing and so positive. I cannot thank them all enough.” He is looking forward to jogging again with Bryce who is considering participation in Cross Country.

LMH takes great pride in providing excellent cardiovascular services to the community specializing in providing timely lifesaving techniques and the latest technology for patients with the risk of cardiovascular disease. Anyone experiencing symptoms of a heart attack should call 911 immediately. The outstanding relationship with the local emergency medical services (EMS) means patients can expect rapid, exceptional care prior to reaching the Hospital. LMH’s equipment and software allow medics to deliver an EKG to the ED before the patient arrives.

Heart Care – How do we compare?

At Licking Memorial Health Systems (LMHS), we take pride in the care we provide. To monitor the quality of that care, we track specific quality measures and compare to benchmark measures. Then, we publish the information so you can draw your own conclusions regarding your healthcare choices.

1. The first step in heart attack treatment is to confirm that the patient is truly experiencing the symptoms of a heart attack. An electrocardiogram (EKG) measures the electrical activity of the heart and is one diagnostic tool used to determine if a heart attack is occurring.

	LMH 2017	LMH 2018	LMH 2019	National Average ⁽¹⁾
Median time from arrival to completion of EKG	4 minutes	5 minutes	3 minutes	8 minutes

2. In patients having a heart attack, emergency angioplasty restores blood flow to the heart muscle by re-opening blocked or clogged arteries. This is completed by inserting a catheter into the artery that feeds the heart, inflating a balloon and placing a stent inside the artery to keep it open. This procedure can help reduce damage to the heart muscle, and has the best results when performed within 90 minutes after arriving in the Emergency Department (ED). Licking Memorial Hospital (LMH) began performing this procedure in 2008.

	LMH 2017	LMH 2018	LMH 2019	National Goal ⁽²⁾
Mean time from arrival until balloon angioplasty performed	54 minutes	58 minutes	55 minutes	90 minutes
Time to balloon within 90 minutes	97%	100%	99%	95%

3. Emergency Medical Services (EMS) are often the first to evaluate and treat patients experiencing heart attack symptoms. EMS acquires a baseline EKG to wirelessly transmit to the LMH ED physician for interpretation and early identification, so that the Catheterization Lab team can be alerted quickly. Medical contact to reperfusion refers to the time it takes in minutes from the first medical contact by EMS with a patient experiencing heart attack symptoms, to the opening of the artery to allow blood flow back to the heart muscle.

	LMH 2017	LMH 2018	LMH 2019	National Goal ⁽²⁾
Medical contact to reperfusion	76 minutes	79 minutes	75 minutes	Less than 90 minutes

4. Licking Memorial Health Professionals (LMHP) physicians also monitor the usage of antiplatelet drugs, such as aspirin or an antithrombotic drug, in patients with coronary artery disease (CAD). The usage of these medications lowers the risk of myocardial infarction (MI) or death in patients with CAD.

	LMHP 2017	LMHP 2018	LMHP 2019	LMHP Goal ⁽³⁾
LMHP CAD patients with aspirin and/or antithrombotic prescribed	94%	94%	95%	Greater than 85%

5. LMHP physicians monitor the cholesterol levels, specifically the LDL (bad cholesterol) levels of their patients with diagnoses of CAD. Elevated LDL cholesterol level is a risk factor for MI, but is reversible through medication, diet and exercise.

	LMHP 2017	LMHP 2018	LMHP 2019	LMHP Goal ⁽³⁾
LMHP CAD patients with LDL less than or equal to 100 mg/dl	63%	67%	73%	Greater than 50%

Data Footnotes: (1) Hospitalcompare.hhs.gov national benchmarks. (2) American Heart Association website (3) Benchmark indicates LMHP Goal.



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6. When performing certain heart procedures, such as a catheterization, a cardiologist may choose to access the heart through the radial artery, located in the wrist, or the femoral artery, located in the upper thigh. A growing body of evidence supports adoption of transradial artery access to improve acute coronary syndrome–related outcomes, to improve healthcare quality and to reduce cost. Accessing the radial artery requires advanced skill; however, radial access offers quicker recovery time by eliminating the need for the patient to remain flat on their back in bed for several hours after the procedure. Also, the risk of bleeding is decreased. Although radial access is routinely utilized, it may not be an option for some patients due to a risk of spasms or the size of the artery. LMHS’ cardiologists possess the advanced skills needed for the procedure and have been offering the safer alternative to patients.

	LMH 2017	LMH 2018	LMH 2019	LMH Goal
Heart catheterization procedures	609	599	593	
Percentage of radial access	79%	83%	89%	83%

Health Tips – Heart Health Begins in the Kitchen

Heart disease is the leading cause of death in the United States. Behaviors that increase the risk factors for heart disease include a poor diet, lack of physical activity, and smoking. Eating foods that are high in saturated fats, trans fat and cholesterol is linked to heart disease and related conditions, such as atherosclerosis. Choosing a heart-healthy diet is one of the ways individuals can greatly reduce their risk of heart disease and its complications.

Vegetables, fruits and whole grains are an important part of a heart-healthy diet. These foods contain high amounts of fiber, vitamins and minerals, which are essential for maintaining good heart health. Leafy green vegetables, such as spinach, kale and collard greens, as well as cherries, blueberries, strawberries and raspberries, contain antioxidants and fiber which help protect blood vessels and lower cholesterol. Whole grains,

including whole wheat, brown rice, oats, rye, barley, buckwheat and quinoa, also are high in fiber and help to play a role in regulating blood pressure.

Low-fat proteins, including chicken, fish and low-fat dairy products are good choices for a heart-healthy diet. Salmon, tuna and shellfish contain omega-3 fatty acids, which research has shown can reduce the risk of heart disease and stroke. The American Heart Association recommends eating two servings of fish per week.

Foods that are high in saturated fats, such as red or fatty meats, cheese, butter and whole dairy products, should be avoided. Saturated fats can raise blood pressure and cholesterol while also contributing to coronary artery disease. Replacing saturated fats with foods that contain monounsaturated and polyunsaturated

fats, such as nuts, seeds and avocados, can help to reduce bad (HDL) cholesterol and promote heart health.

Limiting salt intake is another way to reduce the risk of heart disease. A diet that is high in sodium can raise blood pressure, which is a contributing factor to heart disease. Fresh herbs, such as rosemary, thyme, basil, oregano and sage, are flavorful alternatives to salt.

Making simple dietary changes can provide long-term benefits for heart health. Planning ahead with a weekly menu can help individuals incorporate heart-healthy foods into their diet and also provide variety. Eating heart-healthy can be easy and enjoyable, and it is important for individuals to discuss dietary changes with their physician to ensure that proper nutrition is maintained.



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Please take a few minutes to read this month’s report on **Heart Care**. You’ll soon discover why Licking Memorial Hospital is measurably different ... for your health!

The Quality Report Card is a publication of the LMHS Public Relations Department. Please contact the Public Relations Department at (220) 564-1572 to receive future mailings.

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