QUALITY IN ACTION

“WE CONSIDER NOT ONLY OUR DUTY TO THE PATIENT OF TODAY, BUT NO LESS OUR DUTY TO THE PATIENT OF TOMORROW.”
Quality Measures Web Site – The Cleveland Clinic’s quality efforts are on national display on our Quality Measures Web site. Designed to educate and inform patient-consumers on how to choose a quality health care provider, the Web site presents objective information on standards and outcomes in specific medical specialties. Since its launch, the frequently updated site has been visited by tens of thousands of consumers from across the nation.

Quality Indicator Guides – The Cleveland Clinic publishes a comprehensive series of patient-friendly guides to help patients choose a doctor or hospital for their care. These educational guides include specific Clinic-related data for many diseases and conditions, and the six criteria recommended by the Clinic for choosing a health care provider: credentials; participation in research and education; experience; patient satisfaction; range of services; and outcomes. These guides can be found on the Clinic’s Quality Measures Web site.

Leapfrog Initiative – The Cleveland Clinic is participating in a national patient safety initiative designed to focus attention on three practices proven to reduce preventable medical errors: evidence-based hospital referral, intensive care unit physician staffing and computer physician order entry. This voluntary safety initiative is spearheaded by The Leapfrog Group, a national organization founded by The Business Roundtable, which is made up of Fortune 500 CEOs, The Robert Wood Johnson Foundation and others. The Leapfrog Group will use its Hospital Patient Safety Survey to identify facilities that provide the highest standards of care and most innovative treatments to ensure patient safety and improve outcomes. Such facilities will be designated by The Leapfrog Group as preferred caregivers.
Quality in Action: The Year in Review

The Cleveland Clinic has emerged as one of the nation’s leading exponents of quality in health care. It has moved aggressively to define quality, establish the best practices and put these practices into effect for better, safer, more cost-effective patient care. It is sharing outcomes information and boosting public knowledge of health and medicine through the media, the Internet and community forums. It is building essential strength in research and education, and collaborating with complementary institutions to advance knowledge and improve care. Finally, through a program called World Class Service, it has called upon the energy and imagination of the largest and most highly skilled personnel base in Northeast Ohio to bring forth new ideas and establish an institutional culture that is second to none in service, patient satisfaction and operational efficiency.

In 2003, The Cleveland Clinic consolidated its efforts to take ownership of quality, to quantify it, define it and, ultimately, epitomize it in every activity, for the benefit of patients, the health of the community and the advancement of science and medicine around the world. These efforts, a selection of which are highlighted in this book, are summarized by the only word that can contain their various intentions, methodologies and effects. That word is quality.
Dear Friends:

In 2004, The Cleveland Clinic took significant steps toward realizing projects that will have a major impact on our institution in coming years. The new Cleveland Clinic Heart Center and Cleveland Clinic Lerner College of Medicine are two of the most important undertakings in our history. Their influence will extend well beyond our time and place, and affect the lives and health of patients and families far into the future.

The new Cleveland Clinic Heart Center is the most critical project before us. An expertly designed complex of a cardiac hospital, ambulatory services, advanced surgical and diagnostic capabilities, laboratories, physician support facilities, and patient and visitor amenities, the new Heart Center will be the right building, at the right place, at the right time to meet the growing challenges of heart disease in America.

The need for this facility is urgent. Heart disease is already America’s deadliest and most disabling malady. The next two decades will see an overwhelming rise in new cases, as the largest age cohort in history enters the most at-risk demographic. It is a crisis on our doorstep. The new Heart Center will expand our ability to care for heart patients and their families, grow our opportunities to test new therapies and find new cures, and provide the space, tools and amenities we need to fulfill our role as America’s leading heart center.

The campaign for the new Heart Center is now under way. There is no more pressing item on our institutional agenda. The success of this campaign and the completion of this new facility are crucial to more than the future of heart care. As heart services are consolidated in the new building, an enormous amount of space will become available in existing facilities, allowing us to expand other vital medical services, including our growing Neurosciences Center and The Children’s Hospital.

The first phases have begun. The cardiac rooftop project is complete for the interface between the old and new buildings. A new office-garage building is under construction on Euclid Avenue, along with a pedestrian tunnel linking it to the main campus. The next phase, abatement of the existing garage, will begin in 2004, followed by construction of the technology and outpatient areas, and the cardiac hospital. The opening is scheduled for early 2008.

The effect of the new Heart Center will be felt across Northeast Ohio and throughout the state. In the most direct sense, it will give the people of this region access to the best heart care in the world in the most advanced facility of its kind. Economically, our expanded services will create new jobs, enrich local businesses and boost local tax revenues. Surrounding communities and institutions will benefit from the halo effect.

As a landmark of world medicine, the Heart Center will strengthen the region’s already substantial biomedical technology industry. It will spin off new products, create new businesses and help make Northeast Ohio a magnet for new and relocating biotechnology enterprises.

Our second leading project is the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University (CCLCM). Like the new Heart Center, CCLCM represents a giant step into the future. Scheduled to matriculate its first class of 32 students in July 2004, CCLCM offers a unique curriculum devised by more than 100 Cleveland Clinic staff physicians and scientists working long and extra hours. CCLCM has been created to meet the pressing national need for physicians with the skill and desire to carry out research and take today’s scientific breakthroughs to the level of applied patient care. The first class of students, selected from more than 600 applicants, is superbly qualified, highly motivated and eager to learn. Their presence will add energy to our institution and our community. We look forward to welcoming them to The Cleveland Clinic.

Both the Heart Center and CCLCM are knowledge-based enterprises that partake of the enormous intellectual capital that is the real wealth of The Cleveland Clinic. Over the past year, knowledge, creativity and a passion for innovation have been evident in all areas of our institution.

2003 was a year of uncommon achievement at The Cleveland Clinic. The future beats the past every time. The new Heart Center and CCLCM are the foundation of tomorrow’s Cleveland Clinic, a republic of ideas and the best example of physician-managed health care.

Sincerely,

Floyd D. Loop, M.D.
Chairman and Chief Executive Officer
Executive Committee of the Board of Trustees 2003–2004

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*Emeritus Trustee
NEWS FROM AMERICA’S #1 HEART CENTER

Combining the services of the departments of Cardiovascular Medicine, Thoracic and Cardiovascular Surgery, and Cardiovascular Anesthesiology, the Cleveland Clinic Heart Center is the most accomplished and honored cardiac care center in the world. In 2003, Heart Center physicians and researchers, working with Heart Center nurses, technicians and allied health professionals, continued to care for an enormous volume of patients at the highest level of professional expertise, advancing care through the development and refinement of new techniques and performing groundbreaking studies into the causes of heart disease and the efficacy of new treatments.

FIRST GENE LINK TO HEART ATTACK AND CORONARY ARTERY DISEASE

The Cleveland Clinic Heart Center once again made medical history as researchers announced the first confirmation of a specific gene identified as a cause of human coronary artery disease. Eric Topol, M.D., chairman of the Department of Cardiovascular Medicine, and Qing Wang, Ph.D., director of the Center for Cardiovascular Genetics, led the groundbreaking research, which could lead to better screening and lifesaving treatment for patients who have a family history of heart disease.

It all began with a single patient, who came to The Cleveland Clinic for treatment of a serious heart condition. It was learned that this patient had 10 siblings and that nine of them had had heart attacks – mostly in their early 60s. This was a strong signal that the problem in this family was not only diet and lifestyle, but genetic as well.

Dr. Topol and a team of 50 researchers sorted through billions of bits of genetic information from 26 members of the patient’s immediate and extended family.

“What we discovered is called a ‘deletion mutation,’” says Dr. Topol. This means that there are elements missing from the gene that prevent it from doing its job. “This deletion affects coronary artery walls, making them less able to protect themselves from plaque buildup and heart disease. It was a protein no one had guessed was associated with coronary artery disease.”

HEART SURGERY: EXPERIENCE COUNTS

Cleveland Clinic Heart Center surgeons include some of the most experienced in the world in all types of heart surgery. And, as a new study demonstrates, experience matters. A recent article in the New England Journal of Medicine stated: “For most procedures, the mortality rate was higher among patients of low-volume surgeons than among those of high-volume surgeons.” In 2003, Heart Center surgeons performed 8,121 surgical procedures. The Heart Center’s mortality rates that year for both primary bypass surgery and valve surgery were well below the national average reported by the Society of Thoracic Surgeons, with mortality that was half or less than half of the society’s benchmark for patients 65 or older. The Heart Center’s 2,254 valve procedures in 2003 continue to give it America’s largest experience with valve procedures. Overall mortality for these procedures was 2.9 percent, despite increasing complexity and number of reoperations. In the extremely complex area of great vessel surgery, where experience is particularly important, the Heart Center performed 475 surgeries.
TWO STARTLING STUDIES

1. SYNTHETIC HDL REVERSES ATHEROSCLEROSIS

Cleveland Clinic Heart Center-led research provided strong evidence that only five weekly infusions of a synthetic form of the good cholesterol, HDL, can remove significant amounts of plaque from the coronary arteries. “This is an extraordinary and unprecedented finding,” says Cleveland Clinic Heart Center cardiologist Steven Nissen, M.D., who directed the 10-center nationwide study. “This is the first convincing demonstration that targeting HDL, good cholesterol, can benefit patients with heart disease, the leading cause of death in the United States.” It was discovered that a certain genetic protein, passed down from generation to generation in a small Italian town, protects many of the inhabitants from the ill effects of low HDL. Recently, researchers isolated and synthesized this genetic protein and made it into a biopharmaceutical product called Apo A1 Milano – a kind of synthetic HDL that Dr. Nissen has described as “liquid Drano” for clogged arteries. Dr. Nissen cautions that “much more testing needs to be performed to determine whether this unique form of HDL can be used routinely to treat patients with atherosclerosis.”

2. STATIN STOPS ATHEROSCLEROSIS COLD

In addition to the results of his Apo A1 Milano trial, Dr. Nissen also released the results of an unrelated study showing that atherosclerosis (plaque buildup in the coronary arteries) can be halted in its tracks by using the highest dose of Lipitor – a highly effective statin. The study is the first to demonstrate that it is possible to halt the progress of coronary artery disease using a statin drug. It was also the first to compare the effectiveness of two competing statin drugs. Comparing the statin brand-named Lipitor to another popular brand at both of their maximum allowable doses, the study showed that Lipitor was not only more effective at lowering cholesterol, but that it also reduced the growth of plaque in the coronary arteries to essentially zero. The study, the results of which were released at the annual meeting of the American Heart Association, involved 654 people with atherosclerosis and high levels of blood cholesterol. Dr. Nissen believes that the results suggest that doctors may want to consider prescribing Lipitor in higher doses to patients who have a high risk of heart attack.
PHYSICAL EXAM AS MORTALITY PREDICTOR
Physical examinations can provide critical information unavailable by other means to help patients experiencing urgent cardiac care issues, such as heart attack or unstable chest pain, according to a study by Heart Center researchers published in the Journal of the American Medical Association. Data gleaned from such exams – including Killip classification – are important in predicting all-cause mortality for acute coronary syndrome (ACS) patients at intervals of 30 days and six months, Cleveland Clinic researchers said. Killip classification grades the severity of acute and chronic heart failure by assigning the failure a level of I to IV, with I indicating no evidence of heart failure and IV indicating cardiogenic shock in which the heart is unable to supply sufficient blood to the body.

VASCULAR SURGERY GRANT
The National Institutes of Health awarded the Heart Center a $5 million grant to fund clinical studies of atherosclerotic disease of the lower extremity blood vessels. The five-year grant was awarded by the National Heart, Lung and Blood Institute. The funding will be used to assess whether cholesterol-lowering agents can lead to plaque regression, a partial reversal of the atherosclerotic process. Principal investigator Kenneth Ouriel, M.D., chair of the Division of Surgery, will lead researchers from the departments of Cardiology, Vascular Surgery, Interventional Radiology and Biomedical Engineering in conducting the study. Researchers anticipate enrolling 275 patients with existing peripheral arterial disease. Ultrasound tests will be used to determine the amount of plaque buildup in each participant's arteries, as well as the components of that plaque, such as cholesterol, calcium or fibrous tissue.

FIRST IN U.S. TO USE NEW ATRIAL FLUTTER DEVICE
The Heart Center became the first in the nation to use a new cardiac ablation system to treat atrial flutter. The device uses radiofrequency energy to help block the errant electrical impulses that cause the heart to “flutter.” The new cardiac ablation system uses a larger tip electrode to deliver up to 100 watts of radiofrequency energy to the heart to create scar tissue. The scar tissue then blocks the electrical impulses that are causing the flutter. “We strive to bring patients the full spectrum of technologies and treatments needed to help us deliver world-class care,” says Andrea Natale, M.D., associate staff cardiologist and co-head of the Section of Pacing and Electrophysiology. “We are pleased to add this to the list of options for people experiencing heart rhythm issues.”

STEM CELLS SHOW PROMISE IN HEALING HEARTS
A study led by Marc Penn, M.D., Ph.D., Cardiovascular Medicine, published in The Lancet, shows that stem cells can help cardiac tissue to repair itself weeks after a heart attack. The study identified the first stem cell “homing factor” for cardiac muscle tissue, which allows stem cells to “home” to an area of tissue damage. The body’s normal reparative process is short-lived, lasting only a few days following a heart attack. Cleveland Clinic researchers identified stromal cell-derived factor-1 as the first stem cell homing factor for the heart. The organ naturally expresses the molecule following a heart attack, but the molecule is not present long enough to lead to significant cardiac tissue regeneration. While these new findings are based on biological models, the research holds promise in helping to battle one of man’s leading killers. “This study indicates
that the body will work to heal itself if it has the right tools available,” says Dr. Penn. “Our job is to use this information to determine how to recreate the signals that orchestrate tissue regeneration to maximize the effectiveness of stem cell technology and improve lives.”

**HEART TRANSPLANT MILESTONE**

The Cleveland Clinic Heart Transplant Program completed its 1,000th transplant in January 2003. Only two other hospitals across the nation have reached this landmark, according to the United Network for Organ Sharing. The recipient of the 1,000th heart was a 27-year-old man from Dayton, Ohio, who was suffering from congestive heart failure.

**SURGICAL INNOVATIONS**

- The left atrial appendage is a finger-like projection from the heart that can be a source of stroke-causing blood clots in some patients. Heart Center surgeons are now routinely closing the left atrial appendage in patients having cardiac surgery to decrease the risk of postoperative stroke.
- The Heart Center continues to pioneer new surgical approaches to eliminate atrial fibrillation, a rhythm disorder. In 2003, the Heart Center increased its use of newer technology, including radiofrequency ablation devices and a robotic device that uses a video camera and robotic arms to guide the surgeon to the operative site through small incisions.
- Heart Center surgeons are using an innovative treatment for aortic aneurysms – life-threatening, bulb-like swellings that occur in the large blood vessel that descends from the heart to lower trunk. In a single operation that involves both conventional and laparoscopic techniques, they are replacing the entire aorta with a mesh tube, from the aortic valve all the way down to the abdomen, where the vessel forks toward either leg. The surgery is done through simultaneous incisions in the chest and mid-abdomen.
- Endoscopic vein harvesting is done in almost 75 percent of cases where veins are required for coronary artery bypass grafts. Using specially designed instruments and video equipment, small incisions along the upper and lower leg replace the one long leg incision that had been the previous standard, decreasing patient discomfort and leg wound infection.

**ANTIOXIDANTS VS. HEART DISEASE**

Controverting a widely held belief, a Heart Center study of antioxidant vitamins demonstrated that these vitamins do not reduce the risk of cardiovascular disease. The research, published in *The Lancet*, demonstrated that patients given vitamin E showed no better mortality rates than a control group, and patients given beta-carotene (a source of vitamin A) experienced slight increases in mortality and cardiac death over the control group. Although no clinical trials have shown proof, vitamin E and beta-carotene used in combination or separately are believed to be associated with a delay in the progression of coronary artery disease and to protect against cardiovascular events. Cleveland Clinic researchers, led by Marc Penn, M.D., Ph.D., analyzed seven randomized trials of vitamin E treatment and eight of beta-carotene treatment to study the effects of the vitamins on long-term cardiovascular morbidity and mortality. “We now have the clinical evidence needed to actively discourage the use of vitamin supplements containing beta-carotene due to the significant excess in overall mortality and cardiac death,” says Dr. Penn. “Further, we discovered that vitamin E did not provide a significant benefit on cardiovascular health.”

**CONVENTIONAL RISK FACTORS IMPORTANT**

Eighty to 90 percent of patients with coronary heart disease (CHD) have at least one of four major risk factors: diabetes, high cholesterol, high blood pressure or cigarette smoking, according to a Heart Center study published in the *Journal of the American Medical Association*. Prior to this research, it was believed that many patients with CHD lacked major risk factors. Lifestyle can have a meaningful impact upon these “conventional” risk factors, and controlling them can dramatically reduce the risk of CHD, says study investigator and senior author Eric Topol, M.D. “Even when we are able to define the genes inducing coronary disease, this work proves that the basics of lifestyle – diet (weight) and exercise – are critical to address,” says Dr. Topol.
HOLLYWOOD FIGURE JOINS THE CLEVELAND CLINIC IN BATTLE AGAINST SMOKING

Cleveland native Joe Eszterhas, who wrote the hit movies “Flashdance,” “Basic Instinct” and “Jagged Edge,” has teamed up with The Cleveland Clinic to produce a memorable series of anti-smoking messages for TV. Three years ago, Mr. Eszterhas was diagnosed with throat cancer and was treated at the Clinic. Since then, he has made the battle against cigarettes his personal crusade. As part of that crusade, Mr. Eszterhas wrote and filmed several 30-second public service announcements directed by noted Hollywood director Tony Kaye. These announcements have aired in movie theaters and in such national outlets as Good Morning America, CNN American Morning, Access Hollywood and Canadian National Television.

The public service announcements are part of a larger Cleveland Clinic initiative called “Join Joe.” The “Join Joe” campaign is an effort to provide support for those seeking help quitting smoking through a non-commercial Web site (www.clevelandclinic.org/joinjoe) that will link people to a variety of free programs and information.

THE CLEVELAND CLINIC RECEIVES ITS LARGEST NIH GRANT

A $17 million grant has been received from the National Institutes of Health (NIH) to establish a general research center at The Cleveland Clinic. The five-year renewable grant is the largest amount ever given to The Cleveland Clinic by the NIH. Under Program Director Serpil Erzurum, M.D., the Cleveland Clinic General Clinical Research Center will expand the Clinic’s patient research capabilities significantly, providing centralized support for clinical and translational research and expanding clinical research training and career development programs. Research at the center will be conducted in the areas of cancer, pulmonary disease, multiple sclerosis, cardiovascular disease, liver disease, inflammatory bowel disease, pediatrics, arthritis, collagen vascular disease, women’s health, pain, septic shock, bioterrorism and biomedical engineering. “The General Clinical Research Center will serve as a catalyst for the growth of clinical research throughout The Cleveland Clinic,” says Richard Rudick, M.D., chairman of the Division of Clinical Research and director of the Mellen Center for Multiple Sclerosis Treatment Research at the Clinic. “The rapid growth of sponsored research and the strategic importance assigned to clinical and translational research at the Clinic make establishing the General Clinical Research Center essential.”

CLEVELAND CLINIC CENTER FOR NEUROLOGICAL RESTORATION IS AWARDED GRANT FOR BRAIN NEUROMODULATION CENTER

The neurosurgical treatment known as deep-brain stimulation (DBS) is showing remarkable results in treating a range of movement disorders, most notably Parkinson’s disease, essential tremor and dystonia. Research is under way investigating DBS’s effectiveness with other conditions, such as intractable depression, obsessive-compulsive disorder and brain injury. The state of Ohio has awarded $7.6 million to create a Brain Neuromodulation Center at the Cleveland Clinic Center for Neurological Restoration to foster advances in DBS technologies and therapies from conception to reality. The Cleveland Clinic is a national leader in the use and research of this technique. Joseph F. Hahn, M.D.; Ali R. Rezai, M.D.; and Jerrold L. Vitek, M.D., Ph.D., of The Cleveland Clinic, will provide leadership for the new center, which will be a collaborative project with Cleveland’s Case Western Reserve University and Toledo’s Medical College of Ohio. The center will be based at The Cleveland Clinic main campus. “More than 100 nervous system disorders afflict millions of people worldwide,” says Dr. Hahn, a noted neurosurgeon and chairman of CCF Innovations, the Clinic’s technology commercialization arm. “Deep-brain stimulation already has helped tens of thousands of those people to reclaim their lives. We believe this avenue of treatment can be refined and expanded to help millions more. The Brain Neuromodulation Center will allow Cleveland – and Ohio – to be at the forefront of this emerging field.”

DBS has been described as a “pacemaker for the brain.” The treatment involves implanting electrodes in the brain to deliver electrical impulses. These impulses provide patients with relief from the tremors, rigidity, slowness of movement and other symptoms associated with their neurological conditions. DBS is used most commonly to treat patients with Parkinson’s disease, essential tremor, dystonia or tremor caused by multiple sclerosis.

Dr. Rezai, a neurosurgeon, and Dr. Vitek, a neurologist, co-chair the Center for Neurological Restoration and are considered world leaders in deep-brain stimulation. The center’s team includes functional neurosurgeons, movement disorder neurologists and support staff. The Clinic currently performs the largest number of DBS procedures in the nation.
TREATING TINNITUS
Severe tinnitus, or ringing in the ear, can interfere with patients’ lives to a serious extent. A Tinnitus Management Clinic has been formed in the Head and Neck Institute to offer a variety of management approaches for this condition. Staffed by a team of otolaryngologists, audiologists and psychologists, the Clinic’s goal is to move patients from an intolerant to a tolerant state of tinnitus. The program includes a health workup, educational sessions and, when needed, follow-up appointments with audiologists and psychologists. Among a variety of psychoacoustic and self-reporting methods used to evaluate patients is a standardized, self-reporting test developed at The Cleveland Clinic. Known as the Tinnitus Handicap Inventory, it is used to obtain a baseline measurement against which treatment outcomes can be evaluated. Treatment options range from biofeedback to wearable devices, depending on the patient’s need.

NEW HEARING AID BYPASSES EAR
The Head and Neck Institute is now offering a surgically implantable system that conducts sound waves directly through bone for treatment of hearing loss. Used in the treatment of one-sided hearing loss, the system bypasses the middle ear and produces hearing by enhancing natural bone transmission as a pathway for sound to travel directly to the inner ear.

CORRECTING DISEQUILIBRIUM
A Section of Vestibular and Balance Disorders has been established in the Head and Neck Institute to provide laboratory diagnosis, medical neurotology and vestibular rehabilitation of patients with dizziness, disequilibrium and imbalance. The section has state-of-the-art, computer-based electrystagmography and rotational chair and posturography, with the world’s largest database of laboratory test results. As Northeast Ohio’s only comprehensive laboratory, the section offers regional referral laboratory services for physicians outside The Cleveland Clinic. Clinical and basic science research is ongoing, particularly in the areas of vestibular-evoked potentials, outcome of home-based vestibular rehabilitation and genetics of motion sickness.

The Cleveland Clinic Head and Neck Institute is Named
Ear, nose and throat care at The Cleveland Clinic has made giant strides over the past 10 years. The Cleveland Clinic’s otolaryngology services are recognized among the 10 best in America in U.S. News & World Report’s annual “America’s Best Hospitals” survey. To recognize the department’s growing national profile, The Cleveland Clinic’s otolaryngology services will now be carried out as the Cleveland Clinic Head and Neck Institute. Under the chairmanship of Marshall Strome, M.D., the Department of Otolaryngology has grown to 32 full-time staff physicians, caring for adult and pediatric patients with routine and complex ear, nose and throat disorders, making it one of America’s largest otolaryngology programs. During a year that saw patient visits and surgical procedures grow dramatically, staff members contributed nearly 100 scientific publications to peer-reviewed medical journals, were appointed to offices in national societies and journals, received numerous awards and grants, and served frequently as visiting professors.

“As the Head and Neck Institute, we are positioned for greater achievement and an even higher national profile in years to come,” says Dr. Strome.
Glickman Urological Institute Continues to Advance

Recognized among the top two programs in America in U.S. News & World Report’s annual “America’s Best Hospitals” survey, the Cleveland Clinic Glickman Urological Institute has the largest urology staff in the United States, with in-depth expertise in every urological subspecialty area. Over the past nine years, the Urological Institute has experienced the largest increase in new patient visits of any department in the Division of Surgery, performing more than 14,000 operations in 2003 alone. Its program in reconstructive kidney surgery is the largest in the world, and the institute is one of only three programs in the United States routinely performing laparoscopic radical prostatectomy for prostate cancer. The 136 kidney transplants performed in 2003 at the main campus are part of a pattern that has seen the number of transplants rising almost steadily from 89 in 1997. Affiliate programs in Youngstown, Akron and Charleston, West Virginia, bring the 2003 total up to 210. Research is integrated into the institute’s activities. In 2003, there were 146 peer-reviewed publications by staff, 78 ongoing prospective clinical research studies and 50 ongoing laboratory research projects, and the program in prostate cancer research won The Cleveland Clinic “Research Program of the Year” award.

Andrew Novick, M.D., chairman of the Glickman Urological Institute, performs an open partial nephrectomy for live video broadcast to attendees at the Institute-sponsored World Summit on Kidney Surgery.

STREEM CENTER FOR ENDOUROLOGY ESTABLISHED
Donations from friends and colleagues of Steven Streem, M.D., have helped establish the Steven B. Streem Center for Endourology within the Glickman Urological Institute. The center honors Dr. Streem for 20 years of distinguished service and outstanding contributions to the field of endourology and stone disease. The mission of the center, consonant with Dr. Streem’s vision, will be to foster continued excellence in the practice and science of this urologic subspecialty area.

DNA DAMAGE AND MALE FERTILITY
Researchers in the Center for Advanced Research in Human Reproduction, Infertility and Sexual Function have been studying the causes of male infertility and looking for new ways to assess sperm for assisted conception. A new study shows that standard measurements of sperm concentration, motility and morphology may be missing subtle defects that may lead to infertility. Sperm DNA damage may play a significant role in male infertility at this level, and the researchers suggest that testing for the DNA integrity of sperm before assisted conception may lead to a higher rate of satisfactory outcomes.

WORLD SUMMIT ON KIDNEY SURGERY
After the tremendous success of the Glickman Urological Institute’s Radical Prostatectomy Summit 2002, the institute held a World Summit on Kidney Surgery at The Cleveland Clinic in 2003, chaired by Andrew Novick, M.D, chairman of the Urological Institute. The entire summit was transmitted live to nine countries. A total of 1,829 registered urologists participated in this event. The summit included didactic lectures, live human surgery, videos, panel discussions and debates.
UNDERSTANDING WEST NILE VIRUS

Every summer, the media drumbeat grows louder and more urgent on the disease known as West Nile Virus. But enormous information gaps remain. This year, Cleveland Clinic researchers took the lead in filling those gaps, reporting important new information that made it possible to pinpoint the earliest symptoms and complications of the disease, and helping to ensure fast and appropriate treatment for patients everywhere.

West Nile Virus is transmitted by the bite of an infected mosquito and is currently found in 44 states, with 149 confirmed cases in Ohio alone in 2002. While many victims suffer only flu-like symptoms, a small percentage can develop serious neurological inflammation.

“Misdiagnosis of West Nile Virus is a concern,” says Lara Jeha, M.D., who led a study of West Nile patients at The Cleveland Clinic. The study results were published in the journal *Neurology*. “We want to help establish the best methods to identify the disease so that it can be treated most effectively.”

Dr. Jeha’s study revealed that the disease was characterized most often by rash, low back pain, limb pain and gastrointestinal complaints, as well as fever. Muscle weakness might develop over the course of three to eight days, with weakness in the breathing muscles calling for mechanical ventilation in some cases. Other symptoms might include confusion, agitation, lethargy, tremor, seizures and other abnormalities detectable only through laboratory test and neuroimaging. Serious complications might include breakdown of muscle tissue, salt-depleted blood and death.

“We now know West Nile can cause symptoms we didn’t think of before last season,” Dr. Jeha told a recent medical gathering, where she reported the results of her study. “We need to be vigilant.”

WEB SITES WIN AWARDS

Cleveland Clinic Web sites won major awards in the eHealthcare Leadership Awards 2003, held in Phoenix, Arizona. Awards went to:

- Department of Gastroenterology (www.clevelandclinic.org/gastro) – Silver for Best Site Design; Distinction for Best Healthcare Content.
- e-Cleveland Clinic (www.eclevelandclinic.org) – Gold for Best eBusiness Site.
- Heart Center (www.clevelandclinic.org/heartcenter) – Platinum for Best Healthcare Content.
- Neuroscience (www.clevelandclinic.org/neuroscience) – Distinction for Best Healthcare Content.

E-CLEVELAND CLINIC SCREENS FOR ADOPTERS

More and more Americans are adopting children from overseas – more than 19,000 children in any given year. Most of these children are younger than 5 and may not be accompanied by health reports or medical records. To provide prospective adoptive parents with a full picture of an adoptee’s health, e-Cleveland Clinic has launched a preadoption evaluation service for children adopted internationally or locally. A board-certified pediatrician specializing in adoptions carries out the evaluation, reviewing and analyzing data like medical history, laboratory results, radiology images, video information, birth history, delivery, hospitalization, growth parameters, developmental milestones, illnesses and treatment, and immunization history.

“e-Cleveland Clinic offers prospective adoptive parents a convenient and highly effective tool in preparing to welcome a child into their lives,” says C. Martin Harris, M.D., chief information officer and executive director of e-Cleveland Clinic. “When it comes to health and well-being, awareness of past illnesses and treatments can help dramatically in pursuing what’s best for the child.”

e-Cleveland Clinic provides reliable, secure second opinion services over the Internet to patients from around the world. Among the service’s features is MyChart®: Your Personal Health Connection™, which currently allows a pilot group of patients to view portions of their personal health record and related information, request and cancel appointments and request prescription renewals.
Growth and Outstanding Results at The Children’s Hospital

Michael A. Levine, M.D., joined The Children’s Hospital at The Cleveland Clinic as Physician-in-Chief and Chairman of Pediatrics in 2003. “I see The Children’s Hospital at The Cleveland Clinic as a vibrant academic health center where staff are committed not only to providing each child with the best medical care but also to seeking the best care for all patients,” says Dr. Levine, whose division served the Cleveland community with great distinction this year, and made significant achievements in patient care, research and education.

RESEARCH BREAKTHROUGH
Jose Olarte, M.D., Pediatric Critical Care, won the Ortho Biotech Award for excellence in critical care medicine, at the Congress of Critical Care Medicine, for the development of a novel mode of mechanical ventilation called dual-frequency ventilation. Dr. Olarte’s breakthrough may change the standard of care for children with head injuries and heart disease who require ventilatory support. Other members of the division pursued advanced research studies in inflammatory bowel disease, cardiac physiology, cancer biology and the genetic regulation of hormone action.

SUPERIOR CARE IN PEDIATRIC INTENSIVE CARE UNIT (PICU)
Patients in The Children’s Hospital PICU are four times more likely to survive a life-threatening illness than patients in the average hospital, according to an internally conducted comparative statistical study. The Children’s Hospital PICU continues to be the only unit of its kind in Cleveland to have board-certified pediatric intensivists in house to provide hands-on care to patients around the clock. In 2003, 921 children received 3,740 days of care in the unit.

CONGENITAL CARDIAC ANESTHESIA
A unique asset of The Children’s Hospital, the Section of Congenital Cardiac Anesthesia provided services during more than 500 surgical procedures and 200 catheterization procedures – 35 percent of which were for children younger than 1. A national leader in its field, the section coordinated the Pediatric Cardiac Anesthesia Seminar at the annual meeting of the Society of Cardiac Anesthesia this year, with members also presenting four abstracts. During the year, section staff also participated as visiting professors at national and international conferences.

EPILEPSY SERVICES EXPAND
The Pediatric Neurology and Pediatric Epilepsy sections welcomed new staff members in 2003, and services were expanded in the Pediatric Epilepsy Monitoring Unit. This has resulted in a record number of national and international pediatric referrals for epilepsy surgery. Current research projects include continued study of brain malformation, epilepsy and clinical outcomes after epilepsy surgery.

GENERAL PEDIATRICS EXTENDS CLINICAL SERVICES
In the Emergency Department, General Pediatrics is now providing seven-day-a-week, peak-hour pediatric coverage. As part of the department’s literacy program, readers and free books are available for children receiving emergency care.
The department also has developed an academic hospitalist service, the first of its kind in Cleveland. Moreover, during the year the department initiated a pre-operative consult service for all high-risk operative patients (in conjunction with Pediatric Anesthesia and Surgery) and an enuresis clinic in cooperation with Nephrology and Urology.

**NICU SEES GROWING ADMISSIONS**
The Neonatal Intensive Care Unit (NICU) takes care of the sickest and tiniest newborns. In 2003, clinical activity in the NICU grew by 50 percent over the previous year, with a 24 percent increase in patient days.

**PEDIATRIC NEPHROLOGY OPENS DIALYSIS CENTER**
The Power Pediatric Dialysis Unit, named after Judith M. Power, opened in March 2003 and is the only full-service pediatric dialysis center in Northeast Ohio to offer hemodialysis, peritoneal dialysis, recreational therapy and educational therapy services in conjunction with a transplant center.

**SPECIAL CAMP FOR SPECIAL KIDS**
“Around the World in Six Days” was the theme for the 2003 Fresh Air Camp, a specially designed camp for children with tracheostomy – and ventilator-dependence. The 16 campers enjoyed a world fair and carnival, a day of Olympics-style fun, tree-climbing and much more. The camp is a cooperative effort of volunteers from area hospitals including The Children’s Hospital and The Cleveland Clinic Children’s Hospital for Rehabilitation. Fewer than a dozen camps in the country and no other camp in Northeast Ohio can accommodate these medically complex children.

**RECOGNIZING COURAGE**
Staff at The Cleveland Clinic Children’s Hospital for Rehabilitation are honored to work every day with children who are challenged by medical problems. To recognize those children who have demonstrated great character in overcoming obstacles in life, the hospital established the Courage Award. Given quarterly, the award is open to any child in the community who has struggled with difficult medical issues. Winners in 2003 were R.J. Ceraolo, Anna Cunningham, Marquita Nelson and Ryan Pritchard.

**FOCUS ON AUTISM**
Cleveland Clinic Center for Autism executive director Vanessa K. Jensen, Psy.D., recently received the Distinguished Service Award, the most prestigious honor bestowed by the Ohio Psychological Association. The Center for Autism provides diagnostic and intervention services for children with autism, including a home-based intensive behavioral intervention program, a school and an early childhood education program. The school is certified by the state of Ohio and is the only one of its kind in the state.
Throughout 2003, one of the most innovative educational programs in the history of medicine consolidated its curriculum, interviewed applicants and took the final steps toward welcoming its first class of 32 students in 2004. Six hundred and one individuals from across the United States applied for the 32 slots in the new program, and more than 100 Cleveland Clinic faculty have been working to finalize the details of the curricular components and assessment process.

The Cleveland Clinic Lerner College of Medicine of Case Western Reserve University was established in 2002, under the leadership of Eric Topol, M.D., provost and chief academic officer. The program is an historic partnership between one of the nation’s top academic medical centers and a medical school renowned for its history of innovation in medical education and research. Its mission is to attract and educate a select group of highly qualified individuals who seek to become physician investigators and scientists committed to the advancement of biomedical research and practice.

To prepare for the students, the second-floor medical-education offices in the Lerner Research Institute building underwent extensive renovation to accommodate the educational and administrative needs of the program. The four classroom installations are an indication of the extent to which this program represents a giant step into the future of education. Each classroom is equipped with an interactive “electronic whiteboard,” wireless access and a conference table for six. Teaching methods will focus on active learning principles including problem-based learning, labs, problem sets, electronic (self-study) curriculum and seminars. The curriculum will be organ-system based and integrated with related clinical experience. Clinical experience and research will be integrated throughout the curriculum. Classes begin in July 2004.

The Digestive Disease Center became the first center in the world to use optical coherence tomography (OCT) to define indeterminate colitis and differentiate it from Crohn’s disease, with which it is often confused. The difference is critical for physicians in making the proper therapeutic choices. Bo Shen, M.D., Gastroenterology and Hepatology, led the study, which found that OCT’s cross-sectional images offer higher resolution than the alternative high-frequency endoscopic ultrasound and, thus, enable the assessment of deep layers of the colon wall.

The Cleveland Clinic Digestive Disease Center has one of the world’s largest registries of Barrett’s esophagus (BE) cases and is putting it to use for research. One of the most severe complications of chronic gastroesophageal reflux disease, BE is often a precursor of esophageal cancer. Digestive Disease Center researchers are using the BE registry to assess possible inheritance patterns for BE and to better risk-stratify patients using new biomarkers. They also are working on new treatments, including high-dose acid suppression to prevent BE-caused tissue changes and decrease the risk of cancer.

New approaches to patient care are being explored through the new Center for Integrative Medicine. The center is a response to growing evidence that genetic makeup, environmental factors, lifestyle, and behavioral, psychological, societal and spiritual factors interact to affect physiological pathways, health and medical outcomes. Relying on sound medical research, the center will act on the knowledge that many chronic diseases are caused by lifestyle, that anxiety and depression can affect outcomes and that there is healing power in a strong relationship between the patient and health care provider. The center’s approach will combine mainstream medical therapies and complementary or alternative therapies for which there is some high-quality scientific evidence of safety and effectiveness. Examples of integrative approaches include guided imagery, biofeedback, massage, nutritional counseling, exercise, meditation, Tai Chi, yoga, support groups, hypnosis, music therapy, art therapy and acupuncture. The center will perform outside-funded research, train medical students and fellows, offer educational programs, establish standards and collaborate with other centers and departments. Already a “Healing Hearts” program has been initiated to offer the benefits of guided imagery and other integrative approaches in the management of pain and anxiety and to facilitate postsurgical recovery in the Heart Center.
NEW WAY OF DIAGNOSING BRAIN TUMORS
Researchers in the Brain Tumor Institute discovered what may be a new approach to diagnosing brain tumors or extensive disruption of the blood-brain barrier (the system that protects the brain from foreign substances – both harmful and therapeutic). The test involves measuring serum levels of a protein called S100B. This protein leaks into cerebrospinal fluid in the event of brain injury. “This research is significant because it provides the basis for developing a blood test for the diagnosis of brain tumors,” says Andrew A. Kanner, M.D., a neurosurgeon and researcher in the Center of Translational Therapeutics and the Cerebral Vascular Laboratory in The Cleveland Clinic’s Brain Tumor Institute, and the lead researcher in the study. “Such a blood test could do for the diagnosis and follow-up of primary and metastatic brain tumors what the prostate-specific antigen (PSA) blood test has done for the detection of prostate cancer. It also could provide a more cost-effective alternative to using an MRI to follow patients with known brain tumors.”

STUDYING BONE MARROW FAILURE WILL HAVE WIDE APPLICATION
The NIH gave the Taussig Cancer Center $4.5 million over five years to establish a Bone Marrow Failure Clinical Research Center, under principal investigator Jaroslaw Maciejewski, M.D., Ph.D., Hematology/Medical Oncology. The Center will study rare hematologic conditions characterized by a failed stem cell function and deficient blood cell production. They include aplastic anemia, myelodysplastic syndrome and paroxysmal nocturnal hemoglobinuria. The results of the laboratory and clinical studies will provide important insights into the function of bone marrow that will have broad application to health in other areas. “Studying rare diseases provides fundamental clues to how our body works and how other diseases that are more frequent evolve,” Dr. Maciejewski told a local newspaper.

POWERFUL RESPONSE TO NEW MULTIPLE MYELOMA AGENT
Mohamad Hussein, M.D., Hematology/Medical Oncology, completed a study showing that thalidomide combined with a chemotherapy regimen (DVd) that was designed at The Cleveland Clinic produces response rates and quality of responses similar to, or greater than, bone marrow transplantation in multiple myeloma patients. Other agents, such as Revimid, in combination with DVd appear to be very promising. Dr. Hussein released the study results at a national symposium he chaired at the American Society of Hematology.

BALLOON CATHETER BRACHYTHERAPY TO PREVENT METASTASIS
The Brain Tumor Institute took part in a multicenter trial of a new radiation delivery device to prevent metastasis after brain tumor surgery. Called GliaSite, the device is a small radiation-filled balloon. After brain tumor surgery, the balloon is implanted into the tumor bed, where it delivers radiation to the adjacent tissues for three to seven days before being removed. The study showed that GliaSite is a safe and effective treatment for brain tumors. Future trials will assess the treatment’s effect on survival and quality of life.

1,000TH GAMMA KNIFE PATIENT
Doctors at the Gamma Knife Center within the Brain Tumor Institute treated their 1,000th patient with Gamma Knife, a non-surgical radiation delivery system used to treat a variety of brain tumors, blood vessel malformations and neurologic disorders. The Gamma Knife Center treated its first patient on Jan. 27, 1997, and was Ohio’s first such treatment center. The Cleveland Clinic remains one of five centers in the world certified by the Gamma Knife manufacturer to train physicians new to Gamma Knife radiosurgery.
UNCOVERING THE SECRETS OF CELL DIVISION
Cleveland Clinic researchers have definitively identified two proteins that are essential for cell division. This discovery could have significant implications for the development of highly targeted anti-tumor drugs. The proteins, Syntaxin 2 and Endobrevin, were identified by a team of scientists led by Thomas Weimbs, Ph.D., a researcher in the Cleveland Clinic Department of Cell Biology. Prior to this study, researchers knew that Syntaxin 2 and Endobrevin were involved in the fusion of cell membranes. Through their lab work, however, Dr. Weimbs and his colleagues determined that Syntaxin 2 and Endobrevin also play a key role in cytokinesis, or cell division. “This is very significant because cytokinesis is a fundamental process common to all organisms,” Dr. Weimbs says. “Understanding the role of Syntaxin 2 and Endobrevin in cytokinesis is especially important because cancer cells use the same cell-division mechanism to proliferate. Our hope is that identifying the involvement of these proteins in the final stages of cytokinesis will allow for the development of much more specific anti-tumor drugs.”

NEW MARKER FOR CARDIOVASCULAR DISEASE
Thanks to research carried out by Stanley Hazen, M.D., Ph.D., Cardiovascular Medicine, and researchers at the Boston University School of Medicine, there may soon be a new test for cardiovascular disease. Dr. Hazen and his colleagues discovered that measuring systemic levels of a substance called nitrotyrosine in patients is a powerful new marker for assessing risk for coronary artery disease. Nitrotyrosine is a protein modification generated by nitric oxide-derived oxidants. They further determined that testing for nitrotyrosine also is a good way of measuring the anti-inflammatory effects of statins – a popular cholesterol-lowering drug. “These results suggest that we can use blood levels of nitrotyrosine as a molecular fingerprint to identify a specific type of damage that occurs in vessels during development of atherosclerosis,” Dr. Hazen says. “Nitrotyrosine appears to be a powerful new diagnostic test for identifying individuals at risk for heart disease and for monitoring how they respond to commonly used therapies.”

NEW TEST PREDICTS CARDIAC RISK SIX MONTHS OUT
Cleveland Clinic researchers identified a new blood test to determine whether a person is in imminent danger of heart attack or death – especially those with symptoms not recognized by current laboratory methods. The test measures the blood level of myeloperoxidase (MPO) – an enzyme found in disease-fighting white blood cells. Previous Cleveland Clinic research found that an elevated MPO level can signal risk for heart disease. The new study showed that it can also identify people at increased risk for heart attack, in need of bypass surgery or angioplasty, or at increased risk for cardiac death within six months of presenting to the emergency room with chest pain. The study, led by Stanley Hazen, M.D., Ph.D., was published in the New England Journal of Medicine.
WOMEN IN MORE DANGER OF POST-SURGICAL RENAL FAILURE

A study led by Charuhas V. Thakar, M.D., Nephrology and Hypertension, discovered that women who undergo open-heart surgery are more likely than men to develop acute renal failure (ARF). The condition is strongly associated with an increased risk of mortality. The study appeared in the American Journal of Kidney Diseases and involved the largest absolute number of female patients ever reported in research examining the relationship of gender and race to ARF after open-heart surgery. In addition, the study involved one of the largest numbers of African-American patients ever studied for the same purpose. The influence of race on the risk of ARF was not definitive, according to the research. “This study confirms the link between ARF and post-operative mortality following open-heart surgery. Analyzing gender as an independent risk factor has allowed us to gain new insight in understanding ARF in heart surgery patients,” says Dr. Thakar. “In addition, identifying such variables may help us to provide better care for patients at higher risk for developing ARF following heart surgery.”

DIABETIC FOOT CARE PROGRAM ESTABLISHED

To ensure that people with diabetes receive the comprehensive care necessary to keep their feet healthy and functional, a new Diabetic Foot Care Program has been established at The Cleveland Clinic. The new multidisciplinary program brings together a wide range of health professionals to treat all foot diseases commonly suffered by diabetic patients. Specialties represented in the program include dermatology, endocrinology, infectious disease, orthopaedic surgery and podiatry, together with vascular medicine and surgery. “Many people with diabetes believe foot amputation is inevitable, but that’s just not true today,” says Peter Cavanagh, Ph.D., academic director of the Diabetic Foot Care Program. “With proper treatment and care, many foot problems can be prevented.” Patients with diabetes often suffer from nerve damage that causes loss of sensation. Because of this, the feet can be injured without patients being aware. Skin injury can occur and, if left unchecked, can result in foot ulcers or open sores on the feet that can be hard to treat, become infected or even require surgical procedures. Poor circulation, also common in diabetics, can impair healing or actually cause ulcers. The Cleveland Clinic Diabetic Foot Care Program seeks to help patients care for their feet and avoid these and other foot complications.

WORLD CLASS SERVICE MOVES AHEAD

In January 2003, The Cleveland Clinic formally launched the most comprehensive service initiative in the history of the organization. Called World Class Service, it involves every member of The Cleveland Clinic family in a program to transform the institutional culture and to create a reputation for service and patient satisfaction equal to its achievements in medicine. Since the launch of World Class Service, more than 8,000 Cleveland Clinic personnel have attended special briefing sessions and leadership seminars. Communication has increased among leadership, personnel, patients and families as part of an ongoing discussion of service and operational issues.

A World Class Ideas Program was rolled out, inviting personnel at all levels to submit innovative ideas for improving patient service and employee satisfaction. More than 10,500 ideas were submitted in 2003 and 1,700 of these ideas have been implemented. The high participation rate demonstrates the level of enthusiasm this initiative has generated and the strong desire of Cleveland Clinic personnel to make service and operational efficiency a permanent part of the institutional culture.

One of the basic activities of World Class Service is the assembly of multidisciplinary teams to meet, set goals and establish procedures for specific areas or activities. They address everything from cancer and cardiovascular continuum of care to employee satisfaction and logistics. These teams have been meeting regularly and generating outstanding results.

World Class Service places a strong emphasis on quantifiable outcomes. Surveys have gone out to randomly selected patients who have been treated in the Emergency Department, hospital, Outpatient Surgery Center or the Post Acute Care Unit. The results are tallied by an outside company. Since the World Class Service initiative has been implemented, rates of patient satisfaction have moved sharply upward.

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Family Health and Surgery Centers

The Cleveland Clinic family health and surgery centers offer primary and many specialty and imaging services at conveniently located facilities throughout the Northeast Ohio area. Locations include Beachwood, Brunswick, Chagrin Falls, Creston, Elyria, Independence, Lakewood, Lorain, Solon, Strongsville, Westlake, Willoughby Hills and Wooster. Sports Health and Rehabilitation is offered at the Jewish Community Center in Beachwood.

FAMILY HEALTH CENTERS ELECTRONICALLY UNIFIED

The Cleveland Clinic’s 13 family health centers saw more patients than ever in 2003, including more first-time patients. This year, the centers achieved one of the most anticipated goals of 21st century medical operations: the electronic integration of all patient records among all the different locations and The Cleveland Clinic main campus. That means that physicians and other health professionals at family health centers will have confidential access to the same medical record for each patient, enhancing patient safety and making it easier to assure quality care across the board. The electronic medical record also enhances patient safety by checking for drug interactions with new prescriptions and by eliminating errors in interpretation that can occur with handwritten prescriptions and records.

GROUP CARE IS POPULAR

Clinic Care Plus began at the Cleveland Clinic family health centers in 2003, becoming popular with patients and physicians alike. Clinic Care Plus combines traditional one-on-one physician visits with a chance to participate in a group medical appointment led by a physician and behavioral health specialist. A group might include 10 to 15 patients with similar conditions and might combine individualized consultations, educational segments and group discussion. Individual examinations are privately performed. The sessions give patients 90 minutes of high-quality time with physicians, enabling a more relaxed discussion and more holistic consideration of the patient’s condition.
DIVISION OF EDUCATION

The Cleveland Clinic Division of Education managed a tremendous range of activities in 2003. Operating one of America’s largest graduate medical education programs, the division added newly accredited fellowships in Pediatric Cardiology and Endovascular Surgical Neuroradiology; expanded accredited fellowships in Anesthesiology, Cardiac Electrophysiology, Neurosurgery, Radiology and Urology; and introduced new advanced fellowships in Cytology, Gastrointestinal Pathology and Skull Based Surgery. In 2003, there were 713 residents and fellows in ACGME/ABMS programs at The Cleveland Clinic (up from 683 in 2002), and 112 advanced fellows. The division also supported 152 medical students from Case Western Reserve University, 20 from The Ohio State University and 82 from The Pennsylvania State University among the total 480 medical students rotating to our campus from schools around the country.

The Center for Continuing Medical Education boosted its offerings to 102 in 2003, welcoming 10,267 participants to its courses (almost 1,000 more than in 2002) – 8.5 percent of them international participants. Online course offerings garnered 59,450 participants, while continuing education presented through The Cleveland Clinic Journal of Medicine had 27,281. The center’s Web site, www.clevelandclinicmeded.com, had 60,000 unique visits per month in 2003, nearly doubling the traffic of the year before.

The Department of Patient Education and Health Information enjoyed robust attendance at its community Health Talks (3,308 attendees), gave its tobacco prevention program to 2,000 students at 10 schools, continued to produce and manage programs for the in-house TV network (CCTV), and maintained 11 Health Information Kiosks, the Health Information Resource Center and the Health Information Web site that has 103,400 visitors each month.

The Cleveland Clinic Journal of Medicine continues to see a dramatic rise in readership response among the 95,000 physicians to whom it is distributed nationwide.

The Center for Online Medical Education and Training (COMET) developed several programs to support computer-based training, including a HIPAA training course that was completed by more than 25,000 employees throughout the Cleveland Clinic Health System.

CLEVELAND CLINIC PARTNERS WITH LOCAL INSTITUTIONS TO CREATE STEM CELL CENTER

The Cleveland Clinic joined with Case Western Reserve University, University Hospitals of Cleveland, Athersys and other research partners to announce the creation of a new Center for Stem Cell and Regenerative Medicine in Cleveland.

The new center will work to improve patient care by developing and commercializing stem cell biology therapeutics to treat a broad range of diseases. The center also will involve BioEnterprise Corp., a not-for-profit business accelerator in Cleveland; The Ohio State University; and six other industry partners.

Stem cells are a type of cell produced in the adult body that divide to replace old and expired tissue cells, and to repair diseased or damaged parts of the body. Though they are relatively rare in any given adult body, these cells have tremendous regenerative powers that have inspired a whole generation of research into new therapies and cures for diseases ranging from cancer to broken bones.

Floyd D. Loop, M.D., chairman and CEO of The Cleveland Clinic, says the center will have the potential not only to repair patients’ lives, but to help transform the state’s economy as well. “Establishment of this center offers the potential to profoundly enhance Ohio’s biomedical and biotechnology industry,” Dr. Loop says. “The center will provide the state with a signature biotechnology competency that will be propelled by the immense clinical capabilities of the collaborating institutions.”

Ohio Governor Bob Taft visited The Cleveland Clinic to announce state funding for the collaborative effort. Contributions from the state will help to build a new six-story building on The Cleveland Clinic campus that will be devoted to stem cell and genetic research. Ground has been broken for the new building, which will be situated across East 96th Street, between the Lerner Research Institute and the Lab Medicine Building.

Eric Topol, M.D., chairman of the Department of Cardiovascular Medicine and provost of the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University, told a local newspaper that with its outstanding brain trust, “Cleveland could become the stem cell capital of the U.S.A.”
SPEAKING SPANISH
Weston has launched an unprecedented Spanish-only educational forum on health topics in the community. Drawing from its multicultural patient base of West and Southwest Broward County, Weston chose Hispanic Heritage Month to launch the 10-part series, which began with cardiology and ended with a discussion of colon cancer. Talks were given by the facility’s staff physicians, 35 percent of whom have Hispanic heritage, with approximately 20 to 30 attendees per session. With the success of this series, an even more extensive Spanish-only forum is planned for 2004.

CHEST PAIN CENTER IN NAPLES
With the goal of eliminating unnecessary hospitalizations, Naples has launched a new Chest Pain Center in its Emergency Department. A project of James V. Talano, M.D., director of Cardiology, the center evaluates patients who arrive with chest pain complaints. In many facilities, these patients would be routinely hospitalized – a frequently unnecessary and expensive step. Dr. Talano’s center determines each patient’s risk for cardiac event and assigns treatment according to risk. High-risk patients may get immediate critical care or interventional procedures. Patients at intermediate risk may be fast-tracked through the Emergency Department into comprehensive diagnostic testing. Low-risk patients are scheduled for stress-tests and follow-up visits. The center makes it possible for physicians to screen for the full range of diseases that may cause chest pain, including tumors or lung masses.

NEW SPINE INSTITUTE
Under the leadership of spinal surgery pioneer Robert S. Biscup, D.O., Weston and Naples have collaborated to create a new Spine Institute. Combining pain therapy, neurology, physiotherapy, neurosurgery, orthopaedic surgery, minimally invasive spine surgery, biofeedback and medical management therapies, the new institute treats the full range of back problems, and will offer second opinions. Chairman and director Dr. Biscup says that “we will be able to treat any and all problems, from muscle pain to conditions requiring surgery, in patients of all ages, regardless of whether or not they have had prior back surgery.”

FOCUSING ON HEREDITARY CANCER
Weston has opened a special Hereditary Cancer Prevention Clinic to identify and care for cancer patients with hereditary or familial cancer, including cancer of the colon, rectum, uterine and breast. Under the leadership of Surgery Division Chair Juan Nogueras, M.D., and with Elizabeth Stone, M.D., and Marcia Cruz-Correa, M.D., Ph.D., the center will provide personalized risk assessment, genetic counseling, prevention options and referrals. In research published in the journal Science (2003) and Gastroenterology (2004), Dr. Cruz-Correa identified a biological marker strongly associated with colon cancer – a discovery that gives hope that a new screening test for this condition may be on the horizon.

SLEEP DISORDERS
A multi-disciplinary Sleep Disorders Center has been established at Naples to treat sleep apnea, narcolepsy, insomnia, restless syndrome, night terrors and other conditions. The new center utilizes a sound-insulated sleep laboratory with advanced equipment to monitor a patient’s physical state during various stages of sleep and wakefulness.

New Programs Open at Cleveland Clinic Florida
Cleveland Clinic Florida’s integrated medical campuses in Weston and Naples continue to open new programs and strengthen their profiles in research and education. Staff physicians in Weston now number approximately 120, practicing more than 40 different specialties. Its 150-bed hospital (in partnership with Tenet South Florida) offers open heart surgery, kidney transplantation and a 24-hour emergency department among its many services. Naples’ full-service offerings also include a state-of-the-art surgery center, 70-bed hospital, and sophisticated diagnostic capabilities. Naples doubled its cardiology staff in 2003, and now has approximately 40 staff physicians in more than 16 medical specialties.
A NATIONAL FIRST FOR RADIOLOGY

Siemens International chose The Cleveland Clinic as the site for the first-ever 16-slice PET/CT unit in the United States. A collaborative effort by the Division of Radiology and Siemens has triggered new levels of research and broadened the use of PET imaging for clinical studies. The scanner is being used on patients opting to have full-body or partial-body CT screenings. Some researchers believe that the scanner will be of assistance to physicians in the diagnosis of early-stage heart disease without the need for invasive procedures. Richard D. White, M.D., head, Section of Cardiovascular Imaging, summarized the impact of a 16-slice scanner on cardiology for the journal Imaging Economics, saying that it "has been such a dramatic change that we now realize we were doing very little with CT in the past."

PROTEIN CAN BLOCK ABNORMAL BLOOD VESSEL GROWTH

Searching for new treatments for age-related macular degeneration, researchers at the Cleveland Clinic Cole Eye Institute discovered that a protein produced naturally by the body helps to prevent abnormal blood vessel growth. Future research will focus on translating the discovery into synthetic drugs and gene therapies designed to potentially treat diseases, such as age-related macular degeneration, diabetic retinopathy and cancer. TIMP-3, or tissue inhibitor of metalloproteinases-3, is one of a family of four proteins able to prevent the breakdown of specific cellular barriers. In addition, as Cleveland Clinic researchers learned, TIMP-3 also works to prevent abnormal blood vessel growth. Such growth, if unchecked, can lead to the "wet" form of age-related macular degeneration or feed the development of cancerous tumors. For abnormal blood vessel growth, or angiogenesis, to occur, a molecular lock must be opened," says Bela Anand-Apte, M.D., Ph.D., lead investigator of the new study. "Scientists have known for some time that the body seeks to prevent this from occurring by producing a number of proteins, one of which is TIMP-3. "What wasn't known, and what we have discovered, is how TIMP-3 actually works," Dr. Anand-Apte continues. "We have determined that TIMP-3 affects the lock itself by binding to it and blocking the keyhole. This insight will help us to better explore its potential in medical treatments."

CCF INNOVATIONS MAKES WAVES

CCF Innovations (CCFI) is The Cleveland Clinic’s technology commercialization arm, helping Cleveland Clinic innovators bring their products to market. In 2003, CCFI had record performance in almost every major category and many new initiatives of its own. Highlights include:

- Three new spin-off companies
- Four new equity partners
- $17 million in commercialization and technology development grants
- $1 million collaboration with Technion–Israel Institute of Technology
- 20 licenses
- $5.0 million in philanthropy

The Cleveland Clinic’s leadership in technology commercialization was furthered by the unprecedented 2003 Cleveland Clinic Medical Innovation Summit. This sold out event attracted one of the most distinguished groups of medical company CEOs, government leaders and venture capitalists ever assembled for a two-day symposium at the Cleveland Clinic InterContinental Hotel and MBNA Conference Center. More than 850 executives, investors and clinicians attended from nearly every state and 7 countries.
The Cleveland Clinic Foundation

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Jack Kahl & Associates, LLC

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Senior Executive Vice President
IMG

ROBERT KAY, M.D. *
President
Stark & Knoll, Co., L.P.A.

NORMA LERNER
Director
MBNA Corporation

ROBERT L. LINTZ
Plant Manager (Retired)
General Motors Corporation

WILLIAM E. MACDONALD **
President and Chief Executive Officer (Retired)
The Ohio Bell Telephone Company

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Vice Chairman
National City Corporation

PATRICK F. McCARTAN, ESQ.
Managing Partner (Retired)
Jones Day

The Cleveland Clinic Foundation

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Professor, Teachers College
Columbia University

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Monarcha Enterprises

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Client Executive Department
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**STATISTICAL HIGHLIGHTS THE CLEVELAND CLINIC FOUNDATION**

<table>
<thead>
<tr>
<th>Patient Care</th>
<th>2002 *</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Clinic Visits</td>
<td>2,491,806</td>
<td>2,647,233</td>
</tr>
<tr>
<td>New Clinic Patients</td>
<td>107,358</td>
<td>113,110</td>
</tr>
<tr>
<td>Emergency Visits</td>
<td>50,561</td>
<td>54,394</td>
</tr>
<tr>
<td>Total Admissions (excluding newborns)</td>
<td>51,166</td>
<td>52,204</td>
</tr>
<tr>
<td>Surgical Cases</td>
<td>65,560</td>
<td>68,723</td>
</tr>
</tbody>
</table>

**Education**

- Residents and Fellows in Training: 804, 825
- Medical Students: 548, 480
- Accredited Residency Training Programs: 51, 54
- Allied Health Students: 305, 392
- Programs for Allied Health Specialists: 29, 31

**Research**

- Total NIH Multi-Year Grants Awarded: 187, 224
- Total Amount – All Grants Awarded (federal, corporate, other research): $106,252,000, $109,595,000

**Internet Site (clevelandclinic.com)**

- Unique Visitor Sessions: 2,141,287, 3,578,044
- Online Appointments (monthly average): 367, 612

*Includes revised figures since 2002 Annual Report.

**FINANCIAL HIGHLIGHTS CLEVELAND CLINIC HEALTH SYSTEM†**

<table>
<thead>
<tr>
<th>$ in thousands</th>
<th>2002</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Assets</td>
<td>3,758,780</td>
<td>4,026,400</td>
</tr>
<tr>
<td>Net Assets</td>
<td>1,206,958</td>
<td>1,492,335</td>
</tr>
<tr>
<td>Net Patient Care Revenues</td>
<td>2,824,061</td>
<td>3,150,338</td>
</tr>
<tr>
<td>Charity Care</td>
<td>157,300</td>
<td>201,400</td>
</tr>
</tbody>
</table>

†Current year estimates subject to final year-end audit.
Ralph Straffon, M.D., 1928-2004

Ralph Straffon, M.D., former chairman of the Division of Surgery and Department of Urology, and The Cleveland Clinic’s first chief of staff, passed away on January 22, 2004. Dr. Straffon was elected to the Board of Governors twice, in addition to serving ex officio, and after his retirement, co-chaired the capital campaign that helped to build the Lerner Research Institute, Cole Eye Institute and Taussig Cancer Center. He was elected president of the American College of Surgeons in 1993 – the highest and most-honored post achievable by an American surgeon. One of the most important figures in the history of The Cleveland Clinic, Dr. Straffon was beloved by his patients, admired by his peers and internationally recognized as one of the finest surgeons of his time.