Collaborative Studies at UTMC
by Dr. Blair Grubb M.D., Professor of Medicine and Pediatrics, Division of Cardiovascular Medicine

Researchers in cardiovascular medicine at The University of Toledo Medical Center’s Heart and Vascular Center have embarked upon a number of innovative, collaborative studies with members of other departments within the University. Each year at least five percent of all implantable cardiac devices such as pacemakers and implantable defibrillators become infected and have to be removed. This results in a significant cost to the American public and also a great degree of discomfort and risk to the patients who receive these devices. Dr. Blair Grubb, UT Distinguished University Professor of Medicine and Pediatrics, and Dr. Marlene Welch, plastic surgeon at The University of Toledo Medical Center, have worked together to develop a new technique for wound closure. This innovative closure technique draws upon principles established by both cardiology and plastic surgery and blends them together.

Their research, recently published in the American Journal of Therapeutics, indicates that infection rates could be effectively cut to nearly zero using their new innovative methodology. Further collaborative efforts between Dr. Welch and Dr. Grubb continue to refine these techniques to provide outcomes that lower infection rates and leave scars that are cosmetically more attractive.

At the same time, a collaborative effort to alleviate suffering in patients with Parkinson’s disease has been established between the Department of Neurology and the UT Heart and Vascular Center. Up to one-third of patients suffering from Parkinson’s disease will develop severe orthostatic hypotension. As that number continues to increase as populations age in the U.S., more action will be needed to alleviate pain and suffering.

Dr. Grubb and Dr. Lawrence Elmer, professor of neurology and medical director of the Center for Neurological Health, have published the first collaborative studies that look at the best treatment modalities for patients suffering from orthostatic hypotension secondary to Parkinson’s disease. Their research, published in the Journal of Innovations in Cardiac Rhythm Management, demonstrated that the drug pyridostigmine was a safe, inexpensive and effective treatment to prevent these dramatic blood pressure changes in patients with Parkinson’s. Further collaborative studies between cardiology and neurology are underway to better treat individuals who suffer from these devastating illnesses.

Lung Cancer Screening at UTMC
By Dr. Thomas A. Schwann, M.D., M.B.A., Professor of Surgery, Chief of Cardiothoracic Surgery

Lung cancer is the most common cancer of both men and women. It is estimated that in 2012 approximately 170,000 people will develop lung cancer and approximately 160,000 will succumb to lung cancer. Lung cancer mortality exceeds that of breast cancer, colon cancer and prostate cancer combined. Roughly one in 16 women and one in 13 men will develop lung cancer in their lifetime. More than 40 percent of patients present with advanced disease and thus it is not surprising that the overall survival of patients with lung cancer is an abysmal 15 percent. Despite advances in diagnostic and therapeutic modalities, the prognosis for patients with lung cancer has improved only slightly from 13 percent in the 1970s to 15 percent noted in the 2000s. The overwhelming majority of lung cancers are related to smoking and the incidence of lung cancer and its associated mortality has paralleled the rise in the smoking patterns throughout the world. Currently, there are 90 million smokers in the U.S. with a substantially higher number of people exposed to second hand smoke. The total cost of care for smoking associated conditions has been estimated to be $150 billion annually.

Given the poor outcomes of patients with lung cancer, the results of a recently published study noting a 20 percent relative reduction in lung cancer mortality associated with screening of high risk population may represent the most significant advance in thoracic oncology of the last 50 years. The National Lung Screening Trial, sponsored by the National Cancer Institute, was published in 2011. This was a prospective randomized study enrolling more than 50,000 patients who were at high risk for developing lung cancer. The subjects were randomized to two screening protocols: annual low dose CT scans (LDCT) annually for three years or annual chest radiographs (CXR) for three years. The patients were followed for an additional three and a half years following screening and cancer specific mortality rates were compared between the two groups. Significantly more tumors were identified by LDCT scanning than by CXR. Figure 1A. Importantly, the results were quite compelling in favor of LDCT scanning resulting in a relative cancer specific mortality decrease of 20 percent, which was highly statistically significant (p=0.005). Figure 1B. Overall mortality was decreased by 6.7 percent in the LDCT cohort which was also statistically significant (p=0.02).

Such dramatic results engendered a lot of attention from the media, refocusing attention on lung cancer. The results led to the call for lung screening from a public health perspective and currently both the American College of Chest Physicians and the American Society of Clinical Oncology have expressed support for implementation of a large scale lung cancer screening while calling for third party coverage for these services. Although it is still a subject of considerable debate, the cost versus the benefit of such a program also seems substantial. Using actuarial methodologies, it has been estimated that providing insurance coverage for lung cancer screenings to the population at risk...
Limb salvage and wound care presents a unique need for the involvement of multiple disciplines and specialties. With this complexity in mind, the Wound Care & Hyperbaric Center at The University of Toledo Medical Center opened its doors with a goal to provide treatment for all those who are in need of wound healing. With a multidisciplinary approach, the center has succeeded in treating very complex cases, achieving wound closure in many of the patients that it has treated. Our team of specialists includes vascular surgeons, plastic surgeons, infectious disease specialists, orthotists, nutritionists and wound nurse practitioners, working side-by-side to provide the latest treatment and most advanced technology for wound healing. Having an integrated wound healing team is easily achieved in our academic center, where access to the appropriate and advanced treatment is part of our mission.

One of our strongest attributes is the mastery of improving the blood flow to the affected, or wounded, limb. This is done by our highly-skilled vascular surgeons who have access to all open and minimally invasive procedures. Knowing that there is not one singular treatment that fits all problems, we excel in both endovascular procedures, using methods to open occluded vessels by balloon angioplasty and stenting, or removal of the “plaques” blocking vessels using other methods. In cases in which endovascular procedures are not the answer, open interventions using alternative surgical procedures are used by the same vascular team, still achieving excellent results. Both endovascular and open procedures are essential for the success of any program of revascularization and both procedures are skillfully provided by our vascular surgeons.

Our surgical team also provides debridement of ulcers to improve healing, oftentimes followed by reconstructive surgery. In cases of open wounds that will require tissue coverage, our plastic surgeons, who have a special interest in wound care, will provide the necessary surgical intervention. Flap procedures as well as skin grafts to varying ulcer types are successfully used by our plastic and vascular surgeons to help patients achieve wound closure and regain function. Our vascular team and plastic surgery team work in conjunction, along with our wound management team, to ensure flap or graft viability and provide ongoing management.

In addition to our ability to provide great surgical (both vascular and plastic) management of wounds, we also have a team of providers that helps ensure continued success with wound healing. Once a patient has undergone revascularization or endovascular repair, we are able to work with the patient on nutrition, offloading, gait modification, prevention and management of infection, as well as advanced topical wound therapy. All services are coordinated by our wound nurse practitioner, who tirelessly makes sure that everything works in tandem to provide the best care for our patients.

In some cases, however, wounds persist in spite of all interventions. In such cases, hyperbaric oxygen therapy may be indicated. Oxygen is a drug; if it is delivered excessively, therefore, it can harm tissues and organs. The drug “oxygen”, in indicated dosages, proves to be an effective adjunct in wound healing. Normally, the oxygen is transported via the blood to the organs; however, in some patients, (such as those with diabetes) this route will be interrupted by the presence of small vessel disease. In such cases, the delivery of oxygen is provided by dissolving the oxygen in tissue fluids, thus resulting in increased oxygen delivery to injured tissue despite compromised microcirculation. This is done by allowing the patient to breathe a high concentration of oxygen under high pressure known as hyperbaric oxygen therapy. The high pressure is achieved via a chamber simulating diving under water at different depths, thus increasing atmospheric pressure. The higher the diving depth, the higher the concentration of oxygen dissolved in the tissues. Hyperbaric oxygen therapy is approved for a number of conditions such as arterial gas embolization, diabetic ulcers, carbon monoxide poisoning, gas gangrene, crush injuries, necrotizing infections, radiation injury, compromised skin grafts and chronic refractory osteomyelitis.

If a patient is experiencing any of these conditions, he or she will sit comfortably in our multiple-person chamber for a predetermined time that is based on diagnosis. For most conditions, the patient will complete about two hours of therapy, five days per week, under strict supervision of certified physicians and staff who are well trained to deal with all potential emergencies. In addition to being used for treatment, the chamber at UTMC is a social environment where patients interact with each other and with the staff in the chamber at the time of diving. Patients are able to provide support to one another, as well as learn more about their specific condition.

While hyperbaric oxygen therapy is a large part of our ability to successfully treat a multitude of wound types at the Wound Care & Hyperbaric Center, it is also our team of vascular surgeons, plastic surgeons, infectious disease and wound care providers, as well as ancillary staff that allow us to carry through an overall mission of limb salvage and wound healing. We are excited to maintain our patients as our number one priority as we continue to develop our strong team of providers and staff.

Multi-specialty approach, oxygen therapy, present hope for saving tissue, limbs

By Munier Nazzal, M.D., Professor of Surgery, Chief of Vascular and Endovascular Surgery

Photo by Daniel Miller
Lung Cancer Screening at UTMC

By Dr. Thomas A. Schwann, M.D., M.B.A., Professor of Surgery, Chief of Cardiothoracic Surgery

would increase the annual premiums to the insured by a dollar annually with a total cost of $19,000 per life-year saved. This compares favorably with the cost per life-year saved of other currently accepted screening programs for breast cancer, cervical cancer and colorectal cancer.

Encouraged by these results, UTMC has initiated a lung cancer-screening program in northwest Ohio for patients at high risk for lung cancer. To insure success and duplicate the protocol of the NLST, a multidisciplinary team of pulmonologists, specially trained radiologists, oncologists and thoracic surgeons has been established to provide patients with the most up to date integrated care, allowing for minimal disruption of their day to day activities. The program, the only of its kind in northwest Ohio and southeast Michigan, is open to current and former smokers over the age of 55 who will undergo annual screening by LDCT scanning for three years. As part of the program, the subjects will be enrolled in an aggressive smoking cessation effort. The cost of the screening will be subsidized by UTMC, such that each subject will incur out of pocket costs of only $100/CT scan. The early interest in this program has been encouragingly gratifying. To provide referrals to the program, contact Adele Griffin, clinical research coordinator, at 419.383.3539 or at adele.griffin@utoledo.edu.

References:

LEVANT2

by Mark Burket M.D., Professor of Medicine, Chief of Cardiovascular Medicine

A new treatment for blocked leg arteries is now being performed at The University of Toledo Medical Center: angioplasty using a balloon coated with a drug called paclitaxel.

Many people suffer from claudication, leg pain produced by cholesterol blockages in leg arteries. Typically pain is first noticed in the calf, occurs with walking, and is described as “cramping”, “tightening”, or “burning”. The most common blood vessel responsible for these symptoms is the femoral artery, which courses through the muscles of the thigh on its way to the lower leg. For many years physicians have treated such blockages by expanding a balloon on the inside of the vessel, a technique known as angioplasty. This procedure effectively improves blood flow to the leg and relieves pain in most patients. Its biggest limitation has been the tendency for blockages to recur, a process known as restenosis, which is seen in about 40% of treated patients.

A variety of strategies to prevent restenosis have been proposed over the years. One technique involves coating the angioplasty balloon with a drug called paclitaxel, which slows the growth of scar tissue responsible for renarrowing. In European studies, treatment with coated balloons reduced the need for repeat procedures by over two thirds.

Until recently, paclitaxel-coated balloons were unavailable in the United States. The Food and Drug Administration has now approved their use in a clinical trial called LEVANT2, being conducted at The University of Toledo Medical Center and other worldwide hospitals. Patients must have leg discomfort with walking and significant narrowing of the femoral artery between 4 and 15 centimeters in length. The study launched officially at the Medical Center in May with the enrollment of the first patient. For questions about the study, please contact research coordinators at 419.383.3853. An outpatient appointment can be arranged if desired.
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