

C onnections



USC Sports Medicine & The Gamecocks: A Winning Combination

Nick Prochak knew that playing football for the Gamecocks and pursuing his education at the University of South Carolina would have its challenges. The tight end just didn't realize that one of those challenges would be a life-threatening injury occurring off the football field.

Prochak remembers the January evening almost a year ago when a collision on his moped left him lying in the road, rapidly losing blood with his left leg broken in multiple places. By the time he was transported by ambulance to Palmetto Health Richland, USC team orthopaedic surgeons Dr. Christopher Mazoué and Dr. Jeffrey Guy were already there. Through a system of communications set up by USC Sports Medicine, the two physicians were immediately alerted

about the accident. An hour after his arrival, Prochak underwent surgery on his leg.

Athletes like Prochak are provided with diagnostic, therapeutic, and preventive health care services through USC Sports Medicine. A partnership with the Department of Family Medicine and Department of Orthopaedic Surgery and Sports Medicine, the comprehensive sports health team includes orthopaedic surgeons, primary care sports medicine physicians, sports medicine fellows, and certified athletic trainers. Based at the USC Sports Medicine Center at Two Medical Park, the program serves individual athletes and teams at all levels of competition, including professional, collegiate, high school, and recreational athletes. Services to the University of

South Carolina expanded in the summer of 2008, when USC Sports Medicine became the official health care provider for all of the school's 21 athletic teams and more than 450 athletes.

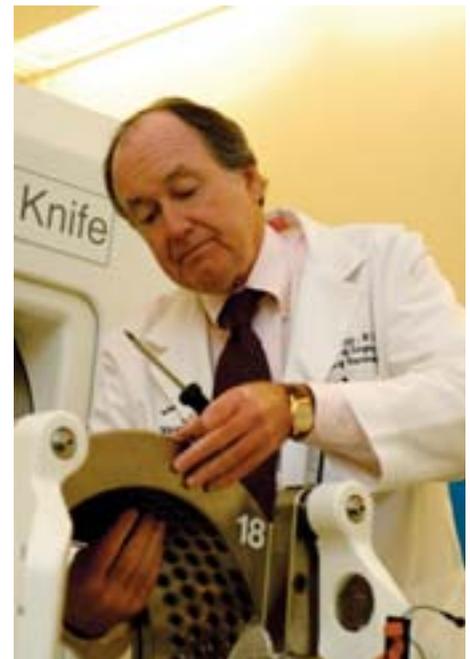
Dr. Guy, who serves as Medical Director for USC's intercollegiate athletics, sees the expansion as a culmination of efforts over the past seven years. "One of the things I noticed [when I came in 2001] was the tremendous potential and wealth of health care providers at the university, yet there was not a lot of interaction between them." So began the process of building a collaborative network of support services throughout the university and the School of Medicine. Today the umbrella of health care for the athletes is a collaborative

See Sports Medicine on Page 6.

It certainly wasn't the diagnosis that Cassandra Johnson* wanted to hear. Test results for the 56-year-old woman revealed the source of the raging headaches that had been plaguing her for the past few weeks. The cancer that had started out in her breast had metastasized to her brain.

Would the schoolteacher be facing hospitalization for major brain surgery, weeks of recovery, and an extended leave from her job? The answer was no. Because of technology available at the Palmetto Health Gamma Knife Center on the Richland campus, her tumor could be treated on an outpatient basis. She'd even be back home by lunchtime the same day.

Johnson was scheduled for Gamma Knife radiosurgery, a procedure that uses radiation, or gamma rays, to destroy brain tumors and blood vessel abnormalities. Conceived by a Swedish neurosurgeon, Dr. Lars Leksell, the treatment involves neither a knife nor an incision. Dr. Burke Dial, Associate Professor of Clinical Surgery with the USC School of Medicine and Medical Director of the Gamma Knife Center noted, "I think Dr. Leksell wanted the term 'knife' to imply that this was a surgically precise treatment of deep-seated, inoperable brain tumors." While the location of Johnson's nickel-sized tumor would have made it risky to remove through traditional surgery, she was a suitable candidate for the one-session radiation treatment.



Dr. Burke Dial makes an adjustment on one of the Gamma Knife's collimator helmets, which is used in delivering radiation to the patient.

**BRAIN SURGERY
WITHOUT AN
INCISION**

Gamma Knife Radiosurgery

6:30 a.m.

Johnson arrived at the Gamma Knife Center, which is the only one of its kind in South Carolina. After having an IV inserted, she had a lightweight aluminum frame affixed to her head. This would serve as a measurement tool throughout the morning's treatment. Though bulky, it would not cause her any discomfort once it was in place.

8:40 a.m.

Accompanied by a nurse, Johnson was taken upstairs for an MRI. Dye was injected into her IV to allow physicians to view the tumor more clearly. With the frame attached to her head, a scan was taken that produced over 150 detailed images. Dr. Dial and a radiologist studied the images on a monitor, zeroing in closer as needed. The position of the tumor was identified with mathematical coordinates to determine the precise spot where the radiation would be targeted in her brain.

9:30 a.m.

Johnson wasn't involved during this portion of the treatment. While she watched TV in another room, Dr. Dial worked with one of the radiation oncologists and medical physicists on the Gamma Knife team to devise a treatment plan. Using the MRI results that they accessed on

their computer, the team used specially designed software to study the tumor, its shape, dimensions, and location. During this planning phase, the specific dose of radiation was determined and the time required to treat it. If Johnson had more than one tumor, then the planning process would have evaluated each one and the precise treatment for each.

11:05 a.m.

The team was ready for Johnson again. The nurses positioned her on the Gamma Knife table and the frame on Johnson's head was attached to a large silver dome. Called a collimator helmet, the dome is lined with rows and rows of numbered holes (201 to be exact), through which the radiation would be delivered. The calculations from

** While Cassandra Johnson is not an actual patient, her experience was compiled from actual patient treatments at the Palmetto Health Gamma Knife Center.*

See Gamma Knife Radiosurgery on Page 4.



Restructured Division Bringing Genetics Into Everyday Medicine

For the past 30 years the USC School of Medicine has held a notable distinction: housing one of only three regional genetics centers in South Carolina. Over the past three decades, the Division of Genetics, based in the Department of Obstetrics and Gynecology, has offered a full range of testing and counseling services for infertility, the detection of birth defects in expectant mothers and diagnosis of developmental genetic problems in children. In the mid-1990's, as the field of genetics grew, the division's scope of services expanded to include chromosome studies in leukemia and counseling for patients with a likelihood of developing adult onset genetic disorders due to hereditary factors.

Today the field of genetics is still evolving, and finding itself more and more in the center of many new developments in medicine. At the School of Medicine this evolution has led to the reorganization of the Division of Genetics to better serve the entire School of Medicine. The new stand-alone division has been renamed the Division of Clinical Genetics and Molecular Medicine. The addition of a molecular diagnostic laboratory will expand the existing menu of services to offer molecular karyotyping, expanded screening and mutational testing for cancer, thrombosis, pregnancy loss, iron storage disease, cystic fibrosis and drug metabolism. "The expansion of molecular-based testing to in-

clude conditions important in the medical management and diagnosis of conditions important in adult populations has ushered in a new era in genetic testing that emphasizes bedside applications," said Dr. Anthony Gregg, Associate Pro-



Bob Best, Ph.D.

fessor and Medical Director for the newly reorganized division.

The establishment of the molecular lab in early 2009 will allow the School of Medicine to introduce new tests which can be extremely helpful to physicians in making accurate diagnoses and tailoring treatment. One treatment in which genetics can provide useful information is the use of Coumadin in preventing blood clots. "The current problem with Coumadin is

that it is a trial-by-error dosing approach. This can be hazardous to patients and take some time for the physician to determine the best starting dosage and subsequent dosage adjustments," said Dr. Gregg. "By studying a couple of genes, you can predict the dose of Coumadin with very close precision," said Dr. Bob Best, Professor and Director of the division. "Incorporation of a patient's personal genetic information into primary care is often referred to as 'personalized medicine,'" added Dr. Best. Though currently in a formative stage, personalized medicine is expected by many to play an increasingly important role in everyday health care in the future.

As new tests are added to the lab's capabilities, they will also be able to provide physicians with valuable information about their patients when prescribing a number of other medicines, including codeine and antidepressants. Cancer care will benefit from testing that will be used to aid in diagnosis, determine the best drug therapy, and monitor for relapse after surgery. "Performing these tests onsite will allow physicians to have direct contact with the division's professionals for help in interpreting results and will bring more rapid turnaround time to tests, benefiting physicians and their patients," said Dr. Gregg.

Excited about the future of genetics in clinical medicine, Dr. Gregg and Dr. Best see the division's growth dovetailing into the School of Medicine's primary care focus. Dr. Best said, "There is a lot of genetic information out there that would be useful in the routine care of patients that is not being used to its maximum benefit." He noted that physician and patient
See Genetics Services Expanding on Page 8.

Gamma Knife Radiosurgery (From Page 2)

the MRI and the planning process had determined that Johnson's treatment would start with a number four collimator helmet. One of four helmets used with Gamma Knife radiosurgery, this one contained holes with the smallest diameter, meaning less radiation would flow through each hole.

11:16 a.m.

Johnson received the first dose of radiation. "Though each individual beam of cobalt radiation is too

energy. Using the different size beams that go through the helmets and combining these clouds we can customize the treatment to fit the size and shape of a patient's particular tumor," Dr. Dial said. One or more tumors, up to four centimeters in size, can be treated in a single session.

11:35 a.m.

Johnson's second and last dose of radiation was completed. Once the helmet and the frame were re-

to accomplish is for the abnormal tissue to stop growing, so we follow patients with MRI scans to see when this occurs." In some patients this occurs sooner. "Sometimes the tumors are gone in six weeks. We love it when that happens; it's always rewarding," Dr. Dial said.

An Effective Treatment Option

Of the approximately 225 patients treated annually at the Palmetto Health Gamma Knife Center, the vast majority of them (57 percent) have cancerous tumors that have metastasized from another area of the body to the brain. Dr. Dial noted that the procedure can be particularly helpful to patients whose cancer is successfully being controlled in other parts of the body. "If such brain tumors are not destroyed, then they can kill patients very quickly," he said.

Gamma Knife is also being used successfully for other types of malignant tumors and benign brain tumors. Other diagnoses that can be treated with the procedure include: trigeminal neuralgia, a painful facial nerve disorder, and arteriovenous malformations (AVMs), an abnormal collection of arteries and veins in the brain. Dr. Dial added that, "Surgeons are sometimes reluctant to operate in a particular area of the brain because of the risks associated with it." For patients, that could mean permanent loss of sensory, language, and/or motor skills. "With the Gamma Knife we have much less risk because it is so precise," he said. Since anesthesia is not required and no incision is made, other potential surgical complications are also eliminated.

See Gamma Knife on Page 8.



Dr. Dial inserts a core into a collimator helmet. Specific holes in the helmet can be plugged to protect certain vital areas of the brain during the procedure.

weak to cause any harm, when all 201 beams come together, we can use them to destroy tumors," Dr. Dial said. As the treatment was being conducted, Johnson, lying quietly on the table, did not experience any pain.

11:25 a.m.

The nurse removed the helmet. A number eight helmet was then placed on the table and Johnson's frame attached to it. "The beams create a cloud of high radiation

moved and she had a brief rest, she was on her way home with her husband. While her entire process only took five hours, other patients requiring more complex treatment may spend twice that amount of time at the center.

As she left the hospital, was Johnson's tumor gone? It's not that simple, Dr. Dial explained. "The results are not immediate and can take months before they are visible on a scan. What we are trying



COMPARING NOTES. Beverly Harper (left) discusses the needs of a new patient and her family with Dr. Warren Derrick (right.)

Parent Fills Unique Role In Pediatric Practice

It wasn't unusual for Beverly Harper to get a call from her son Matthew's school about his aggressive behavior in the classroom. Yet Harper was determined to do whatever was necessary to help her son, who has autism and ADHD. Then she met some parents through Family Connection of South Carolina, a support network for families of children with special needs. Harper found out that she didn't need to go it alone. "There was nothing I could say that these parents didn't understand, empathize or cry with me about," she said.

Through Family Connection, Harper was also paired up with a volunteer Support Parent, a mother of a child with the same diagnosis. This one-on-one relationship helped her in managing the day-to-day challenges of raising a child with autism. Years later, in the summer of 2007, Harper was ready to take on a helping role herself. Twice a week she spends half a

day at the Children's Hospital Outpatient Center with a unique new program. There she provides support and information to mothers and fathers of children with disabilities or chronic medical conditions. Her employment as a Parent-to-Parent Partner was made available through a grant secured by the Department of Health and Environmental Control and South Carolina Solutions.

South Carolina Solutions is a medical home network jointly sponsored by the School of Medicine and an administrative organization known as Community Solutions of Florida. Its purpose is to offer a network of providers and case management services for people on Medicaid. Harper's presence in the outpatient center represents the first time a Parent-to-Parent Partner has been provided for a pediatric practice in South Carolina as part of a medical home network.

Dr. Warren Derrick, Distin-

guished Professor Emeritus-Pediatrics, is integrally involved in South Carolina Solutions and serves as a board member for Family Connection. Over the past 30 years at the School of Medicine, he's experienced many parents who suddenly found themselves facing a life-altering diagnosis. "They didn't know who to run to, who to talk to, or what to anticipate. The most important thing is to help families understand that this is not as devastating as they might think," he said.

That's where Beverly Harper comes in. Working with the physicians and nurses as part of the medical team, she offers a listening ear and a warm heart when parents are feeling anxious and overwhelmed. "One of the great things about having a parent right there in the clinic is that these families immediately know that they are not the only ones in the world with a child with special needs," said Jackie Richards, Associate Director, Family Connection.

A Valuable Guide

A former librarian who has used her research skills to advocate for her son, Harper educates parents on the various health care and educational resources available to them through Family Connection and other organizations. When some couples communicate to Harper that they don't need any further assistance, she lets them know they can get back in touch later on. "In a loving way I tell them that we all need some help. It took me a year before I chose to reach out to other parents, and it was one of the best

See Parent-to-Parent on Page 7.



Sports Medicine (Continued From Page One)

effort between the School of Medicine, the Department of Athletics, the College of Education's Athletic Training Program, the Arnold School of Public Health's Department of Exercise Science and Palmetto Health Richland.

USC's athletic trainers serve as the first line of defense for keeping athletes healthy and managing injuries. Physicians at the Sports Medicine Center are only a phone call away. "Expedient access to care is a critical part of sports medicine," said Dr. Guy. "It's not only important to have a really good communication system, but to use the system properly," he said, explaining that in case of injury, athletic trainers know how to reach one of the physicians at all times. Physicians also conduct pre-participation physicals, provide on-site coverage at designated practices and games, staff walk-in clinics, and do some travel with teams.

When a problem occurs, the sports medicine staff encourages athletes to keep their parents in the loop. Prochak's father and mother, Joe and Grace, appreciate not only the care their son has received, but also being actively included in the process. "Whenever I finish talking with Dr. Guy I un-

derstand exactly what is happening with Nick. He has done a very good job in helping Nick get over the bumps in the road," said Joe Prochak. For Prochak, those bumps have included shoulder surgery his first year at USC and re-

specialists, USC Sports Medicine would have been able to handle this as efficiently as a routine strain or sprain. "If we encounter something uncommon or better served outside our system, we have a list of subspecialists we



Dr. Jeffrey Guy (left) works with tight end Nick Prochak's knee in USC's training room after one of the team's practice sessions.

cent surgery to repair a torn meniscus. "It's comforting to know that when there is a problem I will not only be evaluated immediately on the field, but that I can get in with the doctor in a day or two," Prochak said.

As Prochak pushed himself to recover after each surgery, Dr. Guy and the athletic training staff monitored his rehabilitation process. "You have to assess the motivation level and personality of each patient. Nick is extremely motivated and I spent more time trying to slow him down," Dr. Guy said. He added, "The question is how to quickly, but safely, get someone back to their sport." Had Prochak needed the services of any other

refer to - from physicians here in town to others in Charlotte and Tennessee and Alabama - people whom we consider to be the top in their field," Dr. Guy said.

As far as Prochak is concerned, he's got the best in orthopaedic care right in Columbia. When he found out that Dr. Guy would be out of the country for ten days during football season, he was reassured by the reason: the orthopaedic surgeon had been hand-picked to provide surgical sports medicine coverage at the 2008 Olympic Games in Beijing, China. "We are tremendously lucky to have that kind of expertise available at USC," he said.



Dr. Jeffrey Guy

"The question is how to quickly, but safely, get someone back to their sport."



New Facility Enables Physicians To Serve Patients Better

A heart attack can be a wake-up call for an individual to pay closer attention to his health and lifestyle habits. For some people it's also the first indication that they have diabetes, which has already made a profound impact on their cardiovascular system.

While South Carolina ranks second in the nation in the prevalence of diabetes, an equally alarming fact is the estimated 150,000 citizens in the state who have the disease but don't even know it. The physicians at University Diabetes and Endocrinology Center are no strangers to these disturbing statistics. Their move last summer to a larger facility, dedicated solely to the Division of Endocrinology, Diabetes and Metabolism, is helping to address the growing diabetes problem.

The center, at Two Medical Park, Suite 306, offers services including an insulin pump therapy program, in-office hemoglobin Alc testing, and glucose meter download stations. Patient education, on such topics as blood glucose monitoring and insulin injections, is an integral component of the care provided. "Because we are no longer sharing space with other physicians, we can now see patients much more efficiently," said Dr. Tu Lin, Professor of Clinical Internal Medicine and Division Director.

Additional exam rooms at University Diabetes and Endocrinology Center allow the two full-time physicians, two part-time physicians, and three fel-

lows to treat more patients, a benefit that Dr. Ali Rizvi appreciates. Dr. Rizvi, A. T. Chalk Endowed Professor of Internal Medicine and director of the center, has seen a shift in the type of patients referred to the division. "In the past, type 2 diabetes manifested itself later in life. Now we are seeing the same thing in patients in their 20's and even in their teens, which was virtually unheard of in the past," he said. Dr. Lin expressed concern about the habits of the younger generation. "We need to encourage children to eat healthy and be more physically active. With all of the hamburgers and soft drinks, we are going to see a lot more overweight people and diabetes."

Treating Diabetes In The Future

For the physicians, the new center represents one step in the division's long-range plans in combating diabetes. Future goals include expansion of clinical services and personnel, such as a certified diabetes educator and dietitian. The division would also like to enhance its teaching efforts with mini-fellowships in intensive diabetes therapy for practicing health care professionals. Research objectives include additional clinical trials, as well as more studies that focus on the causes of diabetes. "There is a lot we still don't know about. We also need to learn how to translate the knowledge and research we already have into everyday patient care," said Dr. Rizvi.

Patient care at the center includes a personalized plan for each individual based on his or her medical profile and lifestyle. "If we can help them manage their diabetes, then we can help avoid complications," Dr. Lin said. Dr. Rizvi adds that reducing the risk of complications involves an even broader scope. "Funding and resources are needed upfront to promote prevention. Problems are being found too late. If we can identify diabetes earlier, then we can avoid the need for serious intervention later on such as heart bypass surgery."

Parent-To-Parent (From Pg. 5)

decisions I ever made."

Dr. Derrick cites another important benefit of parents supporting other families who are raising a child with the same diagnosis. "A parent who has been there knows the red flags to watch for that could avoid a long ER visit or hospitalization. That goes a long way to improve the health of the child."



Genetics Services Expanding (Continued From Page 3)

education is going to play a key role in the months and years ahead in integrating genetics into the community. The two envision a not-too-distant future in which clinicians put genetics to use on a daily basis, from helping to select the best drug for a patient to diagnosing disease earlier. Dr. Best anticipates that the next decade will bring a major focus on prevention and maintenance in health care, as well as a steady shift toward the realization of personalized medicine. "Along with other technologies, genetics will be aimed at monitoring changes be-

fore an individual even comes down with an illness," he said.

Defining his vision of the expanded division, Dr. Best notes, "We are positioning ourselves to interact with a wider group of people in medicine to access the most meaningful and practical developments in genetics as they emerge and prove their value in patient care," he said. "We want to ensure that the genetic tools that are most empowering to physicians and patients are on the table and ready for full use in everyday medicine."

Gamma Knife (From Pg. 4)

For certain patients, Gamma Knife is a viable alternative to whole brain radiation, a treatment that is provided five days a week for a period of four to six weeks. Explaining that whole brain radiation must be delivered in small increments because of its effect on normal brain tissue, Dr. Dial notes that this type of treatment can have a significant permanent impact on a patient's memory and cognitive ability.

While Gamma Knife offers patients advantages over both traditional surgery and whole brain radiation, Dr. Dial points out that, "Gamma Knife has replaced surgery and whole brain radiation in many cases, yet it does not replace either one in all cases. Both remain useful treatment options, depending on the particular patient and his or her circumstances."

Note: In November the center added the latest in Gamma Knife technology. The Perfexion unit is the most precise and efficient radiosurgery equipment available. "This decreases the amount of time the patient spends on the treatment table, as well as allowing us to treat some areas we have not been able to access, such as the lower base of the skull," said Dr. Dial.



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