“Though my bike trip across America was a solo ride, I sensed that the donor and I were riding tandem and that it took both of us to get to the finish line.” — Ken Dockery, 43, South Euclid, Ohio. Ken was born with a defect in his bicuspid aortic valve, making it difficult to climb stairs or carry heavy objects without chest pain. Just three months after an aortic and pulmonary valve transplant, Ken was back on his bike. Today he competes in marathons and triathlons and raises funds through a cycling event he created, the Inspire Hope Tour.
2011 Highlights

Some 20 disciplines across 11 of Cleveland Clinic’s institutes and ambulatory surgery centers utilize bone and soft tissue during surgical reconstruction. In 2011, Cleveland Clinic used approximately 6,500 tissue segments and obtained hundreds of oocytes and sperm donations for in vitro fertilization.

Research and Innovations

Cleveland Clinic has established activities in musculoskeletal stem cell research, tissue engineering and musculoskeletal tissue healing at our Orthopaedic Research Center. Cleveland Clinic physicians also have been active in the American Association of Tissue Banks, the American Academy of Orthopaedic Surgeons Committee on Biological Implants and the American Society of Testing and Materials, as well as with the U.S. Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention in promoting safety of tissues.

The tissue transplant program includes cardiology/cardiothoracic surgery, bone transplant (including adult and pediatric orthopaedics, spine and neurology), urology, colorectal surgery, vascular surgery, dentistry, plastic surgery, obstetrics and gynecology, andrology and in vitro fertilization, general surgery and dermatology. See below for overviews of many of these specific program offerings.

Cleveland Clinic’s Musculoskeletal Tissue Storage facility, directed by Michael Joyce, MD, is a model tissue management program that monitors the safety, effectiveness and availability of musculoskeletal tissue grafts. The program ensures that Joint Commission standards are met by qualifying all vendors; tracing tissues from receipt through storage, preparation and use; identifying and reporting recipient adverse events; and handling tissue recalls successfully. At Cleveland Clinic, the storage facility requires a swipe badge for entry and has a carbon dioxide tank backup system in case of electrical failure.

Cardiology/Cardiothoracic Surgery

Cleveland Clinic’s cardiology and heart surgery program has been ranked No. 1 in the nation for the past 17 years in U.S. News & World Report’s “America’s Best Hospitals” survey. Cleveland Clinic has the largest heart valve surgery practice
in the United States, having performed 2,816 procedures on our main campus in 2011, including 967 valve repairs and 1,849 valve replacements. Of those replacements, 1,714 represented bioprosthesis, 199 mechanical, 81 homograft and three autograft.

**Bone Transplant**

**Adult and Pediatric Orthopaedics:** Adult and pediatric procedures are performed to address trauma, bone healing problems and congenital deformities. Large bone replacement for reconstruction after cancer resection is also performed. To provide support, donor bone is used to fill in defects secondary to fractures and joint replacement. The pediatric service uses allograft tissue that is size-matched to the recipient, with the intent that the allograft eventually will be replaced by normal living host tissue.

**Sports Medicine:** Knee and ankle soft tissue injuries can be surgically repaired using tendons and ligaments from tissue donors. These donated soft tissues also can be used in partial or total joint replacement. Tissue also is used in repairing rotator cuff injuries.

Cleveland Clinic offers a fresh-tissue osteochondral allograft program via Lifebanc for cartilage defects in the knee. Our team members also perform autologous cell-cultured chondrocyte transplantation for cartilage surface defects of the knee, as well as allograft meniscal transplants.

**Spine/Neurology:** Cleveland Clinic spine surgeons are experienced in the surgical management of spinal stenosis, disc herniation, spinal tumors, spinal trauma, scoliosis and other complex deformities and disorders of the cervical, thoracic and lumbar spine. These disorders may require bone transplants to help alleviate pain and to enhance the patient’s quality of life.

**Urology**

*U.S. News & World Report* has ranked Cleveland Clinic's urology program one of the top in the United States every year since 1990. Our urology program utilizes tissue as a treatment option for incontinence and for the reinforcement of soft tissue after surgery. Tissue allografts also are used in urethroplasties and pubovaginal sling procedures.

**Colorectal Surgery**

Cleveland Clinic's gastroenterology program was ranked second in the nation in the 2011 *U.S. News & World Report* “America’s Best Hospitals” survey. Our Department of Colorectal Surgery utilizes tissue in specialized procedures, including anal fistula repair and ventral hernia repair.
Vascular Surgery

The Department of Vascular Surgery performed more than 2,476 procedures in 2011 (limited to Cleveland Clinic’s main campus, and excluding conscious sedation cases). The department uses tissue allografts for repair and reconstruction of weak or severely diseased blood vessels. One-third of all procedures performed by the department are for atherosclerosis, peripheral arterial disease and peripheral vascular disease. Other conditions treated surgically include aneurysms, carotid artery disease and venous disease.

Dentistry

The Department of Dentistry uses tissue in the surgical repair of extraction sockets and periodontal defects, as well as during dental implantation. Bone allografts in these procedures promote additional bone growth to strengthen the various implants used.

Plastic Surgery

The Department of Plastic Surgery uses tissue (primarily skin grafts) for a variety of procedures and surgeries. These include facial cosmetic surgery, reconstruction of pediatric craniofacial defects, wound coverage, and cosmetic and reconstructive breast surgery.

Andrology and In Vitro Fertilization

Cleveland Clinic’s Andrology Laboratory and Reproductive Tissue Bank, which has provided therapeutic sperm banking services since 1980, conducts sperm counts and a variety of tests on semen. The Fertility Center, part of the Ob/Gyn & Women’s Health Institute, offers a wide range of procedures including in vitro fertilization, intracytoplasmic sperm injection, sperm aspiration, assisted hatching, blastocyte transfer and embryo cryopreservation. The center also obtains egg and sperm donations and offers an in vitro fertilization surrogate program.

Focus on Quality

To ensure safety and the best possible results, allograft donors are thoroughly screened via an in-depth medical history and tested for viruses and bacteria. Safety procedures follow published rules, standards and guidelines of the FDA and the American Association of Tissue Banks. Our tissue transplant program also adheres to Joint Commission standards established in 2005. These standards are meant to provide higher quality assurance and patient safety through the ability to trace all tissues from the donor or source facility to all recipients or other final disposition.
Throughout 2011, the Transplant Center used software developed specifically to track tissue implants, ensure compliance and enhance patient safety. The web-based system, Tissue TrackCore, provides an electronic record for all actions associated with tissues received until final disposition. It is currently implemented in more than 125 operating and procedure rooms. In 2010 the system was responsible for handling the tracking of 5,839 tissue segments. It also has electronic interfaces with the Cleveland Clinic Operating Room Information System and receives product and donor information from vendor systems.

**Selected Publications**


Leadership

Michael Joyce, MD
Medical Director, Musculoskeletal Tissue Storage Facility

Staff

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Fast facts

Initiated: 1983

Fresh Osteochondral Graft Transplant Program established in 1998 by the Department of Orthopaedic Surgery, Adult Reconstruction Section

First sacral bone transplant performed by neurospine surgeons in 2001

First mosaicplasty performed by Orthopaedic Adult Reconstruction and Sports Medicine surgeons in 2001

Perform first near-total facial transplant in the United States (2008)