

RSNA Highlights

In last months issue we started our review of RSNA04, in this months issue we bring you news of all of the other sessions covered at last years meeting

Imaging Tool May Help Physicians Diagnose Bipolar Disorder

Magnetic resonance (MR) spectroscopy may provide vital information in the diagnosis of bipolar disorder. Bipolar disorder, a serious condition of the brain affecting 2.3 million Americans, is characterized by an alternating pattern of emotional highs and lows.

Using MR spectroscopy of the brain, researchers at the Mayo Clinic in Rochester, Minn., identified significant differences between the brain chemistries of people with and without bipolar disorder.

Currently, bipolar disorder is diagnosed by psychiatrists on the basis of symptoms and, when available, family history. Often patients go undiagnosed for years.

Using MR spectroscopy, a special form of MR imaging that allows researchers to analyze the chemical properties of tissue, Dr. Port and colleagues studied 60 to 70 regions of the brain at a time, gathering thousands of data points. The spectroscopic scans enabled the research team to perform statistical analysis on 14 separate areas of the brain and five metabolites, chemical substances found in brain tissue.

The preliminary findings indicated that certain metabolite levels differed significantly between the bipolar group and control group in four areas of the brain that control behavior, movement, vision and reading, and sensory information.

CT Helps Find Cause of Puzzling Cough in WTC Rescue Workers

Radiologists are one step closer to solving a mysterious condition affecting World Trade Center (WTC) rescue and recovery workers.

"WTC cough" is an uncharacterized ailment of rescue workers at the World Trade Center site who were exposed to airborne toxins on or after Sept. 11, 2001.

Specialized CT scans identified WTC cough as air trapping, which causes shortness of breath, dry cough or wheezing. Although thought to be benign, air trapping is symptomatic — causing shortness of breath, dry cough or wheezing — and is treated as a variant of asthma, with inhaled steroids and bronchodilators.

Wipeout! Surfing Creates Wave of Unique Injuries

Surfing inflicts its own variety of injuries that can be perplexing for physicians unfamiliar with the sport.

When surfers are injured, many times there are no telltale abrasions since the impact is often with water and not a solid object. Surfers are also usually leashed to their boards, making it easier for them to strike the boards even after they tumble off.

Surfing injuries can be classified into three groups: paddling toward the surf, catching a wave and marine environment. Injuries associated with paddling toward waves included dislocated shoulders, as well as board traumas like skull fractures, facial fractures and bruises to the vocal chords. Common injuries suffered while catching or riding a wave included head and neck trauma, broken arms and legs, and damage to the knees. Environmental injuries included foreign matter in the lungs, damage to the ear canals from exposure to cold water, lacerations from surf board fins, and stings and bites from marine life.

“Emergency physicians need to diagnose quickly, but without an understanding of some of the unique aspects of surfing injuries, they’re apt to take additional time trying to determine what happened,” said lead author and recreational surfer Jeremy Kuniyoshi, M.D., a radiology resident at the University of California San Diego. “Most doctors know more about riding golf carts than riding waves.”

Thyroid Treatment Can Trigger Homeland Security Detectors

Diagnostic nuclear medicine tracers - such as those used in PET scans, bone scans and cardiac scans - can be detected in the body for periods between 24 hours and 30 days and can result in patients triggering radiation detectors.

“The nuclear medicine community has been aware that patients set off detectors, but now we expect it to become a more common occurrence with the increasing number of extremely sensitive portable Homeland Security radiation detectors deployed among security personnel,” said the study’s author, Lionel Zuckier, M.D.

Dr. Zuckier supports the recommendations made by the Society of Nuclear Medicine (SNM) and the U.S. Nuclear Regulatory Commission that hospitals develop an official letter or card indicating what type of nuclear medicine procedure a patient received, the date of service and whom to call at the hospital for verification.

Diagnostic Imaging Surge by Non-Radiologists Draws Concerns

Imaging experts say they are alarmed by the dramatic increase in the number of diagnostic imaging tests being performed by physicians other than radiologists.

Private practice and imaging centers have significantly increased diagnostic imaging services compared to hospitals and radiology departments.

Among radiologists, noninvasive diagnostic imaging utilization rates rose 11.6 percent; among all non-radiologists, utilization rate increases were twice as high, at 23.5 percent; among cardiologists, those rates were twice again as high at 42.2 percent.

Medicare reimbursement for magnetic resonance imaging (MRI) services increased at six times the rate (599 %) for orthopedic surgeons than for radiologists (99 %).

The proportion of noninvasive diagnostic imaging performed in hospitals fell, with the in-patient percentage dropping from 33.6 percent to 28.4 percent, while imaging at private offices and imaging centers rose from 28.1 percent to 32.6 percent.

The utilization rate of radionuclide myocardial perfusion imaging (RMPI), an exam of the heart that uses radioactive tracers to diagnose coronary artery disease, rose 78 percent among cardiologists, compared with only 2 percent among radiologists.

Although the data cannot assess whether the individual tests ordered were needed, Dr. Levin said it is difficult to find any clinical, technological or public health trends between 1997 and 2002 that could explain the marked disparity between the increases in utilization rates by radiologists and non-radiologists.

“Other than being a way for the cardiologists and orthopedic surgeons to increase their revenues, there really is nothing that can explain this increase of imaging services,” Dr. Levin said.

International Trial Finds Benefits of Breast MRI in Women at High Risk

Magnetic resonance imaging (MRI) enables radiologists to accurately identify tumors missed by mammography, according to the first international, multicenter trial comparing the two screening methods in women at high-risk for breast cancer.

The medical community has been trying to determine the best screening method for women genetically at high risk for developing breast cancer.

Mammography performs very well for the general population but is not optimal for imaging dense breast tissue. Women at genetically high risk need to be screened at a younger age, when they are more likely to have dense breast tissue.

The researchers found that MRI had a 1.1 percent diagnostic yield, and mammography had a 0.3 percent diagnostic yield, meaning that MRI would detect 11 cancers in 1,000 high-risk women while mammography would detect three.

Constance Dobbins Lehman, M.D., Ph.D., assistant professor and director of breast imaging at the University of Washington Medical Center, Seattle Cancer Care Alliance, noted that there is no evidence that MRI is an effective complement to mammography in average risk women. “Although MR is a very powerful tool for detecting cancer, it is not perfect,” she said. “There are benign areas of breast tissue that can look suspicious but do not represent breast cancer and yet may lead to a biopsy.”

New Stroke Prevention Therapy As Effective As Invasive Surgery

A new study has found Angioplasty and stenting, the same techniques used to clear arteries blocked by heart disease, can also be used on the carotid artery to prevent stroke.

The results from 180 patients with carotid artery disease showed that angioplasty and stenting were as effective as surgery, with comparable rates of neurologic complications and a similarly low rate of restenosis, or re-narrowing of the artery after treatment.

Angioplasty and stenting are less invasive than carotid artery surgery, which can lead to brain damage, nerve injuries, stroke or heart attack.

After three years and 180 patients, the results showed that carotid angioplasty and stenting had the same amount of neurologic complications as surgery (3%) and the same rate of restenosis after treatment (4%).

Whilst the cost of the materials used in carotid angioplasty and stenting is high, once all costs of the surgery are factored in the overall cost of the procedure is similar to that of surgery.

Outpatient Lung Cancer Procedure Promising for Inoperable Disease

According to a new study lung cancer patients who are poor candidates for surgery have a new alternative with image-guided radiofrequency ablation (RFA), a safe and effective office-based procedure.

Radiofrequency ablation (RFA) offers a safe, minimally invasive means of treating small lung tumors.

“Experience leads me to believe that as lung cancer detection improves, we eventually will be able to avoid surgery by eradicating early-stage lung cancer with minimally invasive means,” said study co-author Damian Dupuy, M.D.

RFA uses a specially designed needle connected to a radiofrequency generator that delivers electrical current to ablate, or “cook,” tumors. Computed tomography (CT) or ultrasound is used to guide the needle to the tumor site for ablation. The procedure can be used on patients who are considered poor surgical candidates.

“Although the patients we treated were poor surgical candidates, the procedures went very well,” Dr. Dupuy said. “Our complication rate was low, and morbidity and mortality rates were lower than those of lung surgery. Plus, RFA is an outpatient procedure with a tremendously condensed recovery period.”

Dr. Dupuy and colleagues determined that RFA alone or in conjunction with chemotherapy and radiation therapy is safe and feasible for treatment of primary lung tumors and tumors that metastasize from other parts of the body.

Colon Cancer Screening with CT May Also Identify Heart Attack Risk

According to a new study virtual colonoscopy, an imaging procedure used for early identification of colon cancer, may also detect heart attack risk in patients.

Computed tomographic (CT) colonography, more commonly known as virtual colonoscopy, is a minimally invasive procedure that tests for colon cancer by creating 2-D and 3-D fly-through images that identify such abnormalities as pre-cancerous polyps. Virtual colonoscopy requires no sedation and is less costly than conventional colonoscopy.

According to the Centers for Disease Control and Prevention, heart disease is the leading cause of death in the United States, followed closely by cancer. Colon cancer is the second leading cause of cancer deaths. The American Cancer Society recommends that men and women be screened for colon cancer beginning at age 50.

Medical records showed a direct correlation between high aortic calcium scores measured during the procedure and the nine patients who experienced heart attacks subsequent to the screening. By noting calcification scores during virtual colonoscopy procedures, physicians may have an additional means of identifying patients at risk of developing cardiovascular disease.

Radiologists Use MRI to Keep Basketball Players on Their Feet

Early identification of potential stress fractures with magnetic resonance imaging (MRI) can reduce the threat of season-ending injuries for college basketball players, MRI depicts excess fluid accumulation in the foot before a stress fracture becomes evident.

A stress fracture is a small crack in a bone brought on by overuse or repeated impact on a hard surface over a long period of time. The muscles that absorb the shock of the impact eventually become fatigued, diverting much of the stress to the underlying bone.

More than one-third of athletes studied demonstrated foot abnormalities, if undetected these can lead to season or career ending injuries.

Obesity Hinders Imaging Quality, Diagnosis

Obesity can limit the ability to obtain quality images using current imaging equipment. "Hospital radiology departments are increasingly unable to adequately image and assess obese patients because of the limitations in current radiology equipment," said Raul Uppot, M.D., a fellow in abdominal imaging and interventional radiology at Massachusetts

General Hospital (MGH) in Boston.

Incidence of obesity has increased dramatically in the last 20 years. Today, nearly one in three Americans is obese.

The study reviewed radiology reports filed between 1989 and 2003 that were labeled as "limited by body habitus," meaning limited in quality due to the patient's size. The percentage of limited reports nearly doubled over the 15-year period, from 0.10 percent in 1989 to 0.19 percent in 2003, which strongly correlates with the increase in obesity in the state of Massachusetts from nine percent in 1991 to 16 percent in 2001.

CT and magnetic resonance imaging (MRI) are predominantly limited by the amount of weight the equipment can support and the size of the area designed to accommodate the patient. Under most circumstances, quality CT images can be obtained in patients weighing up to 450 pounds, and most MRI equipment can accommodate patients up to 350 pounds.

The direct cost impact of obesity on medical imaging has more than tripled since 1995.