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UNIVERSITY of PITTSBURGH neurosurgery news

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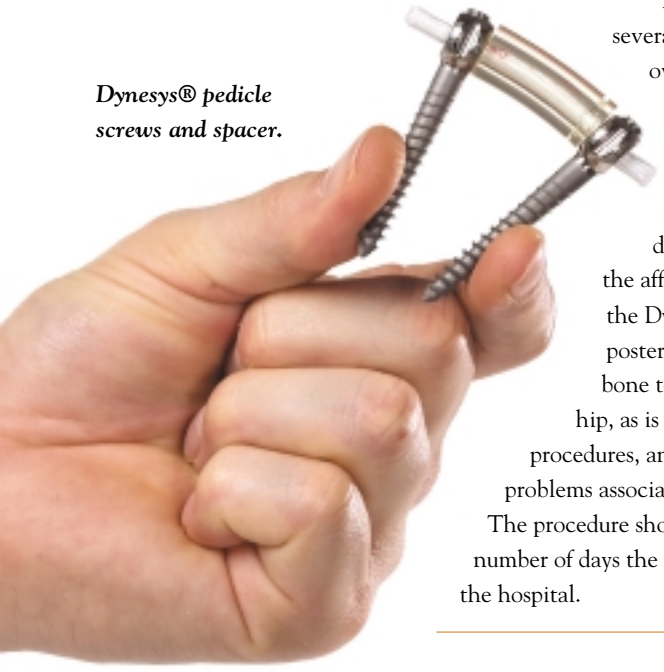
University of Pittsburgh doctors studying new procedure for treating chronic lower back and leg pain

Neurosurgeons at the University of Pittsburgh's Spine Services Division are conducting a clinical study to assess the effectiveness of a potentially revolutionary new procedure in treating patients with lower back and leg pain caused by grade one spondylolisthesis or stenosis.

Under the direction of division director and UPMC Presbyterian chief of neurosurgery William Welch, MD, doctors are utilizing the Dynesys® Spinal System, designed to stabilize the spine without fusion.

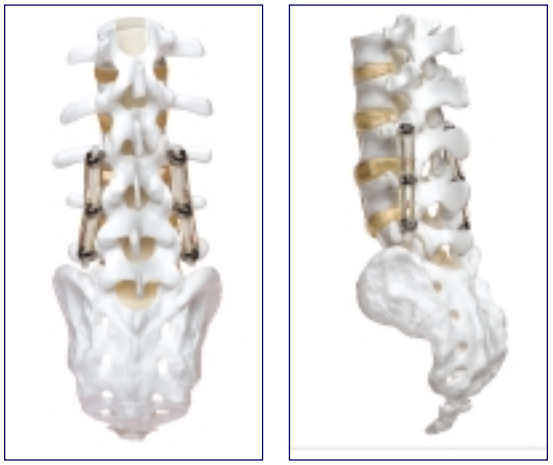
The Dynesys system uses flexible materials to stabilize the affected lumbar region while preserving the natural anatomy of the spine. The procedure allows some motion in the spine and is easy to implant using a familiar surgical approach.

The intent of the Dynesys system is to provide spine surgeons with an alternative to the rigid fixation provided by today's systems for spinal fusion. The system is constructed of flexible materials that stabilize the affected vertebral segments. The Dynesys system consists of external spacers made of surgical polyurethane tubing surrounding a polyethylene cord. The dynamic push/pull relationship between the spacers and the cord stabilizes the affected vertebrae. The system is designed to permit careful controlled bending, straightening and twisting movement in the affected joints.



Dynesys® pedicle screws and spacer.

This unique system has several potential advantages over current fusion techniques. The most important is the preservation of the intervertebral discs and anatomy of the affected vertebrae. Also, the Dynesys system, installed posteriorally, does not require bone to be taken from the hip, as is required in other fusion procedures, and eliminates any problems associated with this procedure. The procedure should also reduce the number of days the patient recovers in the hospital.



Photos courtesy of Centerpulse Spine-Tech Inc.

Front and side views of Dynesys stabilization system attached bilaterally to spine.

"This is a very important procedure," Dr. Welch stated. "It not only fuses the spine but it also allows movement and reinforces the spinal ligaments. It may ultimately prove safer and more effective than disc replacement."

Chronic back pain in the lumbar region, caused by problems with the intervertebral discs, is usually given noninvasive treatment for as long as possible. When such treatment no longer provides relief, the primary solution until now has been removal of the affected discs and fusion of the vertebral segments. It is estimated that nearly 400,000 people in the U.S. undergo fusion procedures each year.

Although new in the United States, the Dynesys system has been available since 1994 in Europe where over 8,000 patients have been successfully treated, according to Dynesys developer Centerpulse Spine-Tech.

The University of Pittsburgh's Spine Services Division is among a select few leading spine centers across the United States to participate in this study. Physicians and developers are confident that this FDA clinical study will provide strong evidence of its efficacy and mark a major step forward in treating lower back and leg pain.

While under study in the United States, the Dynesys system is considered an investigational device and is limited by federal law to investigational use. ■

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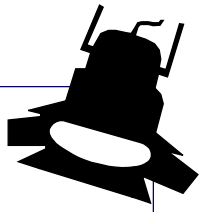
Spotlight: Our 'Centers of Excellence'



Neurosurgery's focalized interests foster precise care

At the University of Pittsburgh, neurosurgery has become stronger through the use of "centers of excellence." In this model, neurosurgical subspecialists devote time to research and patient care in 16 focused areas. The collaboration of physicians in these 16 centers enables us to provide precise patient care.

Center for Cranial Nerve Disorders. Provides care for cranial disorders such as trigeminal neuralgia, facial pain, hemifacial spasm, Bell's palsy, glossopharyngeal neuralgia, torticollis, tinnitus, essential hypertension, balance disorders, and other blood vessel compression syndromes.

Center for Endovascular Therapy. Management and treatment of complex blood vessel disorders using minimally invasive techniques and navigating inside blood vessels themselves.

Cerebrovascular Surgery Section. Stroke-related treatment including management of intracerebral or subarachnoid hemorrhage, arteriovenous malformations, and extra- and intracranial occlusive vascular problems.

Brain Tumor Center. Treatment for a wide variety of malignant and benign brain tumors in conjunction with medical neuro-oncologists and the University of Pittsburgh Cancer Institute.

Center for Image-Guided Neurosurgery. Minimally invasive radiosurgery (featuring two Gamma Knife® units) of brain tumors, vascular malformations, movement disorders (including Parkinson's Disease) and chronic pain.

Center for Minimally Invasive and Cranial Base Neurosurgery. Treatment of complex disorders involving the skull base including benign and malignant brain tumors, pituitary tumors, congenital anomalies, trauma, and vascular anomalies. Features state-of-the-art microsurgical and endoscopic treatment for brain and spinal disorders.

Neurosurgical Spine Services Division. Provides care for patients and athletes who have spine injuries, painful disc conditions, neck, arm, back or leg pain. A leader in numerous leading edge, minimally invasive techniques including CyberKnife® radiosurgery.

Brain Trauma Research Center. Clinical management, research, and treatment for traumatic brain and spinal injuries.

Center for Injury Research and Control (CIRCL). Conducts injury control research, provides training for health care professionals, and informs the public and community leaders on injury control measures.

Pediatric Neurosurgery. Treatment of children with tumors, spinal deformities, cranial malformations, spasticity, and epilepsy, as well as adults with neurological diseases stemming from childhood or congenital conditions.

Center for Clinical Neurophysiology. Expertise in technologies that help diagnose disease, facilitate safe surgery, and monitor ICU patients.

Center for Surgical Pain Management. Provides a multitude of surgical options for the management of intractable pain syndromes ranging from head and facial pain syndromes to problems of cancer pain, failed back syndrome and other chronic benign and malignant pain problems.

Surgical Epilepsy Center. Provides state-of-the-art surgical techniques as applied to the diagnosis, cure and/or treatment of adults and children with medically intractable epilepsy.

Brachial Plexus and Peripheral Nerve Injury Center. Provides treatment of adults and children with brachial plexus and peripheral nerve problems including birth injuries, trauma, thoracic outlet syndrome, tumors, and entrapment neuropathies

Community Neurosurgery. Provides comprehensive neurosurgical patient care at the region's leading community hospitals in the eastern suburbs of Pittsburgh.

Tri-State Neurosurgical Associates. Practicing neurosurgeons in the western Pennsylvania, eastern Ohio, and northern West Virginia areas.

To contact any of the physicians associated with our centers of excellence, please contact us at (412) 647-3685 or neuroinfo@upmc.edu. ■

Changes in resident work hours: Is it the right course?

by Douglas Kondziolka, MD

There is no doubt that residents work long hours. In perhaps no other profession are students/physicians asked to meet a standard so high. Whereas their classmates may already be practicing in the Family Medicine environment, residents choosing a surgical subspecialty end up working hours much longer than their compadres from medical school. The hours are much longer than most other professionals at similar ages.

Given the amount of material they are asked to learn and the breadth of disease that they must become familiar with, the work hours would seem reasonable. Work a full day and operate on a number of patients, take care of them at night and meet many new patients transferred to the Emergency Room or direct to the Intensive Care Unit, and then often be asked to work a full day the next. Is this a reasonable way to meet the interesting duality of residency: learn the profession and actually take care of people at the same time? The Accreditation Council for Graduate Medical Education (ACGME) does not think so.

Will shorter hours mean inferior neurosurgeons who leave residency with less experience than those trained in the past? This may not in fact be true. The American Board of Neurological Surgery has never set numerical standards for the number of aneurysms one must clip to be proficient, nor the number of lumbar laminectomies one must do to have seen a wide spectrum of outcomes (can one ever do enough?). Nevertheless, it is intuitive that less hours spent in training leads to less training. A neurosurgeon with less training may be less equipped to deal with the demands of the specialty.

Dong Woo John Chang, MD, a neurosurgeon at Ohio State University, surveyed neurosurgery program directors (42% response) and neurosurgery residents (10% response). He found that 62% of neurosurgery residents and 79% of program directors opposed work hour restrictions. A negative effect on neurosurgical training was expected by 56% of residents and 80% of program directors. At the same time, 82% of residents did not want lengthening of neurosurgical training to make up for the reduced numbers of weekly hours.

The Accreditation Council for Graduate Medical Education (ACGME) now requires all residency programs to limit work to no more than 80 hours a week averaged over a four-week period.

Other possible solutions included both lengthening or shortening residency, increasing the number of residents, employing foreign medical graduates, physicians assistants or nurses to take up some of the work of the residents, instituting a night float system, or reducing research and elective time. Employing physician extenders is costly, but may be the simplest way to address the work force problem.

As one of the largest training programs in the United States with three graduating residents per year, our center is better poised to meet these restrictions than programs training one resident a year, perhaps already stretched too thin. On the other hand, with the program treating a large number of patients (over 7,000 surgeries last year) the wide variety of educational opportunities available to our residents makes them willing to stay a little longer or work a little harder. We are watchful that their desire to learn more and see more (the education component) does not exceed the work force restrictions (the "service component").

James Bean, MD, chair of the AANS/CNS Washington Committee raised the important question of the effect of resident work hour restrictions on the work ethic of neurosurgeons entering practice. Will neurosurgeons who have trained under an 80 hours work week limit their practice? Are they poised to service their communities and practices for more than 80 hours a week? Will they have the mindset of leaving the hospital, and their patients, to the care of others simply because that was the model they were exposed to in residency?

In Europe, many countries have much shorter work weeks for their residents. Has this led to a lack of neurosurgical service or fewer adequately trained neurosurgeons? Such answers remain unknown?

It is clear that American patients have become used to the fact that there has always been a neurosurgery resident waiting for them at a Level I trauma center and a resident available to speak to families in the middle of the night when their loved one entered the hospital with a severe brain injury. On one hand, the public is used to the tremendous value of resident service. By reducing their opportunity for education – what the resident truly seeks – the public may be asking for a different kind of neurosurgeon. Perhaps not the kind they truly want. ■

Dr. Kondziolka
Vice Chairman, Education

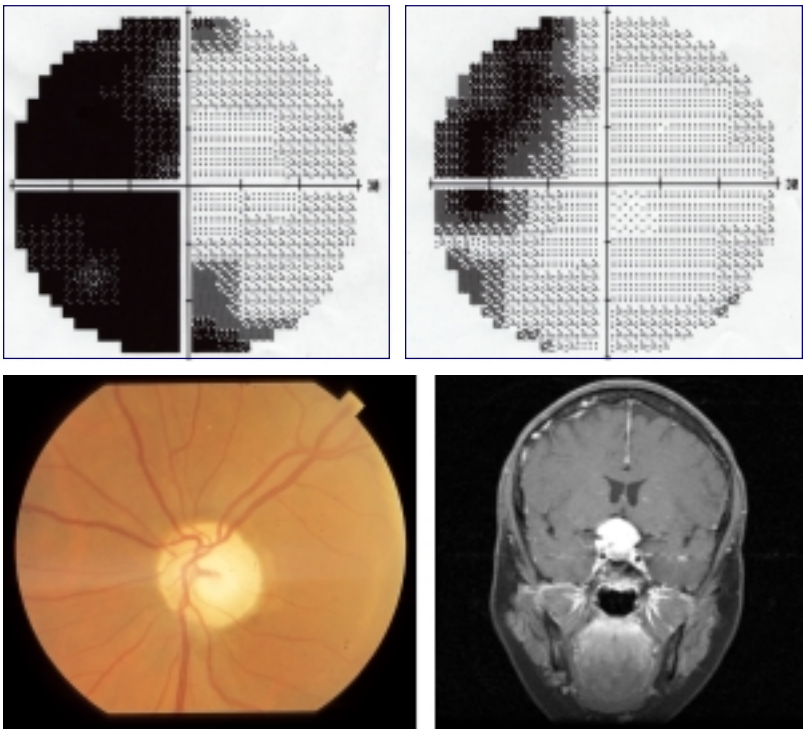
Neuro-Ophthalmology Service plays integral diagnostic role

by Tammy Capazzoli
Neuro-Ophthalmology Coordinator

The neuro-ophthalmology service at the UPMC Eye Center in the Eye and Ear Institute serves an integral purpose in the diagnosis of neurosurgical disease and the management of affected patients. The physicians within the Department of Neurosurgery at the University of Pittsburgh Medical Center work closely with the Neuro-Ophthalmology Unit, to determine optimal visual outcomes, both within the pre- and post-operatively neurosurgical milieu.

Important surgical management decisions often rely on the neuro-ophthalmic examination. Many of the patients referred from the Department of Neurological Surgery are diagnosed with pituitary tumors and other skull base tumors.

Given the proximity of the skull base and pituitary gland to the optic apparatus, it is necessary to formally address any neural compression pre-operatively and after surgical decompression has been accomplished. In order to assess clinical outcome objectively, formal examination of visual function is very helpful, if indispensable, and it is readily and easily available through the neuro-ophthalmology service.



(top) Improvement in visual field defect after pituitary tumor decompression; (bottom left) MRI of a typical tumor of the sella displacing the optic apparatus sideways invariably causing loss of vision and potentially irreversible optic atrophy; (bottom right) Fundus photograph of an atrophic optic nerve, resulting from tumorous compression and it is most often associated with field of vision loss.

Neuro-Ophthalmology director Misha L. Pless, MD, (r) with coordinator Tammy Capazzoli.

The value of the neuro-ophthalmology service in neurosurgery management is most notable in helping establish the relationship between tumor or lesion and the optic apparatus. Neuro-ophthalmic evaluation is most helpful to the neurosurgeon in the process of decision-making regarding the timing of surgery.

A skull base tumor may not appear impressive in size on a MRI but the patient may already present with significant visual loss – the magnitude of visual loss by chiasmal compression is directly proportional to the rapidity of growth, and tumor size, and usually inversely proportional to the chronicity of compression. Urgency for surgical decompression aimed at visual preservation and vision restoration is decided upon within a team environment in which neurosurgical intervention is melded with neuro-ophthalmic input. Similarly, decisions not to intervene surgically are often taken after careful neuro-ophthalmic evaluation is in place. Finally neuro-ophthalmic consultation is exceedingly useful to the neurosurgeon in establishing whether or not a given visual deficit corresponds to a given compressive mass lesion.

The neuro-ophthalmologist is able to establish the cause of visual loss by having at his or her disposal many different techniques of studying visual function with great accuracy. A patient who presents with a pituitary tumor and happens to have glaucoma and/or cataracts could have significant visual dysfunction. It must not be assumed the visual loss has resulted from tumor compression until all other possibilities of local disease have been exhaustively ruled out.

The Department of Neurological Surgery and the Neuro-ophthalmology Unit routinely co-manage patients diagnosed with arteriovenous malformation, carotid stenosis, meningioma, carcinoma of the sinuses and aneurysm. The Neuro-ophthalmology Unit also follows patients who have undergone skull base surgical and radiosurgical approaches for tumor management. These patients are co-managed for best results. ■

Normal pressure hydrocephalus: Diagnosis and treatment

Normal pressure hydrocephalus (NPH) is a condition that primarily affects the elderly. Symptoms may include difficulty walking (a magnetic gait in which the patient feels his/her feet are stuck to the ground), urinary incontinence, and cognitive difficulties. Patients may harbor one or more of these signs and symptoms, however, when the full triad is present the chance of relief following cerebrospinal fluid diversion (shunting) is greatest.

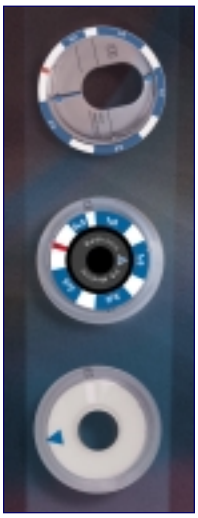
The etiology behind NPH is not known, however, most work points to an alteration in fluid reabsorption and brain tissue compliance. As individuals age, their cerebrums lose tissue water content. This loss increases the brain's compliance making it more easily distensible. Therefore, even at normal cerebrospinal fluid pressures the ventricles enlarge. Imaging studies, alone, however, cannot make the diagnosis of NPH because as individuals age their brain's lose volume and the ventricles enlarge (*ex vacuo* hydrocephalus). With NPH, the ventricular volume gain is often judged to be out of proportion to the degree of tissue shrinkage. In addition, the gyri are often seen to be flattened against the inner surface of the calvarium as opposed to being rounded with enlarged sulci in *ex vacuo* hydrocephalus. Once the ventricles enlarge in NPH they stretch the surrounding white matter tracts creating the symptoms listed above.

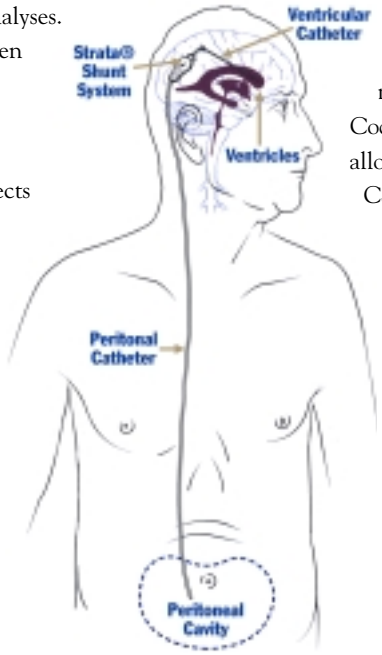
Many elderly patients may present with enlarged ventricles, organic dementia, difficulty ambulating, and incontinence from bladder abnormalities yet not have NPH. To better predict which patients will respond best to ventriculoperiotoneal or lumboperitoneal shunting procedures physicians have employed a variety of tests including spinal fluid taps, cerebral blood flow studies, and cerebrospinal fluid pressure wave analyses. Over the past several years we have chosen to put eligible patients through a trial of continuous spinal fluid drainage so as to temporarily create the conditions of a permanent shunt. By mimicking the effects of VP shunting we feel we can best detect which patients will respond to a surgical procedure.

As per our protocol all patients are seen preoperatively by a urologist to rule out a bladder or sphincter structural abnormality. All are then admitted to the hospital for a four- or five-day evaluation period. Prior to insertion of a lumbar drain individuals have their gaits objectively analyzed by a member of the physical therapy department. Cognitive function is analyzed by a member of the neuropsychiatry department. Once testing is completed a lumbar drain is inserted into the subarachnoid space and approximately 40-60 cc of spinal fluid is drained from the patient every eight hours. Gait is reanalyzed twice a day by the physical therapist and cognition is evaluated by the treating physician, neuropsychiatrist, and/or family member. If patients improve subjectively over the four-day drainage period they are offered a permanent spinal fluid diversion procedure. Those that do not improve are felt to be poor surgical candidates.

Photos courtesy of Medtronic Neurologic Technologies

With five pressure level settings, the programmable, adjustable Strata® valve can be "fine-tuned" by the physician after surgery. Adjusting the valve and verifying the setting is done quickly in the physician's office using a simple set of magnetic tools (below, right), eliminating the need for additional surgeries.





Once the decision had been made to insert a shunt we generally opt for a ventriculoperitoneal system. A programmable valve (Medtronic Strata Valve or Codman Medos Valve) is used because it allows the surgeon to adjust the degree of CSF drainage after insertion without having to reoperate on the patient to place a new shunt with a new higher or lower pressure valve. Patients are usually discharged the following day and followed periodically with clinical examinations and CT scans to assess the operation's efficacy.

If you have a patient with symptoms consistent with suspected NPH, please contact Michael Horowitz, MD or Julie Genevro, BSN, CNRN, at (412) 647-6358 or (412) 647-7768. ■

'Think First For Kids' program teaches young students to think first about safety and injury prevention

Traumatic brain injury and spinal cord injury are the leading cause of death and disability from injury among children and young adults in the United States. More than 22,000 children under 20 years of age die of injuries each year, and about 600,000 are seen in emergency rooms. An additional 30,000 suffer permanent disabilities. Motor-vehicle crashes, falls, sports and recreation - especially diving, and violence are the most common causes of these injuries. Brain and spinal cord injuries are the most devastating and costly type of injury, resulting in more physical and psychological damage and more years of cost productivity, than any other injury. The majority of injuries are preventable.

To help reduce these numbers, the Department of Neurological Surgery's Center for Injury Research and Control (CIRCL) and the Injury Prevention Center at Children's Hospital help sponsor the "Think First for Kids" (TFFK) program, a comprehensive injury prevention program for first through third graders.

TFFK educates students about activities that place them at risk, while teaching them proper ways to stay safe and injury-free. The program helps students develop lifelong safety habits to minimize their risks of sustaining brain, spinal cord, and other traumatic injuries.

After introducing brain and spinal cord anatomy, the program focuses on safety in motor vehicles, water, bicycling, sports and recreation, as well as violence and safety around weapons. The lessons convey the message that children can enjoy a fun-filled, exciting life without hurting themselves if they "think first" and use their minds to protect their bodies.

Chris Vitale, RN, Children's Hospital of Pittsburgh injury prevention coordinator, instructs students on the proper manner to wear a bicycle helmet.

ThinkFirst For KIDS is presented in a classroom format and is designed for full integration into the elementary school curriculum. Each grade has a separate curriculum and array of classroom activities setup specifically for its grade level.

The six-week TFFK curriculum is based on six modules with each module focusing on a specific safety topic. The curriculum, although best presented in its entirety, can be adapted to accommodate the needs and time demands of the school.

The program's curriculum also helps school districts meet certain academic standards set down by the Pennsylvania State Board of Education in the category of Health, Safety and Education.

TFFK was developed by the Think First National Injury Prevention Foundation whose stated mission is to prevent brain, spinal cord and other traumatic injuries through the education of individuals, community leaders and the creators of public policy.

Since its inception in 1998 the Pittsburgh chapter of TFFK has presented the curriculum to more than 10,000 students in almost 70 schools in Allegheny and Beaver counties. In addition, over the last two school years, the local chapter has distributed close to 1,300 bicycle helmets to the students participating in the program.

Karen Zuri is the Pittsburgh chapter's project director and Darius Carlins is the local program coordinator helping conduct school presentations.

P. David Adelson, MD, professor of neurosurgery at the University of Pittsburgh and director of pediatric neurotrauma at Children's Hospital of Pittsburgh, is the local Think First For Kids sponsoring physician. Dr. Adelson is an active member of the national foundation, serving on the board of directors and chairing the Resource Development Committee. He is also the Think First Liaison to the Congress of Neurological Surgeons executive committee.

Think First for Kids works closely with the staff at Children's Hospital of Pittsburgh's Benedum Pediatric Trauma Injury Prevention, and Community Education Departments. For more information on Think First For Kids, contact Carlins or Zuri at (412) 648-3903. ■

University of Pittsburgh Neurosurgery Program Ranked As One Of Best In Country

The University of Pittsburgh Department of Neurological Surgery ranked as one of the best neurosurgery programs in the country in a recent *US News & World Report* magazine poll. The rankings appear as part of the magazine's 14th annual "America's Best Hospitals" article analyzing 203 top medical centers in 17 specialties. Our parent hospital, UPMC Health System, ranked 15th on the list.

The University of Pittsburgh Department of Neurological Surgery is the largest neurosurgical academic provider in the United States, performing over 9,000 procedures annually. We utilize 10-12 technically-advanced operating rooms each day in the four primary site hospitals that we staff. Our physicians are leaders in their field pioneering advances in brain, neck, spine and peripheral nerve care.

The "America's Best Hospitals" article appeared in the July 28 edition of the magazine.

Annual Report

The Department of Neurological Surgery's 2003 annual report is now available. A .pdf copy of the report is available on our website at www.neurosurgery.pitt.edu. If you would like to receive a printed copy of the report, please contact us at (412) 647-3685 or e-mail us at neuroinfo@upmc.edu.

Grants And Awards

• "Transcriptomic Analysis of Therapeutics in Brain Trauma," **C. Edward Dixon, PhD**, NIH - National Institute of Neurological Disorders and Stroke ($446,000).

• "Video Compression for Remote Monitoring of Neurosurgery," **Mingui Sun, PhD**, NIH, National Institute of Biomedical Imaging and Bioengineering ($1,120,237).

• "Center for Injury Research and Control CDC Grants," **Harold B. Weiss, MS, MPH, PhD,** Centers for Disease Control and Prevention ($4,498,178).

• "A Clinical Study of Dynesys® as a Non-Fusion Device for Spinal Stabilization," **William C. Welch, MD**, Centerpulse Spine-Tech, Inc. ($131,400).

More information on these and other grants underway at our department can be found on our website's *Research* section.

Announcements

• The *Journal of Neurotrauma* invited **C. Edward Dixon, PhD**, to serve on their editorial board effective August 1.

• **A. Leland Albright, MD**, served as visiting professor at the University of Mississippi, October 14-15.

• **Douglas Kondziolka, MD**, served as visiting professor at Dalhousie University in Halifax, Canada, September 16-17.

• **Ghassan Bejjani, MD**, served as visiting professor at the American University of Beirut (Lebanon), August 13, where he gave grand rounds on the adult Chiari malformation. Dr. Bejjani was also appointed delegate of the AANS at the World Federation of Neurosurgical Societies.

• **Dr. Bejjani**, president of the World Association of Lebanese Neurosurgeons, is organizing a homecoming congress for WALN members in Beirut on June 28-30, 2004. For more information visit the organization's website at www.waln.org.

Congratulations

• **Kevin Walter, MD**, completed the HSBC Ironman USA Triathlon in Lake Placid, NY on July 27. Dr. Walter completed the event in 14 hours, 26 minutes and 8 seconds. The triathlon, held at the site of 1932 and 1980 Winter Olympics, consisted of a 2.4-mile swim, a 112-mile bike course and a 26.2 run.

• Dr. Walter's lab student **Daniel Geynisman** was awarded the David B. Anderson Medical Student Summer Fellowship from the American Brain Tumor Association for the project "Microvascular Endothelial Cell Gene Expression Changes Associated with Brain Tumor Angiogenesis." Geynisman completed his first year at the University of Pittsburgh Medical School this past year.

•New baby boy (Zachary David, June 24) to **Dianne Delaney**, senior programmer analyst, and husband Sean; new baby boy (Anthony HanChul, June 22) to **Louisa Urgo**, physician assistant, and husband David; new baby boy (Joseph Robert, April 16) to **Ava Puccio**, traumatic brain injury nurse coordinator, and husband David.

• Marriage for **John Lee, MD**, to Hannah Bae, MD, (Department of Radiology), October 4 in South Korea.

• **Louisa Urgo**, physician assistant, **Gloria J. Greco**, appointment secretary to Ian Pollack, MD; and **Paul Stanick**, web design specialist, were each recognized by UPMC Human Resources in its 2002 Services Awards for five years of service.

Welcome and Transition

Pedro Aguilar, MD, has accepted a position as neurosurgery resident. He is transferring from the University of New Mexico.

Mary Ann Vincenzini is now senior administrative assistant to department chairman L. Dade Lunsford, MD; **Melissa Persinger** is now administrative secretary to John Moossy, MD, and Kevin Walter, MD; **Melissa Lukehart**, resident coordinator, is now also administrative secretary to Douglas Kondziolka, MD.

Upcoming Events

• October 27: **CIRCL 10th Anniversary Symposium Celebration**, 1:00 - 4:00 pm, Biomedical Science Tower, Room S100. Half-day symposium on rural and occupational injuries. (412) 648-2600.

• November 10-14: **Principles and Practice of Gamma Knife Radiosurgery**. Training course targeted at neurosurgeons, radiation oncologists and medical physicists interested in Gamma Knife treatment certification. (412) 647-6483. ■

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Carotid Occlusion Surgical Study to help identify high risk stroke patients

Patients with symptomatic carotid occlusion have a 7% stroke rate per year for five years. While most subsequent strokes are due to embolic events, it has always been suspected that compromised hemodynamics also played a significant role. The inability to identify individuals at increased stroke risk due to compromised hemodynamics is a common explanation of why earlier attempts to surgically improve the cerebral circulation with bypass surgery failed to show efficacy.

With the advent of technologies which can measure the cerebrovascular reserve as well as the oxygen availability, we have found two approaches to identifying a group of patients with a distinctly elevated stroke risk.

The COSS (Carotid Occlusion Surgical Study) is now active at the University of Pittsburgh and at a dozen other sites nationally. This study is NIH-funded and uses the measurement of OEF (oxygen extraction fraction) to identify a high-risk subgroup. The high-risk subgroup will then be randomized to either best medical care or extracranial to intracranial bypass surgery, with careful monitoring of both groups for five years. Even the patients that do not have an elevated OEF benefit from inclusion in the study. Knowing that there is no persistent hemodynamic compromise is important because it allows the treating physician to use aggressive control of blood pressure to prevent future occlusive disease. Because bypass surgery has been shown to carry a very small surgical risk, and because extensive experience in this type of surgery has yielded very high patency rates, we believe that inclusion in this trial should provide clinical benefit to all patients.

If you are aware of a patient suspected of having a carotid occlusion who has had, or continues to have, ischemic symptoms appropriate to an occluded artery, please contact the study coordinator, Lori Kirby, at (412) 647-0948 to arrange a screening clinic visit. To discuss a referral, you can also contact the study's principal investigator, Howard Yonas, MD, director of the UPMC Cerebrovascular Surgery Section, at (412) 647-6360 or yonash@upmc.edu. ■