

osupdate

HEART DISEASE: NEW IMAGING CAPABILITIES ALLOW A CLOSER LOOK

A multidisciplinary team of cardiologists, radiologists and cardiac imaging specialists in the OSU Medical Center Heart Program – which encompasses the OSU Ross Heart Hospital and the OSU Davis Heart and Lung Research Institute – is working to give referring physicians access to clinical tools that provide accurate, timely, non-invasive diagnoses.



“OSU is a national leader in providing access to newer cardiac interventions,” says William Abraham, MD, FACP, FACC, director of the OSU Division of Cardiovascular Medicine. “At the Richard M. Ross Heart Hospital, OSU provides the region’s only novel cardiac imaging capabilities through state-of-the-art equipment that allows extremely detailed, specific information about the heart and blood vessels.”

Abraham, a world-renowned heart specialist, also is associate director for Clinical and Translational Research at the OSU Dorothy M. Davis Heart and Lung Research Institute (DHLRI).

Primary care physicians who identify patients as high risk for heart disease due to high cholesterol, chest pain, high blood pressure, family history or smoking can now obtain conclusive noninvasive information that will greatly enhance their ability to provide appropriate cardiovascular

treatment or refer their patients to a specialist.

“Patients with acute coronary syndromes should, of course, be directed to the Emergency Department or be referred directly for cardiac catheterization,” notes Subha Raman, MD, medical director, CMR/CT (cardiac magnetic resonance/computed tomography) at the OSU Ross Heart Hospital. “For any other patient requiring accurate cardiovascular diagnosis, including determination of the presence and severity of coronary artery disease, OSU offers two new solutions: CMR and cardiac CT, along with our comprehensive nuclear, echocardiography and vascular capabilities.”

The 64-slice CT is the newest application of computed tomography technology and provides detailed three-dimensional images of the heart.

“Extremely high resolution and speed enable specialists to look at not only the coronary arteries, but also to evaluate heart function, bypass grafts,

IN THIS ISSUE:

A-1 & A-2

Heart Disease:
New Imaging Capabilities
Allow a Closer Look

A-3

News Briefs

A-4

Women and
Heart Disease:
Overcoming Disparities

A-5

Research Highlights

A-6

Can Genetics Reveal
Family Ties That Bind
Our Heart Strings?

A-7

New Faces
CME Opportunities



and even stents - allowing us, in many cases, to eliminate the need for invasive diagnostic procedures," Raman explains. "While older CT methods such as electron beam CT have historically provided coronary calcium scores, current generation cardiac CT, such as we have at OSU, can additionally define the amount of blockage, including the ability to identify 'soft' or noncalcified plaques, which are often the types of plaque that rupture and cause heart attacks."

CMR is particularly good for assessing cardiac function because it can easily differentiate between scar tissue and muscle that may benefit from better blood supply. Raman says CMR is extremely useful in diagnosing a variety of conditions, including ischemic and valvular heart diseases, pericardial disease, congenital heart disease and aortic disease. In addition, it can identify the underlying causes of arrhythmias and cardiomyopathies. It can also reveal subendocardial perfusion abnormalities and microvascular disease in patients with diagnostic dysfunction or metabolic syndrome.

"CMR is particularly exciting, because in addition to assessing potential myocardial viability, it is also beginning to tell us about metabolic function, including how the heart generates energy and how it functions at the cellular level," says Charles Bush, MD, FACC, medical director of the OSU Ross Heart Hospital. "This is in the very early stages but holds tremendous promise."

According to Dennis Bauman, MD, a cardiologist at OSU who has been caring for cardiology patients for more than three decades, "CMR may be the diagnostic tool of choice for many patients because a single test event can provide answers to multiple clinical questions, including those about perfusion and hemodynamic flow. I also find cardiac CT technology extremely useful for my patients who have had a stent and then develop symptoms. Now I can readily determine the patency of the stent without the patient having to undergo repeat cardiac catheterization."

Besides these cardiac imaging capabilities, the OSU Medical Center Heart Program offers virtually any form of heart and vascular care, including invasive diagnostics, interventional services, electrophysiological services, cardiothoracic and peripheral vascular surgery, patient care clinics, rehabilitation, prevention and the region's only heart failure and cardiac transplantation programs, as well as access to clinical trials.



a little medical 'magic'

Benjamin Sun, MD, who was part of the team that performed the first heart-lung transplant at the OSU Ross Heart Hospital in 2005, has been working with Subha Raman, MD, to image left ventricular assist devices (LVADs) in his patients.

"Dr. Raman is a magician who is able to tweak the cardiac CT to allow images around the pump, so we can see if there is an infection or assess blood flow," says Sun, who directs the OSU Division of Cardiovascular Surgery. "I'm hopeful that one day soon we will actually be able to visualize inside the pump - this will be extremely beneficial to our patients."

Sun is equally enthusiastic about the ability of cardiac magnetic resonance (CMR) to identify scar tissue via three-dimensional images. "This helps us strategize from a surgical standpoint what we want to do. By knowing the extent of scar tissue, which no other device has been able to tell us, we can produce better outcomes for our patients."



advancing medical knowledge

Conducting research to advance medical knowledge is one of the missions of OSU Medical Center. Orlando "Lon" Simonetti, PhD, has been developing new cardiac imaging applications to extend the capabilities of cardiac magnetic resonance (CMR) and cardiac computed tomography (CT).

"Each technology has its strengths - when you find blocked coronary arteries with cardiac CT, CMR will show their functional significance," says Simonetti, director of Cardiac MR and CT Research at the OSU Davis Heart and Lung Research Institute.

"Our research team is focusing on atherosclerotic plaque imaging," he says. "With both CT and MR, we are looking directly at the buildup of plaque to differentiate vulnerable lesions from benign. With CMR, we are designing new pulse sequence programs that allow us to image cardiac perfusion and blood flow velocity to help physicians noninvasively diagnose and evaluate patients with cardiovascular diseases."



newsbriefs

HOSPITAL PROJECTS IMPROVE PATIENT CARE

OSU Medical Center continually makes changes and upgrades facilities to improve the care your patients receive during their stay or visit. Recent upgrades include: a new helipad atop Rhodes Hall that can accommodate five helicopters and will help OSU more effectively address trauma cases and disasters; improvements to patient rooms in Rhodes and Doan Halls and the opening of a unit that will increase the number of private rooms and enhance their patient care function; a Sleep Disorders Center equipped with small, less intrusive cameras and staffed by five physicians, a respiratory therapist, sleep technicians and a nurse practitioner; and a new state-of-the-art Emergency Department at University Hospital East. The new ED more than doubles the size of the previous ED and contains approximately 15,000 square feet dedicated to advanced treatment technology.

For more information, call 1-800-293-5123.



OSU PSYCHIATRISTS TARGET SELF-MUTILATING BEHAVIOR

The prevalence of self-mutilation among adolescents has led child psychiatrists at OSU Medical Center to adopt a more comprehensive approach to targeting the behavior by screening all inpatient children and adolescents for problems with self-injury. Often referred to as cutting, the practice is most common among adolescent girls and can take other forms of self-injury, such as burning and hitting. The behavior occurs in an estimated 4 percent of the population and in up to one in five children and adolescents

undergoing psychiatric care. OSU child psychiatrist Lily Spetie, MD, and colleagues also have met in past years with central Ohio teachers and guidance counselors who faced issues associated with identifying the behaviors among their students.

For more information or to contact Dr. Spetie, call 1-800-293-5123.

OSU SPECIALISTS ADDRESS URINARY INCONTINENCE

OSU Medical Center has taken important steps to address urinary incontinence by recruiting two specialists in this discipline. Jason Gilleran, MD, has joined the Division of Urologic Surgery, and Andrew Hundley, MD, has joined the Department of Obstetrics and Gynecology. Gilleran's clinical interests include urinary incontinence and voiding dysfunction; Hundley's include urogynecology and female incontinence. Both physicians also have a clinical interest in pelvic organ prolapse. The two are accepting new patients and physician requests for consults.

To reach either physician, call 1-800-293-5123.

(Read more about them in "New Faces," page A7.)



WOMEN AND HEART DISEASE: OVERCOMING DISPARITIES



According to the American Heart Association, more than 500,000 women in the United States alone die of cardiovascular disease every year, says Subha Raman, MD, medical director, CMR/CT (cardiac magnetic resonance/computed tomography) at the OSU Richard M. Ross Heart Hospital. “In fact,” she adds, “it is the leading cause of death and disability for U.S. women.”

Raman is involved in several outreach and research plans, including the Women’s Cardiovascular Health Program at OSU. She is also principal investigator for a National Institutes of Health study on the role of iron in atherosclerosis and whether the cessation of monthly iron loss in menopause may mean a loss of cardio-protective factors.

“In addition,” she says, “because women experiencing acute coronary syndrome are more likely to present with atypical symptoms, educating women about their heart health is essential in making a positive difference in outcomes.”

“We need to educate women; education is the key,” agrees Sarah Ross Soter, who along with her husband, William Soter, gave a \$2 million gift to OSU Medical Center to establish the Sarah Ross Soter Endowed Chair in Women’s Cardiovascular Health. The chair will support a nationally prominent physician-researcher specializing in women’s heart care at the OSU Ross Heart Hospital.

When Mrs. Soter was treated for atrial fibrillation by William Abraham, MD, FACP, FACC, director of the OSU Division of Cardiovascular Medicine, she realized the need. “Dr. Abraham provided excellent care. We talked about how the warning signs of a heart attack are different in women, about how so little research has been directed toward women’s heart health and the reasons many women do not understand that heart disease, the number one killer of women, is their greatest health risk.”

“Most cardiovascular studies include only 20 to 25 percent women, while women represent 50 percent of the population suffering from heart disease,” Abraham says, noting that, in the 1940s and ‘50s when medicine began to study heart and vascular disease, they were viewed as a man’s disease. He says that bias continued well into the 1970s and adds that women, whose symptoms are much more subtle than men’s, are still often unaware of the warning signs and in many cases receive a different level of care.

“We are very grateful to the Soters, especially to Mrs. Soter, who also founded the OSU Women’s Cardiovascular Health Advisory Council, a group of community leaders dedicated to advancing women’s cardiovascular health,” Abraham says.

The Women’s Cardiovascular Health Program at Ohio State will have several components, including awareness and prevention to educate women about warning signs and the importance of beginning healthy heart habits early enough in life to make a difference.

Teach the warning signs

Women with cardiovascular disease may present with both classic and atypical symptoms, including:

Classic (men & women)	Atypical (usually women)
• Chest pain	• Nausea/queasiness
• Cold sweat	• Tightness in throat
• Neck/jaw pain	• Pain in back
• Arm heaviness/pain	• Shortness of breath

osuresearchhighlights



OSU ENCOURAGES INCREASED AWARENESS OF WOMEN WITH EPILEPSY

Knowledge gaps among women with epilepsy about their condition might be due in part to a lack of awareness among primary care physicians, an OSU study suggests. When Lucretia Long, an epilepsy nurse practitioner, surveyed 202 primary care physicians about women and epilepsy, few understood that hormonal fluctuations during menstrual cycle can affect seizure frequency, and most were unfamiliar with the association between epilepsy and female sexual dysfunction. Although at least three-fourths knew that women with epilepsy can have healthy pregnancies, less than half knew that women taking antiseizure medications can safely breastfeed their babies. The study appeared in the journal *Epilepsy and Behavior*. "This is important because women with epilepsy often seek primary care practitioners for evaluation and treatment," says Long. "I believe primary care physicians see such a range of patients and diagnoses that many haven't had an opportunity to become aware of issues specific to women with epilepsy." However, she adds, the overwhelming majority of those surveyed were very interested in learning more about epilepsy, "so we are hopeful that we can develop educational interventions to increase knowledge."

For more information or to contact Long, call 1-800-293-5123.

MOLECULAR DEFECT FOUND THAT MAY CAUSE HEART FAILURE

A new study at OSU has identified a molecular defect in cardiac cells that may be a fundamental cause of heart failure. The findings show that specialized proteins called ryanodine receptors (RyRs) malfunction in the failing heart. The RyRs form channels that become leaky, leading to calcium imbalances that prevent the heart from contracting effectively and relaxing adequately. This condition worsens until the heart can no longer work as a pump.

"We found drastic changes in the way muscle cells in the failing heart handle calcium," says Sandor Gyorke, PhD, a professor of physiology and cell biology. "Discovery of this mechanism suggests at least one potential target for treating the causes of this disease."



Sandor Gyorke, PhD

For more information or to contact Gyorke, call 1-800-293-5123.

RESTORING SILENCED GENE KILLS LUNG CANCER CELLS

Researchers at OSU have found that restoring a gene often silenced in lung cancer causes the cancer cells to self-destruct. The research focused on *WWOX*, a tumor-suppressor gene that is lost or silenced in a large majority of lung cancers and in cancers of the breast, ovary, prostate, bladder, esophagus and pancreas. The study showed that, both in the laboratory and in animal experiments, restoring *WWOX* can slow or stop the cells' growth. "This suggests that if this gene could be delivered to, or reactivated in, the tumor cells of lung cancer cases deficient in this gene, it should have a therapeutic effect," says study co-author Kay Huebner, PhD of the OSU Comprehensive Cancer Center's Molecular Biology and Cancer Genetics Program.

For more information or to contact Huebner, call 1-800-293-5123.

CAN GENETICS REVEAL FAMILY TIES THAT BIND OUR HEART STRINGS?

Cardiovascular disease has been the leading cause of death in the United States every year since 1900 except 1918, when the influenza epidemic claimed more lives.

According to Amy Sturm, MS, a certified genetic counselor and clinical instructor in the OSU Division of Human Genetics, cardiovascular disease causes more deaths per year than the next five leading causes of death combined: cancer, chronic lower respiratory diseases, accidents, diabetes mellitus, and influenza and pneumonia.

"Given these statistics, along with the fact that family history is a known independent risk factor for heart disease, it is important that we help primary care physicians by providing genetic counseling as a new tool to reduce morbidity and mortality caused by cardiovascular disease," Sturm says.

Philip Binkley, MD, MPH, FACC, agrees. "In the future, genetic counseling will become a standard part of prevention and wellness strategy for cardiovascular disease," says Binkley, director of cardiovascular research for the OSU Division of Cardiovascular Medicine. "Although a very detailed family history can uncover significant risk factors, the time it takes to complete such a history exceeds the amount of time generally available in the office setting. When patients are referred for genetic counseling, their physicians are better able to target appropriate clinical tests in a more cost-effective and efficient manner."

Sturm explains that consultation with a genetic counselor can involve as many family members of the patient as are needed to develop an extensive medical pedigree. Often this is as many as five generations, and Sturm notes that most health insurance providers cover the process.

"Although science has yet to identify all of the specific genes responsible for heart disease – not every susceptibility gene or



polymorphism associated with coronary artery disease is yet known - genetic counseling can identify patients at increased risk, which in turn gives physicians a 'heads-up' in making specific preventive recommendations," she says.

"In the future, genetic counseling will become a standard part of prevention and wellness strategy for cardiovascular disease."

– Philip Binkley, MD

newfaces



David O'Malley, MD

Specialty: Obstetrics and Gynecology

Clinical Interests: Gynecologic malignancies, minimally invasive treatment options, developmental therapies and chemotherapies for gynecologic tumors

Residencies: Case Western Reserve University at MetroHealth Medical Center; Cleveland Clinic Foundation

Fellowships: Yale University School of Medicine, New Haven, Conn.; Memorial Sloan-Kettering Cancer Center, New York City



Andrew Hundley, MD

Specialty: Urogynecology

Clinical Interests: Urogynecology, female incontinence, pelvic organ prolapse

Residency: Brigham and Women's and Massachusetts General Hospitals

Fellowship: University of North Carolina Hospitals, Chapel Hill



Jason Gilleran, MD

Specialty: Urology

Clinical Interests: Voiding dysfunction, urinary incontinence and pelvic organ prolapse

Residency: University of Illinois at Chicago

Fellowship: University of Texas Southwestern Medical School, Dallas

To contact any of these physicians, please call OSU Care Connection at 1-800-293-5123.



Critical Care Medicine Series – On OSU MedNet21

If your hospital has an ICU – Don't miss the CME Critical Care Medicine Series only on OSU MedNet21.

Ask your hospital education administrator to contact The Center for Continuing Medical Education at The Ohio State University Medical Center today to purchase these 28 online, on-demand Critical Care Medicine programs, all designed to improve patient safety and outcomes.

Special group rates make this a don't-miss educational opportunity for you and your hospital's ICU faculty and staff. CDs and DVDs are available.

Non-Invasive Ventilation	Nutrition in the ICU	Shock
Pulmonary Embolus	Sedation in the ICU	Large Airway Obstruction
Delirium	Respiratory Failure	Nosocomial Pneumonia
Airway Assessment	Sepsis	ARDS
Coma and Brain Death	Ethics	Renal Replacement
Weaning from Mechanical Ventilation	Mechanical Ventilation: A Primer for the Minimalist	Endotracheal Intubation and Pre-Intubation

... Plus 11 more Critical Care topics applicable to any Intensive Care Unit with the goal of improving patient safety.

OSU MedNet21 Critical Care Series Programs*

The Center for Continuing Medical Education

The Ohio State University Medical Center
614-293-3576

*These activities have been approved for AMA PRA category 1 credit.

Register online at
<http://ccme.osu.edu>