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The opinions expressed in this newsletter are those of the author(s); they do not necessarily reflect the viewpoint or position of the editors, reviewers, or publisher.

If you have comments or suggestions regarding the content of this or future issues of InPractice, please e-mail them to Managing Editor Cary Boshamer at cboshamer@arrs.org.

InPractice (ISSN 1070-2423) is published quarterly by the American Roentgen Ray Society, 44211 Slatestone Ct., Leesburg, VA 20176-5109. From annual dues of $250, $5 is allocated to the InPractice subscription. Periodical postage paid at Leesburg, VA and additional mailing offices. POSTMASTER: Send address changes to InPractice, 44211 Slatestone Ct., Leesburg, VA 20176-5109. Copyright © 2007 by American Roentgen Ray Society. Printed in the U.S.A.

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Professional Challenges, Professional Achievements

I t is my purpose to address you in my first column as ARRS president with a plan for our profession and our Society, now in its 107th year of existence. We had an exceptional annual meeting in Orlando, and now we look forward to the year ahead and what I see as our key goals and objectives.

One critical key to radiology is a consistent sense of progress—progress in the methods we use to diagnose and treat our patients, progress in the technology available to us. We should remember John Kennedy’s advice to think and act not only for the moment, but also for our time.

Through the advice and consent of the Executive Council and ARRS staff, my goal for the coming year is to develop a series of “Teams of Excellence,” each with a well-defined purpose of improving the Society’s role in supporting all radiologists, including our radiologists in training. These teams will involve both member volunteers and staff, allowing us to take advantage of the depth of knowledge and understanding available to us with the ultimate goal of enhancing member benefits and providing the support necessary to practice in today’s high-pressure health care marketplace.

We also plan to use this model to develop new initiatives to reach out to allied health professionals in radiology, such as radiologic technologists, as well as our radiologic colleagues throughout other parts of the world, our younger members, and the radiology residents who represent the future of our profession. Although our training allows us to perform all aspects of medical imaging, we do not practice in a vacuum. We rely on the support and assistance of those associated with our field, and we have a responsibility to ensure that we embrace their efforts, recognize their achievements, and assist their career development.

Lastly, since its inception, one of the Society’s utmost contributions to radiology has been its development and encouragement of radiologic education. Our specialty, perhaps more than any other, is constantly changing, and we must be ready to recognize the latest methods and knowledge available to us. The Orlando meeting featured one of the most comprehensive and well-received lineups of education sessions in recent memory, providing a unique learning experience for those in attendance. Yet, we must ensure that this wealth of learning is available to the widest possible audience.

As president I want us to explore every opportunity available to us to deliver these learning opportunities to anyone who wants to enhance their skills and knowledge. The Internet has opened up a new dimension of radiologic learning that was unimaginable 10 years ago, and we must step forward and make the most of our capabilities. Each year’s annual meeting features an exceptional lineup of award-winning electronic exhibits, each presenting a new and previously untapped opportunity to enhance radiologists’ skills by reaching a larger audience.

The Society has taken steps to add more educational content to its Web site. We must remember the proverb that cautions that learning which does not advance each day will daily decrease. We must ensure that the Society remains at the forefront of radiologic learning where it has helped to set the standard.

I have presented an aggressive agenda for the coming year. Yet, I firmly believe that we have the skills, both among our members, our potential members, and our Society staff, to make these goals a reality. I encourage each of you to consider what you can do in the months ahead to give back to a profession that has allowed us the opportunity to make a difference in so many lives. I am open to your ideas and suggestions and look forward to the experience and satisfaction of working with you this year for the common good of the Society, our profession, and, most of all, the wellness of our patients.
Radiation Dose

How Much Is Too Much?

The Delicate Balance between Radiation Exposure and Imaging Efficacy

As radiologists take a more visible role in today’s health care delivery system, the means and methodologies by which they treat patients have generated greater scrutiny, primarily in the critical areas of utilization and patient safety. While radiation is utilized in a variety of medical fields for meaningful diagnostic and therapeutic purposes, several leading radiologists speaking at the annual meeting of the National Council on Radiation Protection and Measurements in April suggested the potential for misuse is greatest in the area of diagnostic imaging, as reported in recent studies and media coverage that claim the quantity of studies used today may actually lead to a significant increase in the number of future cancer cases.

These same radiologists, however, were quick to point out that developments in medical imaging, particularly in the fields of CT and nuclear medicine, have had a considerable impact on the level of patient care in recent years as a result of superb anatomic depictions that can be delivered in a matter of seconds rather than minutes, allowing for almost instantaneous diagnoses and confirmation. Additionally, these developments are opening the field to further advancements in imaging hybrids such as PET-CT, CT colonography, and CT angiography. In addition, the convenient availability of medical imaging exams, often performed by non-radiologists, has contributed to this escalating exposure.

According to data cited by James A. Brink, MD, of Yale University School of Medicine, the keynote speaker at the NCRP meeting, the use of CT and nuclear cardiology alone is up by a factor of five since the 1980s. In 1981 there were three million CT exams; in 2005 that number had increased to 63 million. Moreover, each new modality typically delivers a higher dose of radiation. For example, a CT scan delivers about 18 mSv compared to the typical chest study dose of 0.10 mSv. In other words, 67 million CT procedures would represent only 12% of all medical imaging procedures, but 45% of the collective radiation dose.

However, experts agree that deciding how much is too much is not an easily accomplished task, with a host of variables that must be considered for each individual patient.

“The potential benefit that comes with medical imaging in patients with known diagnoses must be weighed against the risks of ionizing radiation, taking into account a patient’s age, gender, and the particular body part to be examined,” noted Brink. “In most primary clinical circumstances, the benefits outweigh the risks, particularly given the potential for diagnoses yet found.”

For example, Brink said that of 62 million CT scans delivered in a year, nearly 14 million of those patients would die of cancer without the benefit of the scan. An additional 31,000 patients would likely die from cancer as a result of the additional radiation from those scans.

Citing a study that followed survivors of the atomic bomb blasts, Brink noted that:

- Radiation-induced cancers appear at the same age as similar spontaneous cancers
- Risk of radiation-induced cancers persist throughout life
- Bone marrow, thyroid, breast, and lung cancers present the greatest mortality risk
- Children are 10 times more sensitive to radiation-induced cancers than adults; girls are at greater risk than boys

Continued on page 6
Continued from page 5

“Currently, it appears that the increasing use of medical radiation technology is likely to result in per capita annual doses close to, or greater than, the natural background exposure level,” noted Fred A. Mettler, Jr., MD, another NCRP session speaker. “However, it is important to bear in mind that substantial clinical benefits often result from exposures associated with diagnostic and therapeutic medical radiation procedures.”

Not a New Issue, Just a Critical One

Questions regarding patients’ excessive exposure to radiation and serial imaging are not new, but the issue has gained momentum through additional medical studies and resulting media coverage.

Robert L. Brent, MD, sounded the dosage alarm six years ago at an NCRP conference. “Not only are children more sensitive to radiation than adults, but they will have more years in which cancerous changes might occur,” Brent told the conference. “Because of our continuing uncertainty about added radiation risks in children, we need both prospective and retrospective studies to give us the needed information.”

A 2001 AJR article by David J. Brenner, MD, (Estimated Risks of Radiation-Induced Fatal Cancer from Pediatric CT. AJR, 2001; 176:289–296), cited the hazards of serial imaging in pediatric patients. Brenner noted that 600,000 abdominal and head CT examinations annually on patients under the age of 15 years could result in 300 deaths from cancer attributable to radiation. Two additional articles in the same issue noted that some facilities made adjustments in technical factors that took into account the age or size of a pediatric patient undergoing CT.
Talking to Parents about Pediatric Radiation Dosage

In many instances, a radiologist’s frank discussion with the parents of a pediatric patient can be important to any recommended radiologic procedures, especially CT. In fact, one recent study suggests that an easy-to-read informational handout can help parents better understand the possible risks associated with pediatric CT, without scaring them to the point where they decide to forego what could be a potentially life-saving procedure.

The study, “Informing Parents about CT Radiation Exposure in Children: It’s Okay to Tell Them,” is featured in the August issue of the AJR and online at www.ajronline.org. The study, authored by David Larson, MD, and colleagues, was done to determine how parents’ understanding and willingness to allow their children to undergo CT changes after being informed of the radiation dose and potential risk involved.

“After reading the handout, 62% of the parents reported no change in their level of concern,” the authors report. “No parent refused or requested to defer the CT after reading the handout.”

Yet, the study notes, there remains some disagreement about whether the issue of radiation exposure is even something that should be raised with patients and their parents, insisting that it is solely an issue for radiologists and clinicians to decide. They continue to maintain that patients and parents might become “unnecessarily upset” by dosage information and be reluctant to undergo a CT scan when it is the most appropriate imaging technique for the patient’s case.

He pointed out there has already been progress in this area. In fact, many manufacturers, he noted, are already taking steps to effectively reduce radiation dosages.

Developing a Dosage Monitoring Agenda

Brink cited four key considerations to controlling patient radiation exposure:

- Determine if CT is the best choice for a patient; CT should be avoided when a sonogram or MRI is of comparable diagnostic utility
- Avoid repetitive studies; if a patient’s prior diagnostic radiation exposure is excessive, CT should be avoided
- Tailor the exam to the patient; base protocols on pediatric health/weight or adult abdominal dimensions
- Tailor the exam to the application; CT technique should be monitored and controlled to ensure that the dose is as low as reasonably achievable

At Yale, Irena Tocino, MD, director of Quality Assurance and Process Improvement for Diagnostic Radiology, directed a six-month effort to develop an effective algorithm for the diagnosis of pulmonary embolism that places CT imaging in the context of other clinical, laboratory, and imaging tests. This algorithm provides concise guidance to all health care professionals, no matter the field of practice. To demonstrate the efficiency of the Yale algorithm, Brink displayed the flow chart used for a patient with a suspected pulmonary embolism. The process may seem confusing at first, he said, but it has proven to be a success.

“This is the kind of thing we need to ensure that we don’t overuse CT,” Brink explained. “However, we have to use the right amount; not enough doesn’t give us the answers we need.”

For radiologists and facilities interested in introducing an effective radiation protection program, Brink offered four key components, as proposed by Steven C. Birnbaum, MD, radiation safety officer for Southern New Hampshire Medical Center:

- Educate clinicians and radiologists
- Pay close attention to technical modifications; consider algorithms for utilizing nonionizing modalities
- Identify patients who have elevated radiation exposure levels; include a notation in the patient’s imaging record as you would with a contrast allergy and notify the referring physician
- Investigate extreme exposure; pursue further history and counseling for patients with exposures greater than 100 mSv
Today’s Learning, Tomorrow’s Patient Care

“There is no doubt that my practice of radiology will be positively influenced by my education at this meeting.”

—Joseph M. Fonte, MD
Boston, Mass.

Orlando, Fla., is best known as the home of the Magic Kingdom and other spectacular theme parks. Yet, for one week in May, Orlando also was the center of radiologic learning as radiologists from around the country and from the four corners of the globe attended the American Roentgen Ray Society’s 107th Annual Meeting.

Utilizing a variety of educational formats, this year’s meeting offered attendees contemporary courses focusing on the latest challenges and issues facing radiologists. From 75 instructional courses to an intensive categorical course featuring a blue-ribbon panel of experts to the four-day case-based imaging review course, this year’s meeting offered something for everyone, no matter their specialty or where they practiced.

“For more than a century, the ARRS has represented the finest in radiologic learning, for experienced radiologists and those training to launch their careers,” said Anton N. Hasso, MD, the Society’s 2007–2008 president. “This year’s meeting not only upheld that tradition, but it continued to demonstrate the Society’s dedication to the educational interests of its members and all of radiology as it looks toward future issues and educational opportunities.”

The following pages provide you with a concise review of the events, courses, and news that highlighted this year’s ARRS meeting. Mark your calendars now for the 108th ARRS Annual Meeting, April 13–18, 2008, in Washington, D.C. Look for the latest news and information on next year’s meeting in future issues of ARRS InPractice and on the ARRS Web site at www.arrs.org.
Hasso Named ARRS President

Anton N. Hasso, MD, has been named the 2007–2008 president of the American Roentgen Ray Society. Hasso, professor of radiological sciences and director of neuroimaging research at the University of California, Irvine, took office on May 6, 2007, during a ceremony held at the ARRS Annual Meeting in Orlando, Fla.

“My aim as ARRS president is to develop ‘Teams of Excellence’ consisting of both the volunteer and staff assets of the society in order to enhance member benefits,” Hasso said of the coming year. “We also plan to use this model to develop new initiatives in reaching out to the allied health professionals in radiology, such as radiology technologists, our colleagues in other countries, and our young members and residents.”

Hasso received his medical degree from Loma Linda University School of Medicine and completed his residency at the White Memorial Medical Center, as well as a cardiovascular radiology fellowship at Loma Linda University. He served as a National Institute of Neurologic Diseases and Stroke Special Fellow in Neuroradiology at UC Los Angeles. Hasso previously served on the faculty of Loma Linda University and is a former chairman of the department of radiology at UC Irvine.

Recognized worldwide as an expert in diagnostic neuroimaging, Hasso’s clinical interests include the applications of CT and MR imaging in disorders of the head and neck. He has authored more than 118 peer-reviewed articles as well as 78 books, book chapters, and monographs.

Hasso is a reviewer and member of the editorial boards of seven scientific journals in his specialty, including: the AJR, the American Journal of Neuroradiology, and the Journal of Magnetic Resonance Imaging.

In addition to his clinical and research efforts, Hasso has served in a variety of leadership positions with numerous radiologic organizations, and he has been recognized in Orange Coast Magazine’s “Best Doctors in Orange County,” the list of “Best Doctors in America,” and in the “Guide to America’s Top Radiologists.”

ARRS Announces New Officers

President
Anton N. Hasso, MD
Professor of Radiological Sciences and Director of Neuroimaging Research University of California (UC), Irvine, Calif.

President-Elect
John K. Crowe, MD
Scottsdale Medical Imaging, Ltd.
Scottsdale, Ariz.

Vice President
Ella A. Kazerooni, MD
Professor and Director of Cardiothoracic Radiology Department of Radiology University of Michigan, Ann Arbor, Mich.

Secretary
Joseph K.T. Lee, MD
Chair, Department of Radiology University of North Carolina at Chapel Hill, N.C.

Treasurer
Howard P. Forman, MD
Associate Professor of Diagnostic Radiology Yale University School of Medicine, New Haven, Conn.

ARRS Honors Edward Nagy

A framed certificate of a memorial resolution in honor of Edward C. Nagy, former executive director of the Academy of Radiology Research (ARR), was presented to Nagy’s wife, Deborah, during the 2007 ARRS Annual Meeting in Orlando, Fla. ARRS President Anton N. Hasso, MD, made the presentation, citing Nagy’s leadership and dedication to the field of radiology. Hasso noted Nagy’s critical role in the enactment of federal legislation creating the National Institute for Biomedical Imaging and Bioengineering.

Bylaw Revisions Approved by ARRS Membership

The proposed bylaw revisions as published in the Winter 2007 issue of ARRS InPractice were presented at the membership business meeting during the recent ARRS annual meeting held in Orlando, Fla. The revisions were designed to consolidate and streamline membership categories and expand the definition of domestic membership to include countries within North America or territories of the United States. A formal motion was made and passed by the membership of the ARRS on May 9, 2007.

Visit the Web site at www.arrs.org to read the full text of all the bylaw revisions.

C. Douglas Maynard, MD

Maynard Emphasizes Research in Caldwell Lecture

One of radiology’s most respected leaders, C. Douglas Maynard, MD, former chairman of the department of radiology at Wake Forest University School of Medicine in Winston-Salem, N.C., emphasized the importance of ongoing radiologic research in his remarks as the 2007 Caldwell Lecturer at the ARRS Annual Meeting in Orlando, Fla., in May.

Maynard’s lecture, “Radiology Research: Good to Great?”, outlined various areas of radiology research including the creation of research and education funds by various radiology societies and the changing “culture” in radiology departments and its importance in the development of research in these departments.

“What has occurred in our field has been nothing short of miraculous,” said Maynard. “Clinically, we have gone from a specialty in which it was not uncommon to interpret studies several days after performance to a situation today in which only 24-hours-a-day, 7-days-a-week on-line coverage is acceptable to our clinician colleagues. In other words, we’ve gone from ancillary to necessary. What a change.”

Maynard also discussed the lessons learned from his 23 years as a chairman of radiology department. He emphasized that serving in such a leadership role requires a firm commitment. Moreover, he added, successfully competing for extramural funding requires an investment by the school as well as the radiology department.

He outlined what it will take for radiology not to fall into the trap of “good is the enemy of great” as described in the book Good to Great, by Jim Collins. Maynard urged radiology departments to accelerate cultural transformation, expand the research enterprise to more departments, and continue to change research direction.

The annual Caldwell Lecture was established in 1920 to honor the research and educational achievements of founding member and X-ray pioneer Eugene Caldwell, MD.

Maynard’s complete Caldwell Lecture will be available in the October issue of the AJR and online at www.ajronline.org. You can also view Maynard’s Caldwell lecture on the ARRS Web site beginning July 6.

Conference Abstracts Spotlight Radiology’s Best

With its reputation for providing a matchless forum for the latest in radiologic education and development, this year’s recently held ARRS Annual Meeting in Orlando, Fla., continued the tradition with more than 270 abstracts presented during the meeting’s 26 scientific sessions.

“The oral presentations at this year’s scientific sessions represented the best that radiology has to offer,” noted Jonathan S. Lewin, MD, chair of the ARRS Program Committee. “No matter your subspecialty or specific interest, this year’s meeting provided you with information you need to practice in today’s environment.”

In addition, more than 450 educational and scientific exhibits on 12 key topics were presented. Awards were given to 50 electronic exhibits (please see page 14 for complete list of winners).

“This year’s exemplary lineup of scientific sessions and electronic exhibits once again raised the bar of radiologic research and learning and further demonstrated the value of ARRS membership and the investment of time in attending the Society’s annual meeting,” said ARRS President Anton N. Hasso, MD.

To view all of the abstracts from the 2007 ARRS Annual Meeting online, please visit www.ajronline.org. Click on “Select an Issue from the Archive” and then choose the supplement to the May issue of the AJR.
The 2007 Case-Based Review Course Tops Last Year’s Attendance

The increasingly popular and comprehensive Approach to Diagnosis: A Case-Based Imaging Review, offered for the second year at the 2007 ARRS Annual Meeting, attracted more than 700 attendees, topping last year’s attendance. Moreover, nearly half of those in attendance were radiology residents.

“Putting this course together is an immense challenge, but the collaboration with radiology colleagues and the benefits to the learner have been an extremely positive and gratifying experience for all of us,” noted course director Melissa Rosado de Christenson, MD.

This year, the course offered new cases with the goal of helping attendees become proficient in detecting imaging features associated with a broad array of diagnoses from different radiology subspecialty areas.

Other course directors for this year’s session were: Gerald Abbott, MD (who heads the chest section), Brian Funaki, MD (who heads the vascular and interventional radiology section), and Stacy Smith, MD (who heads the musculoskeletal radiology section). Section chairs significantly contributing to the course included:

- Michelle Michel, MD (neuroradiology)
- Don Yoo, MD (nuclear medicine)
- Deborah Baumgarten, MD, MPH (genitourinary radiology)
- Claude Sirlin, MD (gastrointestinal radiology)
- Leslie Scoultt, MD (ultrasound)
- Christine Denison, MD (breast imaging)
- Sanjeev Bhalla, MD (cardiovascular imaging)
- Lisa Lowe, MD (pediatric radiology)

The full course takes place over four days during the week of the ARRS annual meeting, with each subspecialty section presenting 30 cases, for a total of 27.5 hours of instruction. Each case is presented with a history, images, differential diagnoses, teaching points, and suggested readings. Attendees are encouraged to apply this information as they determine the diagnosis. These sessions may be particularly helpful to practicing radiologists in “putting everything together and learning how to form a differential diagnosis,” according to attendees.

Evaluations also indicated that the “superb program” was valuable to trainees in “preparing for boards, especially since many subspecialties are represented.” Many attendees rated the overall quality and value of the course as “excellent” and stated that they are already planning on attending next year’s course as well.

Course attendees received a workbook containing 330 cases, each one presenting the history of the patient, imaging findings, and differential diagnosis. Diagnoses and suggested readings are listed in a separate section at the end of the book.

If you were unable to attend the meeting or the course, the syllabus is available for purchase. To order the 2006 or 2007 syllabus (with almost 700 total cases) or for more information, visit the ARRS Web site at www.arrs.org.
ARRS Awards 2007
Gold Medalists for Distinguished Service

More than 50 of the 450 exhibits at this year’s ARRS Annual Meeting in Orlando, Fla. were recognized for their exemplary presentation. Electronic exhibits submitted to ARRS were reviewed by a panel of prominent radiologists who scored and ranked each exhibit prior to the meeting. Judges then convened to determine those exhibits deserving of an award.

**GOLD MEDAL**
E064: Cardiac Imaging — Are We There Yet?
Author(s): Vibhu Kapoor

**SILVER MEDAL**
E021: MRI Differentiation of Benign and Malignant Breast Lesions: Test Your Skills of the ACR BI-RADS Lexicon
Author(s): Dana Rausch
E114: Interactive PET/CT Brain Quiz
Author(s): Daniel Vinocur, Julieta Oneto, Jean Jose, Steven Zell, William Smoak
E275: MRI Assessment of Bone Marrow
Author(s): Catherine Roberts, Felix S. Chew

**BRONZE MEDAL**
E093: Imaging of Lung Transplantation
Author(s): Yuen-Li Ng, Narinder Paul, Anna Walsham, Tae Bong Chung, Demetris Patsios, Shaf Keshavjee, Gordon Weisbrod
E144: Fat — From Head to Toe — Imaging Significance of Fat Visualized in Various Lesions Throughout the Body
Author(s): Raul Uppot, Peter Hahn, Dushyant Sahani, Michael Blake, Debra Gervais, Peter Mueller
E239: Fetal MR: Feasible, Safe and Helpful
Author(s): Patricia Oliveira, Suzan Goldman, Raquel Amaral, Germana Santos, Guillerme Demarchi, Denis Szejnfeld, Claudia Rezende, Nitamar Abdala, Jacob Szejnfeld
E278: Demystifying MRI of the Wrist
Author(s): M. Shane Whitlock, Felix S. Chew, Michael Richardson, Catherine Roberts
E283: Benign Wrist Masses Diagnosed on Radiologic Studies
Author(s): Brady Huang, Ahmed ElSherief, J. Timberlake, Marlon Maragh, Gwy Suk Seo, Johnny Monu
E431: Applications of SPECT/CT in Nuclear Radiology
Author(s): Michael Roarke, Ba Nguyen

In addition, 40 exhibits were recognized with a certificate of merit. To view the full list of electronic exhibit winners, please visit the Scholarships & Awards section of the ARRS Web site at www.arrs.org.
Neuroradiology Categorical Course Draws Crowd, Approval in Orlando

More than 600 attendees filled the room for the 2007 categorical course on neuroradiology at the ARRS Annual Meeting in Orlando, Fla., with many calling it a tremendous boost to their knowledge, skills, and performance as radiologists.

The course, led by Mauricio Castillo, MD, Kelly Koeller, MD, and Suresh Mukherji, MD, was divided into three key sections:

- Brain imaging
- Spine imaging
- Head and neck imaging

A complete syllabus accompanied the course and is now available for persons who could not attend.

“This superb 40-chapter syllabus will become a true textbook in neuroradiology for many radiologists and other physicians,” Castillo said. “New techniques and procedures are discussed; however, each chapter also contains basic information that will be useful for the daily practice of clinical neuroimaging.”

The course and accompanying syllabus are designed for radiologists, radiologists-in-training, and allied health professionals with a demonstrated interest in brain, spine, and head and neck imaging in both adult and pediatric populations.

7 Easy Steps to Earning Neuro CME Online

If you weren’t able to attend the categorical course in Orlando you can still purchase the neuroradiology syllabus and earn up to 20 CME credits for completing selected modules or all of the course. Follow these quick-and-easy steps to purchase your syllabus and earn your credits:

1. Visit the ARRS Lifelong Learning Center at www.arrs.org and click on the “Books” section
2. You can choose to purchase a print copy of the Neuroradiology Syllabus with the CME option ($45 for ARRS members; $200 for nonmembers) or without CME ($100 for nonmembers). Note: ARRS members receive the CME option for free when they purchase the book
3. Add your preferred option to the shopping cart and complete your purchase
4. Once your purchase is complete, and if you selected the CME option, the syllabus will be available in your My Education folder
5. You can complete any of the modules you choose (Brain Imaging I, Brain Imaging II, Spine Imaging, Head and Neck Imaging), earning 5 CME credits per module by answering questions on the material online
6. Once you successfully complete a module, you can print out your CME certificate
7. You can return in the future and earn additional CME for any of the modules you have not yet completed

Plans are already underway for next year’s categorical course, which will focus on the critical field of emergency radiology. The course, coordinated by Diego Nunez, MD, Jorge Soto, MD, Stephen Ledbetter, MD, and O. Clark West, MD, will be held in conjunction with the 2008 ARRS Annual Meeting, April 13–18, in Washington, D.C.
Comments Demonstrate ‘Hands-On Value’ of ARRS Instructional Courses

One of the most important aspects of the ARRS Annual Meeting is to provide the opportunity for radiologists to share information that can be applied to their daily practice at the meeting’s conclusion. And this year’s meeting, held in Orlando, Fla., was no exception, providing more than 75 instructional courses focusing on some of the most important issues in medical imaging today.

At the conclusion of each of the meeting’s education sessions, attendees are asked to fill out evaluation forms, offering their candid feedback and comments on the presentations, speakers, and choices of topics. The ARRS relies on this feedback to plan future courses and ensure that it is providing attendees with useful and pertinent material they can apply to their practice.

The results of these evaluations further demonstrated the high level of value that the ARRS education sessions provide attendees. For example, the attendees at the session titled “Controversies in Spinal Imaging” provided the following feedback:

- 69% “strongly agreed” that the program met their expectations; 31% “agreed”
- 72% said the session’s format contributed to their learning experience
- 58% said they “strongly agreed” that the session presented useful information that they could apply to their lifelong learning goals and practice; 40% “agreed”
- 85% said they “strongly agreed” that the session’s faculty demonstrated expertise and sufficient knowledge of the subject

Among the individual comments offered after the conclusion of the spinal imaging session:

- Very good review of the literature and integration with personal experience
- A very helpful course; well done

If you would like more information on the ARRS’ array of radiologic educational opportunities, including meetings, symposia, Web lectures, articles, and self-assessment modules, and how they can help you meet your continuing education and maintenance of certification needs, please visit the Lifelong Learning section of the ARRS Web site (www.arrs.org). These educational products and programs are presented in a variety of formats to meet the challenging demands and schedules of today’s radiologists and radiology residents.

Interactive Online Learning Tool Attracts Submissions, Users at Annual Meeting

The Case of the Day program is one of the most popular features of ARRS annual meetings, and this year’s meeting in Orlando, Fla., was no exception. In fact, the program set new standards for on-site users this year.

More than 400 attendees of this year’s annual meeting took advantage of the opportunity to test their skills each day, either through the computer terminals set up in the exhibit hall or on their laptops using software developed by IMCO Technologies. Each of the cases were provided by radiology residents at the Indiana University School of Medicine.

After submitting their responses, participants could review the answers and see who the top scorers were for each question.

Although this year’s annual meeting is over, you can still test your diagnostic skills with the 2007 Case of the Day program, as well as with cases from earlier annual meetings, by visiting the ARRS Web site at www.arrs.org and clicking on the “Lifelong Learning Center” tab along the left-hand side of the ARRS homepage.

If you have any questions regarding the ARRS Lifelong Learning Center please call (800) 438-2777.
Instructional Courses Set Stage for Tomorrow’s Practice

As the adage goes, “Today’s research is tomorrow’s practice.” And, if the instructional courses and presentations from this spring’s ARRS Annual Meeting in Orlando, Fla., are any indication, tomorrow’s radiology practices will have more beneficial tools and information at their disposal than ever before.

Among the key highlights from the abstracts presented at this year’s meeting:

- The use of computer-aided detection (CAD) with computed radiography (CR) is effective in the detection of breast cancer. “These results demonstrate that CAD’s performance with CR is comparable to that with film screen mammography and will result in the improved detection of breast cancer,” said Rachel Brem, MD, the lead author of the study.

- MR images taken of prostate cancer patients prior to treatment show the cancer’s spread outside the prostate gland capsule and help predict the likelihood of the cancer’s return. “We found that a subset of patients who presented with imaging signs of extracapsular extension prior to radiation were more likely to develop metastases in the future,” explained lead author Antonio Westphalen, MD.

- There is a significantly higher rate of transcription error for women compared to men when using commercial voice recognition applications. “The immediate impact of the study for radiologists is an increased level of awareness that women may need to spend more time training on the system than their male counterparts and may have to work somewhat harder to make the system successful,” said Syed Ali, MD, lead author of the study.

- CT colonoscopy has a 90% agreement rate with optical colonoscopy for finding clinically significant polyps. “From a practical standpoint, this is very important, because if CTC is to be an effective screening tool, it must not only have a high sensitivity, but have a sufficiently high concordance rate at subsequent optical colonoscopy to avoid unnecessary colonoscopies;” said Tyler Prout, MD, the study’s lead author.

- Percutaneous imaging-guided radiofrequency ablation of hepatocellular carcinoma is a safe and effective technique, with benefits such as reduced post-procedural pain and length of hospital stay. “Our study further revealed an interesting finding in that the approaches used for ablation do not affect the effectiveness of the ablation treatment,” noted Hi Seong The, MD, the lead author of the project.

- High intracoronary attenuation significantly improves diagnostic accuracy in 64-slice CTCA of the coronary arteries. “[This study’s results] stress the importance of high intra-coronary attenuation before coronary CT angiography to achieve better diagnostic accuracy and therefore better diagnosis,” said Filippo Cademartiri, MD, one of the study’s authors.

- Functional anesthetic discography (FAD), a new diagnostic procedure involving injecting anesthetic directly into a spinal disc, can be used to confirm the presence of injured discs as the source of a patient’s lower back pain symptoms. “We hoped that by using FAD in our practice we could isolate patients who would likely benefit from disc surgery,” noted lead author Jonathan Luchs, MD. “FAD is a functional examination; it relies on the patient’s induction of pain during active patient movement, which is far different than the typical discogram.”

If you missed the 2007 ARRS Annual Meeting or were not able to attend certain informational courses, be sure to visit www.arrs.org, for the latest Web lectures and other educational materials from this year’s meeting.
If it is determined that a diagnostic error committed by a radiologist is the result of negligence (in other words, a breach of the standard of medical care), the radiologist will be held liable for any patient injury caused by that error. If a radiologist’s diagnostic error is determined not to be due to negligence, the radiologist will not be held liable for malpractice. Can these two kinds of radiographic errors — those that constitute negligence and those that do not — be distinguished? Let us focus on this question in detail, with hopes of finding an answer.

At the conclusion of a medical malpractice trial, a jury determines whether the conduct of a defendant-physician constituted negligence. Prior to deliberation, jurors are instructed on the law by the presiding judge. The judge explains that medical negligence is a breach by the defendant-physician of the standard of medical care to which the physician is held. Judicial instructions defining the standard of medical care are formulated from a myriad of previously published state appeals court decisions, i.e., the “Common Law.”

Let us briefly review portions of some relevant appeals court decisions rendered over the past century to see whether we can gain a clear understanding of the distinction between radiologic errors that are related, and those that are not related, to malpractice.

**Decisions of Appeals Courts: The Common Law**

In 1860, the Supreme Court of Illinois issued its first decision on what constitutes the standard of care of a medical physician. The lawsuit claimed that a physician, who incidentally was represented by a then-practicing attorney named Abraham Lincoln, had been negligent in improperly applying a cast to treat a wrist fracture that had been sustained by the plaintiff. The Court declared [1]:

> When a person assumes the profession of physician and surgeon, he must…be held to employ a reasonable amount of skill and care. While he is not required to possess the highest order of qualification, to which men attain, still he must possess and exercise that degree of skill which is ordinarily possessed by members of the profession. And whether an injury results from a want of skill or the want of its application, he will, in either case, be equally liable.

Ten years after Wilhelm Roentgen’s discovery of X-rays, a State of New York Appeals Court issued an opinion as to what constitutes the standard of care of a medical physician. Although the lawsuit did not involve radiology, the Court decision could have applied to radiographic interpretation [2]:

> The law requires a physician to possess the skill and learning which is possessed by the average member of the medical profession…and to apply that skill and learning with ordinary reasonable care. He is not liable for a mere error in judgment, provided he does what he thinks is best after a careful examination (italics added). He does not guarantee a good result.

A 1944 Nebraska Supreme Court decision also could have been applicable to radiologists [3]:

> A patient is entitled to an ordinary, careful, and thorough examination (italics added)…and, while he does not insure the correctness of his diagnosis, a physician or surgeon is required to use reasonable skill and care. If he omits to inform himself, by proper examination (italics added), as to the facts and circumstances and injury results, he is not relieved of liability of errors in judgment…. It is the duty of a physician or surgeon in diagnosing a case to use due diligence in ascertaining all available facts and collecting data essential to a proper diagnosis.

Nearly a half-century later, the Delaware State Supreme Court pointed out [4]:

> It is not enough…for the plaintiff to show that some other physician would personally have
acted any differently than the defendant…
or that there is an approach which would be
clearly, certain errors in perception by
resulting from “reasonable” or “ordinary”
outcome. Hindsight bias is the tendency for
A radiologist may review an X-ray using the
degree of care of a reasonable radiologist,
but fail to detect an abnormality…Radiolo-
gists simply cannot detect all abnormalities
on all X-rays…Errors in perception occur
when a radiologist diligently reviews an
X-ray, following all the proper procedures
and using all the proper techniques, and
fails to perceive an abnormality which in
retrospect, is apparent.

Clearly, certain errors in perception by
radiologists viewing radiographs—those
resulting from “reasonable” or “ordinary”
conduct—do occur in the absence of neg-
ligence. Radiologists may feel perplexed at
the vagueness of the words “reasonable” and “ordinary” as used by the courts in de-
fining the standard of medical care, for
the courts have never been able to give us con-
crete definitions of these terms. All courts
have been consistent, however, in holding
that the physician’s level of knowledge and
skill must be at least that which is minimally
acceptable, but need not be perfect [7].

The theoretical legal issue that must be
determined by a jury in cases that focus on
an alleged missed radiologic diagnosis is
whether the radiologist missed a lesion
but, rather, whether the missing of the lesion

is acceptable within the usual and custom-
ary standards of the radiologic community.

Considering that the standard of care is not
absolute and the trial jury will have been
exposed to conflicting testimony from expert
medical witnesses, and arguments presented
by the attorneys representing the plaintiff
and defendant respectively, this determination
is far from simple. Furthermore, whatever
the verdict, another jury hearing the same
evidence and pondering over the same argu-
ments could well render a different verdict.

Defending Radiographic Misses:
Hindsight and Outcome Biases

It is difficult to defend a radiologist who
has failed to perceive a radiographic abnor-
mality that, in retrospect, can be readily
perceived by both medical and nonmedical
observers alike. This difficulty is, in part,
the result of two kinds of biases: hindsight and
outcome. Hindsight bias is the tendency for
people with knowledge of the actual outcome
of an event to believe falsely that they would
have predicted that outcome [8].

Outcome bias is the tendency for people
to attribute blame more readily when the nature
of the outcome is serious, than they would if
the outcome were comparatively minor [9].

Neither hindsight nor outcome bias should
influence jurors sitting in a medical malprac-
tice trial in their determination of whether
medical negligence has occurred, and, if so,
the extent of compensation that should be
awarded to the plaintiff. The fact is, however,
that knowledge of the nature and severity of
the injury sustained by the patient has been
shown to substantially influence juries’ find-
ings of both the defendant’s liability and the
amount of the plaintiff’s compensatory dam-
age. Indeed, researchers have shown that
the severity of the patient’s disability, not the
occurrence of the actual negligence, was
predictive of payment to the plaintiff [10].

Summary and Conclusions

The question of whether a missed radi-
ographic diagnosis constitutes malpractice
has confounded radiologists, patients, attor-
neys, judges, jurors, and the general public
for more than a century.

Much of the medical community, including
many radiologists, as well as attorneys and lay
people alike, believe that if a radiologist has

missed an important finding that can be seen
retrospectively on radiographs, the miss cannot
be considered anything but negligence.
The blunt fact is that it is difficult to argue in
the courtroom that a radiologist who is well
trained and well paid to detect all abnormali-
ties should be excused for failing to perceive a
radiographic abnormality that, many months
or years later with the benefit of “20/20” hind-
sight, can be seen not only by the radiologist
but by other individuals as well. Nevertheless,
presenting data that include statistics regard-
ing the frequency of errors committed by radi-
ologists during the course of ordinary every-
day practice, explanations about why certain
radiographic abnormalities appear inconspic-
uous, evidence that the conduct of the defen-
dant-radiologist has been careful and prudent,
and expert testimony that it is not possible for
any radiologist or other professional to adhere
to a standard of perfection, can at times be suf-
ficiently persuasive so as to effect a jury ver-
dict in favor of the defendant-radiologist.

In an article published 30 years ago [11],
I observed:

In spite of all that has been written, as well
as the various legal opinions that have been
rendered, there is still no practical answer to
the question, “When is a radiographic error
simply an error and when is it malpractice?”

Three decades later, the answer to this
question still eludes us; the distinction be-
tween radiographic errors and malpractice
remains as blurry as ever.

Note: A greatly expanded version of this article, including an extensive list of references, appears in the September 2007 issue of the AJR.

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Each month the editors of the AJR compile a table of contents featuring 50 to 60 of the most important articles in radiology covering topics from molecular imaging to medical ethics. AJR in Brief is your quarterly guide to the journal; it will highlight articles of note as well as identify CME opportunities. All AJR content is available to ARRS members and AJR subscribers at www.ajronline.org.

June AJR

Rapidly evolving safety issues—in particular, the use of gadolinium-based contrast agents in patients with compromised renal function—prompted the expedited publication of the “ACR Guidance Document for Safe MR Practices: 2007” by Emanuel Kanal, MD, et al. While not yet official ACR policy, the document represents the best guidance currently available.

Imagine having free access to close to 100,000 images from more than 12,000 peer-reviewed scholarly articles with a keyword search and a click of your mouse. ARRS GoldMiner™ makes this possible, pointing you to an image database and resources that allow you to use images in lectures and other educational activities, as well as the full text of articles. Learn the details from the tool’s creators, Charles Kahn, MD, and Cheng Thao, in “GoldMiner: A Radiology Image Search Engine.”

Upon reflecting on the content in the June issue of AJR, Editor in Chief Robert J. Stanley, MD, emphasized the depth of imaging information radiologists can offer referring clinicians, as well as the direct therapeutic interventions radiologists now offer for a variety of oncologic indications. See the two articles by Ronald Zagoria, MD, and colleagues, “CT-Guided Biopsy for the Diagnosis of Renal Tumors before Treatment with Percutaneous Ablation,” and “Effect of Radiofrequency Ablation of Renal Tumors on Renal Function in Patients with a Solitary Kidney,” as well as the promising treatment results described in “Treatment of Morton’s Neuroma with Alcohol Injection Under Sonographic Guidance: Follow-Up of 101 Cases,” by Richard Hughes, MD, et al.

July AJR

Anastomosis cases highlight the July issue of AJR with two innovative studies. “Utility of Contrast Enema Examinations for Detecting Anastomotic Strictures after Total Proctocolectomy and Ileal Pouch–Anal Anastomosis,” by David Dolinsky, MD, et al., suggests that routine contrast enema examinations following total proctocolectomy and ileal pouch–anal anastomosis are a sensitive test for detection of strictures at the ileoanal anastomosis when an anastomotic diameter of 8 mm or less is used as the threshold value for diagnosing the strictures.

The second article, “Nonanastomotic Strictures after Colonic Interposition,” by Diane X. Li, MD, et al., determines that nonanastomotic strictures usually appear on upper GI tract radiography as long segments of smooth, tapered narrowing involving the interposed colon, most likely resulting from chronic ischemia.

In an accompanying commentary, Stanley notes that although fluoroscopic contrast studies of the GI tract are rarely performed, in many instances the classic approach to evaluating the GI tract cannot be improved upon, adding that these two previously mentioned studies will be personally useful.

August AJR

The past comes to life in “MRI and Multinuclear NMR Spectroscopy of a 3,200-Year-Old Egyptian Mummy Brain,” by Stephen J. Karl, MD, et al. Around 1200 BC, Nakht, a 16-year-old Egyptian weaver, was mummified and interred. He lay forgotten for 3,200 years until the mid-1970s, when archeologists and modern medical science brought his story to life once

Continued on page 21
again. The original autopsy, performed by an international multidisciplinary team, revealed a variety of ailments including infection or malnutrition, cyst of Trichinella spiralis, and a possible rupture of the spleen.

But what of Nakht’s brain? Advances in MR technology and multiaxial NMR spectroscopy enabled researchers to image the cerebral brain hemispheres that had been removed during the 1975 dissection. While acknowledging that imaging mummified tissue “remains a technological and logistic challenge,” the authors found that bound water remained in the sample, making it possible to generate images of the ancient brain.

Another unique application of radiologic technology is highlighted in a study relating radiologists’ role in a Dutch program to interdict drug smuggling. Emeri Brogdon, MD, et al., reported that experienced radiologists are achieving rates of “high accuracy, sensitivity, and specificity” in identifying intracorporeal drug smugglers’ attempts to evade capture by standard detection methods. Patients suspected of possibly carrying narcotics were given the option of abdominal screening or detention to prove their innocence. During the 2-year test period, 3,150 travelers were radiographed and 21% were found to be carrying intracorporeal drug packages.

CT colonography is a hot issue in radiology these days and is well represented in this issue with three articles. “Comparative Performance of Two Polyp Detection Systems in CT Colonography” by J.G. Fletcher, MD, et al., evaluates two automatic polyp detection systems to determine their sensitivity and false-positive rate in patients who have undergone CT colonography and subsequent endoscopy. Perry J. Pickhardt, MD, authored “Screening CT Colonography by Technique and Interpretation,” which provides a practical review of his current approach to CTC screening. (For more on this subject, please see the “How I Do It” article on page 30 of this issue.) The final article, “CT Colonography for Follow-up after Curative Surgery for Colorectal Cancer,” by Young Joon Choi, MD, et al., discusses CTC efficacy for surveillance of colorectal cancer after curative surgery while providing evaluations for other conditions.

CME in the AJR

Each issue of the AJR not only provides you with the latest in radiologic education and research, but offers the opportunity to earn CME credits. For more information on the following CME articles, please visit www.arrs.org.

The latest CME articles are:

June 2007 AJR

1. “Femoroacetabular Impingement: Radiographic Diagnosis—What the Radiologist Should Know,” by Moritz Tannast, MD, et al., shows the important radiographic criteria that indicate the two types of femoroacetabular impingement.

2. “MRI of Malignant Neoplasms of the Uterine Corpus and Cervix,” by Evis Sala, MD, and colleagues, reviews the role of MRI in the imaging of malignant neoplasms of the uterine corpus and cervix, describing its role in staging, treatment planning, and follow-up.

3. “Normal and Variant Coronary Arterial and Venous Anatomy on High-Resolution CT Angiography,” by Sunil Kini, MD, and colleagues offers a pictorial essay of the anatomy of the coronary arteries and subjacent cardiac veins using a 64-MDCT scanner.


July 2007 AJR


2. “Imaging Manifestations of Meckel’s Diverticulum,” by Khaled M. Elsayes, MD, et al., familiarizes the radiologist with the current imaging of Meckel’s diverticulum and presenting complications.

August 2007 AJR

1. “Imaging in Metastatic Renal Cell Carcinoma,” by Nyree Griffin, MD, et al., discusses recent advances in systemic therapies for metastatic renal cell carcinoma that are likely to have a significant effect on the way patients with advanced disease are imaged.

2. “MRI Findings of Uterine Lipoleiomyoma Correlated with Pathologic Findings,” by Kazuhiro Kitajima, MD, and colleagues, describes the MRI findings of uterine lipoleiomyoma and correlates them with histopathologic findings.


4. “Radiologic Investigations Complement and Add Diagnostic Information to Capsule Endoscopy of Small-Bowel Diseases,” by Dean T. Maglinte, MD, et al., reviews how commonly performed radiologic examinations compare with capsule endoscopy in the investigation of small-bowel diseases, analyzes the limitations of capsule imaging, and proposes an algorithm for use of specific radiologic examinations to complement wireless capsule endoscopy.
The Melvin M. Figley Fellowship in Radiology Journalism is just one of the scholarships the ARRS offers radiologists looking for a unique challenge and opportunity to enhance their careers.

Other ARRS fellowships include:

- Lee F. Rogers International Fellowships in Radiology Journalism — Like the Figley Fellowship, the Rogers Fellowship promotes interest in radiology journalism through hands-on experience in medical writing, manuscript editing, and the ethics of scientific journalism. The Rogers Fellowship, however, is specifically for radiologists practicing abroad and will be awarded next in 2009.

- Leonard Berlin Scholarship in Medical Professionalism — This special ARRS program supports study and research relating to medical ethics, medico-legal principles, patient accountability, and other topics focusing on medical professionalism. Open to radiologists at all stages of their career, the ARRS Research Committee may select up to one scholar each year.

- The ARRS Scholars Program — This program is designed to foster the professional growth of emerging leaders in academic radiology by providing recognition and financial assistance in support of ongoing activities and studies.

- Residents in Radiology Awards — The awards program recognizes special achievements by radiology residents who have presented exceptional papers on the discipline of radiology and radiological science. Winning papers are announced each February and are presented at the following ARRS annual scientific meeting and submitted for publication in the *AJR*.

For more information on these special ARRS fellowship and scholarship programs, please visit the ARRS Web site at www.arrs.org.
AJR Integrative Imaging Offers Articles to Challenge Your Skills

The June issue of AJR Integrative Imaging continues to boost the publication’s growing reputation as providing an excellent radiologic learning opportunity for radiologists and residents alike, with the added benefit of important CME and SAM credits. The June issue features six new and challenging articles that are taken from the files of many of the nation’s leading medical facilities. The cases include three self-assessment modules:

- **Imaging of Cardiac Masses and Myocardial Disease**, an in-depth look at the clinical features of cardiac masses and myocardial disease, with an emphasis on CT and MRI
- **Diagnostic Imaging Approach to Dextrocardia**, providing a unique perspective on the underlying causes of dextrocardia and their clinical significance
- **Safe MR Practices**, a key primer to boost your knowledge and minimize hazards to patients, medical personnel, and others in the MR scanner environment

Also included in the June issue of AJR Integrative Imaging are:

- **Radiological Reasoning: Right Atrial Mass**
- **AJR Teaching File: Left Ventricular Mass in a Patient with Ischemic Heart Disease**
- **Approach to Dextrocardia in Adults: Review**

“We look for cases that present not only a diagnostic challenge but a distinctive learning opportunity for the reader,” said Felix S. Chew, MD, associate editor. “Each of these cases meets that requirement.”

And be sure to look for the upcoming September 2007 issue of AJR Integrative Imaging, which presents nine more chances to enhance your radiologic skills. Those include:

- **Currarino Syndrome**
- **Intermittent Claudication of the Lower Extremity in a Young Patient**
- **Dyspnea Following Surgical Repair of Partial Anomalous Pulmonary Venous Return**
- **Upper Extremity Deep Vein Thrombosis**
- **IVC Filter Migration**
- **Infertility in a Young Woman**
- **Cleidocranial Dysplasia**
- **Imaging of Congenital Uterine Anomalies**
- **Imaging Popliteal Artery Disease in Young Adults with Claudication**

Your life revolves around images

The ARRS invites members and others to submit distinctive images for consideration as future covers of AJR Integrative Imaging, our highly respected CME publication.

Submit images to www.editorialmanager.com/ajrii

**AJR Series Celebrates 100 Years of Medical Imaging**

As part of the AJR’s Centennial celebration in 2006, the journal began publishing a series of commentaries that revisited the 100 most-cited articles from the journal’s first 100 years, the period that saw the exponential growth of radiology from its infancy to its integral role in medicine today. These classic articles, with the complementary thoughts by contemporary radiologists, offer an important insight into radiology’s history and evolution.

The series, suggested and organized by Liem T. Bui-Mansfield, MD, a 2004 ARRS Figley Fellow, demonstrates how past research continues to influence the work being carried on today.

“Radiologists should keep track of this list because it reflects our history, the history of medicine, and it helps us understand and appreciate radiology,” Bui-Mansfield, who serves as the series’ guest editor, said when the Centennial list was first assembled. “It shows that many papers that are frequently cited to this day deal with problems that remain a daily concern to patients, referring physicians, and radiologists.”

“On behalf of the AJR editorial staff and readership, I would like to thank Dr. Mansfield for this Centennial series, for conceiving of the idea, and seeing the project through to its successful creation,” noted Robert J. Stanley, MD, AJR editor in chief. “This series has generated an enormous amount of interest through the radiologic community and will continue to serve as an integral learning tool, both for practicing radiologists and those just entering the field who want to know more about its history.”

The most recently published articles in the Centennial series are:

- **Studies on the accuracy of diagnostic procedures** (1959)
- **MRI in the detection of malignant infiltration of bone marrow** (1986)
- **MR cholangiopancreatography using HASTE (half-Fourier acquisition single-shot turbo spin-echo) sequences** (1996)

For a complete list of the 100 articles in the AJR Centennial series, please see page 3 of the January 2006 issue of the AJR or visit www.ajronline.org.
As an ARRS member you have partnered with the oldest and most respected radiologic organization in the United States. Your membership means you are integral to advancing radiology’s influence and role in today’s intricate health care marketplace and ensuring the highest quality of imaging care for patients. Just as the radiology profession is ever changing, so is your ARRS membership. New membership benefits are introduced regularly, further increasing the value of your ARRS membership.

“We have a number of new and innovative ideas that we have recently introduced, or will be debuting in the near future, to enhance ARRS membership,” said Bernard F. King, MD, chair of the Department of Radiology at the Mayo Clinic in Rochester, Minn., and the new chair of the ARRS Membership Committee. “Attendees of the successful ARRS Annual Meeting, which recently concluded in Orlando, Fla., had the opportunity to see first-hand how important their ARRS membership is to their careers.”

Look for your new ARRS membership card soon. Keep the card handy for quick reference to your membership number, your key to a wealth of ARRS benefits, including:

- Online access to the AJR, radiology’s leading professional peer-reviewed journal, 24 hours a day
- Online access to AJR Integrative Imaging, a quarterly publication focusing on lifelong learning and continuing education opportunities
- Continuous access to free continuing medical education (CME) and self-assessment modules (SAMs) with every issue of the AJR and AJR Integrative Imaging
- Quick and easy online registration for the Society’s lineup of upcoming symposia focusing on cutting-edge topics such as cardiac CT angiography, PET/CT, and MR imaging of the musculoskeletal system, as well as the ARRS annual meeting where you can earn more CME credits than ever before
- Significant discounts for the ARRS Web Lecture Series, each one presented by leaders in many of radiology’s most innovative subjects
- My CME and SAM Tracker, which automatically tracks your earned continuing education credits (including date of activity, number of credits earned, and number of subspecialty credits earned) and SAM credit earned
- The freedom to manage your ARRS membership with a few easy steps on your computer or PDA at www.arrs.org
The Standard in Radiologic Education

Since its inception more than a century ago, the ARRS and its pioneering leadership has emphasized the importance of excellence in radiologic education through its publications and meetings, with learning opportunities that allow you to enhance your knowledge at every stage of your career.

Two recently introduced educational tools that have already proven to be valuable assets to educators and diagnosticians alike and have taken their place among the Society’s most popular learning opportunities:

• The *Approach to Diagnosis: A Case-Based Imaging Review Workbook*, featuring 330 challenging cases in 11 modules from some of radiology’s leading educators

• ARRS GoldMiner™, the online research tool that places thousands of peer-reviewed radiologic images at your fingertips

However, King is quick to point out that ARRS members will have the opportunity to enjoy even more radiologic learning opportunities in the near future, further establishing the Society as radiology’s prime education center.

“With Maintenance of Certification (MOC) now required for all new American Board of Radiology (ABR) certificate holders, there is the need for the Society to act as ‘MOC Central,’” King said. “The ARRS is the place to go for all of your MOC needs since the Society was the first to be approved by the ABR to issue SAMs and offers everything from the different SAMs in various formats to the opportunities to earn CME credits.”

An Eye on the Future

While the ARRS leadership is proud of the Society’s leading role in supporting the needs of its membership, the Society must continue to change, just as radiology continues to change. One of the most challenging tasks ahead, King noted, is the need to discern and adequately address the continuing needs of the profession.

“We are expanding our efforts to recruit a more diverse group of radiology stakeholders into the ARRS membership,” King explained. “This includes a concerted effort to enlist more international members, more radiology physicist members, and more radiology-affiliated professionals.”

This effort to engage a broader cross-section of the radiology profession extends to radiologists-in-training, as well, King added, assisting the profession’s leaders of tomorrow as they set out on their chosen career path.

“We want the ARRS to be a vital organization for all residents and fellows in training,” King emphasized. “We are convinced that if we provide important services to our radiology resident physicians, they will remain with the ARRS throughout their career and continue to participate and contribute to the future of the profession through their efforts with the ARRS.”

To learn more about the host of membership benefits available to you as an ARRS member, please visit www.arrs.org.
Advances and Applications of MR Imaging of the Musculoskeletal System
A PRACTICAL AND COMPREHENSIVE COURSE

September 15 and 16, 2007 • InterContinental Mark Hopkins • San Francisco, CA
Symposium Director: Clyde A. Helms, MD

13 Category 1 CME credits will be provided.

Target Audience: Diagnostic and interventional radiologists and other professionals at all career stages with an interest in current applications of MR imaging to the detection and management of musculoskeletal injuries, diseases/disorders, trauma and pain.

Goals and Objectives: Upon completion of the symposium, participants will be able to:
1. Describe an MR imaging protocol for each anatomical area(s) of the musculoskeletal system in response to various clinical problems/symptoms;
2. Identify the features and characteristics found on imaging that contribute to the diagnosis of the types of injuries, diseases, infection and trauma presented;
3. Describe the various characteristics associated with age, stages and associated conditions; and
4. Apply these advances in MR imaging of the musculoskeletal system to their practice.

Saturday, September 15
8:00 am – 5:30 pm
Knee I: Meniscus — Clyde A. Helms, MD
Knee II: Ligaments/Cartilage — Nancy M. Major, MD
Osseous Trauma — Mark W. Anderson, MD
Hip — Nancy M. Major, MD
Wrist — Mark W. Anderson, MD
Ankle 1 — Mark W. Anderson, MD
Ankle II — Mark W. Anderson, MD
Elbow — Nancy M. Major, MD
Shoulder Cuff — Clyde A. Helms, MD
Shoulder Labrum — Clyde A. Helms, MD
Shoulder – Miscellaneous — Clyde A. Helms, MD

Sunday, September 16
8:00 am – 2:15 pm
Lumbar Spine — Clyde A. Helms, MD
C-Spine Trauma — Mark W. Anderson, MD
Tumors — Nancy M. Major, MD
Marrow — Nancy M. Major, MD
Selected Cases — Mark W. Anderson, MD
Selected Cases — Nancy M. Major, MD
Selected Cases — Clyde A. Helms, MD

The American Roentgen Ray Society (ARRS) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The American Roentgen Ray Society designates this educational activity for a maximum of 13 AMA PRA Category 1 Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

Presented by the American Roentgen Ray Society
The ARRS now offers a series of performance-based symposia at convenient locations around the country, designed for practicing radiologists as well as trainees. The symposia, which offer CME credit, deliver distinctive educational opportunities that are easily accessible for busy clinicians.

Each symposium focuses on a specific topic of interest to today’s radiologists, providing comprehensive, in-depth information coupled with interactive skills-building exercises.

Back by popular demand is the Cardiac CT Angiography symposium. On Sept. 7–8, 2007, James A. Brink, MD, of Yale University, and Sanjeev Bhalla, MD, of the Mallinckrodt Institute of Radiology, will again direct this well-received course for diagnostic and interventional radiologists in Minneapolis. Designed as a clinically based course, the program covers the basic principles of cardiac CTA and its methodologies. According to Brink, the course “is both useful and applicable for the practicing radiologists in identifying the role and advantages of using cardiac CTA in imaging various cardiovascular disorders.”

Adds Bhalla, attendees will have the opportunity to “apply the use of CTA imaging to more than 50 supervised cases,” as well as determine when it is appropriate to refer chest pain patients in the emergency department for further evaluation. Business and legal issues relevant to a cardiovascular imaging service will also be discussed.

On Sept. 15–16, 2007 in San Francisco, ARRS will host Advances and Applications of MR Imaging of the Musculoskeletal System. Course director Clyde A. Helms, MD, of Duke University, has developed a practice-based curriculum that includes recent developments in musculoskeletal imaging. Each faculty member will present a comprehensive overview of each anatomic location with its anatomic and radiologic correlation and then address the roles and advantages of various imaging techniques, including recent MRI developments as well as newer techniques.

Based on needs assessments, ARRS will offer Impact of PET-CT on Oncologic Imaging in Baltimore on Oct. 5–6, 2007. In addition to reviewing PET-CT principles, protocols, anatomy, and physiology in diagnostic radiology, attendees will learn to “identify imaging characteristics and findings associated with a wide range of oncologic diagnoses,” according to course director Michael P. Federle, MD, of the University of Pittsburgh. Moreover, adds Federle, “attendees will have the opportunity to apply their knowledge to cases to gain competencies and utilize PET-CT protocols in making accurate diagnoses.” The limitations and potential pitfalls of PET-CT will also be discussed as well as relevant practice issues.

For more information or to register for any or all of these courses, please visit the ARRS Web site at www.arrs.org.
ARRS Debuts WomensImagingOnline at 2007 ARRS Annual Meeting

A prototype for WomensImagingOnline.org (WIO), ARRS’ new online women’s imaging community, was showcased at this year’s ARRS Annual Meeting in Orlando, Fla. Meeting attendees visited the ARRS booth in the exhibit hall to experience firsthand the planned look and features for this exciting new site, including exclusive original articles. They also toured some of the current features such as the job board, news section, and CME opportunities and learned of some of the future features presently in the works, such as patient resources, industry guides, and journal clubs.

“Here the members of the women’s imaging community at large can expect to find an educational resource, a research forum, a platform for contacts in industry, a patient information resource, and a practical everyday guide for practice management,” said Marcia Javitt, MD, chair of the WIO Advisory Panel, in an introductory message posted to the site. “We invite you to routinely integrate its use into your workday, to support and participate in our offerings, and to join us in the shaping and molding of this important project in the months to come.”

The ARRS aims to have WIO fully online and accessible this summer. Please visit the ARRS Web site at www.arrs.org for the latest news on this exciting new opportunity.
New CME Web Lectures Now Available

In response to requests for more online educational programs that are easily accessible and available anytime, ARRS now offers a new Web lecture every month. Visit the ARRS Web site at www.arrs.org to view the array of specialty topics and links to the Web lecture you would like to view.

Each month, an instructive Web lecture will focus on a radiology topic and consist of one to four presentations from ARRS’s annual meeting courses. These lectures are designed to provide radiologists and other health care providers with research findings and up-to-date practical information they can apply to their training and practice. Faculty includes radiology’s best known leaders and experts. Each presentation includes slides and audio, along with multiple-choice questions that can be completed and submitted online for CME credit. Credit as a self-assessment module (SAM) is offered for some courses. ARRS members enjoy significant discounts for all online educational activities.

Three new Web lectures are available:

**MDCT in Selected Abdominal Emergencies: Acute Flank Pain; Small Bowel Obstruction; Spontaneous Hemoperitoneum; Acute Female Pelvis**

Four presentations; 1.5 CME/1 SAM credit.
- **MDCT in Selected Abdominal Emergencies: Small Bowel Obstruction**, Felipe Munera, MD (17:59 min.)
- **CT Imaging of the Acute Pelvis in Females**, Douglas Katz, MD (22:07 min.)
- **Imaging Acute Flank Pain**, Jeffrey Neitlich, MD (24:03 min.)
- **Spontaneous Hemoperitoneum: A Bloody Mess**, Brian Lucey, MB, MRCPI, FFRRCSI (20:26 min.)

Each presentation covers an emergent abdominal condition describing the advantages, role, and importance of CT imaging along with guidelines and protocols appropriate for various gastrointestinal and genitourinary conditions in men and women presenting in an acute setting. According to Munera, “CT has become an important tool in the management of patients with small bowel obstruction.” This course “teaches the most up-to-date CT imaging protocols for diagnosing acute flank pain,” adds Neitlich. Current information is presented on interpreting the causes and findings of small bowel obstruction as well as its complications; acute flank pain and spontaneous hemoperitoneum; and disorders of the female genitourinary tract such as ovarian cysts, ovarian torsion, and ectopic pregnancy.

**CT Angiography of the Pulmonary Arteries**

Three presentations; 1.5 CME credits.
- **CT for Chronic Pulmonary Embolism**, Sanjeev Bhalla, MD (24:38 min.)
- **CT Angiography for Pulmonary Embolism: Current Status**, Joel E. Fishman, MD, PhD (26:22 min.)
- **Spiral CT for Acute Pulmonary Embolism**, John R. Mayo, MD (32:22 min.)

The current status of CT angiography in the diagnosis of pulmonary embolism (PE) as a cause for pulmonary hypertension is presented by three experts. CT’s importance, technical goals, pitfalls, and findings in chronic PE are highlighted with a focus on cardiac, pulmonary, and pulmonary artery signs. Fishman emphasizes that this program is intended to “demonstrate the performance and importance of CT pulmonary angiography in detecting pulmonary embolism, especially as a cause of hypertension.” For acute pulmonary embolism, CT angiography of the pulmonary circulation and relevant issues, common image artifacts, and evidence supporting its use are discussed. Recent data, including PIOPED II for detection, are covered. Additional topics include the incidence of isolated subsegmental pulmonary embolisms, findings from studies of patients with negative CT who do not receive anticoagulation and newer aspects of PE diagnosis from CT. Clinical applications and technical hints are also provided.

**Pediatric Mediastinum: Vascular Lesions**

Edward Y. Lee, MD (39:11 min.)

Using various techniques and viewing different locations, the faculty demonstrates normal mediastinal anatomy and how to detect common masses followed by which features and imaging appearances are associated with diagnosis of pediatric mediastinal vascular anomalies and abnormalities. According to Lee, “recognition of mediastinal vascular lesions in pediatric patients is critical for accurate diagnosis and appropriate patient management.” As each technique is presented, there is a focus on how and where features are recognized and how they contribute to an accurate diagnosis and guide clinical management.

More information about upcoming Web lectures can be found in ARRS InPractice or on the ARRS Web site at www.arrs.org.
Lessons from One Facility

Based on his experiences at UW, Dr. Perry J. Pickhardt offers facilities considering a CTC program a few words of advice:

- Maximize everyone’s skills. Everyone needs to be on board with the CTC process, from the hospital administrators to the gastroenterologists (who may offer some resistance) to each member of the clinical team. At UW, CT technologists were trained to independently perform the entire CTC examination. With the radiologist available for complex cases, there is more time for a comprehensive interpretation.

- Begin with a robust colonic preparation. The staff at UW uses a low-volume CTC preparation with three basic components: a laxative, dilute barium, and iodinated water-soluble contrast medium, whose improved performance characteristics are ideal for CTC screening.

- Determine adequate distension of the colon. Adequate distention, rather than maximal distention, is important to ensure patient comfort and safety, a critical factor with any imaging procedure.

- Take advantage of 3D visualization. Don’t rely on 2D evaluation alone since it is an inadequate method for low-prevalence CTC screening.

- Remember to think ahead. One unexpected UW challenge was providing patients with the correct CTC preparation materials. The preparation required a prescription, but the combination of agents was not something most pharmacies routinely stocked, so plan ahead.

- Utilize the best systems. At UW, the CTC interpretation system is validated and Food and Drug Administration-approved for colorectal screening. Moreover, upgrades to the UW software have resulted in faster and more accurate CTC interpretations.

- Recognize the potential pitfalls. Prominent and complex folds, diverticular fold thickening, and shifting of pedunculated polyps can present a problem with 2D evaluation. With 3D evaluation, annular masses, submucosal or extrinsic lesions, and impacted diverticula can be an issue.

Well-Crafted Plan Key to a Successful CTC Program

Perry J. Pickhardt, MD
University of Wisconsin

CT colonography (CTC), perhaps better known as virtual colonoscopy, has become one of the most talked about imaging procedures in recent years, thanks to its demonstrated potential for improving early detection rates and potentially reducing the mortality rate of colorectal cancer.

Successful clinical trials and increased public awareness of the dangers of colorectal cancer have resulted in more radiologists and imaging centers embracing the new technology to the benefit of their patients. More recently, studies suggest that CTC can also identify extracolonic cancers in asymptomatic patients and, in fact, one study reports that CTC found more cancers outside the colon than inside, providing further incentive for the growth of the procedure.

Yet, as with any new modality, introducing a new procedure to your staff and facility can present unique challenges. However, if you take the time to develop a detailed plan of action, and pay close attention to the various factors of the process, you have a better chance of success.

Perry J. Pickhardt, MD, one of radiology’s recognized CTC experts, helped his institution, the University of Wisconsin Medical School, successfully implement a CTC program several years ago. To date, more than 90% of the facility’s CTC studies have had negative results.

“CT colonography…is ideally suited for population screening of asymptomatic adults,” Pickhardt said. “CTC screening is less invasive, less time-consuming, and less expensive than optical colonoscopy and can be at least as effective.”

However, despite its potential, CTC is saddled with one major drawback. As Pickhardt noted, “the current lack of third-party coverage…has stalled the logical transition of CTC from a research tool and limited diagnostic test to a full-fledged examination for widespread population screening.”

Despite the challenges, Pickhardt said a facility can implement a successful CTC program if you start with a well-crafted plan.

“Practices interested in developing a comprehensive CTC program should not view this as just another study opportunity, but instead should approach it in a very systematic fashion,” Pickhardt counseled. “To provide a quality service, all programmatic aspects (e.g., CTC coordinator, technique, interpretation, diagnostic algorithm, performance results, and patient follow-up) must be properly addressed.”

One key factor to remember, Pickhardt cautioned, is that any weak link in the process can mean a breakdown of the entire implementation process and cost your department and facility additional time and money.

For example, he noted, “optimal preparation and distention cannot compensate for an inadequate CTC software system or an ineffective interpretive approach.”

The potential for CTC screening is wide open, Pickhardt said, citing the high positive predictive value and decreased test-positive rate, and can present a satisfying opportunity for an imaging facility looking to add new modalities for its patients.

“If the procedural details are properly addressed, CTC screening can have a profound effect on screening for and prevention of colorectal cancer,” Pickhardt said. “There are challenges to the widespread use of CTC for primary screening, but these challenges are not insuperable.”

To learn more about the CTC program at the University of Wisconsin, please read the article “Screening CT Colonography (Virtual Colonoscopy): Technique and Interpretation” in the August 2007 issue of the AJR, available online at www.ajronline.org.
Your Opportunity to Complete 50 Supervised Cases

Cardiac CT Angiography
A PRACTICAL APPROACH

September 7-8, 2007 • Marriott Minneapolis City Center • Minneapolis, MN
Symposium Directors: James A. Brink, MD and Sanjeev Bhalla, MD
13.5 Category 1 CME credits will be provided.

Target Audience: Diagnostic and interventional radiologists and other radiology professionals at all career stages with an interest in the applications of CT angiography in imaging of the heart and coronary arteries.

Goals and Objectives: Following completion of the program the learner should be able to explain the basic principles of cardiac CT angiography, discuss appropriate levels of radiation dose and delivery of contrast media and describe three-dimensional reconstruction methods. The learner should be able to evaluate the use of cardiac CTA in imaging adult congenital heart disease, the coronary arteries, coronary plaque and triaging patients with chest pain in the emergency room. In addition, the learner should be able to discuss the development and management of a cardiac CT service.

Invited Faculty

Cardiac CT: Principles, Radiation Dose, and Three-Dimensional Reconstruction Methods — Elliot K. Fishman, MD
Coronary Anatomy and Anomalies — Smila Patel, MBBS, MRCP, FRCR
Chest Pain in the Emergency Room: Evaluation and Triage with CTA — Ella Kaczkorn, MD
Cardiac CT: Structure and Function — Geoffrey D. Rubin, MD
Coronary CTA — Geoffrey D. Rubin, MD
CT of Adult Congenital Heart Disease — Marilyn Siegel, MD
Quantification and Characterization of Coronary Plaque — Kevin M. Johnson, MD
Physics of Coronary CT Angiography — DeAnn Haas
Optimizing Contrast Medium Delivery for Cardiac CTA — James A. Brink, MD

Business Aspects of Cardiac CT Angiography; Coding, Reimbursement and Turf Issues — Jonathan Berlin, MD
Legal Issues with Cardiac CT Angiography Interpretation Agreements — Tom Greeson, JD

Case-based presentations are scheduled for Friday and Saturday; attendees can participate in 50 supervised reads.

The American Roentgen Ray Society (ARRS) is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The American Roentgen Ray Society designates this educational activity for a maximum of 13.5 AMA PRA Category 1 Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity.
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Earn valuable CME credits with these articles in the September issue of the AJR:

- "MDCT and 3D CT Angiography of Splanchnic Artery Aneurysms"
- "Artifacts in ECG-Synchronized MDCT Coronary Angiography"

Earn valuable CME/SAM credits with these articles in the September issue of the AJR Integrative Imaging:

- "Imaging of Congenital Uterine Anomalies"
- "Imaging Popliteal Artery Disease in Young Adults with Claudication"

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