

RSNA *News*

AUGUST 2002 ■ VOLUME 12, NUMBER 8

THE NEWSMAGAZINE OF THE RADIOLOGICAL SOCIETY OF NORTH AMERICA

Log in to the Future at RSNA 2002



Photo courtesy of East Carolina University

Also Inside:

- EBCT Measures Coronary Calcium Progression
- FDA Approves New Brachytherapy Device
- Reducing Errors in Radiology
- RSNA Journal Editors Offer Expert Advice to Potential Authors
- Chicago's Exciting Events and Attractions Add Allure to RSNA 2002

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RSNA *News*

AUGUST 2002

- 1** People in the News
- 2** Announcements
- 4** Letter to the Editor
- 5** 2002 RSNA Board of Directors Report

- Feature Articles**
- 6** EBCT Measures Coronary Calcium Progression
- 8** FDA Approves New Brachytherapy Device
- 10** Reducing Errors in Radiology
- 13** Log in to the Future at RSNA 2002
- 16** Mini Tutorial: Internet For You—Part 6
- 20** RSNA Journal Editors Offer Expert Advice to Potential Authors

- Research and Education ... Our Future**
- 23** Vanguard Spotlight: Bracco Diagnostics Inc.
- 23** Program and Grant Announcements
- 24** Research and Education Foundation Donors

- 25** Meeting Watch
- 27** Chicago's Exciting Events and Attractions Add Allure to RSNA 2002

- 31** Exhibitor News
- 32** www.rsna.org

RSNA News

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Levitt Foreign Adjunct Professor

1999 RSNA President **Seymour H. Levitt, M.D.**, has been appointed foreign adjunct professor in the Department of Oncology-Pathology at the Karolinska Institutet in Stockholm, Sweden. Dr. Levitt is currently a professor of therapeutic radiology at the University of Minnesota Medical School in Minneapolis and a member of the Board of Trustees for the RSNA Research and Education Foundation.



Seymour H. Levitt, M.D.

2002 Distinguished Alumnus Award

Murray L. Janower, M.D., former chairman of St. Vincent Hospital and professor of radiology at the University of Massachusetts Medical School in Worcester, has received the 2002 Distinguished Alumnus Award from Wayne State University School of Medicine in Detroit. He was honored for outstanding professional achievement and leadership in state, regional and national organizations.



Murray L. Janower, M.D.

Knote Re-elected AMA Speaker

John A. Knote, M.D., has been elected to a third term as Speaker of the AMA House of Delegates. Dr. Knote is a board-certified radiologist from Lafayette, Ind.



John A. Knote, M.D.

ASTRO Names 2002 Gold Medal Winners

The American Society for Therapeutic Radiology and Oncology (ASTRO) has announced its 2002 Gold Medalists: **Steven A. Leibel, M.D.**, from Memorial Sloan-Kettering Cancer Center in New York; **Victor Marcial, M.D.**, from the University of Puerto Rico School of Medicine and University Hospital; and **Marvin Rotman, M.D.**, from SUNY-Downstate Medical Center in Brooklyn. The awards will be presented during ASTRO's annual meeting in New Orleans October 6-10.

In Memoriam

World-renowned cancer specialist **Nina Einhorn, M.D., Ph.D.**, died May 10 in Stockholm, Sweden, at the age of 77. Dr. Einhorn received an RSNA Honorary Membership in 1999. She was a pioneer in the field of gynecologic radiation oncology. She was married to the late **Jerzy Einhorn, M.D., R.N.O.**, an internationally respected leader in diagnostic radiology and radiation therapy.



Nina Einhorn, M.D., Ph.D.

SGR Announces 2003 Cannon Medalist, Lecturer

The Society of Gastrointestinal Radiologists will award its 2003 Cannon Medal to **Alexander R. Margulis, M.D.**, from Weill Medical College of Cornell University in New York. **Emil J. Balthazar, M.D.**, from New Bellevue Hospital in New York, will be the Cannon Lecturer at the 2003 meeting, February 16-21, in Cancun, Mexico.



Alexander R. Margulis, M.D.

Austrian Cross of Honor

B. Gilliam Brogdon, M.D., is the recipient of the Austrian Cross of Honor for Science and Art, First Class. He received the award from the Austrian ambassador during a ceremony in Mobile, Alabama. Dr. Brogdon, the former chairman of radiology at the University of South Alabama, is also the University Distinguished Professor Emeritus of Radiology.



B. Gilliam Brogdon, M.D.

Continued on next page



Send your submissions for *People in the News* to rsnanews@rsna.org, (630) 571-7837 fax, or *RSNA News*, 820 Jorie Blvd., Oak Brook, IL 60523. Please include your full name and telephone number. You may also include a non-returnable color photo, 3x5 or larger, or electronic photo in high-resolution (300 dpi or higher) TIFF or JPEG format (not embedded in a document). *RSNA News* maintains the right to accept information for print based on membership status, newsworthiness and available print space.

Phelps Earns Coveted SNM Award

The developer of PET technology, **Michael E. Phelps, Ph.D.**, received the Cassen Award at the Society of Nuclear Medicine (SNM) Annual Conference in Los Angeles in June. The award is in recognition of outstanding achievement and encourages development and growth in nuclear medicine. Dr. Phelps is the president of the Academy of Molecular Imaging and is the Norton Simon Professor and chair of the UCLA Department of Molecular and Medical Pharmacology.

Also at the SNM conference, **Jorge Barrio, Ph.D.**, professor of molecular and medical pharmacology at the UCLA School of Medicine, received the 2002 Paul C. Aebersold Award. **Sanjiv S. Gambhir, M.D., Ph.D.**, director of the Crump Institute for Molecular Imaging at the UCLA School of Medicine, received the 2002 Taplin Award.

Neiman Executive Director of ACR

Harvey L. Neiman, M.D., has been named executive director of the American College of Radiology (ACR). Dr. Neiman, chairman of the ACR Board of Chancellors, succeeds **John Curry** in January 2003. Dr. Neiman is the chairman of the Department of Radiology at Western Pennsylvania Hospital in Bloomfield and a clinical professor of diagnostic radiology at the University of Pittsburgh School of Medicine.



Harvey L. Neiman, M.D.

ANNOUNCEMENTS

Visiting Professors Head Down Under

The second team of 2002 RSNA visiting professors begins their assignment this month. The team, George A. Taylor, M.D., *Team Captain*, Richard I. Markowitz, M.D., and Maria E. Schmidt, M.D., will travel to New Zealand and Fiji. They will spend a week participating in lectures and touring local radiology facilities as part of the International Visiting Professor Program administered by RSNA's Committee on International Relations and Education.

Later this year, two two-person teams will travel to Colombia and Peru. In January, Donald P. Frush, M.D., *Team Captain*, and Peter J. Strouse, M.D., traveled to Singapore and Thailand.

For 2003, the RSNA Board of Directors has approved funding for visiting professor teams to visit Africa, Guatemala and El Salvador.



The first team of 2002 visiting professors visited the Wat Arun (Temple of Dawn) in Bangkok, Thailand in January.

RSNA Technical Exhibition Retains Status as Largest Medical Trade Show

The technical exhibition at the RSNA Scientific Assembly and Annual Meeting remains the largest medical trade show in the United States and Canada in terms of net square feet of paid exhibit space. The April 2002 issue of *Tradeshow Week* reports that RSNA's technical exhibition had 445,825 net square feet of paid exhibit space at RSNA 2001 at McCormick Place in Chicago. That compares to 279,950 square feet for Medtrade's meeting held at the Ernest N. Morial Convention Center in New Orleans, and 251,747 square feet for the Healthcare Information & Management Systems Society's meeting in New Orleans.

Among all trade shows, the technical exhibition at RSNA 2001 was ranked 41, up from 43 in 2000. The largest trade show in 2001 was the International Consumer Electronics Show in Las Vegas with 1,225,003 net square feet of exhibit space.

RANK	HOST	NET.SQ.FT.	PROF. ATTEND.	DATE
41	RSNA	445,825	20,788	Nov. 2001
93	Medtrade	279,950	20,120	Oct. 2001
107	HIMSS	251,747	8,400	Feb. 2001
110	AAO	245,000	11,892	Nov. 2001
111	ACC	244,400	19,615	Mar. 2001
142	AHA	192,520	15,806	Nov. 2001

Source: *Tradeshow Week*

The Count is in for RSNA 2002

A total of 7,674 abstracts were submitted for consideration for RSNA 2002—that's 56 more than last year's 7,618. This year's abstracts include 5,468 scientific paper or poster abstracts, 2,049 education exhibit abstracts, and 157 *infoRAD* abstracts.

The final selections for scientific presentations were made in mid-July. Letters have been sent notifying individuals about the status of their submitted abstracts for scientific papers and poster presentations; 1,698 scientific papers and 504 posters were accepted. Letters for education exhibits were mailed in mid-June; 1,073 were accepted including 12 cases of the day. 137 *infoRAD* abstracts were accepted.

SCIENTIFIC PRESENTATION ABSTRACT SUBMISSIONS BY SPECIALTY:

Breast Imaging	356	Nuclear Medicine	102
Cardiac	301	Pediatrics	353
Chest	433	Physics	495
Gastrointestinal	862	Radiation Oncology and Radiobiology	380
Genitourinary	328	Radiology Informatics	55
Health Services, Policy and Research	148	Ultrasound	137
Musculoskeletal	394	Vascular and Interventional	452
Neuroradiology/Head and Neck	672	TOTAL:	5,468

Job Services at RSNA 2002

The ACR Professional Bureau will return to the RSNA Scientific Assembly with a new, state-of-the-art Web-based career fair. The new service combines the best aspects of the previous paper-intensive interviews with the high-tech abilities of the new online job and resume posting service. Job seekers and employers will have the ability to go online, establish personal accounts and post



their resume or job ad. The system allows each person to create a calendar to schedule interviews and to indicate times he or she is not available. Sophisticated error checking prevents double booking of times and/or people.

RSNA will continue providing a Web-based job bank with similar functionality for use by radiology support personnel through infoSYSTEM. The job center (location to be

announced) will provide quiet areas in which employers and job seekers may meet for scheduled interviews. ACR staff will be present to provide assistance.

SUNDAY – WEDNESDAY (DEC. 1–4)

8:00 a.m. – 6:00 p.m.
(last scheduled interview 5:30 p.m.)

THURSDAY (DEC. 5)

8:00 a.m. – 4:00 p.m.
(last scheduled interview 3:30 p.m.)

Program Dedication

The RSNA 2002 *Scientific Program* will be dedicated to 1967 RSNA President **Harold G. Jacobson, M.D.**, a renowned musculoskeletal radiologist who was a medical pioneer, a prolific author and an extremely popular professor. He died last October at the age of 89.

The 2002 Eugene P. Pendergrass New Horizons Lecture will be dedicated to **Juan M. Taveras, M.D.**, who died in March at the age

of 82. Dr. Taveras was one of the best known, most accomplished and most influential leaders in radiology worldwide. He was widely regarded as the father of neuroradiology and pioneered the concept of subspecialization in radiology practice. He was the recipient of a 1980 RSNA Gold Medal.

Bone Densitometry Education Lectures

The International Society for Clinical Densitometry (ISCD) will host bone densitometry education lectures and a certification exam for the clinical and technical tracks December 7–8, 2002, immediately following RSNA 2002 at McCormick Place.

Bone densitometry education lectures and certification exams are available for physicians, Ph.D.s, technologists/allied healthcare professionals, nurse practitioners and physician assistants.

For more information, contact ISCD at (202) 367-1132 or www.iscd.org.

MR Safety

In response to recent concerns about adverse incidents relating to MR imaging procedures, the American College of Radiology has an updated series of guidelines and procedures for MR safety. A multidisciplinary blue ribbon panel was created to address these critical issues. The panel, chaired by Emanuel Kanal, M.D., prepared its report under the auspices of the ACR's task force on patient safety, chaired by James P. Borgsted, M.D. The panel's white paper is published in the June issue of the *American Journal of Roentgenology* and is also available on the ACR Web site, www.acr.org.

At RSNA 2002, December 1-6 in Chicago, Dr. Kanal will direct the Update Course in Diagnostic Radiology: Practical MR Safety Considerations for Physicians, Physicists and Technologists. The update course consists of eight refresher courses.

To register for these or any other refresher courses at RSNA 2002, see your *Refresher Course Enrollment, Scientific Program and Advance Registration and Housing* brochure which was mailed in June, or go to www.rsna.org/rsna/advanceregistration.

For more information on RSNA 2002, call (630) 571-7862 or e-mail reginfo@rsna.org.

I just don't get it.

Can someone tell me why the June 2002 issue of RSNA News featured a two-page article on HIPAA with the Secretary-Treasurer of the AMA as the only quoted source?

The casual observer would conclude that no one in radiology had any opinion or insight into HIPAA and its problems, or that no radiologist was articulate enough to voice those opinions.

I thought this was the *RSNA News*, not the *AMA News*. I don't belong to the AMA, on purpose. In many instances (and HIPAA is just one) the AMA has taken a position that is contrary to the interests of the practicing radiologist. I have no interest in supporting that organization or its efforts, and I certainly don't want the RSNA to be the AMA's mouthpiece.

The ACR has worked long and hard to get a measure of sanity injected into the Privacy Rule. Those efforts have finally come to fruition. Now the AMA objects, and you people provide another forum for the AMA's misguided opinions. Have you taken complete leave of your senses?

As it relates to physician-to-physician communications, the Privacy Rule is burdensome, it's unnecessary, and it's a solution in search of a problem. Of course patient privacy is fundamental to the patient-physician relationship. But physicians are not in the habit of disclosing health information inappropriately. We don't need this gargantuan administrative nightmare to tell us how to behave ourselves. The original HIPAA enacted in 2001 put significant, onerous restrictions on the necessary free flow of information among healthcare providers. Every radiologist I know was glad to see those restrictions eased.

What most radiologists don't realize is that the consent requirement never applied to the overwhelming majority of us. Since we are indirect treatment providers, we are not required to obtain consent or post notices, either under the original or the revised rules. So why should we care? Because the vast majority of physicians from whom we need to obtain patient information to do our jobs

properly are direct treatment providers, so their hands are tied by these consent rules. For example, when trying to schedule a biopsy for a patient, the referring physician is not permitted to send me the PT/PTT without the

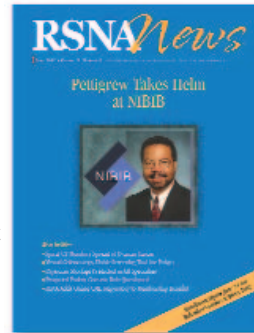
patient's expressed written permission, requiring the patient to come in and sign a form. I'm allowed to request it, but that physician is not allowed to send it. Does that make sense to anyone? I didn't think so.

There's a fine line between paranoia and a fervent desire for privacy, and unfortunately paranoia seems to have reigned in the writing of the original Privacy Rule. The proposed changes are a breath of fresh air, the AMA notwithstanding.

MARK A. GUENIN, M.D.

TRISTÁN ASSOCIATES

PENNSYLVANIA



Editor's Response:

RSNA welcomes comments from its members. One of RSNA's goals is to improve communication and strengthen relationships between radiologists and all members of the medical community.

Last year, the RSNA Board of Directors directed RSNA News to expand its scope of coverage to include items of interest to radiologists that are not necessarily based on RSNA initiatives.

RSNA News has featured two other articles on HIPAA (July 2001 and March 2002) in which radiology professor Samuel J. Dwyer III, Ph.D., was interviewed. The second article also featured information from the Association of American Medical Colleges published in the New England Journal of Medicine and information on how to contact ACR for help in sorting out the Privacy Rule.

RSNA News Send your Letters to the Editor to rsnanews@rsna.org, (630) 571-7837 fax, or *RSNA News*, 820 Jorie Blvd., Oak Brook, IL 60523. Please include your full name and telephone number. *RSNA News* maintains the right to accept information for print based on membership status, newsworthiness and available print space.

RSNA Board of Directors Report

The RSNA Board of Directors held a very productive June meeting in Chicago. Much was accomplished, ranging from enhancements to the RSNA Scientific Assembly, to broadening the Society's impact on radiologic research and education internationally, to reaching a consensus on a new policy for authors of scientific and educational material regarding their intellectual property rights.

RSNA 2002

This year, the *Walk Through the Week* brochures will be available online only. The brochures offer a listing of the week's activities by radiologic subspecialty. Attendees will be able to easily sort, download and print the information of specific interest to them. This is part of the overall goal of providing attendees the easiest, most effective means of tailoring the annual meeting to meet their needs.

The 2002 *Scientific Program* will be dedicated to 1967 RSNA President Harold G. Jacobson, M.D. The 2002 Eugene P. Pendergrass New Horizons Lecture will be dedicated to Juan M. Taveras, M.D.

To optimize the usefulness of RSNA educational products and programs for radiologists, faculty members at the scientific assembly will be invited to participate in a one-day educational program at RSNA Headquarters to help them prepare for their courses. This year, the program will be offered to those teaching Refresher Courses. The training program will include a session on instructional design and a session on teaching and presentation techniques. The program will be extended to other faculty in subsequent years.

A number of international radiology societies have expressed interest in obtaining access to the education exhibits from the RSNA Scientific Assembly. The Board has approved a recommendation from the RSNA Committee on International Relations and Education (CIRE) to provide assistance to societies requesting access to

exhibits that are particularly germane to the regional needs of radiologists.

Intellectual Property Rights and Medical Images

The Board of Directors has approved a recommendation to alter its current policy with respect to scientific manuscripts and educational material submitted for publication by RSNA. Presently, authors transfer copyright ownership of their articles and educational material in total to RSNA—a policy followed by nearly all publishers. Under the new policy, authors will still transfer copyright ownership to RSNA, but RSNA will give authors a license for use of their images that extends for the full term of copyright and allows the authors to sublicense their images to others. Thus, when an author wishes to use images from his or her *Radiology* or *RadioGraphics* article in an article or book chapter to be published by another organization, the author need not request RSNA permission.

It is hoped that this new policy will help our busy authors and advance the communication of science and radiology education while maintaining the integrity and quality of original publication.



Brian C. Lentle, M.D.
Chairman, 2002 RSNA Board of Directors

Revitalizing the Radiology Research Enterprise

The Board has approved the next cycle of consultations in the Revitalizing the Radiology Research Enterprise (RRRE) program. RRRE is a pilot program designed to help academic radiology departments strengthen their research infrastructure and clarify their strategic direction with regard to radiology

research. Two senior radiology researchers from other institutions visit the departments and provide consultation. Five departments completed the process during the first cycle.

Community Outreach

As a thank you to Chicago for helping to ensure that the RSNA Scientific Assembly and Annual Meeting is friendly, affordable and efficient for the attendees, the Board has approved a scholarship program for Chicago public high school students. The program will include a radiology-related competition that not only will be a goodwill gesture, but will also increase public awareness about the specialty and, it is hoped, influence the career choices of these teenagers.

Continued on page 21

EBCT Measures Coronary Calcium Progression

“Calcium begets calcium.” Think of those three words as a postulate for calcium progression in the coronary arteries. A study in the July issue of *Radiology* (*Radiology* 2002; 224:236-241) concludes that, in asymptomatic subjects, “initial calcium score is the most important factor affecting the rate of coronary calcium progression.” Contrary to data sifted from previous studies, age, gender and most traditional risk factors—with the exception of hypertension and diabetes—appear to be less important.

Researchers at UCLA and the Kaiser Moanalua Medical Center in Honolulu wanted to test the hypothesis that the rate of coronary artery calcium progression is greater in men than in women, and that it is age specific, especially in women.

“We hypothesized that women would start with lower calcium and that the calcium would progress slower than in men of similar age, then women would start to catch up after menopause,” says lead author Hyo-Chun Yoon, M.D., Ph.D., from the Department of Diagnostic Imaging at Kaiser, who began collecting clinical screening data in 1994.

In this retrospective study, 217 men and women underwent at least two electron-beam CT (EBCT) studies of the heart. Individuals with histories of documented ischemic heart disease, myocardial infarction or coronary bypass surgery were excluded from the study.

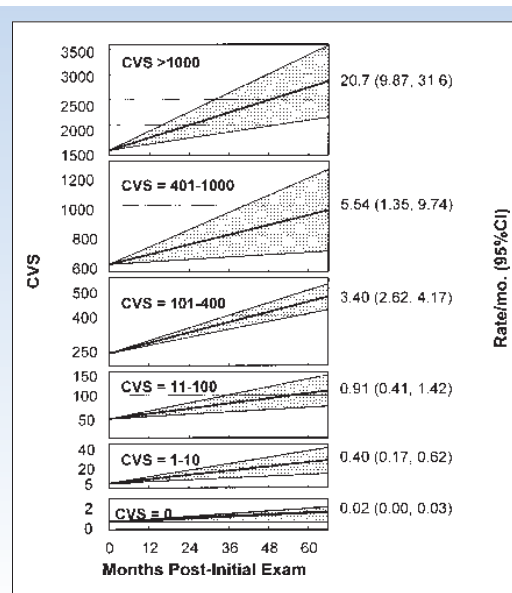
In measuring calcium, the researchers used both calcium volume score (CVS) and coronary calcium score (CCS). Dr. Yoon says there’s considerable debate about which system is most effective. “I personally think cal-

cium volume is the more reliable statistic. A recent study suggests that interscan variability is less with calcium volume than the conventional Agatston scoring algorithm. But unfortunately, most clinical outcome studies have been based on calcium score, which makes comparisons more difficult. We found that it didn’t matter as far as calcium progression is concerned.”

Dr. Yoon says subjects within each

cium accumulation, and if you start out with little or no calcium, you’re unlikely to develop significant calcium, at least at a two-year follow-up. We also found that women have less calcium than men and men get calcium earlier and they get more of it,” Dr. Yoon says.

“For the 134 subjects with non-zero CCS, the annualized relative rate of change was 38 percent. The relative rate of change in CVS was 29 percent,”



Estimated rates of coronary artery calcium progression that were based on initial CVS. Regression lines (thick lines) are presented within corresponding 95% CI (stippled areas).

(*Radiology* 2002; 224:236-241)
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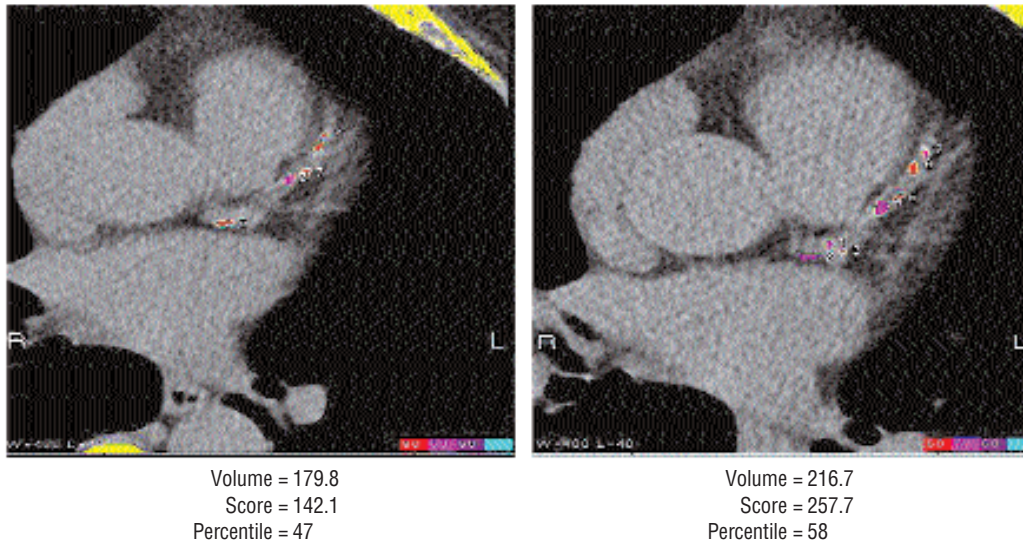
gender were stratified by age. “Since previous studies have shown the CCS for women generally tends to trail men by approximately 10 years, we used an age cutoff of 50 years of age or less for men and 60 years of age or less for women.” The average interval between the subjects’ first and last studies was 26 months. Risk factors included hypercholesterolemia, overweight, hypertension, family history, smoking and diabetes.

“The main thing we found was that if you start out with high amounts of calcium, you’re likely to get more cal-

explains Dr. Yoon. “Among 114 subjects with a non-zero baseline score and a follow-up CCS greater than 20, the annualized relative increase in CCS was 35 percent.”

Dr. Yoon says these findings concur with a study by Budoff and colleagues in which 299 asymptomatic subjects underwent two EBCT studies with an average interscan period of just over two years. “They observed an average annual rate of change in CCS of 33 percent, although the authors did not describe a method for calculating this rate of change.”

Change in 1 Year



Measured calcium in a patient on two occasions, one year apart, showing an increase in volume.

Images courtesy of Tracy Callister, M.D.

In any case, the two studies reached similar conclusions about the rate of calcium accumulation and the reduced hierarchy of age, gender and most cardiac risk factors. But Dr. Yoon cautions, “Given the relatively small numbers of patients in both studies, the true importance of any of these risk factors awaits further study.”

Tracy Callister, M.D., director of the EBT Research Foundation in Nashville, says the current study is one of the first to show that CT scanning can be used to measure coronary calcium progression. That translates into a relatively non-invasive tool for tracking the effectiveness of treatment.

“If you’re building up cholesterol plaque in your arteries, I’d like to be able to put you on a treatment strategy and bring you back and look and see if it’s stopped growing, going away or still growing. Rather than shoot dye into arteries, it would be much easier to do something like this,” says Dr. Callister, who is also the co-medical director of the Lifetest Imaging Center, a center in which cardiologists and radiologists work side by side.

“There’s a large public demand for cardiac CT scanning and this study supports the idea of doing serial or fol-

low-up scanning to track heart disease,” says Dr. Callister. “This is good news for both cardiologists and radiologists involved in the use of these scans in the detection and prevention of this leading killer.”

One problem with cardiac CT scanning is that heart motion and field of

The main thing we found was that if you start out with high amounts of calcium, you’re likely to get more calcium accumulation, and if you start out with little or no calcium, you’re unlikely to develop significant calcium, at least at a two-year follow-up.

— Hyo-Chun Yoon, M.D., Ph.D.

view can lead to a 10 percent to 15 percent variation in results.


“If I bring you back in a year and you’re at 35 percent, your 35 percent might really be only 20 percent or it might be 50 percent. While I can’t with precision say how much more calcium

you’ve accumulated,” he says, “I do know you do have more calcium.”

Where does this leave us with regard to clinical application of this technology? Dr. Callister says 35 percent to 40 percent of the population—the intermediate-risk people with a 10 percent to 30 percent risk of heart attack or death over 10 years—would benefit most from CT scanning of coronary calcium.

Drs. Callister and Yoon agree that anyone with a moderate or high amount of coronary calcium should be re-scanned annually. Those with just a little calcium can wait two or more years. And the optimal age for a baseline screen, says Dr. Callister, appears to be between 40 and 65 for men and 50 to 70 for women.

Dr. Yoon says this study moves physicians closer to confidently using coronary artery scanning as an aid to setting long-term treatment goals. Dr. Callister adds, “We put a patient on treatment, then can use these scans to track that patient and decide whether treatment and lifestyle should be modified further.” □

 The full text of Dr. Yoon’s study is available at radiology.rsnaajnl.org.

FDA Approves New Brachytherapy Device

A major ongoing challenge in the treatment of early stage breast cancer is optimizing treatment to the primary tumor while minimizing effects to the surrounding normal tissue. Refinements in surgical approaches show that breast conservation therapy (BCT) confers comparable results to mastectomy, with increased local control and some indication of survival benefit with the addition of radiotherapy (RT).

In an attempt to refine RT techniques to further isolate the treatment area, investigators are examining how much radiation is needed as adjuvant to BCT. Conventional treatment uses five weeks of external beam radiotherapy (EBRT) to treat the entire breast, usually followed by a boost to the tumor bed either with brachytherapy or further EBRT.

“Outcomes are very good with this technique,” says Frank Vicini, M.D., from the Department of Radiation Oncology at William Beaumont Hospital in Royal Oak, Michigan, “but there is little scientific proof that the entire breast needs to be treated in all women.”

To test the feasibility of further reducing irradiation to normal breast tissue, investigators are examining whether irradiating only a part of the breast is sufficient for controlling disease. Interstitial brachytherapy, used as a sole radiotherapy modality after BCT,

is one technique that has been shown to be safe and reproducible in phase I and phase II studies. Using multiple needles as catheters to temporarily implant radiation seeds in the breast encircling the lumpectomy cavity, this technique allows delivery of the radiation to a well-targeted treatment area with minimal harm to surrounding normal tissue.

One large advantage of partial breast irradiation (PBI) is that it



Frank Vicini, M.D.
Department of Radiation Oncology
William Beaumont Hospital

reduces the treatment time from six-and-a-half weeks to five days, which enhances its appeal particularly for patients who don't have easy access to a radiation oncology clinic, says Dr. Vicini.

One potential disadvantage of this technique, however, is its difficulty. “Only about a dozen or so institutions perform interstitial brachytherapy on a regular basis because it is so difficult to do and hard to teach,” explains Dr. Vicini. “Many patients also have problems with the idea of having

needles or catheters temporarily placed in their breast.”

MammoSite Radiation Therapy System

The MammoSite Radiation Therapy System (RTS), developed by Proxima Therapeutics, Inc., of Alpharetta, Ga., offers an alternative to interstitial brachytherapy. Approved in May by the Food and Drug Administration for treatment of early breast cancer, the

MammoSite RTS offers an easier and more accessible brachytherapy technique for both patients and physicians.

Instead of using multiple needles as catheters to place irradiation seeds in the breast, the MammoSite RTS device inserts a balloon catheter into the breast tumor resection cavity at the time of lumpectomy or shortly thereafter. The balloon is inflated and a single radiation seed is temporarily placed

within it. After five days, the balloon is deflated and the catheter removed.

Clinical data from eight medical centers of 26 women with early-stage breast cancer, who had the device temporarily implanted after lumpectomy, showed that the device was safe and effective for all patients with no serious adverse events attributable to the device, and with good to excellent cosmetic results in 85 percent of the patients.

Reducing the number of catheters and the number of treatment days need-



Dr. Csaba Polgar
National Institute of Oncology,
Budapest

ed are two big advantages of this system for patients. For physicians, creating a more user-friendly brachytherapy device will make it easier to use. "It doesn't take as much training to use MammoSite and it is immediately available to physicians who have never done a brachytherapy procedure," explains Dr. Vicini.

In Europe, where this device has been approved for use since August 2001, a study has just opened for patient accrual. Six European institutions are participating in the European MammoSite Study to test MammoSite as a boost treatment before whole breast RT and as a sole radiation modality, says Dr. Csaba Polgar from the National Institute of Oncology in Budapest, Hungary.

Is the Technology Ahead of the Science?

Since use of the MammoSite RTS to deliver PBI rests on the premise that PBI is a viable alternative to whole breast irradiation (WBI), it is important to look at the evidence. Does PBI confer comparable outcomes to that of WBI in women with early breast cancer?

Reports from the largest retrospective trials with the longest follow-up of interstitial brachytherapy to treat the partial breast have shown good outcomes. Studies from William Beaumont Hospital, headed by Dr. Vicini, and from the Ochsner Clinic in New Orleans both report low rates of local and regional recurrences, and minimal side effects with this treatment in selected women. These data are based on a median follow-up of 36 months and 75 months, respectively.

Although these retrospective studies suggest that PBI is safe and effective, little randomized data are available to sufficiently compare PBI to WBI. One study from the Christie Hospital in Manchester, England, of 708 patients treated by EBRT to the whole breast or partial breast, found a sub-

Reducing the number of catheters and the number of treatment days needed are two big advantages of this system for patients.

stantial increase in local recurrence for patients receiving partial breast irradiation (*Clin Oncol* 1993;5:278-283). However, in the group of patients with cancers similar to the ones currently recommended for PBI, the success rates were identical. Early results from the second study, headed by Dr. Polgar, of 126 randomized patients treated by brachytherapy to the partial breast or EBRT to the whole breast, found no loco-regional recurrences at 30 months, distant metastases in only four patients and comparable incidence of side effects (*J Surg Oncol* 2002;80:121-128).

Assessment of these studies by Dr. Vicini and colleagues (*Sem Radiation Oncology* 2002;12:31-39) points to the lack of careful patient selection in the Manchester trial that could account for the higher recurrence rates with brachytherapy. Dr. Vicini says one important caveat of the use of brachytherapy as the sole RT modality after BCT is that it should be used only for selected patients: 1) patients with adequate surgical margins and optimal surgical excision of their tumor; 2) patients who have a low risk of harboring occult multicentric disease or tumor extension beyond the surgical site; and 3) patients in whom the site of irradiation is properly determined by dose-volume histogram analyses. The Manchester trial included patients who did not meet such criteria.

The importance of proper patient selection is highlighted in the manufacturing information accompanying MammoSite.

More long-term data are needed to evaluate the comparative effectiveness and safety of PBI to WBI. According to Dr. Polgar, "to get evidence-based results, we have to wait for the long-term results of phase III trials." Dr. Polgar and his group will present their five-year update on the Hungarian clin-

ical trials at this year's ASTRO meeting. Also to be presented are early results from a prospective phase II cooperative group trial by the Radiation Therapy Oncology Group (RTOG 95-17) of partial breast irradiation using interstitial brachytherapy, which just ended patient accrual.

Until more evidence is available, the FDA has approved the use of MammoSite RTS on condition that it includes a warning label that says "the safety and effectiveness of MammoSite as a replacement for WBI to treat breast cancer has not been established."

Easier and More Accessible Radiotherapy

As recognition grows that many women with early stage breast cancer can be treated with less invasive surgical techniques, additional recognition is growing that less invasive radiation techniques may also be available. The need to provide easier and more accessible radiation techniques is particularly pressing as many women who receive BCT still do not receive adjuvant radiation, despite strong evidence indicating improved outcomes with the addition of RT after BCT.

"A point that's missed a lot is that many women who receive BCT do not receive irradiation of any kind," emphasizes Dr. Vicini. "These women are not being treated by the standard of care which recommends RT after BCT in most women who receive BCT."

Because MammoSite is so much easier to use than interstitial brachytherapy, Dr. Vicini says it is becoming a favorite approach for those who are treated by PBI. He hopes that this approach will help increase the number of women receiving the standard of care for their breast cancer treatment.

Dr. Polgar is more cautious. "I think that partial breast irradiation is a promising new option in the treatment of properly selected low-risk breast cancer patients," he explains. "So PBI should be viewed as a promising field of clinical research, but for now, whole breast RT remains the standard of care." □

Reducing Errors in Radiology

Editor's Note: In late June, The New York Times published two articles and an editorial that were critical of mammography screening and its accuracy. The following RSNA News article addresses some of those concerns.

Below is the ACR response to The New York Times.

ACR Challenges NY Times' Portrayal of Mammography

The American College of Radiology strongly disagrees with the negative—and at times inaccurate—portrayal of mammography in recent issues of *The New York Times* (“Spotting Breast Cancer: Doctors Are Weak Link,” June 27; “Mammogram Team Learns From Its Errors,” June 28). Michael Moss’ depiction of mammography plagued by quality control difficulties and inexpert radiology professionals is reckless and can only serve to deter the progress in the detection and treatment of breast cancer. The combination of high quality films and expert interpretation, even in the face of a rising incidence of breast cancer, has contributed to a 20-percent reduction in deaths from the disease over the last 10 years.

As with any medical specialty, radiology is not a perfect science and variability is inherent. However, the ACR has established measures, including educational programs and self-assessment tests, to assist radiologists and their staffs in delivering the highest level of care available.

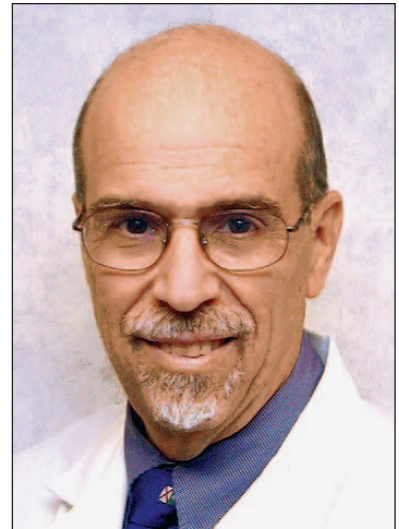
For more information, see ACR’s Web site at www.acr.org.

Although the practice of medicine remains a strong blend of science and art, advances in medical technology, coupled with an increased reliance on evidence to determine practice patterns, has shifted the emphasis to the scientific aspect of medicine. The human component of a physician treating his or her patient, which always involves a degree of uncertainty, is sometimes forgotten in the drive to create standard practice patterns that will ensure optimal care.

This drive to ensure quality care is noble and right in a profession that first strives to “do no harm,” and further hopes to give the best care possible. But errors happen. And as noted in a recent report by the Institute of Medicine (National Academy Press, 1999), they are happening in clinical medicine at a very high rate.

The rate of errors in radiology is comparable to that for all other medical errors, notwithstanding the fact that the specialty of radiology is technology-heavy and is able to provide tangible evidence of missed calls. But the fact that the error rate in radiology has remained fairly constant from the earliest study by Garland in 1949 to more recent studies of newer technologies, such as MR, CT and ultrasound, attests to the fact that technology has not and probably will not solve the problem of human error.

So how can errors be reduced in radiology? To arrive at some answer to this question, it is important first to understand the scope of the problem. By all published accounts from the 1940s onward, the rate of radiologic misses has stayed around 30 percent. Important to emphasize, however, is



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that this rate reflects retrospective analyses. “Thirty percent is an accurate figure in the context of a retrospective review,” explains Leonard Berlin, M.D., chairman of the Department of Radiology at Rush North Shore Medical Center in Skokie, Ill. Yet, one must bear in mind that looking at data with hindsight will often be biased based on the human tendency to perceive the expected.

If one looks at prospective data, the results look very different, according to Dr. Berlin. Such a study, published in *Academic Radiology* (*Acad Radiol* 1998; 5:148-154), shows an error rate of four percent to five percent when tracking radiologic errors made on average days in six radiology departments over a seven-year period.

Comparing the retrospective and prospective data highlights the difference in denominators between the two types of review, explains Dr. Berlin,

who adds, “errors are in the eye of the beholder.” In hindsight bias, or retrospective review of radiographs, radiologists will see more errors because they know that errors occurred. “Once you know the results, you’ll be much better at predicting error,” explains Dr. Berlin. Prospectively, however, errors are not already known.

Although it is useful to recognize hindsight bias as a variable in interpreting radiologic errors, it also highlights the need to reduce radiologic errors. “Just because we can predict in advance that there will be a 30-percent error rate, doesn’t provide an excuse for errors,” emphasizes Dr. Berlin. “We need zero tolerance.”

Zero tolerance may be an ideal, but reducing radiologic errors in practice remains elusive and difficult. One important reason for this has to do with the types of errors that are most common in radiology, which deal with the vagaries of human perception and judgment influenced by social, psychological, circumstantial and behavioral aspects of human nature. According to Dr. Berlin, perceptual errors or missed diagnoses account for up to 75 percent of all errors. These occur when a radi-



Vagaries of Human Perception

The image shown is either an elderly lady or a young lady.

ologist does not see what is on the image. Cognitive errors, the second most common, occur when a radiologist correctly reads the image but attaches the wrong significance because of such things as insufficient knowledge, prejudice or repetition error.

“Many of the errors are research errors,” says Dr. Berlin, meaning that the errors are minor or that they are discovered within a short time and corrected without an effect on outcome. More troublesome are errors that do affect outcomes. Missed malignancies are one of the more frequent errors, occurring most often in chest radi-

ographs and mammograms. The severity of the problem is highlighted by a retrospective study by the Mayo Clinic that found an error rate of up to 90 percent of missed lung carcinomas (*Radiology* 1983; 148:609-615).

Defining what truly constitutes an error is an ongoing discussion in the field of radiology. In the context of liability concerns, defining what an error is may help establish a standard of care that can meet the legal question on reasonability. Negligence is determined by reasonability, explains Dr. Berlin, “Did you make a diagnosis, or miss a

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Reducing errors may be as simple as implementing three major principles of radiology residency training, according to Stephen R. Baker, M.D.

- No “on call” for more than 24 hours
- Proper training in cognitive, perceptual and procedural abilities
- Attending physician available at all times, either in person or through teleradiology

Reducing Errors in Radiology

Continued from previous page

diagnosis, that a reasonable radiologist would make or miss?" However, even though professional standards are helpful to improve quality of care in radiology, says Dr. Berlin, "What kind of standard of care can help reduce perceptual errors?" No one has yet figured this out.

Many experts believe that reducing the error rate depends on systematic changes to radiological practices. Stephen R. Baker, M.D., chairman of the Radiology Department and associate dean of Graduate Medical Education at the University

of Medicine and Dentistry of New Jersey, sees potential for improvement by implementing three major principles in radiologic residency training. First, "residents should not be on call more than 24 hours under any circumstances," emphasizes Dr. Baker, citing several studies that show increased error rates when residents are required to work extensively long shifts. Second, proper training in cognitive, perceptual and procedural (dexterity) abilities are needed to ensure that residents are sufficiently trained. According to Dr. Baker, residents, before they are given the responsibility to make the initial interpretation for emergency studies, should be required to pass written and oral tests that assess their cognitive abilities, as well as a practical test to assess their procedural skills, particu-

larly for ultrasound. And finally, Dr. Baker emphasizes the importance of an available attending physician at all times, even offsite, as a backup to review all questionable images (double reading). Although this requires manpower, it is feasible in

The rate of errors in radiology is comparable to that for all other medical errors, notwithstanding the fact that the specialty of radiology is technology-heavy.

large departments and particularly those with radiology residency programs with busy emergency departments, says Dr. Baker.

Data published in the July issue of *Radiology* (2002; 224:42-46) support the idea that double readings may improve quality of

care. Of 512 abdominal/pelvic CT scans initially interpreted by attending radiologists in the emergency department, subsequent review by subspecialty abdominal imaging radiologists found discordant readings in 153 cases (29.9 percent). Of these discordant readings, patient management changed in 12 cases (7.8 percent).

Howard P. Forman, M.D., M.B.A., and his co-authors from Yale University School of Medicine in New Haven, Ct., write: "Our findings show that clinically significant improvement of patient management does occur with a quality assurance program using redundant systems. Although most discordant interpretations do not result in a change in patient management, there are a number of cases in which patients are managed differently as a result of new

clinically significant findings."

Double reading is not a cure-all. "Double-reading increases sensitivity by 8 percent to 15 percent," explains Dr. Berlin, "but it also introduces lots of false positives." Although Dr. Berlin agrees that double reading is a good thing for quality assurance meetings and situations, he points out that for many smaller practices double reading is unmanageable given the manpower required.

One new technology that may help improve diagnosis and reduce error is computer-assisted detection (CAD). "Preliminary data show that CAD can reduce misses by 20 percent to 30 percent" when used for mammography, says Dr. Berlin. He cautions that it will take years to determine the validity of the data. "Thus far, nothing has lowered error rates." □



For more information on Dr. Forman's study in *Radiology*, go to radiology.rsna.org.

Log in to the Future at RSNA 2002

Radiologists will have the newest, fastest Internet technology at their fingertips—literally—when RSNA 2002 presents a demonstration of high-performance networking and its future applications in healthcare, December 1–6 at McCormick Place in Chicago.

This year's *infoRAD* presentations will include a tutorial and demonstration on "Next Generation Internet, Internet2 and the Future of Medical Practice and Education."

RSNA is working with the Internet2 consortium, the National Library of Medicine (NLM) and the Metropolitan Research and Education Network (MREN) on the presentation.

"We're pleased to have been able to help bring to McCormick Place the high performance networking capabilities that are required to make these tutorials and demos a reality," says Joe Mambretti, director of the MREN consortium.

Several demonstrations with applications of interest to radiologists will be presented at RSNA 2002.

"Unlike a traditional poster session, the demos will allow the radiologists to actually sit down at the keyboard and get some hands-on experience with high performance networking applications," says Mary Kratz, manager of the health science

initiatives for the Internet2 consortium. "Live demos are exciting because participants can hear from the researchers who developed these applications and get a detailed perspective on the

applications."

The Internet2 consortium issued a call for demonstrations at the RSNA meeting and two other fall events, with a July 12 deadline for submitting an application.

Internet2 and the Future of Radiology

With radiologists at the forefront among healthcare professionals in their need for information, this revolutionary technology could open up new possibilities in areas such as image storage and sharing, remote review and diagnosis.

In 1998, NLM announced a new Next Generation Internet (NGI) research program to develop innovative medical projects that demonstrate the application and

use of NGI capabilities. These new technologies would enable the transfer of massive amounts of data instantaneously, accurately and securely providing researchers better access to key developments in medical science. NLM hopes the program will improve our understanding of how NGI can affect healthcare, health education and health research systems in such areas as cost, quality, usability, efficacy and security.

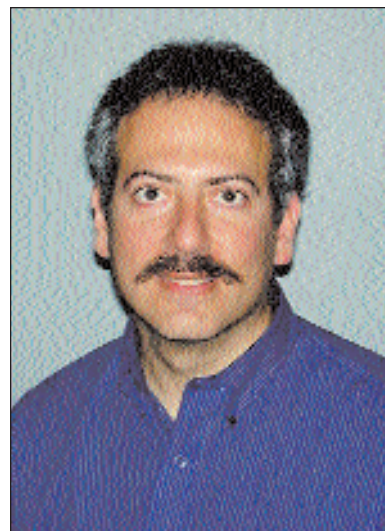
According to Michael J. Ackerman, Ph.D., NLM assistant director for high performance computing

and communications, "The availability of the NGI will lead to a whole new set of applications that are based on the ability to control, feel and manipulate devices at a distance. To get an idea of



[High-performance networking] will eventually revolutionize the way we practice medicine.

—David S. Channin, M.D.



Eliot Siegel, M.D.
RSNA Electronic Communications Committee



David S. Channin, M.D.
RSNA Electronic Communications Committee

what we foresee, one needs only to read the terms used in the descriptions of the projects: telepresence, tele-immersion, teletrauma, telemammography, internetworking and nomadic computing."

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Members of the RSNA's Electronic Communications Committee are excited about the possibilities offered by Internet2 technology.

"Radiology images are getting larger and larger," says Eliot Siegel, M.D., chief of radiology and nuclear medicine for the VA Maryland Health Care System and associate professor of diagnostic radiology at the University of Maryland School of Medicine. "One direct application of advanced networking might be to take some of these very large datasets—for example, cross-sectional CT scans, where we might acquire as many as 3,000 images—and be able to transfer them from one place to the other."

Dr. Siegel, a member of RSNA's Electronic Communications Committee who chairs the Medical Imaging Resources Center subcommittee, says the technology offers the potential for a radiologist at a central location to read studies in real time from multiple distant locations.

"With the shortage of radiologists, the ability of one radiologist to be



Next Generation Telemedicine System at the Telemedicine Center at East Carolina University (www.telemed.med.ecu.edu/chsc).

made more efficient and to be able to read from images obtained at multiple locations is becoming more of a necessity than a luxury for us," he says. "High-performance networking certainly holds the promise to be able to do that."

David S. Channin, M.D., chief of imaging informatics at Northwestern University Medical School, suggests that in addition to collaboration and communication, Internet2-type technology could offer radiologists another option. "Maybe assisted diagnosis—computer assisted or human assisted diagnosis," he says. "It doesn't matter

if I'm talking to a human being or to a computer box, by virtue of the fact that I'm connected to this grid, I can connect to the appropriate resource in a timely fashion." Dr. Channin is a member of

RSNA's Electronic Communication Committee and two of its subcommittees.

Distance learning and remote storage of images are among the other potential uses of next generation networking technology.

"The potential to be able to have either a distributed or central repository with very fast access, so that hospital

health care workers essentially are able to access this remote archive as though it were actually within their own medical center, is very exciting," Dr. Siegel says.

"I think the key point is that advanced networking is really like a new kind of hammer and we're going to see the kinds of houses that can be built with this new kind of hammer," Dr. Channin says. "It will eventually revolutionize the way we practice medicine. It's a new tool in the toolbox and we just have to come up with clever uses for the tool." □

What is Internet2?

Internet2 (www.internet2.edu) is a research and development consortium being led by more than 190 top research universities working with government agencies and corporate partners. Its primary goals are to:

- Create a leading edge network capability for the national research community
- Enable revolutionary Internet applications
- Ensure the rapid transfer of new network services and applications to the broader Internet community



The university-led Internet2 consortium and the federally-led Next Generation Internet (NGI) (www.ngi.gov) are parallel and complementary initiatives that are already working together in many areas. Internet2 is also forming partnerships with similar advanced networking initiatives around the world.

"Next Generation Internet, Internet 2 and the Future of Medical Practice and Education"

This session will be held eight times during RSNA 2002 in the *infoRAD* tutorial classroom. Seating is limited to 75 people for each session. 1.5 hours of category 1 CME credit are available. Some of the sessions are already sold out. To check the availability, go to www.rsna.org/rsna/advanceregistration/, e-mail reginfo@rsna.org or call (630) 571-7862.

Internet for You – Part 6

Searching the WWW

Finding Web documents can be easy or seem impossibly difficult. This is due, in part, to the sheer size of the World Wide Web (WWW), currently estimated to contain several billion documents. It is also because the WWW is not indexed in any standard vocabulary, unlike a library's catalogs which use accepted standardized subject descriptors to their documents. To make the WWW searches more efficient, special search tools have been created. When the search tool is used to search the Web, the user does not search the Web directly. It would take a very long time to perform a direct search among over a billion Web pages residing on computers all over the world. When the search tools are used, users get access to the intermediate databases, which were created to organize Web pages registered with the search tool. Those databases are part of the search tools and they provide users with URL links to the actual Web pages.

There are three types of the search tools: search engines, meta-search engines, and subject directories/guides.

Search Engines

Search engines are programs written to query and retrieve information stored in a database containing selections of Web pages. Databases are compiled by *spiders*, also called crawlers or robot programs, which automatically gather information from all over the Web. Spiders work around the clock, visit the Web, scan pages on the fly, use hyper-text links on each page to discover and read a site's other pages, and download Web documents into the search engine server. This way spiders keep the search engine database up to date. They

obtain new pages, update already catalogued pages and delete broken links. There is very minimal human oversight. It can take six months for spiders to cover the Web, resulting in a certain degree of delay. The search engines are like the online "librarians" tracking locations of Web pages. When queried, they retrieve records from their own archives, so pages may no longer exist on the Web or may have moved.

Examples of search engines include Infoseek, AltaVista, Google, Ask Jeeves, Lycos and HotBot.

Meta-Search Engines

Meta-search engines are very quick search tools that superficially search several individual search engines. In a meta-search engine, a user submits keywords that are applied simultaneously to several individual search engines and their databases of Web pages. Users get back results from all the search engines queried. Aggregate results are based on the "vote" of the individual sites. Meta-search engines do not own a database of Web pages. They send search terms to the databases maintained for other search engines. Because they catch only about 10 percent of search results in any of the search engines they visit, they are called "quick and dirty." Meta-search



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engines can be downloaded for free and can be customized to search selected search engines with complex search features.

Examples of meta-search engines include Copernic, Ixquick, ProFusion and SurfWax. A growing number of meta-search engines are becoming portals, such as Excite. Portals are sites that offer searching and links to thematic resources in addition

to many other services such as stock quotes, airline tickets, shopping malls, news links, games, chat rooms, free e-mail and much more.

Directories/Guides

Web directory (also called catalog or guide) is a Web site and another tool for locating information on the WWW. Subject directories are collections of hand-selected sites organized into hierarchical subject categories and compiled by professional or volunteer editors, subject specialists, agencies, associations or hobbyists. Unlike search engines, Web directories contain organized lists of topics and subtopics leading to the sources of information. Directories provide categorized lists of Web sites with brief descriptions. The user can move from menu to menu, making one selection after another, until he/she gets to the level where sites of interest are listed. The user is looking for a general category

of things, and that is how directories are organized.

Examples of Web directories include Yahoo!, Google's Directory and university libraries, which maintain their own subject directory.

The main difference between a search engine and a directory is that the search engine indexes all the information on all the Web pages it finds, whereas a directory categorizes Web sites and contains very little information about them (just the description). The search engine indexes are generated automatically, based on the words and phrases that are found on the Web pages. There is no human judgment filtering the information. The subject directories are created from human input; therefore directories contain far fewer sites. Also, since directories are updated manually, which is very time consuming, some old sites that are no longer valid (dead links) are listed long after their demise. A search engine takes the user to the exact Web page on which the words and phrases the user is looking for appear. A directory takes users to the home page of a Web site, and from there they can browse. The search engine should be used when the aim is to get to a particular piece of information quickly, when the user has limited time. A directory is very helpful to users who have only a vague idea of what they want and would like guidance. A directory functions like "yellow pages," the user knows what he/she is looking for but the exact name is unknown. The search engine becomes very helpful whenever the user knows the exact name.

Many search services use both schemes in a hybrid combination. These services send out a spider to collect Web sites, alongside people cataloging sites submitted by developers. Examples include Infoseek, Excite and Google.

Search Strategies

There are two search strategies that can be used to find relevant Web docu-

Advanced Search Techniques

PHRASE SEARCHING:	Requires terms entered in search box to appear in exactly the same order in documents retrieved. Phrase has to be enclosed in double quotations " ".
TRUNCATION:	Used when looking for terms with many possible endings. For example, typing in: femini* returns hits for feminism, feministic, feminine, etc.
BOOLEAN LOGIC:	A way to combine terms using "operators" such as AND, OR, AND NOT and sometimes NEAR (within 10 words).
GROUPING TERMS:	Search terms are grouped with the use of parenthesis (). What appears inside the parenthesis is processed first during searches.
SUB-SEARCHING:	Searching within the results of a previous search, allowing for subsequent narrowing of the list of hits.
FIELD SEARCHING:	Used to search within specific parts of Web pages, designated as titles, authors, etc.

ments. The first is a simple keyword search, where the user enters one or more keywords separated by spaces in the search box. In this type of search, the user accepts the system's defaults and may be overwhelmed by too many off-target results, especially when searching large databases. But when searching small and specialized databases, this is the best strategy. The small size of the databases makes more complex searching unnecessary and may even exclude many relevant documents. A second type of search strategy is the advanced search. The advanced search techniques include phrase searching, truncation, Boolean logic, grouping terms, sub-searching, and field searching.

Phrase searching requires that the terms entered in the search box appear in exactly the same order in the documents retrieved. To perform a phrase search, for example, a proper name, name of organization or movement or a distinct phrase, the phrase has to be enclosed in double quotations " ".

Truncation can be used when the user is looking for terms with many possible endings. Truncation permits retrieving all these variations in one search term. Some systems search word endings variants automatically (femini*, for feminism, feministic, feminine, etc.).

The **Boolean logic** can be applied as a way to combine terms using "operators" such as AND, OR, AND NOT

and sometimes NEAR (within 10 words). For example, AND forces all the terms to be present in all documents retrieved. OR retrieves records with either term. It will help if there are synonyms or spelling variations (women OR females). AND NOT excludes terms. If the user anticipates a lot of search results with terms he/she does not want, Boolean AND NOT will help. For example, when searching for *biomedical engineering AND cancer*, such a query will bring a long list of academic programs. If the user just wants to search for their research reports, to exclude the documents containing the words *department of* or *school of*, a query should contain "*biomedical engineering*" AND *cancer* AND NOT "*department of*" AND NOT "*school of*". **Grouping terms** is possible with the use of parenthesis (). As in algebra, what appears inside the parenthesis is processed first during searches. Some search engines permit **sub-searching**, which is searching within the results, allowing for subsequent narrowing of the list of hits. The **field searching** can be used to search within specific parts of the Web pages, designated as titles, authors, etc. For the advanced searches, the AltaVista search engine works very well. It has great coverage, claims hundreds of million of sites and allows using advanced query features such as Boolean logic,

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sub-searching and truncation. It also allows limiting the number of documents by date and translates to and from foreign languages.

Image Databases

During the last few years we have witnessed an explosion in the use of image databases to include image archives available over the Internet. As the image databases grow larger, the traditional methods to retrieve images of interest from such large collections are no longer sufficient. Keywords are still the most common technique used to provide information about the content of the image database. However, to describe the images to a satisfying degree of detail, sophisticated keyword systems are need-

ed. One serious drawback in keyword approach is the need of trained personnel not only to attach keywords to each image, which is time consuming, but also to

retrieve images by selecting keywords that are the best descriptors for image content, which requires the knowledge of the index used to catalog images.

The newest image retrieval techniques are focusing on automated **content-based image retrieval** (CBIR). The basic principle underlying all current CBIR techniques is the use of image analysis algorithms to automatically extract a number of image attributes at the time of image archive implementation. These attributes may include numerical values, histograms, color, texture, shape, small index pictures, etc. Due to the complexity of the image information, the user cannot expect exact matches between the query and retrieved images from the database. The similarity between the user's query and images in the archive is assessed by similarity matrices; finding the near-

est neighbors of the query among the images in the database with respect to a suitable pre-defined metric.

Image queries can be divided into three levels of abstraction: primitive features such as color, texture or shape, logical features such as the identity of objects shown, and abstract attributes such as the significance of the scenes depicted. While current CBIR systems operate effectively only at the lowest, primitive features levels, most users demand higher levels of retrieval. After a decade of intensive research, CBIR technology is now beginning to move out of the laboratory into the marketplace, in the form of commercial products like IBM's QBIC, or Virage's VIR Image Engine.

After a decade of intensive research, CBIR technology is now beginning to move out of the laboratory into the marketplace

Demonstration versions of numerous experimental systems can be viewed on the Web, including QBIC (this system allows searches by visual image content such as color percentages, color layout and textures), MIT's Photobook (a fully automatic system for detection, recognition and model-based coding of faces for potential applications

such as video telephony and automatic face recognition), Columbia University's WebSEEk (a content-based image and video search and catalog tool for the Web), and Viper (a system for visual information processing for enhanced retrieval) from the University of Geneva. Also, AltaVista, Yahoo! and Google search tools now have image retrieval facilities. The image search engines, such as Google Image and AltaVista Image, allow finding images on the Web based on keywords or phrases.

Video

Video sequences are an increasingly important form of image data for many users and pose their own special challenge to those responsible for their storage and retrieval, both because of their additional complexity and their sheer volume. Video images contain a wider

range of primitive data types (the most obvious being motion vectors), occupy far more storage, and can take hours to review, while the comparable process for still images takes seconds at most. All but the shortest videos are made up of a number of distinct scenes, each of which can be further broken down into individual shots depicting a single view, conversation or action. A common way of organizing a video for retrieval is to prepare a storyboard of annotated still images (often known as key frames) representing each scene. Another is to prepare a series of short video clips, each capturing the essential details of a single sequence—a process sometimes described as video skimming. Carnegie-Mellon University's Informedia project has pioneered new approaches for automated video and audio indexing, navigation, search and retrieval. The Informedia approach uses combined speech, language and image understanding technology to automatically transcribe, segment and index the video. The same tools are applied to accomplish intelligent search and selective video retrieval.

No one service catalogs the whole Web. Each service logs parts of it and a certain overlap exists. It is estimated that each of the search engines provides about 40 percent unique content and there is an overlap of about 60 percent among search engines. Therefore, to obtain a broad coverage it is recommended to try more than one search tool. Services also differ in a way they rank hits. For instance, some advertisers pay for their sites to be listed on some services, so their sites get priority listing, being listed in the search even if their site has nothing to do with what the user is seeking.

Some search engines, such as Google, use unique ranking algorithms that are based on how many other sites link to a particular site. Google adds weight to frequent citations. The popularity ranking is based on the assumption that other pages would create a link to the "best" pages. This type of

ranking usually works very well, returning quality documents.

Typical ranking algorithms used by search tools involve the location and frequency of keywords on a Web page, the location/frequency method. Pages with the search terms appearing in the HTML title tag are often assumed to be more relevant than others to the query. Search engines also check if the search keywords appear near the top of a Web page, such as in the headline or in the first few paragraphs of text. They assume that any page relevant to the topic will mention those words right from the beginning. Frequency is the

other major factor in how search engines determine relevancy. A search engine will analyze how often keywords appear in relation to other words in a Web page. Those with a higher frequency are often deemed more relevant than other Web pages.

Conclusion

There are hundreds of search tools on the Web. Try using a variety of search services using your favorite key words and you will see how radically different the hits are with each search engine or directory. No one service is perfect, so use as many as you have time for.

Using many search engines will help you get a feel for how the different kinds of services work. You will soon find a favorite search tool that will allow you to get to all the information you need quickly and painlessly. □

Editor's Notes: The final installment in the "Internet for You" series will appear in the November issue of RSNA News.

The original mini-tutorial on the Internet by Katarzyna J. Macura, M.D., Ph.D., was published in the AAWR Newsletter Focus. Dr. Macura is updating her series for RSNA News.



JOURNALS

Radiology in Public Focus

A press release has been sent to the medical media for each of the following scientific articles appearing in the August issue of *Radiology* (radiology.rsnaajnl.org):

"Gender Differences in Muscle, Bone, and Fat Volume in Pre-pubertal Children"

Fat accumulation and musculoskeletal development varies between boys and girls, even those as young as five years of age.

Kiumars Arfai, M.D., from Childrens Hospital Los Angeles, and colleagues used abdominal CT to scan 31 pairs of healthy Caucasian girls and boys (5–10 years of age), matched for age, height and weight.

They found that compared with boys, girls had, on average, 28-percent greater total fat and 30-percent higher subcutaneous fat,

but 10 percent less paraspinal musculature and 15 percent smaller vertebral cross-sectional dimensions.

They showed similar amounts of visceral fat.

The researchers write,

"Taken together, these data indicate that gender is an important determinant of the morphology of humans well before the beginning of puberty."

In a separate interview, co-author Vicente Gilsanz, M.D., Ph.D., also of Childrens Hospital, said this study shows that "certain traits associated with negative health outcomes in

adults, such as low bone density, a precursor to osteoporosis, or high visceral fat, which can lead to cardiovascular disease, can be measured in children."

(*Radiology* 2002; 225:338-344)

"Is the Spatial Distribution of Brain Lesions Associated with Closed-Head Injury in Children Predictive of Subsequent Development of Posttraumatic Stress Disorder?"

Using MR imaging of the brain on 94 children, adolescents and young adults who experienced closed-head injury (CHI), researchers have found that those who do not develop symptoms of posttraumatic stress disorder (PTSD) one year after CHI, tend to have higher lesion fractions in the

limbic system on the right than subjects who do satisfy the reexperiencing criterion for PTSD.

Edward H. Herskovits, M.D., Ph.D., from Johns Hopkins Medical Institutions in Baltimore, R. Nick Bryan, M.D., Ph.D., from the Hospital of the University of Pennsylvania in Philadelphia, and colleagues say the lesions induced by CHI in the limbic system on the right may inhibit subsequent manifestation of PTSD reexperiencing symptoms.

They add that their study represents the only lesion-deficit analysis of PTSD after CHI in children or adults.

(*Radiology* 2002; 225:345-351)



RSNA Journal Editors Offer Expert Advice to Potential Authors

The editors of RSNA's two peer-reviewed journals are making house calls in an effort to improve the quality and the review process for submitted manuscripts.

Radiology Editor Anthony V. Proto, M.D., and RadioGraphics Editor William W. Olmsted, M.D., launched a pilot program in May after Dr. Proto submitted the idea and received approval from the RSNA Board of Directors. RSNA pays the editors' expenses and also the luncheon for those who attend.

"I thought that the visiting editors program would be of help in that both editors would be able to discuss the similarities and differences between their respective journals," says Dr. Proto. "Also, I believed it would be helpful for authors to learn of common problems with manuscripts resulting in their rejection."

Over the next three years, they will visit as many as three radiology programs per year to give presentations addressing issues such as manuscript decision categories, acceptance and rejection rates, reasons for manuscript rejection, types of submissions appropriate for each journal and common problems seen in submitted manuscripts.

"In particular, we hope to provide prospective authors with information that can be of help to them both in their research projects and in communicating their work in the form of the written manuscript," Dr. Proto adds.

The first stop in the RSNA Visiting Editors Program was Boston where Drs. Proto and Olmsted were greeted by enthusiastic audiences at Massachusetts General Hospital, Brigham and Women's Hospital and Boston Univer-



RadioGraphics Editor William W. Olmsted, M.D. (left), poses with Pablo R. Ros, M.D., M.P.H. (center), executive vice-chairman of the Radiology Department at Brigham and Women's Hospital, and Radiology Editor Anthony V. Proto, M.D. (right), during the inaugural stop in the Visiting Editor's Program.

sity Medical Center. Those in attendance included department chairs, junior faculty, residents, fellows and even the medical students.

"At all three institutions there was a tremendous audience," says Dr. Olmsted. "We presented our material in two 45-minute segments and then allowed 90 minutes for questions and answers. In each instance, the faculty and residents asked questions right up to the last minute, and the discussion and interchange were excellent."

Some of the questions about *Radiology* and *RadioGraphics* included how to get an edu-

cation exhibit published, how the interactive education process in the RSNA Education Portal works, and about the

At all three institutions there was a tremendous audience. . . . In each instance, the faculty and residents asked questions right up to the last minute, and the discussion and interchange were excellent.

—William W. Olmsted, M.D.

planned 2003 *RadioGraphics* monograph issue which will be online only.

For *Radiology*, key questions centered on the types of manuscripts desired, common problems with manuscripts, reasons for manuscript rejection and the evaluation processes.

Not only are the audiences learning something, but the editors are also learning something. "I think we're getting a lot of valuable feedback from the audience," says

Dr. Olmsted. "In Boston, there were a tremendous number of really good questions. I'm quite sure I will look at some *RadioGraphics* issues differently as a result of these discussions."

Pablo R. Ros, M.D., M.P.H., executive vice-chairman of the Radiology Department at Brigham and Women's Hospital believes the program is valuable, "We are delighted that the RSNA Board of Directors and its journal editors selected our group of institutions as the very first site to visit in this program. The overall impression from the attendees was very positive."

The next scheduled stop for the Visiting Editors Program will be Vanderbilt University in Nashville this fall. In 2003, they will travel to Rhode Island Hospital, the University of Virginia and the University of South Alabama. In 2004, it will be Indiana



An enthusiastic lunchtime crowd gathers at Brigham and Women's Hospital to familiarize themselves with the missions of *Radiology* and *RadioGraphics*, and to discuss manuscript preparation and review procedures.

University School of Medicine, the National Naval Medical Center Programs and Michigan State University.

Once the three-year pilot program is completed, the RSNA Board of

Directors will review its success and will decide if the program will continue. □

RSNA Board of Directors Report

Continued from page 5

RadiologyInfo™

The Board approved the three-year plan and budget for the RSNA/ACR joint patient education Web site, *Radiology-Info* (www.radiologyinfo.org). The plan includes continually enhanced content and promotion to general physicians so that they can encourage their patients to review the site prior to having a radiologic procedure. In July, a newly redesigned *RadiologyInfo* was launched with information on more than 40 common diagnostic, therapeutic and interventional procedures. (See July *RSNA News*.)

RSNA Board Structure

In order to focus more attention on the Society's mission of "promoting excellence through education and by fostering research with the ultimate goal of improving patient care," the Board has approved for presentation to the membership the creation of a liaison for sci-

ence. This liaison will work closely with the RSNA Research and Education Foundation, the Foundation's Board of Trustees, Foundation Committees, the RSNA Scientific Program Committee, Associated Sciences Committee, Research Development Committee and the science editor. More details will be available in a special communication that will appear in a future edition of *Radiology*, *RadioGraphics* and *RSNA News*.

Other Board Action

- The Board authorized a three-year pilot program to establish a Research and Education Foundation Fund to be jointly administered with the Canadian Radiological Foundation (CRF). Canadians contributing a minimum of \$1,000 to this fund would receive a tax receipt from CRF. The R&E Foundation would distribute the funds.
- Free online access to *Radiology*, *RadioGraphics* and InteractED will be granted to qualifying institutions in

emerging nations.

- The Board authorized adoption and support of the AMA's Declaration of Professional Responsibility: Medicine's Social Contract with Humanity, subject to review by counsel.
- The Refresher Course Committee will begin organizing 2003 refresher courses around the CAQ examinations, using case-based/audience response courses.

BRIAN C. LENTLE, M.D.

CHAIRMAN, 2002 RSNA BOARD OF DIRECTORS

Editor's Note: In our continuing efforts to keep RSNA members informed, the chair of the RSNA Board of Directors will provide a brief report in RSNA News following each board meeting.

The next RSNA Board Meeting is in September.

Vanguard Company Spotlight

Bracco Diagnostics Inc.



As a Vanguard contributor to the RSNA Research and Education Foundation, Bracco Diagnostics Inc. of

Princeton, N.J., supports the notion of providing scientists with the necessary resources to pursue novel research activities.

“Grants from the Foundation are extremely important,” says Carlo Medici, company president and chief executive officer. “They provide young investigators opportunities to explore unique research ideas that may make a significant impact on the healthcare of patients.”

Reed A. Omary, M.D., M.S., can attest to the value of Bracco’s support. Dr. Omary received the 1999 Bracco Diagnostics/RSNA Research Scholar Award to conduct his studies of renal artery stenosis. He credits the academic time he received from the award for helping him to earn a five-year, \$550,000 grant from the National Institute of Diabetes & Digestive & Kidney Diseases to continue his renal artery research.

Dr. Omary is one of six young investigators who have pursued their

research goals as a result of Bracco’s generosity. Another is Haiying Hang, Ph.D., from the Center for Radiological Research at Columbia University in New York. Dr. Hang is the 2001 Bracco Diagnostics/RSNA Research Scholar. He says the Bracco Diagnostics/RSNA Research Scholar Award is a tremendous help for his work and career development. Dr. Hang is studying the “Relationships between ATM and the RAD1p/ RAD9p/HUS1p Protein Complex.”

Part of the Bracco Group in Milan, Italy, Bracco Diagnostics was established in 1994 when the Bracco Group acquired Squibb Diagnostics from Bristol-Myers Squibb. With more than 70 years of contrast media experience, Bracco Diagnostics develops and distributes a wide variety of diagnostic imaging agents in the United States. Bracco’s products are used in conjunction with x-ray, CT, MR and nuclear medicine procedures.

“Bracco Diagnostics is proud to support the RSNA Research Scholar Program and to be an RSNA Research

and Education Foundation Vanguard company,” adds Medici.

The RSNA Research Scholar Program is designed to provide support for young faculty members early in their academic careers by freeing at least one-half of their time to gain experience in research. The grant is \$75,000 annually for two years to faculty members in North American institutions who are within five years of their initial faculty appointment. Scholar applicants must be nominated by their host institution and are required to take the *Advanced Course in Grant Writing* offered through the RSNA Department of Research. If

awarded, the scholar may select a medical student/scholar assistant to help in his or her research project.

For more information on the RSNA Research and Education Foundation grant programs, contact Scott Walter at (630) 571-7816 or at walter@rsna.org.

For more information about becoming an RSNA Research and Education Foundation Vanguard company, contact Deborah Kroll at (630) 368-3742 or at dkroll@rsna.org. □



PROGRAM AND GRANT ANNOUNCEMENTS

How to Write a Good Grant Application

Deadline for Registration is October 25, 2002

This four-hour workshop will be on November 30, 2002, immediately prior to RSNA 2002 in Chicago. The goal of the workshop is to provide participants with an introduction to writing a grant

proposal for NIH, specifically relating to the radiologic sciences. The course is primarily intended for faculty in academic centers who wish to pursue a career in radiologic research. (*Participants must be registered for RSNA 2002 to attend.*) For more information, contact Joseph Koudelik at (630) 368-3758 or jkoudeli@rsna.org.

Introduction to Research

An Introduction to Research workshop will be offered at RSNA 2002 to second-year residents. Sessions are cosponsored by RSNA, ARRS and AUR. For more information, contact Joseph Koudelik at (630) 368-3758 or jkoudeli@rsna.org.



Research and Education Foundation Donors

THE BOARD OF TRUSTEES of the RSNA Research and Education Foundation and its recipients of research and educational grant support gratefully acknowledge the contributions made to the Foundation **between May 30, 2002 and June 27, 2002.**

DIAMOND (\$10,000+)

Canon, U.S.A.
Varian Medical Systems

PLATINUM (\$1,000 - \$4,999)

Betty J. & Robert J. Douglas, M.D.
Michael S. Huckman, M.D.
Lippincott Williams & Wilkins

SILVER (\$200- \$400)

Arkansas Heart Hospital
Leovigildo Ferat Montalvo, M.D.
Julie & Bruce L. McClennan, M.D.

BRONZE (\$1 - \$199)

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Jorge Garcia Solis, M.D.
Stefano Sposato, M.D.
Robert Jan Van Geuns, M.D.
Jakub Wiskirchen, M.D.

26
MEMBERS
(as of June 27, 2002)

RSNA PRESIDENT'S CIRCLE MEMBERS
(\$1,500/year for 10 years)

Judy and William A. Murphy Jr., M.D.

HORIZONS IN RADIOLOGY

Online donations can be made at www.rsna.org/research/foundation/donation.

RSNA: WORKING FOR YOU

R&E Education Grants

The RSNA Research and Education Foundation Education Study Section has completed its review and scoring of the 27 grant applications submitted for the four Educational Program Grants offered each year by the Foundation. The Grants Committee will now evaluate the scores and available funding to determine which proposals should be funded. Their recommendation will go to the R&E Foundation Board of Trustees for final approval in September. To view current grant recipients, go to www.rsna.org/research/foundation/recipients.html.

New Courses at RSNA 2002

The categorical course in diagnostic radiology at RSNA 2002 will be *Findings at Ultrasound—What Do They Mean?* And the two-day IHE Symposium is now the *Radiology Informatics* series, which will be held throughout the week.



E-Mail Connections

Have you submitted your e-mail address to RSNA? If not, you may be missing out on essential information. Members with e-mail addresses receive notification of urgent news in radiology, a monthly E-Newsletter and important reminders and updates about membership benefits, annual meeting registration and course information. You may unsubscribe at any time. To submit your e-mail address, contact the Membership and Subscriptions Department at membersh@rsna.org or (630) 571-7873.

Provisional Letters

RSNA members who recently completed their residencies will receive a letter from the Membership Department requesting an update of their professional information. To ensure continuous receipt of RSNA member benefits, make sure we have your current address, phone number and e-mail address.

Reminder for Residents

August 15 is the deadline for residents to submit a completed membership application to receive three complimentary print copies of *Radiology* (October, November and December 2002) and two complimentary issues of *RadioGraphics* (September–October, November–December 2002).



If you have a colleague who would like to become an RSNA member, you can download an application at www.rsna.org/about/membership/memberapps.html, or contact the RSNA Membership and Subscription Department at (630) 571-7873 or membersh@rsna.org.

News about RSNA 2002

Badge Wallets

North American attendees who register by **November 1, 2002**, will have their badge wallets, containing their name badge, tickets and attendance vouchers mailed to them prior to the Scientific Assembly. Badge wallets will be sent to Non-North American attendees two to three weeks before the meeting if their registration forms are received by **October 11, 2002**.

International registration forms received October 12 – November 1 require badge wallets to be picked up at McCormick Place in the South Building, Room S100, Desk A during professional registration hours.

A free **Metra Train System pass** for the seven days of RSNA 2002 will be placed inside the badge wallet.

Pocket and Transportation Guide

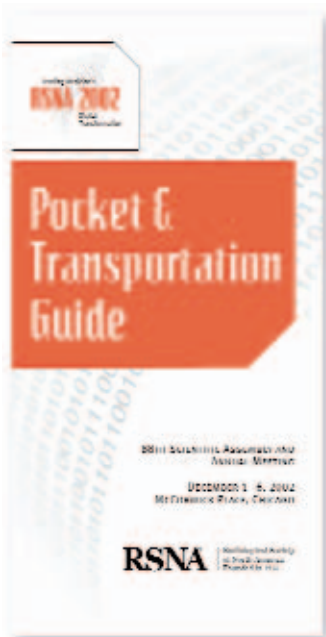
Another important element of the badge wallet is the RSNA *Pocket and Transportation Guide*. This pocket-size booklet provides “must-have” information to navigate in and around RSNA 2002.

The first part of the booklet is a complete transportation guide. It includes:

- Shuttle bus schedules, routes and boarding locations
- Taxi fees, loading and unloading areas
- Airport transportation service with times, cost and boarding information
- A complete Metra Train System schedule outlining station locations, times and drop-off destinations
- Parking lot locations, hours and fees

The second part of the booklet offers a complete overview of the RSNA Scientific Assembly and Annual Meeting including:

- A complete A-Z listing of everything available to attendees
- Room assignments for the scientific sessions, refresher courses and plenary sessions
- Floor plans of each building and each floor of McCormick Place



Stay at Your Favorite Hotel

To ensure getting the hotel of your choice for RSNA 2002, register as soon as possible. Of the 65 hotels that are in the RSNA block, 60 still have rooms available.

General registration and enrollment for Refresher Courses are under way. You may register for both simultaneously via the Internet, fax or mail.

CME Opportunities

RSNA 2002 offers up to 80.5 hours of category 1 credit toward the AMA Physician's Recognition Award.

Registration Made Easy

Online (24/7)
www.rsna.org/rsna/advance-registration/

New in 2002, all registration categories are eligible to register by Internet. If you request hotel reservations, a hotel room deposit will be charged to your credit card.

Fax (24/7)
(800) 521-6017
(847) 940-2386 outside the United States and Canada

Phone (M – F, 8 a.m. – 5 p.m. CT)
(800) 650-7018
(847) 940-2155 outside the United States and Canada

Mail
ExpoExchange/RSNA 2002
108 Wilmot Rd., Ste. 400
Deerfield, IL 60015-0823

A confirmation will be sent by e-mail, fax or mail for each registration processed and for every change made. Please allow seven days for receipt of confirmation. Contact rsna@expoedge.com with your registration questions.

Important Dates for RSNA 2002

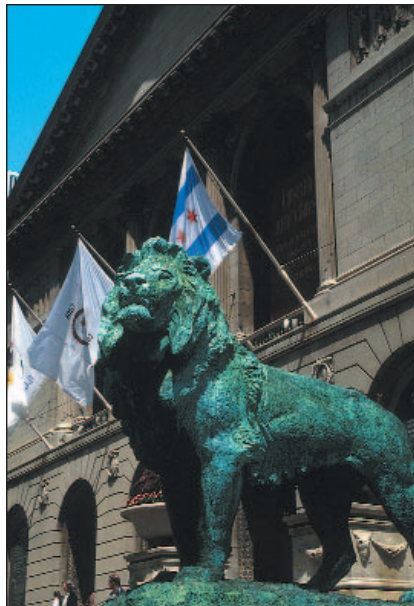
October 11	Registration Deadline for Non-North American Attendees to Receive Badge Wallet by Mail
November 1	Final Advance Registration Deadline
December 1-6	RSNA 88 th Scientific Assembly and Annual Meeting



DECEMBER 1 – 6
McCORMICK PLACE,
CHICAGO

Museums and Attractions

As you plan your free time in Chicago during RSNA 2002, you may want to stop by the Field Museum to see *Pearls and Chocolate*, two new temporary exhibits. Meanwhile, The Art Institute of Chicago is host to *The Medici, Michelangelo, and the Art of Late Renaissance Florence* (see article on following page).



The Art Institute of Chicago

Shuttle Bus Service

Children under the age of 16 will be allowed to ride on the RSNA shuttle buses; however, they still will not be allowed to attend the meeting. Onsite childcare will be available for children ages six months to 12 years through ACCENT on Children's Arrangements, Inc. Application forms are available on the Internet at www.rsna.org/rsna/advanceregistration/.

Advance Registration Saves Time & Money

Registration rates increase \$100 onsite, so register by November 1 to save money and avoid long lines at McCormick Place. Also, housing reservations are made on a first-come, first-served basis. The sooner you register, the better your chances of booking the hotel of your choice.

For more information on RSNA 2002, call (630) 571-7862 or e-mail reginfo@rsna.org.

NEW AT RSNA 2002

NEW "HANDS-ON" WORKSHOPS AT RSNA 2002

Fujifilm Medical Systems will join four other companies offering "Hands-on" Computer Workshops: Basic Training for Radiologists" at RSNA 2002.

SUNDAY - THURSDAY 9:00 - 10:30 A.M.

Introduction to Next Generation PACS

SUNDAY - THURSDAY 11:30 A.M. - 1:00 P.M.

Advanced Radiologists Workflow

The other companies are AGFA Healthcare, Siemens Medical Solutions USA, GE Medical Systems and Philips Medical Systems.

Although workshop reservations are made through RSNA, the workshops are not offered for CME credit. For more information or to register, go to www.rsna.org/rsna/advanceregistration.

CATEGORICAL COURSE IN DIAGNOSTIC RADIOLOGY

Findings at Ultrasound—What Do They Mean?

Peter L. Cooperberg, M.D., Director
J.W. Charboneau, M.D., Co-director
Tom Winter, M.D., Co-director

This series of eight courses is accompanied by a syllabus.

SUNDAY, DECEMBER 1
Obstetrics I

MONDAY, DECEMBER 2
Gynecology

TUESDAY, DECEMBER 3
Liver
Musculoskeletal

WEDNESDAY, DECEMBER 4
Fetal Anomalies

THURSDAY, DECEMBER 5
Doppler Technique
Abdomen

FRIDAY, DECEMBER 6
Small Parts



To register, use your *Advance Registration Brochure* or register on the Internet at www.rsna.org/rsna/advanceregistration. For more information or to order a brochure, call (630) 571-7862 or e-mail reginfo@rsna.org.

Chicago's Exciting Events and Attractions Add Allure to RSNA 2002

Whether you're a veteran visitor or a "first-timer" to the Windy City for RSNA 2002, Chicago's calendar of events for the first week in December is loaded with a diverse selection of art, music and activities. There's something for everyone in the family!

Chocolate and Pearls at the Field Museum

Journey around the world as the Field Museum's *Chocolate* exhibition examines the history, science and culture of chocolate. This product of the rainforest's cacao plant is followed across cultures and through time beginning in Central America and continuing to Aztec Mexico and then to upper-class Europe before becoming a mass-produced, ubiquitous part of today's popular culture.

The Field's exclusive *Pearls* exhibition explains their glamour, history and science through more than 600 objects comprising nearly half a million pearls. The only gems formed in living organisms, pearls never need to be cut or pol-

ished. Their luminous colors include black, gold, pink, purple and white.

While visiting the Field Museum, say hello to Sue, the largest, most complete and best preserved *Tyrannosaurus rex* fossil ever discovered. It is one of the many noteworthy specimens in the Field's permanent collection. The Field anchors the Museum Campus on South Lake Shore Drive at Soldier Field.

THE FIELD MUSEUM
1400 S. Lake Shore Dr.
(312) 922-9410
www.fnmh.org



Marilyn Monroe's husband, Joe DiMaggio, purchased this simple but elegant necklace in Japan during their 1954 honeymoon.

© American Museum of Natural History
Photo by D. Finnin



On Valentine's Day, chocolate is a symbol of love—the ideal romantic gift, combining sweet indulgence and elegant taste.

Photo courtesy of The Field Museum

Late Renaissance Art from Florence at the Art Institute

In addition to the spectacular permanent collection, two special exhibitions will be at the Art Institute in December. The much awaited Italian exhibition, *The Medici, Michelangelo, and the Art of Late Renaissance Florence*, includes nearly 200 works of art from paintings to costumes, sculptures and tapestries. Michelangelo's art will be featured along with work from Bronzino, Cellini, Giambologna, Pontormo and Salviati who were also employed by the Medici family. This is the

first time some of the works have left Florence.

A concurrent exhibition includes approximately 60 pieces of Spanish sculptor Juan Muñoz work from the mid-1980s onward. Do not miss his famous "conversation pieces," which comprise large groups of figures.

THE ART INSTITUTE OF CHICAGO
111 S. Michigan Ave.
Tickets: (312) 930-4040
Membership: (312) 575-8000
www.artic.edu
www.ticketmaster.com

Terra Museum of American Art

This anniversary celebration is not to be missed. *A Place on the Avenue: Terra Museum of American Art Celebrates 15 Years in Chicago* exhibits a diverse selection of Daniel J. Terra's collection of significant works of American art. Art acquired after Ambassador Terra's death in 1996 will be displayed in a separate gallery to demonstrate the continuing spirit of the collection.

The permanent Terra Collection consists of more than 700 important works by American artists with an emphasis on American Impressionism.

664 N. Michigan Ave.
(312) 664-3939
www.terramuseum.org

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Museum of Contemporary Art

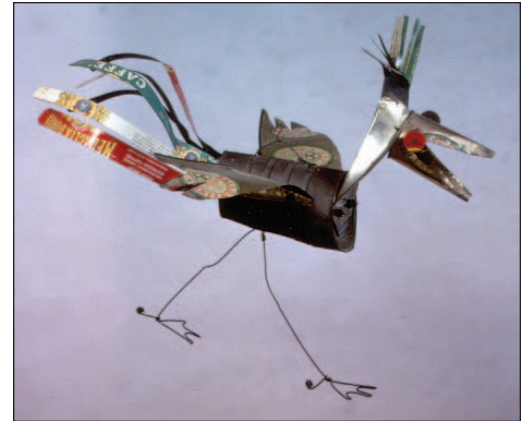
The three exhibits at the MCA in December range from visually stunning to thought provoking. See 15 of Alexander Calder's mobiles and stabiles made of bronze, found objects, metal and wood. The Leonard and Ruth Horwich Family Loan exhibition spans Calder's approximate 40-year career beginning in the '20s.

The now-you-see-it-now-you-don't concept is pushed to the extreme by sculptor Giuseppe Gabellone. The photos in this exhibit are of sculptures created by Gabellone and destroyed soon after photographing them. Gabellone thereby questions the documentary accuracy of photographs and the permanence of sculpture.

British video artist Gillian Wearing showcases the tragedy and humor of daily life. Her work is based on the filmed words and actions of Londoners.

The MCA's permanent collection represents trends in art after 1945, with a special emphasis in Surrealism (1940s and 1950s), Minimalism (1960s), conceptual art and photography (1960s to the present), installation art and art by local artists. The collection includes painting, sculpture, photography, video, film and installations.

220 E. Chicago Ave.
(312) 280-2660
www.mcachicago.org



Alexander Calder, *Bird*, 1952. Coffee cans, tin and copper wire. The Leonard and Ruth Horwich Family Loan.

SHEDD AQUARIUM

The aquarium is home to aquatic life from around the world. Visit the seahorses, otters, seals, dolphins, penguins and whales. The Shedd, a principal part of the Museum Campus, is a tasteful blend of contemporary and 1930s architecture situated on the shore of Lake Michigan.

1200 S. Lake Shore Dr.
(312) 939-2438
www.sheddnet.org

ADLER PLANETARIUM

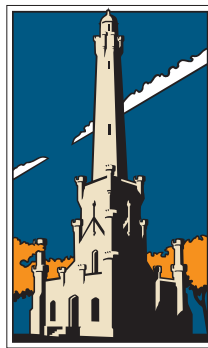
The shows at the planetarium are scheduled continuously throughout the day. See unforgettable views of our solar system from the Hubble Space Telescope, watch solar

storms and see how the universe began five-billion years ago. Also, view the sky through the eyes of African astronomers from 1,000 years ago and learn about the history of Mars as seen by various cultures through the ages. The Adler Planetarium is located on a scenic section of the Museum Campus jutting into Lake Michigan.

1300 S. Lake Shore Dr.
(312) 922-7827
www.adlerplanetarium.org

PEGGY NOTEBAERT NATURE MUSEUM

The photographic exhibition titled "Food Chain" links who eats whom in sometimes



CHICAGO
CONVENTION AND TOURISM BUREAU

humorous and surprising ways. Also, be sure to enjoy the beauty of the Judy Istock Butterfly Haven. The permanent exhibits explore how humans impact the environment.

2430 N. Cannon Dr.
(773) 755-5100
www.chias.org

MUSEUM OF SCIENCE AND INDUSTRY

The Museum of Science and Industry has something for everyone: a farm, a U-505 submarine, a fairy castle and a coal mine. Visitors may walk through the human heart, watch chicks hatch and throw their voices in the whispering gallery. Aspiring astronauts may visit the lunar module and the Apollo 8 Command Module.

57th St. and
Lake Shore Dr.
(773) 684-1414
www.msichicago.org

CHICAGO HISTORICAL SOCIETY

This urban museum presents the fascinating multicultural heritage of the region in creative, up-to-date exhibits.

1601 N. Clark St.
(312) 642-4600
www.chicagohs.org

GARFIELD PARK CONSERVATORY

View the holiday flower show at the Garfield Park Conservatory, which was built in 1907. The conservatory was designed by architect Jens Jensen and is one the world's largest gardens under glass.

300 N. Central Park Ave.
(312) 746-5100
www.garfield-conservatory.org

Performing Arts in Chicago

Theater

THE DEAD

by Richard Nelson
music by Shaun Davey
James Joyce's haunting Irish
Christmas Eve musical

Court Theatre
5535 S. Ellis Ave.
(773) 753-4472
courtheatre.uchicago.edu

GOD AND COUNTRY

by Douglas Post
A new musical of Antigone

Victory Gardens Theater
& Training Center
2257 N. Lincoln Ave.
(773) 871-3000
www.victorygardens.org

I JUST STOPPED BY TO SEE THE MAN

by Stephen Jeffreys
An English rock singer investi-
gates legends surrounding a Delta
blues singer

Tickets go on sale September 12
Steppenwolf Theater
1650 N. Halsted St.
(312) 335-1650
www.steppenwolf.org

SECOND CITY

Comedy and improvisation
Mainstage and ETC stage

1616 N. Wells St.
(312) 337-3992
www.secondcity.com

FAMILY PERFORMANCES:

42ND STREET

Ford Center for the Performing Arts,
Oriental Theatre
24 W. Randolph
(312) 902-1400
www.ticketmaster.com



A CHRISTMAS CAROL

Tickets go on sale August 12th
Goodman Theatre
170 N. Dearborn St.
(312) 443-3800
www.goodman-theatre.org

THE NUTCRACKER

Joffrey Ballet of Chicago
Auditorium Theatre
50 E. Congress Pkwy.
(312) 902-1500
www.auditoriumtheatre.org
www.ticketmaster.com

STOMP

The Shubert Theatre
22 W. Monroe St.
(312) 902-1400
www.ticketmaster.com

TUBES

by Blue Man Group
Performance Art Meets Music
Briar Street Theatre
3133 N. Halsted
(773) 348-4000
www.blueman.com
www.ticketmaster.com

Symphony and Opera

LYRIC OPERA OF CHICAGO

Die Walkure

December 2, 6
Hear the famous cry of "hojotoho" as the
Valkyries ride across the sky in the third opera
of Wagner's famous Ring Cycle

by Richard Wagner
Conductor: Sir Andrew Davis
with Andrea Rostjane Eaglen, James Morris,
Deborah Voigt, Thomas Studebaker, Marjana
Lipovsek and Phillip Ens.

Sweeney Todd

December 4
A tale of revenge set in Victorian London
by Stephen Sondheim
Conductor: Paul Gemignani
with Bryn Terfel, Judith Christin, Nathan Gunn,
Timothy Nolen, Celena Shafer, David Cangelosi,
Sheri Greenawald, Matthew Lord and Bonaven-
tura Bottone.

Tickets go on sale in August

20 N Wacker Dr
(312) 332-2244 x5600
www.lyricopera.org

THE CHICAGO SYMPHONY ORCHESTRA

December 5
Pierre Boulez, conductor
Daniel Barenboim, piano
Haydn Symphony No. 2
Schoenberg Piano Concerto
Schoenberg Chamber Symphony No. 2
Strauss Burlesque

220 S. Michigan Ave.
(888) 294-3550
www.chicagosymphony.org

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Family Activities

AMERICAN GIRL PLACE

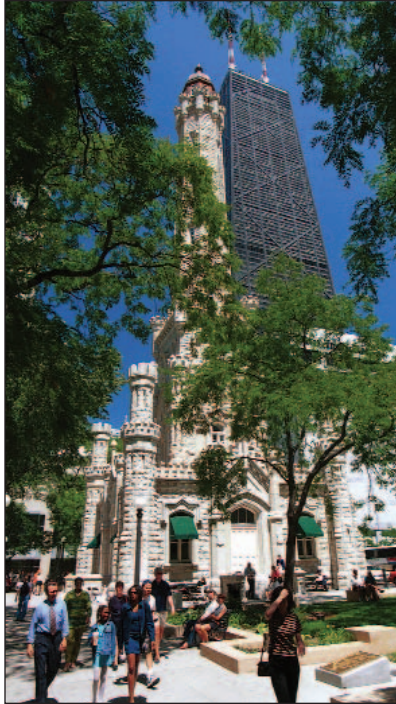
Shoppers at American Girl Place may choose among the beautiful dolls and catch *Circle of Friends: An American Girls Musical* in the theater. Lunch, tea and dinner are served at The Café. Reservations are recommended.

111 E. Chicago Ave.
(877) 247-5223
www.americangirl.com

CHICAGO CHILDREN'S MUSEUM

This museum is uniquely geared to children in the 5th grade or younger and their families. The hands-on exhibits are creatively focused on art, science and humanities. The Gingerbread Fantasy Factory exhibit will be open for holiday visitors. Children may decorate their own cookies while being entertained by the Gingerbread Man or watching performances of the Gingerbread Rag. Additionally, children may enter Arthur's™ World, a 2,500 square foot exhibition based on the Emmy award-winning PBS children's television series and popular books by Marc Brown.

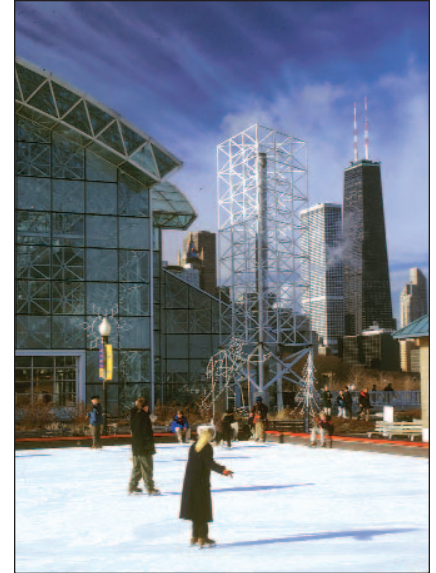
700 E. Grand Ave.
on Navy Pier
(312) 527-1000
www.chicildrensmuseum.org



LINCOLN PARK ZOO

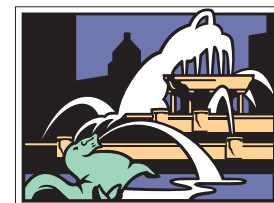
The Lincoln Park Zoo is the oldest zoological garden in the country, as well as one of the most modern. Casting a festive glow on the zoo grounds, the ZooLights Festival is a nightly event during the holiday season.

2200 N. Cannon Dr.
(312) 742-2000
www.lpzoo.com



Tours & Events Brochure

For information about RSNA-sponsored tours and events in Chicago during RSNA 2002, a *Tours & Events Brochure* is available. Those who participated in tours at RSNA 2000 and RSNA 2001 will automatically receive a copy. You may download a brochure or request one to be mailed at www.rsna.org/rsna/advanceregistration. Check the box at the top right-hand corner of the Registration and Housing Form (From 1) for the brochure to be mailed.



CHICAGO
CONVENTION AND TOURISM BUREAU

RSNA 2002 Exhibitor News

NEW!

One-Day Badge to View Technical Exhibits

For the first time, RSNA is offering a one-day badge to view the technical exhibits floor at the annual meeting. The badge allows entrance to the technical exhibits only—not the *infoRAD* area or any of the scientific sessions. The one-day pass can be purchased onsite for \$150 per day at the professional registration desk in the McCormick Place South Building, Room S100.

Technical Exhibit Hours

Sun., Dec. 1 – Wed., Dec. 4	10:00 a.m. – 6:00 p.m.
Thurs., Dec. 5	10:00 a.m. – 2:00 p.m.

Promotional Opportunities at RSNA 2002

Traditionally, about 27,000 radiology professionals attend the RSNA Annual Meeting each year. To ensure your company gets maximum exposure, take advantage of the many promotional opportunities available.

“Exhibitors who integrate other marketing tools into their exhibition plans record a much higher success rate” than exhibitors who do not, according to studies performed by the Deloitte &

Touche Group which were included in *Cold Facts/Hot Tips*, a publication by the Center for Exhibition Industry Research.

Promotional vehicles at RSNA 2002 include:

- RSNA Journals
Radiology
RadioGraphics
- *Buyer's Guide*
- *Pocket Guide*
- *Daily Bulletin*
- *RSNA News*
- *RSNA Link*
(www.rsna.org)
- Coupon Book

■ Motion Billboard

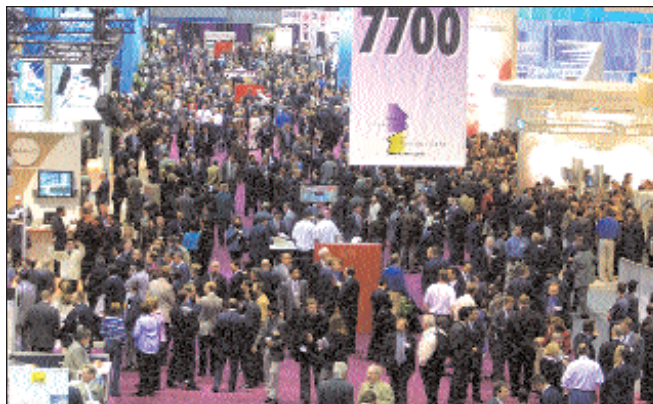
Sponsorship is also available for the annual meeting bag, badge lanyards, the *Scientific Program*, *infoSYSTEM* terminals and the ExpoCard.

For more information, contact Jim Drew at (630) 571-7819 or e-mail: jdrew@rsna.org.



Important Exhibitor Dates RSNA 2002

Aug. 16	Deadline for Reduction/Cancellation of Exhibit Space (For Partial Refund) Deadline for Final Exhibit Space Payment Deadline for RSNAnet “Early Bird” Discount
Sept. 3	Deadline for submission of free form/peninsula/mobile exhibit plans
Sept. 16	Deadline for RSNAnet Network service application/contract and floor plan drop location
Sept. 23	Target floor plans mails Non-refundable block housing deposits due Block housing deposits and rooming lists are due
Nov. 25	Target Move-in Begins
Dec. 1-6	RSNA 88 th Scientific Assembly and Annual Meeting



RSNA 2001 featured 636 companies in 445,925 square feet of exhibit space.

New Exhibitors

RSNA 2002 will welcome 54 first-time exhibitors. Because of the large number of acquisitions and mergers again this year, the *2002 Buyer's Guide: Radiology Products and Services* will provide a cross-reference listing, if all companies involved were exhibitors at RSNA 2001.

For more information, contact RSNA Technical Exhibits at (630) 571-7851 or e-mail: exhibits@rsna.org.

Exhibit Space Summary

(as of June 21, 2002)

By McCormick Place Building

TOTAL	423,590 sq. ft.
South	288,390 sq. ft.
North	135,200 sq. ft.

By Exhibit Type

Technical	525
<i>infoRAD</i>	1
Hands-on Computer Workshops	4
Headquarters Office Space	23
Publishers Row	15
Mobile Units	11

www.rsna.org

Membership Registration Online

In June, RSNA began testing a new feature allowing RSNA membership renewal online (www.rsna.org/memberservices/). This new feature, which will be fully available in September, will be in the same area of *RSNA Link* where you can update your mailing address for RSNA journals and correspondence, check the CME Credit Repository and search the Education Portal catalog.

Membership renewal uses the RSNA shopping cart, so you can order RSNA education materials and sign up for RSNA short courses during the same online session.

Online Donations to R&E

Members and nonmembers can now make online donations to two programs of the RSNA Research and Education Foundation. All individual and corporate programs are described in a new subsection, "Make A Donation," which can be found at www.rsna.org/research/foundation/donation/.

Visitors can make gener-

al contributions or become members of The RSNA President's Circle through *RSNA Link*. Like membership renewal, donations are added to your shopping cart. Alternatively, you can download, print and mail or fax a donation form. Additional R&E Foundation donation programs are also available. Check the address above for details.

General news about the R&E Foundation is now easier to find. The main Foundation page (www.rsna.org/research/foundation/) includes "R&E Foundation in the News," a scrollable window that contains recent items from *RSNA News*. Older browsers may not display this feature.

RSNA Short Courses

The RSNA Department of Research has posted a brochure for each of its four courses in PDF format:

- *Advanced Course in Grant Writing*
- *How to Write a Good Grant Application*
- *Introduction to Grantsmanship*
- *Introduction to Research*

A single PDF for the *Advanced Course in Grant Writing* replaces the series of Web pages that constituted the online brochure for that course.

Young Academics

RSNA's Committee on International Relations and Education has renamed the International Young Academics Seminar. That program is now called Introduction to Research for International Young Academics. Program details are available at www.rsna.org/international/CIRE/iyaseminar.html.

Radiologic Organizations

The subsection of "About RSNA" called "Related Societies and Organizations in the Radiologic Sciences" has been renamed "Radiologic Organizations." Societies that RSNA used to manage or still manage are now listed with other societies on the same menu.

Societies that wish to have an informational page created or updated in this subsection are encouraged to submit information by e-mail to webmaster@rsna.org or

by fax to RSNA Webmaster 1 at (630) 571-7837.

Other Web News

The National Human Genome Research Institute (NHGRI) has launched a new Web site (www.genome.gov) focused on genomic research, including the international Human Genome Project slated for completion in April 2003. The new Web site supports ongoing scientific studies by researchers inside and outside of the institute as well as provides a reliable source of genomic information for a wide range of audiences.

"This new site will make it easy for anyone interested in genome science to find answers to many of their questions," says NHGRI director Francis S. Collins, M.D., Ph.D. "The Web team has worked hard to provide an intuitive structure for the large amount of scientific information developed by the institute's scientists. The well-organized links between higher-level pages and the information within the site make it simple for users to find what they are looking for."

connections Your online links to RSNA

RSNA Link
www.rsna.org

Radiology Online
radiology.rsna.org

Radiology Manuscript Central
radiology.manuscriptcentral.com

RadioGraphics Online
radiographics.rsna.org

Education Portal
www.rsna.org/education/etoc.html

CME Credit Repository
www.rsna.org/cme

RSNA Index to Imaging Literature
rsnaindex.rsna.org

RadiologyInfo™
ACR-RSNA public information Web site
www.radiologyinfo.org

RSNA Online Products and Services
www.rsna.org/memberservices

2001 RSNA Annual Report
www.rsna.org/about/annualreport.html

RSNA 2002 Exhibitor Prospectus
www.rsna.org/rsna/te/prospectus/

Advance Registration for RSNA 2002
www.rsna.org/rsna/advanceregistration/

Medical Meetings

October – December 2002

SEPTEMBER 28–OCTOBER 2

American College of Radiology (ACR), Annual Meeting, Loews Miami Beach Hotel, Miami • (703) 716-7545

OCTOBER 3–7

Royal Australian & New Zealand College of Radiologists, 53rd Annual Scientific Meeting, Adelaide Convention Centre, Adelaide, South Australia • www.ranzcr.edu.au

OCTOBER 5–6

American Institute of Ultrasound in Medicine (AIUM), Practical Aspects of Vascular Sonography: Optimize Your Skills, Swissotel, Chicago • (800) 638-5352

OCTOBER 6–9

Society of Radiation Oncology Administrators (SROA), 19th Annual Meeting, Hotel Intercontinental, New Orleans • (866) 458-SROA

OCTOBER 6–9

American Society of Radiologic Technologists (ASRT), Ernest Morial Convention Center, New Orleans • www.asrt.org

OCTOBER 6–10

Association of Residents in Radiation Oncology (ARRO), Ernest Morial Convention Center, New Orleans • (800) 962-7876

OCTOBER 6–10

American Society for Therapeutic Radiology & Oncology (ASTRO), 44th Annual Meeting, Ernest Morial Convention Center, New Orleans • (800) 962-7876

OCTOBER 12–16

XXI Interamerican Congress of Radiology, CIR2002, Hilton Hotel, Cartagena, Colombia • asor@epm.net.co

OCTOBER 18

Society of Nuclear Medicine (SNM), Reimbursement for Nuclear Medicine Procedures, Sheraton Providence Airport, Warwick, R.I. • (703) 708-9000 x1255

OCTOBER 18–19

Advanced Course in Grant Writing, RSNA Headquarters, Oak Brook, Ill. • (630) 368-3758 or ord@rsna.org

OCTOBER 19–20

Hong Kong College of Radiologists, 10th Annual Scientific Meeting, Hong Kong Academy of Medicine, Aberdeen, Hong Kong • www.hkcr.org or enquiries@hkcr.org

OCTOBER 19–21

American College of Radiology Imaging Network, Ritz-Carlton, Pentagon City, Arlington, Va. Contact: Irene Mahon at (215) 574-3150

OCTOBER 23–27

Academy of Molecular Imaging, 2002 Annual Conference, Sheraton Hotel and Marina, San Diego • www.ami-imaging.com

OCTOBER 25–27

Society of Radiologists in Ultrasound (SRU), Grand Hyatt San Francisco, San Francisco • www.sru.org/meeting/

NOVEMBER 8–13

Association of American Medical Colleges (AAMC), Hilton San Francisco & Towers, the Westin St. Francis and the Renaissance Parc 55, San Francisco • (202) 828-0400

NOVEMBER 30

How to Write a Good Grant Application (prior to RSNA 2002), McCormick Place, Chicago • (630) 368-3758 or ord@rsna.org

DECEMBER 1–4

Introduction to Research (during RSNA 2002), McCormick Place, Chicago • (630) 368-3758 or ord@rsna.org

DECEMBER 1–6

RSNA 2002, 88th Scientific Assembly and Annual Meeting, McCormick Place, Chicago • www.rsna.org

DECEMBER 7–8

International Society for Clinical Densitometry (ISCD), Bone Densitometry Certification Lectures and Exam, McCormick Place, Chicago • (202) 367-1132

DECEMBER 8–11

American Medical Association (AMA), Interim Meeting, New Orleans Hilton & Towers, New Orleans • (312) 464-5000