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## SMRT 13th Annual Meeting Program Report

James J. Stuppino, B.S., R.T. (R)(MR), 2004 Program Committee Chair



The SMRT did indeed rise to excellence at the 13th Annual Meeting held 14-16 May 2004 in the beautiful city of Kyoto, Japan, at the Kyoto International Conference Hall. Keeping with our theme of "Rising to Excellence," more than 160 technologists from 22 different countries attended the poster walking tour and the 2-day didactic educational meeting. Over 40 posters were on display this year throughout the meeting. Due to the success of the format last year, selected posters were featured at the Poster Exhibit and Walking Tour reception on Friday evening, 14 May, with authors giving a brief oral presentation followed by time for discussion. A special thanks to **Tyco Healthcare Mallinckrodt** for once again sponsoring this gala reception. This event continues to be very well received and we encourage technologists to consider oral presentations of their posters.

On Saturday morning, the didactic session was started by outgoing President Maureen Ainslie, M.S., R.T. (R)(MR), who welcomed the attendees and the morning moderator was Julie Strandt-Peay, B.S.M., R.T. (R)(MR). The first invited speaker was outgoing board member Silke Bosk, R.T., who shared her expertise on MR colonography and virtual colonoscopy. David W. Stanley, B.S., R.T. (R)(MR) was the second speaker and he shared his experience on 3 T imaging. Bobbie Burrow, A.S., R.T. (CT)(MR) moderated for the next section of the meeting where award winning proffered papers were presented. Caron Murray, R.T. (R)(MR) A.C.R., presented the first place award, research focus, paper entitled "*Projection Reconstruction and Time Resolved Imaging of Contrast Kinetics in Breast MRI.*" Joanne Muldoon, M.R.T., (R)(MR) earned the second place award, research focus, with her paper entitled "*Use of Guidance Software during MR Breast Interventional Procedures.*" The next proffered paper was presented by Mercedes Pereyra, R.T. who was awarded first place, clinical focus, with her paper entitled "*Comparison Between Single Breath-Hold Volumetric Delayed Enhancement Imaging of the Left Ventricle and Navigator Guided Free Breathing 3D DE Imaging.*" Sandra Massing, R.T. presented the third place award



SMRT President, Cindy T. Hipps presents the President's plaque to Maureen Ainslie.

clinical focus paper entitled "*Assessment of Myocardial Viability Using Contrast Enhanced MRI-Comparison of GD-DTPA and GD-Bopta.*"

The SMRT Business Meeting was held during the lunch hour. Maureen Ainslie, M.S., R.T. (R)(MR), President of the SMRT called the meeting to order. The Executive Committee and new Policy Board members were introduced and outgoing members were thanked for their service. Maureen Ainslie turned the gavel over to Cindy Hipps who spoke to the attendees and began her term as SMRT president. The awards presentations followed and the SMRT Business Meeting was adjourned. (See the Education Committee report for your peers who received awards for their submissions).

## Editor's Letter

Julie Strandt-Peay, B.S.M., R.T. (R)(MR)



**G**reetings,

2004 Program Chair **Jim Stuppino** begins this issue of *Signals* with his report on the Kyoto meeting. You will become acquainted with **Cindy**

**Hipps**, the new SMRT President as she begins her term. **Julia Lowe**, Education Chair announces the names of those whose work earned awards. This year's forum held as a joint presentation with the ISMRM was co-organized by **John Christopher**, SMRT Executive Committee Member. New this year, we are publishing the report of the business meeting so that you as members are kept informed of the activities within your professional organization. Thanks to the diligent efforts of **Anne Sawyer-Glover** you are able to place the faces of your peers and invited speakers with their names on the photographs taken during the Annual Meeting. These depict many of those who actively participate and are willing to volunteer their time and talents on our behalf. Members who have shared their work are among the first of the award winning papers with more coming in subsequent issues of *Signals*.

The SMRT is in active dialogue with other professional organizations as explained by External Relations Chair, **Maureen Hood**. **Anne Sawyer-Glover** introduces the new home study offering which looks at cardiovascular MR imaging. You are invited to participate in choosing the future leaders of the SMRT by **Maureen Ainslie**, Nominating Committee Chair. Reports from **Linda Varnis** in Pennsylvania and **Julia Lowe** in Ohio articulate the quality of the SMRT Regional Educational Seminars. The ever informative safety column from **Frank Sherlock** discusses new information about your patients. **Bill Faulkner** discusses the use of Gadolinium at low-field MRI. **Nanette Keck**, 2005 Program Chair, invites us to the United States of America for the next Annual Meeting.

Coming next quarter: more award winning papers, news about our profession, and educational information you can use in your daily MR practice. Please feel free to contact us with your suggestions for educational articles. ●

## Meet the New SMRT President: Cindy T. Hipps, B.H.S., R.T. (R)(MR)

Julie Strandt-Peay, B.S.M., R.T. (R)(MR)



**Signals:** *How long were you working in MRI before you knew about the SMRT?*

**Cindy:** I started working with MRI in 1986. I can't remember exactly how I found out

about the SMRT but the first Annual Meeting I attended was the organizational meeting held in 1990 in New York! The only Annual Meeting I missed since, was the one held in Australia because, I had my son, Tucker then. I attended the Atlanta Local Chapter seminars every year after they started. After attending the first Annual Meeting, I was hooked and wanted to get involved.

**Signals:** *Why did you think it was important to get involved?*

**Cindy:** I think it is important for all technologists to promote their profession and this happens when we get involved. I am one of those types that must become involved because it helps me personally to grow professionally. I would become stagnant if I did not get actively involved. The SMRT is a great avenue for MR technologists to grow professionally while staying abreast of this ever-changing modality! The SMRT not only provides continuing education, rewarding professional work, but lasting personal relationships. I have so many wonderful friends through the SMRT! I was lucky to have met Candi Roth, Bill Faulkner, Luann Culbreth, Donna O'Brien, and Bobbie Burrow at those first seminars. They were instrumental in putting me on various committees. I have been attending meetings since 1990 with committee work starting in 1997. I was elected to the Policy Board in 1999.

**Signals:** *Where do you work now and how does the SMRT fit in with your job?*

**Cindy:** I work for Greenville Radiology, PA in Greenville, South Carolina, which is a group of 36+ radiologists. I am the MRI Coordinator for two fixed sites. I do not see a professional career in MRI without the SMRT. As a routine diagnostic MRI technologist,

the SMRT provides the means for me to stay on top of the current technology. Otherwise, I would become complacent in my job. My radiologists are very supportive of my role in the SMRT and encourage my association because they see the benefits to me and our other technologists!

**Signals:** *What do you see as the most important project of the SMRT this year?*

**Cindy:** The SMRT is at a crossroads. There are several activities pending that could take us to a higher level in the MR community. We have plans to work with the ARRT on several projects that will promote MR technologists. There will be more information concerning this as it becomes available. The SMRT is beginning to be seen by other health care organizations as representing the MR professionals. This emerging identity brings both opportunity and responsibility.

**Signals:** *What else do you hope the SMRT can accomplish this year?*

**Cindy:** I would like to continue the "Each One Reach One" campaign that Maureen Ainslie started. I would like to see our membership grow by leaps and bounds. I would like to see more technologists like myself become members. It is clear that we do not all have to be at the same level to learn from each other. I learn from the research technologists and they learn from me as a routine technologist. We all have something to give to the field of magnetic resonance and usually that is our experiences!

**Signals:** *How do you juggle SMRT duties with home and work?*

**Cindy:** Even as a working mother of an active son, I find time to stay involved with the SMRT. Of course, my husband of 22 years helps me maintain the workload. Without the support of my family and my co-workers, I would not be able to fit the extra SMRT duties into my day! My co-workers help by taking up my slack when SMRT duty calls! I have a GREAT support system! ●



## President's Letter

Cindy T. Hipps, B.H.S., R.T. (R)(MR)

**T**he SMRT 13th Annual Meeting held in conjunction with the ISMRM 12th Scientific Meeting in Kyoto, Japan was a great experience for all in attendance! It was wonderful to see such a diverse group of individuals in the Land of the Rising Sun. **Jim Stuppino**, SMRT Program Chair and **Julie Lowe**, SMRT Education Chair did an outstanding job with the program as well as handling all the last minute details for awards. You can read more about the meeting and the awards in their reports. Their entire committees should be commended for a job well done! **John Christopher**, is the SMRT Executive Board Member and Co-Organizer of the SMRT/ISMRM Joint Presentation, "Managing MR Artifacts and Pitfalls" hosted on Monday during the ISMRM meeting. The forum was well attended and our own SMRT **Greg Brown** gave a presentation on "MR Artifacts—A Technical Perspective" that was very informative. We are proud of our SMRT colleagues.

As I reflect on events that took place in Kyoto and the many tasks that are at hand surrounding the SMRT, I am excited that, as an organization, we are at a crossroad. The SMRT needs you, **the members**, to help us as we move forward with issues that impact MR technologists worldwide. We are keeping abreast of developments in Advanced Practice for RT's and welcome any comments you might have as to the role MR professionals might play concerning Advanced Practice for RT's. We are working diligently to update our curriculum guidelines. We need your input! We welcome any comments you might have concerning educational requirements for training MR Technolo-

gists or Advanced Practice. You may contact any of the SMRT Policy Board Members or **John Christopher**, SMRT Education Chair 2004-2005.

As we explore new avenues to increase membership, I encourage each of you to continue with the membership drive that **Maureen Ainslie**, SMRT Past President, started which is "Each One, Reach One." She has provided enthusiastic insight to align the SMRT in the years to come. Even though our membership has grown tremendously over the past few years, there are many more MR technologists working in the routine ranks everyday that need the quality MR education the SMRT offers. I cannot place a price tag on what this organization has provided me over the years as I work each day in a rural hospital and outpatient MR center. **Todd Frederick**, SMRT Membership Chair 2004-2005, has already begun brainstorming new ideas to help reach technologists in MR training as a way to help educate them and keep them interested in the field of MR. Some of this requires SMRT By-law changes, so you will hear more about this over the next year as **Andrew Cooper**, SMRT By-Laws Committee Chair, reviews the by-laws. Again, I encourage you, **the members**, to communicate any ideas you might have concerning membership growth.

Regional seminars play an important role in the SMRT's mission to offer quality MR education! Already in this fiscal year, which ends in September, there will be a total of seven Regionals. **Cindy Comeau** has done an outstanding job chairing this committee over the past year! As of the end of May, **Jim Stuppino**, SMRT Regionals Chair 2004-2005, has five Regionals on the books for the next fiscal year starting in October 2004. If you are interested in hosting an SMRT Regional in your area, start by going to the SMRT website and downloading the Regionals Packet. Then, get in touch with Jim and bring an SMRT Regional to your local area, whether it is



(l. to r.) 04-05 SMRT President, Cindy T. Hipps; 04-05 ISMRM President, Walter Kucharczyk; 03-04 SMRT President, Maureen Ainslie; and 03-04 ISMRM President, Michael E. Moseley.

Europe, North America, or anywhere else in the world.

The External Relations Committee, chaired by **Maureen Hood** continues to maintain relationships with many other healthcare organizations. During her tenure, she has done an exceptional job promoting MR technology and the SMRT in a professional manner. Even though she has completed her tenure of three years, she will continue to work closely with the committee. This year plans were made at the RSNA Associated Sciences Consortium Planning Meetings for RSNA 2004. The SMRT has been charged with planning one day of the mini-symposium for 2004 on the topic "Image Guided Therapeutics." Work continues on the CARE Act as developed through the Alliance for Quality Medical Imaging and Radiation Therapy.

**Maureen Hood** was also instrumental in writing "How to become an MR Tech" as featured on the website of the Health Professions Network. You can view that page by going to: [http://www.healthpronet.org/ahp\\_month/04\\_04.html](http://www.healthpronet.org/ahp_month/04_04.html). The SMRT is very fortunate to have members like **Maureen Hood**. We give her our thanks for a job well done!

The SMRT continues to add new chapters each year. You can organize a local chapter in your area to help offer additional MR education to technologists. If you are interested, please contact **Judy Wood**, SMRT Chapters Committee Chair 2004-2005. When asked by **Julie Strandt-Peay**, SMRT *Signals* Editor, how I became involved in the SMRT, I reflected back. It was the Atlanta Chapter that was instrumental in my becoming involved in the SMRT and I am very grateful to that chapter

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2004-2005 SMRT President, Cindy Hipps addresses the attendees with a call for volunteers to serve on committees and help promote the SMRT by continuing the "Each One Reach One" membership drive.



SMRT President, Maureen Ainslie, presents the President's Award to Eric L. Douglas, R.T. (R)(MR) for his work entitled "Direct Comparison of Sensitivity Encoding (SENSE) Accelerated and Conventional 3D Contrast Enhanced MR Angiography (CE-MRA) of Renal Arteries: Effect of Increased Spatial Resolution."

which continues to provide me with an educational experience every year! Thanks **Bobbie**, **Donna**, and **Carolyn**!

**Nanette Keck**, SMRT Program Chair 2004-2005, is already in motion planning the SMRT 14th Annual Meeting in Miami Beach, Florida. She will review the suggestions made by the attendees from the Kyoto meeting as she selects the topics and speakers for the meeting. Miami will be a meeting you will not want to miss, I promise!

**Anne Sawyer-Glover**, SMRT Educational Seminars "Home Studies" Editor, continues to amaze me with her energy and enthusiasm. She is relentless when it comes to ideas and creativity. Even though the shoes of **Kelly Baron** will be hard to fill, Anne will meet the challenge. I would like to thank Kelly for her dedication to the home study project and for the past five years as editor! You are awesome and we continue to enjoy all the rewards of the past issues. I look forward to many more issues of the home studies as led by Anne and her committee.

The Publications Committee of the SMRT, as chaired by **Greg Brown**, will continue to be busy this year. *Signals* Editor **Julie Strandt-Peay** and Home Studies Editor **Anne Sawyer-Glover** will be working closely with Greg and his committee. As presented to the attendees at the Kyoto meeting, **Greg** stressed that there are many opportunities for MR technologists to show their writing skills. MRI Devices is requesting articles from practicing technologists for their newsletter, as is *Advance* for RT's. If you are interested in writing

an article to publish, contact **Greg Brown** or **John Christopher**, SMRT Education Chair.

The SMRT is successfully maintaining the budget required for operations. **Anne Sawyer-Glover** has done an outstanding job over the past three years keeping up with our finances. She has been working with **Laurian Rohoman**, SMRT Treasurer 2004-2007, to make the transition a smooth one. Anne was instrumental in making our Kyoto meeting successful with her leadership in gaining corporate sponsorship. Without the financial help of our corporate vendors, we would not be able to offer the quality educational opportunities that we offer. We are very thankful for their support!

I would like to thank **Jennifer Olson** and the entire ISMRM Office for their continued support and hard work. She always goes above and beyond the call of duty. The ISMRM provides much support to the SMRT. Thanks especially to **Michael E. Moseley, Ph.D.** and **Walter Kucharczyk, M.D.**, of the ISMRM for your encouragement (see photo page 3).

I look forward to serving the SMRT as President. We have an impressive Policy Board and Committee Chairs for 2004-2005. With their help, there is nothing we cannot accomplish. I personally welcome any comments or suggestions you, as a **member**, might have. Feel free to contact me via email at [cthipps@charter.net](mailto:cthipps@charter.net). This will be an exciting year! ●

The Section for Magnetic Resonance Technologists would like to thank the following donors for their generous support of the SMRT 13th Annual Meeting:

**GOLD CORPORATE MEMBERS:**

**Amersham Health**  
**Berlex Imaging/Schering AG Germany**  
**GE Healthcare**  
**Philips Medical Systems**  
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**Hitachi Medical Systems America, Inc.**  
**Toshiba Medical Systems Corporation**  
**Tyco Healthcare Mallinckrodt**

SMRT would like to thank:

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**Central Pennsylvania Local Chapter of SMRT**  
**Central Pennsylvania MRI Center**  
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**Toshiba Medical Systems Corporation**  
**Tyco Healthcare Mallinckrodt**

for their generous support of the SMRT 13th Annual Meeting.

SMRT would also like to thank:

**MRI Devices Corporation**  
 for its support of the  
*SMRT Educational Seminars Home Studies.*



# Education Committee Report on the SMRT Annual Meeting in Kyoto, Japan

Julia B. Lowe, B.S., R.T. (R)(MR), SMRT 2004 Education Committee Chair



The Education Committee is happy to report the success of the Thirteenth Annual Meeting of the Section for Magnetic Resonance Technologists, (SMRT) held May 14-16th, 2004.

167 attendees met at the Kyoto International Conference Hall for the purpose of promoting education and developing professional relationships.

The Poster Walking Tour began Friday evening, and was hosted by **Tyco Healthcare Mallinckrodt**. This has always been my favorite part of the program because of the relaxed and social atmosphere of technologists/radiographers gathered to share their work. Posters are displayed and presented by their authors and perused and studied by attendees. The poster reviewers use this opportunity to ask questions of the authors to help them determine the final poster score. Five authors were invited to give a 10-minute oral presentation beside his/her poster. This approach was introduced at the 2003 Annual Meeting in Toronto and because of its success is now a part of the Poster Walking Tour Reception.

The proffered paper oral presentations and awards were determined by blinded review prior to the meeting. A total of 52 abstracts were submitted for review for the 2004 Annual Meeting representing 14 countries. A panel of 11 reviewers selected from the Education Committee carefully judged and scored abstracts using a standardized scale and set criteria. The highest overall scoring abstract was distinguished by the President's Award and was selected to be presented in the program by the winning author. At the SMRT Business Meeting Awards Luncheon, President, Maureen Ainslie, presented the President's Award to Eric Douglas, R.T., (R)(MR) for his work entitled, "Direct Comparison of Sensitivity Encoding (SENSE) Accelerated and Conventional 3D Contrast Enhanced MR Angiography (CE-MRA) of Renal Arteries: Effect of Increased Spatial Resolution."



H. Cecil Charles, Ph.D., from Duke Image Analysis Lab, Duke University presenting his lecture entitled "Clinical and Research Spectroscopy."

The other highest scoring abstracts were distinguished by first, second and third place awards given in both clinical and research categories and were also presented as proffered papers in the program. Jim Stuppino, Program Committee Chair, recognized these winning technologists/radiographers at the Awards Luncheon. The oral presentation awards for the clinical category are as follows:

**1<sup>st</sup> Place:** "Comparison Between Single Breath-Hold Volumetric Delayed Enhancement Imaging of the Left Ventricle and Navigator Guided Free Breathing 3D DE Imaging" by Mercedes Pereyra, R.T.

**2<sup>nd</sup> Place:** "Optimization of Contrast-Enhanced Peripheral MR Angiography with Mid-Femoral Venous Compression (VENCO)" by Sandra Massing, R.T.

**3<sup>rd</sup> Place:** "Assessment of Myocardial Viability Using Contrast-Enhanced MRI-Comparison of Gd-DTPA and Gd-BOPTA" by Sandra Massing, R.T.

The oral presentation awards for the research category are as follows:

**1<sup>st</sup> Place:** "Projection Reconstruction and Time Resolved Imaging of Contrast Kinetics in Breast MRI" by Caron Murray, R.T. (R)(MR), A.C.R.

**2<sup>nd</sup> Place:** "Use of Guidance Software during MR Breast Interventional Procedures" Joanne Muldoon, M.R.T., (R)(MR)

**3<sup>rd</sup> Place:** "Pathogenesis of Corticospinal Tract Degeneration in ALS Patients by Diffusion Tensor Imaging" by Helle Juhl Simonsen, (MRT)

The posters that are presented Friday evening must be judged and scored before the beginning of the SMRT Business Meeting and Awards Luncheon on Saturday. The poster score that is given by the panel of reviewers is averaged with the author's initial abstract score which determines the final poster score. Julia Lowe, Education Committee Chair, presented the poster awards to technologists/radiographers at the Awards Luncheon. The awards for the poster clinical category are as follows:

**1<sup>st</sup> Place:** "Possibility to Differentiate between Metastasis and Radiation Necrosis by MR Spectroscopic Imaging" by Yvonne Van Der Meulen, R.T.

**2<sup>nd</sup> Place:** "Case Report: Clinical Use of Susceptibility-Weighted MR Venograph" by Karen Bove Bettis, R.T. (R)(MR)

**3<sup>rd</sup> Place:** "Time-Resolved Renal MRA with TRICKS" by David Stanley, B.S., R.T. (R)(MR)

The awards for the poster research category are as follows:

**1<sup>st</sup> Place:** "Truncated Fat Saturation with Elliptic Centric K-Space Filling for Contrast Enhanced Bilateral Breast MRI" by Caron Murray, R.T. (R)(MR), A.C.R., B.H.A.

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**2<sup>nd</sup> Place:** "Can fMRI Studies Be Performed across Scanners? A Comparison of fMRI Results between Two 3T Scanners" by Paula Rowser, R.T.

**3<sup>rd</sup> Place:** "A New Look into Kicking a Football-An Investigation of Muscle Activity using MRI" by Kara Baczowski, R.T.

I would like to express my thanks to the technologists and radiographers for submitting such excellent work to the SMRT and to thank all of you who attended the meeting. For those of you that couldn't make it to Japan, please

enjoy reading the winning abstracts in the *Signals* newsletters.

As the Education Committee chair, I would like to thank the Education Committee members for their work on implementing Student Scope and updating school listings on the SMRT Website, and for reviewing abstracts and posters. It is rewarding that we are now receiving continuing education credits for technologist's proffered paper presentations at the annual meetings.

Personally, I would like to thank the SMRT members for electing me as

a Policy Board Member. I have learned so much in the past three years about education in MRI. But, more importantly I've learned about the people of the SMRT. I am fortunate to have worked with such a motivated and respected society as the SMRT. Thank you! ●

**Editor's Note:** The work of Julia Lowe was instrumental for SMRT to now receive continuing educational credits for the proffered paper presentations. We appreciate her efforts.

For those of you not able to attend the SMRT 13th Annual Meeting, there are syllabi available through the SMRT Office. Call or see the SMRT web page for details.

## 2004 SMRT and ISMRM Joint Presentation: Managing MR Artifacts and Pitfalls at the ISMRM Annual Meeting

John M. Christopher, B.A., R.T., Forum Co-Organizer, SMRT Executive Committee Member

We had tremendous success this year with the joint forum; an unofficial count of 250 attendees, a new record! The forum by design is a grand collaboration of energy and talent between the ISMRM and SMRT which continuously promotes the highest quality of education in the MR field. This year's session was specifically designed to attract a broad audience from both organizations with a topic to interest all, artifacts. There are many mechanisms that cause a wide range of artifacts, both intrinsically and extrinsically and it is very important that we all are able to identify and understand the cause of these artifacts. For the physicists, understanding the origin of certain artifacts is essential so they may better address hardware/software issues or pulse sequence designs. It is imperative for the technologist to be able to identify and comprehend the source of an artifact so they may be able to avoid the cause altogether and know how to correct for them. It is crucial the physician understands these artifacts and is able to identify them to avoid any misinterpretations. This succession signifies the common ground all these professions stand on and the mutual collaboration between them only strengthens the foundation we all learn on and solidifies the spirit of this joint forum.



(l. to r.) John M. Christopher, B.A., R.T., David N. Firmin, Ph.D., Kim Butts, Ph.D., Gregory C. Brown, B.S., R.T. (R)(MR), and Katsuyoshi Ito, M.D.

With this in mind, we had a very distinguished line-up of speakers from around the world representing four different countries; Australia, the U.K., the U.S., and Japan. Mr. Gregory Brown, who is the SMRT Publication Committee chair, gave a great presentation on the technical perspective of MRI artifacts. He was followed by Dr. David Firmin who offered an excellent talk on the physics of cardiac and blood-flow artifacts. The next to talk was Dr. William Bradley who gave a dynamic lecture on the neuro and cardiac pitfalls of MR imaging. Following him was Dr. Katsuyoshi Ito who presented an extremely informative talk on body and cardiac pitfalls. With very little overlap, each talk complimented the group as a whole

and all were captivating and well done. There was also a nice touch added by the moderator in the way he opened and closed the forum in Japanese (western style), which reflected the politeness and respectfulness of our Japanese hosts in the beautiful city of Kyoto. This truly was a wonderful experience for me.

I would like to graciously thanks all our speakers, Dr. Kim Butts who was co-organizer of this forum, Dr. Jeffrey L. Duerk and everyone involved in this forum from the ISMRM and SMRT for donating their time and energy for the success of this endeavor.

*Domo arigatoo gozaimasu.*  
Thank you very much. ●



# SMRT Business Meeting Report

## Meeting Called to Order at 12:00:

Maureen Ainslie

## Introduction of Policy Board Members:

Maureen Ainslie

Thanks to all Policy Board members for their dedication and support for SMRT over the past year.

**Awards Presentation:** The following awards are traditionally presented each year at the Annual Meeting.

- Crues-Kressel– Luann Culbreth, M.Ed., R.T. (R)(MR)
- Fellow of the Section– Carolyn Roth, R.T. (R)(MR)(CT)(M)(CV)
- Fellow of the Section– Heidi Berns, M.S., R.T. (R)(MR)
- Honorary Membership– Dr. Emanuel Kanal, M.D.
- Distinguished Service– Kelly Baron, B.S.R.T., (R)(MR)

## Summary of the last year:

- Annual Meeting– 167 registrants in Kyoto
- Seven Regional Seminars last year– Salt Lake City, Utah, USA; Seattle, Washington, USA; Durham, North Carolina, USA; Boston, Massachusetts, USA; Cleveland, Ohio, USA; Bethlehem, Pennsylvania, USA; Ottawa, Ontario, Canada
- Scheduled for next year: Atlanta, Georgia, USA; New York, New York, USA; Boston, MA; Charleston, South Carolina, USA; Salt Lake City, Utah, USA; Toronto, Ontario, Canada; Stanford, California, USA
- SMRT Educational Seminars– Four home studies published this year, a library of 22 published
- ARRT Non-RT proposal– SMRT responded would be willing to provide input to the proposal process
- Education Initiatives– Updating Curriculum guidelines, Ad Hoc committee exploring role of Advanced Practice MR technologist

## Finance Committee Report: Anne Sawyer-Glover

- Challenges in support for Kyoto
- Thanks for vendor support
- MRI Devices, Inc. support of the home study program

## New Policy Board Member introduction:

Nancy Hill-Beluk, R.T. (R)  
Carolyn Bonaceto, B.S.  
Bobbi Lewis, R.T.  
Mark Spooner, R.T.  
Wendy Strugnell, B.Sc.

## External Relations Committee Report: Maureen Hood

- Network Allied Health Professions
- RSNA– Symposia “MR-Guided intervention”
- Alliance for Radiologic Excellence– Minimum education standards: CARE Bill 101 HR co-sponsors
- HPN– Health education opportunities– Core curriculum for allied health programs
- ADVANCE– In need of MR articles
- HPN– MRI feature ([www.healthpronet.org](http://www.healthpronet.org))

## Program Committee Report: Jim Stuppino

- Thanks to Program Committee, Education Committee, Finance Committee
- Over 50 submissions for abstract/posters for presentation
- Stressed importance of meeting evaluations

## Education Committee Report: Julie Lowe

- Thanks to those who submitted abstracts, 52 submissions from 14 countries, all of outstanding quality.
- Thanks to those who reviewed and scored proffered papers and posters
- Poster Walking Tour Friday evening was well received
- Call for volunteers for Education Committee



2003-2004 SMRT President, Maureen Ainslie addresses the attendees.

## Nominations and Awards Committee Report: Maureen Ainslie for John Koveleski

- Call for nominations for Policy Board 2005 and President-Elect
- Call for nominations for Awards 2005

## Regionals Committee Report: Maureen Ainslie for Cindy Comeau

- Regional packet and FAQ now available on the website
- Call for regional chairs– free year's membership awarded to members who host a regional.

## Publications Committee Report: Gregory Brown

- This year's committee– Solid relationship between home studies, *Signals*, and additional publication efforts
- Ad-hoc MRI Devices newsletter committee– Call for Articles
- Call for reviewers for educational material
- Call for articles for *Signals*, articles and question writers for the home studies
- Thanks to committee members and publication volunteers for their dedication and hard work

## Local Chapters Committee Report: Bobbie Burrow

- Nine local chapters
- Introduction of two new local chapters: Macon, Georgia, USA; Charlottesville, Virginia, USA

## Membership Committee Report: Todd Frederick

- All-time high membership in the first quarter of 2004
- Non-renewals are a re-occurring problem
- Call for continued “Each One, Reach One” membership drive
- Call for membership ideas
- Maureen stated that there are approximately 15,000 technologists in US only, stressed need to promote membership

## Proffered Paper Awards

**Presidents Award**– Eric Douglas, R.T. (R)(MR)

**Proffered Paper Awards**– Presented by James Stuppino

**Poster Awards**– Presented by Julia Lowe

## Announcement: ISMRM/SMRT Joint Presentation:

*“Managing MR Artifacts,”* Monday, 14.00

## Introduction of the SMRT Officers

- Presentation of plaque to Anne Sawyer-Glover, outgoing Treasurer
- Introduction of Laurian Rohoman as incoming Treasurer
- Recognition of outgoing Secretary, William Faulkner
- Introduction of Gina Greenwood as incoming Secretary

## Passing of Gavel to Cindy Hipps

SMRT President, 2004-2005

## Presentation of President's plaque to Maureen Ainslie

SMRT President, 2003-2004

**Call for volunteers** to serve on committees and help promote SMRT: Cindy Hipps

## Call for New Business:

Carolyn Roth– response to ARRT re: non RT's sitting for exam– this will be addressed by SMRT

## Motion to Adjourn: Bobbie Burrow

Second by Jeff Jahn

Motion passed

Meeting Adjourned 12.45

## Invited Speakers to the 2004 Kyoto Meeting



Roland Bammer, Ph.D.



Silke Bosk, R.T.



Gregory Brown, R.T.



H. Cecil Charles, Ph.D.



Michael Kean, R.T.



Alayar Kangarly, Ph.D.



E. Scott Pretorius, M.D.



Martin A. Prince, M.D.,  
Ph.D.



Carolyn K. Roth, R.T.  
(R)(MR)(CT)(M)(CV)



Anne Sawyer-Glover,  
B.S., R.T. (R)(MR)



Michaela Schmidt, R.T.



Frank G. Shellock, Ph.D.



A. Gregory Sorensen, M.D.



David Stanley, B.S.,  
R.T. (R)(MR)

Below are comments from the 2004 Annual Meeting evaluations.

*"Excellent job. Excellent research."*

*"Very enjoyable. Great learning experience."*

*"Topics very good. Speakers give new practice and material."*

*"Excellent programme- very educational."*

*"Love the paper presentations. Great topics- great job all!"*

*"I applaud the committee on a job well done!"*

*"Awesome job done! Thanks to SMRT staff, AV staff, SMRT board."*



## 2004 Clinical Focus and Research Focus Oral Presentation Award Winners



2004 President's Award—

**Eric L. Douglas, R.T. (R)(MR)**

St. Luke's Episcopal Hospital/Texas Heart Institute, Houston, Texas, USA

*"Direct Comparison of Sensitivity Encoding (SENSE) Accelerated and Conventional 3D Contrast-Enhanced MR Angiography (CE-MRA) of Renal Arteries: Effect of Increased Spatial Resolution"*

See page 6 *Signals* Number 48 2004 Issue 1.



1st Place Award, Oral Clinical Focus—  
**Mercedes Pereyra, R.T.**

Department of Diagnostic Radiology,  
St. Luke's Episcopal Hospital,  
Houston, Texas, USA

*"Comparison Between Single Breath-Hold Volumetric Delayed Enhancement Imaging of the Left Ventricle and Navigator Guided Free Breathing 3D DE Imaging"*

See page 13.



1st Place Award, Oral Research Focus—  
**Caron Murray, R.T. (R)(MR), A.C.R.**

Sunnybrook and Women's College  
Health Science Centre, Toronto,  
Ontario, Canada

*"Projection Reconstruction and Time Resolved Imaging of Contrast Kinetics in Breast MRI"*

See page 12.



2nd Place Award, Oral Clinical Focus—  
**Sandra Massing, R.T.**

Department of Diagnostic and Interventional  
Radiology, University Hospital Essen,  
Essen, Germany

*"Optimization of Contrast-Enhanced Peripheral MR Angiography with Mid-Femoral Venous Compression (VENCO)"*



2nd Place Award, Oral Research Focus—  
**Joanne Muldoon, M.R.T. (R)(MR)**

Sunnybrook and Women's College  
Health Science Centre, Toronto,  
Ontario, Canada

*"Use of Guidance Software During MR Breast Interventional Procedures"*

3rd Place Award, Oral Clinical Focus—  
**Sandra Massing, R.T.**

Department of Diagnostic and Interventional  
Radiology, University Hospital Essen,  
Essen, Germany

*"Assessment of Myocardial Viability using Contrast Enhanced MRI-Comparison of Gd-DTPA and GD-Bopta"*



3rd Place Award, Oral Research Focus—  
**Helle Juhl Simonsen, M.R.T.**

Danish Research Center of MR, Hvidovre  
Hospital, Hvidovre, Denmark

*"Pathogenesis of Corticospinal Tract Degeneration in ALS Patients by Diffusion Tensor Imaging"*

## These Abstract Authors Were Selected to Give Oral Presentations at the Meeting



**Anne Dorte Blankholm, R.T. (MR) Pg.D.**

Department of  
Neuroradiology, Aarhus  
University Hospital,  
Aarhus, Denmark

*"3D FIESTA (TRUE FISP) Compared to 3D IR-SPGR (Inversion Prepared Spoiled Grass) at C2 Level in the Assessment of Multiple Sclerosis"*



**Anna Kirilova, R.T. (R)(MR)(MRT)**

Princess Margaret  
Hospital, Toronto,  
Ontario, Canada

*"Evaluation of PROstate Spectroscopy Examination (PROSE) Sequence in the Treatment and Follow-Up of Patients Pre- and Post-Brachytherapy"*



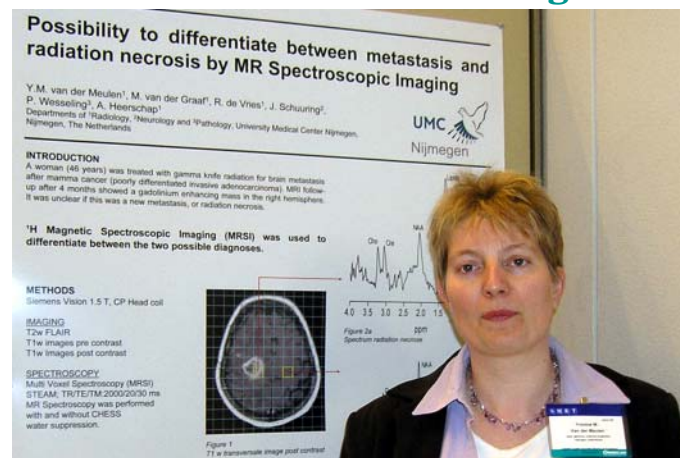
**David Stanley, B.S., R.T. (R)(MR)**

Applied Science  
Laboratory, GE  
Medical Systems,  
Milwaukee,  
Wisconsin, USA

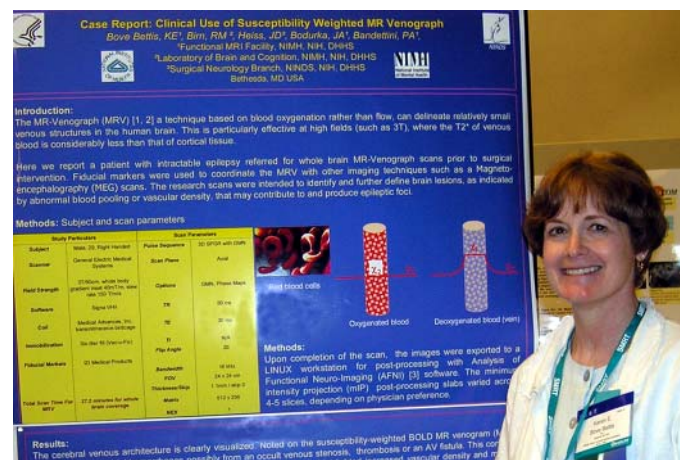
*"MR Assessment of Laparoscopic Nissen Fundoplication"*



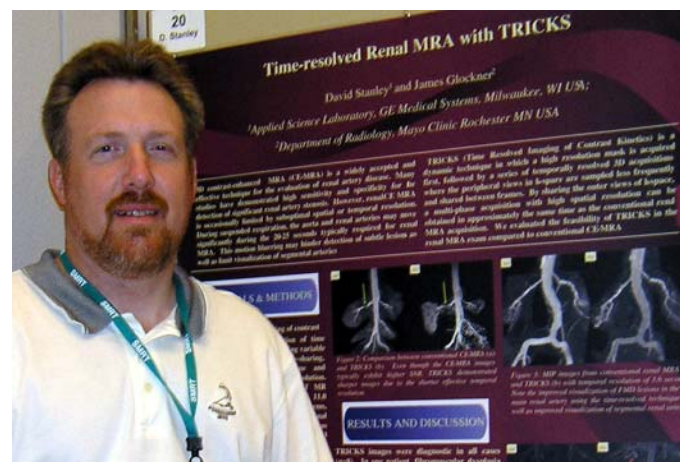
# Award Winning Clinical Focus and Research Focus Poster Presenters at the SMRT Annual Meeting



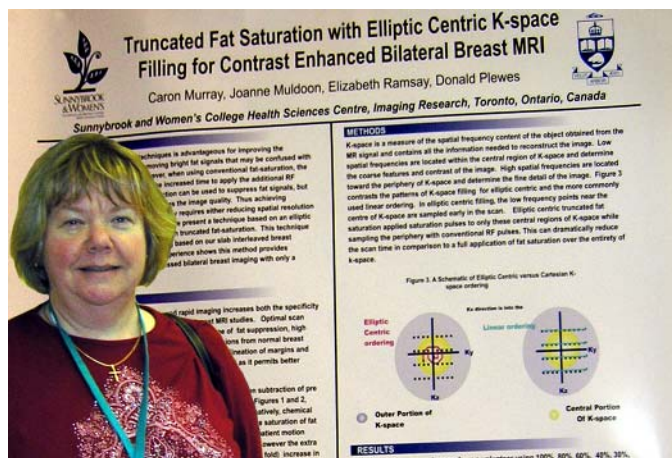
**2004 1st Place Clinical Poster– Yvonne Van der Meulen,** Department of Radiology, University Medical Center Nijmegen, Nijmegen, The Netherlands, “*Possibility to Differentiate between Metastasis and Radiation Necrosis by MR Spectroscopic Imaging*”



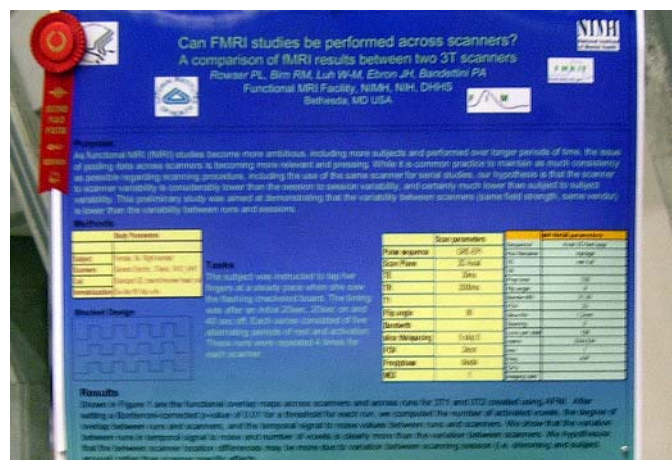
**2004 2nd Place Clinical Poster– Karen Bove Bettis,** FMRI Core Facility, NIMH, NIH, Bethesda, Maryland, USA “*Case Report: Clinical Use of Susceptibility Weighted MR Venography*”



**2004 3rd Place Clinical Poster– David Stanley,** Applied Science Laboratory, GE Medical Systems, Milwaukee, Wisconsin, USA, “*Time-Resolved Renal MRA with TRICKS*”



**2004 1st Place Research Poster– Caron Murray,** Sunnybrook and Women's College Health Sciences Centre, Toronto, Ontario, Canada, “*Truncated Fat Saturation with Elliptic Centric K-space Filling for Contrast-Enhanced Bilateral Breast MRI*”



**2004 2nd Place Research Poster– Paula Rowser,** (unable to attend) FMRI Core Facility, NIMH, NIH, Bethesda, Maryland, USA “*Can fMRI Studies be Performed Across Scanners? A Comparison of fMRI Results Between Two 3T Scanners*”



**2004 3rd Place Research Poster– Kara Baczkowski,** Department of Radiology, The Avenue Private Hospital, Windsor, Victoria, Australia, “*A New Look into Kicking a Football: An Investigation of Muscle Activity Using MRI*”





**SMRT Policy Board, Executive Committee, and Ex-Officio Members.**

(Seated l. to r.) Anne Sawyer-Glover, Julia Lowe, Laurian Rohoman, Karen Bove-Bettis, Cindy Hipps, Maureen Ainslie, Muriel Cockburn, Silke Bosk, and Julie Strandt-Peay. (Standing l. to r.) Judith Wood, Carolyn Bonaceto, John Christopher, James Stuppino, Todd Frederick, Mark Spooner, Andrew Cooper, Scott Kurdilla, Gregory Brown, Bobbie Burrow, and Maureen Hood. (not pictured: Cindy Comeau, Denise Davis, William Faulkner, Marcia Gervin, Gina Greenwood, Nancy Hill Beluk, John Koveleski, and Wendy Strugnell).

The afternoon sessions continued with a talk by Policy Board member Greg Brown, R.T., entitled, “*MRI for the Management of Hematochromatosis.*” Out-going SMRT Treasurer, Anne Sawyer-Glover, B.S., R.T. (R)(MR) presented excellent information on state-of-the-art in breast imaging. E. Scott Pretorius, M.D. kept the audience’s attention with his talk on the male pelvis and some interesting research conducted at his hospital. Eric Douglas, R.T., (MR) presented the President’s Award proffered paper entitled, “*Direct Comparison of Sensitivity in Coding (SENSE) Accelerated in Conventional 3D Contrast Enhanced MR Angiography (CE-MRA) of Renal Arteries: Effect of Increased Spatial Resolution.*” Sandra Massing, R.T. then presented the second place award, clinical focus, paper entitled, “*Optimization of Contrast Enhanced Peripheral MR Angiography with Mid Femoral Venous Compression (VENCO).*” The day concluded with Dave Stanley, B.S., R.T. (R)(MR) presenting his proffered paper on “*MR Assessment of Laparoscopic Nissen Fundoplication.*”

The Sunday didactic sessions began with the incoming president, Cindy Hipps, B.H.S., R.T. (R)(MR) welcoming the attendees for day two of the SMRT Annual Meeting. Roland Bammer,

Ph.D., enlightened the audience about diffusion tensor MR tractography. Carolyn K. Roth, R.T. (R)(MR)(CT)(M)(CV) shared with the audience her expertise in advances in abdominal imaging. The next speaker was Michaela Schmidt, R.T. and she spoke on “*One-Stop Shopping: The Thirty-Minute Ischemic Heart Disease Exam.*” Frank G. Shellock, Ph.D. discussed his extensive experience on functional assessment of the joints using kinematic MRI. Contrast MRA and new blood pool agents was then offered by Martin A. Prince, M.D., Ph.D.

After lunch, H. Cecil Charles, Ph.D., presented practical information on clinical and research spectroscopy. Additional proffered papers were also presented. Helle Juhl Simonsen presented the 3rd place award research focus paper entitled “*Pathogenesis of Corticospinal Tract Degeneration in ALS Patients by Diffusion Tensor Imaging.*” Anne Dorte Blankholm presented “*3D FIESTA (TRUE FISP) Compared to 3D IR-SPGR (Inversion Prepared Spoiled Grass) at C2 Level in the Assessment of Multiple Sclerosis.*” Anna Kirilova presented “*Evaluation of PROstate Spectroscopy Examination (PROSE) Sequence in the Treatment and Follow-Up of Patients Pre- and Post-Brachytherapy.*”

The day concluded with the “*MR Safety Forum*” moderated by Frank G. Shellock, Ph.D. Material was presented by the panelists: Alayar Kangarly, Ph.D., Gregory A. Sorenson, M.D., Michael Kean, R.T., and Dr. Shellock, which addressed: MRI safety at 8-Tesla; the safe use of contrast agents; pediatric considerations for MRI safety; and an update of MRI safety and implants, respectively. Following the presentations a question and answer session enabled a very lively discussion.

At the conclusion of the meeting, James J. Stuppino, B.S., R.T. (R) (MR), Program Chair, thanked everyone for their attendance and support of the SMRT. He extended a special thank you to those who attended the meeting and participated in the educational program.

Whether or not you were able to attend this year’s meeting in Kyoto, it is not too early to think about next year’s meeting in the exciting city of Miami Beach, Florida. The SMRT would like to thank all of our sponsors listed in the program syllabus and here in *Signals*. I would like to personally thank all of the members of my Program Committee and the staff at the ISMRM Office, especially Jennifer Olson for all of their support.

We hope to see you in Miami Beach in 2005. ●



2004 1st Place Proffered Paper Oral Presentation, Research Focus-

## Projection Reconstruction and Time Resolved Imaging of Contrast Kinetics in Breast MRI

Caron Murray, R.T., A.C.R., (R)(MR), Joanne Muldoon, M.R.T. (R)(MR), Elizabeth Ramsay, Ph.D., Donald Plewes, Ph.D.  
Sunnybrook and Women's Health Sciences Centre, Toronto, Ontario, Canada

### Purpose

In our institution, screening of high-risk breast cancer patients uses a low-resolution bilateral breast contrast-enhanced study, followed by a unilateral high-resolution study if any abnormal breast enhancement is found. However, this protocol requires the subject to return for a second visit, with an additional IV insertion and injection of contrast. With a PR-TRICKS<sup>1</sup> pulse sequence, it is possible to produce both high spatial and high temporal resolution images from a single set of data, thus eliminating the need for two separate patient visits. PR-TRICKS is a 3D acquisition method which uses radial K-space trajectories in the Kx-Ky plane (Projection Reconstruction or "PR"), combined with a time-ordered Cartesian sampling scheme in the Kz direction ("TRICKS"). Since PR samples the center of the Kx-Ky plane more densely than outer regions, it is possible to obtain low spatial resolution images with a small number of radial trajectories. Alternatively, if more projections are included in the image reconstruction, high resolution images can be obtained.<sup>2</sup> TRICKS divides Kz into centrically ordered blocks that are acquired in a repetitive sampling sequence. By choosing various combinations of radial and Kz data, it is possible to produce high spatial and temporal resolution data from one large data set.

### Method

The diagram in Figure 1 shows how K-space is organized for our application of PR-TRICKS. In the Kx-Ky plane, there were 256 projections divided into 4 "dither groups," each containing 64 projections. In the Kz direction, 36 slices were organized into 3 "frames" A, B, and C, with the A frame containing planes closest to the centre of Kz. The time order of K-space sampling is indicated in the table in Figure 1. For each breast, twelve low-resolution images were reconstructed from each A frame. These images included only the 64 projections of a single dither group, and took 12 seconds to acquire. Reconstruction of high-resolution images included all 256 projections and all 36 Kz values. Each set of high-resolution images had 36 slices per breast and took 192 seconds to acquire. In order to provide a bilateral capability, we adapted this concept to our TR slab interleaved bilateral imaging method.<sup>3</sup>

Eight healthy subjects were scanned on a 1.5T Signa CVMR Magnet (GE Medical Systems, Milwaukee, Wisconsin, USA) after obtaining informed consent. The PR-TRICKS sequence parameters were: (TR/TE/FA)=(15.6ms/3.2ms/30), 20cm FOV, 256 readout points per trajectory, and slice thickness 2.0-3.0mm. Both low resolution and high resolution images were reconstructed, and comparisons

were made to equivalent Cartesian images.

### Results

The images in Figure 2 show a low-resolution PR image (a), a high resolution PR image (b), and the corresponding Cartesian image (c). The reduction in resolution is apparent with the reduced scan time of image (a). With the low resolution image, streak artifacts appear due to the undersampling of K-space in the reconstruction. However, the resolution, contrast and signal/noise for the high resolution PR image are comparable to the Cartesian image.

### Conclusion

With a single acquisition, images can be obtained with large variations in effective scan times (16 fold) and corresponding resolution. Since our preliminary experience suggests that the images are acceptable, clinical application of this sequence is currently underway. This new protocol would require only a single procedure while providing information on the dynamics of contrast enhancement as well as the high spatial resolution images necessary for anatomic/pathologic recognition. ●

### References

1. Peters et al, *MRM* 2000; 43:91-101.
2. Song et al, *MRM* 2001; 46:503-509.
3. Greenman et al, *MRM* 1998; 39:108-115.

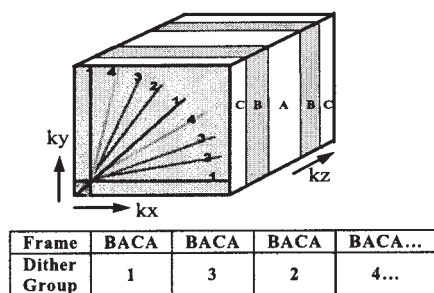


Figure 1. Schematic of K-space sampling for PR-TRICKS.

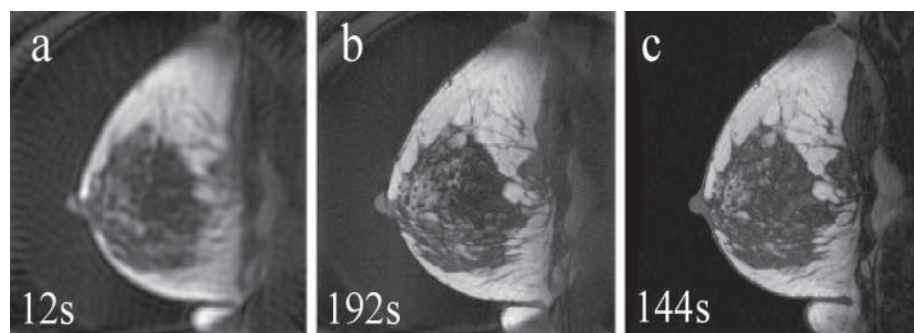


Figure 2. PR-TRICKS images using 64 radial projections/12 Kz samples (a), 256 radial projections/36 Kz samples (b), and the Cartesian image sampled at 256x256x36 (c). Corresponding scan times are shown.





2004 1st Place Proffered Paper Oral Presentation, Clinical Focus-

## Comparison Between Single Breath-hold Volumetric Delayed Enhancement Imaging of the Left Ventricle and Navigator Guided Free Breathing 3D DE Imaging

Mercedes Pereyra, R.T.<sup>1</sup>, Roshan Ravindran, M.B., Ch.B.<sup>1</sup>, Eric Douglas, R.T.<sup>1</sup>, Veronica Lenge, M.D.<sup>1</sup>, Raja Muthupillai, Ph.D.<sup>2</sup>, and Scott D. Flamm, M.D.<sup>3</sup> <sup>1</sup>Department of Radiology, St Luke's Episcopal Hospital, Texas Heart Institute, Houston, Texas, USA, <sup>2</sup>Department of Radiology, St Luke's Episcopal Hospital, Texas Heart Institute, Houston, Texas, and Philips Medical Systems, Cleveland, Ohio, USA, <sup>3</sup>Departments of Radiology and Cardiology, St Luke's Episcopal Hospital, Texas Heart Institute, Houston, Texas, USA.

### Introduction

Delayed enhancement (DE) imaging following Gd-DTPA administration has been shown to identify regions of irreversible myocardial injury. Conventional 2D DE techniques acquire a single slice per breath-hold requiring several breath-holds to cover the entire left ventricle (LV), which is time consuming and often introduces misalignment of slices due to inconsistency in breath-hold position through the examination. Sensitivity encoding (SENSE) has recently been described as a means for accelerating MR image acquisition in the context of DE imaging to reduce breath-hold duration. An alternative method to acquire high resolution volumetric DE data is using real-time navigator guided approach during free breathing.

### Purpose

The purpose of this study was to directly compare the breath-held 3D DE imaging approach against 3D free breathing DE imaging using qualitative and quantitative metrics.

### Method

Thirteen patients (3/13 male, 59 $\pm$ 17 years), were imaged at 1.5 T (Philips Gyroscan NT-Intera) using a VCG gated, inversion-recovery TFE sequence, wherein following a 180° pulse, a set of gradient echoes were collected in diastole using a five element cardiac surface coil. Ten contiguous short axis slices from the apex to base were acquired for both techniques.

*Specific acquisition parameters were:*  
*BH 3D DE with SENSE:* TR/TE/flip/ views per RR/scan duration = 4.0/1.3/ 15°/49/24 heart beats (hb) per volume; acquired voxel size: 1.6x2.0x10 mm; reconstructed as: 1.5x1.5x10 mm;  
*Nav 3D DE Technique:* TR/TE/flip/ views per RR/scan duration = 6.8/3.3/15°/20/ 104 heart beats (hb) per volume; acquired voxel size: 1.09x1.23x10.0; reconstructed as: 0.68x0.68 x10mm.

*Post processing:* The images were transferred to a post-processing workstation (EasyVision) and the following quantitative parameters were computed: Signal-to-Noise ratio (SNR) of blood, normal myocardium, and injured myocardium, Contrast-to-Noise ratio (CNR) between injured and normal myocardium, and between blood and normal myocardium were also computed. The two techniques were qualitatively evaluated for overall image quality (IQ) on a scale of 1 through 4 (1: Excellent, 2: Good, 3: Moderate, 4: Poor, and respiratory artifacts on a scale of: 1: None or minimal; 2: Mild; 3: Moderate and 4: Severe.

### Results

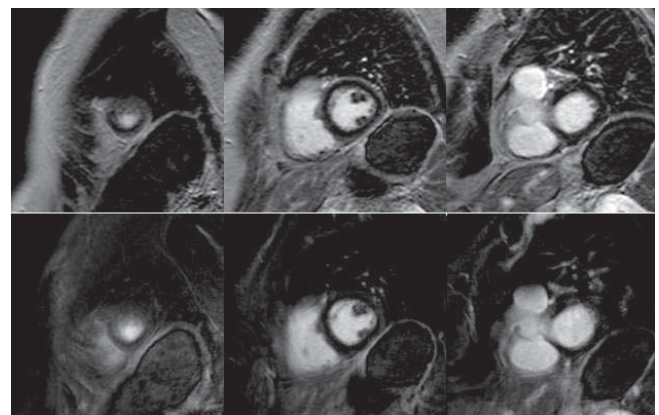
The navigator method on the average required 200 heart beats to finish the acquisition with a 50% acquisition efficiency. Quantitative results showed that the myocardium was well suppressed in both methods (SNR<sub>mus</sub> = 2.5 $\pm$ 1.6 for BH-3D Vs 3.7 $\pm$ 1.3 for 3D-Nav), and there was little difference in SNR<sub>blood</sub> between the two techniques. The CNR<sub>bl-my</sub> were also similar (20.1 $\pm$ 8.7 for BH-3D Vs 24.6 $\pm$ 9.5 for 3D-Nav) indicating preserved contrast between the two techniques. Although statistical significance could not be assessed due to the small number of cases, there was a trend towards higher CNR<sub>injury-my</sub> for the 3D Nav approach 36.4 $\pm$ 22.4 vs 27.2 $\pm$ 2.84 for the 3D-BH approach. Quantitative parameters evaluated are listed in Table 1, and some representative results are shown in Figure 1.

**Table 1: Comparison of quantitative parameters.**

	3D-DE BH	3D-DE Nav
SNR <sub>myo</sub>	2.5 $\pm$ 1.6	3.7 $\pm$ 1.3
SNR <sub>blood</sub>	24.7 $\pm$ 11.2	26.6 $\pm$ 10.9
CNR <sub>blood-my</sub>	20.1 $\pm$ 8.7	24.6 $\pm$ 9.5
CNR <sub>injury-my</sub>	27.2 $\pm$ 2.8	36.4 $\pm$ 22.4
IQ	1.4 $\pm$ 0.8	1.2 $\pm$ 0.4
Resp. Artifacts	1.5 $\pm$ 0.9	1.6 $\pm$ 0.7

### Conclusions

It is clinically feasible to apply either single breath hold 3D DE technique or navigator guided free breathing 3D-DE technique. Based on the quantitative and qualitative results, both techniques yield comparable results. The quicker BH approach suffers from slightly lower spatial resolution, and T<sub>1</sub> blurring due to longer acquisition window. Effective myocardial signal nulling and higher spatial resolution are achievable in the 3D navigator approach despite the prolonged acquisition time. The 3D Navigator approach may be suitable for pediatric patients, sedated patients, or when high spatial resolution is required, e.g., in assessing non-ischemic myocardial injury as in sarcoidosis, post-alcohol septal ablation for patients with HCM, etc. ●



**Figure 1.** Representative images from the 3D-DE BH (above) and 3D DE-Navigator (below) techniques.



2004 1st Place Proffered Paper, Research Poster-

## Truncated Fat Saturation with Elliptic Centric K-space Filling for Contrast-Enhanced Bilateral Breast MRI

Caron Murray, R.T., A.C.R., (R)(MR), Joanne Muldoon, M.R.T. (R)(MR), Elizabeth Ramsay, Ph.D., Donald Plewes, Ph.D.  
Sunnybrook and Women's Health Sciences Centre, Toronto, Ontario, Canada

### Purpose

The use of fat-suppression techniques is advantageous for improving the sensitivity of Breast MRI by removing bright fat signals that may be confused with enhancing breast masses. However, when using conventional fat-saturation pulses, the temporal resolution suffers. Alternatively, image subtraction can be used to suppress fat signals, but patient motion frequently compromises image quality. Achieving acceptable temporal resolution requires either reducing spatial resolution or imaging only a single breast. Our objective was to provide a consistent and homogeneous fat saturation technique applicable to our slab interleaved bilateral breast screening protocol<sup>1,2</sup> without an appreciable increase in scan time by using an elliptic centric K-space filling along with a truncated fat saturation technique.

### Method

Elliptic centric ordering was used for filling 3D K-space in conjunction with a spoiled gradient recalled pulse sequence (FSPGR). Fat saturation pulses were used only for a central region of K-space with a TR of 35 ms. The remaining portion of K-space

without saturation pulses required a shorter TR of 15.6 ms. Thus the total scan time is determined by the ratio of the saturated to unsaturated regions of the K-space. We compared the image quality of fully fat saturated K-space acquisitions at 256x256 pixels to that obtained by saturating 48% and 24% of K-space.

To date we have scanned a total of 13 subjects on a 1.5T Signa CVMR (GE Medical Systems, Milwaukee, Wisconsin, USA). The fat saturated images were acquired with a 3D Sagittal FSPGR sequence using a Gd-DTPA injection of 0.1 mmol/L/kg, a slice thickness of 2.0 – 3.0 mm, 1 NEX, TE min full, flip angle 30 degrees, and a bandwidth 31.25Khz.

### Results

In the figure, we compare images from a volunteer using 100%, 49%, and 24% saturated portions of K-space. The corresponding scan times were 4:46, 3:25, and 2:46 minutes respectively. The corresponding images taken without any fat suppression was 2:08 minutes. Note that full pre-saturation more than doubles the unsaturated imaging time that renders it too slow for use in bilateral dynamic breast

MRI. The image quality for the truncated elliptically ordered presaturated images is very similar to the fully saturated acquisition, while achieving substantial reduction in scan times. Misregistration of anatomical and pathological structures due to motion is not a concern, because diagnosis can be based on viewing the un-subtracted images.

The scan time was further reduced by using 192 phase encodes instead of the original 256. This was applied to an additional 12 patients from our high-risk screening study with acceptable results.

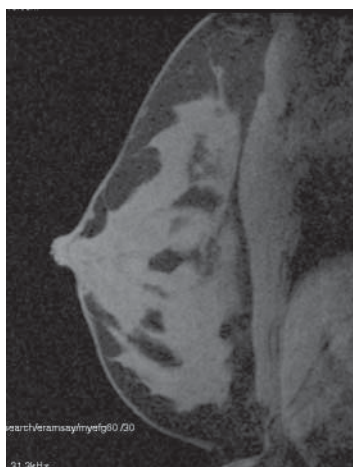
### Conclusion

By changing the ordering of K-space from linear to elliptic centric and applying a fat saturation pre-pulse to only a portion of K-space, we have demonstrated that it possible to achieve a robust fat saturation technique without an appreciable difference in scan time. ●

### References

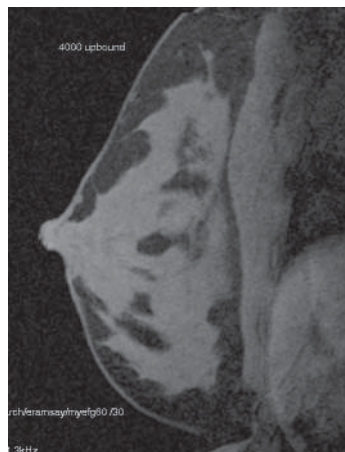
1. Greenman RL et al, *Magn. Reson. Imaging.* 39:108-115, 1998
2. Warner E, et al, *Journal of Clinical Oncology*, 19(15), 3524-3531, 2001.

100% Fat Saturation



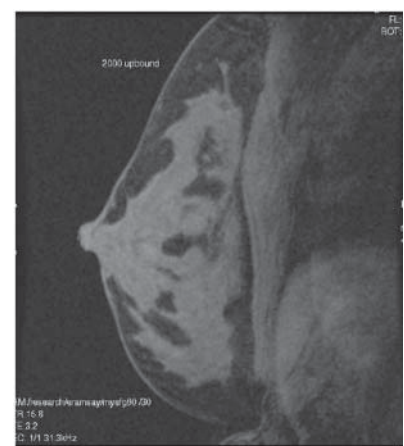
Scan Time = 4:46 min

49% Fat Saturation



Scan Time = 3:25 min

24% Fat Saturation



Scan Time = 2:46 min





**2004 1st Place Proffered Paper, Clinical Poster–**

## Possibility to Differentiate Between Metastasis and Radiation Necrosis by MR Spectroscopic Imaging

Y.M. van der Meulen,<sup>1</sup> M. van der Graaf,<sup>1</sup> R. de Vries,<sup>1</sup> J. Schuurung,<sup>2</sup> P. Wesseling,<sup>3</sup> A. Heerschap<sup>1</sup>

Departments of <sup>1</sup>Radiology, <sup>2</sup>Neurology and <sup>3</sup>Pathology, University Medical Center Nijmegen, Nijmegen, The Netherlands

### Introduction

A woman (46 years) was treated with gamma knife radiation for brain metastasis after breast cancer (poorly differentiated invasive adenocarcinoma). MRI follow-up after 16 months showed a gadolinium enhancing mass in the right hemisphere. It was unclear if this was a new metastasis, or radiation necrosis. <sup>1</sup>H Magnetic Spectroscopic Imaging (MRSI) was used to differentiate between the two possible diagnoses.

### Methods

Both MRI and MRSI data were recorded using a Siemens Vision 1.5T system with the CP-HEAD coil. This patient was measured using a standard measurement protocol. T<sub>2</sub>, PD-weighted transversal scans and

T<sub>1</sub>-weighted transversal pre- and post-gadolinium scans were performed. A two dimensional MRSI dataset was acquired using a STEAM (TR/TE/TM:2000/20/30ms) sequence with and without CHESS water suppression. The MRSI slice was positioned to contain the most contrast-enhanced part of the lesion.

### Results and Discussion

The highest signal in the spectra obtained was present at 1.3 ppm and was assigned to lipids, probably originating from necrotic tissue, which can be present both in radiation necrosis and in brain metastases. Furthermore, signals were observed at 2.0, 3.0, and 3.2 ppm. These signals can be assigned to N-Acetyl Aspartate (NAA), Creatine (Cre), and Choline

(Cho), respectively. Of these three signals NAA showed the highest signal intensity, the signal intensities of Cre and Cho were very similar. This pattern is also visible in spectra of normal white matter. In a spectrum of a metastasis high Cho and low NAA signal intensities are usually present, as well as a high lipid signal.

### Conclusions

Because of the presence of lipids in combination with the relatively normal pattern of NAA, Cho, and Cre, this spectrum is indicative for radiation necrosis. Histopathological analysis of biopsy tissue confirmed this diagnosis. This case demonstrates that MRSI can be used as a non-invasive tool to differentiate between metastasis and radiation necrosis. ●

## 2004 SMRT Annual Meeting in Kyoto, Japan

### *Rising to Excellence in Education...*



2004 President's Award–

**Eric L. Douglas, R.T. (R)(MR)**

St. Luke's Episcopal Hospital/Texas Heart Institute,  
Houston, Texas, USA

*“Direct Comparison of Sensitivity Encoding (SENSE)  
Accelerated and Conventional 3D Contrast-Enhanced  
MR Angiography (CE-MRA) of Renal Arteries:  
Effect of Increased Spatial Resolution”*

### *...Experiencing Richness in Culture*



## 2004 Clinical Focus and Research Focus Oral and Poster Presenters



**Angela S. Agostinelli,**  
MRI Unit, Medical Imaging  
Australasia (MIA), Victoria,  
Australia  
*"MRI of the Scrotum"*



**Christopher Au,**  
Dept. of Diagnostic Imaging,  
National Taiwan University,  
Singapore  
*"Use of Gadolinium MR  
Venography to Evaluate Central  
Venous Stenosis and Occlusion  
in Patients on Hemodialysis"*



**Carol Awde,**  
MRI Dept., St. Joseph's  
Healthcare, Hamilton,  
Ontario, Canada  
*"Diffusion Tensor Imaging:  
A Comparison of Single and  
Multichannel Coils at 3T,"* and  
*"Comparison of Contrast MRA:  
1.5 VS. 3T,"* and *"Musculoskeletal  
Imaging at 3 Tesla"*



**Kara Baczkowski,**  
Dept. of Radiology, The  
Avenue Private Hospital,  
Windsor, Victoria, Australia  
*"A New Look into Kicking  
a Football—An Investigation  
of Muscle Activity Using MRI"*



**Anne Dorte Blankholm,**  
Dept. of Neuroradiology,  
Aarhus University Hospital,  
Aarhus, Denmark  
*"3D FIESTA (TRUE FISP)  
Compared to 3D IR-SPGR  
(Inversion Prepared Spoiled  
Grass) at C2 Level in the  
Assessment of Multiple Sclerosis"*  
and *"Optimizing T1-Weighted  
Imaging at 3 Tesla in the Brain"*



**Karen Bove Bettis,**  
Functional MRI Facility,  
NIMH, NIH, DHHS,  
Bethesda, Maryland, USA  
*"Case Report: Clinical Use of  
Susceptibility Weighted MR  
Venograph"*



**David Cardwell,**  
University of Arkansas for  
Medical Sciences,  
Little Rock, Arkansas, USA  
*"Rehearsal and Gutturalization  
of Cognitive Test for More  
Successful and Robust fMRI  
Data"*



**Tak Yeung Chan**  
MRI Unit, Prince of Wales  
Hospital, Hong Kong, China  
*"Diffusion Tensor Imaging as  
a Tool to Investigate any  
Structural Change of the Brain  
Before and After Formalin  
Fixation"*



**Gek Eng Violet Chua,**  
National Neuroscience  
Institution, Singapore,  
Singapore  
*"Functional Magnetic  
Resonance Imaging using  
BOLD Technique to Image  
Adult Craniopagus Twins"*



**Andrew Cooper,**  
MRI Unit, University  
Hospital, Nottingham,  
England, UK  
*"MR Imaging in the  
Evaluation of Parenchymal  
Brain Damage in Non-  
accidental Head Injury  
(NAHI)"*



**Randy Earnest,**  
Riverwoods Imaging Center,  
Provo, Utah, USA  
*"The Research of Research—  
Medical, Professional, and  
Economic Effects of MR  
Research and the Role of  
Technologists"*



**Lili Baekgaard Elgaard,**  
Dept. of Neuroradiology,  
Aarhus University Hospital,  
Aarhus, Denmark  
*"Differentiating Necrotic  
Tumours from Cerebral  
Abscesses"*



**Charles Fasanati,**  
Northwestern Memorial  
Hospital, Chicago,  
Illinois, USA  
*"Navigator Triggered 3-D  
Turbo Spin-echo for MRCP:  
Comparison with Single Shot  
Techniques"*



**Mark Given,**  
Dept. of Diagnostic  
Imaging, IWK Health  
Centre, Halifax,  
Nova Scotia, Canada  
*"Comparison of CT, DWI and  
Arterial Spin Labeling (ASL)  
for Assessment of Neonatal  
Infarct"*



**Jane W. Johnson,**  
Applied Science Laboratory  
West, GE Medical Systems,  
Menlo Park, California, USA  
*"Comparison of Fat Saturation  
Methods: DIXON-FSE vs.  
Fat Sat-FSE in the Knee"*



**Bong Joo Kang,**  
Dept. of Radiology,  
St. Mary's Hospital,  
The Catholic University of  
Korea, Seoul, South Korea  
*"MRI Findings of Breast after  
MRM and TRAM Flap in  
Patients with Breast Cancer"*



**Peter Kappert,**  
Dept. of Radiology,  
University Hospital  
Groningen, Groningen,  
The Netherlands  
*"MR Spectroscopy with an  
8-Channel Headcoil"*



**Kraig Von Kissinger,**  
Cardiac MR Center, Beth  
Israel Deaconess Medical  
Center, Boston,  
Massachusetts, USA  
*"Quantification of Aortic  
Flow by MRI—The Impact of  
Temporal Resolution on  
Measurement Accuracy"*



## 2004 Clinical Focus and Research Focus Oral and Poster Presenters



**Anna Kirilova,**  
Princess Margaret Hospital,  
Toronto, Ontario, Canada  
*"Evaluation of PROstate Spectroscopy Examination (PROSE) Sequence in the Treatment and Follow-Up of Patients Pre- and Post-Brachytherapy"*



**Scott Kurdilla,**  
Brain Imaging Research Center,  
University of Pittsburgh,  
Pittsburgh, Pennsylvania, USA  
*"High Contrast of Anterior and Posterior Commissure by Use of trueFISP at 3 Tesla"* and  
*"Reduction of Motion Artifacts in Diffusion Tensor Imaging by Suppressing the Signal from CSF and Eye Balls"*



**Zahid Latif,**  
MR Research Facility,  
Wayne State University  
Hospital, Detroit,  
Michigan, USA  
*"Susceptibility Weighted Imaging (SWI)"*



**Alexander Leemans,**  
Vision Lab, Dept. of  
Physics, University of  
Antwerp, Antwerp,  
Belgium  
*"White Matter Fiber Bundle Coregistration for Diffusion Tensor Magnetic Resonance Tractography"*



**Sandra Massing,**  
Dept. of Diagnostic and  
Interventional Radiology,  
University Hospital Essen,  
Essen, Germany  
*"Optimization of Contrast-Enhanced Peripheral MRA with VENCO,"* and  
*"Assessment of Aortic Valve Area in Aortic Stenosis- Comparison of a Steady-state Free Precession Sequence and Transesophageal Echocardiography"*



**Joanne Muldoon,**  
Sunnybrook and Women's  
College Health Sciences  
Centre, Toronto, Ontario,  
Canada  
*"Use of Guidance Software during MR Breast Interventional Procedures"*



**Caron Murray,**  
Sunnybrook and Women's  
College Health Sciences  
Centre, Toronto, Ontario,  
Canada  
*"Truncated Fat Saturation with Elliptic Centric K-space Filling for Contrast-Enhanced Bilateral Breast MRI"*



**Mercedes Pereyra,**  
St. Luke's Episcopal  
Hospital, Houston,  
Texas, USA  
*"Comparison Between Single Breath-Hold Volumetric Delayed Enhancement Imaging of the Left Ventricle and Navigator Guided Free Breathing 3D DE Imaging"*



**Paula L. Rowser,**  
Functional MRI Facility,  
NIMH, NIH, DHHS,  
Bethesda, Maryland, USA  
*"Can FMRI Studies Be Performed Across Scanners? A Comparison of fMRI Results Between Two 3T Scanners"*



**Steven Shannon,**  
EPIX Medical Inc., Cambridge,  
Massachusetts, USA  
*"Preferences for Evaluating Magnetic Resonance Angiography (MRA) Images using Blood Pool Agent Contrast Agent MS-325 for the Detection of Vascular Disease in the Aortoiliac Region (AIOD)"*



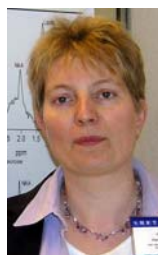
**Ya-Wen Shen,**  
VGH-HT Imaging Center,  
Taipei Veterans General  
Hospital, Taipei, Taiwan  
*"Protocols and Work-flow in Whole-Body MRI Screening"*



**Helle Juhl Simonsen,**  
Danish Research Centre for  
Magnetic Resonance,  
Hvidovre University,  
Hvidovre, Denmark  
*"Pathogenesis of Corticospinal Tract Degeneration in ALS Patients by Diffusion Tensor Imaging"*



**David Stanley,**  
Applied Science  
Laboratory, GE Medical  
Systems, Milwaukee,  
Wisconsin, USA  
*"MR Assessment of Laparoscopic Nissen Fundoplication"* and  
*"Time-Resolved Renal MRA with TRICKS"*



**Yvonne Van der Meulen,**  
Dept. of Radiology,  
University Medical Center  
Nijmegen, Nijmegen,  
The Netherlands  
*"Possibility to Differentiate Between Metastasis and Radiation Necrosis by MR Spectroscopic Imaging"*



**Roberto Vargas,**  
Dept. of Radiology, Karolinska  
University Hospital,  
Stockholm, Sweden  
*"Fast MR-Imaging Protocol using SENSE Technique in the Diagnosis of Occult Hip Fractures and Soft Tissue Injuries"* and  
*"Evaluation of Respiratory Artifacts using Respiratory Triggered Turbo Spin Echo with/without SENSE and Different Breathing Frequencies in the Upper Abdomen"*



**Steven Williams,**  
Dept. of Radiology, Mayo  
Clinic, Rochester,  
Minnesota, USA  
*"Comparison of MRA Techniques of the Thoracic Aorta"*



**Judith Wood,**  
Northwestern Memorial  
University Hospital,  
Chicago, Illinois, USA  
*"Evaluation of Acute Cerebral Ischemia with Magnetic Resonance Perfusion Weighted Imaging Pre- and Post-Revascularization"*



**Dora G. Zeidler,**  
Dept. of Neuroradiology,  
Aarhus University  
Hospital, Aarhus, Denmark  
*"Stroke Protocol on 3 Tesla"*

## 2004 SMRT Poster Exhibit, Poster Presentations and Poster Walking Tour Reception



Five selected poster authors gave short oral presentations of their work during the Friday evening Poster Exhibit Reception sponsored by **Tyco Healthcare Mallinckrodt**. Shown above (l.) Zahid Latif, R.T., (R)(MR)(CT) describes in detail aspects of interest in his poster entitled, “*Susceptibility Weighted Imaging (SWI).*”

The four other oral poster presentations were “*Use of Gadolinium MR Venography to Evaluate Central Venous Stenosis and Occlusion in Patients on Hemodialysis*” by Christopher Au, R.T., “*A New Look into Kicking a Football—An Investigation of Muscle Activity Using MRI*” by Kara Baczkowski, R.T., “*Navigator Triggered 3-D Turbo Spin-Echo for MRCP: Comparison with Single Shot Techniques*” by Charles Fasanati, R.T. (R)(MR), and “*Protocols and Work-flow in Whole-Body MRI Screening*” by Ya-Wen Shen, R.T.



Christopher Au



Kara Baczkowski



Charles Fasanati



Ya-Wen Shen



Zahid Latif



The Poster session allows SMRT attendees to exchange their thoughts and experiences at a personal level.





# External Relations Report May 2004

Maureen Hood, B.S., R.T. (R)(MR), SMRT External Relations Committee Chair



The RSNA Associated Sciences Consortium Planning Meetings for RSNA 2004 took place in Chicago on January 26th, 2004. This year's theme for RSNA 2004 will be "Radiology's Global Forum" and the RSNA Associated Sciences Consortium has selected the theme "Emerging Trends, Global Perspectives" for its mini-symposium series. The SMRT is sponsoring one of the mini-symposia for 2004 on the topic Image-

Guided Therapeutics. There will be two speakers on MR: David Lu, M.D. from the University of California at Los Angeles, covering RF ablation, and Steve Hushek, Ph.D. from Norton Hospital, Louisville, Kentucky, on how to run an iMRI suite, plus one talk on endovascular therapies by Willie Castaneda, M.D. from Louisiana State Medical Center, Shreveport. The Associated Sciences will also again have a booth in the exhibit area. Please stop by to say hi to some of your fellow technologists.

Cindy Hipps attended the Alliance for Quality Medical Imaging & Radiation Therapy meeting in Washington DC, January 25-27, 2004. Work continued on the CARE Act.

More regulatory details are being worked out by each of the groups represented by the Alliance. As of May 2004, 104 Representatives have signed onto HR1214. There is also a Senate version number S1197, with 16 co-sponsors. The United States does not currently have any national standards regarding who is allowed to perform diagnostic imaging. Currently, medical imaging is being regulated by individual states, with education and required competencies for licensing varying greatly, and not all states require licensing. Most state licenses governing radiography do not include MRI. The CARE Act is hoping to set minimum education and competency levels for persons performing diagnostic imaging and radiation therapy, with the exclusion of ultrasound. For more information, please go to <http://thomas.loc.gov/home/thomas.html> and search by the bill number.

The Health Professions Network (HPN) was busy again this spring. The spring 2004 HPN meeting was in Houston, Texas in March. An interesting statistic is that nearly 1:10 people in the US works in healthcare or a healthcare related field, with the allied health fields making up more than half of all healthcare workers. Workforce issues continue to be the number one area of concern for the allied health professions. LaCheeta McPherson from the National Network of Health Career Programs in Two-Year Colleges gave an overview of the allied health core curriculum that is being used in the state of Texas, USA. Many allied health programs share similar core needs such as Basic Health Professions Skills, Pathophysiology, General Health Professions Management, Medical Terminology, and Human Anatomy & Physiology. So a basic program of core courses was developed from which the different allied health disciplines grow from. The program has been found to be very cost effective and statistics are showing an increase in enrollment into the allied health fields due to this core curriculum program. It is hoped that more schools will adopt an allied health core curriculum.

Another exciting HPN feature for MRI was that MR was featured as the Allied Health Profession of the Month for April 2004. "How to become an MR Tech" can be viewed in the archives at [http://www.healthpronet.org/ahp\\_month/04\\_04.html](http://www.healthpronet.org/ahp_month/04_04.html)

Opportunities for MR technologists to publish are available. Anyone interested in writing an article can submit and are encouraged to submit an article to this newsletter, *Signals*. *Signals* is read by your fellow MR colleagues world wide. An alternative option is to write for *Advance for Imaging and Radiation Therapy*. Joyce Ward from *Advance* is looking for MR articles. If interested, please contact Joyce Ward at [jward@merion.com](mailto:jward@merion.com) or see the website at <http://www.advanceforirt.com/> ●

## Update on Home Studies: SMRT Educational Seminars

Editor, Anne Marie Sawyer-Glover, B.S., R.T. (R)(MR)



For our twenty-fourth home studies issue of the *SMRT Educational Seminars*, *Cardiovascular MRI: Update I*, we revisit MR imaging of the heart. The continued challenges that confront us as imagers including new and rapidly developing imaging sequences invite on-going updates to help us acquire the knowledge necessary to ultimately become proficient.

We are especially fortunate to have Cindy Comeau, B.S., R.T. (N)(MR) to direct the organization of this issue. Known worldwide for her expertise in cardiac MRI, Cindy has lectured widely and shared invaluable experiences and wisdom with so many.

Upon reviewing the three articles contained within this issue, I was struck by the absolute detail to which they bring their knowledge and experience to the written page. The images they share are, each simply, "worth a thousand words." Cynthia Souder, Frank Macaluso, and Kraig Kissinger are to be highly commended for volunteering to participate in this issue of the SMRT home studies' program. I am confident that you will find their contributions enlightening and practical enough to implement into your routine scanning.

The SMRT welcomes and actively seeks out articles written by technologists and radiographers as a contribution to our home

studies program. Sharing information with your peers is not only a worthy occupation, it furthers the technology resulting in improved healthcare overall.

Remember, accreditation (U.S.) for all issues is maintained annually by the SMRT. Back issues may be obtained from the SMRT/ISMRM office located in Berkeley, California, USA for twenty dollars (USD) each. For a complete list of back issues, please go the SMRT Website: [www.ismrm.org/smart](http://www.ismrm.org/smart). If you live outside of the U.S. and have interests or questions concerning accreditation within the country you reside, please contact me at [ams@stanford.edu](mailto:ams@stanford.edu) or +1-650-725-9697.

If you are looking to become more involved in the SMRT, please consider writing questions or an article for one of our home studies. The instructions for writing questions will be posted on the SMRT Website in the near future. For additional information, please contact me directly or Jennifer Olson, ISMRM Associate Executive Director, at the office in Berkeley, California, USA ([smart@ismrm.org](mailto:smart@ismrm.org)).

Finally, I would like to thank Tom Schubert and all of the wonderful people at **MRI Devices, Inc.** who support our home studies program, SMRT Educational Seminars. Their enduring belief in technologist and radiographer education is a significant and worthy endeavor. ●

# Call for Nominations

Maureen Ainslie, M.S., R.T. (R)(MR), Past-President and Chair, Nominating Committee



**A**s Past President, it is my honor to chair the Nominating Committee of the SMRT. I am inviting members to nominate SMRT members in good standing to be considered for election by the membership to the Policy Board. Each year five SMRT members are elected to the board. This is a three-year term with responsibility for

participation in a variety of committee activities. The eleven standing committees are Finance, Membership, Nominating, Bylaws, Education, Program (Annual Meeting), Publications, Regional Seminars, External Relations, Awards, and Local Chapters. Policy Board members elected this fall would assume the responsibilities of their term at the 14th Annual meeting held 6-8 May 2005 in Miami Beach, Florida, USA. The individuals elected work diligently on all of the behind-the-scenes activities that are essential for our organization to flourish.

As members of the SMRT, it is our responsibility to promote the continued growth of our organization. We are currently poised to respond to the challenges we foresee in our field over the next few years. We are able to react and respond due to the dedication and many volunteer hours of dedicated MR professionals like you.

The SMRT membership is also responsible for selecting a President-Elect. This candidate must have served on the SMRT Policy Board and be a member in good standing. If you know someone that you believe can provide leadership for the organization and will strive to move the SMRT

forward in a professional manner, contact the person to ensure he/she will accept the nomination and forward their information to SMRT. This is a three-year commitment as President-Elect, President, and Past President. Nominees should be submitted by 1 September 2004. The closing date for nominations is 15 September 2004. This allows time for the list of names to be compiled for the ballots that are mailed to all members in good standing, October 2004. Please submit nominations directly to the ISMRM/SMRT Office, Attention: Jennifer Olson, 2118 Milvia Street, Suite 201, Berkeley, CA 94704 USA +1 510 841 1899. Alternatively, feel free to contact me directly at: maureen.ainslie@duke.edu or +1 919 684 7875.

The Nomination Committee is also responsible for accepting names for the Cruess-Kressel Award. This award is presented to an individual for his/her outstanding contributions to the education of MR technologists and is named in honor of Drs. John V. Cruess, III and Herbert Y. Kressel for their strong support in forming the SMRT. Other awards given out by the membership at the Annual Meeting are the Distinguished Service Award, Honorary Membership, and Fellow of the Sections. I will be accepting nominations for these awards throughout the fall. Criteria for these awards can be found on the SMRT web site under the Award's Committee Policy and Procedures.

I encourage SMRT members to actively participate in your organization by taking the time to consider Policy Board nomination for yourself or a colleague. You can make a difference! ●

## Report on the SMRT Northeast Regional Seminar

Linda Varnis, R.T., Megan Mullen, R.T., and Mark Perna, R.T., Regional Co-Chairs

**T**he Northeast Regional Meeting was held on Saturday, March 20, at St. Luke's Hospital in Bethlehem, Pennsylvania, USA. The seminar was well received with 68 people attending. After a continental breakfast, sponsored by GE Healthcare, the seminar began with a lecture on *Emergency Spinal MRI*, given by Michael Rothman, M.D. George Chovanes, M.D., F.A.C.S., Chief of Neurosurgery at St. Luke's spoke on *MRI Planning for Gamma Knife Radiosurgery and Stereotactic Biopsies*. It gave a nice look at how the MR images are used in the operating room. Frank Shellock, Ph.D., flew from Los Angeles to provide a very informative *Safety and Patient Management Update*. Cindy Comeau, B.S., R.T. (N)(MR), of Cardiovascular Research Foundation in New York, finished the morning with an excellent discussion of cardiac MRI positioning, techniques, and protocols in *Cardiac MRI: Basic Principles and Applications*.

After a nice lunch, provided by Berlex Imaging, James Stuppino, B.S., R.T. (R)(MR), of Valley Advanced Imaging, and Ronald Sattenberg, M.D., Methodist Hospital, Brooklyn, New York, filled the afternoon agenda. Jim spoke on *MR Spectroscopy: Current Status and Future Possibilities* and

*Use of Contrast Media at Low Field*. Dr. Sattenberg gave insight into the thought processes of the neuro-interventionalist's approach to a stroke. He followed that with *Dynamic Pituitary Imaging*. The afternoon break was sponsored by AGFA, who donated cookies and beverages. Seven and half credits were awarded by the ASRT.

This was our first attempt at hosting a Regional Seminar. The day was filled with useful information to absorb, and very busy, but a positive experience. We would like to thank all the speakers who volunteered their time to enrich the knowledge of the technologists. We would also like to thank the vendors for their donations of food, GE Healthcare, Berlex Imaging, and AGFA, and Bracco for sponsoring Dr. Shellock. Frank Shellock, very generously donated 2004 editions of *Reference Manual for Magnetic Resonance Safety, Implants, & Devices* for all who attended, pens, and "Magnet is Always On" stickers, along with MRI Safety DVD's for door prizes.

Lastly, we would like to acknowledge the technologists who gave up their busy Saturdays to make the seminar a success. See you next year! ●



# Report on the SMRT North Central Regional Seminar

Julia Lowe, B.S., R.T. (R)(MR), Regional Chairperson and Education Committee Chair



The SMRT North Central Regional Educational Seminar was a great success. One hundred and twenty five MR technologists from Ohio, Indiana, Pennsylvania, New York, Illinois, Michigan, Maryland, California, and Ontario found their way to the Bunts Auditorium on a Saturday morning, February 28<sup>th</sup>, 2004. Jeff Duerk, Ph.D. from Case Western Reserve University began our morning with a very effective presentation on *MRI Physics Refresher*. Our next speaker, Richard White, M.D., from the Cleveland Clinic Foundation (CCF), gave us new insight into *Cardiac MRI* and how clinicians are using other imaging modalities with MRI to obtain a more complete patient diagnosis. Before the morning break, Cindy Comeau, SMRT Policy Board member and guest speaker provided information to the audience about the SMRT and encouraged non-members to join. She also asked current members to approach her about becoming more involved and perhaps being nominated to run for Policy Board. After the morning break Mark Lowe, Ph.D., also from CCF explained the physics of *Functional MRI and Diffusion Tensor Imaging* and demonstrated some exciting new images from these methods. Micheal Phillips, M.D., of CCF explained to the attendees the physics of *Diffusion-Weighted and Perfusion-Weighted Imaging* and the importance of their clinical applications.

Lunch was next on the agenda. This provided a break for attendees as well as some time to socialize with new acquaintances and co-workers from their pasts. After lunch we all gathered back inside the auditorium to hear Cindy Comeau, B.S., R.T. (N)(MR), of the Cardiovascular Research Foundation

in New York speak to us about some of the pitfalls associated with obtaining *Contrast-Enhanced MRA* and how we might improve our imaging techniques. Next, Frank Shellock, Ph.D., from the University of Southern California lectured on *MRI Safety*, which is always a favorite of attendees. Technologists appreciate the safety updates and the opportunity to ask Dr. Shellock questions in person.

Jeff Ross, M.D., of CCF spoke about *MR Spectroscopy in Neurologic Disease* and incorporated the audience into his talk by quizzing them. I think all would agree that this was one of the most stimulating spectroscopy talks they've ever listened to! Stephan Fischer, Ph.D., from Philips Medical Systems was the last speaker of the day. In *Sequence Optimization for High-Field MRI* he demonstrated how Philips is improving some of the field inhomogeneities that make 3T imaging more difficult than 1.5T imaging and he also spoke of the advantages of a 3T system.

We thank our vendors who provided financial support: Berlex Laboratories, Inc., IMRSEr, Magmedix, Medrad, Philips Medical Systems, and Siemens Medical Solutions. These vendors, along with the CCF Department of Radiology and the SMRT made the seminar easy to accomplish. We enjoyed an eventful day filled with new and exciting information from several experts in the field of MRI. We also had the opportunity to meet others in our field because of the North Central Regional Educational Seminar. The SMRT would like to thank the attendees for spending their Saturday learning the latest in MRI education and advancing their knowledge! I invite you to organize an SMRT seminar in your region. ●



(top, l. to r.) Mark Clampitt, Sharon Spinos. SMRT attendees at the North Central Regional Educational Seminar. Debi Petcher and her colleagues. (bottom, l. to r.) Dr. Micheal Phillips, Susan Ryan, Lori Strnad, Dr. Stephan Fischer, Donna Shaffer, and Kathy Hampton.

## MRI Procedures and Transdermal Medication Patches

Frank G. Shellock, Ph.D., Adjunct Clinical Professor of Radiology, University of Southern California; Founder, Institute for Magnetic Resonance Safety, Education, and Research; President, Magnetic Resonance Safety Testing Services, Los Angeles, California, USA  
[www.MRIsafety.com](http://www.MRIsafety.com) [www.IMRSEr.org](http://www.IMRSEr.org)

This article represents the views of its author only and does not reflect those of the International Society for Magnetic Resonance in Medicine and are not made with its authority or approval.



**T**he use of transdermal patches to deliver medication is increasing. A transdermal patch allows continuous and prolonged delivery of a drug that may be more effective and safer than oral medication. In addition, patches offer the potential to deliver medications that would otherwise require injections. Future advances in technology will expand the utilization of drug patches. In fact, researchers are currently

working on various technologies, including ultrasound and electrical charges, to force larger molecules through the skin. These so-called "active patches" may permit the delivery of insulin to diabetics, as well as the administration of red-cell stimulating erythropoietin for treatment of anemia patients without injections.

Since 1995, several anecdotal reports indicated that transdermal patches that contain aluminum foil or other similar metallic component may cause excessive heating or a burn in a patient undergoing an MRI procedure. For example, a Deponit (nitroglycerin transdermal delivery system) patch, which contains an aluminum foil component, was worn by a patient during MR imaging. The patient received a second-degree burn during the examination, which was performed using conventional pulse sequences and standard imaging procedures (Personal communication, Robert E. Mucha, Schwarz Pharma, Milwaukee, Wisconsin, USA; 1995). This injury was likely due to MRI-related heating of the metallic foil associated with this transdermal patch.

The Food and Drug Administration is aware of at least two other adverse events in which patients wearing nicotine transdermal patches during MRI examinations experienced burns. In one case, the patient entered the MR system wearing a Habitrol transdermal patch. When the patient was removed from the scanner after the MRI procedure, he stated that his arm was "burning". Upon examination, his upper left arm appeared to be mildly erythematous and there was a small blister where the patch was located. In another case, a patient underwent a short (less than 40 seconds) MRI examination of the lumbar spine while wearing a nicotine transdermal patch. Later, the patient complained of burn lines on his upper arms that were associated with the patch.

In consideration of the above, it is highly recommended that any patient wearing a transdermal patch that has a metallic component be identified prior to undergoing MRI. The patient's physician should be contacted to determine if it is possible to temporarily remove the medication patch in order to prevent excessive heating. After the MRI procedure, a new patch should be applied following the directions of the prescribing physician (Personal communication, Robert E. Mucha, Schwarz Pharma, Milwaukee, Wisconsin, USA; 1995). Importantly, this procedure should be conducted in consultation with

the physician responsible for prescribing the transdermal patch or otherwise responsible for the management of the patient.

The Institute for Safe Medical Practices recently stated that medication patches such as ANDRODERM, TRANSDERM-NITRO, DEPONIT, NICODERM, NICOTROL, CATAPRES-TTS, and possibly others should be removed prior to an MRI examination. In addition, other patches to be aware of include the nicotine patch marketed as Habitrol and its "private label" equivalents and hyoscyne bromide, marketed as TransDerm Scop (Personal Communication, 5/19/04, Crispin C. Fernandez, M.D., Medical Affairs, Novartis Consumer Health, Inc., Parsippany, New Jersey, USA). Notably, not all medication patches contain a metallic component. Accordingly, these patches do not need to be removed for the MRI examination. ●

### References

1. <http://www.mrisafety.com/>
2. Institute for Safe Medical Practices, Medication Safety Alert!, Burns in MRI patients wearing transdermal patches. Vol. 9, Issue 7, April 8, 2004. <http://www.ismp.org/msaarticles/burnsprint.htm>
3. Shellock FG, Kanal E. Magnetic Resonance: Bioeffects, Safety, and Patient Management. Second Edition, Lippincott-Raven Press, New York, New York, USA, 1996.
4. Shellock FG. Reference Manual for Magnetic Resonance Safety, Implants, and Devices: Update 2004. Biomedical Research Publishing Group, Los Angeles, California, USA, 2004.

*For more information on safety related issues, please visit:*

**MRIsafety.com**





## Gadolinium Contrast Agents at Mid- and Low-Field

William Faulkner, B.S., R.T. (R)(MR)(CT)

This article represents the views of its author only and does not reflect those of the International Society for Magnetic Resonance in Medicine and are not made with its authority or approval.



The use of gadolinium is fairly routine in many MR procedures. One complaint I often hear related to mid and low-field MR systems has to do with the apparent inability to “see the enhancement.” As we are aware, scanning on low and/or mid-field MR systems requires protocol customizations in many areas and contrast-enhanced exams are no exception.

Gadolinium enhancement is dose dependant<sup>1</sup> and the dose is determined by patient weight. Standard dose is 0.1 mmol/kg. It is interesting to note that a dose of 0.1 mmol/kg dose not necessarily represent the optimal dose. In fact, 0.1 mmol/kg may essentially be the minimum to achieve “diagnostically sufficient” results.<sup>2</sup> For Gadolinium, 0.1 mmol/kg works out to be 0.2 cc/kg. Since the US seems to be the only country that can’t quite grasp the metric system, most techs round off the dose to about 1 cc per 10 lbs (although that is just a bit more than 0.1 mmol/kg). Therefore, if a patient weighs 150 lbs, we inject 14 – 15 cc. For 200 lbs, most of us just give them the whole bottle. Now, here’s where trouble can begin. With low/mid-field MR systems, we tend to see the larger patients, and patients weighing more than 250 lbs are not uncommon. If a 300 lb patient receives only 20 cc, they are quite simply not receiving standard dose. There should be no surprise that the degree of enhancement might not be the same as one would expect with a higher dose.

To further compound this “problem,” the degree of gadolinium enhancement is field strength dependant as well.<sup>3</sup> This makes sense given that we don’t “see” the gadolinium itself on an MR image, but rather the effects (more specifically the paramagnetic effects) of the gadolinium on hydrogen in water molecules. If less than standard dose is

utilized at a lower field, then again, we should not be surprised at the results.

Lastly, we should remember that gadolinium is a paramagnetic contrast agent and, as previously mentioned, the contrast one sees between a gadolinium enhancing lesion and the surrounding tissue is based on T1 contrast. Gadolinium shortens the T1 relaxation time of water molecules in close proximity to the gadolinium and anything with a short T1 shows as high signal intensity on T1-weighted images. The degree of gadolinium enhancement is also parameter dependent. If we were to increase the TR (i.e. reduce T1-weighting) then the increased signal from background tissue would result in reduced contrast between the gadolinium-enhancing lesion and background tissue. Increasing the TR is not the only way to reduce this lesion-to-background tissue contrast, reducing the field strength will have the same effect. T1 times are field strength dependent and at lower field, tissues relax quicker. So, for a given TR, there will be less contrast between a gadolinium-enhancing lesion and background tissue at lower field. It is therefore important that we also pay attention to the parameters we use for T1 weighted sequences after gadolinium. In the next issue, we will look at various sequences that are currently available on most low and mid-field MR systems to see how they may or may not work after the injection of gadolinium.

### References

1. Van Dijk P, Sijens PE, Schmitz PI, Oudkerk M. Gd-enhanced MR imaging of brain metastases: contrast as a function of dose and lesion size. *Magnetic Resonance Imaging* 1997;15(5):535-41
2. Rinck PA, Muller, RN. Field strength and dose dependence of contrast enhancement by gadolinium-based contrast agents. *European Radiology* 1999;9(5):998-1004
3. Knauth M, Wirtz CR, Aras N, Sartor K. Low-field interventional MRI in neurosurgery: finding the right dose of contrast medium. *Neuroradiology* 2001 Mar; 43(3):254-8.

## Signals

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*The SMRT Proudly Presents*

## 14<sup>th</sup> Annual Meeting of the Section for Magnetic Resonance Technologists

Nanette Keck, R.T. (R)(MR), 2005 SMRT Program Committee Chair



**T**he SMRT invites technologists from around the world to plan ahead for the Fourteenth Annual Meeting of the Section for Magnetic Resonance Technologists. This meeting will be held 6-8 May 2005 in conjunction with the Thirteenth Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine at the Miami Beach Convention Center in Miami Beach, Florida, USA.

As MR professionals, we continue to strive to maintain a high standard of performance while providing quality patient care. MR technologists are faced with many challenges to keep up with technologic advancements with ever increasing workloads. The goal of the SMRT is to provide quality educational opportunities for the MR technologist and to establish and maintain a high level of proficiency in the field.

The meeting commences with a Poster Exhibit and Walking Tour Reception on Friday evening, 6 May 2005. We strongly encourage all technologists to participate in the meeting by submitting an oral or poster abstract. The SMRT abstract deadline is **17 January 2005**. Online abstract submission will be available on the SMRT Website: [www.ismrm.org/smrt](http://www.ismrm.org/smrt). The proffered papers and posters have been one of the highlights of past SMRT meetings. This is a great way to learn about new and innovative clinical and research studies that are being performed by our colleagues worldwide. Selected proffered papers will be interlaced throughout the sessions. It is wonderful to see these proffered paper numbers increase with each year.

The SMRT Annual Business Meeting will be held on Saturday, 7 May 2005, giving members a chance to actively participate in and contribute ideas to your professional MR organization.

Along with your weekend registration, you will be invited to attend the ISMRM/SMRT Forum to be held on Monday, 9 May 2005. The topic will be *Protocol Optimization*, bringing together the opinions of radiologists and technologists from within the Society.

As Chair of the 2005 Program Committee, it is my pleasure to invite you to attend this meeting. I would also welcome suggestions on how we can make this an exciting, quality educational weekend in Miami Beach, Florida, USA. ●

### ISMRM/SMRT CALENDAR

#### ISMRM Workshop on Advances in Experimental and Clinical MR in Cancer Research

16-18 October 2004

Manchester, England, UK

#### SMRT Southeast Regional Seminar

18 September 2004

Atlanta, Georgia, USA

#### SMRT Northeast Regional Seminar

25 September 2004

New York, New York, USA

#### SMRT Northeast Regional Seminar

2 October 2004

Boston, Massachusetts, USA

#### SMRT President's Regional Seminar

9 October 2004

Charleston, South Carolina, USA

#### ISMRM Workshop on Aging Connections: Age-Related White Matter Changes in the Brain

21-23 October 2004

Boston, Massachusetts, USA

#### SMRT West Regional Seminar

6-7 November 2004

Stanford, California, USA

#### SMRT 14<sup>th</sup> Annual Meeting

6-8 May 2005

Miami Beach, Florida, USA

#### ISMRM 13<sup>th</sup> Scientific Meeting and Exhibition

7-13 May 2005

Miami Beach, Florida, USA

For more registration information, please contact: ISMRM/SMRT  
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