The BEAM

Mississippi Society of Radiologic Technologists
Affiliated with the American Society of Radiologic Technologists

Letter from the MSRT President:

To My MSRT Family,

I want to start off by saying congratulations to all of the recent graduates in our Radiologic Technology profession. Whether you continue on to further your education or decide to step immediately into the workforce, implement the skills that you have learned over these past couple of years to set goals and light your pathway to success. The road ahead may not be easy, but it is worth it and will pay off. This profession and society offers many avenues to aid in becoming the best technologist that you can be.

Myself, along with six other MSRT members, represented Mississippi this year at R.T. in D.C. I want to personally thank Jennifer, Shazowee, Diane, Robbie, and Lee for all of their dedication and hard work in Washington, D.C. On the state and national level, the MSRT is continuing to make a solid push in getting the CARE bill enacted. The ASRT decided to try a different strategy by attaching the CARE bill to various other legislations in hopes of creating a greater chance of the bill finally getting passed. Continue to check the MSRT website at www.msrt.biz for updates on the CARE bill.

Conference time will be here before we know it and I look forward to seeing you all there in Biloxi, MS, this October!! Now is a great time to be creatively thinking about what exhibit you may want to enter to win the competition or brushing up on your knowledge to help your program take home the bragging rights of prep bowl champions. Also, use this opportunity to network and meet the technologists throughout the state as this could be beneficial in future employment opportunities. Please continue to visit www.msrt.biz for up-to-date information on the 72nd Annual MSRT Conference and other upcoming events. Lastly, I would just like to thank all of my mentors and friends on the Board of Directors of the MSRT. My success would be a failure without each one of you helping me out along the way!

John Melvin, M.S., R.T. (R)
MSRT President

Summer 2013

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Legislative Update:

I'm happy to report that the Registration of Medical Radiation Technologist legislation was passed in the House and Senate then signed by Governor Phil Bryant March 21, 2013.

Our legislation was up for repealer July 2013. The state department of health had some minor word changes they wanted, which did not change the intent of the bill.

For clarification purposes, we added after Fluoroscopic: "both stationary and mobile (c-arm)".
Our bill is next up for repealer July 2016.

Respectfully submitted,
Diane Mayo, R.T.(R)(CT)
Legislative Chair

CARE Bill Update
R.T. in D.C.

The ASRT's RT in DC this year was March 3-6. Mississippi was represented by six MSRT members: myself, along with John Melvin, Shaz Edgerton, Robbie Nettles, and our two student delegates, Jennifer Tucker and Lee Brown. RA Jeff Crowley joined us to work on the MARCA legislation as well as the CARE.

We had a full day of education and prep work for our congressional visits on Monday and were all ready to storm the Hill Tuesday. Due to an unexpected approaching winter storm, two of our members left for home Tuesday afternoon; however, us remaining four decided to take our chances with the impending snow so we could make sure we were able to keep all of our appointments.

We started our day on the Hill with an early Mississippi Breakfast sponsored by Senator Roger Wicker and we were able to meet with Senator Wicker briefly. Next we met with Senator Wicker's Health LA (Legislative Assistant). Then, while in the same building, we met with Senator Cochran's Health LA (appointments are set up in advance by us).

Next we made our way across the US Capitol grounds to the House side and met with the Health LAs for Representatives Harper, Nunnelee, Thompson, and Palazzo. We had great meetings with everyone and, since all of our congressional members have been past co-sponsors of the CARE legislation, we strongly feel they all will be again this congress.

Since we have been working on the passage of the CARE (Consistency, Accuracy, Responsibility and Excellence in Medical Imaging and Radiation Therapy) legislation for about 13 years, the ASRT decided to take a different approach to passage. The plan was, and still is, to have our legislation attached with any medical type bills. Our lobbyists are working behind the scenes to try and make this happen. This is the main message we presented to the LAs we met with. They all suggested we still needed to have bills introduced in Congress as in the past, along with having the bill attached to something else.

Well….unsolicited by us, this is what has happened since our visits on March 5:

- March 13 — Reps. Ed Whitfield and John Barrow introduced the CARE legislation in the House…… H.R. 1146

- March 21 — Senators Harkins and Enzi introduced the CARE legislation in the Senate…..S. 642

- March 14 — Rep. David Reichert introduced H.R. 1148, MARCA, which is Medical Access to Radiology Care Act of imaging services performed by qualified radiologist assistants under the direction of a supervising radiologist.

MARCA would save Medicare dollars because services performed by qualified radiology physician extenders would be reimbursed at 85% of the physician fee.

This is where everyone's help is needed. We need you, your co-workers, family, and friends to contact our state legislators and ask for their support of these bills as a co-sponsor:

- S. 642 - Senator Wicker's office has contacted me to say he will be signing on again but, as of yet, he has not done so. We all need to contact him asking him to do so.

CARE Bill Update
R.T. in D.C.

- H.R. 1146 - Rep. Harper has already signed on as a co-sponsor.
  Please contact your representatives and ask they sign on again this congress.
  They have all been co-sponsors in the past congresses.

- H.R. 1148- Reps. Thompson, Nunnelee, and Palazzo
  Contact all four representatives and ask for their support.
  Last congress, Nunnelee was our only co-sponsor for this bill.

Just keep your email, fax, or phone call brief. Tell them who and what you are, and where you live (they like and want to hear from constituents). Just let them know you support CARE and/or MARCA, and make "the ask" for them to sign on as a co-sponsor.

If you are an ASRT member and prefer to send a "form" type of letter, go to ASRT.org, look under legislative issues, and go to ASRT eAdvocacy for you. It will let you send an email quickly and easily.

Thanks again for your dedication to the profession and for your ongoing support of the CARE bill and MARCA. If you have further questions, please don't hesitate to contact me.

BTW- the remaining RT in DC'ers made it home late March 5. Our next day flight out was canceled, but we were able to get out the night before so we didn't get stranded in DC!

Sincerely,

Diane Mayo, R.T.(R)(CT)
ASRT Committee on R.T. Advocacy Member
dmayort@yahoo.com

ASRT Affiliate Delegates' Report to the Membership

2013 ASRT Annual Governance and House of Delegates Meeting

We (Kristi Moore, John Melvin, and Sherrill Wilson) arrived in Albuquerque, NM, on June 13, 2013. After delegate check in, we attended the ASRT Expo, Welcome Reception, and Pin Exchange. This presents an opportunity for everyone to mingle, make new friends, and visit with old friends.

We attended all mandatory meetings. Sherrill attended both the Radiography and Bone Density Chapter meetings, and Kristi attended both the Radiography and Education Chapter meetings. The first seating of the House of Delegates began Friday afternoon. The credentials report was given and a quorum was established. A total of 147 delegates were seated – 94 affiliate delegates and 53 chapter delegates. Friday night we all attended the grand opening and ribbon cutting of the new 30,000 square foot expansion of the ASRT office.

Saturday began early with the Bylaws Open Forum and Commission Hearings. The most hotly debated motions were related to the proposed dues increase and a change in the Nuclear Medicine Practice Standards. That evening we attended the Honors evening where 3 MSRT members – Diane Mayo, Cathie Kukec, and Dawn McNeil – were elevated to the status of Fellow.

Bright and early Sunday morning began the second seating of the House of Delegates. Due to the debate on Saturday of the bylaws revision and the motions, the House dispensed with the business in record time. The 2 hot topic motions were passed. The new dues for ASRT – as of October 1, 2013 – are as follows: $125 for 1 year; $235 for 2 years; and $335 for 3 years. Members have the option to renew membership (regardless of renewal date) at the current fee until September 30, 2013. The new Speaker of the House is Amanda Garlock Corbin from Washington, and the new Vice Speaker is Mike Odgren from Colorado. The House was finished with business before noon!!! This gave us time for a visit to Old Town Albuquerque for shopping.

We would like to thank the members of the MSRT for the opportunity to represent you in Albuquerque this year and look forward to next year's ASRT Annual Governance and House of Delegates meeting.

Respectfully submitted,

Sherrill Wilson, RT(R)
Kristi Moore, Ph.D., RT(R)(CT)

Mississippi Affiliate Delegates

(L-R): Kristi Moore, Diane Mayo, Suzanne Fisher, Sherrill Wilson

The crew from Mississippi who attended the 2013 ASRT Annual Governance and House of Delegates Meeting

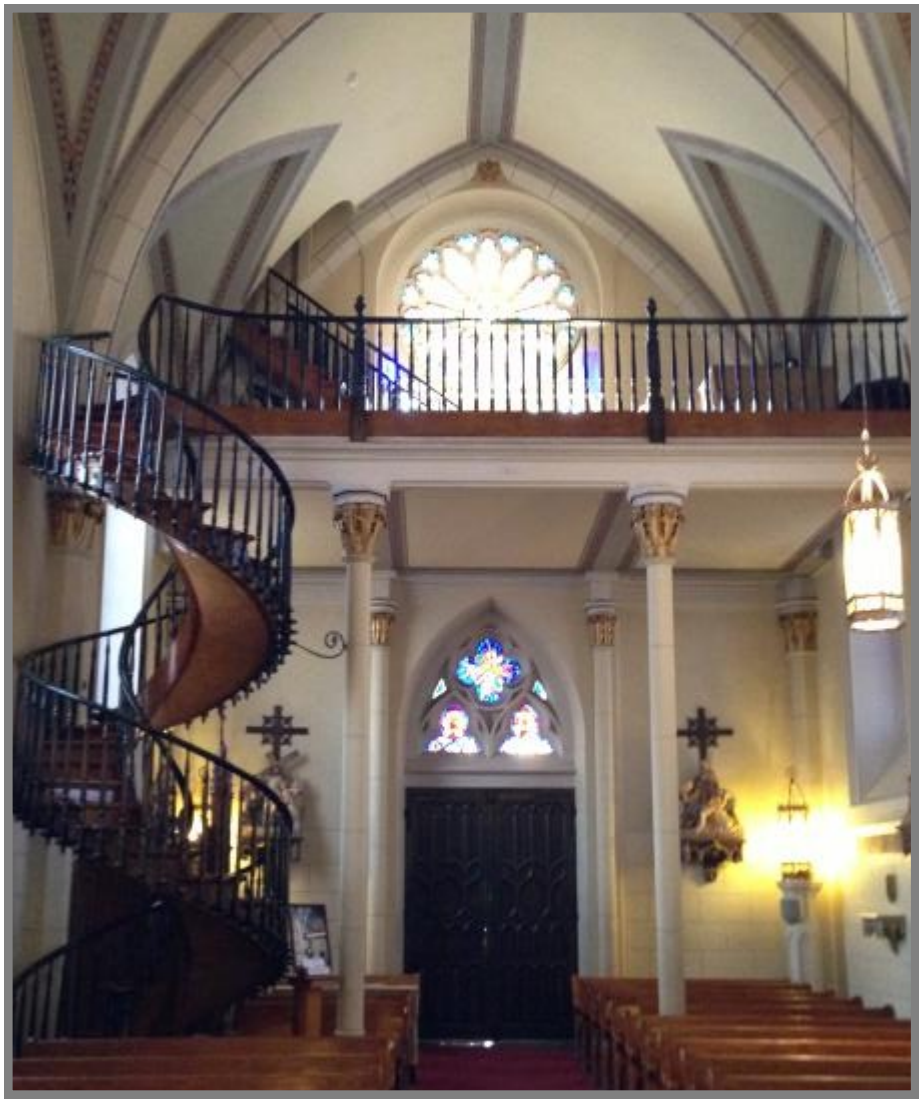
(Pictured above: L-R) Suzanne Fisher, CT Chapter Delegate; John Melvin, Alternate Affiliate Delegate; Brittany Carruth, Student Leadership Development Program Participant; Kristi Moore, Affiliate Delegate; Sherrill Wilson, Affiliate Delegate; Diane Mayo, Radiography Chapter Delegate; Shelby Harrell, Student Leadership Development Program Participant

The **ASRT Grand Opening** was amazing! It was great to see the headquarters of the ASRT…Diane Mayo is pictured below at the desk of Sal Martino, CEO of the ASRT (look through the windows at that awesome view!!!)

(Pictured Above): Diane and Suzanne enjoying the mariachi band!

(Pictured Left): As a fundraiser, individuals could get their picture on the cover of the ASRT Scanner as a keepsake!


OPEN
LORETTO CHAPEL
BUILT - 1873
MIRACULOUS STAIRWAY
OPEN DAILY 9:00am-6:00pm
SUNDAY 10:30am-5:00pm



Congratulations Diane Mayo - ASRT Fellow!!!

(Top Left): Diane, pictured with Sharon Wartenbee from South Dakota

(Bottom Left): Diane, pictured with Phil Ballinger

Congratulations Brittany Carruth and Shelby Harrell for being selected as the two students to represent Mississippi in the ASRT Student Leadership Development Program!!!

Congratulations Graduates Class of 2013

Copiah Lincoln Community College

Front (L-R): Teddi Anders, Megan Buckles, Jacquelyn Brown, Jessica Haygood, Linda Holley, Haley Williams, Hannah Varner, Cassandra Brister

Back (L-R): Janet Ross, Lorien Loomis, Jenna Vannorman, Chasidy Cupit, Michael Newman, Brooke Bridges, Amanda Keith, Katie Adcox

Hinds Community College

Front (L-R): Amanda Strong, Sherry Wilmoth, Kayla Stutson, Beth Standridge

Middle (L-R): Casey Frank, Brittany Thrasher, Brandi Guess, Schyler Sanders, Alicia Weathersby, Robert Merkich

Back (L-R): Jacob Clack, Jessica Rawson, Kristen Stevens, Elyse Sabins, Tanesha Hudson, Jacob Newell

Itawamba Community College

Front (L-R): Heather Holloway, Haley-Rose Collums, Samantha Lewis, Leigh Moser

Middle (L-R): Felicia McKinney, Brian Gray, Derek Dedeaux, Meagan Smith, Wyatt Jenkins, Jaime Gregory, Niki Lincks

Back (L-R): Justin Williams, Rachael Moody, Anna Daugherty, Krystal Nicholson, Erin Williams, Trey Robbins, Jamie Knight

Jones County Junior College

Kneeling (L-R): Maggie Callicott, Chelsey Merritt, Susan Tisdale, Kasey Bishop

Standing (L-R): Amy Firmin, Chase Powell, Jayln Nicholson, Alley Mooney, Kristin Powell, Nguyen Phan, Cody Eidson, Meagen Tucker

Meridian Community College

Front (L-R): Lane Fulton, Antonio Clayton, Matt Haney, Marterell Benamon

Back (L-R): Sasha Phillips, Cayla Coleman, Amber Johnson, Jaquana Williams, Tracy Wolfe, Alyssa Daniels, D'Atra Triplett

MS Gulf Coast Community College

Front (L-R): Kelcey Morris, Lisa Gulledge, Kristen Wooton, Julie Stringfellow, Hannah Douglas, Hayley Casper, Bailiegh Lange, Erin Morris, Kristen Corkhum, Jessica Nguyen, Samarra Nelson, Chelsey Kennedy

Back (L-R): Reuben McCon, Nicole Acree, Christy McKinnon, Andrea O'Neal, Monica Deluca, Jennifer Wyman, Katie Carter, Caitlin Rodriguez, Renaldo Jordan, Trevor Wilkerson

Mississippi Delta Community College

Front (L-R): Brittany Olmi, Stefanie Finley, Kristy Farmer, Allison Williams, Brittany Avant, Jordan Bienvenu

Back (L-R): Madison Williford, Brittnee McCool, Ryan Watson, Whitney Misner, Betsy Skender

Northeast Mississippi Community College

Front (L-R): Donna Blunt, Danielle Bishop, Sally Glover, Judy Brown

Back (L-R): Marisa Lambert, Kayla Lyons, Josh Scott, Robert Schnabl, Rhonda Pharis, Kayla Thompson

Pearl River Community College

Front (L-R): Instructor-Hope Husband, James Buckley, Rachel Kessling, Program Director-David Armstrong

Second (L-R): Brandi Sticker, Kasie King, Chantelle Cosey-Williams

Third (L-R): Lindsay Sellers, Victoria Nettles Daley

Fourth (L-R): Jared Williams, Anna Delancey, Kristen Massey

Fifth (L-R): April Smith Adams, Dejean Laughlin, Emily Ladner, Devin Antunica, Ashlyn Dykes

Not pictured is Vincent Nicholson

University of MS Medical Center

Front (L-R): Stephanie Brewer, Ashley Gant, Erin Windham, Kylie Gardner, Steffi River, Christy Gilmer, Ali West

Second (L-R): Whitney Harper, Almas Sheraz, Erin Strebeck, Abby Blaine, Allison Eads, Jennifer Tucker, Susan Johns

Third (L-R): Lee Brown, Jared Mullins, Holley McNeece, Chelsea Palmer, Wendy Smith, Jimmy Myers

Back (L-R): Ben Davis, Tommy Wells, Kacey Vanderlip, Brad Norris

MSRT Scholarship Recipients

Each of these students has demonstrated outstanding academic and clinical performance throughout their education. We salute them and wish them well in their future endeavors.

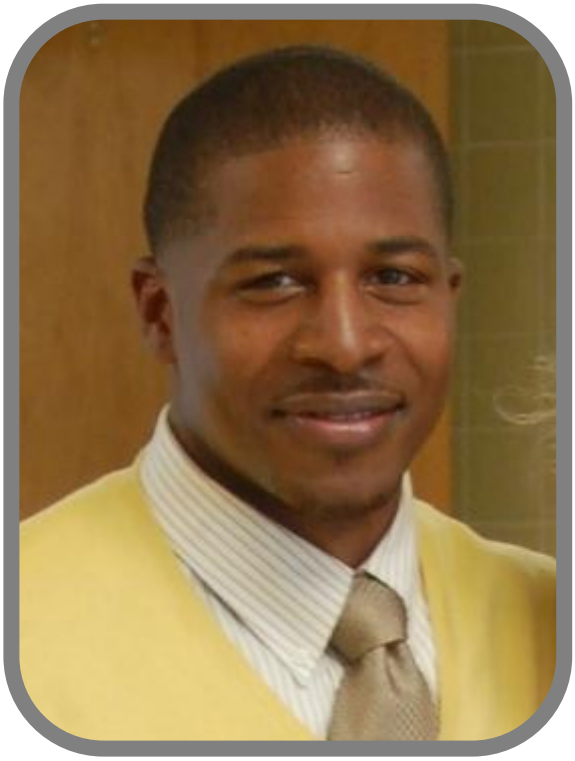
MSRT Board of Directors

Katie Adcox
Co-Lin Community College

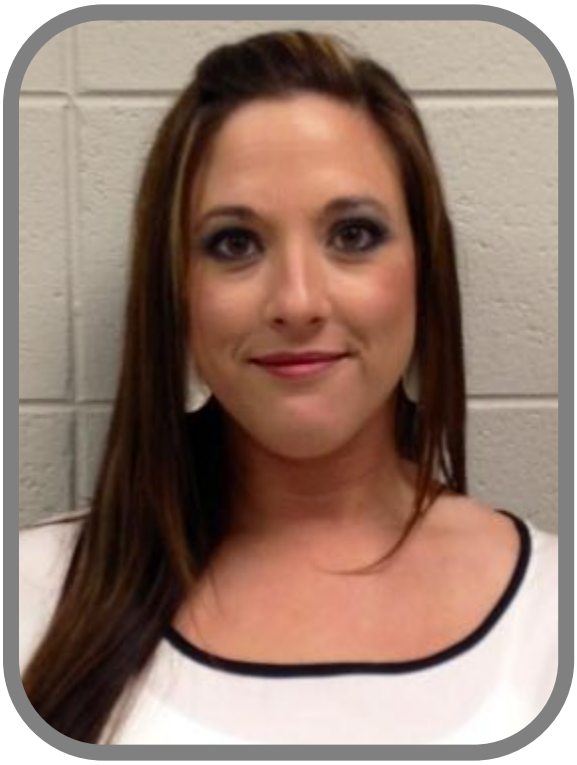
Judy Brown
Northeast MS Community College

Beth Standridge
Hinds Community College

Kristin Powell
Jones County Junior College



Antonio Clayton
Meridian Community College



Betsy Skender
MS Delta Community College

Chelsea Palmer
University of MS Medical Center

MSRT 72nd Annual Conference

October 22-24, 2013

Hard Rock Hotel & Casino

Biloxi, MS

Please continue to check the MSRT website (www.msrt.biz) for updated Conference information.

Contact Information

Hard Rock Hotel & Casino

777 Beach Boulevard

Biloxi, MS 39530

Phone: 228-374-ROCK (7625

Email: http://www.hardrockbiloxi.com/

MSRT 72nd Annual Conference

October 22-24, 2013

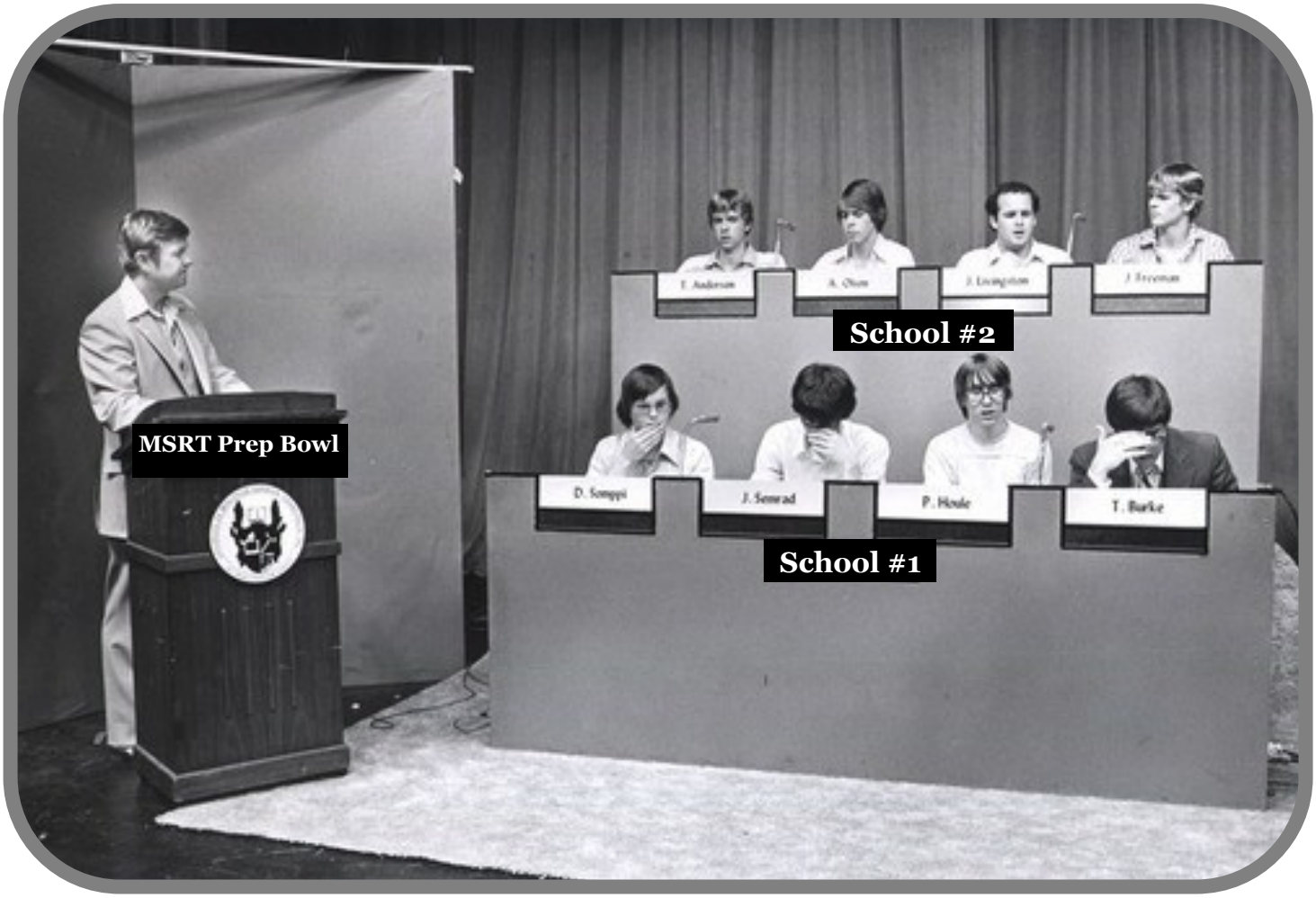
Conference Registration

We prefer you register for Conference online at **www.msrt.biz** when it is available; however, if you prefer to mail in your registration, there will be an avenue for that as well. Please check the website in August for a finalized agenda and registration information.

Student Prep Bowl

Where: Hard Rock Hotel & Casino
When: Wednesday, October 23, 2013
from 7:00 pm until…

Please see the rules beginning on the next page



MSRT Central District Prep Bowl

Rules and Regulations

Purpose:

To review and increase knowledge of radiologic technology among students who should be preparing themselves for the ARRT Registry. This will be an excellent form of registry review.

Eligibility:

Participants in the MSRT Central District Prep Bowl must be enrolled in a JRCERT approved radiologic technology program. Each member of a team shall be in the final year of the program and all team members shall be from the same program. The students participating in the prep bowl must be a member of their state affiliate and registered for Conference in order to participate.

Team Roster:

Each school will be represented by only one (1) team. Each team will be represented by no more than five (5) senior level students from the same approved program of Radiologic Technology. Only three (3) team members may serve on the panel at any one time. Students will be allowed to rotate members during scheduled breaks only.

Officials:

Each official shall be a registered radiologic technologist or a radiologist. No faculty member or clinical instructor of a participating school shall serve as an official unless approved by the MSRT Central District.

- **The Moderator:** Shall serve as competition coordinator. It shall be the duty of the moderator to present all questions, repeat each answer, and call official breaks or time-out. The moderator must read the question only and may not elaborate in any way which might aid in the answering of the question.
- **The Panel of Judges:** Shall be available to verify all challenged questions using text references. The decision of the judges is final. If the question cannot be verified, the question will be thrown out and a new question asked.
- **The Timekeeper:** Shall keep the official response time during competition.
- **The Scorekeeper and Backup Scorekeeper:** Shall maintain a comprehensive score record of the schools in competition. The scorekeeper will keep score on a board visible to the audience, while the backup scorekeeper will keep score independently.

Competition:

Calculators, pencils, and scratch paper will be provided. Team members may only use the items provided. All schools will compete at the same time. Competition will consist of five (5) rounds of categorical questions according to the current ARRT Registry content. The rounds will proceed as follows:

Round	Category	No. of Questions
1	Radiation Protection	4
2	Equipment Operation and Maintenance	4
3	Image Production and Evaluation	4
4	Radiographic Procedures & Anatomy	4
5	Patient Care and Education	4
	Total	20

Time:

Each team will be allowed ten (10) seconds to answer each question. If the answer has not begun in ten (10) seconds or if the wrong answer is given, that question will be discarded.

Questions:

For the collection of questions, the Central District of the MSRT will seek participation from educators of the JRCERT approved radiologic technology programs in Mississippi. The Central District will verify accuracy of questions collected and will not reveal the questions to anyone outside the Prep Bowl committee. Questions will be multiple choice only. During competition, only one repeat per question will be allowed.

Points:

Each question will be worth one (1) point for a possible total of 20 points. In the event of a tie, the competition will go into a sudden death tie-breaker, where random questions will be asked alternately until a winner is declared.

Breaks:

A five (5) minute break will be placed between each round for team member rotation only. After Round Three (3), there will be a fifteen (15) minute recess for the audience and teams.

Challenge:

A question may only be challenged by a member of the three person team participating at that time. The question must be challenged prior to the reading of the next question.
The Judge's ruling is final.

Penalties:

Any coaching or yelling of answers from the audience will disqualify the question from competition and a new question will be asked. Continued disruption will result in removal from the competition area.

Awards:

Plaques will be awarded to First, Second, and Third place teams. The First place team will also receive a $100 cash award from the Central District of the MSRT.

Additional Rules:

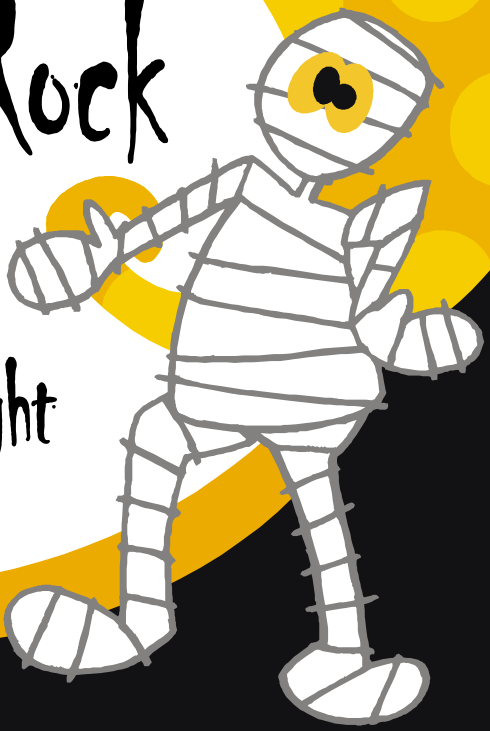
Alcoholic beverages are not allowed and persons with alcohol/alcoholic beverages in their possession shall be considered disruptive and removed from the competition area.

All electronic devices (i.e. cell phones, pagers, Bluetooth, etc.) must have the power turned off and stowed away during competition.

Halloween Costume Party

Where: Hard Rock

When: Thursday, October 24, 2013
from 8 pm until midnight



Tarsal Coalition

Tarsal coalition is the "fusion of two or more bones of the hind foot or, less commonly the midfoot, resulting in absent or restricted movement between these bones" (Claridge & Sakellariou, 1999, p. 1066). There are three various forms of tarsal coalition. They are cartilaginous, fibrous, or bony. These unifications usually occur between different tarsal bones. The two most occurring tarsal coalitions seen in patients are talocalcaneal and calcaneonavicular. The talocalcaneal coalition is where the talus and calcaneus fuse together in the hind foot, whereas the calcaneonavicular coalition is the fusing together of the calcaneus and navicular in the midfoot. Even though there are various forms of tarsal coalition, these two forms are the most prevalent. Tarsal coalition can be corrected with either an operative or nonoperative treatment, depending on the severity of the case.

There are different understandings as to where tarsal coalition originated. One case study shows that "early literature suggested that this syndrome was attributable primarily to the nervous system disease" (Kelo & Riddle, 1998, p. 519). This was later disproved because it does not have anything to do with the nervous system, but rather the skeletal system of the body. This statement made tarsal coalition a misunderstood disease of the tarsal bones. Also, this theory made tarsal coalition take on the name "spastic flat foot." It took many years later for researchers to understand the disease more thoroughly.

Several physicians have played an important role in the development of research to further understand tarsal coalition. In 1769, "tarsal coalition was first described by Buffon" (Claridge & Sakellariou, 1999, p. 1066). Cruveilhier described a calcaneonavicular coalition, and then Zuckerkandl portrayed a talocalcaneal coalition through their studies in 1877. Another researcher by the name of Holl "suggested that there was a relationship between tarsal coalition and the so-called peroneal spastic flatfoot" (Claridge & Sakellariou, 1999, p. 1066). It was not until 1921 that a tarsal coalition was portrayed unto a radiograph. Slomann was the first to image this disease on an oblique radiograph. Through this radiograph many observations were made to better understand the extent of the disease. Harris and Beath are the researchers who are credited

with popularizing a special view just to image the posterior and middle facets of the talocalcaneal joint in 1948 in order to diagnosis tarsal coalition. This particular view is called the "coalition" view. Radiographs are still used in the preliminary diagnosis of tarsal coalition (Claridge & Sakellariou, 1999).

Tarsal coalition can either be congenital or acquired through time. Many studies have been conducted to explain the origin of tarsal coalition and how it occurs. One explanation is that "tarsal coalitions are inherited, most probably as a unifactorial disorder of the autosomal dominant inheritance" (Leonard, 1974, p. 520). This theory is the only rationalization for the congenital form of tarsal coalition. The congenital form would be present at birth and found usually when the patient is a child. Tarsal coalition is an inherited condition in which parents can pass the gene onto the child (Tarsal Coalition, 2012). Acquired tarsal coalition "may occur secondary to trauma, inflammatory arthropathy, neoplasm or ever osteonecrosis, resulting in a rigid painful flatfoot" (Claridge & Sakellariou, 1999, p. 1067). The acquired form is found in adults, rather than children, and does not occur until the patient is older. Although it does not occur until the patient is older, this factor does not affect the severity of the coalition in the patient (Tarsal Coalition, 2009).

Tarsal coalition is rare and not prevalent among the population. From a case study, tarsal coalition's "overall prevalence in the general population is reported to be about 1%" (Claridge & Sakellariou, 1999, p. 1067). This number does not account for the population that has "flat feet" because that is not always associated with tarsal coalition. It does not happen in males more than females or vice versa. Tarsal coalition also does not occur in one race more than another. "Of those affected, 50%-60% have the condition bilaterally" (Claridge & Sakellariou, 1999, p. 1067). Bilateral tarsal coalition is common among those who are affected. This can result in further problems and may have a longer recovery period for the patient if operative treatment was the result.

Of all the different forms of tarsal coalition, two are represented fairly equal throughout the population that was observed in this particular case study. Those affected with talocalcaneal were found to be 48.1% of the population and calcaneonavicular, 43.6% (Claridge & Sakellariou, 1999). There are two more forms that are seen, but are extremely rare among patients with tarsal coalition. Talonavicular coalitions and

calcaneocuboid account for approximately 1.3% of the population (Claridge & Sakellariou, 1999). Even though these forms are extremely rare, they are still seen in different patients with tarsal coalition.

Many patients who have tarsal coalition do not realize they have the condition until they reach young adolescence. Usually they will experience pain while beginning to interact in physical activity. Another common indication is reoccurring sprains in that particular foot. This may be caused by a tarsal coalition. It can also limit the amount of mobility in that foot, which can lead to other types of injuries. "Abnormal stresses, along with a reduced adaptive ability, result in a predisposition to ankle instability as well as pain, inflammation, and eventually joint degeneration" (Claridge & Sakellariou, 1999, p. 1067). Symptoms may include, but are not limited to, the following: pain when walking or standing, tired or fatigued legs, muscle spasms in the leg, walking with a limp, and stiffness of the foot and ankle (Tarsal Coalition, 2009). Another common symptom of patients with this syndrome is a painful arch, or around the arch area, of the midfoot (Tarsal Coalition, 2012). Most patients, by the time they are adults, will experience severe arthritis in the foot that is affected.

There are different means for doctors to diagnose tarsal coalition. The reason for patients consulting a doctor is pain in the hind foot. The pain is "often aggravated by activity or prolonged standing" (Claridge & Sakellariou, 1999, p. 1067). There can be many different deformities in the hind foot that may be palpable. The doctor must also keep in mind that tarsal coalition is not always associated with a flat foot. These are clinical findings for which the doctor would recommend the patient have radiographs of the foot in order to further diagnose the condition.

The first assessment the patient may have would be a plain radiograph or an x-ray. If the doctor were to order an imaging series for tarsal coalition, the radiographer would perform "a basic foot series such as standing AP and lateral views, as well as a 45 degree oblique view, before progressing to more complex imaging studies" (Claridge & Sakellariou, 1999, p. 1068). This would be a standing routine foot series. The radiographer would need to consult with the doctor before making any further images.

The different views in the standing routine foot series can show various signs to the radiologist in diagnosing tarsal coalition. "The AP view of the foot is the least useful, but it can demonstrate the rare talonavicular and calcaneocuboid coalitions" (Claridge & Sakellariou, 1999, p. 1068). The lateral is more important for the radiologist because it shows a special sign in the diagnosis of tarsal coalition. This radiographic sign is identified as "narrowing of the posterior subtalar joint space, failure to visualize the middle subtalar joint, and the 'C-sign,' which is a c-shaped line formed by the medial outline of the talar dome and the inferior outline of the sustentaculum tali" (Claridge & Sakellariou, 1999, p. 1068). In another study, the lateral view of the talus is called a halo sign. This particular sign is caused by a ring-like trabecular bone density below the talus (Kelo & Riddle, 1998). The oblique is the most useful in the imaging series. This can show bony coalitions that are also palpable on the skin.

Computed Tomography, or CT, is the most accurate in diagnosing tarsal coalition. "The coronal section will demonstrate the nature and cross-sectional area of the coalition as well as the presence and extent of any degenerative arthritis present in the joints" (Claridge & Sakellariou, 1999, p. 1069). CT is then used so the doctor can decide what to do during surgery and how to go about repairing the tarsal coalition. Magnetic Resonance Imaging, or MRI, can also be used to obtain cross-sectional images, but CT is more highly recommended.

The doctor may suggest nonoperative or operative treatments. Nonoperative treatments may include restricting the patient's mobility. The patient may not be able to continue various activities. Orthopedic shoes and shoe alterations can help the patient perform daily actions. "A medial heel wedge, Thomas heel, or medial arch support designed to help decrease subtalar motion can be helpful" (Claridge & Sakellariou, 1999, p. 1070). Other tactics in nonoperative treatment include oral medications. These oral medications are nonsteriodal anti-inflammatory drugs, such as ibuprofen (Tarsal Coalition, 2009). Different approaches can be taken in order to avoid surgery.

The alternate approach is an operative treatment. Operative treatment is carried out when nonoperative is unsuccessful for the patient. This intensive surgery is used so that the tarsal bones can move freely and the

motion can become normal. "Many times surgery may involve fusing the affected joint or surrounding joints" (Tarsal Coalition, 2012). After surgery the patient would need to restrain from using that foot or putting any weight on it.

I have a personal interest in this topic because I was born with congenital tarsal coalition. I was not diagnosed until July 31, 2000, at age ten. Most patients with tarsal coalition develop symptoms usually during adolescence (Kelo & Riddle, 1998). My case started with a simple sprain at a gymnastic class I had been attending. My mother, being a nurse, knew that something was obviously wrong with my ankle. Below my ankle there was a protruding mass that was not normal. My mother took me to the doctor and I was immediately sent to an orthopedic surgeon for x-rays. The orthopedic surgeon was not certain from the x-rays if it was tarsal coalition, so I was sent to Baptist Memorial Hospital in Oxford, Mississippi. I was then scheduled to have a CT lower extremity without contrast of the right and left foot.

Soon after the CT, the radiologist, T. Sneed, conducted a report on what he saw through this test. Sneed noted the following in the report: "There are no fractures. There is marked narrowing of the space between the talus and calcaneus at the middle facet. There is some bony over growth seen about the middle facet in this location. Complete fusion of the middle facet has not occurred. Otherwise the bone alignment is normal." This was good news for me as the patient because I would not require immediate surgery.

T. Sneed's diagnosis stated "talocalcaneal coalition at the middle facet with incomplete fusion. This probably explains palpable abnormality on clinical exam." After this conclusion, I was referred back to my orthopedic surgeon, Dr. Cooper Terry. He wanted to meet with me and my mother to decide a plan of action. The surgeon offered that there would not be any need for immediate surgery, which was a relief for my family. Although immediate surgery was not an option, eventually there would be a need for surgery. Dr. Terry suggested that, by the age of forty, I have the corrective surgery. The surgery includes going into the talocalcaneal joint and opening the joint space so that the sinus tarsi will no longer be blocked. Talocalcaneal coalition "restricts subtalar motion to a greater degree" (Claridge & Sakellariou, 1999, p. 1071). This means that most patients with talocalcaneal coalition are required to have surgery even though it may not be

instantaneous. The reason for the pain of tarsal coalition is the blockage of the sinus tarsi and the nerves being pinched in the middle facet of the foot.

Since being diagnosed, my affected ankle has been sprained multiple times. Sprains are common in patients with tarsal coalition, and sometimes this leads to a misdiagnosis (Claridge & Sakellariou, 1999). Throughout Junior High and High School I participated in multiple activities. Cheerleading was challenging because of my tarsal coalition. Many times I had to ice the foot after practice. Stabilizing my ankle throughout cheerleading and track was a necessity. Learning which shoes to wear was also essential. Today I wear special insoles in most of the athletic shoes I wear everyday to make living with tarsal coalition more tolerable.

Tarsal coalition is the fusing together of the tarsal bones in specific forms throughout the hind foot and the midfoot. These forms can be cartilaginous, fibrous, or bony. The two most prevalent coalitions are talocalcaneal and calcaneonavicular. Several physicians and radiologists have performed research to further understand this syndrome. Tests that can be completed to diagnose the patient include: radiographs, computed tomography, and magnetic resonance imaging. Then the doctor will decide whether to require nonoperative or operative treatment for the patient. After being diagnosed with tarsal coalition in 2000, I have found ways to deal with the condition.

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Student Manuscript: 3rd Place Recipient — Jennifer Tucker (UMMC)

Radiography and Progressive Supranuclear Palsy

Progressive supranuclear palsy (PSP) is another name for Steele-Richardson-Olszewski syndrome, a rare, degenerative neurological disease that affects approximately 5% of the population. Even though it is not considered a life-threatening syndrome, people who have PSP will eventually die of complications from the disease. It is considered to be a type of Parkinsonian syndrome. Serial MRI is used to help differentiate among Parkinson's disease, progressive supranuclear palsy, and multiple symptom atrophy Parkinsonian's variant (MSA-P). Currently there is no cure for PSP, and there are no effective drug treatments for this illness.

Progressive supranuclear palsy affects all regions of the brain that control movement. These regions include the cerebral cortex, basal ganglia, brain stem, and cerebellum. The brainstem is composed of the medulla oblongata, pons, reticular formation, and midbrain. It is the oldest part of the brain, and each part is responsible for different survival functions. The medulla oblongata regulates such functions as heart rate, respiration, blood pressure, vomiting, swallowing, and sneezing. The reticular formation manages sleep and attentiveness. The pons and the midbrain connect different brain structures and are where ten of the twelve cranial nerves originate. The cranial nerves control eye-movement and facial movement. The cerebellum is the portion of the brain that helps the body move. After receiving signals from other parts the brain, the cerebellum helps the body move fluidly and precisely, and also assists in maintaining posture and balance by controlling muscle tone (Dubuc, 2002).

Other parts of the brain that are damaged by progressive supranuclear palsy include the basal ganglia, especially the globus pallidus, subthalamic nuclei, and the dentate nucleus of the cerebellum (Hain, 2002). The basal ganglia are involved in receiving information from other parts of the brain and are thought to facilitate movement by using that information (Dubuc, 2002). In addition to the basal ganglia, the cerebral cortex is affected, and the decreased metabolism of the cerebral cortex contributes to the dementia that patients of PSP develop. The cerebral cortex controls many functions, but it is the motor functions that are directly affected by PSP. However, cortical degeneration is minimal (Hain, 2002). The midbrain has nuclei that

control eye movement, and the term "supranuclear" comes from lesions that occur above the nuclei of the midbrain. As the disease progresses, there is a loss of brain cells, not only in the midbrain, but also in the cerebral cortex, cerebellum, and basal ganglia, all of which control movement.

The causes of progressive supranuclear palsy are not clear. Some speculate that it could be caused by environmental factors, free radicals, genetic mutations, or a virus that takes many years to manifest itself ("Causes," n.d.). Recent studies suggest that there could be a mutation in the tau gene. Hain (2002) states that Tau is a microtubule-binding protein that is normally abundant in neurons. There are six different forms of tau in the normal human brain. However, in typical PSP, pathological tau is composed of aggregated 4-repeat forms that accumulate in cells and glia in the brain (para. 12). Whether or not PSP is a genetic mutation or caused by environmental factors is not clear, but the possibility exists that it could be caused by a combination of the two. What scientists do know is that PSP is caused by deterioration of the midbrain, and it is this deterioration that causes an early symptom of PSP called gaze palsy, which is defined as the inability for a patient with PSP to look down.

Although testing for gaze palsy is the most diagnostic exam for progressive supranuclear palsy (PSP), magnetic resonance imaging (MRI) has been used in diagnosing PSP and to distinguish it from other degenerative neurological diseases, such as Parkinson's disease and multiple symptom atrophy Parkinson's variant (MSA-P). Through research, which has specifically used serial MRI, scientists have determined that as the disease progresses, specific areas of the brain atrophy, which causes the symptoms. Since PSP so closely resembles Parkinson's disease and is so often misdiagnosed due to similarities, MRI is becoming a radiologic modality often used to make a determination among Parkinson's disease, PSP, and MSA-P (Oba et al., 2005).

One such study published in *Brain: A neurological journal*, involving longitudinal magnetic resonance imaging (MRI) in progressive supranuclear palsy (PSP) and multiple system atrophy (MSA-P), was performed on several patients over a number of years. The patients were either diagnosed with progressive supranuclear palsy, Parkinson's disease, or multiple-system atrophy of the Parkinson type. The purpose of the study was to determine, through serial MRI scans, the amount of atrophy that occurred over many years to certain regions

of the brain. Findings included that, in patients with PSP, there is significant regional atrophy of the brainstem, specifically the midbrain, and these neurodegenerative diseases have a predilection for brainstem structures. The study also revealed that regional atrophy rates were better markers for the progression of these diseases rather than the lobes of the brain (Paviour, Prive, Jahanshahi, Lees, Fox, 2006). In both Parkinson's disease as well as MSA-P, there is atrophy in regions of the brain, but there is not the regional atrophy of the midbrain that occurs in PSP patients. The study concluded that serial MRI can be used to help distinguish PSP from both Parkinson's disease and MSA-P through the regional atrophy of the midbrain and shrinkage of the brain stem. Also, MRI could be useful in the early diagnosis of neurodegenerative diseases, which could lead to drug treatment that is normally more successful in the first stages of these diseases (Paviour et al., 2006).

As stated earlier, progressive supranuclear palsy (PSP) can be difficult to diagnose and is often misdiagnosed as Parkinson's disease due to similar symptoms, such as unexplained falling and change of gait, which affects both Parkinson's and PSP patients. However, patients who develop PSP do not have the tremors associated with Parkinson's disease, and they also respond poorly to levodopa treatments, a drug treatment that often helps those with Parkinson's disease. PSP resembles multiple symptom atrophy Parkinson's variant (MSA-P) as well, but those with MSA-P have trouble controlling blood pressure, and with PSP there is supranuclear gaze palsy and increased age at the onset of the disease (Hain, 2002).

Early symptoms of progressive supranuclear palsy (PSP) include imbalance, poor postural reflexes, axial rigidity, dysathria, the slowing and slurring of speech, and bradykinesia, which is the inability to move fluidly. In a year's time, patients may have trouble sitting down. Rather than sitting down, they will often "fall into a chair." Patients will begin to have difficulty initiating swallowing. They will also drop food on themselves because they are no longer able to look down to eat (Hain, 2002). Other symptoms include masked facies, a condition that causes those who suffer from PSP to have an astonished, worried expression (Eggenberger, 2012). In addition to the physical changes associated with PSP, there are also psychological changes that include cantankerousness, increased irritability, and forgetfulness. However, the most telling

symptom of PSP is gaze palsy, where the patient has trouble looking downward and increased difficulty in blinking or controlling the eyelids ("PSP Fact Sheet," 2011).

As PSP progresses, the brain cells continue to degenerate and the symptoms worsen. The reason for the degeneration of the brain cells is unknown. The patient's face may become rigid, causing difficulty in smiling or speaking. He will often drool due to his mouth gaping open. He also loses the ability to drive and eventually will lose the ability to walk. Midway through the disease progression, he becomes more rigid. Those who suffer from PSP will not be able to go up and down stairs or drive. Since falling becomes such a danger and the rigidity continues to increase through the progression of the disease, patients with PSP are often confined to a wheel chair. Swallowing becomes more and more difficult as the disease progresses due to the degeneration of brain cells in the cerebellum. As swallowing becomes more difficult, the risk of liquids going down the trachea and into the lungs increases, as does the risk of pneumonia. There is also cognitive degeneration in PSP patients. Unlike Alzheimer's where cognitive degeneration affects the memory, PSP cognitive degeneration is evident in the patient's inability to process thoughts quickly and the difficulty of combining different ideas into a new idea or plan (Progressive supranuclear palsy, n.d., para 46).

In the final stages of the disease, both horizontal and vertical eye movements are lost, as is the ability to blink, and it may become necessary to give the patient eye drops frequently. The rigidity of the patient further increases, and there is no mobility. When complete loss of mobility occurs, the patient will eventually become bed-ridden. Eating becomes even more difficult due to increased difficulty in swallowing. Most patients with PSP will aspirate small amounts of fluid as they eat and drink. When a PSP patient begins to cough after every meal, this usually indicates that there is a danger in developing pneumonia due to aspiration (Hain, 2002). When this finally occurs, a decision to insert a feeding tube into the stomach might be made in order to provide nutrition (National Institute of Neurological Disorders and Stroke, 2011, para. 21). The most common cause of death for a patient with PSP is pneumonia; other causes of death are sepsis and choking.

The prognosis for those with PSP is a life span of approximately five years after diagnosis. There is no proven effective treatment for PSP. There are no drug therapies that have significant impact on the disease.

Drugs used to treat Parkinson's disease have been used to treat patients with PSP, but have been only mildly helpful in 50% of the patients with PSP. Other drugs such as Mirapex, Idazoxan, Ambian, and Physiostigmine have had either a transient effect or no effect at all. However, there are some unproven treatments that might help, including a drug called seligiline that could be helpful in slowing the progression of the disease, but formal studies have not yet been performed. Some think that physical therapy might also help, but ultimately it will not slow the progression of the disease. Other drugs, such as Elavil, an anti- depressant, calcium channel blockers, and vitamin E might help slow the progression of PSP (Hain, 2002). Ultimately, there is currently no effective treatment for PSP (NINDS, 2011).

In conclusion, the facts exist that progressive nuclear palsy is a neurodegenerative disease that is caused by the degeneration of brain cells primarily in the midbrain, a part of the brainstem. PSP affects about 5% of the population and the cause is unknown. Diagnosis is difficult since the early stages may mimic Parkinson's disease as well as other neurodegenerative diseases. Since progressive nuclear palsy affects eye movement, it is most often diagnosed through eye tests and the patient's inability to look downward. Serial MRI has been used to help diagnose PSP by showing the atrophy of the brainstem and midbrain regions of the brain, which help differentiate PSP from other Parkinsonian syndromes. MRI can also be useful in early diagnosis where drug treatment, should any be tried, might be most effective. Currently, there is no effective drug treatment and no cure.

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Student Paper: Shelby Harrell (Student Technologist of the Year Award Candidate)

Radiography Aids Diagnosis of Child Abuse

In the United States, child abuse is responsible for approximately 1400 deaths per year. Some injuries are typically produced as a result of inappropriate force on the tender skeleton of a child. Most child abuse related injuries can be detected through diagnostic imaging. Without diagnostic images to support the findings in the abused children some children would have to return to the abusive environment. X-ray technologists working in the pediatric department of most hospitals come in contact with abused children. The radiologist may be the first to find signs of abuse if the patient has unexplained bone markings. The radiologist has strict medical and legal code to follow in cases dealing with child abuse. Dr. Paul Kleinman constructed the most frequently used classification of fractures related to abuse. The system classifies the fractures obtained into categories of high, moderate, and low specifically for the ultimate diagnoses of child abuse (Gellar, E.).

For children under the age of two, a skeletal survey should be performed when child abuse is being considered. The skeletal survey consists of a series of images collimated down to the specific body part. The series includes frontal and lateral views of the skull, frontal and lateral views of the spine, frontal view of the chest (ribs) and pelvis, and frontal views of the extremities. The advantage of the skeletal survey is its high sensitivity to acute and healing fractures and a relatively low radiation dose compared to other modalities. All abdominal areas should be viewed on at least two projections. A babygram, in which the entire skeleton is depicted on one image, is not a substitute for a skeletal survey. The babygram produces limitation such as geometric distortion and varying exposures across the image. For skeletal surveys, a screen film system with good spatial resolution is needed (Gellar, E.). Computed Tomography (CT) is the best image modality when the child is suspected to have acute neurological findings or retinal hemorrhage. A head CT scan should be performed on all patients one year of age or younger and in all children with neurological symptoms (Dwek, R.).

Battered child syndrome, shaken infant syndrome, stress-related infant abuse and non-accidental

trauma are all terms to describe the complexity of non-accidental injuries in infants and young children as a result of abuse. The child develops shaken infant syndrome from being held around the chest and violently shaken back and forth. This causes the child's extremities to swing back in fourth in a whiplash motion. Rib fractures are a result from being held tight around the chest. The ribs are compressed from front to back and literally almost fold in half. The whiplash motion of the extremities cause a 'corner' or 'bucket-handle' fracture in the metaphyseal region. The 'corner' fracture is described as a small piece of bone avulsed due to shearing forces on the fragile growth plate. The 'bucket-handle' fracture is essentially the same as the 'corner' fracture, except the avulsed bone fragment is larger and shaped like a bucket handle. The corner and bucket-handle fractures are most commonly found in the tibia, distal femur, and proximal humerus (Robben, S.).

Radiography plays a major role in the diagnoses of child abuse. The quality of images the technologist produces help determine the diagnoses of the child. This is why it is always important to take quality images, because in the case of child abuse it could be a life or death situation. Unfortunately, child abuse will never end but I am proud to say I have chosen a profession that makes a difference in the number of child abuse victims out there.

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Student Paper: Brittany Carruth (Student Technologist of the Year Award Candidate)

Pregnancy + X-ray = ?

When treating pregnant women in a hospital setting, many of the traditional forms of health care become controversial. X-ray immediately comes to mind. This has always been a controversial subject among health care workers and the public, alike. One thing is for sure, though. An unborn child is at a heightened state of sensitivity due to the rapid rate of cell division and development, and things like prescription and OTC medications, cigarette smoke, alcohol, and infection should be avoided when possible due to the risks that are involved. In some instances, though, medication and diagnostic exposure to radiation have benefits that outweigh the risks. As with any patient, radiation protection measures should be utilized when possible, and radiologic technologists should always retrieve diagnostic images using as little radiation as possible.

Mayo Clinic obstetrician and medical editor-in-chief, Roger W. Harms, M.D., goes as far as to say that, in reality, most radiologic exams pose no threat to an unborn child due to the location of the exposure. Lead aprons and collars may be worn to block scatter radiation produced during the exam, and, in these cases, x-ray has caused the embryo or fetus no harm. In instances of an abdominal, pelvic, or kidney exam, radiation shielding may not be an option, but it is important to remember that typical doses of radiation –such as doses acquired during an abdominal exam- do not put an unborn child in any danger of the effects of high doses of radiation. While long-term exposure to high doses of radiation could cause genetic changes that have the potential to cause birth defects or cancers such as leukemia later in life, the American College of Radiology states that single diagnostic x-rays do require doses significant enough to cause these adverse effects in an embryo or fetus.

Proper communication with health care providers may actually reveal options that do not involve x-ray such as ultrasound or magnetic resonance imaging (MRI). Also, women who are-or suspect that they might be-pregnant should not hold a child in position for an x-ray. In this case, someone else should be asked to hold the child for their exam. Women who received an x-ray before they were aware of their pregnancy

should not worry. Dr. Roger Harms explains that risk concerning an embryo or fetus due to radiation exposure is, in his words, "exceedingly remote." Conditions requiring radiation treatment might pose larger threats and should be discussed with a health care provider. Any measures that can be reasonably taken to avoid a pregnant woman's exposure to radiation should, in fact, be taken.

An important point for pregnant women to remember, also, is that sometimes the benefits surrounding diagnostic imaging far outweigh the dangers of the small doses of x-ray required to produce these images. X-rays have the potential to reveal life-saving information. When proper radiation protection methods are utilized and communication between a pregnant woman and her health care providers is open, there is no reason for necessary health care to not be obtained. There is much speculation surrounding this topic, though. Personal research and professional opinion should be observed while making the decision in whether or not to allow diagnostic images to be acquired. Women should express any questions or concerns to their health care provider in order to resolve any doubt she may have concerning her pregnancy.

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Letter from the Editor:

I hope everyone has had a great summer so far! I am looking forward to Conference in October...I want to encourage senior students to participate in the Prep Bowl. This is a great way to prepare for the Registry. I also want to encourage students and technologists to participate in the exhibit competitions. Exhibit forms can be found on the website. Forms must be submitted to both the MSRT President and Conference Coordinator if you choose to compete. I hope you enjoyed this edition of The BEAM! The deadline for the next issue of The BEAM is tentatively set for November 15, 2013.

See ya'll soon…

Conference 2013 (Biloxi, MS)

Please be sure to check out the MSRT website in December for the next issue of The BEAM!!!

Kristi