



## Revascularization: The goal of acute stroke therapy

by Howard Yonas, MD and James Gebel, MD



▲  
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Only by increasing the blood supply to ischemic brain tissue have we been able to alter stroke outcome. However, to date, there is only one FDA-approved reperfusion therapy, intravenous TPA. Currently only 1% of ischemic stroke patients receive this therapy, and even fewer actually benefit from it. Despite extensive efforts to alter the ischemic cascade itself with so-called neuroprotective drugs, clinical trials have failed to demonstrate any benefit for this alternative medical treatment strategy.

At the UPMC Stroke Institute, members of all specialties are working closely together to accomplish revascularization as soon as possible following arrival at UPMC Presbyterian Hospital. When patients are seen within three hours of stroke onset, intravenous TPA is the therapy most capable of restoring flow to the greatest number of patients. The efficacy of this type of therapy has been proven for all ages of patients and for all degrees of neurological impairment.

Today the neurointerventional service at UPMC is delivering thrombolytic therapy directly within a middle cerebral or basilar artery clot. One major clinical trial demonstrated the increased ability of this approach to more readily and completely open occluded large vessel segments. Before becoming a standard of care a larger study will, however, have to be performed confirming the broad application and safety of this approach. An alternative approach utilizes mechanical devices to aspirate or disintegrate the clot. The latter approach is being pursued because of its potential to open occluded vessels more rapidly, and by avoiding lytic agents it is anticipated that the risk of hemorrhagic conversion will be reduced. A number of

different devices are being evaluated for this purpose.

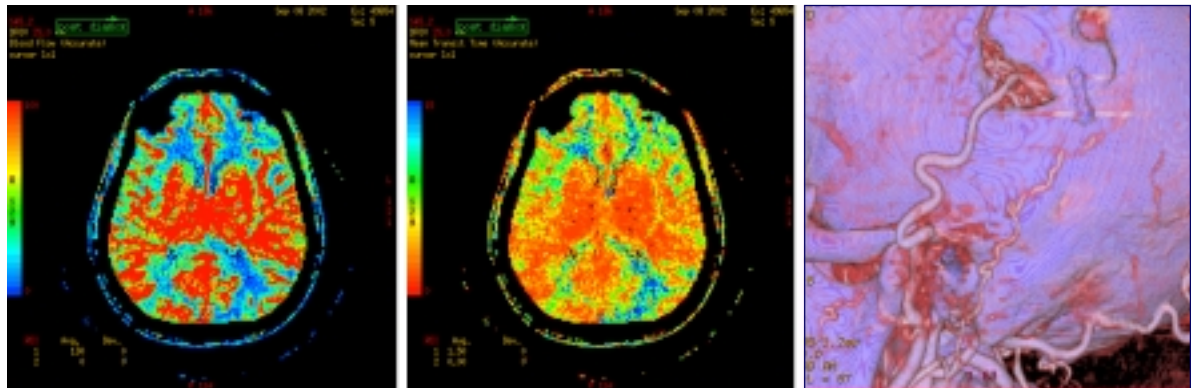
Two such trials—one testing the safety and efficacy of a low frequency ultrasound-based catheter and another testing the safety and efficacy of a high velocity saline jet aspiration catheter—are currently enrolling patients at UPMC Presbyterian Hospital.

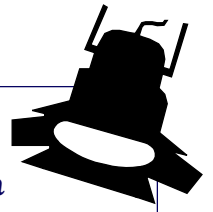
Another important facet of the Stroke Institute is the surgical team that provides the capacity to emergently open extracranial vessels and, in rare circumstances, provide direct revascularization with bypass surgery. Emergent endarterectomy may be lifesaving in those patients in whom occlusion occurs under observation, and in whom surgery can be performed before the intraluminal clot becomes attached to the ICA endothelium. Obviously, the decision to open a large vessel in this setting requires the use of imaging technologies capable of demonstrating that reperfusion can still benefit the tissues at ischemic risk. When life-threatening brain swelling occurs in patients who were or were not candidates for acute interventions the neurosurgical team also selectively offers the lifesaving intervention of hemicraniectomy and resection of necrosed brain.

A final surgical reperfusion strategy recently employed at UPMC in carefully selected patients is extracranial-intracranial bypass surgery. Although a clinical trial failed to demonstrate general benefit of this approach for unselected patients with middle cerebral artery stenosis, members of the medical stroke group have been increasingly impressed by the number of patients who present with large vessel occlusion, often beyond three hours post stroke onset, who have a mild to moderate deficit on arrival which markedly

(see *multi-faceted* on page 3)

▶  
(Left to right),  
Blood flow, mean  
transit time, CT  
Angiogram. CT  
Perfusion and CT  
Angiogram provide  
new window to  
physiology and  
anatomy.





**Spotlight: The Web**

**Neurosurgery website provides wealth of information**

by Paul Stanick

The importance and relevance of a good, thorough website was perhaps never more underscored than in a recent conversation a physician had with a prospective patient. Asked by the physician why the gentleman had not chosen to visit him earlier for the treatment of a condition the physician specialized in, the gentleman responded, "Well I checked the web and I didn't see you mentioned anywhere."

Granted, the time is not yet here where individuals are using the internet as their sole source for determining the direction of their medical care, but the internet is quickly becoming the main starting point in gathering the vital information needed for making critical medical decisions.

Almost three years ago, the Department of Neurological Surgery at the University of Pittsburgh set out on a project to establish itself as the preeminent neurologic academic site on the internet. The resulting website at [www.neurosurgery.pitt.edu](http://www.neurosurgery.pitt.edu) is an encyclopedic source of departmental information, ranking consistently at the top of Yahoo in "neurosurgery" searches.

The intent was to provide a wealth of information for prospective patients and colleagues. At our site, users will find summaries of the many centers of excellence present here and the specialties they provide, information on the many ongoing research projects, biographies of our faculty, detailed information on the many training programs offered, and instructions for patients when visiting our clinic...plus a host of other information.

The intent was also to provide all this information in a user-friendly manner. As a result, the site features easy navigation through its 500+ pages and contains a search function that quickly answers user

queries. The site is presented in an organized, graphically-pleasing format while never sacrificing substance for flash.

The website takes advantage of the industry-standard QuickTime and RealPlayer technologies to present numerous videos on key subjects including coil treatment, microvascular decompression and brain bypass surgery. A particularly popular video is the Gamma Knife video, a 17-minute presentation on what patients can expect from this leading edge, minimally invasive treatment of brain disorders.

Taking the QuickTime technology one step further, the website features a

virtual tour of the Gamma Knife suite, allowing patients to "walk through" and see all aspects of the treatment area.

Copies of the *University of Pittsburgh Neurosurgery News* newsletter are archived and available in .pdf format and users can

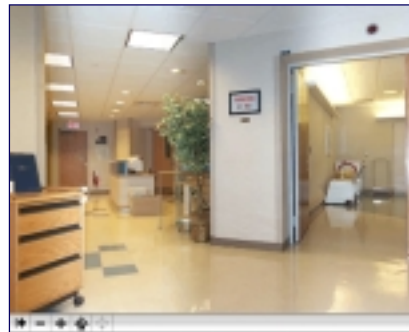
sort through news releases and other items of interest dating back to 1996.

Physician bios are linked to the National Library of Medicine's *PubMed* publication database providing researchers and patients alike quick, easy access to published articles.

Links are provided to websites of interest including neurological-related sites and Pittsburgh-related sites. Our site also features an interactive map to our clinic, including driving directions from any location in the United States and Canada.

As extensive as this website is, it still only scratches the surface of what is ongoing at this leading academic institution. Plans are in motion to further enhance the site for the betterment of the thousands of worldwide users who visit the site weekly. ■

▲ **Our website includes a number of videos including a QuickTime virtual tour of the Gamma Knife suite patient area.**



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**Research Associate**

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## Multi-faceted UPMC stroke team providing state-of-the-art care

(continued from page 1)

worsens over the next 24 to 48 hours. Cerebral perfusion studies in such patients have shown large areas of diffusion-perfusion “mismatch” between the relatively small area of brain tissue that is dead on arrival to the hospital (diffusion positive) with a comparatively large area which is still viable but underperfused. The “mismatched” region being at risk for subacute infarction if blood flow is not restored. Perfusion can be measured today with a number of technologies (MRI, CT perfusion, xenon133 CBF and by Positron Emission Tomography).

Members of the stroke team have realized that the only hope for stopping the relentless loss of additional viable brain tissue to ongoing ischemia is by supplying more blood to the region beyond the point of vessel occlusion. In this setting extra to intracranial bypass surgery has recently been employed to halt the ischemic process. This

novel treatment has been successful for stopping the ischemic process in two patients that were clearly worsening despite optimal medical therapy. UPMC is one of a dozen medical centers in the United States participating in an NIH-sponsored clinical trial re-examining the issue of extracranial-intracranial bypass surgery in patients with occluded internal carotid arteries and hemodynamic TIA and stroke symptoms.

It is clear that with teamwork and the integration of extensive and novel capabilities by each facet of the stroke team that we are succeeding in our mission of providing the best care for the greatest number of stroke patients. Future efforts will continue to work toward not only better therapies but also toward the development of imaging technologies more capable of defining and accurately quantifying the severity of ischemic injury. Only with such information can reperfusion therapy be most effectively delivered to acutely ill stroke patients. ■

### Chairman's Letter: Dr. L. Dade Lunsford

#### *Transition is the key word as department begins challenges of a new fiscal year*

The Department of Neurological Surgery completed a record year in June 30, 2002, performing more than 6,500 operations at our affiliated institutions. We continue to pioneer patient care and investigative efforts as well as to perform our educational mission.

We welcome three beginning neurosurgery residents, Dr. David Atteberry, Dr. Paul Gardner, and Dr. Jonathan Eng. In addition, we welcome our two PGY-1 residents who began July 1, Dr. Karl Lozanne (Yale University) and Dr. Stephen Pirris (University of Pittsburgh).

We are now in a period of some transition within the department. I have served for five years as department chair, having served as interim chair for two years prior to that. As I reflect backwards, I can see the enormous growth of our department in terms of its clinical mission as well as its research goals.

We have continued to build our faculty. We welcome Dr. Kevin Walter, a recent graduate of the Johns Hopkins program, to the Pittsburgh area. Dr. Walter has a special interest in brain tumor management and will be heavily involved in the joint UPCI and Department of Neurosurgery Brain Tumor Center. His efforts will include both UPMC Presbyterian, UPMC Shadyside and UPMC St. Margaret's. His wife, Ellie Carson Walter, PhD, has joined our department to apply her molecular biology expertise. She will help to direct and to fine tune our basic molecular neurosurgery research laboratory.

It is with deep regret, however, that I announce that Dr. Donald Marion, a colleague and friend for more than 20 years, has accepted a new position as Professor and Chairman of the Department of Neurological Surgery at Boston University in Massachusetts.



Don has had a long interest in pursuing leadership of a department, and we wish him the best on this new venture. Dr. Marion's legacy here at the University of Pittsburgh is profound, and includes the development of an internationally recognized CNS trauma program, the successful funding and refunding of a program project grant (The Brain Trauma Research Center), and for many years directorship of the Centers For Disease

Control (CIRCL) grant.

Any leader should help to prepare for such a transition by ensuring that there is sufficient depth that will allow his legacy to continue. Don has done an admirable job in that regard as we might have expected. Dr. Ed Dixon from our department will take over the leadership of the Brain Trauma Research Center and as principal investigator of the program project grant. Dr. David Adelson, associate professor of neurological surgery, and a skilled pediatric neuro-traumatologist, will assume the directorship of the clinical core. Dr. Hank Weiss will head the CIRCL grant.

Transitions are often difficult for patients, colleagues, and resident trainees. While change always brings a certain amount of anxiety, it also prods us to continue to provide the brightest and best opportunities for new faculty to join us. We will continue to search for the best fit for new colleagues to join our robust program, which has 22 clinical neurosurgical practitioners.

We should be proud that other universities want to attract our colleagues. This is a testament to their skills and productivity. When it happens, we will ensure the stability of our program by reaching within and without to ensure continuity of our tripartite mission: patient care, innovative investigation, and education designed to ensure the future of neurosurgery. ■

# The Cerebrovasculature at the University

## Dr. Howard Yonas



Dr. Howard Yonas is director of the Cerebrovascular Surgery Section and co-director of the Stroke Institute at the University of Pittsburgh Medical Center as well as vice chairman of the

Department of Neurological Surgery.

He joined the faculty of the Department of Neurological Surgery at the University of Pittsburgh in 1978 after completing fellowships in microsurgery there and at the Kantonsspital in Zurich, Switzerland.

Dr. Yonas earned a bachelor's degree in chemistry from the University of Pittsburgh in 1966 and an M.D. degree from Ohio State University in 1970. After an internship in surgery at the University Hospital of Cleveland, he served for two years as a flight surgeon in the United States Air Force. He then completed his residency in neurosurgery at the University Hospital of Cleveland.

Dr. Yonas is actively involved in research concerning cerebrovascular diseases, including the clinical application of quantitative cerebral blood flow measurements, alternate approaches for the physiological monitoring of patients with cerebral ischemia, and better understanding mechanisms of formation as well as optimum treatment of cerebral aneurysms.

Dr. Yonas was appointed to the Peter J. Jannetta endowed chair in 1998.

## Dr. Amin Kassam



Dr. Amin Kassam is the director of the Center for Cranial Nerve Disorders and Microvascular Surgery. He is also the co-director of the Center for Cranial Base Surgery and associate director of the Center for Cerebrovascular Surgery.

Dr. Kassam completed his medical and undergraduate education at the University of Toronto and his residency and fellowship training at the University of Ottawa. Following this, he completed postgraduate training in Epidemiology and currently is establishing a Neuroepidemiology and Outcomes Research Center (NORC) to study cost-effectiveness and clinical practice patterns.

Dr. Kassam joined the faculty of the Department of Neurological Surgery at the University of Pittsburgh in February of 1998. He spent the next year focusing on Microvascular Surgery and now serves as the director of this Center. Dr. Kassam has performed over five hundred microvascular decompressions for cranial neuropathy and has provided a unique perspective by using the endoscope to visualize difficult regions.

Since his appointment, he has also built a collaborative center to provide comprehensive care for complex pathology of the skull base. This center builds on the strength of combining the talents of surgeons from multiple specialties. This allows for the use of proven conventional approaches in conjunction with new minimally invasive endoscopic approaches to provide safe and effective treatment for patients.

Dr. Kassam remains active in cerebrovascular surgery and has helped to develop a program to better understand the genetic alterations that lead to the development of intracranial aneurysms.

## Dr. Michael Horowitz



Board-certified neurosurgeon and neurointerventional radiologist Michael Horowitz, MD, earned his medical degree from the University of Rochester.

Following a neurosurgical residency at the University of Pittsburgh and an interventional neuroradiology fellowship at the University of Texas Southwestern Medical Center at Dallas, he was assistant professor of neurosurgery and radiology at the University of Texas Southwestern Medical School.

Dr. Horowitz serves as associate professor of neurosurgery and radiology at the University of Pittsburgh School of Medicine and co-director of UPMC's Center for Neurointerventional and Neuroendovascular Therapy. He is an active participant in the Department of Neurological Surgery's Cranial Nerve Disorders Center where he functions as the academic director.

## Dr. Daniel Wecht



Dr. Daniel Wecht joined the Department of Neurological Surgery as clinical assistant professor in September of 1999 and was recently promoted to the position of clinical associate

professor in the department.

Dr. Wecht graduated from Harvard University and attended medical school at the University of Pennsylvania. He completed his neurosurgery residency at Baylor College and received additional training at Yale University School of Medicine in neurovascular disease. He is board certified with the American Board of Neurological Surgery.

The Cerebrovascular Surgery Section at the University of Pittsburgh provides comprehensive cerebrovascular care. It is nationally known for its work in diagnosis and outcomes studies. The section is led by Dr. Michael Horowitz and Daniel Wecht. The surgical team includes Dr. Lawrence Wechsler, Dr. Wechsler and Tudor Jovin. Drs. Horowitz and Charles Jungreis collaborate closely with all members of stroke program. This program includes Dr. Douglas Kondziolka.

The stroke effort is also closely supported by medicine and neurology departments. This team in conjunction with neurology works with acute as well as subacute and chronic ischemic stroke patients with thrombotic occlusions and intracranial aneurysms.

Specific efforts unique to this center include research in cerebral aneurysms and stroke prevention. The center has also been instrumental in the development of blood flow with stable xenon. Current efforts of the group include the study of acute cerebrovascular accidents who may benefit from early treatment to reduce infarction size. ■

Dr. Wecht specializes in the treatment of brain tumors and cerebrovascular diseases, such as stroke, aneurysms, vascular malformations and carotid artery disease. He also has an active spine and general neurosurgery practice.

Dr. Wecht has been a neurosurgical faculty member at Yale University, (New Haven, CT), University of New Mexico, (Albuquerque, NM) and Allegheny University of the Health Sciences, (Pittsburgh, PA). He is an active participant in multiple professional and scientific societies.

## Dr. Lawrence Wechsler



Dr. Wechsler, professor of neurology and neurological surgery, is director of the UPMC Stroke Institute. He is also vice chairman of clinical affairs with the Department of Neurology.

A nationally recognized expert in the diagnosis and treatment of stroke, he has served as the director of the Stroke Institute of the University of Pittsburgh for the last 15 years.

Dr. Wechsler has directed both the clinical service as well as the development of the research efforts of the stroke program. His clinical skills are recognized widely as is his strong teaching capability.

He has authored numerous articles and chapters pertinent to stroke, stroke treatment and Transcranial Doppler.

# Neurological Surgery Section University of Pittsburgh

University of Pittsburgh is a leader in regional neurovascular research, high-risk vascular surgery. Dr. Howard Yonas and assisted by Drs. Amin Kassam, Dr. James Gebel is integrated within the UPMC Stroke Institute. Dr. Gebel is joined by stroke specialists Drs. James Gebel and Dr. L. Dade Lunsford compose the interventional radiology team that the section is also assisted by Drs. L. Dade Lunsford

Members of the internal as well as rehabilitation and their respective nursing staffs provide care for patients with stroke, intracranial hemorrhage, arteriovenous malformation

Research toward early and noninvasive detection of stroke. Dr. Gebel has been a leader in the study of quantitative cerebral blood flow. The group focus on the early identification of patients with stroke and clot lysis therapies or drugs designed to reduce

## Dr. James Gebel



Dr. Gebel is an assistant professor of neurology at the UPMC Stroke Institute. His research interests include the study of patients with intracerebral hemorrhage, their long-term outcomes, and how patterns of cerebral blood flow and the formation of edema around hematomas affect outcome.

His other research interests include outcome following surgical versus medical therapy for carotid stenosis, cerebral blood flow patterns in patients with acute ischemic stroke, and the epidemiology of stroke by ethnicity in the U.S.

Dr. Gebel is currently studying the effects of disturbances in platelet function and coagulation cascades on hematoma volume, edema formation, cerebral blood flow, and risk of rebleeding in patients with intracerebral hemorrhage as part of an NIH-funded study.

## Dr. Tudor G. Jovin



Dr. Tudor Jovin, assistant professor of neurology, joined the faculty of the department of neurology, VA Medical Center and the Stroke Institute in 2002. A graduate of the University of Dusseldorf, Germany, Dr. Jovin trained in neurology at the University of Pennsylvania

and completed a two-year cerebrovascular fellowship at the University of Pittsburgh. He is currently pursuing further training in interventional vascular neurology. His research interests include imaging of acute stroke and symptomatic carotid plaques.

## Dr. Charles Jungreis



Charles Jungreis, MD is a board-certified radiologist with a certificate of added qualifications in neuroradiology and professor of radiology and neurosurgery at the University of Pittsburgh. Dr. Jungreis earned his medical degree from the State University of New York, Downstate Medical Center. A general surgery internship was followed by a radiology residency at North Shore University Hospital, Cornell Medical College and a neuroradiology fellowship at New York University.

He has been an interventional neuroradiologist at the University of Pittsburgh since 1986.

## Dr. L. Dade Lunsford



Dr. Lunsford is the Lars Leksell professor and chairman of the Department of Neurological Surgery and professor of radiology and radiation oncology at the University of Pittsburgh. He is chief of neurological surgery, and director of the Center for Image-Guided Neurosurgery at the University of Pittsburgh Medical Center.

An internationally recognized authority on stereotactic surgery. Dr. Lunsford is responsible for bringing the Gamma Knife to the University of Pittsburgh Medical Center—the first center in the United States to offer this state-of-the-art, minimally invasive form of brain surgery.

Dr. Lunsford received his medical degree in 1974 from the Columbia University College of Physicians and Surgeons. He completed his internship in surgery at the University of Virginia Hospital and his residency in neurological surgery at the University of Pittsburgh.

Following a one-year fellowship in stereotactic and functional neurosurgery at the Karolinska Institute in Stockholm, Sweden, Dr. Lunsford joined the Department of Neurological Surgery faculty in 1980.

His memberships in professional organizations include the Society of Neurological Surgeons, the American Association of Neurological Surgeons, the Congress of Neurological Surgeons, the American Academy of Neurological Surgery, the American Society for Stereotactic and Functional Neurosurgery, and the International Stereotactic Radiosurgery Society. He is a Fellow of the American College of Surgeons.

Dr. Lunsford was president of UPMC Presbyterian Medical Staff 1999-2001.

## Dr. Douglas Kondziolka



Dr. Douglas Kondziolka joined the faculty of the Department of Neurological Surgery at the University of Pittsburgh in January 1992 and later was named Chief of Stereotactic and Functional Neurosurgery. He also serves as the department's director of education.

Dr. Kondziolka received his medical degree from the University of Toronto and graduated from the neurosurgery residency program in 1991. Previously, he completed a microbiology specialist program at the University of Toronto. From 1989 to 1991 at the University of Pittsburgh, he completed a master of science program in the Department of Behavioral Neuroscience and a fellowship in stereotactic surgery and radiosurgery in the Department of Neurological Surgery.

Dr. Kondziolka is an internationally known expert in radiosurgery and stereotactic surgery. His clinical interests include brain tumor management; movement disorder surgery; Gamma Knife radiosurgery of vascular malformations, tumors, and functional disorders; and trigeminal neuralgia.

Dr. Kondziolka has a special interest in the care of patients with acoustic neuromas and brain metastases. He also is the principal investigator of the first clinical neurotransplantation trials for the care of patients with stroke.

Dr. Kondziolka is a two-time recipient of the Mahaley Award for brain tumor clinical research from the Joint Section on Tumors of the AANS/CNS as well as the Lars Leksell Award from the World Federation of Neurosurgical Societies.

Dr. Kondziolka is a principal on the editorial board of *Neurosurgery*, editor of *Radiosurgery* and numerous other journals.

He is currently president of the American Society for Stereotactic and Functional Neurosurgery, vice-president of the International Stereotactic Radiosurgery Society, and sits on the executive committee of the Congress of Neurological Surgeons. ■

(continued from back cover)

into alignment with the observed position of the treatment target. The CyberKnife aims each beam independently, without a fixed isocenter. When the target moves, the process detects the change and corrects the beam pointing in near real-time.

The CyberKnife was first developed for the treatment of brain tumors at Stanford University. The unit at UPMC Shadyside is one of only six such machines that are actively being used in the United States.

The CyberKnife is currently available for treatment of lesions throughout the spine. These lesions may be either benign or malignant including metastases, meningiomas, neurofibromas, schwannomas, and vascular malformations. The CyberKnife has been used to successfully treat lesions in patients who are otherwise not candidates for surgery or for lesions that are not amenable to open surgical techniques. We continue to prefer the Gamma Knife for brain radiosurgery

#### ***How does the treatment process work?***

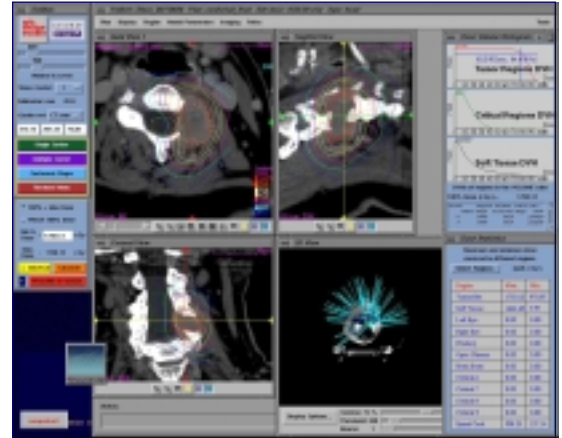
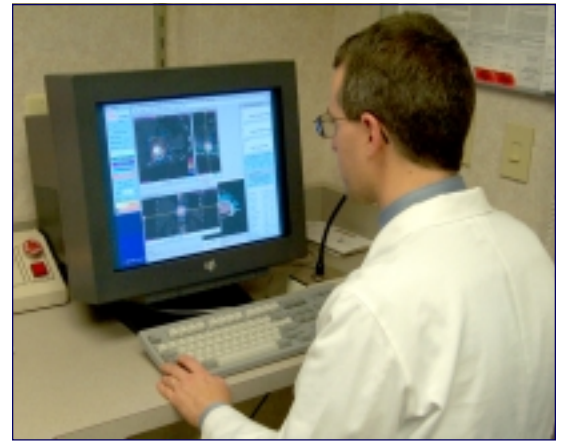
Patients with cervical lesions undergo a CT scan as an outpatient. For thoracic and lumbar lesions, patients first undergo the percutaneous placement of fiducial bony markers as an outpatient. The patient then returns for a CT scan of the tumor. The imaging is transferred to a work station where a treatment plan is developed.

Once the treatment plan has been finalized, the patient returns several days later for the actual treatment. The treatment time takes approximately one to three hours. No sedation is necessary as the patient is able to comfortably lie on the table throughout the procedure.

Spinal stereotactic radiosurgery using a frameless image-guided system can now be performed safely, accurately, and effectively. This technique offers a successful alternative therapeutic modality for the treatment of a variety of spinal lesions not amenable to open surgical techniques, in medically inoperable patients, lesions located in previously irradiated sites,



***Radiation therapist prepares patient for CyberKnife.***



***(Top photo), Dr. Peter Gerszten prepares treatment plan for patient; (bottom), treatment plan for a woman with a large left C5 renal cell metastasis. She had previously undergone external beam irradiation with maximum spinal cord tolerance dose. The tumor was treated with a single fraction of 15 Gy to the 80<sup>th</sup> percentile. Within three weeks, she had significant improvement in her left arm pain.***

or as an adjunct to surgery. The major potential benefits of radiosurgical ablation of spinal lesions are short treatment time in an outpatient setting with no recovery time and good treatment effect.

Research is currently in progress at our institution in evaluating the outcomes of patients who undergo CyberKnife radiosurgery for treatment of neurosurgical lesions. A research grant has been awarded by the American Association of Neurological Surgeons and Congress of Neurological Surgeons Section on Disorders of the Spine and Peripheral Nerves to perform this study.

The Department of Neurological Surgery is working closely with members of the Department of Radiation Oncology, including Dr. Steven Burton and Dr. Shalom Kalnicki, in defining the indications for this new treatment.

Patients who might be candidates for CyberKnife radiosurgery should be referred to the CyberKnife clinic at Shadyside Hospital at (412) 623-6720. ■

### Plans Announced for Sheptak Chair

The Department of Neurological Surgery at the University of Pittsburgh has announced plans for **The Peter E. Sheptak Endowed Chair in Neurological Surgery**. The chair will provide recognition of the career contributions of this talented and unique individual.

Dr. Sheptak has served with great distinction as clinical professor of neurological surgery at the University of Pittsburgh for more than ten years and as vice chairman of the department for five years. He has performed innovative, investigative and clinical work related to spinal degenerative disorders, pain management, cerebrovascular disease, and brain tumors.

Completion of the Peter E. Sheptak Endowed Chair will help promote the career of the next generation neurological surgeon.

For more information, please contact the department at (412) 647-0990.

### Recent Grant Awards

- “Novel Strategies for Brain Tumor Therapy,” **Dr. Ian Pollack**, NH, National Institute of Neurological Disorders and Stroke (\$6,857,707). Study testing hypothesis that novel therapeutic strategies — that take into account the unique features of malignant brain tumors — will induce tumor regression, and potentiate conventional therapies.

- “Inhibition of Growth Factor,” **Dr. Ian Pollack**, National Brain Tumor Foundation (\$25,000). Characterize the effects of glioma cell growth and viability, both *in vitro* and *in vivo*, of small molecule inhibitors of EGFR and PDGFR, G-protein signaling, protein kinase C inhibition, P13-kinase, S6kinase, MAPK kinase, and other downstream targets using a genotypically defined subset of malignant glioma cell lines.

- “Evaluation of Pfizer NOS Inhibitor on Cerebral Oxygenation by NIRS,” **Dr. Edwin Nemoto, PhD**, Pfizer Inc. (\$30,524). Study to determine the effect of a therapeutic dose of the Pfizer NOS inhibitor on cerebral oxygenation by NIRS in the normal rat brain.

- “Gender Differences in Dopamine Function After TBI,” **Dr. C. Edward Dixon, PhD**, NIH, National Institute of Child Health and Human Development (\$149,711). The goal of this proposal is to evaluate the effects of traumatic brain injury (TBI) on neurotransmission in DA pathways in female rodents compared to male rodents.

### Media

- The announcement of an NIH-sponsored \$3 million grant to the department for the study of concussion in high school and college athletes using functional MRI received coverage on WTAE-TV, KDKA-TV, WPGH-TV, KDKA-Radio, KQV-Radio, the *Pittsburgh Post-Gazette* and the *Pittsburgh Tribune-Review* plus other media outlets across the U.S.

### Announcements

- **Dr. Daniel Wecht** was named chief of the department of surgery/section of neurosurgery at UPMC St. Margaret.

### Congratulations

New baby boy (Michael Patrick, August 6) to **Darla McGivern**, senior administrative assistant to Dr. Donald Marion, and husband Michael; new baby boy (Samuel Paul, June 25) to **Shari Willis**, research nurse for Dr. Welch, and husband Paul; new baby girl (Kayla Nicole, May10) to **Diane Delaney**, senior programmer analyst, and husband Sean.

### Welcome

**Dr. Naruo Kuwashima, MD, PhD**, visiting research fellow, working with Dr. Hideho Okada; **Dr. Hidemitsu Sato, MD, PhD**, visiting research associate, working with Dr. Okada; **Dr. Kotaro Nakaya**, working with Gamma Knife team; **Dr. Margaret Wilson, PhD**, visiting research associate, working with Dr. C. Edward Dixon, PhD.

**Jessica Grol**, research specialist for Dr. Joseph King, Jr.; **Jessica Justice**, research specialist for Dr. King; **Emily Rogers**, researcher for Dr. Dixon; **Nancy Spice**, administrator for CIRCL.

**Karl A. Lozanne, MD** and **Stephen M. Pirris, MD**, new residents in the neurosurgery residency training program.

### Appointments

- **Dr. Anthony Fabio, PhD** was appointed assistant professor in the Department of Neurological Surgery.

- **Dr. Daniel Wecht** was named clinical associate professor in the Department of

Neurological Surgery. Dr. Wecht was also made a fellow of the American College of Surgeons.

### Upcoming Events

- October 21-25: **Principles and Practice of Gamma Knife Radiosurgery**. Training course targeted at neurosurgeons, radiation oncologists and physicists interested in Gamma Knife certification. The next two courses are scheduled for January 13-17 and April 7-11, 2003. Contact Charlene Baker at (412) 647-7744 for more information.

- October 23: Visiting Professorship Lecturer Series, **Dr. Christer Lindquist**, medical director of the Gamma Knife Centre at Cromwell Hospital in London, England, will speak on “Gamma Knife Surgery for Vestibular Schwannomas.”

- November 6: Visiting Professorship Lecturer Series, **Dr. Paul McCormick**, associate professor of neurosurgery, College of Physicians and Surgeons, Columbia University. Dr. McCormick will speak on spine surgery.

Each of the above lecturers will take place at the Duquesne Club and include a dinner and reception beginning at 6:00 p.m. Cost is \$45. Please call (412) 647-0990 for more information. ■



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## **CyberKnife® offers frameless stereotactic radiosurgery for treatment of lesions throughout the spine**

by Peter C. Gerszten, MD, MPH

The role of radiation therapy for the treatment of tumors of the spine has been well established. Conventional external beam radiotherapy currently lacks the ability to allow for the delivery of large doses of radiation near radiosensitive structures such as the spinal cord. It is the low tolerance of the spinal cord to radiation that often limits the treatment dose to a level that is far below the optimal therapeutic dose. If the radiation dose could be confined more precisely to the treatment volume, as in the case for Gamma Knife® intracranial radiosurgery, the likelihood of successful

tumor control should increase at the same time that the risk of spinal cord injury is minimized. A new device called the CyberKnife® has the ability to do just that.

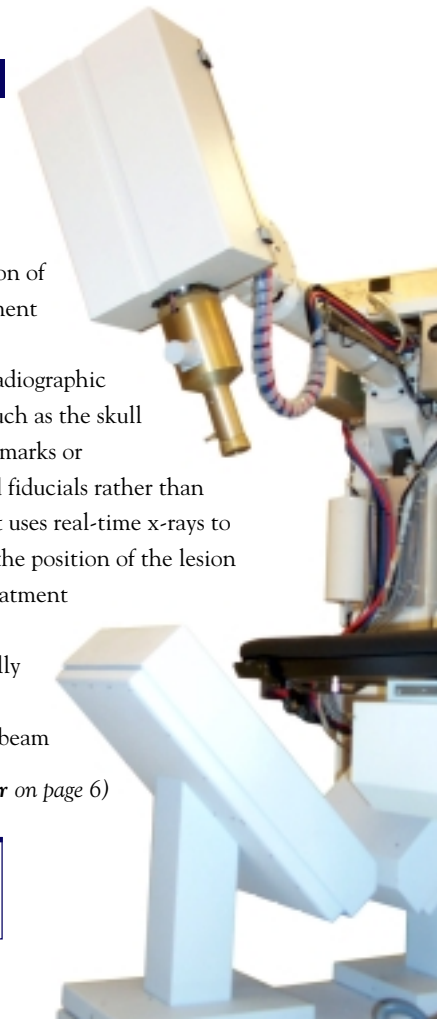
The CyberKnife, manufactured by Accuray, Inc. of Sunnyvale, CA, is now fully operational at UPMC Shadyside. This device is an image-guided frameless stereotactic radiosurgery delivery system.

### **What is the CyberKnife?**

The CyberKnife consists of a lightweight linear accelerator mounted on a robotic arm. Near real-time image allows for patient movement tracking within 1mm spatial accuracy. The CyberKnife references

the position of the treatment target to internal radiographic features such as the skull body landmarks or implanted fiducials rather than a frame. It uses real-time x-rays to establish the position of the lesion during treatment and then dynamically brings the radiation beam

(See **Cyber** on page 6)



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