I want to thank all of you who let us know how much you appreciated our last issue of *Vital Signs*, which highlighted individual clinical research initiatives within Greenville Hospital System University Medical Center (GHS).

This issue highlights interventional services at GHS. Although most of these programs are surgical, we also address related activities involving information technology, infection control, interventional radiology and more. The purpose of this issue is to inform and to provide a reference inventory of these programs, along with contact information.

Throughout this issue are common, important themes emphasizing the underpinnings of our GHS mantra of “Blue-collar Academics.” Each profiled program focuses on innovation to constantly raise the quality bar, persistently measuring quality from the patient perspective. Within these pages, you will find *quality* defined by shorter hospital stays, less pain, improved function, earlier return to work, less scarring and enhanced outcomes.

GHS puts a premium on the multidisciplinary team approach. There is a constant effort to progressively incorporate laparoscopic, minimally invasive and robotic techniques. There also is recognition that fellowship-trained subspecialists bring value to the care equation and work in concert with generalists to the benefit of the patient.

Finally, you will read about the many academic accomplishments of these programs, testifying to recognition of their expertise at the regional and national levels. Many are poised for the ultimate recognition of their extraordinary talents: initiation of fellowship training, in which GHS faculty members will train the next generation of subspecialists by teaching the teachers.

Jerry R. Youkey  
*Editor-in-Chief*

Jerry Youkey, M.D., FACS, is GHS Vice President of Medical Services and Dean of Academic Services.
Welcome to Surgery at GHS

Greenville Hospital System University Medical Center (GHS) is prepared to meet patients’ basic surgical needs as well as to provide the region with high-end tertiary surgical services.

We are pleased to present you with this edition of Vital Signs, which is devoted to surgical activities, both clinical and academic, of GHS University Medical Group (UMG). UMG is a totally integrated, mission-based practice encompassing comprehensive, state-of-the-art patient care, clinical research and medical education.

Dedicated to the mission of setting the clinical standard within the region, educating our future health professionals and providing comprehensive care regardless of ability to pay, all while maintaining financial sustainability, UMG’s Department of Surgery is comprised of more than 50 surgeons, 30 residents/fellows and 12 physician extenders divided into eight divisions: Acute Care Surgery, Minimally Invasive Surgery, Bariatric Surgery, Surgical Oncology, Cardiac Surgery, Colon and Rectal Surgery, Plastic Surgery and Vascular Surgery/Medicine.

Following is a brief look at each division, plus UMG’s Department of Neurosurgery/Orthopaedic Surgery and its Women’s and Pediatric Surgery programs. Articles in this issue will further explore these areas, plus feature news from other surgical specialties that practice at GHS thanks to important relationships with many dedicated surgeons of the GHS Medical Staff.

Acute Care Surgery
GHS’ Acute Care Surgery Service is the most comprehensive provider of surgical care in the Southeast. Encompassing one of South Carolina’s four Level I Trauma Programs in its scope, the Acute Care Surgery division, also known as the Green Surgery Service, has a daily census of more than 100 patients and provides coverage at all GHS campus locations.

Realizing that surgical problems are often unplanned and demand immediate attention, the service has placed a board-certified surgeon in Greenville Memorial Hospital (GMH) 24 hours a day. Indeed, GMH is the only hospital in the five-county upstate region that provides on-site, in-house surgery coverage.

Additionally, the service is piloting a Comprehensive Call Network Program, working with neighboring hospitals to enhance availability of surgical care for patients who present to these facilities with unplanned problems that require operations. As a secondary goal, this network promises to eliminate the traditional model of “surgery call” for surgeons practicing in the network, obviating the need for medical staff call coverage in a time when manpower shortages threaten access to care.

Cardiac Surgery
GHS’ Cardiac Surgery division is the oldest, largest and most established cardiac surgery program in the region, performing more than 1,000 open-heart operations annually. Its surgeons provide comprehensive cardiac surgical care, including minimally invasive valve repair, atrial fibrillation procedures, high-risk cardiac surgery as well as routine coronary artery bypass and valve surgery. Outcomes consistently rank among the top in the nation.

Colon and Rectal Surgery
In 2008, the UMG Department of Surgery acquired the four-physician practice of Greenville Colon and Rectal Surgery, an established group of fellowship-trained, colorectal surgeons who have long participated in the Department of Surgery’s teaching, research and practice initiatives. This acquisition will allow establishment of new programs to better care for colon and rectal disease.

Minimally Invasive and Bariatric Surgery
The Minimally Invasive and Bariatric Surgery divisions provide services at GMH and Hillcrest Memorial Hospital (HMH). They feature the region’s only Surgical Review Corporation-certified Center of Excellence for the care of the bariatric patients, a service provided at HMH. The division also offers access to the region’s only two fellowship-trained minimally invasive surgeons, who practice differentiated laparoscopic surgery.

Neurosurgery/Orthopaedic Surgery
UMG’s Department of Neurosurgery/Orthopaedic Surgery offers the Upstate access to one of the most innovative surgical collaborations in the nation. Leading orthopaedic surgeons, neurosurgeons and sports medicine physicians have combined their expertise under a single umbrella. This department employs many physicians of the prestigious Steadman Hawkins Clinic of the Carolinas, a nationally recognized practice specializing in orthopaedics and sports medicine.

Pediatric Surgery
GHS Children’s Hospital offers the expertise of surgeons who perform general pediatric surgery, plus other surgeons who specialize in pediatric orthopaedics, urology, nephrology and soon, ophthalmology. Children’s Hospital has its own emergency department. The hospital’s surgeons are leading the way in minimally invasive techniques, and there are plans for a new brain tumor clinic.

Plastic Surgery
The Plastic Surgery division is anchored by Greenville’s most experienced and established reconstructive plastic surgeon and...
provides the most comprehensive plastic surgical care in the Upstate, including cosmetic surgery, hand surgery, reconstructive plastic surgery and facial trauma surgery (as part of the Level I Trauma Program). Soon, GHS will welcome the area's only fellowship-trained craniofacial plastic surgeon.

Surgical Oncology
This division has two fellowship-trained surgical oncologists and a dedicated Thoracic Surgery Service. As part of GHS’ Total Cancer Care program, these surgeons actively participate in the Multidisciplinary Cancer Clinics where patients receive one-stop, comprehensive, multispecialty evaluation for their oncological disorders and the latest evidence-based care.

Vascular Surgery/Medicine
The Vascular Surgery/Medicine division, established in 1994, is made up of nine vascular surgeons and five vascular internists. It provides the medical staff of the Institute for Vascular Health. Vascular Surgery/Medicine is nationally renowned for the scope of its practice and the size of its patient population. Faculty members frequently serve as experts on national panels and are featured speakers for regional and national societies. The division was the first GHS academic department to start a postgraduate fellowship and in 2000 was chosen to host the first two-year Vascular Surgery residency curriculum in the country. At the Institute for Vascular Health, providers practice protocol-driven care as dictated by the Vascular Health Alliance, a not-for-profit GHS agency initiated to standardize and monitor care delivery.

Women’s Surgery
Surgeons of UMG’s Department of OB-GYN offer an array of minimally invasive procedures for everything from hysterectomy to breast cancer intervention to treatment of rare conditions such as vaginal agenesis. The team includes fellowship-trained urogynecologists who perform operations to address urinary incontinence, pelvic organ prolapse and other problems. This department also has added plastic surgery procedures, including Laser Vaginal Rejuvenation®.

Community and Academic Service
The Department of Surgery has a long tradition of providing care for all citizens in Greenville County regardless of the ability to pay. Its surgeons staff all of the GHS Surgery Clinics, which provide care to the underserved.

It also has a strong devotion to academics. The department serves as faculty for the University of South Carolina School of Medicine, teaching surgery to third- and fourth-year medical students assigned to GMH. In addition, the department serves as faculty for 24 surgical residents and six fellows. Medical student and postgraduate medical training are seamlessly integrated within all the divisions so that patient care is enhanced and state-of-the-art, evidence-based medicine is delivered.

The Department of Surgery actively participates in national trials. Its clinical research yields 15 to 25 peer-reviewed publications in internationally distributed journals yearly, assuring that evidence-based care is not only practiced here but also developed for others to use elsewhere.

Again, we are pleased to share the latest about surgery at GHS with you in this edition. We believe GHS’ Department of Surgery represents one of the clinical treasures of the Southeast, capable of providing basic surgical needs and high-end tertiary services for all patients.

For more information or to refer a patient, call (864) 455-7886.

Spence Taylor, M.D., FACS, is a vascular surgeon and academic chairman of GHS University Medical Group’s Department of Surgery. He also is chair of the Department of Surgery of the GHS Medical Staff.

GHS Medical Staff: Surgery Quick Facts
Dept. of Surgery Total # Surgeons: 139
# General Surgery: 48
# Dentistry: 19
# Ophthalmology: 18
# Urology: 17
# Oral Surgery: 12
# Plastic: 9
# Otolaryngology: 10
# Cardiothoracic: 5
Dept. of Neuro/Ortho Surgery Total # Surgeons: 78
Department of OB-GYN Total # Surgeons: 84

*Figures as of December 2008.
Role of the Institutes

*Greenville Hospital System University Medical Center (GHS)* has opened two outpatient institutes that provide an innovative link in the healthcare circle.

Early this year, GHS celebrated the opening of two outpatient facilities within Building C at Patewood Medical Campus: the Institute for Vascular Health and the Institute for Musculoskeletal Health & Wellness. The institutes deliver care through a progressive model using the latest technology, and they have a shared academic mission to study and treat orthopaedic and vascular disorders that impair functionality.

The institutes give referring physicians and their patients a convenient one-stop shop for a wide variety of pre- and postoperative testing, evaluation and services. Moreover, the founding research and academic mission of both institutes – which mirrors GHS’ overarching mission for excellence in patient care, research and education – ensures that patients are treated before, during and after surgery using evidence-based protocols. These protocols are continually reviewed to keep best practices in place.

**Access to Care**

Patients with orthopaedic and vascular health problems often find it difficult to get to multiple doctors’ visits at different locations. “Mobility is a big issue for these patients,” said Spence Taylor, M.D., FACS, a vascular surgeon and chairman of GHS’ Department of Surgery. By offering access to vascular and orthopaedic specialists, testing labs and diagnostic equipment under one roof at Patewood C, GHS has created a one-stop shop.

Synergies between the vascular and orthopaedic specialties have prompted GHS to offer services at the institutes that benefit patients suffering from both types of problems, said James Silliman, M.D., president of Steadman Hawkins Clinic of the Carolinas, which makes up the physician core of the Institute for Musculoskeletal Health & Wellness. For instance, the institutes are collaboratively establishing a Limb Health Center to treat patients who have sustained complex injuries, including limb loss.

**Progressive Delivery Model**

The institutes offer a healthcare delivery model that focuses on disease management rather than episodic care. As more insurance companies have sought to reward good health and corporate wellness programs, they have raised premiums and lowered reimbursements for episodic treatment that is the result of poor health, particularly for costly catastrophic health problems that require surgery or an ER visit.

At the same time, the Centers for Medicare & Medicaid Services (CMS) are pursuing ways to consolidate healthcare billing. Four states are participating in a CMS pilot project on orthopaedic and cardiovascular care: Hospitals are billing CMS for both their services and those of orthopaedic and cardiovascular specialists, and then the hospitals are reimbursing the physicians from the total amount they are paid by CMS.
The big picture objective is to lower healthcare costs and improve the population’s overall wellness so that more people can become insured for both preventive and episodic care.

How do these trends relate to GHS’ institutes? The facilities are ideal destinations for individuals who need management of orthopaedic or cardiovascular diseases identified through workplace screenings or primary care physician visits. The institutes also provide a critical link in the healthcare circle for patients who have had a catastrophic episodic health event, such as major surgery or an ER visit, by connecting them with caregivers who can provide health maintenance to help ensure they don’t repeat the experience. The institutes’ physical therapy, nutrition education programs and medically supervised workout services complete the wellness circle.

“The insurers like programs that keep people out of the ER and off the operating table,” said Dr. Taylor. “We’ve taken what we know about what’s current in health care, and we’ve used that knowledge to build this model for delivery of care.”

Intensive Academics and Research
The GHS institutes are built on a foundation that integrates clinical care with academic and research excellence. The Institute for Vascular Health, for example, provides care using guidelines of the Vascular Health Alliance, a not-for-profit GHS organization created to standardize patient care around evidence-based protocols for treatment of cardiovascular disease. No matter which physician or test the patient receives at the institute, he or she will get a consistent, standardized level of treatment deemed the best practice.

“Everything we do is scientifically measured because we want to ensure what we’re doing is working,” Dr. Taylor said.

Likewise, physicians of the Institute for Musculoskeletal Health & Wellness follow evidence-based protocols overseen by seven medical directors. Clinical researchers of the Orthopaedic Research Foundation of the Carolinas (ORFC) collect and review orthopaedic outcomes data and collaborate with GHS to ensure continuous process improvement.

“The research piece is very important to us,” said Dr. Silliman. “We are constantly looking to improve.”

With its institutes, GHS also is working to attract and keep the best and brightest medical professionals in the Upstate. The institutes provide the backdrop for training and research for hundreds of residents enrolled each year in GHS/University of South Carolina School of Medicine physician education programs.

For example, GHS’ Division of Vascular Surgery provides teaching for the state’s only Vascular Surgery Residency Program, South Carolina’s first Vascular Medicine Fellowship and GHS’ General Surgery Residency Program. To train physicians in musculoskeletal specialties, there are fellowship programs for primary sports medicine, orthopaedic surgery, sports medicine and physical therapy. There are also bio-skills training programs aligned with Clemson University and the University of South Carolina.

The institutes also provide fertile ground for research, which helps ensure that upstate residents have early access to the latest treatments, drug therapies and surgical techniques. For instance, the vascular physician faculty participates in approximately 15 industry-sponsored clinical trials annually, and all cases are registered in a national research registry.

Surgical Innovation: Training for Tomorrow
Two of the newest highlights at Patewood C are the Surgical Innovation Center and Radiology Learning Center on the fourth floor. The surgical center includes a Bio-skills Simulation Laboratory, a partnership between ORFC and Clemson University.

The Surgical Innovation Center features a full operating room set-up, complete with high-definition flat-panel video monitors and Smith & Nephew equipment for the latest minimally invasive surgical techniques. Ziehm, a leading supplier of 3-D fluoroscopy technology, has relocated several product engineers and researchers from its Seattle and Tampa offices to Patewood for close collaboration with GHS physicians on product development. Berchtold contributed the lights, booms and OR tables to complete the training experience.

The center serves as a training and education hub for residents, surgical technicians, physician assistants and physical therapists as well as primary care physicians interested in learning about new techniques and technologies. The facility offers hands-on training on cadavers, and its conference center can be linked to operating rooms at Patewood Memorial Hospital for observance of live surgeries.

The Radiology Learning Center offers access to digital X-rays for musculoskeletal conditions. The center’s resources will serve as teaching files for residents as well as primary care physicians throughout the region who wish to research orthopaedic disorders.

For more information or to refer a patient, contact the Institute for Vascular Health at (864) 454-VASC (8272) or the Institute for Musculoskeletal Health & Wellness at (864) 454-SHCC (7422).
What’s Inside?

Here is a quick look inside the Institute for Vascular Health and the Institute for Musculoskeletal Health & Wellness.

Examination Rooms
Flat-panel screens are in most rooms. The physician can connect a laptop PC to the screen to show the patient an educational DVD about his or her condition, an upcoming procedure or therapy instructions. Physicians also use this technology to show patients their X-ray, MRI or CT scan results. All of this information can be downloaded onto a CD or DVD for the patient to take home.

Levels 1–2: Institute for Musculoskeletal Health & Wellness
The institute has as its core the physicians of the Steadman Hawkins Clinic of the Carolinas (SHCC), which specializes in orthopaedics and sports medicine. It features the following:
• Surgeons specializing in operations for back and neck injuries, arthritis and joint replacement as well as arthroscopy and complex reconstructive surgeries to treat knee, shoulder, elbow, foot and ankle injuries
• Sports medicine physicians specializing in nonoperative care of orthopaedic and musculoskeletal conditions
• Proaxis Therapy, a GHS physical therapy affiliate, which brings physical therapists under the same roof with physician specialists, enhancing communication and patient care
• The sports-performance Acceleration Sports Institute, which uses the latest in “fast-twitch” training and other techniques to help patients enhance their athletic capabilities through medically supervised workouts
• Orthopaedic Research Foundation of the Carolinas (ORFC), which advances orthopaedic medicine through research and education
• Evening S.H.I.F.T., an after-hours orthopaedic and sports injury clinic, open to anyone on a walk-in basis from 6:00 p.m. to 9:00 p.m. weekdays
• Saturday Injury Clinic, a “Bump and Bruise” Clinic available for 11 weeks each fall for athletes who have sustained injuries during Friday night football games

Resources at a Glance
• Digital radiography
• Extremity MRI
• Access to CT and MRI
• Bone densitometry
• Injection therapy
• Ultrasound
• Patient education programs

Level 3: Institute for Vascular Health
The largest, most comprehensive vascular center in the Southeast is organized around six programs:
• Vascular Surgery – Largest vascular physician group in the state
• Cardiovascular Risk Reduction Program – Cardiologists available daily to see patients at risk for cardiovascular disease; the program also serves vascular surgery preoperative and postoperative patients, and referrals from the ER and Chest Pain Center
• Vein Center – Treatment of venous diseases, including varicose and spider veins, by vascular specialists
• Wound Care Center – First and only center of its kind in Greenville; treats lower extremity wounds as a complement to the GHS limb salvage program
• Deep Vein Thrombosis (DVT) Center (planned for future) – Outpatient treatment of DVT
• Limb Health Center (planned for future) – Interdisciplinary clinic for patients rehabilitating from limb loss

Resources at a Glance
• 64-slice CT scanner
• Nuclear cardiac imaging
• Duplex ultrasonography
• Echocardiography
• X-ray
• Phlebotomy
• Point-of-service labs
• Hyperbaric oxygen chambers (for wound therapy)
• Vascular lab (performs more than 18,000 exams annually)

Fourth Floor: Surgical Innovation Center
This floor houses the Surgical Innovation Center and Radiology Learning Center. It features a Bio-skills Simulation Laboratory, a partnership between ORFC and Clemson University, used by the institutes and Clemson’s Bioengineering program for bioskills simulation, research and hands-on training. More work areas are under construction.
The surgical education program has many components at Greenville Hospital System University Medical Center (GHS).

There is a broad scope of academic excellence within the Department of Surgery at GHS University Medical Group, the system’s multispecialty group practice. The department offers academic opportunities for undergraduates, medical students, residents and graduate fellows, following the guidelines of the American Commission on Graduate Medical Education.

“It’s part of our mission to train surgeons to serve our community,” said Dane Smith, M.D., FACS, program director. “It’s a win-win situation. GHS gets bright young minds, and students receive training and experience.”

Undergraduate and Graduate Education

At the undergraduate level, GHS partners with Furman University, the University of South Carolina (USC) and Clemson University on research internships that allow students to explore their interest in medical careers. Through a standardized curriculum, these college students learn about Health Insurance Portability and Accountability Act guidelines, participate in projects, review charts and data, write papers and observe cases in the OR.

GHS’ role in educating future physicians and healthcare professionals continues at the graduate level. One-third of USC medical students pursue their clinical training at GHS, participating in clinical rotations and a lecture curriculum. A surgery elective for seniors lets students devote a month to studying one or two surgical specialties. They get first-hand experience, exposure to cases and patient care responsibilities.

Residencies and Fellowships

The surgical residency program is a five-year program with rotations in General Surgery, Surgical Critical Care, Surgical Oncology, Minimally Invasive Surgery and Vascular, Trauma, Pediatric and Cardiothoracic Surgeries. With supervision, residents treat patients in GHS clinics and ERs.

There is stiff competition to participate. The program receives more than 200 applications annually and selects 60 prospective residents for interviews. GHS uses the National Residency Match Program to facilitate connections. Four residents a year are accepted as “categorical” candidates to do all five years of surgical training at GHS. Four “preliminary” yearlong residencies are available, too. GHS also offers surgical fellowships that afford one to two years of advanced training. The Vascular Surgery program provides a two-year Vascular Surgery fellowship and one-year Vascular Medicine fellowship.

The Curriculum

GHS’ high surgical volume gives residents many hands-on operating experiences. GHS provides a well-organized didactic reading program during the first three years, with written exams on each textbook chapter. To help fourth- and fifth-year residents prepare for the American Board of Surgery exams, the department offers a more clinical approach, including extensive oral exams.

The skills curriculum teaches basic and advanced techniques, from suturing and knot-tying to laparoscopy. Residents also train at the Greenville HealthCare Simulation Center, located on Greenville Memorial Medical Campus, where they practice surgery and advanced trauma life support skills. The Surgical Innovation Center at Patweood Medical Campus offers another high-tech setting for skills development. Practice labs, lectures, grand rounds conferences and required clinical research projects complete the curriculum. GHS also offers an international elective program.

The training methods are working: GHS surgical residents have a 100 percent pass rate on their certifying and qualifying exams. Dr. Smith said he is proud of “the extraordinary people” who have graduated from GHS’ programs, concluding, “I would let them operate on me.”

For more information, call Dr. Smith at (864) 232-0055.

Dane Smith, M.D., FACS, is a general surgeon and academic program director at GHS University Medical Group—Department of Surgery.
Research Excellence

Greenville Hospital System University Medical Center (GHS) takes a practical, productive approach to research.

The Department of Surgery at GHS University Medical Group, the hospital system’s multispecialty group practice, is involved in dozens of clinical trials and research projects. Most research is performed in conjunction with industry-sponsored studies, which typically are ongoing at locations across the U.S. These projects enable more effective products and devices to come to market. GHS benefits by gaining access to these devices and treatments well in advance.

“This is an exciting place to be right now,” emphasized vascular surgeon David Cull, M.D., FACS. “We only test trial products we believe have a real potential for offering a substantially better solution.”

Bruce Gray, D.O., FSVM, FSCAI, directs the department’s clinical trials program, supported by four clinical research RNs and two research specialists. Dr. Gray is a national research leader in endovascular technology. He works closely with Eugene Langan, M.D., FACS, program director for Vascular Surgery, who is nationally known for his work and basic research in stent-grafting techniques.

A Strong Foundation

GHS’ Department of Surgery has a long history of clinical research. For many years it has maintained a database of outcomes information. “It allows us to compare results on particular treatments with those of other centers across the country,” Dr. Cull said.

Dr. Cull credits department chair Spence Taylor, M.D., FACS, a vascular surgeon, for the group’s strong research focus. “During the past 15 years, Dr. Taylor has been doing small, retrospective studies. He’s always been the champion,” Dr. Cull said. “He identified people with the same burning desire. That has created a unique environment and rippled over to other areas of surgery.”

Accomplishments

In the past eight years, the department’s faculty members have published approximately 150 research papers, including at least 50 seminal articles that have changed the practice of surgery or the understanding and treatment of diseases. Drs. Taylor, Cull and Gray have written multiple textbook chapters and contributed to improvements in vascular surgery nationally.

In surgical oncology, Steven Trocha, M.D., FACS, has participated in and led studies that explore outcomes of cancer surgery. Alfredo Carbonell, D.O., FACS, FACOS, and William Cobb, M.D., FACS, are involved in industry-based studies that compare different meshes for ventral hernias. Dr. Cobb also has presented two international talks on minimal access surgery. Additionally, almost every surgical resident and fellow has an ongoing research project.

GHS’ research has had prominent exposure at leading surgical meetings. The Southeastern Surgical Congress, which selects only 50 abstracts from 400 submittals for presentation annually, chose seven presentations from GHS to showcase this winter.

Likewise, GHS had a strong presence at the annual meeting of the Southern Surgical Association, the nation’s most prominent regional surgical society. Only 25 abstracts are chosen for presentation, with a maximum of two per institution. GHS, Vanderbilt and Emory were the only institutions to have two abstracts selected. GHS also presented three of the 25 presentations at the most recent Society for Vascular Surgery annual meeting.

Dr. Cull credits GHS’ origins as a community hospital as providing a unique approach to research: “We’re not just doing research for research’s sake or publishing for academic promotion and grants. We’re doing it for the love of research. Dr. Taylor always describes us as ‘blue-collar researchers.’ We ask a basic question: ‘How can this be done better?’ We chip away at uncertainty or the status quo. This directly benefits our patients.”

For more information, call Dr. Cull at (864) 454-8272.

GHS University Medical Group surgeons have been recognized nationally for their innovative research.

David Cull, M.D., FACS, is a vascular surgeon and active researcher of GHS University Medical Group—Department of Surgery.
Surgical Quality

Greenville Hospital System University Medical Center (GHS) is participating in a national quality initiative focused on surgical care.

GHS is engaged in the Surgical Care Improvement Project (SCIP), a national quality partnership designed to decrease common complications from surgery. Like other major quality programs, SCIP (pronounced “skip”) encourages hospitals and clinicians nationwide to improve their quality and empower consumers with information to make more informed healthcare decisions.

SCIP was formed by a coalition of leading healthcare organizations, including the American College of Surgeons, American Society of Anesthesiologists, American Hospital Association, Centers for Medicare and Medicaid Services (CMS), Association of periOperative Registered Nurses and Institute for Healthcare Improvement. The initiative's founders are committed to improving the safety of surgical care through evidence-based guidelines. SCIP's ultimate goal is to reduce the incidence of surgical complications by 25 percent by 2010.

Infections and respiratory, thromboembolic and cardiovascular problems are involved with the highest incidence of postoperative complications. These complications take a toll on patients and families, increase the length of hospital stays and contribute to the overall cost of health care in the United States. SCIP has targeted problems related to three of these four areas for improvement: surgical site infections, deep vein thrombosis (DVT) and adverse cardiac events. There are nine quality measures related to improving outcomes in these areas. (See chart.)

Several measures focus on preventing surgical site infections through preoperative ordering and timely administration of the appropriate prophylactic antibiotic. Another measure relates to the method of hair removal, which is important for preventing surgical site infections. Medical guidelines state that any form of hair removal is acceptable as long as it does not involve shaving the site preoperatively (clipping and using hair removal creams are alternatives).

Control of blood glucose levels following open-heart surgery also is proven to reduce infection, and it is a care measure.

Another measure related to infection prevention ties specifically to colorectal surgery. Studies have shown that hypothermia, particularly in the colorectal surgery population, is associated with a significant increase in adverse outcomes, including an increased incidence in infection.

Two of the measures track the ordering and administration of prophylaxis to prevent DVT, which occurs after approximately 25 percent of all major surgical procedures if no prophylaxis is administered. Likewise, pulmonary embolism occurs following 7 percent of surgeries conducted without prophylaxis. As part of its participation in SCIP, GHS tracks and reports per CMS guidelines how often prophylaxis is ordered and, second, how often DVT prophylaxis is administered in the perioperative period.

Adverse cardiac events, the third focus area of SCIP, are complications of surgery occurring in patients undergoing noncardiac surgery who have multiple cardiac risk factors or established coronary artery disease. A care measure related to adverse cardiac events tracks the administration of beta blockers perioperatively in patients taking beta blockers routinely before hospital admission. This use of beta blockers has been shown to prevent postsurgical cardiac complications.

GHS' Tradition in Quality Partnerships

As part of its commitment to improving surgical care, GHS began publicly reporting its data for SCIP measures in 2006 to the Hospital Quality Alliance. It's not the first time GHS has been at the forefront of a quality initiative.

In 2002, the system was the only one in South Carolina to collaborate in the national Surgical Infection Prevention Project. In 2003, GHS voluntarily began participating in the CMS/Premier Hospital Quality Incentive Demonstration (HQID) Project. Recently Greenville Memorial Hospital (GMH) was awarded the highest HQID honors for clinical care provided to patients undergoing coronary artery bypass graft (CABG) procedures. GMH and Hillcrest Memorial Hospital also received top performer recognition for their high-quality care outcomes for patients undergoing total joint replacement.

Building on the initial success of reporting surgical quality measures from the inpatient arena, this year hospitals across the nation began collecting outpatient surgical care data to report publicly. GHS is participating in this Hospital Outpatient Quality Data Reporting Program (HOP QDRP).

Following standardized evidence-based care protocols, hospitals will report how often the appropriate prophylactic antibiotic is administered within one hour before outpatient surgery. They also will report outpatient measures related to heart attack and chest pain.

To view a hospital’s performance in caring for its medical and surgical populations, visit www.hospitalcompare.hhs.gov and www.mysChospital.org. For more information about these GHS surgical quality statistics, call (864) 455-3877.

Linda Lineberger, B.S.N., clinical operations analyst in the Department of Quality Management at GHS, coordinates GHS’ publicly reported data (medical and surgical) submitted to the CMS and The Joint Commission on a quarterly basis.
### Surgical Care Improvement Project (SCIP)
#### GHS Scores Relative to State and National Averages

<table>
<thead>
<tr>
<th>SCIP Measure</th>
<th>GHS Average 10/07-9/08*</th>
<th>National Average 7/07-6/08</th>
<th>S.C. Average 7/07-6/08</th>
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<tr>
<td>Prophylactic antibiotic selected</td>
<td>99.0%</td>
<td>92%</td>
<td>93%</td>
</tr>
<tr>
<td>Prophylactic antibiotic administered within one hour before incision</td>
<td>97.1%</td>
<td>86%</td>
<td>86%</td>
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<tr>
<td>Prophylactic antibiotics discontinued within 24 hours after surgery</td>
<td>95.6%</td>
<td>84%</td>
<td>89%</td>
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<td>DVT prophylaxis ordered for surgery patients as recommended</td>
<td>93.3%</td>
<td>84%</td>
<td>87%</td>
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<td>DVT prophylaxis administered 24 hours before or 24 hours after surgery as recommended</td>
<td>89.2%</td>
<td>81%</td>
<td>85%</td>
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<td>Blood sugar controlled after open-heart surgery</td>
<td>96.2%</td>
<td>85%**</td>
<td>86%**</td>
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<tr>
<td>Hair removed appropriately before surgery</td>
<td>98.5%</td>
<td>95%**</td>
<td>96%**</td>
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<td>Postoperative normothermia administered to colorectal surgery patients</td>
<td>87.1%</td>
<td>Not yet a required indicator; data not available</td>
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<tr>
<td>Beta blocker administered perioperatively to surgery patients on beta blocker therapy</td>
<td>86.4%</td>
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</table>

** Data for period 10/07-6/08. Not a required indicator previously.
Performing a high volume of surgeries annually, the cardiothoracic and vascular surgeons of GHS University Medical Group (UMG), the system's multispecialty physician group practice, are committed to offering the latest procedures and evidence-based protocols.

Both surgery teams point to inter- and intradepartmental collaboration with other GHS specialists as a factor that raises the level of care at GHS and differentiates cardiovascular surgical services from those of other providers in the region. They also credit GHS' Institute for Vascular Health at Patewood Medical Campus for enabling them to offer comprehensive services that are easy for patients to access (see related article).

**Cardiothoracic Surgery**

There are four experienced cardiothoracic surgeons at UMG. In recent years the division's patient outcomes, as measured by the Society of Thoracic Surgeons (STS) national database, have been far better than predicted for the group's high-risk surgical population. The division is rated in the top 10 percent for quality by the Centers for Medicare & Medicaid Services (CMS) and as a Designated Center of Excellence for coronary artery bypass grafting (CABG).

UMG's cardiothoracic surgeons emphasize that the high quality of cardiac and thoracic care at GHS comes from “team management” of patients among physicians who specialize in cardiac surgery, anesthesiology, pulmonary/critical care and endocrinology.

For instance, physicians in GHS' Cardiovascular Anesthesiology Group have advanced training and experience in transesophageal echocardiography and cardiac physiology. There also are 13 board-certified physicians in the specialty of pulmonary and critical care medicine in GHS' Pulmonary Disease, Critical Care & Sleep Medicine division, which helps cardiac surgeons serve patients pre- and postoperatively. GHS' Endocrinology division also plays a vital collaborative role. It was instrumental in the formation of an interdisciplinary team of physicians, biostatisticians and ICU and infection control nurses to address glucose control, with a focus on postoperative care in the cardiovascular intensive care unit (CVICU).

The Cardiothoracic Surgery division offers a wide breadth of procedures. Following are among the many services offered: CABG; aortic valve replacement (AVR); mitral valve replacement (MVR); complex mitral valve repair; minimal access valve surgery; aortic root replacement, including the Bentall procedure and valve-sparing procedures; surgery of the great vessels, including aortic arch procedures; transmyocardial laser revascularization (TMR); congenital cardiac surgery in adults, including atrial septal defect repair (ASD), ventricular septal defect repair (VSD), anomalous coronary anatomy, aortic coarctation and idiopathic hypertrophic subaortic stenosis;
surgical treatment of cardiac tumors; and noncardiac thoracic surgery, including minimal access video-assisted thoracoscopic procedures.

GHS is known as a leading surgery center for minimally invasive valve repair surgery (see sidebar) and is a national preceptor for standard open and minimal access MAZE procedures for atrial fibrillation.

UMG cardiothoracic surgeons have 10 years of experience with the ABIOMED™ right and left ventricular assist devices (LVAD/RVAD). They also have used extracorporeal membrane oxygenation (ECMO) in the CVICU. During the past two years, the ventricular assist device (VAD) has been implanted as a bridge to recovery in patients who have had open-heart surgery and as a bridge to heart transplants in other patients, with a 50 percent survival rate. GHS has a cohesive clinical relationship with the Cardiac Transplant Program at the Medical University of South Carolina and has established protocols for the transport of patients with VADs.

Another innovation implemented by the division is the use of standardized operative notes with electronic illustrations of patients’ CABG procedures. These notes, compiled in real time during surgery using specialized software, feature information about the placement of a patient’s bypass and other critical details. Data fields of the software are aligned to the STS’ database for use in measuring quality performance. The notes enable quick postoperative communication with referring physicians. Moreover, data can be downloaded and supplied to patients on a credit card-sized document. The card features an illustration of their graft anatomy that they can carry with them in case of an emergency or to aid in future interventions.

The Cardiothoracic Surgery division also uses endoscopic vein harvesting (EVH) to obtain healthy blood vessels for use in coronary artery bypass surgery. This technique can be used to harvest the greater saphenous vein from the leg or the radial

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**GMH Tapped as Minimally Invasive Valve Repair Training Site**

Greenville Memorial Hospital (GMH) and cardiothoracic surgeon Barry Davis, M.D., FACS, will host surgeons from across the nation who want to learn the latest techniques of minimally invasive heart valve surgery. Dr. Davis will serve as a surgical preceptor, one of the few select surgeons qualified to educate other surgeons in these specialized procedures.

The field of minimally invasive cardiac surgery is unique, and there are a limited number of U.S. sites and surgeons competent to perform such complex operations. Medtronic Inc., one of the leading suppliers for valvular surgical products, selected GMH and Dr. Davis as the latest addition to its exclusive stable of training sites. Other training sites include such prestigious healthcare systems as the New York University Cardiac and Vascular Institute, William Beaumont Hospital, St. Joseph’s Hospital and Baptist Health South Florida.

“This honor speaks volumes about our program being recognized as a national training site,” said Dr. Davis. “It is a reflection of the quality of service we, as surgeons, and our staff provide our patients.”

Minimally invasive heart valve surgery offers many advantages over traditional open-heart surgery to treat cardiac valve pathology. Minimally invasive procedures take about two and one-half hours. They require only a two-inch incision between the ribs versus the standard sternotomy. For female patients, the postoperative scar from a minimally invasive operation usually is hidden in the breast crease.

In addition to offering less risk for infection, blood loss and other problems, the minimally invasive approach eases the patient’s recovery. He or she usually spends four to five days in the hospital following surgery compared with seven to 10 days for an open procedure. There also is less postoperative pain, and the patient typically can become more physically active in a shorter time period following surgery than he or she could after an operation that included sternotomy. Driving a vehicle is possible much earlier after minimally invasive heart surgery.

Dr. Davis hopes more physicians and patients will consider an evaluation for this type of surgery. The less invasive surgical approach offers patients an opportunity to be treated for asymptomatic mitral regurgitation before the condition worsens and leads to potential heart failure.

While valvular heart surgery is the focus of the national training initiative, Dr. Davis and his partners also perform other cardiac operations using minimal access approaches, including repairs of congenital defects of the heart and the MAZE procedure to treat atrial fibrillation.

For more information, call Dr. Davis at (864) 455-6800.
artery from the arm. Using special instruments, a physician assistant makes a small incision and delicately removes the vein from the leg and closes the incision. In addition to being the most cost-effective method for vein harvesting, EVH has resulted in decreased infection rates and wound complications, reduced postoperative pain and swelling, enhanced recovery and accelerated ambulation, and minimal scarring for patients.

GHS surgeons also perform surgical ventricular restoration (SVR) procedures. Transmural infarction and cardiomyopathy can lead to left ventricular (LV) dilation, which can cause congestive heart failure (CHF) secondary to LV dysfunction (increased LV end diastolic volume, loss of normal LV elliptical shape, mitral insufficiency and decreased global LV function). GHS surgeons can treat this pathology with SVR.

The goal of SVR is to decrease the size and restore the normal elliptical shape of the left ventricle, therefore improving cardiac function. Candidates for SVR are patients with LV aneurysms, large areas of arterioapical akinesis or dyskinesis, large left ventricles and CHF. Patients with an ejection fraction (EF) as low as 10 percent have been treated with SVR. Patients are best evaluated for SVR with cardiac MRI to determine ventricular volumes and viability. SVR can be combined with coronary revascularization or valve surgery.

**Vascular Surgery**

Since its formation in 1994, GHS' Division of Vascular Surgery has worked to build a team that encompasses “all things vascular.” There are nine vascular surgeons, plus five vascular medicine physicians who specialize in endovascular procedures, venous disease and risk reduction management. The division started the state’s only vascular residency program in 2002 and then launched the state's first vascular medicine fellowship in 2007.

“Their vascular surgeons have a decade of experience with implanting ABIOMED™ right and left ventricular assist devices, which provide temporary support for the part of the heart damaged during heart failure. The devices can help to stabilize patients until a transplant procedure.

The Vascular Surgery division has an excellent track record of outcomes. It's treatment of carotid stenosis with angioplasty and stents has greatly surpassed national standards with a stroke risk of <1 percent. Repairs needed to endovascular stent grafts for abdominal aortic aneurysm (AAA) are one-third to one-half of those reported in the current literature. The division’s claudication procedures enable 97 percent of patients to avoid amputations.

UMG vascular surgeons have been responsible for surgical firsts in the Upstate and beyond. They were the first in the state to implant aortic stent grafts, including grafts to treat both abdominal aortic aneurysms (AAA) and thoracic aneurysms. They also were pioneers in performing combined open and endovascular surgeries.

GHS built the state’s first endovascular operating room, which became a model for other systems across the Southeast. Since then, GHS has invested in converting four of its interventional radiology suites into endovascular ORs. These rooms have a laminar flow of oxygen circulating so that surgeons can perform open surgery with anesthesia as well as endovascular procedures, or a combination of the two, with imaging capability at all times.

Early innovations have paved the way for ongoing advances. UMG vascular surgeon David Cull, M.D., FACS, is a national expert on arteriovenous (AV) access for dialysis patients. Among other developments, he invented the CreatiVasc Hemoaccess Valve System, which reduces complications associated with AV graft operations. He also has a patent pending for the FistulaFinder®, a device that helps dialysis technicians visualize and stabilize a patient’s fistula site. The device greatly reduces the need for repeated “needle sticks,” and has decreased complications caused by failed AV access attempts by 83 percent.
GHS interventionalists from endovascular surgery, radiology and cardiology recently formed a Carotid Stenting Service, a collaborative practice model designed to ensure optimal patient care while centralizing research and outcomes data.

Bruce Gray, D.O., FSVM, FSCAI, is UMG’s director of Endovascular Services and co-director of the American Board of Vascular Medicine. He was the first physician in the state to enroll patients in the Embolic Protection Device in Carotid Artery Stenting (EPIC) trial. The trial involves a new system to capture particles that could be dislodged during the carotid stenting procedure. The carotid stenting procedure, performed through a catheter inserted into the groin, is an alternative to open surgery through a neck incision.

UMG’s vascular medicine specialists also are using catheter treatments to address varicose veins and other venous diseases. These progressive treatments, performed on an outpatient basis, have replaced vein stripping. “The patient is walking as soon as it’s done,” said Marcus Stanbro, D.O., FSVM, director of the GHS Vein Center and program director for Vascular Medicine. “We have board-certified vascular physicians, and this is their core focus.”

**Education and Research**

The Cardiothoracic Surgery and Vascular Surgery divisions are active in teaching tomorrow’s surgeons and conducting research to develop new procedures and treatment protocols. UMG cardiothoracic and vascular surgeons have hands-on involvement in the training of GHS residents and may expand this training on a more regional basis in the future.

The Cardiothoracic Surgery division participates in many national quality initiatives, including contributions of outcomes data to the STS National Database, CMS’ Quality Initiative, the National Surgical Prevention Collaborative and the Prevent IV Clinical Trial.

The Vascular Surgery division participates in approximately 15 clinical trials annually. An ongoing trial focuses on dosing safety of clot-dissolving medicines for the lower legs. Another explores renal artery problems and whether they are solved with certain medications, and yet another investigates AAA stent grafting. The division also is analyzing the issue of how long patients with deep vein thrombosis (DVT) should take anticoagulants and which medications are best. In addition, they are evaluating the safety and efficacy of new oral medications for DVT other than Coumadin®. The division will start two iliac stent trials this year.

For more information or to refer a patient, call the Cardiothoracic Surgery division at (864) 455-6800 or the Vascular Surgery division at (864) 454-VASC (8272).

**Phlebology Expertise Enhances Vascular Care**

Marcus Stanbro, D.O., FSVM, director of GHS’ Vein Center at the Institute for Vascular Health and program director for Vascular Medicine, recently became one of the first physicians in the nation to become board certified in phlebology. Dr. Stanbro, who also is board certified in vascular medicine, passed the first phlebology board examination to be offered in the United States – a test administered by the American Board of Phlebology under the support of the American College of Phlebology.

He is now one of the few physicians in the U.S. to have fellowship training in vascular medicine and to be double-board certified in vascular medicine and phlebology.
Orthopaedic Surgery and Neurosurgery

Greenville Hospital System University Medical Center (GHS) strives to seamlessly connect patients and referring physicians with surgeons in these specialties.

In one of the most innovative collaborations in the country, many orthopaedic surgeons and neurosurgeons have combined their expertise under a single umbrella at GHS.

“Working together enables us to provide the best care because our surgeries are often complementary,” said Edward Bray, M.D., a pediatric orthopaedic surgeon who chairs the departments of Neurosurgery/Orthopaedic Surgery for University Medical Group (UMG) and the GHS Medical Staff.

“Clinical teams enable us to provide consistency of care that offers a new comfort level for patients,” said Stephen Gardner, M.D., FACS, chair of the Medical Staff’s General Neurosurgery division.

With the large number of orthopaedic surgeons and neurosurgeons practicing at GHS, it can be challenging to keep track of the many subspecialties. Within UMG, GHS’ multispecialty physician group practice, the Neurosurgery/Orthopaedic Surgery department employs orthopaedic surgeons, nonsurgical sports medicine physicians and neurosurgeons across a number of divisions, including General Orthopaedic Surgery, Orthopaedic Trauma, Pediatric Orthopaedic Surgery, Neurosurgery, the Southeastern Neurosurgical & Spine Institute (SENSI) and Steadman Hawkins Clinic of the Carolinas (SHCC).

Keeping the Joints Moving

SHCC is a nationally recognized practice specializing in orthopaedics and sports medicine. The clinic’s physicians perform surgeries for back and neck injuries, arthritis and joint replacement as well as arthroscopy and complex reconstruction surgeries to treat hip, knee, shoulder, elbow, foot and ankle injuries.

SHCC surgeons are innovators in many procedures that help patients get their bodies moving again at an optimal level following sports-related injuries and other chronic musculoskeletal conditions. Michael Kissenberth, M.D., director of the SHCC Orthopaedic Sports Medicine Service, said the group’s success relies not only on mastery of the newest surgical techniques but also on a team-centered approach to care that is closely integrated with physical therapists and athletic trainers.

For example, SHCC surgeons have spent years developing protocols for postoperative rehabilitation with GHS physical therapy affiliate Proaxis Therapy. “That team approach is critical,” said Dr. Kissenberth. “It’s one of the key factors that optimizes patient outcomes and accelerates their return to full function.”

SHCC surgeons also are collaborating closely with the high school athletic trainers of GHS Certified Athletic Trainer Services. Trainers assigned to schools across Greenville County are documenting every injury sustained by high school athletes. This information is populating a database that SHCC surgeons are beginning to analyze. Their goal is to develop preventive programs to help keep young athletes healthy and on the field, Dr. Kissenberth said.

When athletes and non-athletes of all ages require surgery, SHCC physicians specialize in procedures to help patients regain mobility and strength as quickly and safely as possible.

Brian Burnikel, M.D., was the first physician in South Carolina to perform Birmingham Hip Resurfacing™, a bone-sparing alternative to total hip replacement that restores a great deal of motion to the hip joint. Dr. Burnikel also is one of the state’s pioneers in the use of the anterior approach to hip replacement. Patients lie supine instead of on their sides for the procedure, which requires only a six- to eight-centimeter incision through the intermuscular plane. The procedure leads to a more stable hip joint and less risk of dislocation.
For surgical care of the shoulder, SHCC is a leader in arthroscopic rotator cuff techniques. In fact, the clinic is involved in several research projects focused on rotator cuff repair and shoulder conditions affecting the “overhead athlete,” or athletes who repetitively raise their arms and shoulders over their heads in the course of playing their sport. SHCC also performs all of the latest ligament reconstruction techniques for knee repair, leveraging minimal access advances to reduce pain and scarring and hasten recovery time.

Dr. Kissenberth and partner Stefan Tolan, M.D., are two of only a few surgeons in the Upstate who perform “tennis elbow” repair arthroscopically. “Patients literally get back to their normal activities months earlier than they do with the traditional open procedure,” Dr. Kissenberth said.

Another factor that differentiates orthopaedic surgical care at GHS is the training infrastructure at SHCC. This summer, a Surgical Innovation Center (including a bio-skills laboratory) opened at Patewood Medical Campus (see “Role of the Institutes”). The first of its kind in the state, the center is a training, research and development hub for SHCC surgeons and GHS' many orthopaedic surgery residents. The facility provides fertile ground for work on continuous process improvement, Dr. Kissenberth emphasized.

SHCC has an accredited fellowship in sports medicine and last fall welcomed six orthopaedic surgeons from around the country to spend the year learning new surgical techniques. These surgeons will be heavily involved in research. “Training the fellows and residents is a very enjoyable and fulfilling part of my job,” Dr. Kissenberth stated. “The teaching program keeps us on the leading edge of sports medicine and orthopaedic surgery.”

On the horizon are projects related to the design of orthopaedic implants, in conjunction with Clemson University researchers, as well as studies to evaluate the biology of soft tissue. The latter is “the next frontier” in orthopaedic surgery as physicians evaluate tissue growth at the cellular level and find ways to promote faster tissue healing after orthopaedic reconstruction, Dr. Kissenberth said. Along those lines, one of the studies under way at SHCC focuses on vascular supply to the rotator cuff following repair.

Multispecialty Care for Spine Patients

UMG’s neurosurgery team includes surgeons from both SHCC and SENSI, a practice that has served patients in the Upstate since 1969. All UMG neurosurgeons perform intracranial surgery for tumors, arteriovenous malformations and aneurysms. Some have subspecialty expertise in spine surgery, pediatric neurosurgery, trauma surgery and tumor resection.

“A spinal tumor may need a neurosurgeon, but stabilization with fusion may need an orthopaedic surgeon,” said Dr. Bray. “It made sense to combine the orthopaedic and neurological spine surgeons into a Spine Institute.”

This team approach has led to development of protocols practiced by all the surgeons. “This benefits the community at the highest level and has made us the busiest spinal service in South Carolina,” said Dr. Gardner.
GHS has laid the groundwork to establish a Spine Center of Excellence for surgical care and nonoperative evaluation and care of adults and children with all types of spinal problems, including degenerative arthritis, spinal trauma, tumors, vertebral compression fractures, athletic spine injuries and deformities. The center's team will include medical physicians, physical therapists, physiatrists, neurologists and pain management specialists. In particular, the team will offer rapid assessment and treatment of on-the-job injuries.

Interdepartmental cooperation plays an important role in the care of patients with cancer of the spinal region. Oncology care for patients with nervous system tumors is provided through the GHS Neuro-oncology Multidisciplinary Center (MDC), a collaboration of GHS neurosurgeons, medical oncologists and radiation oncologists. A strong rehabilitation alliance completes the circle of care. Spine surgeons refer many patients to GHS' Roger C. Peace Hospital—Rehabilitation.

“We involve patients in rehabilitation in the early phases of their care because it produces better outcomes,” said Dr. Gardner.

**Spine and Brain Surgery: Technology Advances**

Disc replacement has revolutionized the treatment of degenerative lumbar and cervical spine disease by allowing motion preservation. “Previously, we used bone grafts and rigid fusion,” said Dr. Gardner. “Artificial discs enable us to re-establish normal anatomy and flexibility while reducing pain.”

UMG spine surgeons also are using biologic replacement materials for bone and cartilage to improve healing, and they are recording outcomes in the Spinal Registry for analysis and future publication.

In the neurosurgery area, where UMG guarantees access for referred patients within one week, improved techniques and instrumentation allow surgeons to apply microscopic intracranial procedures for complex brain tumor operations, as well as for arteriovenous malformations and aneurysms.

The neurosurgeons use stereotactic guidance for biopsies and the removal of brain tumors. “Correlation of the image with patient's anatomy in real time allows for pinpoint accuracy, smaller incisions and quicker recovery,” said UMG neurosurgeon Charles Kanos, M.D. “We also can confirm that the entire lesion has been resected.”

For postoperative care, the surgical team uses equipment specifically designed for monitoring patients who have had surgery for intracranial injury. Following surgery to remove brain tumors, the Neuro-oncology MDC's physicians can provide standard or investigational chemotherapy protocols and radiation therapy.

**Full Care for Hand and Wrist Problems**

With a high level of microvascular expertise and experience, hand surgeons at GHS take referrals for the full variety of hand problems. “We offer a different level of expertise in hand care because it's all we do,” said Edwin Rudisill, M.D., chair of the Medical Staff’s Hand Surgery division and a partner in the Greenville-based private practice, The Hand Center P.A.

The Hand Center's surgeons take trauma call at GHS, often performing free-flap and free-tissue transfers and amputations. “We rarely reattach amputated single fingers unless it's the thumb because patients do not get complete recovery of sensation or motor function,” said Dr. Rudisill.

Nerve repairs and finger reattachments are performed in the fully equipped microvascular operating room at Greenville Memorial Hospital (GMH).

Hand surgeons also run a clinic at GHS, where they offer evaluation and treatment of infections, tennis elbow and other
nonsurgical problems from the fingertips to the shoulder. The most common procedures they perform are surgeries for trigger finger, carpal tunnel syndrome, Dupuytren’s contracture, ganglion cysts, joint replacement, congenital absences, webbed fingers and repair of broken wrists and fingers. One of the four hand specialists also operates on the shoulder for rotator cuff injuries and on the elbow for lateral epicondilitis, tendon tears and medial collateral ligament repair.

Minimal Access Approaches
How often the orthopaedic surgeons and neurosurgeons use minimal access techniques depends on their training, preference, type of procedures they perform and availability of instrumentation.

“Minimal access surgery is sometimes a good option, sometimes not,” said UMG surgeon Timothy McHenry, M.D., chair of the Medical Staff’s Spine Division. “It has to be able to accomplish what can be done in open surgery. The best situation is one in which the surgeon has experience with both open and minimally invasive techniques and can weigh the risks and benefits.”

Increasingly miniaturized instrumentation enables many spinal procedures to be done less invasively or percutaneously. These include operations for degenerative spine disease, ruptured discs, lumbar stenosis and spondylolisthesis.

Orthopaedic and hand surgeons routinely use minimal access approaches for arthroscopic surgery of the wrist, elbow, shoulder and knee. Joint replacements are now performed through smaller incisions.

“The technique reduces the risk of dislocation because it causes less trauma to the muscles,” said Kyle Jeray, M.D., a UMG orthopaedic trauma surgery specialist and chair of the Medical Staff’s General Orthopaedic Surgery division. “Patients have less pain and are able to get back on their feet sooner.”

However, most scoliosis surgery still requires an open approach, as does fracture repair, with a few exceptions. And although carpal tunnel syndrome can be repaired endoscopically, The Hand Center’s surgeons opt not to perform the procedure in that way. “The risks are greater, the results are not equal, and patients do not return back to work or daily activities any faster,” said Dr. Rudisill.

Education and Research
The breadth and depth of the orthopaedic and neurosurgical staff, GMH’s Level I Emergency Trauma Center and large number of complex pediatric and adult cases make GHS an ideal training ground for the 17 residents in UMG’s Orthopaedic Surgery Residency Program.

“In their five years of residency, our residents do upward of 2,000 procedures,” said Dr. Bray. Residents also assist in the care of patients, first-assist in surgery and help provide postoperative care.

“It’s a real educational benefit because a staff physician is always involved in the patient’s care,” added Dr. McHenry. “The resident is never the primary caregiver.”

Integration of neurosurgery with orthopaedic surgery is a special boon for residents interested in spine surgery, who benefit from the complementary expertise. “We are training a new generation of doctors in the latest methods of treating trauma and nontraumatic spine problems,” said Dr. Gardner. A spine surgery fellowship is under discussion.

The American College of Graduate Medical Education requires orthopaedic residents to conduct at least one research project during their residency. They find good mentors in UMG’s staff physicians, many of whom publish in peer-reviewed journals and present at national meetings. “Most of our research is clinically based, but we do some basic science projects with Clemson University, and we hope to increase our activities with the University of South Carolina School of Medicine,” said Dr. Jeray.

GHS neurosurgeons have affiliated with Clemson University for research of head injuries and are using the Spine Registry to compare treatments for spinal fractures and to conduct outcome studies on nonoperative management of back conditions.

GHS neurosurgery research began in the early 1980s when department chair Frank Wrenn, M.D., was president of the American Academy of Neurological Surgeons. During his tenure, he focused on neurosurgical education nationally.

“He initiated clinical studies to improve the delivery of health care to nonurban areas,” said Dr. Gardner. “He started a program here to study different diseases, how patients got them and how to improve access and care. We have continued the mission of improving access for the region.”

For more information about orthopaedic surgery, call (864) 454-4600. For more information about neurosurgery, call (864) 454-7422 or (864) 455-6030.
An innovative protocol for trauma care has helped make the Level I Emergency Trauma Center (ETC) at Greenville Memorial Hospital (GMH) the premier destination for injured patients in the Upstate, western North Carolina and northeastern Georgia. The program incorporates general surgery, orthopaedic surgery, neurosurgery and plastic surgery under the umbrella of Trauma Services.

The ETC was named a “very high-quality” trauma center in the most recent report by the Survival Measurement and Reporting Trial for Trauma (SMARTT). GMH received the highest level of recognition given to trauma centers in the report, which is based on outcomes tracked in the National Trauma Databank, a product of the American College of Surgeons. The college collects data from nearly 80 percent of Level I trauma centers in the United States.

Critical Care Leadership
In July 2008, Richard Roettger, M.D., FACS, who had led GHS' trauma and acute care surgery program since 2002, was appointed vice chairman of regional development for the Department of Surgery of University Medical Group (UMG), GHS' multispecialty physician group practice. He is managing the surgical call network for GHS hospitals and other contract hospitals within the region.

In October 2008, Benjamin Manning, M.D., became the department's director of Trauma. Dr. Manning, who is fellowship trained in surgical critical care, will assist in quality management, academics and community outreach as well as continue the verification of the ETC as a Level I center.

When he was recruited to GHS, Dr. Roettger immediately saw the advantages of involving general surgeons on the trauma team. “When general surgeons perform trauma surgery, they are able to keep diverse surgical skills and maintain those skills,” said Dr. Roettger.

Subsequently, GHS orthopaedic surgeons, neurosurgeons and plastic surgeons were added to the team, ensuring that subspecialty expertise would be available to patients with complex and life-threatening injuries. “This model better serves our community,” he added.

A wide range of acute care surgical services differentiates Level I trauma care at Greenville Hospital System University Medical Center (GHS).
Subspecialty Expertise

GHS orthopaedic trauma surgeon Kyle Jeray, M.D., agrees. The hospital system’s orthopaedic surgeons take trauma call, and several handle trauma exclusively. “We do pelvic and acetabular surgeries that no one else does,” said Dr. Jeray, co-chair/program director of UMG’s Department of Neurosurgery/Orthopaedic Surgery and chair of the GHS Medical Staff’s General Orthopaedic Surgery division.

Additionally, orthopedic trauma surgeons use new “percutaneous” techniques to fix some fractures. These procedures are accomplished through small incisions by passing a plate under soft tissue and then placing screws percutaneously. “The approach minimizes trauma to the soft tissue and helps to preserve the blood supply to the surrounding fracture, which helps the bone to heal,” he explained.

When fractures are at high risk for not healing, GHS trauma surgeons may place recombinant bone morphogenic protein at the fracture site to aid in healing. The product targets undifferentiated cells near the fracture and encourages them to become osteoblasts (bone-forming cells).

There are orthopaedic trauma surgeons on call to treat crushed heels and other injuries of lower extremities. Upper extremity injuries are treated by both the orthopaedic trauma surgeons and hand surgeons. Hand surgeons also take call for complicated hand and wrist injuries.

Spinal fractures are treated by orthopaedic surgeons and neurosurgeons. Additionally, neurosurgeons provide expertise in treating head injuries.

Two fellowship-trained plastic and reconstructive surgeons care for facial injuries, including fractures of facial bones, complex lacerations to the face and deforming trauma to the ears, eyelids, nose or lips.

Fertile Ground for Research and Education

The large number of complex injuries admitted to the ETC provides an ideal backdrop for education. GHS orthopaedic and general surgery residents, physician assistants and medical students rotate through the center, gaining exposure to many subspecialties.

Case volume also offers fertile ground for research. Orthopaedic surgeons are principal investigators in three multicenter studies. One study compares midshaft clavicle fracture outcomes treated with two surgical approaches or a nonoperative approach. The second study is a large international project to determine whether washing open fractures with saline or soap-based solutions and washing with high or low pressures provides superior infection reduction. For the third study, orthopaedic surgeons are investigating outcomes and healing rates of mid-shaft femur fractures treated with different reaming devices. Dr. Jeray also has been awarded a $1 million grant from the U.S. Army to investigate compound fractures.

In 2007, the GHS trauma surgery team gave a presentation that was named “Best Paper” at the annual meeting of the American College of Surgeons’ South Carolina Committee on Trauma. The team now is collecting facial trauma outcomes data in the GHS Trauma Registry, and the plastic surgeons are preparing papers on sternal and mandible reconstruction for peer-reviewed journals.

For more information or to refer a patient, call Drs. Manning or Roettger at (864) 232-0055 or Dr. Jeray at (864) 455-6030.
Surgical Oncology

Surgical oncologists at Greenville Hospital System University Medical Center (GHS) have a strong commitment to collaboration and research.

When it comes to cancer care, the timing and sequencing of treatments is particularly critical. That’s one reason surgical oncologists at GHS work closely with members of the Cancer Center oncology team through the Oncology Multidisciplinary Center (MDC).

“We are committed to being a part of the team at the Cancer Center that offers the best quality of cancer care, whether surgery is the primary priority, a secondary therapeutic option or not even a modality in the treatment,” emphasized Steven Trocha, M.D., FACS.

Dr. Trocha is one of four surgeons specializing in surgical oncology at GHS, along with James Stephenson, M.D., FACS, Brian McKinley, M.D., FACS, and William Bolton, M.D. All are physicians of GHS University Medical Group (UMG), GHS’ multispecialty physician group practice. They also are fellowship trained in either surgical oncology or thoracic surgery. Many other surgeons, including general surgeons and subspecialists, also perform cancer-related operations at GHS.

MDCs: Building Benefits

At the heart of GHS’ cancer care strategy is the MDC concept, which “fast tracks” patients through an array of tests and evaluations crucial to the diagnosis and staging of their cancer and development of the best treatment plan. Previously, patients often had to wait weeks between appointments to get much-needed answers about their disease and start their therapies. During this time, the tumors – not to mention the patient’s level of stress and anxiety – could worsen.

When Drs. Trocha and McKinley joined GHS five years ago, there was an MDC for patients with thoracic cancers. Since then the surgeons have contributed to the phased rollout of MDCs for treating melanoma, sarcoma, lower gastrointestinal (GI) malignancies, upper GI malignancies (stomach, small bowel), hepatobiliary cancers, pancreatic cancer and breast cancer.

The MDC concept requires a very high level of coordination and cooperation among physicians, nurse navigators certified in oncology and other support staff. For instance, surgical oncologists meet regularly with medical oncologists, radiation oncologists and interventional radiologists to discuss individual patient cases. The Cancer Center tries to coordinate patients’ visits so that they can be seen by multiple specialists on the same day.

“I see myself as a cog in the wheel – a part of the team,” Dr. Trocha said. “I think a lot about what my colleagues tell me. Timing is everything when you’re dealing with cancer, and we must be in synch with each other.”

An example is the way GHS’ oncology team approaches the sequencing of solid tumor treatments. Traditionally, a patient would undergo surgery to remove the tumor, followed by radiation or chemotherapy. However, recent international trial results have shown that in certain types of cancer, it is advantageous to administer chemotherapy before surgery. In rectal cancer cases, locally advanced lesions that are T3 or node positive on preoperative assessment, for instance, should undergo neoadjuvant chemoradiotherapy. Following this approach, patients are 50 percent less likely to have a recurrence of that cancer.

“We follow these trials and strive to bring the best practices to the region,” said Dr. Trocha, noting that the Cancer Center cares for many patients who live within a six-state radius. “The different physicians in our group each are committed to staying on the leading edge of oncology knowledge. We’re also open to conversations about the latest advances in other areas.”

Some patients who seek care at the Cancer Center have a disease too advanced to cure. As such, progressive palliative care requires the surgical oncologists to approach each case holistically in conjunction with colleagues from other specialties.

“Our goal is not to cut first,” Dr. Trocha said. “We think about the patients and what is going to give them the best chance for cure or best quality of life for the time they have left.”

Applying Research for Cancer Treatment

GHS’ surgical oncologists are busy with research. Last year alone, results from six key projects were presented at forums, including the 94th Annual Clinical Congress of the American Cancer Society. GHS oncologists also prepared five presentations for the annual J.D. Ashmore Lectureship, a continuing medical education program hosted by GHS. Following are a few examples of abstracts of GHS presentations that have been presented at prestigious oncology gatherings:

• “Use of Sentinel Node Mapping and Biopsy for Thin Melanomas,” Sixth Biennial International Sentinel Node Society Meeting, Sydney, Australia
• “Differential Lymph Node Retrieval in Rectal Cancer: Associated Factors and Effect on Survival,” annual meeting of the American Society of Colon and Rectal Surgeons, Boston
• “Treatment Disparities in Women Older than 70 with Breast Cancer,” annual meeting of the American Society of Clinical Oncology, the world’s largest oncology meeting
• “Local Excision of Rectal Cancer: Retrospective Evaluation of Utilization of Resection Guidelines and Recurrence,” World Gastrointestinal Cancer Congress, Barcelona, Spain
The Cancer Center is the only one in the region participating in the second multicenter selective lymphadenectomy (MSLT II) trial. Findings from this study will help the medical community compare the outcomes of different melanoma treatment approaches.

The center also has the ability to apply research to the care plans of individual patients. Oncologists can analyze tumors removed from the patient to determine what mixture of chemotherapy drugs or radiation will be most effective in keeping the cancer in remission. A new alliance with the Moffitt Cancer Center strengthens GHS’ ability to offer customized cancer care (see sidebar).

This summer, Dr. Trocha began leading the Clinical Undergraduate and Residency Research Education (CURFE) program. Undergraduate students from surrounding universities, GHS medical students and residents are investigating a range of topics, including the following related to cancer:

- “Lung Cancer and CT/PET Imaging”
- “Ductal Carcinoma in Situ (DCIS) and Invasive Breast Cancer: Frequency and Surgical Approaches”
- “Margin Assessment in Breast Conserving Therapy for Breast Cancer”
- “Incidence of Associated Thyroid Pathology in Patients with Hyperparathyroidism”

For more information or to refer a patient, call (864) 455-4YOU.

Steven Trocha, M.D., FACS, is a fellowship-trained surgical oncologist with GHS University Medical Group–Department of Surgery.
Total Cancer Care™ Initiative

Greenville Hospital System University Medical Center (GHS) and Cancer Centers of the Carolinas (CCC) have joined the Total Cancer Care initiative with Moffitt Cancer Center in Tampa, Fla. Patients in the initiative may have broader access to new medications or clinical trials more specific to their cancer.

Many cancer professionals believe this is the beginning of a new paradigm in cancer care. GHS and CCC are the first in the state and among only 15 medical centers nationwide participating in this innovative initiative.

Most patients are treated with standard protocols developed for their type of cancer (breast, prostate, colon, lung, etc.). However, because each tumor is unique, not all will benefit from the same or similar treatment. Recently, technology has advanced in such a way that researchers can test tumors for approximately 30,000 genes. These genes can be studied and used to develop new drug therapies personalized to each patient.

For patients who opt to participate in the new initiative, a portion of their tumor – which otherwise might be discarded – is removed and sent to the Moffitt Comprehensive Cancer Center for gene profiling and other assessments. After the tumor is analyzed, information generated by the analysis is entered in a database containing similar information on other patients involved in the partnership. If in a few months, or even a few years, a new drug is found to be effective for patients with a similar genetic profile, patients fitting this profile are contacted.

One of the many benefits is the potential to learn about new treatment options as they become available. Additionally, many upstate patients diagnosed with cancer may be helped by these discoveries. The initiative's focus on the individual and not just the disease could revolutionize the way other malignant diseases are treated as well.

For more information, call Jeff Edenfield, M.D., at (864) 241-7272.

ACS Honors Dr. McKinley

UMG oncology surgeon Brian McKinley, M.D., FACS, has received the Award of Excellence for Mission Delivery from the South Atlantic Division of the American Cancer Society (ACS). This award is presented to an outstanding volunteer who demonstrates exceptional work in the delivery of the ACS mission. Dr. McKinley holds the leadership role of GHS Cancer Liaison Physician for the Commission on Cancer program. He heads up the Community Outreach Committee for the Oncology Multidisciplinary Center.

Dr. McKinley also is the primary contact for the ACS Targeted Community Investment Grant, “Colon Cancer and Real Education (ColonCARE),” awarded to GHS in April 2008. Through this grant, he has led primary care physician education as well as community outreach to the African American community, which is disproportionately affected by colon cancer.
Thoracic Expertise

Within the Division of Oncology and Thoracic Surgery, James Stephenson, M.D., FACS, and William Bolton, M.D., are specialized in all types of thoracic surgery, including operations for the treatment of cancerous tumors and benign diseases. In addition, within the Division of Cardiothoracic Surgery, Christopher Wright, M.D., FACS, FACTS, regularly treats patients with thoracic tumors and disease. Whereas Drs. Stephenson and Bolton perform both lung and esophageal operations, Dr. Wright focuses on lung procedures.

For treatment of patients with benign esophageal problems, such as reflux, physicians also can refer patients to William Cobb, M.D., FACS, and Alfredo Carbonell, D.O., FACS, FACOS, of the Division of Minimally Invasive Surgery.

“We have a dedicated team of specialists who can handle any thoracic issue,” Dr. Stephenson said.

Expedient, Collaborative Care. GHS’ Oncology Multidisciplinary Center (MDC) approach to cancer treatment means that patients are evaluated quickly and fast-tracked through the many imaging studies and physician visits they need. Physicians who refer patients with abnormal chest X-rays or CT scans can rest assured those patients will be treated right away, Dr. Stephenson said. In its imaging portfolio, GHS offers the latest in endobronchial ultrasound technology for staging pulmonary and esophageal cancers.

Another factor that enhances thoracic surgery at GHS is the large number of physician subspecialists interested in thoracic care and actively involved in patient treatment plans. Thoracic surgeons meet weekly with other physicians who make up the MDC team, including medical oncologists, radiation oncologists and interventional radiologists.

Thoracic surgeons also collaborate closely with pulmonary specialists and pathologists in the care of patients with cancerous and noncancerous diseases. Examples of noncancerous procedures include tissue biopsy for analysis of interstitial lung disease, sympathectomies for treatment of hyperhidrosis and removal of thymomas.

“There is a lot of interest in thoracic care here at GHS,” Dr. Stephenson emphasized. “We offer very global care of esophageal and lung disease.”

Minimally Invasive Surgery Experience. Drs. Bolton and Stephenson are among the few surgeons in the Upstate who can perform minimally invasive pulmonary and esophageal resections. These operations, performed using video-assisted thoracoscopic surgery (VATS) techniques, enable patients to spend less time with chest tubes postoperatively and shorten the hospital stay. There also is much less pain associated with VATS than with thoracotomy.

The sooner patients recover from surgery, the sooner they can start postoperative cancer treatment, such as radiation therapy or chemotherapy. Thus, a speedier recovery enabled by minimally invasive surgical techniques can lead to better overall cancer treatment outcomes.

For information or to refer a patient, call (864) 455-4YOU.

James Stephenson, M.D., FACS, is a thoracic surgeon with the Division of Oncology and Thoracic Surgery of University Medical Group–Department of Surgery.

Dr. Bolton Joins GHS

Last summer GHS welcomed William Bolton, M.D., to the Division of Oncology and Thoracic Surgery of University Medical Group–Department of Surgery. Dr. Bolton joins the system from the M.D. Anderson Cancer Center at the University of Texas, where he served as a clinical instructor for the Division of Thoracic and Cardiovascular Surgery. After graduating from his general surgery residency at GHS, he completed a cardiothoracic surgery fellowship at the University of Mississippi Medical Center. He earned his medical degree from Texas Tech University Medical School.

He has been involved in many cancer-related research projects, and published research papers and prepared exhibitions on topics such as pulmonary cancer and the elderly and minimally invasive surgical oncology. Dr. Bolton is looking forward to expanding GHS’ esophageal cancer surgery program, with an emphasis on minimal access procedures.
Breast Cancer Surgery

As with other types of cancer, it is vitally important for physicians to first understand the specific nature of breast cancer before tailoring a treatment plan to the patient. Within GHS University Medical Group (UMG), there is a strong emphasis on preoperative studies and interdisciplinary physician collaboration to help ensure that the patient’s care plan has been considered from a wide variety of expert angles before a breast cancer operation.

Many UMG general surgeons are experienced in performing breast cancer procedures. Their expertise and surgical services are essential to support the high demand for breast cancer-related operations in the Upstate. Two members of the Department of Surgery who have developed specialized practices for the treatment of breast cancer patients are Gayle Blouin, M.D., FACS, and Wendy Cornett, M.D., MHS, FACS. In addition, Mary Rippon, M.D., FACS, a surgeon with the Breast Health Division of the Department of OB-GYN, also specializes in treating breast cancer and other breast problems.

Planning Is Everything. Before scheduling a breast operation, UMG surgeons often work closely with radiologists, medical oncologists and radiation oncologists. This interaction – whether it takes place under the auspices of the Oncology Multidisciplinary Center, the Breast Cancer Tumor Board or simply a conference call between colleagues – leads to improved clinical outcomes.

For instance, an increasing number of patients are being referred for neoadjuvant chemotherapy to reduce the size of their tumors so that their operations ultimately can be less invasive.

In years past, these same patients typically would have gone to the operating table, with plans for their chemotherapy developed after surgery.

Sentinel lymph node biopsies are another example of how UMG breast cancer surgeons and their colleagues in radiology invest time preoperatively for the benefit of the patient. This procedure has been part of the standard breast cancer staging process at GHS since the late 1990s. During sentinel node biopsy the surgeon removes only the lymph node or nodes most likely to be affected by cancer. Removal of a smaller number of nodes for testing results in fewer postoperative complications, such as arm swelling.

Changing Mindsets, Evolving Best Practices. In the treatment of breast cancer, both patients and surgeons have been slow to accept some new standards of care. For instance, studies show that approximately 50 percent of women are having mastectomies to eliminate their breast cancer when this figure should be closer to 25 percent. “Seventy percent to 80 percent of women with breast cancer qualify for lumpectomies,” Dr. Blouin emphasized. “There is a misconception that mastectomy is the safest option.”

Part of the problem is a lack of understanding of the extent of the cancer and the patient’s overall risk. This fear of the unknown extends beyond surgery into decisions that determine postoperative care, such as need for chemotherapy. UMG physicians stress the importance of genetic testing to determine which patients are most likely to have more aggressive cancers. For women who have early-stage breast cancer that is estrogen receptor positive and lymph node negative, the Oncotype DX test can help determine whether the patient will benefit from chemotherapy. In many cases, postoperative chemotherapy – and all of its unpleasant side effects – doesn’t improve outcomes for these low-risk patients and isn’t medically necessary. “Some just don’t need it,” Dr. Blouin said.

There also are alternative postoperative breast radiation therapy options, such as MammoSite® partial breast radiation (see next page), that do not require radiation of the entire breast. By the same token, if a breast cancer patient’s genetic profile and tumor and node analysis indicate a high risk for metastatic breast cancer or cancer recurrence, she most likely should receive an aggressive treatment regimen. GHS offers genetic counseling and testing for BRoast CANcer (BRCA) gene mutations. Whereas Oncotype DX testing analyzes the tumor genes in the cancer, BRCA testing explores the patient’s genetic makeup.

“The genetic research, the biopsy findings, the different surgical and therapeutic paths that are available – these are all factors that we take into account as part of planning for each patient’s surgery,” Dr. Cornett said.
**The Importance of Intervention.** Drs. Cornett and Blouin see a need to educate women about the importance of having lumps evaluated as soon as possible following detection. Some women postpone seeing a doctor for a lump if they have recently had a normal mammogram. Others delay because they fear a diagnosis of cancer, Dr. Blouin said. “It’s important that all of us in the physician community convey to them that breast cancer treatment is very successful and that most patients recover totally,” she concluded.

For more information or to refer a patient, call Dr. Blouin at (864) 232-0055, Dr. Cornett at (864) 454-2100 or Dr. Rippon at (864) 454-2224. Or call 455-4YOU.

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**MammoSite® Targeted Radiation Therapy**

Partial breast irradiation is a method of delivering targeted postoperative radiation over a period of days (not weeks) to patients who recently have had a lumpectomy to remove cancer. The radiation is delivered only to the part of the breast affected by cancer. The MammoSite Targeted Radiation Therapy System is available on an outpatient basis at the Cancer Center at the Greenville Memorial Medical Campus.

“We have patients who come in for treatment in the morning, leave for work and then come back for the second treatment of the day before heading home,” said Gayle Blouin, M.D., FACS, one of three breast cancer surgeons at GHS trained to perform MammoSite procedures, which are done in conjunction with interventional radiologists. “And patients who live farther away from the Cancer Center find it easier to rearrange their daily schedule for one week compared with almost two months that are required for traditional radiation therapy.”

While the radiation is given for only five days, MammoSite catheters (see images) frequently stay in for longer than five days because of time required to plan the radiation and weekend time between treatments.

A patient must meet the following referral criteria to be a candidate for partial breast radiation:
- The tumor must be invasive (as opposed to noninvasive), be three centimeters or less and completely removed
- The patient must be older than 50
- The nodes must be negative

If a patient meets these criteria, she may be a candidate for MammoSite treatment. She then would be evaluated to determine if her breast anatomy will allow for MammoSite catheterization.

For more information or to refer a patient, call Dr. Blouin at (864) 232-0055 or call 455-4YOU.

**With MammoSite Targeted Radiation Therapy, a small saline-filled balloon is implanted in a patient’s resected tumor site for five days. Then twice daily for five days, a radioactive seed is directed through a catheter to the center of the balloon, where it irradiates the tumor site and area immediately surrounding the cavity. Image courtesy of Hologic™.**

**The MammoSite device consists of a dual-lumen catheter and a variable four- to five-centimeter silicone balloon. Image courtesy of Hologic™.**

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Gayle Blouin, M.D., FACS, is a general surgeon with GHS University Medical Group–Department of Surgery who specializes in breast surgery.

Wendy Cornett, M.D., MHS, FACS, is a general surgeon and fellowship-trained endocrine specialist with GHS University Medical Group–Department of Surgery.

Mary Rippon, M.D., is a physician with the Breast Health division of GHS University Medical Group–Department of OB-GYN.
In spring 2008, GHS University Medical Group (UMG) was pleased to announce that Greenville Colon and Rectal Associates joined the Department of Surgery, now comprising the Division of Colon and Rectal Surgery.

The practice started in the Upstate more than 20 years ago and has four surgeons: James Robbins, M.D., FACS, FASCRS; James Rex, M.D., FACS, FASCRS; Jay Crockett, M.D., FACS, FASCRS; and Patrick Culumovic, M.D., FACS, FASCRS. Each is board certified in general surgery and fellowship trained and board certified in colon and rectal surgery.

Although surgery is their main focus, these physicians help patients with nonsurgical concerns as well. They perform colon and rectal cancer screening and specialize in treatment of all ano-rectal conditions, from perianal dermatologic problems to hemorrhoids and functional disorders.

The need for colorectal surgery is growing as the population ages. Colorectal cancer is the third most common cancer in the United States, behind lung and breast cancer. Approximately 52,000 people die annually from colon cancer in the U.S. While the number of new colon cancer cases is steadily declining, thanks in part to more screening, there still are more than 165,000 new cases diagnosed each year.

Screening is crucial to prevent colon cancer or eliminate it in the earliest stages. Despite more education about the importance of colonoscopies, less than half of the U.S. population eligible for screenings will be screened this year. This statistic is particularly unfortunate because the cure rate for colorectal cancers is about 70 percent, much higher than the rate for many types of cancer.

A History of Innovation

As part of UMG, these surgeons look forward to continuing to bring the latest in colorectal surgical techniques to the community. Their practice performed the first laparoscopic colectomy in the Upstate and continues to perform the majority of laparoscopic and minimally invasive colon resections for indications from diverticulitis to cancer.
Other innovations the practice has introduced to the Upstate include:

- Use of staplers to spare rectal muscle and avoid stomas in lower anterior resections for the removal of rectal cancers
- J-pouch (ileal pouch) rectal reconstruction surgery as an alternative for ileostomies in patients with ulcerative colitis and familial polyposis
- Use of endorectal ultrasound for staging of rectal cancer
- Implementation of a procedure for prolapse and hemorrhoids (PPH), an alternative to conventional hemorrhoid surgery with shorter, less painful recovery

In addition, the physicians offer a full range of surgical solutions for anal sphincter muscle repair, rectal prolapse and anal abscess/fistulas. The practice is expanding the indications for laparoscopic surgical techniques for treatment of colon and rectal cancers and other colorectal ailments.

Beyond surgery, the practice offers basic and advanced treatments for anal and rectal problems, from muscle relaxants and other medications to office-based procedures such as hemorrhoidal banding. The surgeons also are collaborating with UMG urogynecologist Jeffrey Garris, M.D., FACOG, FACS, on the establishment of a GHS incontinence clinic.

**Involvement in Academics and Research**

Drs. Robbins, Rex, Crockett and Culumovic play an active role in the surgical training of GHS’ many residents. Dr. Culumovic, who completed his surgical residency at GHS, said his exposure to the colorectal surgery specialty at GHS led him to return to Greenville after completing his fellowship in Baltimore. Dr. Rex said there is enough clinical volume in colorectal surgery at GHS to support a future fellowship.

The surgeons also are busy with research. Surgical oncologist Steven Trocha, M.D., FACS, recently analyzed their cancer surgery results for a study presented at last year’s annual meeting of the American Society of Colon and Rectal Surgeons. The research also was presented in June 2008 in a poster at the 10th World Congress on Gastrointestinal Cancer in Barcelona, Spain.

The group is collecting specimens and supplying data for a University of Georgia study that involves benign polyp protein analysis. The surgeons will be privy to early results of this research.

For more information or to refer a patient, call (864) 269-5500.

*James Robbins, M.D., FACS, FASCRS; James Rex, M.D., FACS, FASCRS; Jay Crockett, M.D., FACS, FASCRS, and Patrick Culumovic, M.D., FACS, FASCRS, are fellowship-trained colorectal surgeons of GHS University Medical Group–Department of Surgery.*
Endocrine Surgery

Greenville Hospital System University Medical Center (GHS) is the busiest endocrine surgery center in the state.

GHS is relatively unique in having two fellowship-trained endocrine surgeons on staff to care for patients with thyroid, parathyroid, adrenal and other endocrine health problems.

“Endocrine surgery is a very new, rare specialty, and while there is no board certification for it so far, there is formal fellowship training,” said Jonathan Lokey, M.D., FACS.

Dr. Lokey and Wendy Cornett, M.D., MHS, FACS, both of GHS University Medical Group (GHS’ multispecialty physician group practice), are two of 190 active U.S. members listed by the American Association of Endocrine Surgeons. Endocrine surgeons are located primarily at large medical centers. There are three other practicing endocrine surgeons in South Carolina; Drs. Lokey and Cornett are the only fellowship-
trained endocrine surgeons in the Upstate. Patients travel from northeastern Georgia and western North Carolina for endocrine surgery at GHS.

After completing a formal fellowship in 2000, Dr. Lokey worked with GHS' first fellowship-trained endocrine surgeon Jeffrey Mose Macfie, M.D., who has since retired. Dr. Cornett completed her formal fellowship in 2001 and joined GHS' Endocrine Surgery division last year to help Dr. Lokey meet growing demand and to shorten patients' waiting period before surgery. Dr. Cornett also performs breast cancer surgery.

The division is very busy, performing about 500 thyroid and parathyroid surgeries a year – more than any other medical center in the state.

**Minimal Access Perspectives**

The surgeons use advanced procedures and the latest technology to help ensure less pain, earlier postoperative recovery and shorter hospital stays for their patients. GHS was one of the first medical centers in the Upstate to offer minimal access parathyroid surgery and one of the first in the state to do laparoscopic adrenalectomy and laparoscopic endocrine pancreatic surgery, according to Dr. Lokey.

Drs. Cornett and Lokey perform most parathyroid and adrenal surgeries with minimal access techniques. Adrenal surgery is performed laparoscopically, using several small incisions to accommodate a camera and other instruments. For adrenalectomies, the minimally invasive technique is less painful than the traditional open procedure, and the patient can go home much earlier.

For thyroid surgeries, the advantage of a minimally invasive technique is not as certain, and very few patients requiring thyroid surgery are suitable candidates for video-assisted thyroidectomy. “The incision is only one centimeter shorter, and the scar may or may not look better,” said Dr. Lokey.

In most cases, the thyroid is too big to be removed through a small incision, and so the majority of GHS patients (75 percent) have an open procedure that results in minimal pain and an overnight hospital stay.

**Technological Innovations**

GHS was the first hospital system in the state and one of the first in the country to use intraoperative parathyroid hormone (PTH) monitoring for parathyroidectomies. This procedure, performed with assistance from a laboratory technologist in the OR, involves the collection and testing of PTH before surgery and just after removal of the parathyroid. While this testing requires a great deal of coordination between a hospital's surgical and laboratory staff, by checking PTH levels in this way, the surgeon can better verify the success of the procedure while still in the OR.

Another example of a technology implementation that improves quality is the use of laryngeal nerve monitoring in select cases to help reduce the risk of injury to the laryngeal nerve, a major complication in thyroid and parathyroid surgery. While the injury rate for general surgeons should be less than 1 percent, the average injury rate for endocrine surgeons is lower, said Dr. Lokey, whose injury rate is less than one-third of 1 percent.

“We are always looking for tiny improvements, trying to improve that last little 1 percent,” he said.

Drs. Cornett and Lokey are testing an updated, more ergonomic version of the harmonic scalpel, which can decrease blood loss and operating time and speed recovery. “We are analyzing data from 200 cases for a prospective clinical trial,” Dr. Lokey said. The analysis compares surgical results from procedures performed using the new harmonic scalpel with those from operations performed with the older version of the scalpel.

The Endocrine Surgery division also is actively involved in academics, usually publishing one to two papers a year. The *American Surgeon* published one paper analyzing operative findings from 738 thyroid surgeries Dr. Lokey performed at GHS (*Am Surg*, 2005;71:911-3). *The Journal of the American College of Surgeons* published highlights of Dr. Cornett’s research on thyrothymic thyroid rests, which are bits of thyroid tissue that migrate during embryology (*J Am Coll Surg*, 2002;195:635-40). By better understanding the presence of this tissue, the surgeon knows to look for additional portions of the thyroid in the chest that he or she might otherwise miss during surgery.

Looking to the future, Dr. Lokey said growth in endocrine surgery at GHS promises that the specialty can support a fellowship program. Drs. Cornett and Lokey also are exploring the possibility of forming a multispecialty endocrine center in Greenville, with participation from area endocrinologists, neurosurgeons, otolaryngologists and pediatricians.

For more information or to refer a patient, call Drs. Cornett and Lokey at (864) 454-2100.

Wendy Cornett, M.D., MHS, FACS, and Jonathan Lokey, M.D., FACS, are general surgeons and endocrine surgery specialists with GHS University Medical Group–Department of Surgery.
Greenville Hospital System University Medical Center (GHS) surgeons use laparoscopic approaches for many procedures and are exploring advances in natural orifice and single-port techniques.

Ever since laparoscopic surgery emerged nearly two decades ago, patient demand for minimally invasive procedures has soared. As miniaturized instrumentation has been refined, minimal access techniques have gradually replaced many traditional surgical protocols.

“We have reached the point that we perform almost every operation laparoscopically,” said Alfredo Carbonell, D.O., FACS, FACOS, a surgeon with GHS’ Minimally Invasive Surgery division. “There is no question that operating through smaller incisions results in less morbidity, decreased length of stay, quicker recovery and lower costs. And there are additional advantages unique to each procedure.”

Interest in minimally invasive surgery has given rise to more fellowship programs. Fellows must perform a sufficient number of minimal access surgical cases to ensure their outcomes are equal to those of open procedures. University Medical Group, GHS’ multispecialty physician group practice, has two fellowship-trained minimally invasive surgeons – Dr. Carbonell and William Cobb, M.D., FACS.

“When we look at a problem, the first thing we think about is how it can be done through small incisions while preserving the tenets of open surgery,” said Dr. Cobb.

Reinventing Surgery

Gynecologists were the first to use laparoscopic surgery. General surgeons quickly seized on the technique for use in cholecystectomy. Today, Nissen fundoplication, gastric and colon resections, solid organ retrieval and repair of paraesophageal, ventral, incisional and inguinal hernias can be performed laparoscopically.

Patients with hernias can undergo laparoscopic repair at The Hernia Center (see next article). “Whether the hernia is large, complex, occurs in a large patient or has recurred multiple times, we offer a protocolized approach using outcomes data for how the hernia should be managed,” Dr. Cobb remarked.

This minimal access approach requires four incisions of five millimeters (mm). In addition to providing less postoperative pain and quicker recovery, laparoscopic hernia repair greatly reduces the risk that the mesh used for the repairs will become infected.

Moving Tradition Aside

Within weeks of Dr. Carbonell’s arrival at GHS in fall 2007, he began performing innovative minimal access procedures on the pancreas and stomach. For pancreatic surgery, he can access, drain and debride diseased or dead tissue through two small holes in the flank. He also can laparoscopically resect the pancreas as well as gastric stromal tumors.

“Stromal tumors contained in the stomach are ideal for a laparoscopic approach – the procedure requires only one or two nights in the hospital,” said Dr. Cobb, who has helped publish the medical community’s largest series of cases on stromal tumors that have been resected laparoscopically.

Drs. Carbonell and Cobb collaborated with urologists at GHS to develop minimally invasive approaches for partial and total nephrectomy and laparoscopic cryotherapy for renal cell carcinoma. The minimal access surgeons and urologists found that by performing these surgeries as a team, they could help reduce complications. (See “Urology.”)

“Minimal access surgery has become our standard of care for solitary renal masses,” said Dr. Cobb. “Blood loss is minimal,
and the conversion rate to open surgery is less than 2 percent when we assist urology.”

Together the surgeons have published more than 60 articles, primarily on laparoscopic treatment of advanced hernia disease and gastrointestinal surgery.

New Facilities for a New Approach

Laparoscopic surgery is highly dependent on technology, and with 29 minimally invasive surgery suites, GHS’ facilities are leading the way in the Upstate. In a typical procedure, large, crystal-clear images of the inside of the abdomen display on high-definition, flat-screen monitors visible to everyone in the OR.

“It is better than open surgery because the images are magnified and in high definition,” stated Dr. Carbonell. “It affords a view we could never have had before.”

X-ray images display on a screen adjacent to the laparoscopic images. This practice aids in teaching as well as patient care and safety. All GHS surgical residents rotate through the Minimally Invasive Surgery division, and chief residents spend three months exclusively with Drs. Carbonell and Cobb.

Future Developments

Minimally invasive surgery is advancing as rapidly as technology allows, noted Dr. Carbonell. “Three things are happening. We are moving toward smaller ports, made possible by two-mm or three-mm ‘needlescopic’ instruments. We also will be utilizing fewer ports – such as a single port in the navel,” he said.

There also will be increased use of natural orifices to access the body’s interior. One method under investigation involves passing an endoscope down the throat and accessing the abdomen through a hole in the stomach wall. Another method involves accessing the spleen through the vagina, urethra or rectum.

Drs. Cobb and Carbonell are two of a handful of surgeons on the East Coast trained to use the new EsophyX™ by EndoGastric Solutions for “incisionless” fundoplication. Fundoplication, the gold-standard surgical treatment for symptomatic gastroesophageal reflux disease, typically is performed laparoscopically through five small incisions on the abdominal wall.

“The new transoral incisionless fundoplication is fascinating,” said Dr. Carbonell. “It allows us to achieve a result very similar to that of traditional fundoplication without incisions by simply using a flexible endoscope within the stomach and special flexible instrumentation to perform the wrapping of the stomach around the esophagus.”

GHS plans to offer a postgraduate fellowship in minimally invasive surgery in the future.

For more information or to refer a patient, call Drs. Carbonell or Cobb at (864) 676-1072.

William Cobb, M.D., FACS, and Alfredo Carbonell, D.O., FACS, FACOS, are fellowship-trained minimally invasive surgeons with GHS University Medical Group – Department of Surgery, Division of Minimally Invasive Surgery.

William Cobb, M.D., FACS

Alfredo Carbonell, D.O., FACS, FACOS
Greenville Hospital System University Medical Center (GHS) launched The Hernia Center to deliver protocol-driven care in a collaborative environment.

The new GHS Hernia Center, which serves as a regional referral and teaching center for specialized hernia care, is raising the bar in patient safety and successful outcomes.

“A hernia is not just a hole that requires a patch,” said Alfredo Carbonell, D.O., FACS, FACOS, co-director of The Hernia Center and a fellowship-trained minimally invasive surgeon with GHS University Medical Group, the system’s multispecialty physician group practice. “Proper treatment requires a specialized, sometimes multidisciplinary approach.”

Hernias: A Growing Problem
Hernia cases are on the rise, driven in part by the morbid obesity epidemic and also by hernia recurrence brought on by initial hernia repairs. Tobacco abuse, diabetes and collagen disorders are just a few other factors leading to the surge in hernia problems.

For general surgeons nationwide, hernia repairs are behind only endoscopy as the most common outpatient procedure. In the Upstate, hernia inquiries are the third most requested topic posed to the GHS information telephone line. GHS projects that the number of outpatient hernia surgeries will increase to 1,488 cases per year by fiscal year (FY) 2012, up 23 percent from FY 2007.

A Model for Specialized Hernia Care
With the establishment of The Hernia Center, GHS has standardized the approach to hernia care through a focus on minimal access techniques, surgical education, procedure outcomes analysis and involvement in clinical trials and biomaterials research.

The center has allowed several other general surgeons with an interest in hernia care to participate by contributing their hernia surgery outcomes data to help identify best practices and potential problems in approaches to hernia care. They also can participate in hands-on training and education with GHS' top hernia specialists, including Dr. Carbonell and the center’s other co-director, William Cobb, M.D., FACS.

With a goal of improving hernia surgery quality through better understanding of the specialty, the center wants to collect outcomes data for all types of hernia surgeries, including operations for first-time inguinal or ventral/incisional repair (the most common type of hernia surgery) as well as procedures for more complex repairs.

The Hernia Center offers training in GHS' minimally invasive operating suites, a cadaver lab at Patewood Medical Campus and an animal lab at Clemson University. It presents a way for surgeons to stay current by observing and practicing new and innovative hernia repair techniques. Complex hernia cases include recurrent inguinal or ventral hernias, hernias located in an unusual anatomical location and hernias associated with a complicated abdominal wall problem, such as infection or fistula. Surgeons who are active participants in the center often scrub-in with Drs. Cobb or Carbonell to observe their techniques.

Participating surgeons agreed to several core requirements, including a willingness to prospectively track surgical outcomes, membership in the American Hernia Society (AHS) and attainment of continuing medical education (CME) credits with a focus on hernia repair (such as CME credits earned at AHS meetings or through advanced hernia repair courses).

This emphasis on hernia-specific education is expected to improve the success rate of first-time hernia repairs. The center actively enrolls qualified patients into one of many trials, tracks overall hernia surgery volumes and growth, and evaluates outcomes for all participating surgeons quarterly.

Many Advantages for Patients
In addition to undergoing high-quality hernia surgery measured by protocols, patients have access to special programs, such as nutritional counseling, to help them address underlying health issues related to hernia problems.

“When we see a patient, we don’t just see someone with a hernia that needs to be repaired,” said Dr. Carbonell. “We often see a person with disease and risk factors for hernia formation and hernia recurrence we can help with other types of intervention.”

The center is collaborating with surgical specialists from other disciplines throughout GHS to treat patients with pelvic and groin pain that may not fall under the realm of the standard diagnoses treated by orthopaedic surgery, sports medicine or female pelvic medicine.
"We want to open up the lines of communication early about our expertise in abdominal issues so that patients hopefully don’t have to make multiple stops within GHS on their way to a definitive diagnosis," Dr. Cobb said.

To make hernia care more accessible in the community, the center offers a Corporate Hernia Program. This program gives upstate employers an expedited process for scheduling executives and employees of all levels for hernia procedures. "We want to help them get back to work," Dr. Cobb emphasized.

For more information or to refer a patient, call 1-877-235-7540.

Alfredo Carbonell, D.O., FACS, FACOS, and William Cobb, M.D., FACS, are co-directors of The Hernia Center of GHS University Medical Group (UMG). They also are fellowship-trained minimally invasive surgeons with UMG’s Department of Surgery.
Bariatrics

Greenville Hospital System University Medical Center (GHS) offers access to a bariatric surgery practice that is a national Center of Excellence.

Bariatric Solutions, part of GHS University Medical Group’s Division of Bariatric Surgery, and Hillcrest Memorial Hospital, have achieved the prestigious designation of being a Center of Excellence of the American Society for Metabolic and Bariatric Surgery (ASMBS). As a result, referring physicians can rest assured their patients receive safe, comprehensive care that considers the “whole person,” including physiological and psychological needs.

Bariatric Solutions, founded and led by fellowship-trained surgeon Eric Bour, M.D., FACS, employs a full-time psychologist and two dietitians, all specializing in bariatric care. Even among other Centers of Excellence in the nation, this level of specialization and staffing is intense. (The ASMBS requires that a general psychologist and dietitian be part of the patient’s care.)
A 360° Approach to Care
In addition to performing both the Roux-en-Y gastric bypass and gastric banding surgical procedures, the practice offers access to nonsurgical weight loss programs. Its office adjoins Nutrition Solutions, an independent business that includes supervised weight-loss programs, nutrition counseling, healthy cooking classes and other educational opportunities. Nutrition Solutions’ retail store sells vitamins, supplements and healthy prepared meals. It recently launched an online system that allows patients to order from the healthy meal menu, which is planned by a certified bariatric chef, from the convenience of their homes or offices.

Beyond professional counseling offered by Bariatric Solutions psychologist Susan Calhoun, Ph.D., the practice has an emphasis on providing patients with a strong peer support network to help them get through the critical pre- and postoperative phases of bariatric surgery. It’s common to see a full parking lot Tuesday and Thursday evenings when Bariatric Solutions hosts support groups and educational sessions at its office off Woodruff Road. Demand has been so great – paralleling the surge in the practice’s patient base, which grows by about 120 patients annually – that Bariatric Solutions recently added a support group that meets during the day on Tuesday.

Successful Outcomes: Weight Loss and More
Bariatric Solutions’ holistic approach to care has led to impressive outcomes. Its complication rate is less than 1 percent – a requirement to be a Center of Excellence. Weight loss results are in keeping with or better than national averages – patients shed about 85 percent of excess weight after gastric bypass and 50 percent after gastric banding.

The practice’s patient population also is experiencing significant reductions in comorbidities of morbid obesity. Following gastric bypass surgery, almost every Bariatric Solutions patient who had Type II diabetes either no longer has the condition or its severity has declined. Likewise, most patients who have gastric bypass experience postoperative elimination or reduction of hypertension, sleep apnea and high cholesterol.

Expanding Services, Innovative Techniques
As a Center of Excellence, Bariatric Solutions often is invited to be an early implementer of the latest bariatric technologies and materials. In 2008, the practice was among the first in the nation to use the new REALIZE™ Adjustable Gastric Band from Ethicon Endo-Surgery Inc. In fact, Bariatric Solutions is recognized as a best practice site in Ethicon’s “Victory Division,” which means that bariatric specialists across the Carolinas, Tennessee, Virginia, Washington, D.C., Maryland and parts of Georgia are encouraged to visit Bariatric Solutions to see the latest techniques and technologies in action.

Dr. Bour is exploring the possibility of adding “scarless surgery” to the practice’s portfolio. This innovative approach involves accessing and operating on the gastric area with tiny endoscopic surgery tools inserted through the mouth. Bariatric Solutions also may expand its services to include treatment of adolescent patients who are morbidly obese.

For more information or to refer a patient, call (864) 676-1072 or visit bariatricsolutions.com.

Dr. Scott Joins GHS
In October 2008, John Scott, M.D., joined the Division of Bariatric Surgery of GHS University Medical Group–Department of Surgery. Dr. Scott is working closely with Eric Bour, M.D., FACS.

Dr. Scott most recently was medical director for Health Management Resources’ Program for Weight Management™ at the Tennessee Weight Loss and Surgery Center. He also was affiliated with the Tennessee Weight Loss and Surgery Center at the University of Tennessee Medical Center (UTMC) and was an assistant professor of surgery at UTMC. Fellowship trained in minimally invasive surgery at the University of Cincinnati College of Medicine, Dr. Scott did his surgical residency at GHS after completing medical school at UT.
Robotic Surgery

Greenville Hospital System University Medical Center (GHS) is exploring the latest advances in robot-assisted surgery.

While laparoscopic surgery has revolutionized the treatment of many internal disorders, until recently surgeons haven’t been able to use minimally invasive techniques for some of the most delicate and complex operations. Among other factors, use of 2-D video monitors limits operative field-depth perception. Restricted ability to move the hands and wrists and the need for surgeons to use mirrored movements in laparoscopic surgery also curtail its use for very delicate procedures.

Enter robotic surgery.

Heralded as the next evolution in minimally invasive surgery, robot-assisted surgery addresses the challenges of laparoscopic surgery and is taking it to a new level. It gives surgeons unprecedented control and precision and the ability to use a minimally invasive approach for very complicated operations.

With these advantages in mind, GHS formed a committee that represents cardiothoracic, colorectal, gynecologic, urologic and general surgery to investigate robotic surgery. While GHS’ investment in the technology has been postponed, the system eventually plans to acquire a da Vinci® Surgical System from Intuitive Surgical Inc. The committee is working to create credentialing guidelines for physicians interested in using this new technology.

Among those on the committee are Jeffrey B. Garris, M.D., FACS, FACOG, and Larry E. Puls, M.D. Dr. Garris is a GHS urogynecologist who trained on the da Vinci system while at Tulane University when robotic surgery was in its infancy more than five years ago. Dr. Puls is a gynecologic oncologist who recently trained on the system.

How It Works

The da Vinci system consists of two primary components: a viewing/control console and a surgical arm unit. The arm unit has one laparoscopic arm with a tiny camera and three arms with tiny surgical instruments at their ends. As with laparoscopic surgery, the instruments and camera are inserted into the patient through small incisions, or ports.

The OR team, including a robot technician, remains close to and monitors the patient and the surgical arm unit while the surgeon sits (decreasing the risk of fatigue) across the room from the patient at the control console. The console is connected to the surgical arm unit by a cable. The surgeon looks into a viewfinder, part of da Vinci’s InSite® Vision System, to see a 3-D magnified color view of the surgical site. This image is transmitted to the console in real time. The surgeon can change the view instantly, using foot pedals to zoom in (up to 10 times actual size), zoom out and adjust the focus.

“How unlike the 2-D camera in laparoscopy, which doesn’t give you depth perception, the 3-D view with the robot is extraordinary,” said Dr. Garris.

This OR is using the da Vinci Surgical System. The surgeon sits at a console at the left and looks through a viewfinder at a 3-D view of the surgical site. The surgeon operates remote controls that direct robotic arms to operate on the patient through small incisions.
The surgeon manipulates the surgical arms using the system’s EndoWrist® hand controls, which reproduce the movements of the surgeon’s hands, wrists and fingers.

**Dexterity and Precision**

While laparoscopy allows manipulation of instruments up, down and sideways, the hand controls of the da Vinci replicate the 360-degree range of motion of the wrist. This flexibility means more precise suturing, dissection and tissue manipulation, plus the ability to operate for longer periods without tiring.

“The articulation with the robotic approach is better than with the laparoscope,” said Dr. Garris. “It feels more natural and intuitive, much like open surgery, but preserves that minimally invasive approach. You can perform surgery in small spaces with wonderful precision.”

The system’s software translates the movement of the surgeon’s hands into signals transmitted from the console to the robotic arm instruments. The system eliminates hand tremors.

Robotic surgery does have drawbacks. It can’t be used in areas with severe scar tissue, and there isn’t any tactile feedback – although Intuitive Surgical is working to give its system this feature. Training to perform robotic surgery is more time-intensive than that required for mastery of open or laparoscopic techniques. The surgeon typically finds the operating time for his or her first few surgical procedures increased by 30 percent or longer.

The da Vinci system has been used to treat conditions as diverse as endometrial cancer, prostate cancer, obesity and heart disease.

“Once you get over the learning curve, clinical outcomes for patients who have undergone procedures with a robotic system are equal to if not better than outcomes for patients who’ve had surgery with other approaches,” said Dr. Garris. “Robotic surgery provides patient benefits, including less pain, discomfort and blood loss as well as a faster return to normal activities. Having it available at GHS will increase the number of procedures we can offer and will bring us up to the very highest level of technology.”

For more information about robotics for gynecologic and pelvic reconstructive surgery, contact Dr. Garris at (864) 455-1600. For information about robotics for gynecologic oncology, contact Dr. Puls at (864) 679-3900.

Jeffrey B. Garris, M.D., FACOG, FACS, is a urogynecologist with GHS University Medical Group–Department of OB-GYN and serves as director of the Division of Female Pelvic Medicine & Reconstructive Surgery.

Larry E. Puls, M.D., is a gynecologic oncologist with the Cancer Centers of the Carolinas. He also serves on the faculty of GHS University Medical Group–Department of OB-GYN.
Urology

Surgeons at Greenville Hospital System University Medical Center (GHS) are using new techniques and exploring the latest avenues for treating urologic problems.

GHS treats a variety of diseases of the urologic system, from prostate cancer to kidney stones.

Prostate Cancer
William Flanagan, M.D., FACS, of Upstate Urology Associates, said he typically uses one of several core treatments for prostate cancer. The optimal recommendation is based primarily on the patient’s age and overall health. In general, he advises radical prostatectomy for healthy patients younger than 65, and cryotherapy or radiation therapy for those older than 70. For patients age 65 to 70, all three options are potentially good.

Dr. Flanagan has extensive experience in radical prostatectomy and has performed more than 100 cryotherapy procedures during the past three years. This ultrasound-guided approach involves the use of a cryoprobe to freeze and kill cancerous tissue.

When radiation therapy is an option, he works closely with radiation oncologists to provide brachytherapy or external beam radiation. With brachytherapy, Dr. Flanagan and an interventional radiologist insert catheters into the prostate gland and inject rice-sized radioactive seed pellets into the tumor site. These pellets, administered during an outpatient procedure, emit radiation that shrinks the tumor.

Renal Malignancies
Cryosurgery and other minimally invasive techniques also are instrumental in operations to treat patients with kidney cancer.

“Minimally invasive techniques have had a tremendous impact on the management of renal malignancies,” said Dr. Flanagan, who estimated he performs at least 95 percent of partial nephrectomies and total nephrectomies laparoscopically.

Palmetto Greenville Urology Associates has also seen a dramatic increase in minimal access urologic procedures. The practice recently brought on board two physicians who are specially trained in minimally invasive urology – Samuel Sterrett, D.O., and Andrew Bullock, M.D., FACS. Both perform complete laparoscopic renal procedures.

Minimal access approaches dramatically shorten recovery time in urologic surgeries. When renal tissue must be spared, laparoscopic cryotherapy is the optimal approach. By freezing the mass, the surgeon leaves the remaining renal tissue intact. This approach is particularly beneficial to patients with only one kidney who would otherwise need to go on dialysis if they
Renal Stones

To treat renal stones above the ureter, GHS surgeons often use a lithotripsy unit wheeled into the OR. The unit issues a shock that shatters the stones. For stones below the upper ureter, the preferred treatment often is endoscopic laser ablation under direct vision, which can be done regardless of stone composition.

For stones larger than two centimeters, Dr. Mayher prefers percutaneous nephrolithotomy or nephrolithotripsy. To perform these challenging procedures, the surgeon collaborates with an interventional radiologist to guide a small catheter into the kidney via the patient’s back, creating an access shaft to the kidney stone. Next the surgeon inserts a device into the kidney to grind the stone and then vacuum out the broken stone parts through the shaft.

Vasectomy

GHS urologists have performed more than 1,000 no-scalpel vasectomies. The operation is done through a tiny hole using fine instruments that minimize trauma to surrounding tissue.

“No-scalpel vasectomy is highly successful and so popular with patients that we do not do traditional vasectomies anymore,” said Dr. Flanagan.

For more information or to refer a patient, call Dr. Flanagan at (864) 295-1031, Drs. Cobb and Carbonell at (864) 676-1072 or Dr. Mayher at (864) 242-1220.

William Flanagan, M.D., FACS, is a urologist with Upstate Urology Associates P.A. William Cobb, M.D., FACS, and Alfredo Carbonell, D.O., FACS, FACOS, are fellowship-trained minimally invasive surgeons with GHS University Medical Group–Department of Surgery, Division of Minimally Invasive Surgery, and Dr. Bullock.

This technique involves making a six- to seven-centimeter incision around the umbilicus to place the surgeon’s hand for dissection and removal of the specimen. Two additional one-centimeter incisions are made to place instruments and the laparoscope. HALN allows the surgeon to gain the benefits of laparoscopy and maintain the “feel” of open surgery. This combination ultimately leads to improved patient outcomes as compared with traditional open techniques.

“The hand helps us manipulate the kidney, shortens the operating time and makes the procedure safer,” said Dr. Flanagan.

Drs. Flanagan and Cobb and GHS surgical resident Christopher Schneider, M.D., published a research paper analyzing the impact of an initiative driven by the Minimally Invasive Surgery division to reduce the HALN learning curve for urologists and improve patient outcomes. They documented how nephrectomy patients benefited from collaboration between a urologist and a minimally invasive surgery specialist.

Their study found that when the urologist collaborated in the OR with the advanced laparoscopic surgeon to perform nephrectomies, some outcomes were much better compared with those from cases performed by urologists working alone. In the collaborative cases, there was significantly less blood loss (107 milliliters vs. 757 milliliters), need for transfusion (two patients vs. nine patients) and conversion to open surgery (one patient vs. nine patients).

Bladder Problems and Incontinence

Urologists of the GHS Medical Staff are versed in all modes of therapy for bladder cancer, including laser resection. They perform bladder-sparing surgery whenever possible. If necessary, they perform radical removal of the bladder, followed by continent diversion. This procedure creates a neobladder from the intestine. In older patients and patients with cancer of the bladder neck, the ureter may be attached to an ileal conduit.

GHS urologists also perform pubovaginal sling surgery for female urinary incontinence, using slings made of bovine collagen, human collagen and polypropylene. (See also “Women’s Surgery.”) Bovine xenograft is preferred by some urologists who find it easier to work with than the human allograft. Because it is wide and pliable, the xenograft can be useful when the urologist is working with a gynecologist to cover a cystocele defect.
Children's Hospital offers child-friendly amenities, and its staff is experienced in working with children of all ages. These factors make a big difference in alleviating anxiety for children and their parents before an operation.
Pediatric Surgery

From routine tonsillectomy to the latest minimally invasive procedures, Children’s Hospital of Greenville Hospital System University Medical Center (GHS) offers specialized pediatric surgical services.

Pediatric surgery encompasses a broad spectrum of procedures, from neonatal correction of abdominal defects to removal of large tumors. Abdominal procedures, such as hernia repair and appendectomy, are the most prevalent. Operations for management of trauma also are common.

At GHS Children’s Hospital, there is a growing team of surgeons who specialize in performing operations on children: pediatric general surgeons, orthopaedic surgeons, neurosurgeons, a urologist, and soon, an ophthalmologist.

“Physicians and many people in the community generally recognize that a child who needs an operation can be better served by a pediatric surgeon,” said John Chandler, M.D., FACS, FAAP, director of Pediatric Surgery for University Medical Group (UMG), GHS’ multispecialty physician group practice. “Sending a child to a hospital that offers pediatric-oriented surgical care can make the procedure a more pleasant experience for the child and his or her family.”

Dr. Chandler and other surgeons of Children’s Hospital are very accustomed to working with children, as are the nurses, ancillary personnel and subspecialists. “That makes a difference,” he emphasized.

Although many people associate pediatrics with very young children, pediatric general surgeons at Children’s Hospital treat patients from birth to age 18. Patients range in size from premature babies to full-grown individuals. Sometimes the surgeons perform operations on adults who face congenital problems that don’t surface until adulthood. One example is malrotation of the intestines. Surgeons specializing in pediatrics are more likely to have experience with the operation required to treat this problem, and so adult patients with this condition may be referred to Pediatric Surgery.

A Minimally Invasive Emphasis

Children’s Hospital surgeons are dedicated to using the least invasive methods on their patients to minimize recovery time, pain and scarring. Surgical scarring is a particularly important issue in the care of adolescent patients, whose self-esteem is affected greatly by their outer appearance.

Children’s Hospital pediatric surgeon Michael Gauderer, M.D., FACS, FAAP, is a pioneer in minimal access techniques. Nearly 25 years ago, he conceived and developed the percutaneous endoscopic gastrostomy (PEG) procedure that is now the standard for gastric access worldwide. More recently, he has published a technique for pyloromyotomy that is not only less invasive but also safer than some other traditional approaches. He also has fine-tuned an individualized approach to appendectomy to help ensure that patients receive the least invasive option for appendix removal suitable for their circumstances.

Among other minimal access techniques, Dr. Gauderer has embraced the newest procedures for treating chest wall deformities. He has developed a significant practice in these operations, including minimally invasive repair of pectus excavatum. He can repair the child’s sunken chest area via two lateral chest incisions instead of a larger incision in the middle of the chest that would leave a much more noticeable scar.

Laparoscopic technology plays a big role in pediatric surgery just as it does in adult surgery. “The types of operations performed with a laparoscope are constantly expanding, and we’re right in line with state-of-the-art equipment,” Dr. Chandler said.

Surgical Oncology and Neurosurgery

About 5 percent of patients who present to Children’s Hospital for surgery have some form of cancer. The hospital’s pediatric general surgeons can remove tumors from just about any part of the body.

In October 2007, Children’s Hospital boosted its capability to treat children with brain tumors with the addition of Christopher Troup, M.D. To help support a growing caseload, fellowship-trained pediatric neuro-oncologist and hematologist-oncologist Nichole Bryant, M.D., and pediatric neurologist Addie Hunnicutt, M.D., have joined Children’s Hospital.

“We’re in the process of creating a pediatric neuroscience program unlike anything else in the Upstate,” Dr. Troup said.

A major focus is the establishment of a brain tumor clinic that will coordinate patients’ care so that they can see physicians, social workers and other health professionals in one office.

Children’s Hospital also is launching a spasticity clinic. “We have a tremendous population of children with cerebral palsy and spasticity in the Upstate,” Dr. Troup said. “The key people are here, but before now no one had organized a formal spasticity program.” Neurosurgeons, neurologists, a pediatric physiatrist and orthopaedic surgeons are expected to be involved with the spasticity program.

Children’s Hospital also looks forward to the addition of a UMG craniofacial surgeon trained to treat both adults and
children. “Surgeons have primarily been seeing patients for cleft lips and palates,” Dr. Troup said. “This new specialist will help us expand to see more of a complete range of craniofacial problems. It’s a great need that we’ll be glad to have filled.”

Orthopaedic Surgery and Trauma Care
Children’s Hospital supports treatment of both chronic and acute orthopaedic problems. UMG pediatric orthopaedic surgeons treat basic and multiple fractures as well as perform corrective procedures for clubfoot, scoliosis and other congenital problems. The team also cares for patients with lower back pain and sports-related injuries, including those with symptoms of sports overuse.

“We treat any patient under age 18 who has an orthopaedic condition,” emphasized Michael Beckish, M.D., UMG director of Pediatric Orthopaedic Surgery.

The physicians see patients who present for emergency care at Children’s Hospital. These patients have their own entrance separate from the adult ER. On average, the pediatric orthopaedic division has 110 outpatient visits per week and 200 inpatient consultations annually. The surgeons perform approximately 300 pediatric orthopaedic operations a year.

Children’s Hospital also works with the region’s only orthopaedic pediatric surgeons in private practice.

UMG pediatric orthopaedic surgeons work very closely with Children’s Hospital Infectious Disease physicians in the collaborative treatment of an increasing number of osteomyelitis cases.

“Our long-term plan is to grow and have two or three full-time pediatric orthopaedic surgeons on staff,” Dr. Beckish said. “It just takes time because there aren’t many specialists out there.”

Urologic Surgery
Another specialty where physicians are lacking is pediatric urology. Children’s Hospital has been fortunate to have J. Lynn Teague, M.D., MHA, FAAP, on staff since last fall. In addition to providing care for kidney stones, hydronephrosis and bladder problems, Dr. Teague performs operations to treat genital abnormalities, such as hypospadias and undescended testes. He often must employ reconstructive techniques in the repair of children’s abnormal genitalia.

Dr. Teague sees growing demand for pediatric urology in the Upstate. In addition to his caseload at Children’s Hospital,
he cares for patients at monthly clinics in Spartanburg and at Shriners Hospitals for Children, Greenville Unit. At Shriners, he treats children with urinary incontinence and other urologic problems commonly associated with spinal cord defects, such as spina bifida.

Otolaryngology: Head and Neck Surgery

Pediatric ENT surgery consists of much more than inserting tubes into patients’ ears or removing tonsils. While most otolaryngology cases at Children’s Hospital focus on these procedures, ENT surgery specialists treat other conditions as well, said Robert O. Brown III, M.D., FACS, a partner with Greenville Ear, Nose & Throat Associates and chair of the GHS Medical Staff’s Division of Otolaryngology–Head and Neck Surgery.

“Our doctors perform endoscopic sinus procedures on children, evaluate voice or vocal problems, recommend treatments and help with airway obstruction problems,” he said. “We remove benign and malignant tumors on the neck or face and perform operations for pediatric facial trauma.”

Dr. Brown is optimistic about some changes that promise to bring upstate pediatric patients even better care. One coup for the hospital has been a partnership with John McElveen, M.D., who in 2007 started traveling from Raleigh to GHS once a month to perform cochlear implant procedures on adults. Previously, patients had to travel to other cities for this procedure. Within a year, more than half of the cochlear implant operations are expected to be performed on children.

“They help with inpatient and outpatient evaluations, provide treatments and assist with surgical management. It’s a valuable part of their education and offers our patients even better care.”

Dr. Chandler concurred: “We offer an academic setting with high-quality physicians and some of the top people in the state. GHS is growing continuously, and the standard of care continues to improve.”

For more information or to refer a patient, call Children’s Hospital at (864) 455-8860.

John C. Chandler, M.D., FACS, FAAP, is director of the Pediatric Surgery faculty for GHS University Medical Group–Department of Surgery.

Michael L. Beckish, M.D., is director of Pediatric Orthopaedic Surgery for GHS University Medical Group–Department of Orthopaedic Surgery.

E. Christopher Troup, M.D., is director of Pediatric Neurosurgery for Children’s Hospital of Greenville Hospital System University Medical Center.

GHS Pediatric Surgery Contact Information

Pediatric Surgery (864) 455-5070
Pediatric Neurosurgery (864) 454-4600
Pediatric Orthopaedic Surgery (864) 455-6030
Pediatric Urology (864) 454-5135

Transplant Services

Children’s Hospital looks forward to adding kidney transplant surgery to its portfolio of services and is working to build the team to support this new level of surgical care. However, in the meantime, its physicians care for children who need or have had transplants. Children with liver transplants are the most common transplant cases seen, but children with transplanted hearts, kidneys and other organs also visit the hospital’s many subspecialists.

“We partner with key transplant programs across the country to work with the patient before and after the surgery,” said Douglas E. Winesett, M.D., FAAP, director of Pediatric Gastroenterology for Children’s Hospital.

Children’s Hospital subspecialists often help patients identify the best place to have their transplant. After patients have their procedures and return home to the Upstate, Children’s Hospital physicians step back in to provide much of their follow-up care.

“They might need to come in for specialized treatments or therapies or just might need routine follow-up,” Dr. Winesett said. “By working collaboratively with the transplant centers, we give kids the best of both worlds. We help provide access to all the different services they need, and a lot of that care can be given right here at home.”

Research and Education

The faculty of Children’s Hospital is known for its active role in research and trials, particularly in hematology and oncology. With the launch of the brain tumor clinic, there will be some brain tumor studies.

On the academic front, medical residents play an important role in providing surgical care at Children’s Hospital. “The residents are really integrated into the practice,” said Dr. Beckish.
Women’s Surgery

Greenville Hospital System University Medical Center (GHS) offers a full array of surgeries to meet women’s health needs.

GHS offers many surgical services through its Women’s Hospital and the Department of Obstetrics & Gynecology of GHS University Medical Group, the system’s multispecialty physician group practice.

The Department of OB-GYN includes five primary divisions: Breast Health, Female Pelvic Medicine & Reconstructive Surgery, Gynecology, Maternal-Fetal Medicine and Reproductive Endocrinology & Infertility. GHS’ Department of Community Medicine also includes OB-GYN practices to serve upstate women. Following is a sampling of some of the most innovative surgical procedures and services GHS offers through these groups.

Advances in Urogynecology

**Prolift® for Prolapsed Pelvic Organs.** Pelvic organ prolapse occurs in women when the muscles and tissues that hold the pelvic organs in place begin to weaken. Subsequently, the uterus, bladder and rectum may press against the vaginal walls, causing them to protrude into the vagina. Symptoms include back or pelvic area pain as well as urine leakage or difficulty in starting to urinate. Pelvic organ prolapse also can cause bowel problems, including constipation, or a sensation of vaginal bulging or heaviness. Women who have had multiple vaginal births are at greatest risk for pelvic organ prolapse, which occurs in some form (cystocele, rectocele and/or uterine prolapse) in half of women older than 50.

For women with moderate to severe symptoms, a new surgical technique uses the Gynecare Prolift® Pelvic Floor Repair System to restore the prolapsed organ or organs to a correct position. GHS urogynecologist Jeffrey B. Garris, M.D., FACOG, FACS, was the first physician in the United States to receive certified training on the system, and he has performed more Prolift repairs than any other urogynecologist in the Upstate.

The Gynecare Prolift system uses a piece of synthetic nonabsorbable mesh, similar to that used in hernia repair. The soft material can be positioned in one to two hours, less than half the time required for the traditional operation to repair pelvic prolapse. Patients may have regional or general anesthesia.

Using minimally invasive techniques, the surgeon makes very small incisions inside the vagina and inserts the mesh so that it is woven like straps through the pelvis. Initially the mesh is held in place by friction created by these straps, and then body tissues quickly grow into the pores of the mesh, establishing the final support.

Patients go home the following day. “Prolapse can be devastating for some women,” said Dr. Garris. “Prolift relieves symptoms, and it restores normal pelvic anatomy and quality of life.”

**TVT Secur® for Stress UI.** GHS also offers a minimally invasive surgical treatment for stress urinary incontinence (UI), a condition that afflicts up to half of U.S. women on occasion and 10 percent frequently. Stress UI is the unintentional loss of urine during periods of bladder pressure or stress. It occurs with coughing, sneezing, standing and lifting, among other circumstances, and is the most common type of incontinence.
Tension-free vaginal tape (TVT) surgery, also known as suburethral sling surgery, has become the most popular operation to treat moderate to severe stress UI during the past decade. The latest modification of TVT is called TVT Secur. TVT Secur involves the placement of a polypropylene mesh sling below the urethra to offer hammock-like support, preventing involuntary urine loss. After a few weeks, body tissue grows into the mesh, permanently supporting the sling.

Whereas the standard tape had to be threaded through to the urethra from behind the pubic bone, TVT Secur is shorter (only eight centimeters long) and can be pushed into position through a small incision in the vagina. This approach, which causes less tissue trauma, can be performed in less than 30 minutes using local anesthesia. Patients can go home a few hours after the procedure and have a short recovery time.

Dr. Garris, who was the first physician in the Upstate trained to use TVT Secur, said it “builds on the success and safety of the TVT procedure with a less invasive approach that offers minimal pain and easier recovery.”

**InterStim® for Urge UI.** For patients who suffer from incontinence when they have the urge to urinate, GHS offers InterStim Therapy, among other treatment options. Described as a pacemaker for the bladder, InterStim Therapy works by sacral neuromodulation.

The InterStim device consists of a lead connected by an extension wire to a battery-operated stimulator (about the size of a half dollar). The lead is implanted adjacent to the sacral nerves, which govern the reflexes that control the bladder, sphincter and pelvic floor muscles. InterStim Therapy mildly stimulates these nerves, helping the patient control her bladder.

This device is typically implanted under the skin of the upper buttocks below the beltline. The rate, frequency and amplitude of the stimulation are programmable, and patients can adjust stimulation within certain parameters with a hand-held remote. Developed by Medtronic Inc. and FDA-approved since 1997, InterStim Therapy has been in the mainstream for several years. Dr. Garris is a national InterStim preceptor and one of very few physicians in the Upstate offering this therapy.

Before he places the device, candidates test its effectiveness with an external stimulator at home, tracking progress with a voiding diary. If the testing phase is successful, the minimally invasive implantation procedure, which takes 30 to 60 minutes, can be performed while a patient is awake or under anesthesia. Complications include mild discomfort, infection, transient electrical shock, lead migration and change in bowel function, but these are not common and are generally resolvable. Stimulation can be discontinued or the device removed at any time.

InterStim is not indicated for fecal incontinence and defacatory disorders, though clinical studies show promise for such use.

**Minimally Invasive Hysterectomy**

Gynecologists at GHS are experienced in minimally invasive approaches to hysterectomy as well as procedures that provide relief from symptoms that in the past would have required the operation.

There are two traditional types of hysterectomy: abdominal and vaginal. With vaginal hysterectomy, the surgeon makes an incision at the top of the vagina and removes the uterus through it.

“Vaginal hysterectomy tends to be many physicians’ first choice because there is no incision needed on the outside of the body, and there’s a quick recovery time,” said Laura Wang, M.D., FACOG, a gynecologist with University Medical Group. “But some women are not candidates for it.”

Some conditions that preclude vaginal hysterectomy include an enlarged uterus (often the result of fibroids), previous operations, history of severe endometriosis with adhesive disease, small pelvis, a malignant or premalignant condition or simply the need for better exposure to the abdomen.

For many years, patients who were not vaginal hysterectomy candidates had no choice but abdominal hysterectomy. This procedure requires not only a six-inch incision through the abdominal wall but also a typical hospital stay of three days and postoperative recovery period of four to six weeks.
Today there are more options. “Laparoscopic surgery is a minimally invasive alternative for a growing number of women,” said Dr. Wang.

Laparoscopic hysterectomy requires only a small incision near the navel for the insertion of a laparoscope and then other quarter-inch incisions (ports) in the abdomen for other surgical instruments. Benefits include less bleeding and scarring, reduced pain and much shorter hospital stay and decreased recovery time compared with abdominal hysterectomy.

Innovative surgical instruments play an important role. Some surgeons use harmonic scalpels, for example, to detach the uterus from surrounding tissue. Instead of cutting and burning tissue as electrosurgical instruments do, harmonic scalpels use high-frequency sound waves and may offer greater precision in tight spaces. Another critical instrument, called a morcellator, separates the uterus into strips of tissue narrow enough to be removed through tiny incisions.

Three Laparoscopic Approaches

**Total laparoscopic hysterectomy (TLH).** This procedure involves removing the entire uterus, including the cervix, through the vagina. The top of the vaginal opening inside the abdomen is then sewn together using instruments inserted through the laparoscope.

**Laparoscopically assisted vaginal hysterectomy.** In this operation, the surgeon inserts a laparoscope through the abdomen to inspect the upper abdomen extensively during the procedure. A surgeon might opt for this approach if the patient has pelvic adhesive disease that may have rendered a straightforward vaginal approach unsafe. This technique also may be preferred if the surgeon plans to remove the ovaries. During the procedure, the surgeon uses port access to disconnect the uterus and other structures, which then are removed through the vagina.

**Laparoscopic supracervical hysterectomy (LSH).** This less-invasive approach is preferred by surgeons who believe it may be associated with a decrease in future incidence of vaginal prolapse. The surgeon detaches the uterus from the cervix but leaves the cervix and its fibrous support structures intact. The uterus is cut into small strips, which then are pulled out through ports.

After this operation, both cervical dysplasia (precancerous changes of the cervix) and cervical cancer remain a possibility, so routine Pap test screening should continue.

William Coleman, M.D., FACOG, and Greg Johnson, M.D., FACOG, of Greenville Gynecology, have performed more LSH and TLH procedures than any other gynecologists in the Greenville area. They said most hysterectomy candidates are appropriate for LSH and that they have observed a significant reduction in postoperative pain and recovery time, with most LSH patients returning to normal activity within seven to 10 days.

**Alternatives to Hysterectomy**

“We lean toward conservative management of a patient’s condition when we are treating a woman of childbearing age or a woman who otherwise wants to keep her uterus, even when a problem exists that a hysterectomy would solve,” said Dr. Wang.

Beyond medicinal therapies, including birth control pills, some surgical procedures that can prevent or delay a hysterectomy include myomectomy, uterine artery embolization and endometrial ablation.
Myomectomy. With this operation, the surgeon cuts away large uterine fibroids (myomas), common noncancerous tumors of the uterine musculature, without removing the uterus, so a woman can maintain her ability to bear children. Removal of the fibroids tends to weaken and scar the uterine wall, so future deliveries may have to be performed by cesarean section. Myomectomy may not be recommended for women who do not desire future fertility or who are menopausal.

Traditionally a myomectomy is performed through a large incision in the abdominal wall, but some patients are candidates for laparoscopic fibroid tumor removal. A laparoscopic myomectomy is performed while the patient is under general anesthesia and her abdomen is inflated with carbon dioxide gas via a tiny incision. The surgeon inserts the laparoscope through the navel and examines the internal organs, then incises the outer coating of the uterus and muscular wall to remove the fibroid.

After the fibroid is removed from the uterus, it is cut into small pieces with a morcellator, and the pieces are removed through one of the ports or through an incision in the vagina. Following laparoscopic myomectomy, most women leave the hospital within 24 hours. Recovery takes about two weeks. In contrast, abdominal myomectomies require a hospital stay of three to four days and a recovery period of four to six weeks.

Uterine artery embolization. This minimally invasive hysterecmytomy alternative preserves the uterus but is not advised for women who want to become pregnant. Sometimes called uterine fibroid embolization, the operation blocks the arteries carrying blood to the uterus as well as the fibroids. Interventional radiologists perform the procedure. First, they place a catheter through a large artery in the groin and then thread the catheter through the blood vessels until it reaches the uterine arteries. Next they inject plastic particles about the size of grains of sand through the catheter to block the uterine arteries and subsequently decrease the blood supply to the fibroid(s). Patients usually are hospitalized overnight for pain control. Over time, the size of the fibroids decreases because their blood supply is blocked. The procedure typically relieves heavy menstrual blood loss as well as pelvic pressure and pain caused by large fibroids.

Endometrial ablation. This operation, which also is not recommended for women who want to bear children, can reduce or stop abnormal uterine bleeding by using electrical energy, heat or cold to destroy the endometrium (tissue lining the inside of the uterus). Following is one example of how the procedure can be performed: The surgeon inserts a narrow tube called a hysteroscope vaginally into the uterus and then uses the tube’s tiny camera to view the uterine cavity on a monitor while other instruments passed through the hysteroscope destroy the tissue. There are a number of other methods for accomplishing the operation. Complications can include recurrent symptoms that ultimately lead to hysterectomy to control dysfunctional bleeding.

Hysteroscopic Sterilization
For women who desire permanent sterilization but do not want to undergo an abdominal operation, GHS offers the Essure® Micro-Insert System. The first FDA-approved hysteroscopic approach to tubal sterilization, Essure requires no incision or general anesthesia and can be performed in approximately 30 minutes in an outpatient setting.

Hysteroscopic sterilization works by “plugging up” the fallopian tubes to prevent fertilization. Two small coil implants (the micro-inserts) are positioned through the body’s natural pathways (vagina, cervix and uterus) in each fallopian tube. Each one expands upon release, anchoring itself inside the tubes. Over time, the implants trigger scar tissue to grow around them, permanently blocking the tubes.

For more information or to refer a patient, call (864) 455-1600.

Laser Vaginal Rejuvenation®
Age, childbirth and other issues can cause the vagina to stretch and its supportive muscles to lose tone and control, diminishing sexual gratification. Laser Vaginal Rejuvenation (LVR®) is a one-hour outpatient surgical procedure that addresses these issues. LVR can decrease the internal and external vaginal diameters as well as build up and strengthen the perineal body – the area immediately outside the vagina and above the anus.

GHS urogynecologist Jeffrey B. Garris, M.D., FACOG, FACS, performs LVR and the companion procedures of Designer Laser Vaginoplasty® (DLV®). DLV operations are intended to aesthetically enhance the vulvar structures. Dr. Garris was trained in both LVR and DLV by Los Angeles-based gynecologic surgeon David Matlock, M.D., who pioneered the procedures.

“Depending on a patient’s wishes, it’s possible to do laser vaginal rejuvenation with or without surgery to correct urinary incontinence, pelvic floor prolapse or other problems,” said Dr. Garris.
Vecchietti Procedure for Vaginal Agenesis

Each year about one in 4,500 women is born with vaginal agenesis, a condition in which the vagina is absent or shorter than normal. Also known as Mayer-Rokitansky-Kuster-Hauser Syndrome, vaginal agenesis may occur in isolation or with the absence of the cervix and uterus. It usually is diagnosed in girls age 15 to 18 who have not yet begun to menstruate.

The laparoscopic Vecchietti procedure for addressing vaginal agenesis has been widely accepted in Europe since the 1980s but has remained less familiar in the United States. GHS is one of the few U.S. hospital systems to offer this procedure, which is performed by physicians of the Division of Reproductive Endocrinology & Infertility (REI), part of GHS University Medical Group–Department of OB-GYN. Paul B. Miller, M.D., FACOG, an REI specialist with the group, initiated the laparoscopic Vecchietti procedure in the Upstate.

Treatment Alternatives. The most commonly used alternatives to the Vecchietti procedure have some major drawbacks. Nonsurgical treatment involves the use of graduated dilators to expand and enlarge the tissue already present at the vaginal entrance. Patients use the dilator to apply pressure for 15 to 20 minutes a day. Creation of a neovagina with this method takes three to six months on average but can take up to a year if dilators are not used daily or properly.

In the United States, the most common surgical treatment for vaginal agenesis performed by gynecologists is the McIndoe procedure. While the patient is under general anesthesia, the surgeon removes a skin graft from the buttocks and attaches it to a mold of a vagina. Then the surgeon makes an incision where the patient’s vagina started to develop and inserts the mold into this opening. Patients remain hospitalized for a week while the skin attaches, and then the mold is removed.

With the McIndoe procedure, there is a strong tendency for the graft to contract and close up the vaginal cavity. Preventing this stenosis requires conscientious use of dilators postoperatively. The operation also leaves patients with a permanent 10-inch scar at the graft site.

The Vecchietti Way. The Vecchietti procedure is another surgical treatment option for constructing a neovagina. It was developed in Europe in the 1960s as an open, abdominal operation and then evolved into a laparoscopic procedure in the 1980s.

Using the laparoscopic Vecchietti approach, the surgeon places an acrylic bead about the size of an olive at the vaginal opening and connects it to a traction device on the anterior abdominal wall with strong sutures. Then every other day, the patient visits the physician’s office for tightening of the sutures around the device. This tightening pulls the bead inward by about one centimeter a day to create a vagina. This process takes approximately two weeks, and then the device and sutures are removed. For about two months following the procedure, patients who are not sexually active sleep at night with a firm foam rubber mold in the vagina.

“The Vecchietti procedure offers an option for young women with vaginal agenesis who find conservative treatment with dilators difficult or impossible or who show poor progress,” said Dr. Miller. “Understandably, there are some patients who simply can’t get the privacy needed for daily dilator use. For others, the prospect of self-dilation poses a great deal of emotional and psychological trauma.”

“The laparoscopic Vecchietti procedure is a safe, discreet option in which a neovagina can be created in a short amount of time – a week or so of progressive tightening of sutures instead of six months of dilator use,” he concluded. “And unlike the more commonly used McIndoe procedure, it does not involve the painful recovery, the longer operative time, the lengthy postoperative hospital stay and the skin graft that leaves a long scar.”

For more information or to refer a patient, call Dr. Miller at (864) 455-1600.

Paul B. Miller, M.D., FACOG, is a reproductive endocrinologist and infertility specialist with GHS University Medical Group–Department of OB-GYN.
New developments in technology, treatments and techniques abound in plastic surgery.

In an age of subspecialization, it is difficult to find surgeons who have diversity as well as depth of experience. Greenville Hospital System University Medical Center (GHS) is fortunate to have plastic surgeons who bring these qualities, plus flexibility and accessibility, to the community.

“A comprehensive plastic surgery department in the Upstate is unusual, so the range and scope of services we provide enable us to stand out,” said James L. Fowler III, M.D., who along with James G. Wallace, M.D., FACS, makes up the plastic surgery team of University Medical Group, GHS’ multispecialty physician group practice.

Trauma and Cosmetic Care

Drs. Fowler and Wallace are fellowship trained in plastic and reconstructive surgery and certified by the American Board of Plastic Surgery. They alternate call in the Level I Emergency Trauma Center at Greenville Memorial Hospital, where they provide care for deforming injuries to the ears, eyelids, nose and lips; fractures of the facial bones including the mandible and frontal sinus; and complex lacerations.

However, facial trauma comprises only a portion of their work. They perform reconstructive and cosmetic surgery procedures on the face, breasts and body. “We concentrate on breast reconstruction, postbariatric surgery and reconstruction following Mohs skin cancer surgery, in addition to general reconstructive procedures,” Dr. Fowler noted.

New Procedures and Technology

Technique and technology evolve rapidly in the world of plastic surgery. Patients continue to demand procedures that maximize results with minimal bruising, scarring and time away from work and social activities. New procedures and the equipment to perform them are in continual development.

Drs. Wallace and Fowler evaluate each advance carefully and adopt those that will be most beneficial to patients. They have embraced minimally invasive cosmetic procedures, including breast augmentation performed through the axilla and endoscope-assisted brow lifts. The surgeons also have replaced collagen injections with newer, longer-lasting fillers such as Restylane®.

They also offer acellular dermis-assisted breast reconstruction, a relatively new technique. The acellular dermis is an extension of the muscle that allows for coverage of a temporary breast expander, which can be implanted immediately following mastectomy. The expander is a temporary saline-filled device that expands over time following multiple injections in the physician’s office. These injections stretch the skin of the breast, creating a bigger skin “envelope” that is ready to accept a permanent implant during a second surgery. This approach produces a highly stable, less visible implant with a more natural breast shape.

Lasers continue to play a major role in cosmetic surgery. GHS has purchased a dual-erbium laser from Sciton Inc. for multiple types of facial skin resurfacing procedures as well as hair removal and small vein ablation. “The erbium laser is gentler than the CO₂ laser, so patients recover more quickly,” Dr. Fowler pointed out.

Looking Ahead

Drs. Fowler and Wallace soon plan to introduce microsurgical breast reconstruction. In this one-stage procedure, the patient’s own tissue is transferred from one part of the body to the breast with a microsurgical anastomosis, or connection, to provide immediate blood supply.

They also are looking forward to the addition of a pediatric craniofacial surgeon to the team. This fellowship-trained physician will specialize in complex craniofacial deformities caused by birth defects as well as those caused by trauma and cancer.

For more information or to refer a patient, call Drs. Wallace and Fowler at (864) 552-9700.

James L. Fowler III, M.D., and James G. Wallace, M.D., FACS, are plastic surgeons with GHS University Medical Group–Department of Surgery.
Otolaryngology

This division of the Department of Surgery at Greenville Hospital System University Medical Center (GHS) addresses a diverse spectrum of diseases affecting the ears, nose, throat, face and neck.

Many people are familiar with the concept of an ENT physician who treats children’s ear infections and removes tonsils. However, the modern specialty of otolaryngology – head and neck surgery – has grown far beyond those humble beginnings.

It now encompasses a wide range of medical and surgical therapeutic options for adult and pediatric disorders, said Robert O. Brown III, M.D., FACS, a partner with Greenville Ear, Nose & Throat Associates and chair of the GHS Medical Staff’s Division of Otolaryngology–Head and Neck Surgery.

“In the early 1900s, ENT physicians were some of the first doctors to specialize, but back then they were eye, ear, nose and throat doctors,” Dr. Brown explained. “Eventually the eye care became its own specialized field. At first, most of the care was medical in nature, but it evolved over time to involve surgical options. During the past 20 to 30 years, the specialty has gained significant experience in management of complex head and neck tumors and has also become more involved in facial disorders. It is exciting to be in such a dynamic field where we get to see newborns to the elderly, the relatively healthy to the very sick, and have treatments that range from reassurance all the way to major cancer surgery and reconstruction.”

The 10 otolaryngologists on the GHS Medical Staff perform a range of services for adults and children. Ear tube and tonsil procedures are still performed, in addition to evaluation and management of sinus disease, sleep apnea, voice and swallowing disorders, hearing and balance problems, and nasal obstruction. These physicians also provide comprehensive treatment for neck masses and tumors of the mouth, throat, jaw, sinus cavities, salivary glands and thyroid. Some have advanced training in facial plastic surgery, allowing treatment of cosmetic nasal deformities, facial trauma and tumors of the face, ears and lips.

Cochlear Implant Care
In collaboration with Greenville Ear, Nose & Throat Associates, GHS has expanded its capacity to evaluate and treat hearing loss, particularly in the area of cochlear implants. John McElveen, M.D., travels to GHS from Raleigh, N.C., once a month to perform cochlear implant surgery.

“This is a big addition to the services we offer here,” said Dr. Brown. “Now our patients don’t have to travel to Charleston or Atlanta for this surgery.”

Dr. McElveen performed eight cochlear implant surgeries at GHS in the past year. “That number will probably double this year,” Dr. Brown predicted. “And within a year, more than half of the procedures will probably be done on children.”

Cochlear implant surgery isn’t an option for everyone. “Currently it’s limited to those patients with hearing loss caused by such severe nerve damage that a hearing aid will not help,” Dr. Brown explained. “We’re having excellent results.”

The Craniofacial Connection
Otolaryngologists and plastic surgeons on staff at GHS currently provide care for facial trauma, skin cancer reconstruction and some reconstruction after complex head and neck cancer surgery. Care is also provided for cleft lip and palate patients. This treatment will be augmented next year with the addition of a board-certified craniofacial plastic surgeon.

“We hope to be able to meet the needs of these patients locally with a team approach to these complex problems so that they do not have to travel out of town, and they can feel confident that we will provide the resources here that they need,” said Dr. Brown, adding, “GHS is unique in that there is a teaching hospital with the associated resources, but many physicians are in private practice. You really need a dedicated team to meet the needs of the patients of Greenville County and the Upstate, and we hope to provide that right here.”

For more information or to refer a patient, call Dr. Brown at (864) 454-4368.

Robert O. Brown III, M.D., FACS, is an otolaryngologist with Greenville Ear, Nose & Throat Associates P.A. and chair of the Division of Otolaryngology–Head and Neck Surgery, of the GHS Medical Staff.
Ophthalmology

From administering trauma care to offering the latest advances in sight correction, ophthalmologists play a key role at Greenville Hospital System University Medical Center (GHS).

Ophthalmologists on the GHS Medical Staff wear many hats and serve diverse needs, whether rushing to the ER in response to a trauma call or educating patients on the latest laser eye surgery.

Expert Emergency Care
As the only Level I Emergency Trauma Center in the area, Greenville Memorial Hospital (GMH) must have ophthalmic surgeons on call to evaluate and treat ocular trauma and other ophthalmic emergencies. This staffing has become a challenge in recent years as the nation has experienced a shortage of eye surgeons taking ER call. One reason why is that most elective eye surgeries are now outpatient procedures performed in ambulatory surgery centers, many of which are privately owned.

GHS’ commitment to 24-hour ophthalmology coverage for GMH means upstate patients with vision-threatening injuries and eye diseases have the best chance of avoiding visual disabilities that could dramatically change their lives.

Technology Investments
To provide the best in ophthalmic surgical facilities, GHS has updated its Cross Creek Surgery Center. Eye surgeons performing procedures there have access to OPMI Lumera® microscopes from Carl Zeiss AG, chosen as the top technological innovation by the American Academy of Ophthalmology at its annual meeting.

Equipped with Stereo Coaxial Illumination (SCI™) technology, this microscope provides a brighter, sharper, clearer view of the eye – imagery that has been compared to the vividness and resolution seen on a high-definition TV screen. It also offers improved depth perception and detail, richer contrast and a dramatically enhanced red reflex (the reflection from the retina), giving eye surgeons unparalleled visibility during ophthalmic surgery.

GHS also has purchased Advanced Medical Optics Inc.’s new WhiteStar Signature™ Phacoemulsification System for cataract surgery. This technology is used to remove lenses clouded by cataracts in a more efficient manner than in previous systems. Its elliptical cutting pattern allows surgeons to work more rapidly and with lower energy levels for better patient safety and postoperative results.

Advances in Ophthalmology
One of the most exciting advances in ophthalmic surgery is intraocular lens (IOL) implants placed at the time of cataract surgery that can correct both distance and near vision, thus reducing the need for glasses postoperatively. In the past, IOL implants could correct either distance or near vision but not both.

Ophthalmologists on the GHS Medical Staff are using three FDA-approved presbyopic IOL implants. Each has strengths and weaknesses that cataract surgeons discuss preoperatively with patients to help them choose the implant best suited to their needs.

Additionally, there is a role for LASIK surgery in this type of refractive cataract procedure. To obtain the best visual result with the presbyopic IOLs, the patient’s postoperative refractive error and astigmatism must be precisely corrected. LASIK surgery, which changes the shape of the cornea, allows the surgeon to achieve that level of refinement by correcting residual refractive error or pre-existing astigmatism. This combined approach is performed for about 10 percent of presbyopic IOLs implant procedures.

To treat patients with astigmatic corneas (corneas shaped like footballs), the eye surgeon can use the IntraLase™ femtosecond laser to make flaps in the cornea before cataract surgery. A few weeks later, the surgeon performs the surgery, implanting one of the presbyopic IOLs. After the eye has healed, the surgeon lifts the LASIK flap and uses the excimer laser to reshape the cornea to correct residual refractive error or astigmatism. Thus, even cataract patients with high amounts of preoperative astigmatism can have presbyopic IOLs, allowing them to see both far and near with minimal need for glasses.

For more information or to refer a patient, call Cross Creek Surgery at (864) 455-8400.

Anne Parker, M.D., is a cornea fellowship-trained ophthalmologist and founder of Carolina Cornea and Laser Center. She also is chair of the Ophthalmic Division, Department of Surgery, GHS Medical Staff.
**Oral Surgery and Surgical Dentistry**

*Dental surgery leaders of the Greenville Hospital System University Medical Center (GHS) Medical Staff share perspectives on high-tech materials, teamwork and a supportive bedside manner.*

“In just two or three generations, dentistry has seen a huge improvement in people keeping their teeth,” said James Tankersley Jr., D.M.D., an oral and maxillofacial surgeon with his own practice and chair of the Division of Oral Surgery of the GHS Medical Staff.

Better outcomes are the result of ongoing improvements in water fluoridation, dental materials and procedures, and a well-trained dental surgery community. After graduating from dental school, oral and maxillofacial surgeons complete four or more years of hospital-based surgical residency training that may include rotations through internal medicine, general surgery, anesthesiology, otolaryngology, plastic surgery and emergency medicine fields.

**Dental Implants**

“One of the key advancements in oral and maxillofacial surgery during the past 20 years – and even more so in the last few years – is in dental implants,” Dr. Tankersley said.

Rather than resting on the gum line (such as removable dentures) or using adjacent teeth as anchors (such as fixed bridges), dental implants are long-term replacements that provide stability and function just like normal teeth. Oral and maxillofacial surgeons place a post, or implant, made of 100 percent titanium into the jaw. The implant is allowed to fuse with the bone over a period of about three months. After this process, called osseointegration, is complete, the implant is topped with a crown for a natural appearance.

By preserving adjacent teeth, dental implants are a great alternative for replacing missing teeth. Implants are becoming more affordable and are comparable to other forms of dental treatment.

“Today you can have a tooth taken out and have temporary restoration in the same day whereas you previously had to wait a few months,” said Dr. Tankersley.

**Rigid Fixation**

Another relatively recent development in oral and maxillofacial surgery is “rigid fixation” to stabilize facial fractures and to correct mandibular and maxillary deformities.

Because a cast cannot be placed on the face, surgeons can use two basic techniques to stabilize the bones and allow for correct healing. The traditional approach (intermaxillary fixation) involves wiring the jaw shut with wires or elastic bands for six weeks or more while the bones heal. By comparison, rigid fixation uses tiny screws or plates that attach directly and permanently to the fractured sections of the jawbone. It does not require wiring the jaws together.

**Digital Imaging Advances**

Cone beam computed tomography (CBCT) is a new digital imaging solution that provides valuable information for preoperative planning for placement of dental implants, corrective jaw surgery, temporomandibular joint disorder (TMJ) reconstruction and cleft palate correction, said Roger Bryant Jr., D.M.D., an oral and maxillofacial surgeon who uses these new advancements in 3-D implant reconstruction in his practice in Greer.

CBCT scanners use a cone-shaped X-ray beam rather than the conventional linear fan beam of medical CT scanners to provide images of the bony structures of the skull. For oral applications, CBCT is 10 times more accurate than other scanning technology and exposes patients to significantly less radiation. A single scan rapidly produces 3-D, high-resolution images of all oral and maxillofacial structures, including the maxilla and mandible.

**Pediatric Care**

To specialize in treating children, pediatric dentists complete two years of post-doctoral residency training in the recognition and treatment of children’s dental and orthodontic problems. “Only half of what we do is physical dentistry,” said Mary Crockett, D.M.D., a pediatric dentist in private practice and chair of the Division of Surgical Dentistry of the GHS Medical Staff. “There are also many family, emotional, behavioral and medical considerations when planning treatment for a child’s optimal dental care.”

Unfortunately, severe early childhood caries is still common in the U.S., estimated to affect more than 40 percent of children by age 5. The main culprits are diets high in sugar, especially...
sugary drinks, and nursing or drinking from a bottle or sippy cup at will during sleeping hours.

For medically fragile, special needs or young children with extensive restorative needs, the best – sometimes only – alternative is to perform the dental surgery under general anesthesia in an OR setting.

One of the most extraordinary outcomes Dr. Crockett recalls came from such a setting at Greenville Memorial Hospital. A 5-year-old with idiopathic cardiomyopathy was referred to Dr. Crockett for a full dental rehabilitation. Upon examination, Dr. Crockett found many dental abscesses and determined that almost none of the girl’s teeth could be salvaged.

After multiple consults with the girl’s physicians, the caregivers agreed the best treatment path to control the dental disease was full edentualization in the OR under general anesthesia. Sadly, the patient’s social history was as poor as her dental health, and two days following her treatment she was taken into protective custody by the Department of Social Services.

But there is a happy ending. As it turns out, chronic severe dental infection and poor nutrition were causing the girl’s heart to fail. Following treatment, the cardiomyopathy reversed. She was adopted and is thriving today, cavity free.

“They say it takes a village to raise a child, but as a pediatric dentist I think it takes a village to treat a child as well,” said Dr. Crockett. “I couldn’t fully realize all of my specialty without the cooperative support of GHS physicians, CRNAs, nurses and support staff. The children of this community are the real benefactors, and we are lucky to have the opportunity to deliver world-class care.”

For more information, call Dr. Bryant at (864) 968-0900, Dr. Crockett at (864) 234-9800 or Dr. Tankersley at (864) 268-6417.

Roger Bryant Jr., D.M.D., is an oral and maxillofacial surgeon in private practice in Greer. He is a member of the GHS Medical Staff.

Mary W. Crockett, D.M.D., is a pediatric dentist in private practice and chair of the Division of Surgical Dentistry of the GHS Medical Staff.

James Tankersley Jr., D.M.D., is an oral and maxillofacial surgeon in private practice. He also is chair of the Division of Oral Surgery of the GHS Medical Staff.
Radiology

Radioembolization and 256-slice computed tomography (CT) represent radiology achievements that will benefit patients for years to come.

Radiologists at Greenville Hospital System University Medical Center (GHS) are using interventional procedures to care for patients when surgery is not a viable option. They also are ready to use new technology to support surgery, including the next generation CT scanner.

Radioembolization Advances

The radiology profession has made rapid strides in interventional radiology, especially in treating illnesses that no longer have a surgical option. Procedures such as radio-frequency ablation, chemo-embolization, bland tumor embolization and vertebroplasty can address serious medical concerns while leaving the patient with minimal discomfort, reduced trauma, shortened recovery periods and long-lasting results.

A new interventional radiology procedure is called radioembolization. GHS interventional radiologists, working closely with surgical oncologists, are using this innovative approach – also called selective internal radiation treatment (SIRT) – to enhance therapy and improve quality of life for patients with inoperable primary and metastatic liver cancer.

Radioembolization involves injecting tiny “microspheres” (each only about half the diameter of a strand of hair) of the radioactive isotope yttrium-90 into the liver tumor through a small catheter inserted into the patient’s groin and guided to the tumor through the hepatic artery. The spheres, once lodged in the tumor’s vascular bed, emit targeted beta radiation that destroys or slows the growth of cancer cells with minimal harm to normal liver tissue or other organs. The radioactivity disappears within two weeks, but the spheres remain. The procedure takes about one hour and requires only local sedation.

GHS interventional radiologists use two agents for yttrium-90 radioembolization, depending on the cancer’s origin. For patients with inoperable primary liver cancer, they use TheraSphere® beads, which are glass microspheres made by MDS Nordion. For patients with colorectal metastatic disease to the liver who are not surgical candidates and who have failed chemotherapy, the radiologists opt for SIR-Spheres®, resin microspheres from Sirtex Medical Inc.

“With radioembolization we’re able to take advantage of a tumor’s vascularity and target it from the inside out, sparing normal liver cells,” he said.

Radioembolization is generally regarded as a palliative procedure. It can improve quality of life and, in certain cases, shrink liver tumors enough to increase life expectancy. The procedure is safe and generally well tolerated, with side effects of lethargy, poor appetite or nausea usually lasting only a few days.

256-slice CT Scanning

GHS is planning to invest in a 256-slice CT scanner, heralded as the world’s most advanced CT imaging software and machinery. In a single scan, this machine can cover four times the area of its predecessor, the 64-slice scanner. It also can capture a highly detailed 3-D image about five inches in diameter – a slice thick enough to see entire joints and organs, including the heart, brain and most of the lungs and liver.

The scanner’s strength means it can find the earliest and subtlest signs of restricted blood flow or blockages, long before symptoms appear or an organ becomes permanently damaged.

Its speed makes it possible to scan patients with arrhythmia. Any disturbances between successive beats can lead to distortions in the composite scanned image. The 256-slice scanner can acquire a full image of the heart in the time it takes for just one heartbeat. By comparison, the 64-slice scanner requires as many as six or eight heartbeats to capture the same image.

The 256-slice CT scanner also is expected to have value in precisely determining the best candidates for more invasive procedures, such as cardiac catheterization or catheter angiograms of the brain.

For more information or to refer a patient, call (864) 454-1000.

William T. Deeter III, M.D., is a radiologist with Greenville Radiology P.A. and a member of the GHS Medical Staff. He specializes in vascular and interventional radiology.
Anesthesiology

Greenville Hospital System University Medical Center (GHS) anesthesiologists have led initiatives for quality and safety of surgical care.

GHS’ Department of Anesthesiology has been at the center of much movement and change as its physicians have worked diligently to enhance the standard of care provided to patients and colleagues.

Proactive in Protocols, Guidance
During the past two years, the department has demonstrated a multidepartmental approach in working with colleagues to develop and implement clinical protocols. While many protocols are being created by hospitals in response to federal mandates or insurance providers, the Department of Anesthesiology took the lead and enabled GHS to be one of the first hospitals to comprehensively develop such standards.

With the Department of Surgery, anesthesiologists adopted the routine use of sequential compression devices (SCDs) and the continuation of perioperative beta blockers more than a year before a federal directive to do so. These initiatives led to the creation of GHS’ DVT Protocol, Perioperative Beta Blocker Protocol and Preoperative Prophylactic Antibiotic Protocol, part of a system-wide and comprehensive program to improve overall perioperative patient care.

Within the past year, GHS anesthesiologists have developed or revised numerous preoperative guidelines relating to laboratory tests and results, electrocardiograms and NPO status for patients of all ages based on national standards and peer-reviewed data.

Specialized in Focus
The Department of Anesthesiology has refined its intraoperative approach to unique cases such as minimally invasive cardiac surgery and thoracoabdominal aortic aneurysms. It has formed 12- and six-member teams of anesthesiologists to provide coverage and expertise for these types of complex procedures.

Other members of the department often focus their efforts on particular areas of interest such as neonatal surgery or ambulatory surgery/regional anesthesia. For the latter, many anesthesiologists have begun using ultrasound technology for the placement of peripheral nerve blocks, given GHS’ recent acquisition of several machines dedicated to these modalities.

Committed to Leveraging IT
The department is continuing to implement the Philips CompuRecord System in all operating sites throughout GHS. Gilbert Ritchie, Ph.D., director of Anesthesiology Services, and Dale Porter, systems maintenance, have been instrumental in this rollout.

Use of this system begins with the preoperative assessment, when patient information is entered into the CompuRecord. It continues during the course of a patient’s intraoperative surgical procedure and ultimately will extend to postoperative data acquired during the postanesthesia care unit stay.

GHS’ nursing team and notably certified registered nurse anesthetists deserve tremendous credit for helping to streamline this process and for its ongoing refinement in each facility. Ultimately, the CompuRecord System will allow GHS to conduct timely quality monitoring by maintaining a “real-time” database of patient information. This database will support clinical research in a cost-effective manner and track perioperative performance metrics as GHS works to comply with (and exceed) quality measures developed by the federal government and other entities.

Planning for Future of Pain Management
Finally, the Department of Anesthesiology has actively participated in the initial stages of creating a comprehensive pain management program at GHS. Anesthesiologists have been at the forefront of pain management for the past few decades, and yet this type of program must be multidisciplinary in its composition and approach to patient care. As such, the department is collaborating with GHS’ administration in the development of the program and seeking qualified candidates to enhance the services that can be provided to patients.

Clyatt Wendell James III, M.D., is an anesthesiologist with Greenville Anesthesiology P.A. He also is chair of the Department of Anesthesiology of the GHS Medical Staff and medical director for GHS Perioperative Services.

Robert Ray Morgan Jr., M.D., is an anesthesiologist with Greenville Anesthesiology P.A. and is a past president of the South Carolina Society of Anesthesiologists.
Nursing

*Surgical success at Greenville Hospital System University Medical Center (GHS) relies on a strong perioperative nursing team.*

GHS nurses play a vital role in positive surgical outcomes while providing a crucial interface among the hospital system, surgeons, patients and their families. More than 150 perioperative nurses serve in operating rooms across the system, offering patient-centered care backed by sound strategic planning. Both are required to keep patients and their loved ones as comfortable as possible while the nurses maintain their busy schedules.

Providing Comfort

The foremost objective of the OR team is “to treat every patient as if he or she were a family member or significant other,” said Carol Tyson, R.N., B.S.N., operating room clinical director for Greenville Memorial Hospital (GMH). “That’s the best way to ensure the highest level of quality and attention to detail.”

In their work to continually improve the surgical experience at GMH, Tyson and other OR leaders have implemented procedures that shorten the wait between the time when a patient arrives at the hospital and when he or she receives preoperative testing and is assigned to a preoperative waiting room. Family members may wait in the room with the patient until it is time for surgery.

The hospital also has enhanced the atmosphere in preoperative waiting areas by adding photographs to the ceiling, offering more music and TV options and providing patients with warm air blankets. These disposable blankets can travel with the patient into the OR, where they are used during surgery and then sent with the patient to keep him or her warm during postoperative recovery.
GHS also is giving perioperative nurses more schedule flexibility to visit with patients before and after surgery. This extra time recently meant a lot to one OR nurse and a pediatric patient. Before going under anesthesia, the patient was fascinated with the Clemson Tiger surgical cap his nurse wore. With help from fellow nurses who sew the caps, the nurse was able to visit the child shortly after surgery and give him a child-sized scrub cap with the Clemson Tiger.

Some OR nurses are on rotation to lead preoperative tours for pediatric patients and their families to help demystify the OR, familiarizing them with equipment and procedures. (Children may even get a whiff of the special bubblegum-scented oxygen that will come through their oxygen mask during surgery.)

“There is a short time to develop relationships, but still, they do get built,” Tyson said.

Planning and Preparing
Meticulous planning and preparation for surgery is a huge component of the perioperative nursing team’s responsibility and is essential to keeping surgical procedures on schedule. To help streamline surgery planning, GHS has instituted a procedure whereby the patient’s preoperative assessment appointment is scheduled at the same time surgery is scheduled. That way the patient knows as soon as possible when he or she will have an opportunity to learn details about an upcoming procedure from the pre-assessment nurse and to meet with the anesthesiologist.

On surgery days, perioperative nurses and surgical technicians typically arrive at the hospital and start setting up the OR before 7:00 a.m. to prepare for the first surgeries of the day, which usually are scheduled to begin by 8:00 a.m. Nurses are responsible for ensuring the cleanliness of the room and for equipping it with tools and equipment needed for the procedure, plus additional supplies that may be necessary if the care plan changes.

“You’re always anticipating the what-ifs,” Tyson emphasized.

Along with surgeons and anesthesiologists, all pre-, peri- and postoperative nurses at GMH receive Vocera hands-free communication devices so that they can easily discuss the status of patients, OR and bed availability and other issues.

In addition to having two nurse managers and six supervisors in its OR suites, GMH has four nurses responsible for coordinating the activities within each of the hospital’s four OR “cores,” or corridors. Core coordinators ensure ORs are ready for each case and alert OR schedulers if a procedure will finish early or run late. This information can be communicated right away to patients and surgeons.

“This is very pleasing to the OR staff, physicians and patients because it helps them plan and anticipate their day and manage the other responsibilities in their lives,” Tyson said.

In many cases, the OR staff addresses challenges and makes adjustments so there is minimal schedule disruption. “To a patient or surgeon coming into the OR, it can seem that everything has gone seamlessly on a day when it really hasn’t,” Tyson said.

Staying Sharp With Technology
Perioperative nurses must pass a 12-week orientation to become proficient with the types of technology employed by GHS. Minimally invasive surgical systems, with their overhanging booms holding multiple video screens for viewing procedures, often present the greatest learning curve but also the largest rewards in terms of career growth.

“These systems give nurses an opportunity to be more involved in the surgery because they can see the procedure from multiple fields of view and better anticipate the needs of the surgeon,” Tyson said.

The perioperative staff meets bimonthly for educational sessions about new surgical techniques, materials and trends. In the future, GHS’ perioperative nurses will receive hands-on training at the Greenville HealthCare Simulation Center at Greenville Memorial Medical Campus.

For more information about perioperative nursing at GHS, call (864) 455-4882.

Carol Tyson, R.N., B.S.N., is the OR clinical director for Greenville Memorial Hospital.
A strong communications and information technology (IT) infrastructure is essential to providing excellent surgical care.

Communication and the underlying technology that enables it are crucial ingredients in the surgical services offered by Greenville Hospital System University Medical Center (GHS). The system is continually rolling out systems to enhance communications.

Keeping Everyone Informed

GHS University Medical Group, the multi-specialty physician group practice of GHS, is leading an initiative to digitize ambulatory care medical records. The project will ease outpatient surgery follow-up communication, among other goals. For instance, surgeons performing procedures at GHS ambulatory centers can use the system to generate and send a consulting letter to referring physicians via U.S. mail or fax.

The project should be in place at outpatient facilities system-wide by mid-2010. That’s also the year GHS expects to ramp up an upgraded version of its patient information management system that will enable inpatient facilities to use digital medical record processes. Among its many capabilities, the updated software will send automatic e-mail alerts to inform referring physicians when new information about their patients is available on GHS’ NetAccess system.

Lee Van Voris, M.D., chief of GHS Medical Staff Affairs, said GHS is always looking for ways to make information more accessible to an increasingly mobile surgical staff and wider radius of referring physicians.

“For the realization of our vision as a tertiary referral center, communication is a critical need,” Dr. Van Voris said. “It’s one of the spokes in the wheel that we’ve got to make sure is solid. Information sharing is particularly important when patients are coming from farther away for care. You have to get the patient’s information to the referring physician in as close to real-time as you can.”

IT in the OR

In February 2008, Greenville Memorial Hospital (GMH) rolled out an anesthesiology information system from Philips. The software, which integrates with GMH’s anesthesia equipment, automatically records vital signs and preoperative antibiotic administration as required by the Centers for Medicare & Medicaid Services. The system also holds the patient’s preoperative assessment information. Data can be viewed during surgery, and GHS is establishing an interface so it also can be accessed online postoperatively via NetAccess.

In May 2008, Hillcrest Memorial Hospital began to use a new perioperative charting program. Barcode scanning and wireless technology capture real-time information about supplies and equipment used during surgery. It replaces the paper preference cards that OR staff previously used. The solution improves safety by ensuring the right procedure, equipment and supplies are used on the right patient, and streamlines tracking of charges.

GMH and Patewood Memorial Hospital have implemented a system from Vocera for hands-free communication between nurses and anesthesiologists throughout OR suites. The system, which uses voice over Internet protocol (VoIP) technology, enables the surgical team to call colleagues for assistance without leaving the operating table. Calls can be initiated through a voice-activated device attached to the scrubs.

“The surgery and anesthesiology departments have been very proactive in making these programs work and be successful,” said Doran Dunaway, GHS vice president of Information Services and CIO. As a result, GHS plans to extend these innovations system-wide.

For more information, call Dunaway at (864) 455-4707 or Dr. Van Voris at (864) 455-8771. For NetAccess login/information, call (864) 455-7928.

Lee Van Voris, M.D., is chief of Medical Staff Affairs at GHS.

Doran Dunaway is vice president of Information Services and CIO at GHS.
IAHC Will Work to Improve Healthcare Delivery

Greenville Hospital System University Medical Center (GHS) and the University of South Carolina (USC) have formed the Institute for Advancement of Health Care (IAHC), which has a mission to find better ways to deliver health care.

Jerry Youkey, M.D., FACS, vice president for GHS Medical and Academic Services, said this work will have a significant impact on access to health care, need for hospitalizations and ability to attract and train more doctors, pharmacists, social workers and advanced nurses in a time of impending critical shortage.

IAHC will “connect the dots” of resources and interdisciplinary expertise of GHS and USC, bringing focus and support for collaborative initiatives, said GHS vice president for Academic Development Brenda Thames, Ed.D.

Andrew Sorensen, Ph.D., former USC president, has been named IAHC president. His immediate goal is to transform the way doctors, nurses, pharmacists and social workers are educated as part of their clinical rotations. He is organizing and will chair an advisory board of national experts interested in improving health and healthcare delivery. He will serve in an advisory capacity to the USC-GHS team to recruit a top-tier healthcare leader to serve as the director for the IAHC, supported by a $2 million anonymous gift.

In addition to workforce shortages and access problems, IAHC research will address other major healthcare issues, such as escalating costs and lack of standardization of care. “Part of the solution is delivering care before the illness becomes difficult to manage, which means focusing more resources on prevention/wellness outreach and disease management,” said Michael Riordan, CEO of GHS.

For more information, call Dr. Thames at (864) 455-7871.

Dr. Pease Receives Planetree Honor

John Pease, M.D., a hospitalist at North Greenville Hospital–Long Term Acute Care, has been named GHS Planetree Physician Champion, an honor recognizing a doctor who embodies the spirit of patient- and family-centered care. Peers, staff and physician administration submitted nominations for the annual award.

Dr. Hayes Honored for Community Service

James Hayes, M.D., GHS medical director of Research Compliance and retired Children’s Hospital pediatric oncologist, was named 2008 Physician of the Year for Community Service by the S.C. Medical Association. Dr. Hayes, a leading force in the establishment of the cancer center of GHS Children’s Hospital, was nominated by the Greenville County Medical Society. Beyond his work at GHS, Dr. Hayes serves as medical director of the Taylors Free Medical Clinic, which he co-founded in 2005.

GHS Graduate Performs Landmark Cancer Research

William Merritt, M.D., a 2005 graduate of GHS’ OB-GYN Residency Program, was the lead author of an article published in the December 18, 2008, edition of The New England Journal of Medicine. The article, “Dicer, Drosha, and Outcomes in Patients with Ovarian Cancer,” explored the role of the enzymes Dicer and Drosha in interrupting the development of cancer cells. The research study behind the article found that cancer specimens with both high Dicer expression and high Drosha expression were associated with increased median survival in patients (>11 years vs. 2.66 years for other subgroups; P<0.001).

The research is the first to identify molecular mechanisms that can help accurately determine the prognosis and guide therapy for ovarian cancer. Dr. Merritt, who earned his medical degree from the University of South Carolina in 2001, is a senior gynecology-oncology fellow at the M.D. Anderson Cancer Center at the University of Texas.
Greer Memorial Hospital Opens

Greer Memorial Hospital of Greenville Hospital System University Medical Center opened its doors to patients August 24. The hospital, which replaces Allen Bennett Memorial Hospital, is located on Greer Medical Campus at 830 S. Buncombe Road.

The campus is designed to present residents of Greer, Taylors, the Eastside and surrounding communities with a new level of care that brings together the latest technology and a home-like, patient-centered care environment.

Greer Memorial Hospital has 82 private beds and 26 emergency beds. The facility has four boom-style minimal access operating suites, two gastroenterology suites and a full range of imaging services (MRI, nuclear imaging, radiology and CT). There are two surgery waiting areas and eight postoperative recovery bays.

The Women’s Center has a dedicated elevator to eight private labor/delivery/recovery/postpartum rooms with baby care stations. Its newborn nursery is applying for Level II status, and a pediatric unit opened in late 2008. There is an OR dedicated to cesarean sections, including an infant resuscitation center.

In addition to the hospital, the campus is home to two physician office buildings, The Cottages at Brushy Creek long-term care facility, Southern Eye Associates and walking trails.

The information contained in Vital Signs is for educational purposes only—it should not take the place of medical advice or diagnoses made by healthcare professionals.