Needle Procedures for Neck Pain

by Joong Mo Ahn, M.D., Associate Professor, and Georges Y. El-Khoury, M.D., Professor & Director of Musculoskeletal Radiology

Cervical Epidural Steroid Injection

Cervical epidural steroid injections are being widely used for the conservative management of neck pain or cervical radiculopathy, although controversy remains over the efficacy of this procedure. The reported rate of improved pain relief with cervical epidural steroid injection has ranged from 72% to 78% (1, 2).

The injection is performed under CT guidance on an outpatient basis. Interlaminar approach is typically used at the C6-7 level, because the cervical epidural space is extremely narrow, ranging from 1.5 to 2 mm at the C7 level to less than 1 mm at higher cervical levels, and the epidural space at the C6-7 level is the widest in the cervical spine. If indicated, the C7-T1 interspace may be used instead of the C6-7 level. For this reason, diagnostic imaging such as MR imaging or CT myelography is recommended before a cervical epidural steroid injection. If the epidural space is less than 1 mm at the level of injection, cervical epidural injection is not recommended. Also, even with adequate cervical epidural space, patients often complain of transient axial and radicular discomfort on slow injection, attributable to the decreased capacity of the cervical epidural space.

After an informed consent is obtained, the patient is positioned prone on the CT table. A pillow is placed under the patient’s chest to increase the cervical interlaminar space. With use of CT guidance, the spinous process of C7 and the interlaminar target site to be injected, usually the C6-7 or C7-T1 interspace, are identified. The intended target is the superior border of the lower lamina at the desired intervertebral level. The skin over this site is prepped and draped in a sterile fashion. The skin and overlying subcutaneous tissues are anesthetized with buffered 1% lidocaine. A 20- or 22-gauge Tuohy epidural needle is then advanced toward the epidural space with the use of CT imaging. The needle is advanced in a slow and deliberate fashion by means of the loss-of-resistance technique with sterile normal saline in a friction-less 10 mL syringe. Once the tip of the epidural needle passes through the ligamentum flavum and enters the epidural space there is a sudden loss of resistance, as if the contents of the friction-less syringe were being sucked into the epidural space. With a 10 mL slip tip syringe containing 1 mL of nonionic contrast, gentle aspiration for the presence of blood or cerebrospinal fluid is performed. If none is present, 1 mL of nonionic contrast agent is injected. After an even spread of contrast agent within the cervical epidural space is identified (Fig. 1), 1 - 2 cc of steroid preparation (methylprednisolone acetate, 40 - 80 mg) is slowly injected.

The complications of cervical epidural steroid injection include increased neck pain, transient headaches, insomnia, facial flushing, dural puncture, and vasovagal reaction. Major complications (continued on next page)
Needle Procedures, continued from previous page

are direct cord injury due to needle trauma, spinal cord infarction, and epidural hematoma or abscess. Because the cervical epidural space is extremely vascular, there is an increased risk of unrecognized intravascular injection. Accidental injection of even a small volume of steroid into a cervical epidural vein could result in acute pain or neurologic deficit. Also, trauma to the epidural vasculature with subsequent bleeding could lead to spinal cord compression, especially in someone with preexisting diminished capacity of the cervical spinal canal. For this reason, all patients undergoing cervical epidural steroid injections are monitored for at least 1 hour after the procedure.

Cervical Selective Nerve Root Block

Cervical selective nerve root blocks have an important role in the conservative treatment of patients with cervical radicular pain. Appropriate patient selection is crucial because cervical selective nerve root block involves radiation exposure, notable costs, and patient discomfort. This is also performed as an outpatient procedure. The injection is performed with CT guidance. The patient lies supine, with his head turned to the side opposite of the side of the injection in the foramen or is placed in the lateral decubitus position with the side to be injected up. A cushion is placed under the head and neck to make the patient more comfortable and also to keep the patient’s neck in neutral position without any significant lateral flexion. The head is fixed with tape to prevent motion during the procedure.

After thorough cleaning of the skin with disinfecting solution, buffered 1% lidocaine is used to anesthetize the skin and subcutaneous tissue. A 23- or 25-gauge needle is introduced with CT guidance by using a lateral or slightly anterolateral approach dorsal to the large cervical vessels. Because there is only a very narrow window in which to safely access the cervical nerve root, it is extremely important that the site of skin puncture be as close as possible to the preplanned trajectory. The cervical nerve root must be approached from the lateral or anterolateral aspect of the neck because of the lateral mass obstructing a posterolateral or posterior approach (Fig. 2). Of course, the anterolateral approach has greater risk because the ipsilateral carotid sheath, adjacent nerves, and vertebral artery are along the needle pass. Therefore, the safest approach for cervical selective nerve root block is with CT guidance. The needle is aimed at the posterior border of the neural foramen, dorsal to the vertebral artery (Fig. 2A). A thorough understanding of neck anatomy is a minimum requirement for the needle procedures in the neck.

After needle placement, a 0.3 mL of nonionic contrast agent is injected to verify the correct position of the needle tip. The intraforaminal distribution of the contrast material is documented with a CT scan (Fig. 2B). A maximum of 1 mL of a steroid preparation (methylprednisolone acetate, 40 mg) and 1 mL of 0.25% bupivacaine are slowly injected.

Cervical Facet Block

Cervical facet blocks are usually performed under CT guidance for confirmation of cervical facetogenic pain. CT guidance is especially useful when hypertrophic bony overgrowth of a severely degenerated facet joint obscures the approach. CT allows precise localization of the needle tip.

The painful side is up and the patient is positioned in lateral decubitus position with a folded towel under the head to keep the head parallel to the CT table. If the patient’s head was flexed laterally toward the suspected facet joint, the joint would narrow and make intra-articular placement more difficult. The skin surface on the side of the neck is prepared in sterile fashion and draped. One percent lidocaine is instilled subcutaneously. Under CT guidance, a 25-gauge, 2.5-inch spinal needle is advanced toward the facet joint from a direct lateral approach. Nonionic contrast agent can be used to confirm the position of the needle tip within the joint, but this is usually optional. A slow injection of a maximum 0.5 - 1 mL of steroid preparation (methylprednisolone acetate, 20 - 40 mg) and 1 mL of 0.25% bupivacaine are widely used. Although the benefit of intra-articular steroid deposition is to provide a more sustained response, this has not been proven.

(continued on page 5)
Notes from the Chair

We are delighted to welcome three new permanent faculty members to the Department: Brooke Breen, MD, from residency and fellowship training at Tufts-New England Medical Center in Boston, MA, to the Division of Cross Sectional Body Imaging; Jack Kademiyan, MD, a recent graduate of our Neuroradiology fellowship program to the Division of Neuroradiology; and, Jinsuh Kim, MD, from the University of Wisconsin to the Division of Neuroradiology.

Our new first year Diagnostic Radiology residency class comprises eight outstanding individuals including: Aaron Berg, MD (hometown: Lignite, North Dakota), Justin Boatsman, MD (hometown: Cache, Oklahoma), Justin Colling, MD (hometown: Omaha, Nebraska), Todd Ebbert, MD (hometown: New Haven, Connecticut), Brian Fletcher, MD (hometown: Roeland Park, Kansas), Andrea Hastings, MD (hometown: Iowa City, Iowa), Joshua Larson, MD (hometown: Urbana, Illinois), and Ryan Reynolds, MD (hometown: Grand Forks, North Dakota). We extend a warm welcome to each of you and to your families and look forward to having you as colleagues in our Department over the next four years.

The Department is also pleased to welcome new subspecialty Fellow Associate trainees to several divisions including: Musculoskeletal Radiology: Lindy Paradise, MD, Bradley Hammet, MD, Jonathan Staser, MD, and Annietie Okon, MD; Cardio and Thoracic Radiology: Archana Laroia, MD; Cross Sectional and Body Imaging: Wei Fang, MD, Eve Clark, MD, and Michael Macke, MD; Vascular and Interventional Radiology: Sandeep Laroia, MD; Neuroradiology: Aristides Capizzano, MD, Derik Weldon, MD, Joseph Baima, MD, and Brenton Harris, MD; Neuroradiology: Bryan Ludwig, MD.

We began our new academic year with organizational changes at the upper leadership levels of both the College of Medicine and the University of Iowa Hospitals and Clinics. Dean Jean Robillard is now the Vice President for Medical Affairs and Dean of the Carver College of Medicine. In his position as Vice President for Medical Affairs, there are four key institutional leaders that report to him under the new administrative structure: The Executive Dean for the Carver College of Medicine (Dr. Peter Densen), the Associate Vice President for UI Physicians, the Faculty Practice Plan (Dr. Craig Syrop), the Associate Vice President for Finance and CFO of the University of Iowa Hospitals and Clinics (Ken Fischer), and the Senior Vice President and CEO of the University of Iowa Hospitals and Clinics (Director Donna Katen-Bahensky). Under the new structure, several important functions have been reorganized to better serve the academic health care enterprise by combining the operations for the College of Medicine with those of the University Hospitals, including the offices of Marketing and Communications, Information Technology and Information Systems, and Legal Affairs and Legal Council.

During the last fiscal year, the Department successfully installed and implemented several new imaging systems. These include a Digital Fluoroscopy unit, Digital x-ray unit, MiniView 6800 C-arm, Digital Mammography system, 64-slice CT scanner (to be installed at the end of the year) and an O-arm. Concurrent with the acquisitions of these new imaging modalities, we instituted two major clinical service lines: Screening for colon cancer using computed tomography colonography and screening and evaluating cardiovascular disease using our new 64-slice cardiac CT scan. The Iowa Comprehensive Lung Imaging Center (known as I-Clic), a Department research center headed by Dr. Eric Hoffman, is anxiously awaiting the installation of its new dual source 64-slice CT research scan that will be enabled with special monitoring and cardiac/respiratory gating technology for performing high level functional pulmonary imaging research.

The Department of Radiology continues to support the academic/CME programs at the annual meeting of the Iowa Radiological Society. The Society is very appreciative of the efforts of several departmental faculty in achieving its educational missions, including Drs. Lee Bennett and David Kuehn. Notably, at this year’s American College of Radiology annual meeting in Washington, DC, Lee Bennett accepted an award from the Iowa Radiological Society for its excellence in educational programs conducted in concert with its annual society meeting.

This academic year, the Department is developing a strategic plan to improve our expertise, capability, and infrastructure for radiological education via strategic investments in our faculty educators and the Department’s educational information technology.
Sectional Update
Cardiothoracic Radiology: Keeping up with New Clinical Initiatives

Edwin J.R. van Beek MD PhD FRCR, Professor of Radiology, Medicine and Biomedical Engineering, Director of Cardiac CT

Within the field of cardiothoracic radiology, important changes have taken place over the past few years, which can be largely attributed to advancements in computed tomography (CT) technology. As a result of more advanced technologies, it has become feasible to quickly and accurately detect or rule out the most common life threatening acute chest syndromes: pulmonary embolism (PE), aortic dissection/aneurysm and coronary artery disease.

Pulmonary embolism is a very common issue for the emergency physician, and with the changes in management and the introduction of CT pulmonary angiography, the patient throughput has benefited significantly. Where patients were seen by nuclear medicine a few years ago (where delays were often encountered due to availability of service), the introduction of CT now enables a rapid diagnosis within the ER setting (usually within one hour). This increase in accessibility has also led to a large increase in demand for CT investigations from the ER, and the community has seen a decrease of PE findings among those referred for imaging. One of the concerns that is coming to the forefront is that CT carries a radiation burden, and this highlights the need to work out an approach that takes into account clinical assessment and the use of simple blood tests (plasma D-dimer) to ensure we appropriately select patients who may benefit from CT.

Aorta pathology, particularly as a result of trauma and those presenting acutely in the ER, is now easily diagnosed using CT arteriography. Our latest CT systems are capable of visualization of the entire aorta down to the iliac arteries (and run-offs into the lower extremities if indicated) during a single investigation. This approach has significant implications for patient management, as these patients crucially depend on a rapid diagnosis to allow surgical (or interventional) treatment. The move from invasive angiography to CT angiography results in greater speed of the diagnostic pathway, while enabling a full assessment of the other structures in the chest and abdomen (which is particularly relevant in trauma victims).

A new clinical initiative was funded by the Board of Regents, which has allowed us to purchase a cardiovascular 64-slice CT scanner with upgrade of the CT suites. The system became operational in October 2006, and we have seen a steady increase in demand for CT coronary angiography in patients where the diagnosis is often unclear. Many of these patients would normally undergo invasive catheter angiography, but with CT it has been...

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The Radiologic Technology Program at the UI Hospitals and Clinics has been expanding and progressing in some exciting new ways. Between 1998 and 2000, we were enrolling an average of 17 students a year in the program. Today we are enrolling 25 students a year, and the completion rate has increased from 80 to 92%. We graduate approximately 23 technologists per year.

In 2003, the RT program began encouraging students to submit essays to the Iowa Society of Radiologic Technologists (ISRT). In the last couple of years we’ve averaged 11-12 student submissions, and our students have brought back 1st, 2nd and 3rd place winnings every year since they started submitting in 2003. We believe that introducing this kind of participation in professional meetings will encourage students to become more actively involved with other professionals in our field and contribute to the dialogue and literature in Radiologic Technology.

The University of Iowa’s College of Medicine began offering its Radiation Sciences BS degree in 1999. To obtain the degree the student must complete a year of general educational coursework; the RT program; a modality program to include CT, MRI, CVI, Ultrasound, Nuclear Medicine, Radiation Therapy, and PACS/QM; and a course in management, statistics, and informatics. Today, 80%-90% of our technology students end up choosing to go beyond their RT certification and get their bachelor’s degrees. The degree provides employees with a multi-competent technologist and provides the students with increased options for employment upon graduation.

For over 10 years the RT educational department has offered 6 – 9 month independent self study programs in CT, MRI and CVI. This format limits the number of students that can be handled in our clinical setting; 4 to 6 students per program. Starting in Fall 2007 we began offering distance education courses in CT and will begin offering MRI distance education courses in Fall 2008, with hopes of CVI and mammography to follow in 2009. To complete the degree requirements using this format the students are required to take 4 to 7 distance education courses that are facilitated by the instructors in the RT program and other hired consultants. A clinical internship at the UI Hospitals and Clinics is also offered, but is not a requirement for the degree and may be used to gain clinical experience and obtain the exam requirements needed to take the national boards. By allowing students to obtain the clinical component at other facilities, enrollment in the coursework is unlimited. This format also provides a means for working technologists to obtain a BS degree and formal education without leaving their employment. The CT courses currently have 38 enrollees and the clinical internship is full for the year.

References


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The introduction of faster CT scanners has also led to improved assessment of peripheral vascular diseases. The appointment of Dr. Abada within the Interventional Radiology section has also led to participation by vascular radiologists in the imaging of central and peripheral vascular pathology. The effects are widely felt, with increasing use of 3D imaging applications, changes in diagnostic management with decreasing need for diagnostic angiography and more focus on interventional procedures. The residency curriculum has been amended to allow residents one month dedicated to non-invasive cardiovascular imaging (mainly CT and MRI).

Apart from developments within Cardiothoracic Radiology, the section has become involved in reading out the CT portion of PET-CT investigations. This has served a dual purpose: it has helped detect additional findings compared to those of PET alone, and it has helped the training of Nuclear Medicine residents and fellows, who have been confronted with the incorporation of dual-modality imaging without a significant increase in radiology training.
The section has seen increased productivity as a result of all these changes. In particular, CT investigations have grown by 40% annually over the past 2-3 years. This had led to some challenges, as the number of personnel has not seen any increases (in fact, we have seen a 40% decrease), and efficiency and flexibility of available staff was required.

Apart from the significant clinical commitments, the section has been very busy in the areas of research, teaching and wider administration within the institution. The new clinical initiatives have already led to new educational opportunities, and research in cardiothoracic CT is growing with articles and book chapters the natural result of this work, and with an increasing request for staff time to support educational activities in various societies and towards NIH funded research (as well as for editorial boards and grant review boards). The section works closely with the Iowa Comprehensive Lung Imaging Center, allowing pioneering approaches to diagnosis of lung diseases using CT (and increasingly MRI), growth of clinical trials aspects in this field, and towards development of new devices, such as quantitative lung disease assessment and development of computer assisted diagnosis.

In conclusion, the cardiothoracic section has been able to grow their clinical and non-clinical commitments by extending the role of the staff members and by bringing new technology for clinicians. During 2007, we added a new fellowship, which was the result of the changes described above. Ultimately, we hope that we can grow the section with new personnel to keep up with these increasing demands.

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Professional service is also a goal of the section. Some examples of faculty involvement in the past year include: President of the Johnson County Medical Society; Johnson County Delegate to the Iowa Medical Society; Iowa Councilor to the ACR; member of the Musculoskeletal Expert Panel for the ACR Appropriateness Criteria®; reviewers for Radiology, AJR, JACR, Skeletal Radiology, Emergency Radiology, and CORR; volunteers for the ABR; Rules Committee Chair for Society of Skeletal Radiology; and editorial board members for AJR, Skeletal Radiology, and Emergency Radiology.

In closing, the MSK section wishes to thank the recent fellows for their service to the University, Department, and Section. The service and accomplishments of the MSK section would not have been possible without the invaluable help and input of the MSK fellows that have graduated from the program in the last two years: Dr. Marc Beck, Dr. Matthew Berst, Dr. Joseph Burns, Dr. Eric Callaghan, Dr. Mehul Doshi, Dr. Earl Maes, Dr. Maheen Rajput, and Dr. David Rideout.

~ RETIREMENTS ~

Dr. Bruce Brown retired on June 30, 2007 after a 30 year association with the University of Iowa Hospitals and Clinics. His affiliation with UIHC began in 1977 when he arrived from an internal medicine residency at The University of Michigan to begin a fellowship in gastroenterology. At the end of that two year fellowshipship, he joined the staff of the Department of Gastroenterology, advancing to the level of assistant professor by 1986 when he elected to begin a residency in radiology. Upon completion of his radiology residency he became an assistant professor in the Department of Radiology, advancing to Associate Professor in 1995.

During his tenure in Radiology, Dr. Brown served in the capacity of both Director of Body Imaging and Director of Body Imaging Fellowships. He was a regular Guest Lecturer for the Armed Forces Institute of Pathology from 2000-2007. Dr. Brown also served as the principal investigator for a $602,105 grant to introduce virtual colonoscopy to UIHC, a successful three-year study that ended just prior to his retirement.

Dr. Brown was known for his energetic teaching style and passion for the topics he taught. Utilizing his trademark Medi-Tech drain catheter pointer, he earned “Best Lecturer” awards from medical students in the Introduction to Clinical Medicine and the Radiology Preceptorship courses, as well as “Teacher of the Year” from the radiology residents. He was also the 2004 recipient of the Krabenhoff Award for Excellence in Teaching in Radiology.

All of us in Radiology are greatly appreciative of Dr. Brown’s contributions to the department and his unwavering dedication to his patients, colleagues, students and staff.

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All of us in Radiology are greatly appreciative of Dr. Brown’s contributions to the department and his unwavering dedication to his patients, colleagues, students and staff.
Welcome New Faculty!

Brooke K. Breen, MD, Clinical Assistant Professor, joined the Body Imaging section in Radiology. Dr. Breen received her MD from the University of Massachusetts Medical School. She completed both a Diagnostic Radiology residency and MRI fellowship at Tufts-New England Medical Center in Boston, MA. Prior to her appointment at UIHC, she was an Assistant Professor of Radiology, Body and Musculoskeletal MRI and Body CT at Tufts-New England Medical Center.

Jack C. Kademian, MD, joined the Department of Radiology as a Clinical Assistant Professor. Dr. Kademian completed his medical education at St. George’s University in Grenada, and his Radiology residency at St. Joseph Mercy Oakland, Pontiac, MI. Prior to his appointment at UIHC, Dr. Kademian completed a Neuroradiology fellowship at University of Iowa Hospitals & Clinics. He joins the faculty of the Neuroradiology section.

Jeong Min Lee, MD, joined the Department of Radiology as a Visiting Assistant Professor. He received his medical training at Chonbuk National University College of Medicine, Chonbuk, South Korea, where he also completed a Radiology residency. In addition to his appointment at UIHC, he is also an Associate Professor of Radiology at Seoul National University College of Medicine, Seoul, South Korea. Dr. Lee joins the Body Imaging section.

Ramin Midia, MD, Clinical Assistant Professor, received his MD at Hacettepe University Medical School in Ankara, Turkey. He completed his Diagnostic Radiology residency at Southern Illinois University School of Medicine, St. John’s Hospital/Memorial Medical Center in Springfield, IL. Dr. Midia also completed a fellowship in Vascular and Interventional Radiology at the University of Michigan, Ann Arbor, and a fellowship in Neuroradiology at Washington University in Saint Louis, MO. He joins the Vascular Interventional section.

In addition to our new faculty appointments, we would also like to welcome the following fellows:

**Body Imaging**
- Eve Clark, MD, Fellow-Associate
- Wei Fang, MD, Fellow-Associate
- Michael Macke, MD, Fellow-Associate

**Chest**
- Archana Laroia, MD, Fellow-Associate

**Head & Neck**
- Aristides A. Capizzano, MD, Fellow

**Interventional**
- Luis Arangua, MD, Fellow
- Sandeep Laroia, MD, Fellow

**Musculoskeletal**
- Bradley Hammett, MD, Fellow-Associate
- Anietie Okon, MD, Fellow-Associate
- Lindy Paradise, MD, Fellow-Associate
- Jonathan Staser, MD, Fellow-Associate

**Neuroradiology**
- Joseph Baima, MD, Fellow
- Brenton Harris, MD, Fellow
- Derik T. Weldon, MD, Fellow

**Neurointerventional**
- Bryan R. Ludwig, MD, Fellow
- Masanari Onizuka, MD, Fellow

Please note: Two errors were made in the printed version of this section: Drs. Masanari Onizuka and Aristides Capizzano were both erroneously listed as new Neuroradiology fellows. Their correct fellowships are printed above. We apologize for the mistake.
NEW RESIDENTS

DIAGNOSTIC RADIOLOGY

Aaron D. Berg, MD, University of North Dakota

Justin E. Boatsman, MD, University of Texas at Galveston

Christopher W. Colling, MD, University of Nebraska

Todd L. Ebbert, MD, Yale University

Brian A. Fletcher, MD, University of Kansas

Andrea G. Hastings, MD, University of Iowa

Joshua H. Larson, MD, University of Illinois

Ryan Reynolds, MD, University of North Dakota

NUCLEAR MEDICINE

Guy Amir, MD, MPH, Fatima Medical Science Foundation

Damita L. Thomas, MD, Case Western Reserve University School of Medicine

Honors & Awards

Monzer M. Abu-Yousef, MD
- International Referee for Faculty Promotions at the University of Kuwait, Kuwait City, Kuwait, March 2007
- Oral Examiner, American Board of Radiology, Louisville, KY, June 2007
- Included in list of Best Doctors in America, 2007

David Bushnell, MD
- Voted by his peers as one of the top Nuclear Physicist/Nuclear Medicine Researchers from the 2007 Medical Imaging Industry Top 10

Michael P. D’Alessandro, MD
- 2007 recipient of the Singleton-Taybi Award for achievement in pediatric radiology for recognition of a lifetime dedication to the education of medical students, residents, fellows, and colleagues in the discipline of pediatric radiology. Awarded by the Society of Pediatric Radiology.

Bao H. Do, MD
- 2007 recipient of the RSNA Trainee Research Prize for the research project entitled, “Feedback natural language processing of fractures in unstructured reports of emergency department studies”

Georges Y. El-Khoury, MD
- Reviewer for the American Journal of Sports Medicine, 2007
- Consultant to the National Board of Medical Examiners, 2007
- Included in list of Best Doctors in America, 2007

Laurie L. Fajardo, MD
- Recipient of the first annual Health-Care Hero Award in the “Advancement in Health Care” category from the Corridor Business Journal for “heroic efforts in women’s imaging.” Presented in February 2007.
- Voted by her peers as one of the top Women’s Imaging Specialists from the 2007 Medical Imaging Industry Top 10

Mark T. Madsen, PhD
- Voted by his peers as one of the top Nuclear Physicist/Nuclear Medicine Researchers from the 2007 Medical Imaging Industry Top 10

Toshio Moritani, MD
- Appointed to the Electronic Education and Internet Committee for the American Society of Neuroradiology, 2006-2008

Eve Clark, MD, Nita Parekh, MD, Rakesh Patel, MD and Andrew Wu, MD
- Selected to participate in the Toshiba Residents Program at the Society of Radiologists in Ultrasound 2007 Annual Meeting, October 2007, in Chicago, IL.
Wendy R.K. Smoker, MD
- Appointed to the Neuroradiology Faculty, Armed Forces Institute of Pathology, 2007-2008
- Examiner, American Board of Radiology - Diagnostic Radiology Oral Board Examination, Louisville, June 2007
- Reappointed as Chair of the Neuroradiology Section for the ABR Written Examination

Edwin J.R. van Beek, MD
- Appointed to the Editorial Board (Chest) of European Radiology in January 2007
- Appointed to Editorial Board of the Journal of Magnetic Resonance Imaging, May 2007
- Guest Editor, Innovations in Chest Imaging (special issue), Investigative Radiology, 2007
- Elected to the Executive Committee, UI Carver College of Medicine, July 2007
- Appointed to the following review panels: NIH Novel Imaging Section (March 2007) and the National Health and Medical Research Council of Australia (June 2007)
- International Society of Magnetic Resonance in Medicine, May 2007: Chairman, Hyperpolarized Media Study Group; Member, Study Group Review Committee

Marianne Klouda (pictured above right) was awarded the recipient of the Employee of the Year Award for 2006 for her “commitment to providing patients at UIHC with unparalleled healthcare service in keeping with the goals of the Department of Radiology.” The award was presented by Tyler Artz and Laurie Fajardo (also pictured above). Congratulations, Marianne!

2006 - 2007 RADIOLOGY TEACHING AWARDS

MEDICAL STUDENT TEACHING AWARDS

Resident Teacher of the Year
Ahmad Izard, MD

Resident Educator of the Year
Lee Marshall, MD

Outstanding Resident Teachers
Bao Do, MD
Paul Wheeler, MD

DEPARTMENTAL TEACHING AWARDS

Resident Research Award
Denik Weldon, MD

Resident Teacher of the Year
Brent Harris, MD

Resident Award for Outstanding Clinical Service
Brent Harris, MD

Krabbenhoft Award for Excellence in Teaching
Wendy Smoker, MD

Facult Teacher of the Year
Geetika Khanna, MD

Outstanding Senior Faculty Teacher of the Year
Georges El-Khoury, MD

Outstanding Junior Faculty Teacher of the Year
Kelli Andresen, MD

Foundations of Clinical Practice IV Teacher of the Year
Brad Thompson, MD

FIVE YEARS
Trisha Bartz
Janese Bryant
Bridgette Ham
Ashley Heid
Nichole Jenkins
Jessica Johnston
Marla Kleingartner
Clint Mohring
Bao Nguyen
Jamie Rucker
Jane Ruplinger
Melissa Schaedler
Michael Waughop
Kimberly Wiley
Jocelyn Wright
Chatherine Yanachek

FIFTEEN YEARS
Stephen Baker
Marie Beelner
Kevine Hatfield
Tracy Pettinger
Julie Riggert
Janet Roe
Kelli Zimmerman

TWENTY YEARS
Brian Bauer
Cynthia Beaumont
Richard Langholdt

TWENTY-FIVE YEARS
Anthony Knight

THIRTY YEARS
Denise Lange
Barbara Mayberry
Cindy Vest

THIRTY-FIVE YEARS
David Owen
Publications

BOOKS/BOOK CHAPTERS


ARTICLES


Awards from National Meetings

Radiological Society of North America 91st Annual Meeting, Chicago, IL, Nov-Dec 2006

Bruce RJ, Verona WI, Gentry LR, Smoker WRK, Reede DL. Diagnostic evaluation of head trauma. CERTIFICATE OF MERIT AWARD


Khanna G, Menda Y, Kao Sc, Kirby P, Sato Y. Gastroenteropancreatic neuroendocrine Tumors in Children and Young Adults: Advances in Imaging and Targeted Therapy. CERTIFICATE OF MERIT AWARD

American Society of Neuroradiology Annual Meeting, Chicago, IL, June 2007

Alsheik NH, Gentry LR, Smoker WRK, Reede DL. Comprehensive diagnostic evaluation of traumatic cerebrovascular injury. SUMMA CUM LAUDE AWARD

Moritani T, Sato Y, Smoker WRK, Oral R. Diffusion-weighted imaging of excitotoxic brain injury in baby syndrome. (Selected for oral presentation as one of top 10 exhibits)

American Institute of Ultrasound in Medicine Annual Convention, New York, NY, March 2007

Abu-Yousef MM, Laroia AT. Doppler sonography of testicular and extratesticular pathology. SECOND PLACE AWARD

Asian Oceanic Congress of Neuroradiology and Head & Neck, Singapore, January 2007

Moritani T, Sato Y, Smoker WRK, Oral R. Diffusion-weighted imaging of excitotoxic brain injury in baby syndrome. (Selected for oral presentation as one of top 10 exhibits)


• Khanna G, Applegate K. Ultrasound guided intussusception reduction: are we there yet? Abdom Imaging. 2007 Sep 8; [Epub ahead of print].


• Maldonado F, Daniels CE, Hoffman EA, Yi ES, Ryu JH. Focal Organizing Pneumonia on Surgical Lung Biopsy: Causes, Clinicoradiologic Features, and Outcomes. Chest. 2007 Sep 21; [Epub ahead of print]


(continued on next page)


• Shroff R, Kirschner A, Maifeld M, Van Beek EJ, Jagasia D, Dokras A. Young Obese Women with Polycystic Ovary Syndrome have Evidence of Early Coronary Atherosclerosis. J Clin Endocrinol Metab. 2007 Sep 11; [Epub ahead of print]


• Van Beek EJR. Use of virtual imaging techniques – from top to bottom, from life to death. [editorial] Imaging Decisions 2007;11:1
Scientific Presentations & Abstracts

- Ireland RH, Bragg, CM, McJury M, Woodhouse N, van Beek EJR, Hatton MQ, Wild JM. Validation of 3He MRI to CT image registration and the impact on NSCLC IMRT planning. ISMRM, Berlin, 2007. (continued on next page)


• Mohr W, Abraham T, Sohi J, Juweid M. Percent residual gastric activity at four hours (%RGA@4Hrs) after a solid meal cannot be reliably predicted from two-hour data. 1) RSNA Annual Meeting, Chicago, IL, November 26-December 1, 2006; 2) Society of Nuclear Medicine Annual Meeting, Washington, DC, June 2-6, 2007.


• Wang F, Ji D, Lang Zh, Zhang Zh, Huang W, Sun S. Experimental Study: Mechanical Thrombectomy for Acute Pulmonary Embolism. Accepted for oral presentation at SIR 31st Annual Scientific Meeting, Toronto, Ontario, Canada, March 30-April 4, 2006.


• Yang L, Walsh SA, Qing F, Ponto LB, Graham MM. Tumor blood flow in mice with Xe-133 and an ultra-high sensitivity collimator. Presented at the 54th Annual Meeting of the Society of Nuclear Medicine, Washington, DC, June 2-6, 2007.


Invited Speakers


• Andresen KJ. So you want to be a radiologist… Presentation to Medicus, University of Iowa Undergraduate Medical School Interest group. 12 February 2007. Iowa City, IA.


• Golzarian J. ISET Florida, 28 January- 3 February 2007: Embolization case presentation workshop; 2) SMA stenting for chronic mesenteric ischemia: results in 45 consecutive patients; 3) UFE: materials or technique, what is more important.


• Golzarian J. UFE materials: Debate. Society of Interventional Radiology annual meeting, Seattle March 1-6, 2007


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Invited Speakers, continued from previous page

- Kao SC. Imaging of non-rhabdomyosarcomatous soft tissue tumor in children Invited lecture at the Pediatric Hematology and Oncology grand round, Iowa City, IA, April 9, 2007.
- Stanford W. CT Cardiac imaging: Clinical applications. Senior Technologists, University of Iowa Hospital and Clinics Department of Radiology. Iowa City, IA. February 27, 2007.
- van Beek EJ. New imaging modalities for asthma. American Academy of Allergy, Asthma and Immunology, San Diego, CA, Feb. 2007.

**Invited Course Faculty**

- Smoker WRK. CT and MR anatomy and pathology of the neck. MidEast Society of Nuclear Medicine, Ocean City, MD, April, 2007.
• Smoker WRK: Visiting Professor, Cleveland Clinic, Cleveland, OH, April 2007. 1) The Craniovertebral Junction 2) Spinal Neoplasms and M imics 3) The Pharyngeal Mucosal Space and Oral Cavity.

Exhibits / Posters

Grants

Kevin S. Berbaum, PhD
Eyestrain in Radiologists
University of Arizona
$105,000
2/1/2007-1/31/2008

Kevin S. Berbaum, PhD
Improved DBM ROC Methods for
Diagnostic Radiology
US Department of Health & Human
Services, National Institutes of
Health
$628,500

John C. Chaloupka, MD
MAPS Trial: Matrix and Platinum
Science: A Prospective, Random-
ized, Multicenter Trial Investigating
Matrix2tm and GDC Coils for the
Treatment of Intracranial Saccular
Aneurysms
Boston Scientific Corporation
$40,678

Laurie L. Fajardo, MD
ACRIN 2007 Publications Commit-
tee Chair Agreement
American College of Radiology
$14,166
1/1/2007-12/31/2007

Laurie L. Fajardo, MD
Breast MR Lesion Segmentation
Study
Philips Research North America
$1,500

Eric A. Hoffman, PhD
Imaging Isolated Lung During
Ventilation
Carleton Life Support Systems, Inc.
$22,125

Eric A. Hoffman, PhD
Liposomal Contrast Agent Assess-
ment
Marval Therapeutics, Inc.
$120,494
5/14/2007-9/30/2008

Vincent A. Magnotta, PhD
BRAINS Morphology and Image
Analysis
US Department of Health & Human
Services, National Institutes of
Health
$327,024

Saha Punum, PhD
Quantification of Osteophytes in a
Rabbit Model of Osteoarthritis
Merck & Company, Inc.
$30,000

Brad H. Thompson, MD
A Multicenter, Randomized, Double-
Blind, Parallel Group, Phase IV Study
to Compare the Renal Effects of the
Non-Ionic Iso-Osmolar Contrast
Medium, Iodixanol 320 mgI/mL
(VisipaqueTM), with the Non-Ionic
Low Osmolar Contrast Medium,
Iopamidol
300mgI/mL
General Electric Healthcare
$70,250
3/20/2007-12/31/2008

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