Fall 2004

healthpoints

ALL THE POSSIBILITIES OF MODERN MEDICINE

Columbia University Medical Center
Department of Surgery
NewYork-Presbyterian

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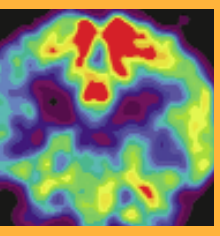

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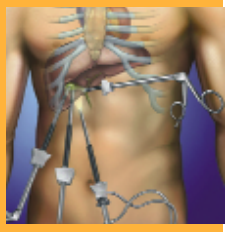

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Careful choices, faster recovery

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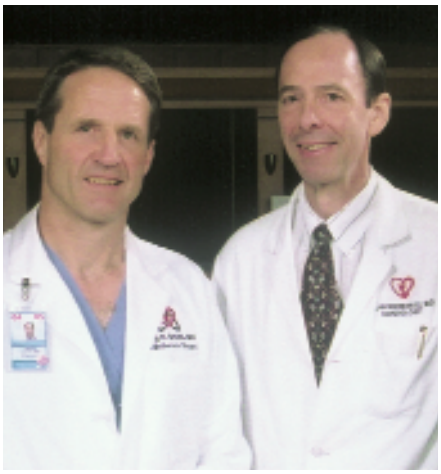
PRESIDENTIAL TREATMENT

Dr. Craig Smith Performs Bypass on Former President Bill Clinton

On September 6, 2004, **Craig R. Smith, MD, FACS** performed a successful quadruple bypass procedure on former President Bill Clinton. The President returned to his home September 10, where he is completing his recovery. Dr. Smith is *Calvin F. Barber Professor of Surgery,* Columbia University College of Physicians & Surgeons and *Chief, Division of Cardiothoracic Surgery,* NewYork-Presbyterian Hospital/Columbia University Medical Center.

Surgeons use bypass procedures, or coronary artery bypass grafts (CABGs), to create new sources of blood for areas of the heart served by blocked arteries. According to Dr. Smith, the blockages in some of the arteries were "well over 90 percent," placing the 58-year-old former President at a high risk for a major heart attack. Fortunately, he had not experienced any substantial damage to his heart muscle prior to his surgery. **Allan Schwartz, MD,** *Chief of Cardiology,* NewYork-Presbyterian Hospital/Columbia University Medical Center, was President Clinton's cardiologist throughout his hospitalization.



Craig R. Smith, MD, FACS and Allan Schwartz, MD

During the four-hour operation, Dr. Smith, assisted by **Yoshifumi Naka, MD, PhD,** *Director of Cardiac Transplantation and the Mechanical Circulatory Support Program,* NewYork-Presbyterian Hospital, used blood vessels taken from President Clinton's chest wall and leg to bypass the blockages and restore an adequate flow of blood to the heart muscle. For just over one hour of the procedure, Mr. Clinton was placed on a heart-lung machine, which maintained the flow of oxygen and blood throughout his body while the new vessels were connected.

"We are delighted to report that President Clinton's surgery was successful and that he is progressing towards a full recovery," said **Eric A. Rose, MD,** *Morris and Rose Milstein, Johnson & Johnson Professor of Surgery and Chairman, Department of Surgery,* Columbia University College of Physicians & Surgeons, *Associate Dean for Translational Research,* Columbia University Medical Center, and *Surgeon-in-Chief,* NewYork-Presbyterian/Columbia.

Columbia's open-heart surgery program consistently performs more than 1,500 open-heart procedures annually. In most subspecialties, the Division of Cardiothoracic Surgery stands alone in the region and among the best in the world.

For information about CABG or other cardiac procedures, please contact the Division of Cardiothoracic Surgery at 800.543.2782.

Congenital Heart Surgery

Choosing the right hospital for your child

Choosing a surgeon or hospital can be a daunting, confusing task for parents whose children must undergo heart surgery. To help families successfully navigate this challenge, a leading pediatric heart surgeon gives some helpful guidance.

According to **Jonathan M. Chen, MD,** *Site Chief of Pediatric Cardiac Surgery* at Weill Cornell Medical Center, parents should begin by asking about the volume of pediatric heart surgeries done each year at the institution. "The relationship between high volumes and surgical outcomes is solid," explains Dr. Chen. In high-volume institutions, the care at all levels—before, during, and after surgery—will very likely be expert.

This relationship between surgical volume and successful outcomes reflects the paramount importance of post-surgical care. "The operation may take four hours, but the child may remain in the hospital for a week or more. The care given after surgery makes a tremendous difference in a child's recovery," explains Dr. Chen.

When asking about a surgeon's experience or the volume of surgeries at an institution, parents should understand that congenital heart defects are, in many cases, unique. Procedures are frequently complex and tailored to the child's individual anatomy, and surgeons may be experienced in a very similar—but not the exact—procedure that a given child requires. "Having substantial experience in similar procedures is what is important," says Dr. Chen.

Because pediatric cardiac surgery requires continuous collaboration from numerous specialists, it is imperative to consider the expertise of not just the surgeon, but of all of the specialists involved. First and foremost, says Dr. Chen, institutions should have a department specializing exclusively in pediatric anesthesia. "This is critically important," he states. "If they don't have a division of pediatric anesthesia, walk away." Similarly, Dr. Chen advises parents that institutions should have a robust division of pediatric cardiology. "You have to have outstanding cardiologists, or else you won't have outstanding surgical results."

Other experts are also needed: "In the operating room, we rely heavily on the expertise of echocardiographers to tell us what is going on. In most procedures, we need perfusionists who specialize in managing the pediatric heart-lung bypass machine. Before and after any heart surgery, we must have excellent support from cardiac catheterization specialists, both

At five months of age, Marissa Ackerman (left) underwent surgery to repair an obstruction in her aorta and diseased aortic valve. "Thanks to the efforts of Dr. Quaegebeur and the wonderful doctors and staff at Columbia, she is a very healthy and energetic four-and-a-half year-old today," says Marissa's mother, Michele.

to help elucidate the anatomy and physiology, as well as to address any problems that may occur post-operatively."

In assessing the quality of post-surgical care, parents are encouraged to tour medical centers before making a decision. They should visit the intensive care units and ask who will be on call during their child's recovery. Parents should seek referrals from knowledgeable nurses, physicians, and other healthcare practitioners both within and outside an institution. For further information, they may also wish to speak with other families whose children have undergone treatment, to obtain candid evaluations of care.

Among pediatric cardiac centers, one commonly used marker of overall acuity is experience in particularly skilled operations such as the arterial switch procedure for transposition of the great arteries. At NewYork-Presbyterian Hospital/Columbia, **Jan M. Quaegebeur, MD,** *Director of Pediatric Cardiac Surgery at the Congenital Heart Center,* began performing the operation on neonates in the early 1980's, and has since been at the forefront of a series of evolutions of the operation. Today, he performs more arterial switches than virtually any surgeon on the eastern seaboard, and has outstanding surgical outcomes compared to national averages.

Another hallmark of a hospital's expertise is its experience in surgery for Hypoplastic Left Heart Syndrome (HLHS). **Ralph Mosca, MD,** *Site Chief of Pediatric Cardiac Surgery* at the Morgan Stanley Children's Hospital of NewYork-Presbyterian, has written extensively about this condition and its operative

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LUNG SURGERY

Expert advice for obtaining expert care

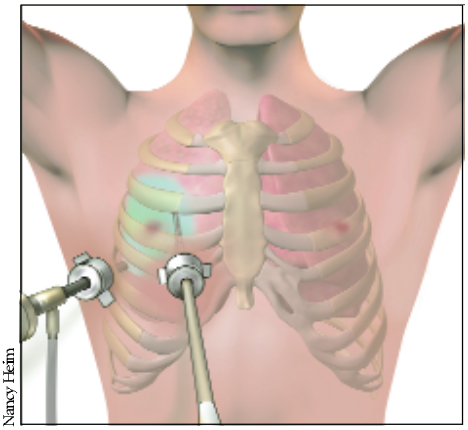
For some patients, the journey between developing symptoms and finding oneself in an operating room can seem like a sudden, uncontrollable process. As with all matters of healthcare, however, being well-informed and making educated choices can determine whether one receives the best treatment or not.

According to **Kenneth M. Steinglass, MD,** *Director of General Thoracic Surgery* at NewYork-Presbyterian Hospital/ Columbia University Medical Center (NYPH/CUMC), patients should begin by choosing surgeons who specialize in treating their particular condition. "One of the advantages of a center such as Columbia is that physicians can subspecialize in very specific areas." Although all chest surgeons are trained in both lung and heart surgery, individuals with lung or esophageal disease should seek a surgeon who exclusively treats non-cardiac chest diseases (lung, esophagus, mediastinum). Such an expert is best qualified to address the subtleties of thoracic problems and to consider all the appropriate diagnostic and therapeutic options.

"Each of the dedicated, non-cardiac thoracic surgeons at Columbia is able to pursue unique techniques in our subspecialty," says **Joshua Sonett, MD,** *Surgical Director of Lung Transplantation.* "Some have expertise in minimally invasive thoracoscopic surgery for lung cancer and emphysema. Other members focus on esophageal and other thoracic surgeries. If we were a smaller group, we would not be able to have such focus." The ability of Columbia thoracic surgeons to specialize in specific conditions and procedures has contributed to the program's enormously successful outcomes.

"In addition to carefully selecting a surgeon, patients should consider the expertise and resources of the institution," adds Dr. Sonett. Columbia's lung transplant program, one of the highest volume centers in the U.S., achieves outstanding results compared to national averages. For adult transplant patients, one-year survival exceeds 90% and the two-year survival rate is over 80%—versus the national average of 78% for one-year survival.

"We achieve this not just because of our surgical and medical expertise, but because of the commitment of the whole hospital," Dr. Sonett explains. "The high level of care in the ICU, the nursing support, and the integrated team approach are what make such results possible." Because Columbia's lung failure and transplantation programs are so strong, he says, they are able to triage even the sickest patients to the most appropriate treatments.



Nancy Hehn

Video-assisted thoracoscopic surgery for emphysema: during Lung Volume Reduction Surgery (LVRS), one incision permits access of the thoracoscope (for viewing), while forceps and a surgical stapling instrument are used to remove the affected tissue through two other incisions.

Columbia is similarly successful in treating emphysema with Lung Volume Reduction Surgery (LVRS). During LVRS, up to 30% of lung tissue may be removed either by open or video-assisted thoracoscopic surgery. With its multifaceted approach to patient care, NYPH was the leading enroller of patients in the National Emphysema Treatment Trial (NETT). This pivotal trial proved that LVRS is beneficial for selected patients with emphysema, and it directly led to Medicare coverage of the procedure at approved institutions. Today, under the leadership of **Mark E. Ginsburg, MD,** *Surgical Director of the Lung Failure Center,* and **Byron M. Thomashow, MD,** *Clinical Professor of Medicine,* Columbia's dedicated team of surgeons, pulmonologists, physical therapists, and nurse coordinators maintains its leadership position with one of the most successful programs in the country.

LUNG CANCER

In the area of thoracic oncology, Columbia continues its role as a prominent national leader. "We know we can safely and more effectively treat lung cancer patients using a multidisciplinary approach, utilizing treatments that combine advances in medical oncology, radiation therapy, and surgery," states Dr. Sonett. Until recently, for example, it has been considered unsafe to operate on patients with lung cancer who have received chemotherapy and high dose radiation. In a study published in the October 2004 *Annals of Thoracic Surgery,* however, Dr. Sonett demonstrated that surgery can in fact be performed safely in

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Aortic **Aneurysms**

We all know the value of prevention in maintaining one's health—that we should eat properly, exercise, avoid smoking, and maintain a healthy lifestyle. But few of us give thought to what had, until recently, been considered an obscure cause of sudden death: massive bleeding caused by rupture of the aortic artery. While aneurysms are indeed rare, occurring in only 10-15 per 100,000 people, aortic aneurysm rupture is a medical emergency and is often fatal. However, rupture is preventable with treatment if the aortic aneurysm is detected early.

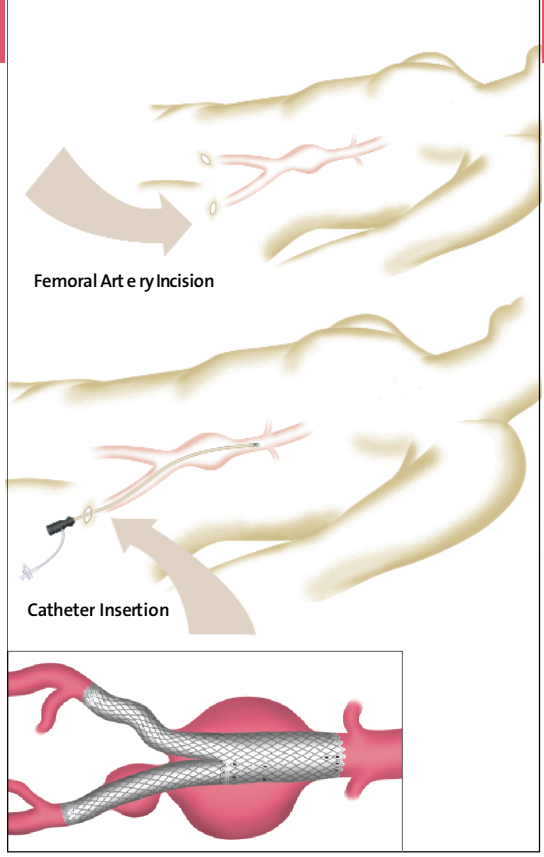
The aorta extends upward from the heart, arches, and then extends downward through the entire torso, so that its shape resembles a large candy cane. An aneurysm can develop in any part of the aorta. At first, a developing aneurysm looks like a narrow balloon in which a small section begins to enlarge and bulge outwards. This bulging causes the artery walls (lining) to become thinner and weaker. Once that section reaches a size twice the aorta's normal diameter, it is called an aneurysm. If the aneurysm gets too big, it may burst (rupture). This can result in a devastating rate of death: up to 70%. If an aneurysm is detected before rupture, however, elective repair is successful in the vast majority of cases. Successful outcomes, then, depend on early detection and planned interventions to avoid emergency situations.

The most common cause of aortic aneurysm is atherosclerosis, or hardening of the arteries; plaque in the arteries forms a barrier between inner and outer layers of the aortic wall, causing important structural proteins in the aorta to break down. The subsequent weakness of the aortic wall leaves it susceptible to the constant pressure of rushing blood, and in time it begins to stretch outward, forming an aneurysm. Other predominant risk factors include smoking, hypertension, and diabetes. In addition, individuals who have a first-degree relative with an aortic aneurysm have a 17% incidence of developing aneurysms themselves.

The main screening tools are physical examination and ultrasonography. CT scans and MRI are then used to more accurately evaluate the size and location of an aneurysm. Detection is easy enough with today's non-invasive technology; the difficulty lies in bringing patients at risk to the screening itself. Most people are not screened specifically for aneurysms unless their family history suggests a clear risk. Instead, those who are lucky learn they have an aneurysm incidentally during routine exams or during CT scans or X-ray examinations to evaluate other health problems.

Educated patients can take the initiative by being aware of the risk factors for aneurysms and requesting screenings, however. "Because most individuals with aneurysms experience no symptoms until the aorta ruptures, the importance of screening among people at risk cannot be overstated," says **James F. McKinsey, MD,** *Site Chief, Division of Vascular Surgery* at NewYork-Presbyterian Hospital/Columbia. While men are four times more likely to develop aneurysms than women, both men and women at risk should request screening if they have predisposing conditions including:

- Family history of aortic aneurysms
- Coronary (heart) artery disease
- Peripheral vascular disease (such as blocked arteries in the neck or legs)
- High cholesterol
- Hypertension
- Smoking
- Diabetes



Endovascular stent grafts are advanced to the site of the aneurysm through small incisions in the groin.

If an aneurysm is detected before rupture, surgical repair is successful more than 98% of the time. Repair is generally recommended for aneurysms over five to five-and-a-half centimeters in diameter in men and four-and-a-half centimeters in women. At this size, the risk for aneurysm rupture is approximately 15% per year without repair. On the other hand, an elective operation at this size can be performed with less than 2% risk of death.

Advances in Treating Infrarenal Aortic Aneurysms

As with many types of surgical procedures, advances in minimally invasive technology are revolutionizing the treatment of aortic aneurysms.

Endovascular stent grafting is a minimally invasive alternative to "open" surgical aneurysm repair in which small incisions are made in the groin, through which catheters are advanced to the area of the aneurysm. Through the catheters, a synthetic fabric tube (graft) supported by wire mesh (stent) is placed at the site of

the aneurysm. The stent graft is then secured above and below the aneurysm, sealing off the aneurysm and assuring safe flow of the blood. This minimally invasive procedure can be performed under local or regional anesthesia, and does not require general anesthesia in most cases.

"While open procedures are still necessary in some cases, endovascular stents are becoming more widely used because of their potential advantages to patients: less post-surgical pain, faster recovery and return to normal activity, less blood loss, fewer pulmonary complications, and lower risk of major complications overall," states **Peter L. Faries, MD,** *Chief of Endovascular Surgery* at NewYork-Presbyterian Hospital.

At this time, thoracic aneurysms (those occurring in the chest) and thoracoabdominal aneurysms still require open surgery. However, clinical trials of endovascular stent grafting for these areas are ongoing at the Columbia and Weill Cornell campuses of the NewYork-Presbyterian Hospital. For aneurysms in lower portions of the aorta such as below the kidneys (infrarenal), however, stent grafts are FDA approved and available to all appropriate patients.

"About 80% of patients we see in our practice with abdominal aortic aneurysms may be eligible for endovascular stent grafts," says Dr. McKinsey. For young and healthy patients, open procedures are often recommended." Adequate room above and below the aneurysm to adhere the graft to the vessel must be available; the presence of branching arteries right next to the aneurysm may prevent the use of endovascular stent grafts. Physicians in the Division of Vascular Surgery are now researching new ways of placing juxtarenal grafts (right next to the renal arteries).

Patients with significant renal dysfunction are at higher risk of complications from endovascular repair because the contrast dye used to facilitate visual placement of the grafts can cause temporary or permanent renal failure. "Use of alternate contrast agents and intravascular ultrasound can decrease the risk of the minimally invasive procedure in these patients," states Dr. Faries.

The NewYork-Presbyterian team performs 130-150 infrarenal stent graft procedures each year, with excellent outcomes. The biggest complication, says Dr. McKinsey, is delayed leak or migration (movement) of the graft. For this reason, patients must initially be monitored every six months, and then yearly, with CT scans or ultrasound. In the event of graft migration or leakage, a secondary procedure may be required.

Despite these potential complications, however, this minimally invasive procedure carries a five-fold lower risk of death compared to open surgery; the risk of death is about 4.2% after open surgery, compared to 0.8% after endovascular stent grafting, according to a recent study done by the NewYork-Presbyterian Hospital Division of Vascular Surgery and published in the *Journal of Vascular Surgery.* Longer-term studies on numerous grafts are currently underway in FDA-sponsored trials.

"In most centers, about 40-50% of patients may be eligible for the minimally invasive procedure. At NewYork-Presbyterian, we perform it in 80% of cases. We are studying and developing new, innovative grafts, we have significant experience in implanting them, and we are willing to do additional procedures (such as placing conduits so that grafts may be placed through smaller access arteries) in order to make endovascular stent grafting possible. For high-risk patients, we often find creative ways of adjusting the procedure. In short, we don't take 'no' for an answer," says Dr. McKinsey.

Patients may request further information on vascular disease, request a screening, or make an appointment by visiting www.nypvascularcare.com and clicking on "vascular disease prevention."

Lung Surgery

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such patients. "This sets the stage for wider national trials of this type of high intensity regimen." The thoracic surgery team is currently collaborating with **Howard L. Kaufman, MD,** to apply his expertise to lung cancer. Dr. Kaufman is *Vice Chairman of Surgical Oncology* at the Department of Surgery and is renowned for his research on the immunological treatment of melanoma. New studies on lung cancer vaccines are now under development and are scheduled to begin in 2005.

Other notable areas of expertise include:

- **Lyall Gorenstein, MD,** *Director of Minimal Access Thoracic Surgery,* has developed and is advancing new techniques in less invasive approaches to chest disorders. Under his direction, the *Hyperhidrosis Treatment Center* has helped scores of young adults with this condition.
- **Dr. Ginsburg** is a world leader in diaphragmatic pacing, a novel therapy which can support certain patients with end-stage lung failure due to diaphragmatic dysfunction.
- **Dr. Steinglass** oversees Columbia's renowned and longstanding practice of surgery for myasthenia gravis.
- **Drs. Sonett** and **Ginsburg** also lead the multidisciplinary management of benign and malignant airway obstruction.
- **Drs. Ginsburg, Sonett,** and **Gorenstein** are developing new applications of robotic technology to the treatment of a wide variety of thoracic problems.

Dr. Steinglass concludes, "We are pleased that our General Thoracic Surgery program offers the most comprehensive array of thoracic surgical services in the entire region. With expertise, innovation, and compassion, we are committed to offering the highest quality thoracic care to those whom we serve."

For information about diagnosis and treatment of lung diseases, including surgery and transplantation, please call 800.543.2782.

Plastic Surgery

New focus on safety and quality of life

Our culture enjoys a great fascination with elective cosmetic surgery, as evidenced by soaring statistics:

In 2003, American women had nearly two million elective cosmetic surgical procedures overall, representing an increase of 87% since 1997. The top five surgical cosmetic procedures in 2003 were:

- liposuction: 384,626, up 3% from 2002
- breast augmentation: 280,401, up 12%
- eyelid surgery: 267,627, up 17%
- rhinoplasty: 172,420, up 10%
- breast reduction: 147,173, up 17%*.

In this environment, surgical makeovers are being marketed in much the same manner as other consumer goods. Because of the higher cost of care in large academic medical centers, the majority of procedures are performed in smaller private facilities, often on an outpatient or ambulatory basis, and often by practitioners other than board-certified plastic surgeons. Such trends may give the misleading impression that elective cosmetic surgery can be a rather casual undertaking. In light of such trends, leading surgeons urge patients to give careful thought to the important considerations of safety and quality of life before deciding on surgery.

SAFETY

The safety of elective procedures has been steadily improving due to advances in operative care, says **Robert Grant, MD, FACS,** *Acting Chief, Joint Division of Plastic Surgery* at Columbia University Medical Center and Weill Cornell Medical Center. Nevertheless, every surgeon and every institution will have complications at some time. It is therefore imperative to choose both highly qualified surgeons and accredited facilities.

"Patients should make sure to choose fully Board-certified specialists," says Dr. Grant. Accreditation by the American Board of Medical Specialties is an indication that the surgeon keeps current with medical advances, is proficient in managing complications, and practices in a way that makes good use of available resources. In addition to asking practitioners directly about their credentials, patients should inquire about the surgeon's level of experience with the particular procedure they are considering.

Another critical aspect for patients is choosing a facility with top accreditation. Because of serious concerns about the safety of operating in non-accredited surgical centers, the American Society of Plastic Surgery has mandated that Board-certified plastic surgeons operate only in accredited facilities. Patients should ask if the facility has been recently surveyed and is accredited by one of the nationally recognized accreditation organizations; such accreditation indicates that the institution actively promotes safety as well as compliance with all of the appropriate governmental and regulatory requirements for safe operation.

"Accreditation by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) or American Association for Accreditation of Ambulatory Surgery Facilities (AAAASF) indicates that an institution is doing everything possible to maximize safety and achieve the desired result," Dr. Grant states. Although the main U.S. accreditation body is JCAHO, smaller

facilities may instead choose to be licensed by an individual state or Medicare program. AAAASF provides a more cost-effective certification for smaller facilities that perform only cosmetic surgery.

"As academic surgeons, we have great responsibility to ensure that we perform procedures in the safest way possible," explains Dr. Grant. "Emergencies do happen, and Columbia has redundant systems in place to ensure maximum safety. In private practitioners' offices, however, such checks and balances may be absent."

Dr. Grant recalls one case in which a patient in his late 60's developed heart changes during his elective operation, despite receiving full medical clearance before surgery. With no delay or additional inter-facility transport, the patient was evaluated and admitted for observation to the Cardiac Catheterization Unit, where he recovered uneventfully. Says Dr. Grant, "The family and I were delighted to have this back-up so readily available. It made all parties much more comfortable in dealing with this patient's unexpected heart problem."

"Studies are giving clear indication that cosmetic surgery can make a tremendous difference in patients' health and well-being."

QUALITY OF LIFE

As safety has improved, the criteria for evaluating plastic surgery have broadened, according to Dr. Grant. "It used to be that morbidity and mortality guided decisions about whether the benefits of a procedure offset its risks. Then, in the 1970's and 1980's, people began evaluating cost effectiveness and length of stay. Now, quality of life is emerging as yet another important area of consideration."

"For many years, surgeons have known that cosmetic procedures could improve people's well-being and quality of life," says Dr. Grant. "There was no scientific study to support this anecdotal knowledge, however. Now, studies are giving clear indication that cosmetic surgery can make a tremendous difference in patients' health and well-being."

A prime example is the BRAVO (Breast Reduction Assessment of the Value of Outcomes) study of breast reduction surgery, in which Columbia's Division of Plastic Surgery was a key participant. This landmark study demonstrated that prior to surgery, patients with large breasts suffered from pain, especially back pain, reduced lung capacity, and other symptoms—independent of body weight or obesity. Improvements in these symptoms after breast reduction surgery gave evidence of great value to patients. These results led managed care companies to include many more breast reduction procedures as a covered, "medically necessary" benefit.

Moving further, physician-researchers are now evaluating patient satisfaction using psychometric techniques, which quantitatively measure the ability to do certain tasks before and after surgery.

According to Dr. Grant, new studies are also investigating whether the effects on self-esteem or satisfaction are maintained or temporary, and they are working to determine ways of predicting which patients will be more likely to have positive results after cosmetic surgery. "This type of study has been used previously to measure quality of life after orthopedic operations. Now we are using the same sorts of tools to evaluate patients after eyelid surgery, breast augmentation surgery, facial reconstruction, and other procedures, to see if the results really are the same as what the anecdotal evidence suggests."

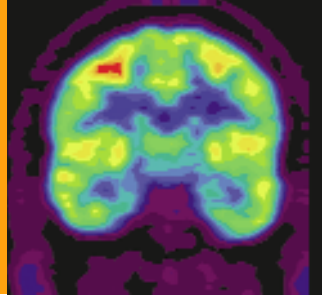
With numerous studies currently investigating patient safety, satisfaction, and quality of life, Columbia is on the leading edge of efforts to learn how to better care for surgical patients. In collaboration with the Veterans Administration system and the American College of Surgeons, **Mahmoud El-Tamer, MD,** *Assistant Professor of Surgery* at Columbia University College of Physicians & Surgeons and *Director,* Columbia University Breast Center at Palisades, is studying patient safety in surgery at private hospital settings.

Since 2002, the Department of Surgery has also been holding quarterly conferences devoted to the examination of surgical outcomes in the department, and continual raising of benchmarks for safety and quality of life. *The Measurement Assessment Systems and Standards* (MASS) conferences, instituted by **Eric A. Rose, MD** and **John A. Chabot, MD** and led by Departmental Quality Assurance Chair **William Middlesworth, MD,** take the uncommon step of conducting an in-depth analysis of each surgical division's operative volume, complications, outcomes, and length of stay compared to national benchmarks. "The MASS conference provides a forum for critical evaluation of how we practice, with the goal of improving patient care. It differs from more traditional conferences in its emphasis on data and trends rather than individual complications," says Dr. Middlesworth.

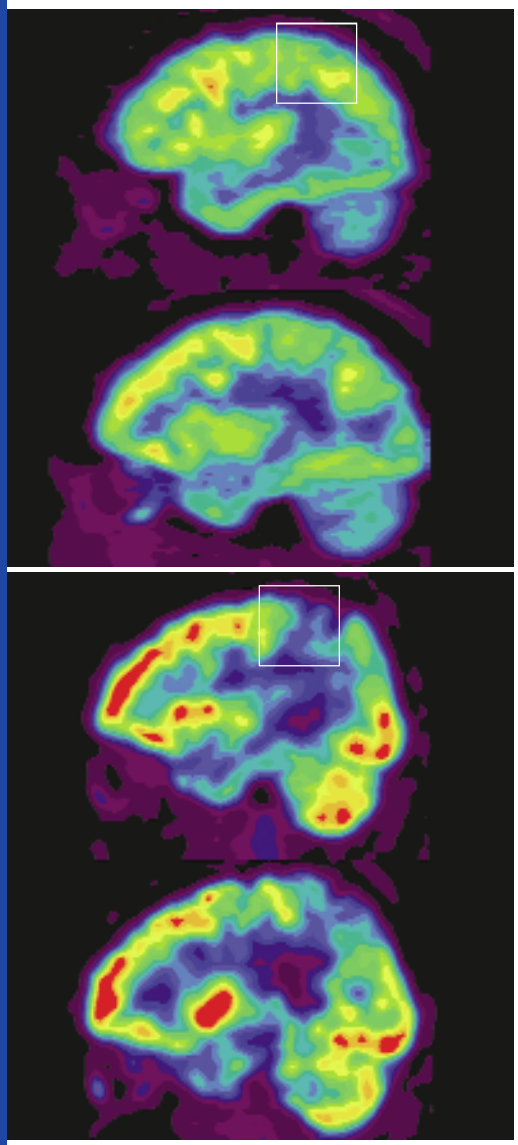
*Statistics provided by the American Society for Aesthetic Plastic Surgery.

For more information, please contact the Plastic/Aesthetic Surgery Program at 800.543.2782 or visit www.columbiaplastics.org.

PET Scans for Alzheimer's Disease
A View of Hope



Among the greatest hardships for the 4.5 million Americans afflicted by Alzheimer's disease, and for their families, are the unknowns associated with the disease. Even after a clinical diagnosis is made, patients and their families may not be sure about the effectiveness of treatments.



The top PET scan shows a healthy brain, while the bottom scan shows Alzheimer's disease. The marked decrease in brain activity in the highlighted portion is consistent with Alzheimer's.

Purely clinical evidence of improvement may be absent or modest. What's more, the effects of treatment may only slow the progression of the illness. Recent advances in PET (positron emission tomography) imaging, however, may help to shed some light on Alzheimer's, by offering hope of an earlier, more accurate diagnosis, as well as a way to monitor the progression of the illness and the benefits of treatment.

On September 15, 2004 the Centers for Medicare and Medicaid Services (CMS) announced its intention to expand coverage of PET scans to a limited group of Medicare beneficiaries. (See sidebar for specific indications.) Some private insurers also cover PET for Alzheimer's on a case-by-case basis.

IMAGING ALZHEIMER'S WITH PET

Traditionally, physicians have relied upon thorough medical and physical examinations, as well as interviews with family members and friends, to detect the presence of Alzheimer's. Unfortunately, reaching an early, accurate diagnosis—and selecting the corresponding treatment—can be hampered by the similarity of Alzheimer's symptoms to those of other dementia disorders. Previously, the only way to confirm an Alzheimer's diagnosis was through a brain biopsy or an autopsy of the brain.

PET imaging offers physicians the opportunity to view Alzheimer's disease directly by revealing telltale patterns in the brain. Unlike CT and MRI scans, which show the physical structures of the body, PET scans reveal the body's metabolic or chemical activity. For Alzheimer's disease, the ability to view characteristic changes in metabolic activity is critical to imaging the disease, since these changes are too microscopic to appear on a structural level.

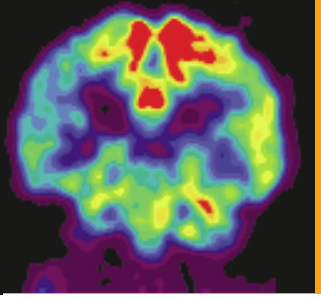
Before undergoing a PET scan, patients receive an injection of a *tracer*, an imaging agent that requires a very tiny or trace dose and therefore has no clinical side effects. For suspected Alzheimer's, individuals receive a specific tracer known as FDG, which measures the uptake of glucose. The cell death associated with Alzheimer's disease results in decreased glucose uptake in select regions of the brain, creating a unique signature on a PET scan.

"PET for Alzheimer's has three major purposes," says **Ronald L. Van Heertum, MD,** *Professor of Radiology*, Columbia University College of Physicians & Surgeons and *Director, Columbia Kreitchman PET Center*. "First, it is a noninvasive tool to help establish an early diagnosis. Second, it is useful in determining differential diagnoses—identifying Alzheimer's versus other dementia disorders. Finally, in the future we may use it to evaluate response to therapy—seeing whether a patient is benefiting from a particular medication or treatment."

THE DIAGNOSTIC ROLE OF PET

"Alzheimer's can be difficult to diagnose in its initial stages, when individuals have mild cognitive impairments and some memory problems," says **Davangere P. Devanand, MD,** *Professor of Clinical Psychiatry and Neurology,* Columbia University College of Physicians & Surgeons. "When added to other clinical diagnostic techniques, and when read and interpreted by an expert radiologist, PET may be able to help us achieve an earlier diagnosis."

According to **Yaakov Stern, PhD,** *Professor of Clinical Neuropsychology* and *Director of the Cognitive Neuroscience*



Far left: **PET scan of a healthy brain.**
Left: **PET scan of a brain with Alzheimer's disease.**

Columbia Kreitchman PET Center
212.923.1555 • info@columbiapet.org

Division, Gertrude H. Sergievsky Center and the Taub Institute for Research on Alzheimer's Disease and the Aging Brain, Columbia University College of Physicians & Surgeons, "PET can really have a beneficial role when the differential diagnosis is not clear. For example, when we're not sure if a patient has fronto-temporal dementia versus Alzheimer's. If the symptoms are similar and the history is not quite clear, then PET may be able to help point us in the right direction."

While researchers have yet to find a cure for Alzheimer's, there are medications available—such as cholinesterase inhibitors and memantine—that may help to improve or stabilize symptoms for some patients. "We are trying to push the envelope back on making a diagnosis earlier and earlier, when we have a greater likelihood of a treatment response," says Dr. Van Heertum. "Also, if we can identify the disease earlier, hopefully we can cut down on the number of tests and the associated anxiety and stress for patients and their families. We'd like to be able to establish a diagnosis at a time when patients are still capable of making decisions and can take an active role in planning their own future."

PET AND ALZHEIMER'S RESEARCH

Further advances in PET for Alzheimer's may be on the horizon. Dr. Devanand and **John Mann, MD,** *Professor of Psychiatry and Radiology* at Columbia University College of Physicians & Surgeons, are currently in the beginning stages of research into a new PET tracer, known as the Pittsburgh compound B, that attaches directly to amyloid deposits in the brain. By directly visualizing increased levels of amyloid, this tracer may enhance the ability of PET scans to not only indicate the presence of Alzheimer's disease, but also to perhaps reveal the severity or progression of the disease.

Dr. Stern is spearheading research into a novel analytic approach that looks for covariance patterns—relationships between areas of the brain. His team recently compared the PET scans of patients with early and mid-stage Alzheimer's with those of healthy elderly individuals. "We found spatial patterns in the brain that were expressed in all the participants, but to a greater degree in Alzheimer's patients," Dr. Stern reports. "Using these patterns, we then looked at PET scans of groups with other mild cognitive impairments and were able to differentiate their conditions from Alzheimer's. It's a promising way to analyze scans."

In addition, PET may eventually help to advance the development of new Alzheimer's medications by allowing researchers and physicians to view how the brain responds to treatments. "Since PET gives us the ability to measure very small concentrations of chemicals, it is uniquely suitable for the study of neurotransmitters, enzymes, receptors, and other proteins in the brain," says Dr. Mann. "By examining these individual components we can understand the impact of diseases such as Alzheimer's on the brain, as well as the effect of potential new treatments."

Finally, by improving the ability of researchers to evaluate medications, PET may be able to help reduce the cost associated with developing new therapies, while helping to determine optimal doses. "Currently we use animal models to initially test new medications and have to guesstimate on efficacy and dosages levels once we move to clinical trials with people," Dr. Mann continues. "With PET, we can use a tracer to specifically label our targets, so we will know precisely how much of a given medication is required for the drug to work. And we will be able to do this at a fraction of the cost, in a fraction of the time, and with a fraction of the number of clinical trial patients."

For more information on PET for Alzheimer's disease, please contact the Columbia Kreitchman PET Center at info@columbiapet.org or 212.923.1555.

PET FOR ALZHEIMER'S: MEDICARE COVERAGE

The recently approved CMS criteria for coverage of FDG-PET for Alzheimer's includes the following:

- Six months of documented cognitive decline from unclear origin
- Comprehensive clinical evaluation by a physician experienced in the diagnosis and assessment of dementia
- Scan performed in an accredited PET facility and the reading of the scan done by an expert with substantial experience in interpreting such scans in the presence of dementia
- A SPECT scan or previous FDG-PET scan has not been obtained for the same indication

The CMS also approved FDG-PET for Alzheimer's for participants in select clinical trials. For more information on the indication criteria, please visit: http://www.cms.hhs.gov and search for 'PET for Alzheimer's decision memo'.

Medical Error Reporting System

Improving patient safety

Annetine Gelijns, PhD, Co-Director of InCHOIR

Alan Moskowitz, MD, Co-Director of InCHOIR

To err is human. Unfortunately this holds true even among the world's most qualified physicians, nurses, and other healthcare professionals. According to a report issued in 1999 by the Institute for Medicine, medical errors account for 44,000-98,000 deaths per year in U.S. hospitals, which place them among the top 10 causes of preventable deaths in the nation.

At NewYork-Presbyterian Hospital/Columbia, the International Center for Health Outcomes and Innovation Research (InCHOIR) is unwilling to simply accept such statistics. With a grant from the Agency for Healthcare Research and Quality (AHRQ), and in collaboration with **Harold Kaplan, MD,** from Pathology and **Mary Cooper, MD,** from Clinical Practice Evaluation, InCHOIR has developed a Medical Errors Reporting System designed to improve patient safety by identifying systemic vulnerabilities, communications lapses, and other potential threats to patient safety.

Using this innovative, web-based reporting system, physicians, nurses, and other healthcare professionals voluntarily report events including both errors and "near miss events" that could have, but did not, harm a patient in the hospital. These events are then reviewed and, if serious, analyzed to determine their root causes. The steps leading up to the events are diagrammed in a tree so that the systemic conditions can be identified. When enough cases yield sufficient information, corrections to these issues can be developed.

The medical error reporting system is already implemented throughout numerous sections of NewYork-Presbyterian Hospital, including the Children's Hospital of NY, the Allen Pavilion, the Weill Cornell and Columbia campuses, and affiliated hospitals including the University of Chicago Healthcare System. At Columbia, the Department of Surgery served as the pilot location. The system is addressing incidents such as retained instruments (medical equipment or supplies left in a patient's body), which may be affected by factors such as length of surgery, emergency status, and obesity.

According to **Annetine Gelijns, PhD,** *Co-Director of InCHOIR,* the reporting system has a number of intelligent, unique features. "The system has fuzzy matching logic built in so that when an event is analyzed, it searches for duplicates. It also does analysis and finds corrective actions or recommendations for that particular event."

Many physicians and nurses are eager to use the system, says Dr. Gelijns. "This system is not designed to blame individuals, but rather to identify underlying problems in the healthcare system." Nevertheless, success of the medical errors reporting system will require some cultural changes within the hospitals. Unlike the mandatory state reporting of falls, wrong-side surgery, or other high-profile or high-frequency events, this program encourages voluntary recording so that the hospital can actively prevent mistakes or mishaps.

To encourage active participation, InCHOIR has surveyed NewYork-Presbyterian Hospital physicians, nurses, and other practitioners about their perceptions of the institution's willingness to learn from their feedback, and their comfort with reporting. This survey will be repeated annually in order to continually improve the efficacy of the program. If the program is successful, says **Alan J. Moskowitz, MD,** *Co-Director of InCHOIR,* "we should see an increase in the frequency of medical event reporting, along with a decrease in the potential severity of the events reported."

To learn more about the research conducted at InCHOIR, please call 212.305.9100 or visit http://www.inchoir.org.

InCHOIR is uniquely devoted to clinical evaluative research and scientific policy analysis. Through interdisciplinary research, InCHOIR studies the health and economic impacts of healthcare interventions, including new and emerging technologies such as mechanical circulatory assist devices. The division's goals include improving the safety, efficacy, and cost of patient care, as well as advancing innovations in medicine.

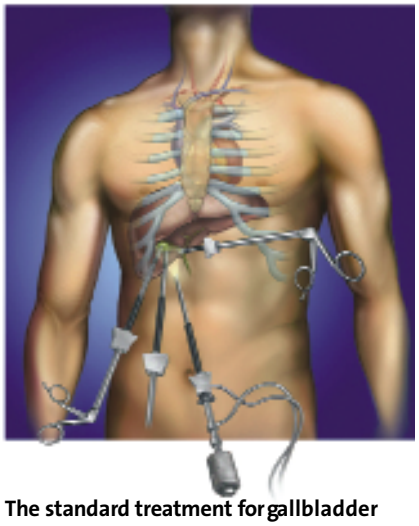
Laparoscopic Surgery

Careful choices, faster recovery

In today's competitive healthcare environment, patients and their families are learning that they can expect more than simply resolving a medical problem through surgery. They are shopping around—seeking the best doctors, the best hospitals, and in this age of rapidly expanding technological advances, the best surgical methods. In many cases, patients may actively choose those treatments that are safer, simpler, or less invasive than others.

Given the excellent minimally invasive techniques now available, leading surgeons encourage their patients to make careful choices. "When faced with a recommendation for surgery, patients should aggressively ask their surgeon whether it can be performed laparoscopically," advises **Dennis L. Fowler, MD.** "If the surgeon says no, patients should seek a second opinion from another surgeon." Dr. Fowler is *Director of the Minimal Access Surgery Program* at NewYork-Presbyterian Hospital, *U.S. Surgical Professor of Clinical Surgery* at Columbia College of Physicians & Surgeons, and *Professor of Clinical Surgery* at Weill Cornell Medical Center.

Laparoscopic surgery is a minimally invasive technique in which the surgeon makes several very small incisions (half inch or smaller). Through one incision, a thin telescope with a camera is threaded to the surgical site, where it transmits images to a television monitor in the operating room. Meanwhile, the tiny surgical instruments used to accomplish the surgery are guided through one or more other incisions. Compared to traditional operations, which require larger incisions, laparoscopic operations result in shorter recovery time, less pain, reduced blood loss, reduced risk of infection, and other advantages. Patients generally leave the hospital and resume normal activity in about half the time compared to patients who undergo open surgery.



The standard treatment for gallbladder disease is laparoscopic cholecystectomy (removal of the gallbladder). Most patients spend one night in the hospital and resume normal activities within one week.

Dr. Fowler, who has been performing minimally invasive surgery since 1990, explains that a majority of abdominal operations can now be performed with minimal access techniques. "Surgery for colon cancer, ventral hernia repair, esophagectomy, splenectomy, and anti-reflux procedures are now done routinely with minimal access." While some hospitals must perform open bariatric operations because they do not have laparoscopic surgeons on staff, bariatric surgery (surgery for weight loss) is also commonly done laparoscopically today. "Every patient considering bariatric surgery should ask the surgeon if he or she can do it laparoscopically," says Dr. Fowler.

While physicians and patients have prized the advantages associated with shorter recovery since the broad application of laparoscopic techniques began about 15 years ago, recent investigations have documented some additional, critical results. A May 2004 study in the *New England Journal of Medicine* proved that, in addition to shorter recovery time, minimally invasive procedures resulted in equally successful cure rates for colon cancer as compared to open procedures. "This provides even more evidence that surgery for colon cancer should be done laparoscopically," says Dr. Fowler. Since laparoscopic colon surgery is a relatively new specialty, many of the surgeons who perform the procedure currently practice at NewYork-Presbyterian Hospital/Columbia.

Looking to the future, Dr. Fowler is excited about the next revolution in technology. "Laparoscopic surgery will become even less invasive, more computer-controlled, and safer," he explains. In conjunction with the Department of Computer Science at Columbia University, his team has developed a prototype robotic camera and is now working to refine it so that it is insertable and computer controlled. When that happens, it will be even more precise than current robotic technology, according to Dr. Fowler. "Results will be more reproducible, and therefore such surgeries should be even safer than they already are."

To learn more about minimal access surgical procedures, please contact the Minimal Access Surgery Center at 212.305.0577 or visit online at www.nyp.org/masc.

Ribbon-cutting ceremony marks the opening of two vascular surgical facilities in June 2004. The new state-of-the-art operating rooms are dedicated to the minimally invasive treatment of atherosclerosis and other conditions of the vascular system. *From left:* **Bruce Gantt, Administrator for Transplantation Service Line; Dr. K. Craig Kent, Chief of Vascular Surgery; Dr. James F. McKinsey, Site Chief, Vascular Surgery; Dr. Herbert Pardes, President and CEO of NewYork-Presbyterian Hospital.**

Congenital Heart Surgery continued from page 2

repair. In this dramatic condition, infants are born with an undeveloped left side of the heart that cannot support circulation. A complex, three-stage operation is required to establish circulation to that side, and the first stage, called the Norwood procedure, commonly results in a 20-30% death rate nationwide. "At NewYork-Presbyterian Hospital we do a substantial number of Norwood procedures," says Dr. Chen. "Our mortality rate is 10-15%, and we are currently studying the way we do the procedure to achieve further improvements."

According to Dr. Chen, involvement in clinical trials is another key indicator of a hospital's excellence. If a center is at the forefront of research, it has the necessary volume of patients to support clinical trials, as well as the commitment to improving patient outcomes. In all, he says, "Parents should look for a great place, not just one great surgeon."

For more information about pediatric cardiac surgery, call the NewYork-Presbyterian Heart Institute at 800.5-HEART-2 or visit www.columbiaheart.com.

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