



Radiographer

Published by and for the Missouri Society of Radiologic Technologists

Contents

Presidents Message.....	2
Legislative Update.....	3
Student Intern.....	4
Calendar.....	5
In Memoriam	6
Volunteerism.....	8
ASRT Conference.....	9
Lecturers.....	10
NEW MoSRT Fellows.....	19
Past Presidents Breakfast.....	20
Conference Sponsors.....	21
Essay Winners.....	30
Display Winners.....	34
Scholarship Recipients.....	39
Murray Memorial Lecturer....	43
NEW Life Member.....	44
MoSRT Award of Excellence...45	
Cashion Student Intern.....	46
Student Bowl Teams.....	47
Board of Directors.....	60

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Note from the editor:

I think that it is important that you (the readers of this journal) understand that this document is designed to be read online. The size of the text and the size of the images is optimized for viewing on your monitor. While you certainly could print it out, I think that you would realize that it would be similar to the Readers Digest LARGE PRINT edition.

In this issue!

- Photos of ALL Student Bowl Teams
- First group of MoSRT Fellows
- In Memoriam – Henry Y. Cashion

I'd like to thank all who contributed to this issue of the Radiographer.

In particular I extend my appreciation to Webmaster Joe Oller who developed so much of this information for the MoSRT website and from whom I shamelessly borrowed every time I needed information.

I encourage each of you to consider what you might offer for publication in future issues.

Some folks may not be able to use the links in this newsletter! You can copy and paste them into your browser or mail program!

Presidents Message

Good morning Missouri technologists, I am hoping everyone enjoyed the MoSRT annual conference this past April in Columbia. As you can probably guess, we are back to the drawing board actively working on next year's conference. Thank you again for your continued support of your state society.

What is currently on my mind is to provide you with a legislative update. March 31, 2015 was our annual state advocacy day in Jefferson City we call RT in JC. This day happened to coincide with the day our state licensure bill, HB 109 was scheduled to be heard in the Professional Licensure committee. We had approximately 55 technologists and students attend our state advocacy day and had that many attend the hearing. It was a wonderful experience for everyone, as most of us are not able to see our state government in action. Yes, we all packed into a very small hearing room; I think the committee was very impressed to see such support of the bill.

Unfortunately, the bill did not make it out of committee this session. What does that mean for Missouri technologists? We keep working! MoSRT will invite any interested parties to come to our next MoSRT board meeting July 10-11, 2015 in Columbia Missouri. Open communication is vital to make sure we align the verbiage for the next bill to include everyone in the profession.

The common goal for all interested parties is patient safety. We have to make certain Missouri patients are receiving imaging studies from educationally prepared and clinically competent individuals. We can make sure we accomplish this when we all continue to work together.

Okay, as I gently climb down off that soapbox and climb onto another one; let me invite you to take the opportunity to volunteer. This can be at the state, local district, or our national organizations. Contact any board member should you have questions, as always feel free to contact me! There are so many ways a technologist can get involved in your profession and devote a large amount of time or a limited amount of time. Visit MoSRT website (mosrt.net) for suggestions, look for opportunities in your local districts; also check out ASRT.org to see what volunteer opportunities are there.

MoSRT will continue to work with our bill sponsor and with ASRT, as well as other organizations, to develop our next bill language. If you should have questions about the next bill, contact me at diane.hutton@mosrt.org. Should you have questions about volunteer opportunities, contact me or any of the board members listed on our MoSRT website.

Thank you, let's keep this momentum moving forward!

Diane Hutton, BA, RT(R)
MoSRT President

Legislative Update

Fellow Missouri Technologists:

I wanted to provide each of you with an update on MoSRT legislative efforts. At our last board meeting in August, an invitation was sent out for all interested groups to provide feedback to assist with legislative verbiage while we continue to work on our next bill.

Our bill sponsor, Representative Galen Higdon will sponsor the bill again during the next legislative session and will pre file the bill in December.

Look for a Missouri 'call to action' as the bill begins its march through the House of Representatives; at that time we will need everyone to begin contacting their representatives for their support of the bill.

So right now, we are working closely with ASRT on the bill language to have it ready to present to Representative Higdon, then discussions will begin at the House level to fine tune the bill for presentation.

Continue to watch the website mosrt.org for news. I will update MoSRT membership through the web site as changes occur.

Thank you all, as always please let me know if you have questions/suggestions by emailing me at diane.hutton@mosrt.org.

We have booked February 9, 2016 as our date for RT-in-JC. So please mark your calendars!

Student Intern

William "Brandon" Hull!



Hello everyone! My name is William "Brandon" Hull; I attend Mercy's Southwest Baptist University's school of Radiologic Technology. I was born in San Bernardino California, but I grew up in Cabool Missouri and currently live in Springfield Missouri. I am perusing Radiology for multiple reasons. One is that it allows me to work hands-on with patients ensuring the up most care and we'll being of their health. Two it's a career field with almost limitless options which allows me to be able to move almost anywhere in the world. I plan on promoting the MoSRT to students to show why it's important for them to get involved so together we can strengthen this field that we all love.

Student Intern Brandon Hull recently submitted the following report to the MoSRT Board of Directors regarding his trip to the ASRT Conference in Albuquerque, New Mexico.

"The ASRT meeting was absolutely amazing. We were given the opportunity to get to see the inter workings of the ASRT and the ARRT. We also got to meet radiologic, MRI, CT, and many other technologist who provided invaluable information about our career field and its inter workings. We got the opportunity to meet and interact with students who were from all over the country who all provided insight about their specific radiologic technology programs. I can say I made some lifetime friends who even now almost a month later I am still speaking with and we all bounce ideas off of each other. We got to see the ASRT museum which showed us where our career field started and where it is today. We got the opportunity to see how members are elected to both individual organizations like CT or MRI and even how we select our ASRT members. I loved getting the opportunity to sit through and entire board meeting and watch the interactions. It was awesome to be able to sit down with technologist from all over the country and get insight on how they do certain things and how we can continue to improve it in every way. I can say I learned more in 5 days about my field than I had the entire time I have been in school. It was a wealth of knowledge and it only strengthened my passion for this career field I am just getting started in. I hope to push more students to try and experience this as I wish everyone had the same opportunity because it is a once in a lifetime experience. Thank you again."

— William Brandon Hull

Calendar for 2015 - 2016

JANUARY 31, 2016

DEADLINES *for submission of:*

- Technologist Scholarship
- Student Scholarship
- Essay/Scientific Paper
- Exhibit/Scientific Display
- Student Bowl

FEBRUARY 9, 2016

RT-in-JC

Capitol Building
Jefferson City, MO

APRIL 6 - 8, 2016

MoSRT 84th Annual Conference

Holiday Inn Executive Center
Columbia, MO

JUNE 23 - 26, 2016

ASRT Annual Conference

Tropicana Las Vegas Casino Hotel Resort
Las Vegas, NV

OCTOBER 8, 2016

Fourth District Seminar - 8 hours

Saint Lukes Medical Center
Emerson Auditorium
Chesterfield, MO

In Memoriam

Henry Y. Cashion, RT-R 1938 - 2014

Mr. Cashion received his training at Saint Francis School of Radiologic Technology in Cape Girardeau and was certified in 1959 as a registered technologist by the American Registry of Radiologic Technologists.

He joined the Missouri Society of Radiologic Technologists the same year. His membership, comprising more than 50 years, makes him the longest continuously active member of the Missouri Society.

Henry served the Missouri Society in a variety of capacities including National Exhibit Chairman, Secretary, Treasurer, Sixth District Representative, and Education Committee.

He became a Registered Medical Technician at the University of Kansas in 1962, and received a certificate in the EEG program at Washington University in St. Louis in 1963. Henry received a certificate in Hospital Management from the University of Missouri at Columbia in 1970. He received an Associate of Arts degree from Flat River Junior College in 1962.

With a varied career in health services, Mr. Cashion was Supervisor of Radiology at Farmington State Hospital; Chief of Medical Laboratory Services for Medical Arts Clinic in Farmington; Director of Laboratory Services for Farmington State Hospital; a technologist at Kirksville College of Osteopathy; and Supervisor and Director of Radiology Services at Farmington Community Hospital.

Henry was Program Director of the School of Radiologic Technology, which he founded, at Mineral Area Regional Medical Center in Farmington since 1983.

It was through Henry's generous donation of a Coolidge Tube that the MSRT Board of Directors was able to establish the student internship program. Henry's only stipulation was that the money be used to help students. The donated tube was auctioned via the website to raise funds. Doug Decker of Utah won the auction with his bid of \$600. His company planned to reenergize the tube and use it for research



Melissa Mace, a student at Cox Health Systems, was selected as the first Henry Y. Cashion Student Intern. 2003



Henry with just a few of his many student interns! 2014

purposes. In a spur of the moment decision, the MSRT Past Presidents matched the auction winner's bid and the final total for the student internship program was more than \$1,200. The MoSRT Board of Directors announced that the name of the student internship program would be The Henry Y. Cashion Student Internship.

Memoriam



Missouri State receives first Henry V. Cashless Student Leadership Award



Member of the MSRT since 1982
1978 Lieutenant, New Orleans
1979-81 ST. Louis, Mo.
1981-82 ST. Louis, Mo.
1982-83 ST. Louis, Mo.
1983-84 ST. Louis, Mo.
1984-85 ST. Louis, Mo.
1985-86 ST. Louis, Mo.
1986-87 ST. Louis, Mo.
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2010-11 ST. Louis, Mo.
2011-12 ST. Louis, Mo.
2012-13 ST. Louis, Mo.
2013-14 ST. Louis, Mo.
2014-15 ST. Louis, Mo.
2015-16 ST. Louis, Mo.
2016-17 ST. Louis, Mo.
2017-18 ST. Louis, Mo.
2018-19 ST. Louis, Mo.
2019-20 ST. Louis, Mo.
2020-21 ST. Louis, Mo.
2021-22 ST. Louis, Mo.
2022-23 ST. Louis, Mo.
2023-24 ST. Louis, Mo.
2024-25 ST. Louis, Mo.



1988-2014



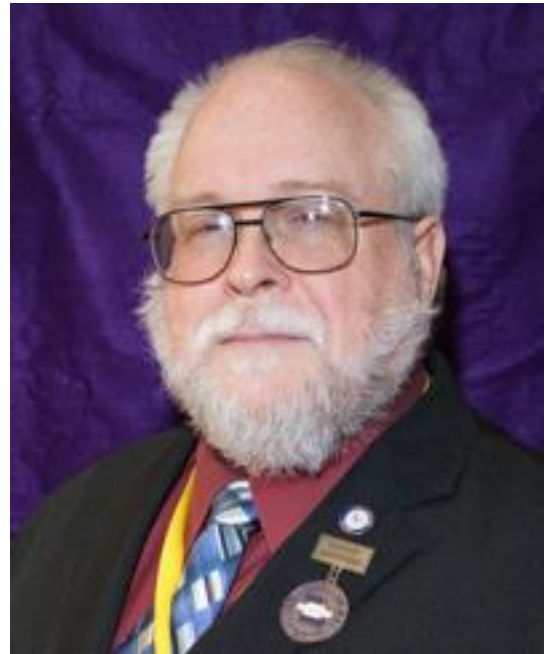
Volunteerism

Martin G. Henson, RT-R

Some 35 years ago Martin G. Henson left the US Navy for civilian life and he also joined the MoSRT. This turned out to be a very good thing for the MoSRT because in 1985 there was a call for a Photographer to cover our annual conferences, and Marty volunteered. Now some 30 years later he has defined the position of Photographer and Historian for the MoSRT.



Marty at the
1991
Conference



In 1991, when Marty was called to active duty for Desert Storm, he answered the call but due to quick termination of this conflict he was back in time for the conference that year. Of note is that he provided MRE's (meals-ready-to-eat) for the silent auction that year!

Over all of his years of service Marty only missed one annual conference (1994) because he was unemployed at the time. Over his lengthy volunteer career Marty has honed his photographic skills and developed many others. He began putting the photos that he took into albums and then he began to add additional items to albums until he had a complete history of each annual conference in each album.

In 2001, Martin G. Henson was elected to Life Membership in the MoSRT. In 2006 he was honored to present the Ulysses D. Murray Lecture "75 Years of the MoSRT: A Perception".

In recent years Marty has developed a 10 page portfolio which outlines the photographs that he plans on taking and also makes it very easy to locate those images when we are working on the website and on the Radiographer.

Marty's title is actually Historian-Photographer and as historian he has collected a ton of data and a bunch of lists, including such things as Life Member, Past Presidents, Student Interns, scholarship recipients, etc.

In addition to all of the above, Marty has always been ready to help at the Registration desk or anywhere else that he may be needed. His willingness to help has made him a cherished member of the MoSRT.

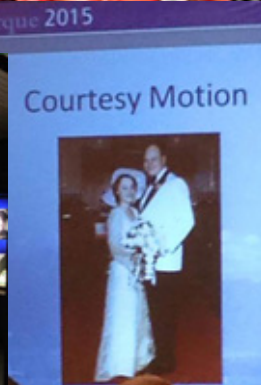
ASRT Annual Conference – June 25-28, 2015



Missourians



Student Interns



New Fellows

Donita Shipman

Anne Brittain



ASRT Fellows

Conference Lecturers -Wednesday- April 8, 2015



Are We There Yet?

Dawn McNeil MSM, R.T. (R)(M), RDMS CRA, FASRT

Assistant Professor, St Catherine College, Springfield KY



Healthcare in Haiti: My Experience

Richard Fucillo R.T. (R)(CT)

Per Diem CT/MRI Technologist, Everett WA



Relationship-Based Care

Patrick Murphy BS, R.T. (R) (CT)

Assistant Director of Radiology, Memorial Hospital, Belleville IL

Conference Lecturers -Thursday- April 9, 2015

Reducing Patient Exposure with Digital Radiography

Parts 1 & 2

Dean Brake, M.Ed RT-R

Associate Professor, St Louis Community College at Forest Park



- 1. Radiation Therapy: A Historical Perspective**
- 2. CT & MRI Enterography**
- 3. Forensic CT & MRI**

Richard Fucillo R.T. (R)(CT)

Per Diem CT/MRI Technologist, Everett WA

Comparative Abdominal Imaging Techniques & Interpretation in Veterinary Medicine

Thomas Hanson, DVM, MS, RT(R)(CT)

University of Missouri, College of Veterinary Medicine



Conference Lecturers -Thursday- April 9, 2015

Adjunct Drugs & Their Usage in Radiology

Debra Hewing MBA, CNMT, R.T. (N), NCT, CCRP

Program Coordinator, Instructor, Doisy College of Health Sciences, St Louis University, St Louis MO



Cruisin' Through the Cross-sectional Heart

Ashlyn Hull M. Ed R.T. (R) (CT)

Instructor, Radiologic Science Program, Avila University , Kansas City MO

What Kind of Contribution Will You Make?

Tammy R Homan MSRS, R.T. (R) (M) (CT)

Director of Imaging, Southeast Hospital, Cape Girardeau MO



Conference Lecturers -Thursday- April 9, 2015

What Do Those T & Z Scores Mean? A Bone Densitometry Primer

Rodney Fisher R.T. (R) (CT), CNMT

Assistant Prof., Midwestern State University, Wichita Falls TX



Odds & Ends: Everyday Physics & Exposure Principles

Jason Young BS, R.T. (R)

Clinical Coordinator, Cox School of Diagnostic Imaging, Springfield

MO

Conference Lecturers -Friday- April 10, 2015

1. **Customer Service**
2. **Greater Than Yourself Mentoring**
3. **Clinical Success**
(Ulysses D. Murray Memorial Lecture)

Dawn McNeil MSM, R.T. (R) (M), RDMS CRA, FASRT

Assistant Professor, St Catherine College, Springfield KY



MRI: All About That Gad(olinium)

Martha Kennedy MA, ARMIT, R.T. (MR)

Program Director, Instructor, MRI, Doisy College of Health Sciences, St. Louis University, St Louis MO



MRI Safety for Radiology Professionals

Dan Smock BHS, R.T. (R) (MR) (CT)

MRI Supervisor/Safety Officer, Children's Mercy Hospitals & Clinics, Kansas City MO



Conference Lecturers -Friday- April 10, 2015

Passing the Test: Regurgitation vs Application

Austin Turner MS, CNMT, PET, R.T. (MR), ARRT

CI Instructor, St Louis University, St Louis MO



1. Fluoroscopy & The Technologist's Role In Reducing Radiation Exposure 2. Radiation Exposure & What You Should Tell Your Patients

Dr. Nima Kasraie

Medical Physicist, Children's Mercy Hospitals & Clinics Kansas City MO

Radiation Biology & Radiation Protection

Thaddeus "Tad" Morris BS, R.T. (R) (CT)

Professor, Radiologic Sciences & Imaging Dept. Cox College, Springfield

MO



Conference Lecturers -Friday- April 10, 2015

Missouri Legislative Update

Diane Hutton BA, R.T. (R)

CI & Educator, Heartland Regional Medical Center, St Joseph MO



Stress & Automatic Behaviors in Your Radiology Department

Dustin Ward R.T. (R) (CT) (MRI), ARRT

MRI/CT Tech, St Lukes' Northland & Research Hospitals, Kansas City MO

Osteoporosis in Men

Norman Hente MS, R.T. (R), FASRT, FMoSRT

President, BarNor Services, Granite City IL



Conference Lecturers - Saturday- April 11, 2015

Perceptions of Breast Screening: The Mammographer's Viewpoint

Carla Allen Ph. D,-c, R.T.(R) (CT) ARRT,

Assoc. Clinical Prof, University of Missouri, Columbia MO



Why Ultrasound?

Dawn McNeil MSM, R.T. (R) (M), RDMS CRA, FASRT

Assistant Professor, St Catherine College, Springfield KY

MRI Safety

Dr. Brandon Massin

Radiologist, Radiology Specialists of St Joseph, St Joseph MO



Conference Lecturers - Saturday- April 11, 2015

Helping Your Patients Understand Radiology

Using Teach Back

Nanci Burchell MBA, CNMT, FSNMTS

Radiation Safety Officer, Children's Mercy Hospitals & Clinics, Kansas City MO



Cruisin' Through Management: Delegation,

Micromanagement, & Balance

Tammy R Homan MSRS, R.T. (R) (M) (CT)

Director of Imaging, Southeast Hospital, Cape Girardeau MO

NEW! MoSRT Fellows – Friday - April 10, 2015



L to R: Darrell McKay, Barbara Hente, Norman Hente, Donita Shipman, and Michael Ward.

At the Friday Luncheon, the first ever group of MoSRT Fellows was elevated. This first group to be so honored was selected because they are ASRT Fellows and would meet all of the qualifications to be MoSRT Fellows. The Missouri Society is proud to recognize these members for their many contributions to our society and the profession.

The MoSRT is proud to present this new opportunity for Missouri Technologists that have been active in their profession and have made significant contributions to the MoSRT. Technologists can start applying for Fellow status now. To apply you will need to read all rules and complete an application, the Fellow Committee will then review all applications, and those who qualify will be recommended for elevation to Fellow. For more information you can go to our website at <http://www.mosrt.net/honors/>

Elevations to MoSRT Fellow will be awarded at the next annual Conference. All questions should be directed to the Fellow Committee Chair, Barbara Hente at barbara.hente@mosrt.org.

Past Presidents Breakfast – Saturday – April 11, 2015



Front Row seated (L to R)

Coretta Schroer	1976-77 & 1990-91
Barbara Hente	1987-88
Norman Hente	1978-79
Joan Hedrick	2010-11
Mary Sebacher	1975-76

Back Row (L to R)

Ron Ott	1973-74
Janet Akers	2014-15
Kristi Littleton	2012-13
Kelley McDonald	2013-14
Tammy Homan	2011-12
Michael D. Ward	1982-83 & 1986-87
Danny Cantrell	1991-92 & 2008-09
Darrell McKay	1970-71 & 1988-90
Donita Shipman	1995-96 & 1997-98

SPONSORS – April 9-10, 2015



BRACCO DIAGNOSTICS

Lisa Kaminski

<http://www.bracco.com/>

SPONSORS – April 9-10, 2015



Brown Medical Imaging

Peggie Sanders

www.brownsmedicalimaging.com/

SPONSORS – April 9-10, 2015



Cox College
Michelle Massengill
Joelene Powell
Jason Young
Daniel Edwards
Tad Morris
www.coxcollege.edu

SPONSORS – April 9-10, 2015



Mercy College of Nursing and Health Sciences
Charlie Hungerford
mercy.sbuniv.edu

SPONSORS – April 9-10, 2015



OTTAWA University

Micki Reed

Lydia Matlock(inset)

www.ottawa.edu

SPONSORS – April 9-10, 2015



Saint Louis University

Debra Hewing

Austin Turner

Martha Kennedy

www.slu.edu

SPONSORS – April 9-10, 2015



St. Luke's Hospital Schools of Advanced Imaging

Mary Wooldridge

Tiffany Johnson

<http://www.saintlukeshealthsystem.org/school-radiologic-technology>

SPONSORS – April 9-10, 2015



State Fair Community College

Ruthann Pfremmer

Renee Cella

<http://www.sfccmo.edu/>

SPONSORS – April 9-10, 2015



Supertech

Christopher Mell

<http://www.supertechx-ray.com/>



Essay Winners – April 10, 2015



Technologist Essay Winner

1st Place - A Standardized Exposure Index for Digital Radiography

Dean Brake - St Louis Comm. College Forest Park

Essay Winners – April 10, 2015

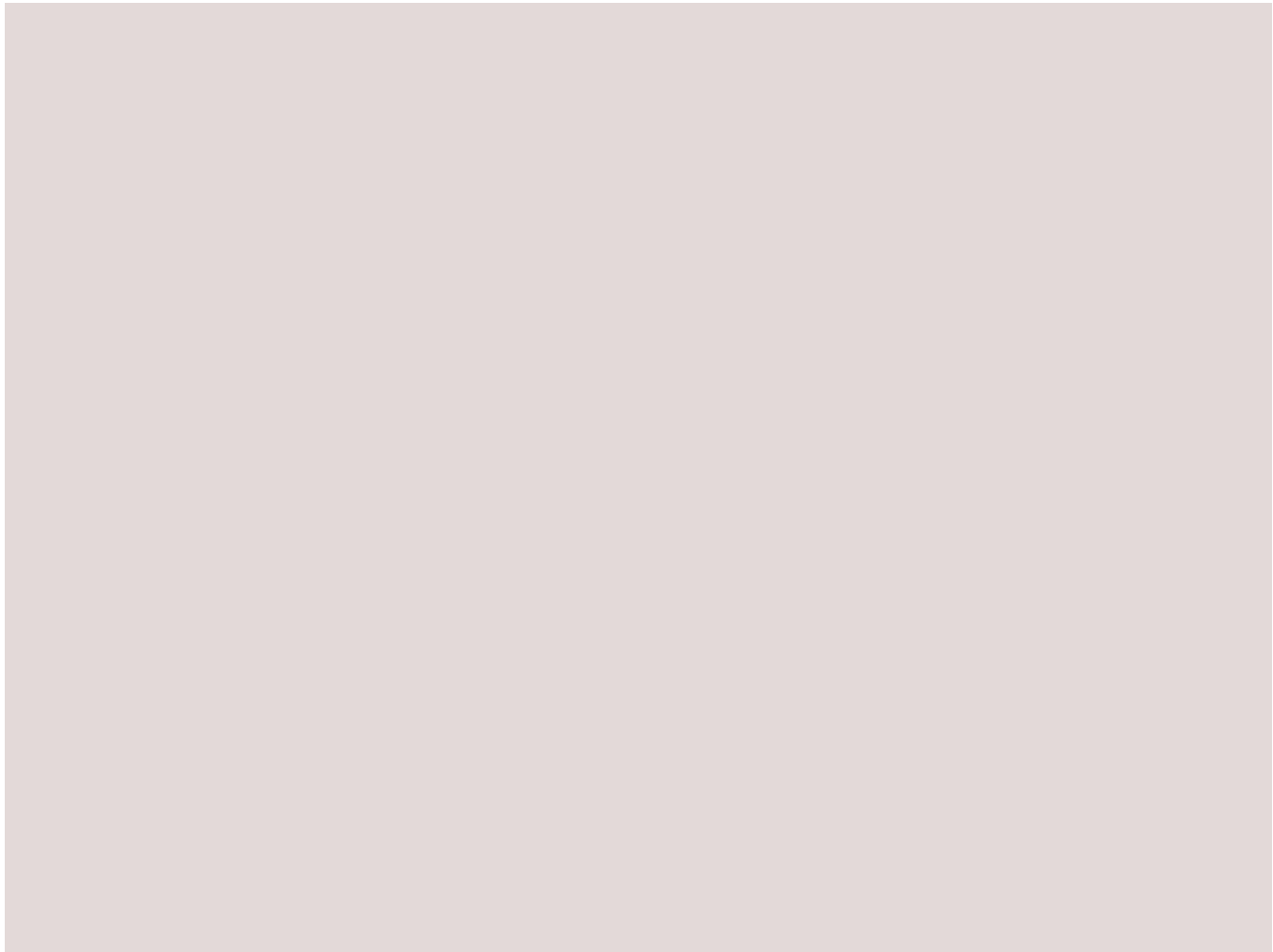


Student Essay Winner

1st Place - The Biological Impact of an MRI

Abigail Ferry - St. Louis University

Essay Winners – April 10, 2015



Student Essay Winner

2nd Place - The ALARA Technique

Tadwick W Campbell - Avila University

Essay Winners – April 10, 2015



Student Essay Winner

3rd Place - Cosmetic Interventional Radiology:
A Profitable New Avenue In Exceptional Patient Care

Amber D Bix - Hillyard Technical

Shuttering is NOT Collimation

Collimation

is used to restrict the size of the x-ray field. Collimation amount of tissue exposed to radiation and is performed to limit the patient's radiation exposure. The can reduce dose to the patient by exposing only the area "Collimating to the appropriate field size is a basic protecting the patient from unnecessary exposure" (1). exposure to the anatomy of interest is fundamental for detection during radiographic imaging procedures. As are required to use pre-exposure collimation by the standards for Medical Imaging (2).

exposed area also reduces the amount of scatter (3) the tissues that strikes the IR. "The decreased amount of scatter reaching the IR results in higher radiographic contrast (4). Decreasing scatter decreases image noise and improves image detail. Collimation improves image quality (1, 3, 4) and is very important in digital radiography because digital detectors are more sensitive to low levels of radiation, and the digital image might demonstrate reduced image contrast (5) due to scatter radiation striking the receptor. "By improving contrast, you can also cause errors in the computer processing of the image (3, 4)." (6)

Shuttering


is a technique, making electronic or post-exposure shuttering is a post acquisition option that may be used for pre-exposure collimation. It should never be used to limit anatomy from the image making the image look like it is collimated (1, 4, 5, 6, 7).

is a viewing technique only. "The one and only reason for shuttering is to eliminate ambient light around the tightly collimated anatomy. Shuttering should never be used to mask poor collimation (1, 3, 5, 6). The radiologist is responsible for interpreting the image and must not be aware of pathology in the anatomy by shuttering (1, 4)." "The patient has the right to an image acquired during an X-ray examination (1)." (8)


is also documented a decrease in the use of collimation with digital processing. Shuttering is being used instead of collimation (1, 3, 4, 5, 7).

Purkinje chest radiograph of infant. Request was made to include left central vessel catheter placement. Collimation was left open, unnecessarily exposing entire torso and pelvis of extremities. Image was cropped to meet box for interpretation (9).

Collimation and Shuttering



Only images that have been tightly collimated should be shuttered. (5, 6)
Notice how this image has more contrast than the uncollimated images on the right.



Images that are not collimated smaller than the IR like the one above, should not be shuttered. Only images with a collimated edge should be shuttered. (1, 4, 5, 6)




Image properly shuttered to show collimated edges. All anatomy exposed is demonstrated (1, 4, 5, 6)

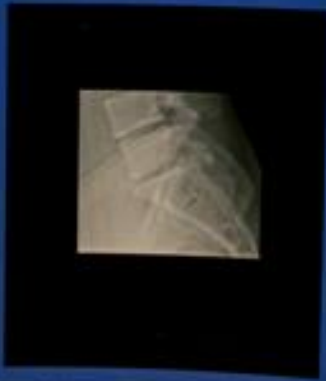




Image from above incorrectly shuttered. Exposed anatomy has been cropped. Collimated edges are not demonstrated (1, 4, 5, 6, 8). Note image has less contrast than the properly collimated images on the left.

Medical - Legal Issues

The radiologist is responsible for interpreting the entire image and may not be aware of pathology in masked areas (1, 4). The images below are of a 3-year old girl with mild torticollis after minor trauma. Image A is an electronically collimated AP view of the cervical spine and shows no abnormalities. Image B is the original non-collimated AP view which demonstrates a right clavicle fracture. "The patient has the right to all information acquired during an X-ray examination." (1)

© University of California San Francisco Department of Radiology. Digital radiography. Center of the Older Adult. © 2009. © University of California San Francisco Department of Radiology. Center of the Older Adult. © 2009.

ASRT Position Statement

Digital Imaging Cropping or Masking in Radiography

"It is the position of the American Society of Radiologic Technologists that a digital image should not be cropped or masked such that it eliminates areas of exposure from the image that are presented for interpretation. Pre-exposure collimation of the x-ray beam is necessary to comply with the principle of as low as reasonably achievable (ALARA). To determine that exposed anatomy on an image is not significant or of diagnostic value is a medical decision and is therefore outside of the scope of practice for a radiologic technologist." Adopted ASRT 1100, Main Motion, C-14.10, 2014 (8)

Summary

Limiting the size of the x-ray field (collimation) during radiography is an important radiologic safety practice and the responsibility of the radiologic technologist. Collimation reduces patient exposure while improving image quality (7) Post processing electronic shuttering should not replace tube collimation but, if used, should demonstrate the actual collimated borders during image acquisition (7).

References

1. American Society of Radiologic Technologists. ASRT Position Statement on Digital Imaging Cropping or Masking in Radiography. 2014. Available at: <http://www.asrt.org/ASRT-Position-Statement-on-Digital-Imaging-Cropping-or-Masking-in-Radiography>
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Technologist Display Winner

1st Place - Shuttering is NOT Collimation

Dean Brake - St. Louis Community College



Scientific Display Winners – April 10, 2015

The Validity of Using Low Dose CT from ¹⁸FDG PET/CT Scans to Obtain Calcium Scores and Determine Patient Treatment

Background

Cancer is a life-threatening disease that affects a large population worldwide. One of the main courses of treatment for this disease is chemotherapy. Unfortunately, chemotherapy can be very toxic to the heart muscle and cause even more health concerns. To determine the likelihood of these patients developing cardiovascular disease, radiologists look at calcium scores as a predictor. The calcium scores are typically rendered by highlighting regions of interest in plaque build-up of the coronary arteries found on a normal contrast enhanced computed tomography (CT) scan. In recent years, over-exposure of radiation has been a hot topic of discussion and the reduction of radiation exposure from diagnostic exams is a top concern. Most often, cancer patients receive CT scans as well as positron emission tomography sessions combined with a lower dose CT scan (PET/CT) for diagnosis and staging. From the PET/CT scans, radiologists can use the low dose CT portion to calculate the calcium scores of cancer patients. In using this low dose scan, patients receive less radiation exposure yet still receive the prediction for developing heart disease at the same time as their routine staging exams. It is important that patient's calcium scores are calculated and reported throughout treatment. If the score is in the higher range, a new course of treatment can be planned to increase the quality of life without permanently damaging the cardiac muscle.

Methods

- We retrospectively reviewed 200 FDG PET/CT scans from one institution. Coronary artery calcification was noted and a log was kept to record these cases.
- Thirty total patients were chosen with confirmed coronary artery disease. Fourteen of these patients also had a routine chest contrast enhanced CT scan.
- Using the program Vital (computer software), regions of interest were drawn around visibly calcified coronary arteries and a final score (in Agaston units) was logged.
- Calcium scores were recorded for both low dose CT (from PET/CT) and contrast enhanced CT scans (when available).
- The 30 scores found from the low dose CT from the PET/CT portion were also classified based on the Rotterdam Coronary Classification Table which determined the severity of coronary artery disease (Table 1).

Results

- In the fourteen patients who had PET/CT and cCT, the mean calcium score for the low dose CT was 669.36 and the mean score for the cCT was 624.64
- In comparing the two methods, a correlation of 0.99 was observed as seen in chart 1.
- The Rotterdam scale was used to rank the 30 low dose CT patients: 13 were classified as moderate risk and 17 were classified as high risk.


Table 1. Rotterdam Coronary Classification Table

CCS (Agaston)	Risk	Description
< 100	Non-Identified	Negative test. Findings are consistent with a low risk of having a cardiovascular event in the next 5 years.
100-199	Minimal	Minimal calcifications are present. Findings are consistent with a low risk of having a cardiovascular event in the next 5 years.
200-399	Mild	Mild coronary calcifications are present. There is thirty fold or minimal coronary stenosis. A mild risk of CAD exists.
400-499	Moderate	Moderate calcium is detected in the coronary arteries and confirms the presence of atherosclerotic plaque. A moderate risk of having a cardiovascular event exists.
≥ 500	High	A high calcium score may be consistent with significant risk of having a cardiovascular event within the next 5 years.

Objectives

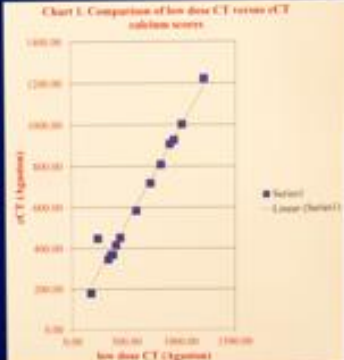
- To validate calcium scores derived using the low dose CT portion of a PET/CT scan by comparing it to the gold standard, contrast enhanced CT (cCT).
- To use calcium scores to determine presence and severity of coronary artery disease.

PET/CT vs. CT



Figures courtesy of Philips Imaging for PET/CT and Siemens for CT. These are images of the two types of imaging equipment that produced the images and reports used in this study.

Chart 1. Comparison of low dose CT versus cCT calcium scores



Conclusions

Using the low-dose CT from PET/CT scans for calcium scoring was found to be a reliable method with a strong correlation (0.99) when compared to the gold standard contrast-enhanced CT. Since many types of chemotherapy are cardio-toxic, the addition of this information in a PET/CT report may eliminate the need for dedicated contrast-enhanced CT for calcium scoring and reduce patient radiation exposure. Ultimately, cancer patients can monitor their cardiac health while choosing the best treatment for the highest quality of life.

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 3. The Rotterdam Study, Rotterdam University, 2013, http://www.rotterdamstudy.com/
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Technologist Display Winner

2nd Place - The Validity of Using Low Dose CT from FDG PET/CT Scans to Obtain Calcium Scores and Determine Patient Treatment

Hannah Sweet - St. Louis University

Radiographer • December 2015 • Missouri Society of Radiologic Technologists

Scientific Display Winners – April 10, 2015



What is "Non-Lesional Epilepsy"?


Epilepsy is a disorder that involves having recurrent seizures. There can be a variety of different causes such as genetic risk, perinatal trauma, stroke, brain injury, and infections. A majority of epilepsy patients do not have a known cause. In most cases, when the cause is unknown, brain lesions may be visible on a CT or MRI scan. However, there is a community of patients who have what is referred to as "MRI-negative" or "Non-Lesional" epilepsy. These patients show no signs of lesions on an MRI or CT scan.

There are two different forms of "Non-Lesional" epilepsy:

1. A lesion that is not visible at all. This means the cause for seizures is happening at the chemical level, where neurochemical problems are responsible for allowing electrical signals to be carried through the brain.
2. A lesion exists but our current imaging is not sensitive enough to distinguish it from the surrounding healthy brain tissue.

Epilepsy Facts

- There are **4000** cases of **Non-Lesional** epilepsy in the US as the number of people with cerebral malformations (CM), nuclear cisterns (NC), multiple sclerosis (MS), and optic chiasm (OC).
- **47** cases of **Non-Lesional** epilepsy in the United States have been reported.
- **1** in **20** people will develop epilepsy at some point in their lifetime.
- The majority live with people who epilepsy is **2-3** times higher than the general population and the risk of seizures is **2-3** times higher.
- Higher concentrations of sodium in cerebrospinal fluid are found in **70%** of all **Non-Lesional** epilepsy patients.
- Changes occur in the normal brain approximately **10-15** minutes after the seizure. The subject can be scanned with an MRI scanner and the brain tissue right after the seizure to get correct diagnosis.



Advanced Imaging For Non-Lesional Epilepsy

7-Tesla MRI Machines

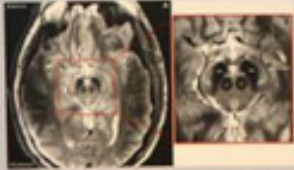
MRI became a popular imaging system in the 1970's. At this time the magnetic strength was 0.6-Tesla. The industry gradually worked up to a 1.5-Tesla machine, and eventually achieved a 3.0-Tesla machine. However, 90% of diagnostic imaging is still performed using 1.5-Tesla machines.¹ The quality of images improves with the strength of the magnet. Thus, research of the 7-Tesla machine has begun advancement in the world of radiologic imaging. The 7-Tesla is very similar to the 1.5 and 3.0-Tesla machines as it operates on the same gradient performance. The chart below shows some of the benefits a 7-Tesla has over a 1, 1.5, and 3-Tesla machine.⁴

Approximate Comparison	1- Tesla	1.5-Tesla	3-Tesla	7-Tesla
SNR	1	1.5	3	7
Proton T1 (sec)	1	1.1	1.3	1.8
Chemical shift (ppm) (field-dependent)	1	1.5	3	7
BOLD contrast in venules (%)	1	2.4	3.5	8.00


The University Of Minnesota Medical School conducted diagnostic research on patients with epilepsy with a 7-Tesla machine. The research involved 10 candidates, each of which had epilepsy with no visible lesions on past MRIs. The 7-Tesla machine allowed the discovery of visible lesions leading to successful treatment for 8 of the 10 candidates.⁵

Researchers have been investigating the effects of 7-Tesla MRI machine use on patients. Results, so far, have shown patient complaints of vertigo, seeing flashing lights, and tingling/numbness in the extremities during the imaging. No effects have been reported after the procedure has been completed.¹


MRI Imaging



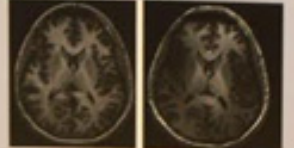
7-Tesla MRI image from a T2-weighted GRASE (Gradient And Spin Echo) pulse sequence of the midbrain.⁶



Brain scans showing the extreme difference in detail between a 1.5T, 3T, and a 7T.⁷



High resolution imaging using 7-Tesla MRI. Images on the left show atrophy and iron accumulation within the right basal ganglia of a patient with an atypical movement disorder compared to a normal control subject. Images on the right compare the right hippocampus of a patient with epilepsy acquired using 7-Tesla (left) and 3-Tesla (right) MRI.⁸



MRI image quality compared at 3-T and 7-T using nearly identical acquisitions and quadrature transmit volume radiofrequency coils. Signal/noise is improved ~2x at 7-T compared to 3-T.⁹

Why is This Advancement Needed?

Locating lesions is essential to diagnosing and treating epilepsy. When a doctor is able to see the probable focal spot causing seizures, precise surgery or other methods, such as effective medication, can possibly eliminate seizures. If the focal spot cannot be identified, effective patient treatment is greatly reduced. Higher field strength MRI machines increase the likelihood of locating focal spots and lesions.

A majority of current epilepsy treatments involve medications that can cause dangerous and extreme side effects, reducing quality of life. Just a few common side effects include:

- Dizziness
- Memory impairment
- Depression
- Nausea/vomiting
- Tremors
- Insulated feeling
- Weight change
- Liver damage
- Skin defects

Many patients don't respond to medications, a majority having non-lesional epilepsy. This results in attempting numerous medications, in the hope of obtaining to seizure and no side effects.

Using advanced imaging to locate previously non-visible lesions would lead to effective treatment and possible elimination of side effects and seizures. One major treatment is surgery, which allows many patients to remain seizure free for life.

What Imaging Do We Currently Do?

The most common way of diagnosing epilepsy is with MRI scans and EEG studies. The most common diagnosed form of epilepsy is temporal lobe epilepsy which is caused by scarring in the brain tissue. MRI scans can sometimes show the location of scarring, when resolution is high. In most instances, which is common, imaging can be used to plan surgery and remove the site of abnormal tissue.

Currently, 1.5 and 3.0-Tesla machines are used to attempt to find lesions. The higher the strength of the magnet, the more detailed the images are. Most hospitals can't afford the cost of purchasing a 7-Tesla machine because of the expense. However, many hospitals are beginning to purchase 7-Tesla machines.

Student Display Winner

1st Place - Advanced Imaging for Non-Lesional Epilepsy

Alaina Lathrum - University of Missouri



Scientific Display Winners – April 10, 2015

The Effect of Pulmonary Arterial Hypertension on Standardized Uptake Values of the Liver in PET/CT Imaging

Background

Pulmonary Arterial Hypertension (PAH) is a cardiovascular condition characterized by increased blood pressure in the pulmonary arteries emanating from the right ventricle. Patients with PAH exhibit non-specific symptoms including dyspnea upon exertion, chest pain, and peripheral edema (Gaine 1998). PAH is defined as having an elevated mean pulmonary arterial pressure (MPAP) ≥ 25 mmHg at rest. The pressure can be measured by right heart catheterization. The severity of PAH can also be assessed by measuring the mean pulmonary artery diameter (MPAD). A cutoff of 38.3 mm is used for severe pulmonary arterial hypertension (Kam et al. 2013). PAH has also been linked to portal hypertension, portopulmonary hypertension, and liver disease (Robalino 1991).

Image 1: The effects of pulmonary hypertension are visualized. Note the hypertrophy in the right ventricle.






Image 2: 'M' depicts the measurement of the mPAD in a transaxial CT slice. The patient has severe PAH.



In PET/CT imaging, patients are given measured amounts of F-18 FDG (Fluorodeoxyglucose). The Standardized Uptake Value (SUV) of the liver is calculated as an internal reference point in the body. The SUV is calculated by drawing a Region of Interest (ROI) in the liver that has a homogeneous distribution of FDG.

Image 3: The liver SUV uptake is measured in a homogeneous region in the liver in a fused PET/CT image.



Objective

The objective of this study was to examine a potential link between Pulmonary Arterial Hypertension (PAH) and liver disease. It has been hypothesized that PAH may be due to an underlying hepatic disorder. This study examined the potential effect that PAH may have on SUVs of the liver obtained in PET/CT imaging.

Methods

- 19 patients (12 male, 7 female) with PAH who also underwent PET/CT imaging were retrospectively reviewed. Control patients, matched for age and gender, were also reviewed.
- The mean pulmonary artery diameter (MPAD) and the liver SUV for each patient was measured.
- For patients who underwent multiple PET/CT scans, the most recent scan was used for measurements.
- Patients who had an MPAD greater 38.3 mm were considered as having severe PAH.
- A two-sample unpaired t-test for unequal variances was used to compare SUV among the groups.

Results

- The mean age of the cases and controls was 62 (range 51-80).
- The mean MPAD (mm) for patients with PH was 34.46, ranging from 26.9 to 52.3. The mean MPAD (mm) for control patients was 25.54, ranging from 17.6 to 28.7.

	Mean SUV	Standard Deviation	Standard Error	Minimum	Maximum
Patients without PH	2.38	.48	.08	1.8	3.4
All Patients with PH	2.45	.74	.17	1.7	5
Patients with Mild-Moderate PH	2.29	.45	.11	1.8	3.3
Patients with Severe PH	3.15	1.28	.44	2.2	5

- There was no significant difference in SUVs for subjects with PAH and the control patients, between subjects with severe PAH and the subsequent control group, nor the subjects with mild-moderate PAH and their control group, ($p=0.7248$), ($p=1.6619$), and ($p=1$) respectively.

Conclusion

Our study suggests PAH does not have a significant impact on the liver SUV obtained in PET/CT imaging. There was no statistically significant difference between subjects with mild-moderate PAH and the corresponding control patients, nor the patients with severe PAH and the subsequent control patients. These results indicate that PAH, regardless of severity, does not affect the liver SUV and therefore does not preclude using the liver as an internal reference point in FDG PET/CT examination.

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 ◀Image 1 courtesy of National Children's Hospital.
 ◀Image 2 courtesy of Medical College of Wisconsin.
 ◀Image 3 courtesy of Diagnóstico Médico Ochoa, Rosario, Argentina.

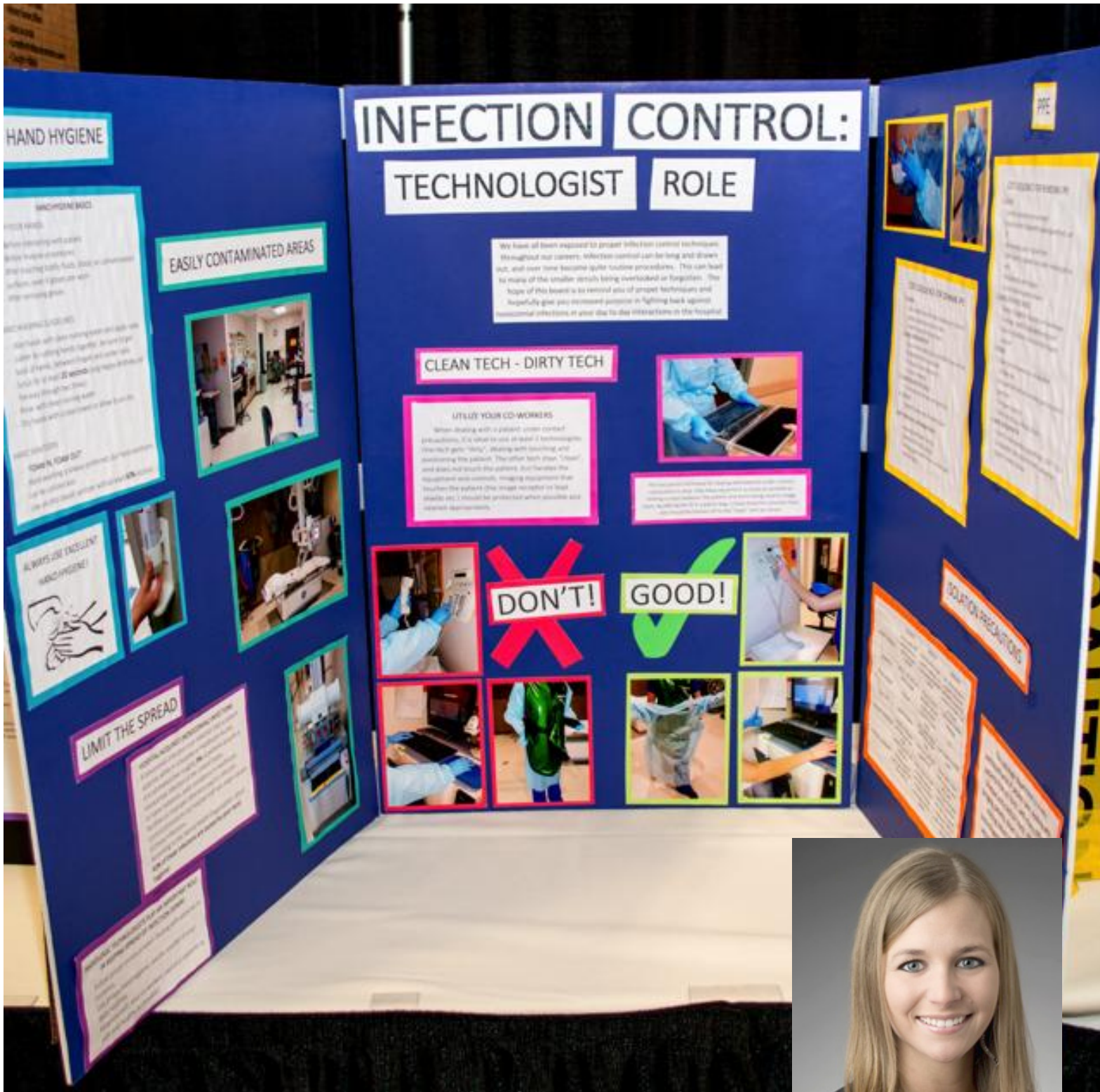


Student Display Winner

2nd Place - The Effect of Pulmonary Arterial Hypertension on Standardized Uptake Values of the Liver in PET/CT Imaging

Junaid Yasin - St. Louis University

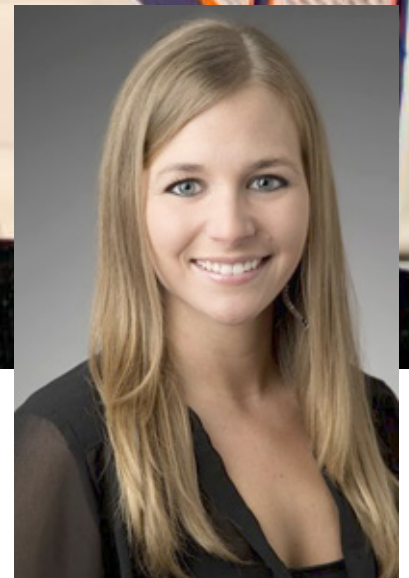
Scientific Display Winners – April 10, 2015



Student Display Winner

3rd Place - Infection Control: Technologist Role

Mikaela Tinsley - Research Medical School of Radiology



MoSRT Scholarship Recipients



MoSRT Technologist Scholarship

Hannah Sweet

St. Louis University

MoSRT Scholarship Recipients



Robert A. Feldhaus Memorial Student Scholarship

Callie Miller

Rolla Technical Center

MoSRT Scholarship Recipients



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William "Brandon" Hull

Mercy School

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Student Bowl Teams – April 9, 2015

1st Place



Research Medical Center School of Radiology Technology

Front: L to R: Tiaper Saper, Vince Delinger, Elizabeth "Liz" Vajgrt

Back: **Coach** – Nancy Stephens

Program Director – Don Hessel

Student Bowl Teams – April 9, 2015

2nd Place



Cox College

Front L to R: Cindy Sippy, Michelle Siegismund, Grant Glor

Back L to R: **Coach** - Daniel Edwards, Chelsea Gamble

Program Director - Kacie Craig

Student Bowl Teams – April 9, 2015

3rd Place



Hillyard Technical Center

Front L to R: Melissa Johnson, Jessica Knadler, Amber Bix,

Back L to R: McKensie Knight, **Coach** – Lorinda Ross

Program Director – Mallary Hann

Student Bowl Teams – April 9, 2015

4th Place



State Fair Technical College

Front L to R: Mikiah Mullins, **Coach** - April Young, Amanda Grosz,

Back L to R: Brianna Bridges, Coleen Lawrence

Program Director – Ruthann Pfremmer

Student Bowl Teams – April 9, 2015



Avila University

Jenny Blake, **Coach**-Kristi Littleton, Racheael Haefele,

Angela Livingood Lacey Marron-Burgard

Program Director – Ashlyn Hull

Student Bowl Teams – April 9, 2015



Jefferson College Radiologic Technology Program

Whitney Smith, Debra Honaker-Pieper Charlotte Skaggs,

Coach - Janet Akers, Nathan Evans

Program Director – Janet Akers

Student Bowl Teams – April 9, 2015



Linn State Technical College/Medical Radiologic Technology

Lindsay Miller, **Coach** - Vicki Johnson, Abby Leuberring,

Joshua Lange, Andrew Hardwick

Program Director – Melissa Hart

Student Bowl Teams – April 9, 2015



Mercy School of Radiologic Technology

Sebrina Rogers, Chelsea Cave, Whitney Whorton,

Coach - Amanda Doneski, Shannan Evans

Program Director – Joan Hedrick

Student Bowl Teams – April 9, 2015



Missouri Southern State University

Jennifer Day, Annie Epperson, Emily Morrison,

Coach - Alan Schiska, Cody Todd

Program Director – Alan Schiska

Student Bowl Teams – April 9, 2015



Rolla Technical Center Radiography Program

Natascha (Matesowicz} Szumla, **Coach** - Maggie Ogden, Callie Miller,

Laura Hovis Haley Kelley

Program Director – Maggie Ogden

Student Bowl Teams – April 9, 2015



St Louis Community College at Forest Park

Stacie Gates, Marsel Cuka, Christopher Roth,

Coach - Sally Polta, Armod Rainey

Program Director – Vince Featherson

Student Bowl Teams – April 9, 2015



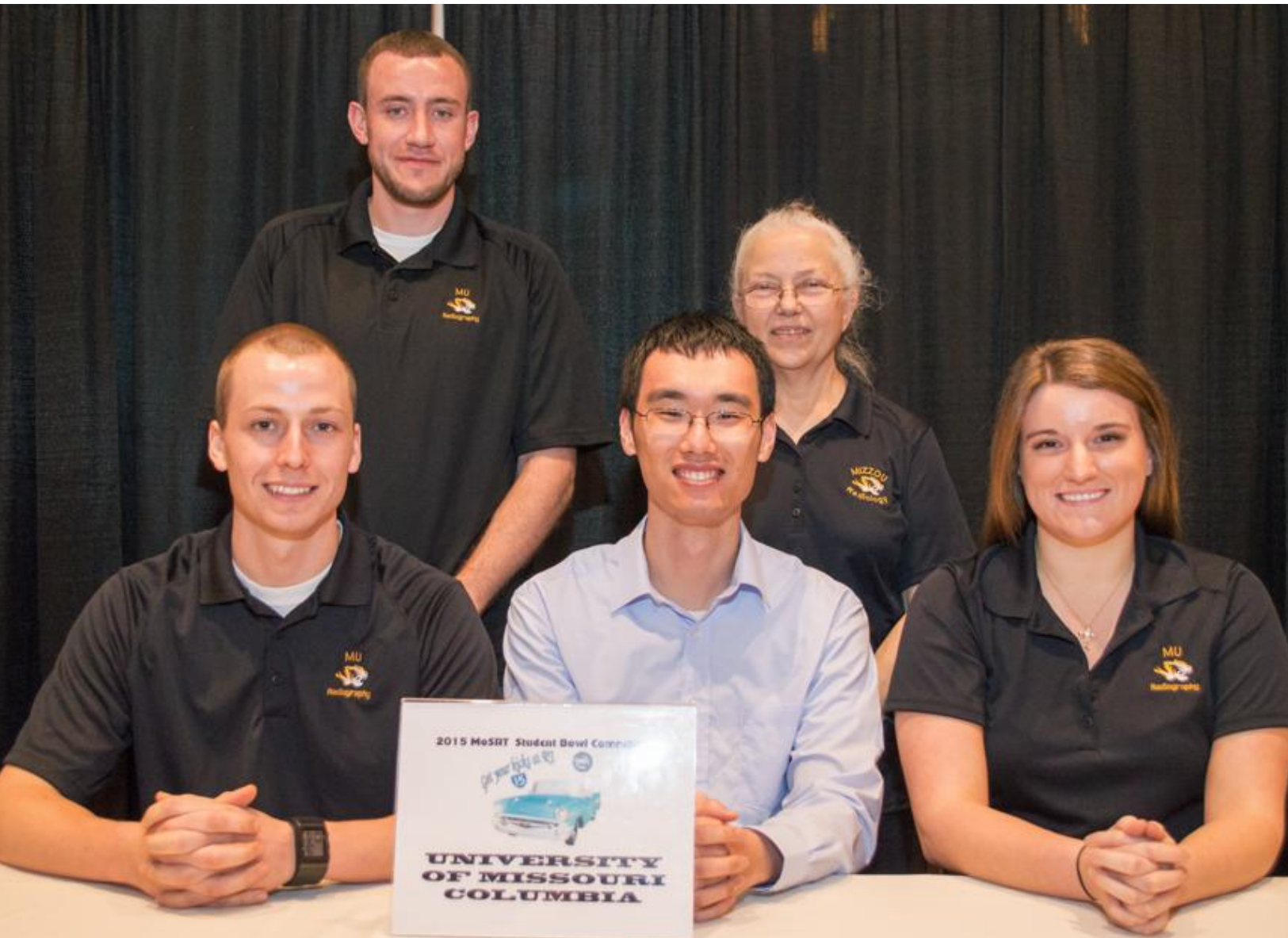
St Luke's School of Radiologic Technology

Ashley Martin, **Coach** - Mary Wooldridge, Akaysha Ragan

Kathryn Mahoney Hannah Either

Program Director - Mary Wooldridge

Student Bowl Teams – April 9, 2015



University of Missouri

Chris Robbs, Jin Yan, Kara Dueker,

John Delavigne **Coach** - Pat Tew

Program Director - Patricia Tew

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