The Rotating Anode

WINTER 2020

KSRT 2020 X-RAY VISION

WHAT'S YOUR SUPER POWER

HOW DO YOU ROTOR UP!

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Official Publication of the Kansas Society of Radiologic Technologists
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Hays, KS 67601

EXECUTIVE COMMITTEE MEETING MINUTES

10 a.m. Sept. 28
Salina Public Library

Call to order: The meeting was called to order by Brian Ralph at 10:08 a.m.

Quorum: Jen Smith established a quorum.

Voting members present: Ronda Sunnenberg, president (via Zoom meeting); Brian Ralph, chairman of the board; Toni Caldwell, immediate past president.

Non-voting members present: Harmony Ibarra, president-elect; Jen Smith, secretary-treasurer (filling in for the executive secretary); Megan Rucker, education chair; Kyle Ibarra, nominations co-chair.

Approval of minutes: The minutes were approved without objection.

Financial report: The financial report through Sept. 9 was emailed out before the meeting by Denise Orth, executive secretary. The report showed income of $3,005.97 and expenses of $5,893.26. The net worth report showed a checking account balance of $9,693.49 and certificates of deposit worth $43,427.19 for a total net worth of $53,120.68. Toni moved to accept the financial report as presented by Megan, Ronda seconded; motion passed.

Old business:

Affiliate Development Program update: The society has been accepted in the program, and Ronda just needs to sign the agreement. The goals we want to focus on include membership (which would help the society financially), mentoring programs, and legislative efforts. Toni also will work on keeping the information organized for future years.

Affiliate Financial Assistance Program update: Toni and Denise have been discussing participating in it. Toni needs additional information about how often the society can apply for the program because if we are limited in that, she would like to hold on to the money for upcoming legislative efforts.

ASRT survey update: Toni discussed the recent ASRT survey results. She will present on them at the annual convention. Webinars and CEs as well as society presence were common items mentioned.

New business:

Kansas Board of Healing Arts: The executive committee discussed difficulties with students getting temporary licenses from the board.

Announcements: Doug Billings has resigned from the radiologic technologist council, so a position is open.

Adjournment: Brian Ralph adjourned the meeting at 10:28 a.m.

BOARD OF DIRECTORS MEETING MINUTES

10:30 a.m. Sept. 28
Salina Public Library

Call to order: Brian Ralph called the meeting to order at 10:31 a.m.

Quorum: Jen Smith established a quorum.

Voting members present: Ronda Sunnenberg, president (via Skype meeting); Brian Ralph, chairman of the board; Toni Caldwell, immediate past president and legislative chair; Harmony Ibarra, president-elect; Jen Smith, secretary-treasurer and editor of The Rotating Anode; Alexa Ritter, director at large; Megan Rucker, education chair.

Non-voting members present: Susan Dumler, professional development vice chair; Melinda Chiroy, scholarship chair (via Skype meeting); Kyle Ibarra, nominations co-chair; Lisa Eddy, secretary-treasurer mentee. **Additional participant:** Kathleen Lippert, executive director of the Kansas Board of Healing Arts (via phone).

Approval of minutes: The minutes were approved without objection.

Consent agenda: The consent agenda was approved without objection.

Items on the consent agenda:

Immediate past president/bylaws: No bylaws need changing; helped the executive secretary update policies on paperwork to be turned in to ASRT; kept the president apprised of several developing licensure events; attended the July Board of Healing Arts Radiology Council meeting; started correspondence with Lawrence Memorial Hospital concerning sponsorship and speakers for the annual convention; reached out to Washburn to speak to students about the KSRT; met with Kathleen Lippert, director of the Kansas Board of Healing Arts, concerning licensure increases, solutions to improve communication with hospitals, programs and licensed radiologic technologists and long waits for licenses; met with Jason Elliott at Cleveland University radiologic technology program (he has had his students join KSRT and wants them to attend convention; he also wishes to volunteer in any capacity and that the school can offer space for symposiums).

Vice president/membership: Waiting on replies from other societies about membership tactics and will be able to give a more complete report then but as of now nothing to report.

Secretary-treasurer: Minutes from the June meeting were distributed before the September meeting for approval.

Professional development: The 2020 Convention rules for competitions have been updated and emailed to program directors; brainstorming some mingling games for the students to do when speakers finish early at convention;

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created warning signs to keep speakers on time.

ASRT senior delegate: Attended the ASRT House of Delegates meeting in June in Orlando and submitted the required report.

West area representative: Nothing to report. Looking to see if Kelly Denton would be interested in serving as the west area representative.

Legislative: Has taken several letters asking for donations to shop owners in Lawrence for convention; contacted Lawrence Memorial Hospital about sponsorship, speakers and vendors; attended the July Kansas Board of Healing Arts Rad council meeting; met with Kathleen Lippert concerning licensure increases and license problems; spoke with the Kansas Hospital Association concerning an RT day and PAC donation; spoke with the ASRT about a KHA PAC donation; attended the CTRA regional calls for the ASRT; has not been able to connect with mentee.

***Rotating Anode* editor:** With the board deciding to hold back publishing the June meeting minutes until after approval at the September meeting, there was no content for the *Anode*, so no issue was produced. Next deadline is Oct. 21.

Historian/nominations co-chair: Attended the Kansas Hospital Association meeting with Megan Rucker; reached out to a few vendors during KHA to see about becoming a vendor at KSRT annual meeting; reached out to an OB/GYN and an IT leader to speak at KSRT's convention.

Financial report: Megan presented the financial report. The financial report through Sept. 9 was emailed out before the meeting by Denise Orth, executive secretary. The report showed income of $3,005.97 and expenses of $5,893.26. The net worth report showed a checking account balance of $9,693.49 and certificates of deposits worth $43,427.19 for a total net worth of $53,120.68. Toni moved to accept the financial report, Megan seconded, motion passed.

Old business:

Affiliate Development Program update: The society has been accepted in the program, and Ronda just needs to sign the agreement. The goals we want to focus on include membership (which would help the society financially), mentoring programs, and legislative efforts. Toni also will work on keeping the information organized for future years.

Kansas Board of Healing Arts: Kathleen Lippert called in to the meeting to discuss proposed fee cap increases for state licenses for all healing arts professionals. The KBOHA has to contribute money to the federal prescription drug monitoring program (K-TRACS), which had not been planned for. Fees already have been raised on MDs/DOs/DCs; other professions are at the top of their regulated fee cap. The KBOHA is planning to open up the statutes on all health professions to raise the fee cap. The plan is to have the same cap for all professions. The society will compile and consider talking points.

Cleveland University: Toni met with Jason Elliott, program director. He is excited about his students joining the KSRT and wants to bring them to the annual convention.

ASRT survey update: Toni discussed the recent ASRT survey results. She will present on them at the annual convention. Webinars and CEs as well as society presence were common items mentioned.

Convention: The space for the Thursday evening social has been reserved. Denise Orth, executive secretary, sent out a rough draft for the script to streamline things. Megan is firming up the schedule, but is still in need of speakers. The theme is "2020 X-Ray Vision: What's Your Superpower?"

Kansas Hospital Association: Toni discussed RAs with them; the association would support us, but not financially. Megan and Kyle attended the KHA's annual meeting in Wichita in September for networking oportunities.

Student ad hoc committee: No updates. Toni is trying to get time to visit classrooms with a student to get other students interested but not having much luck.

WEST AREA REP EMAIL VOTE

Dec. 26-27

The board of directors received an application for the west area representative position from Kelly Denton. In an email discussion, Denise Orth moved that the board appoint her to the position ahead of the January board meeting to allow her to participate. Katilyn Slaton seconded the nomination, and the vote was unanimous.

New business:

Recent legislation: ASRT is pushing for support for RAs.

AHRA Education Day at Hutchinson Regional Medical Center: No updates. Megan will continue to follow.

ASRT House of Delegates Senior Delegate: Denise submitted her House of Delegates report to the ASRT and to the KSRT Board of Directors.

Student Leadership Development Program: Information needs to be sent to program directors.

Announcements:

Deadline for next issue of *The Rotating Anode* will be Oct. 21.

Doug Billings has resigned from the Rad Tech council, so there is an opening for any interested technologist.

KDHE has a job opening for an enviromental scientist (x-ray inspector).

Adjournment: Harmony moved to adjourn the meeting, Toni seconded. Meeting adjourned at 1:18 p.m.

RADIATION PROTECTION AND REDUCTION TECHNIQUES

By Alexis Kelly, Washburn University
Second-place essay winner

Abstract

One of the most important aspects of working in diagnostic radiology is protecting patients, personnel, and others from the dangers of radiation while still producing a high-quality image. This requires several methods and devices that, when used in conjunction, can reduce patient dose. Lead aprons and shields are commonly the first device one would think of when it comes to radiation protection. While using lead is a good start, there are other things that can be used in addition to that. Appropriate milliamperage and kilovoltage values for the patient and body part being imaged must be utilized. This not only will ensure a high-quality image but will protect the patient and others from unnecessary radiation. Technique charts and appropriate post-processing techniques also are important to reduce repeat images, which therefore reduces dose. Ensuring that the correct part is being imaged also reduces repeats as well as patient frustration. Decreasing patient movement through the usage of immobilization devices and good communication skills is arguably the most important method to reduce repeat imaging which will overall reduce patient dose. There are several ways to reduce radiation dose to the patient and to personnel.

When radiologic technologists are performing exams, the most important aspect of their job is that they are conscientious of their use of ionizing radiation. This means thinking about protecting their patients, themselves, and others that may be in the room. There may be differences in each exam and with each patient, but what must remain the same is the technologist's use of radiation protection techniques. This includes, but is not limited to, the use of shields, appropriate use of factors, correct processing techniques, and more.

Through the years the knowledge of how x-rays work has evolved. It is now known that certain negative effects can occur with the use of ionizing radiation. When x-rays first were used, this was not known. Once the first negative effects, such as skin erythema, began being seen, it was imperative that protective devices be produced and used. Currently the most popular protective devices are aprons, gloves, and movable walls with lead in them. Lead has been proven to decrease the penetration of x-rays with its high atomic number. For patients the use of lead aprons is most commonly used to protect the reproductive organs when it does not impede the exam. Lead devices also can be used to protect breast tissue and the lens of the eye (Sherer, Visconti, Ritenour, and Haynes, 2014).

There are four main types of shields in use today. The most common is the flat contact shield radiographers place over the reproductive organs during the exam. Shadow shields are less common, but they are made of a radiopaque material suspended above the field of interest and it casts a shadow over the area to be protected. Shaped contact shields are not used as often because of the time it takes to use them. They are used for male patients and generally are placed in a pair of briefs and then the patient puts them on. However, these will not protect the patient in the posterioanterior projection. Clear lead shields are similar to shadow shields and can be used to protect the gonads and breast tissue.

The use of appropriate mAs and kVp values is imperative. This is a major reason why it is important that technologists have the correct education and licensure to administer ionizing radiation. When film imaging was used, it was clear when the incorrect dose was used because of the narrow latitude seen in film-based imaging. When digital imaging began being used, it had a wider exposure latitude. This means that exposure factors could be too high or too low, but the resulting image still could look acceptable. With post-processing window level and width being available for use, the technologist can somewhat adjust the density and contrast of the image. However, it must be noted that these post-processing techniques and the wide latitude are not an excuse for improper exposure factors. Also, they can only fix so much, and a gross overexposure or underexposure cannot be fixed with these techniques.

Continuing with kVp and mAs, most sites have started using technique charts. This is a great tool for technologists to use, especially when they are unfamiliar with the equipment. These charts give a standardized starting value for sthenic patients. It is important to remember that some adjustment to these values may be needed and that separate charts are needed for pediatric patients. Although it can be time-consuming to make these charts, it is well worth it in the end. After the exposure button has been pressed, the processing of the image is next. Even though the final image pops up on the monitor in a few seconds, it still has a process it goes through before it is on the monitor. With cassette-based and film-based imaging, it is clearer that there is post-processing that must be done before the image is seen. With all three of these imaging techniques, it is important that the technology is working correctly to prevent mistakes on the final image and ultimately to prevent repeat images. This means ensuring that the correct chemicals are used with film processing and that the processor itself is working correctly, With cassette-based imaging, the processor must be working correctly, or artifacts can appear on the image, which may require a repeat. Digital imaging equipment must be in working order to reduce artifacts on the final image.

The ordering physician has the responsibility to determine if the patient should have the exam or not. It is the responsibility of the radiographer to make sure the correct exam

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Mammography

Palliative Care

Leadership

Practice Standards

Sonography

Pediatrics

KSRT 2020 X-RAY VISION

WHAT'S YOUR SUPER POWER

HOW DO YOU ROTOR UP!

April 2-4, 2020
Doubletree Inn and Suites, Lawrence, KS
Group Rate: $109/night Code: Rad or KSRT Conference
Rate expires March 3, 2020

The KSRT Board welcomes you to a Networking Social
Thursday, April 2, 2020 6:30-9 pm

Brochure and Registration are available online at:
https://www.ksrad.org/annual-convention.html

83RD ANNUAL KSRT CONVENTION

REGISTRATION DETAILS

☐ Mr. ☐ Ms. ☐ Sir ☐ Madam

Name:..... Credentials:.....

Address: .....

Zip code:.....Town: ..... State: .....

Phone: .....

Email: .....

REGISTRATION FEE

Become a member when registering to this workshop and benefit from the discounted members' rate from now on

	Already member *Friday only or Saturday only*	*Friday and Saturday*	**Non-Members** *Friday only or Saturday Only*	*Friday and Saturday*
Registration Fee	$80 (early bird)* $100 (regular)*	$160 (early bird)* $180 (regular fee)*	$160 (early bird)+ $200 (regular fee)+	$320 (early bird)+ $360 (regular fee)+
Students and Senior Members	$40 (early bird)* $55 (regular fee)*	$ 55 (early bird)* $85 (regular fee)*		

The registration fee includes workshop material and meals.

*I confirm my following membership is valid

+ Membership application available at www.ksrad.org

I plan to attend:

- **Friday only (March 3, 2020)**
- **Saturday only (March 4, 2020)**
- **Friday and Saturday**

Eating at the reception Friday evening!

- **Yes**
- **No**

Please join the KSRT Board for a social event Thursday evening from 6:30-9 pm.

We host a silent auction annually to fund the scholarships given out. If you wish, please donate an item to be included in the silent auction.

Total Registration: $_____

You may register online at www.ksrad.org or by mailing this form and a check to: Denise Orth, Executive Secretary KSRT, 1702 Mermis Court, Hays, KS 67601

By filling out the registration form, the participant gives consent that ORGANIZER can process the data provided within the framework of the conference and allow photographs to be made during the conference. This includes, unless registered participants object, all handling needed for the applicant's participation at the event and for the drafting of a list of participants which will be distributed at the conference, and placing photographs in the pictures gallery accessible only by participants and ORGANIZER members, in the ORGANIZER newsletter or selecting some for articles on the conference in a journal or newspaper, or in any other web/printed publication.

ANNUAL CONVENTION SERVICE PROJECT

This year's service project will benefit the Lawrence Humane Society. If you would like to participate, please bring items to the convention. The organization's greatest needs are:

- Block-style cheddar cheese for dog training
- Soft, meaty dog treats like Pup-Peroni and Beggin Strips
- Hot dogs – all beef, for training
- Kitten Milk Replacer (KMR) and Puppy Milk Replacer (Esbilac)
- Kong dog toys – all sizes
- Laundry detergent, regular and high efficiency
- Linens, such as blankets, towels and sheets
- Stretch and Scratch scratchers
- Glass cleaner
- Gallon-size plastic zipper bags
- Nutri-cal

Other needed items:

- Cat and dog toys
- Canned cat food – Friskies pate
- Canned pumpkin
- Disinfecting wipes
- Hand sanitizer
- Nylon dog collars
- Paper towels
- Creamy peanut butter
- Plastic pet carriers and collapsible wire crates
- Scrubbing brushes and sponges

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has been ordered on the correct part. All radiographers can think of one example when a patient came in for a right elbow exam, but when asked say it is the left elbow that is hurting, or a similar example. Communicating with the patient at the start of the exam about what part hurts can prevent repeat exams. Also, if the right elbow was examined and no abnormal finding are found, but the left elbow was fractured, this obviously affects the patient negatively. In a world where "many imaging studies ... may not be indicated" (Krug), it is important that radiographers do a little research on their patients. Another common example is a patient who had a chest x-ray done in the ER in the morning, but now a different physician ordered a chest x-ray, not knowing about the one done that morning. That is also a responsibility of the radiographer to double check and make sure the exam was not already done.

A large aspect of reducing repeat images is decreasing the amount of patient movement. There is little to be done to control involuntary motion such as breathing. However, there are many methods to control voluntary motion. Radiographers use a multitude of tools every day to reduce voluntary motion. For pediatric chest imaging a commercial immobilizer known as the Pigg-O-Stat is utilized. This immobilizer may look quite barbaric, but it reduces repeats and reduces radiation to personnel. The device places the child in an uncomfortable position, but for a two-view chest exam the device easily is turned from anteroposterior to lateral positions, which lessens the time of the exam. Non-commercial devices also are used, but most radiographers may not realize they are using them. Sponges, tape, and sandbags are examples of these devices. In fluoroscopy, shoulder pads, footboards, and straps are used to help control patient movement. Arguably, the most important part of the diagnostic exam in reducing repeat images is correctly communicating with the patient. Communication is not just what is being said, but it encompasses both verbal and non-verbal language (Admin, 2016). It is key to remember both can determine if an exam is successful. When a patient enters the exam room, it is important to describe the exam and what the radiographer will be doing. It is very likely that the patient is already in pain, so it is important that the radiographer tells them what they are doing before they do it. Manipulating the part that is hurting without telling them what is happening can be very frightening and can cause repeats by the patient moving or shaking from the pain they are in. When the exam is fully explained, the radiographer is more likely to have fewer repeats by gaining the patient's cooperation.

Although the goal is to reduce repeat images, there must be a way to analyze the repeats that inevitably occur. This is done through a repeat analysis, part of a quality control program. Repeated images are looked at for why, and those results are tallied into groups. Examples of the groups used are overexposed images, underexposed images, incorrect positioning, mechanical errors, and others. For example, if there are many images repeated for underexposure, maintenance may need to be called to ensure that the radiographic unit is properly calibrated.

In conclusion, there are several ways to protect patients and personnel from the radiation used in diagnostic radiology. There are also many ways to lower patient dose. The methods and devices discussed help reduce biological damage to the human body and all healthcare personnel should be up to date on all methods and devices discussed.

References

Admin. (2016). *Communication*. Radiology Key. Retrieved from https://radiologykey.com/communication.

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Krug, S. (2008). *The art of communication: strategies to improve efficiency, quality of care and patient safety in the emergency department*. Pediatric Radiology, 38(11), S655-9. Retrieved from EBSCOhost.

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PAST, PRESENT, AND FUTURE OF X-RAY

By Ryleigh Sampson, Newman University
Third-place essay winner

Abstract

X-ray has been an important tool for diagnosing patients since its discovery in the late 1800s. There is now digital radiography that is quicker to work with. It is interesting to think about what it could become in just 10 or 20 years because the field of radiology is always evolving. Although x-ray is very helpful with diagnosing patient issues, it has its dangers. These dangers were brought to researchers' attention and it eventually was followed with great inventions to prevent unnecessarily large amounts of exposure. With the accidental finding of x-ray, it has become a very significant tool for patient care.

The discovery of x-ray was completely accidental. The man who discovered it was Wilhelm Conrad Roentgen. At the time of the accident, he was experimenting with the effects of cathode rays. He learned that electricity flowing over a glass tube would cause a blue glow. Later, researchers found out the blue glow was from the ionization in the air around it (Carroll 6). Along with this glow, researchers learned how to place objects in the path of the beam to see them fluoresce. Roentgen had in mind that cathode rays would fluoresce only if they are in the path of a beam. One day when he was researching, he saw a piece of paper with barium on it glowing across the room while the tube was on. This was not in the path of the beam like previously seen. After seeing this, he realized there was some type of radiation created for that to happen (Carroll 7). This ended up being accidental because he was not expecting an object to fluoresce outside the beam of electrons. This experiment that lead to the invention of x-ray is where it gets its name from; the "x" being the unknown (Carroll 7). After this experiment he was able to discover more characteristics about x-ray. Radiography was introduced once he practiced on his wife's hand and was amazed that he could see bones through flesh.

Discovering natural radioactivity also was by accident and it came after x-ray radiation was found. Antoine Henri Becquerel was inspired and intrigued by Roentgen's discovery. Roentgen never knew where the phosphorescence in his x-ray tube came from, and that is what Becquerel was determined to find. He had a phosphorescing crystal and a plate put away in a drawer from a previous experiment. He casually decided to develop the plate, and to his surprise, he saw an exposure on it. He realized x-rays must have been emitted from the phosphorescing crystal while it was in the drawer (Carroll 8). This happened because of the natural alpha, beta, and gamma radiation.

Thomas Edison was intrigued by the discovery of x-rays and wanted to experiment more with them. If he had not had an interest in x-ray, the long-term effects of radiation would not have been discovered so early. No one knew the dangers of radiation when it first was discovered; consequently, no precautions were taken when experimenting with it. Thomas Edison's assistant, Clarence Dally, was the first victim of radiation when he started showing signs of degenerative problems after working with it for a long period of time. He always was volunteering to stand in front of the x-ray beam for their experiments. Most days they would be doing this for hours at a time. A couple of years into their research, Dally had visible skin conditions along with limb pain and hair loss. He eventually developed cancer and had both of his arms amputated, then he died shortly after. Thomas Edison stopped researching x-rays because of how unsafe it appeared to be after seeing what happened to his assistant. According to Gilbert King, from Smithsonian.com, Edison told a reporter from *The New York World*, "I stopped experimenting with them two years ago, I am afraid of radium and polonium too, and I don't want to monkey with them." A major event that brought attention to the risks of radiation was an event called the "Radium Girls." These workers painted radium onto watch dials. They would lick their paintbrushes and the chemicals would get in their body. Whenever radium enters the body, it is treated as calcium and goes into the bones. This led to a lot of people becoming sick from the radiation. Multiple workers sued the company for not taking more action or being more cautious with their workers. This event got a lot of public attention, which led to a radiation study of long-term effects that came out in 1993. This event influenced other work places to make a safer environment for their workers.

Inventions improving the amount of patient exposure were made not long after x-rays were discovered. Large amounts of radiation exposure have been cut down to seconds. William Rollins invented x -ray filtration and collimation. He figured out if he put something else in the beam along with the patient's body part, it would reduce the amount of exposure penetrating through. For the collimation he made plates with gaps in it to tighten the area, saving patient dose (Carroll 9). Different inventions to improve the way x-ray images turned out and the efficiency with which they were done also were brought up shortly after. The Potter-Bucky grid was designed to reduce scatter radiation. This would make the image look cleaner and easier to read. The rotating anode tube was made to get a higher amount of heat to be able to use higher technique. Without this it was easy for melting to happen because it would become too hot. In 1942, the phototimer was made so technique exposures for each body part were standardized. This same year, an automatic film processor was de-

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signed (Carroll 10). Before this, films had to be in several different solutions before they were developed. The development of fluoroscopy was made just one year later by Thomas Edison. This allowed the doctor to view a patient's body in real time. For 50 years there was no improvement to the invention. To run a fluoroscopy machine, very high technique was needed for the screen to be bright enough to see anything. This caused it only to be used in extreme medical cases. The doctor always got a lot of radiation from it while working on patients (Carroll 9). Around 50 years later, John Coltman invented the image intensifier. "This device converts incident x-rays into an electron beam, which can then be both focused and sped up by using electrically charged plates" (Carroll 9). This increases the brightness up to 5,000 times. This reduced the exposure tremendously and became one of the best inventions for patient exposure.

The development of digital imaging did not come until about the mid-1970s. It was called CR, which stood for computed radiography. It replaced film and the processing that came along with it. This saved time and it produced a better-looking image. The downfall to CR is that it requires increasing radiographic techniques by close to double. This was not a great development for patient care. "It was originally called photostimulable phosphor digital radiography because of the image receptor plate that can be stimulated to emit light by a laser beam" (Carroll 88). CR was developed by using phosphor plates, which can store and release image data. The CR imaging plate is made up of an image receptor plate which is put inside a cassette. When an x-ray is taken, the imaging plate stores energy from the x-ray beam and turns it into the latent image. A latent image is the invisible image information that has not been processed yet. The latent image on the imaging plate must be put through a machine called the CR processor to produce the final x-ray image. Before the cassette is placed in the CR processor, it must be marked in the computer with the correct patient information. The CR processor will convert the latent image to an x-ray image from a cassette. This happens by stimulating it using laser beams to scan across the imaging plate quickly. When stimulated, a light is emitted and detected by the photomultiplier tube. It is then converted to a computer monitor by using analog-to-digital converter. When the plate is done being scanned, it is exposed to a second bright light erasing the plate for instant reuse. If the plate is not erased, the latent image will show up on top of the new latent image next time it is used. Radiographers should erase an imaging plate before using it just to be sure it is fully clean. Imaging plates also can develop fog over time from background radiation, which also has to be erased (Carroll 596-600).

Although CR was not great for saving patient dose, it led to the discovery of DR. This stands for digital radiography. DR is an imaging system that does not need a cassette to make an exposure. "The image receptor electronically sends information for each exposure directly to the computer processing system housed in the x-ray machine, it then displays the image on the x-ray machine console" (Carron 592). The transition from CR to DR was significant for the technologists. One of the biggest advantages that came out of it was the amount of time it saves. With CR, technologists had to leave the patient in a room to go upload a film that would take several minutes. Now with DR, the image can be uploaded in 30 seconds or less. DR has helped out in raising productivity levels. The quicker exams get done, the more exams can be fit into one day. Another great development that came along with DR is the PACS system. This stands for Picture Archiving and Communication System. This is an easy and quick system for radiologists to see images. All across the states different radiologists can be allowed access to this system. At one point to look at a patients' image they would have to find that patient's x-ray film. It then moved up to CDs. This made it easier from film, but it still was not convenient. Now that doctors have the PACS system, it makes their diagnosis easier. This discovery made patient care a lot more efficient. DR allows the technologist to adjust the technique by a click of a button. This can be a bad thing if the technologist isn't paying attention and does not lower the technique. Another bad situation is when the technique does not get increased for a bigger patient and the image is too underexposed and needs repeated. If there is an exam done on a child, the algorithm will need to be changed so it is not for an adult-sized patient. The good thing about the technologist setting the technique on CR was that it was habit and it had to be done for every exam. Now it is not so much a habit because it is already set up. Another downfall to DR is that it is still more expensive than CR. According to Marc Katz, on radiologytoday.net, the cost of DR has become more affordable than it used to be, but not enough to turn a whole department from CR to DR. He thinks there will be a mixture of both in radiology facilities for a while. DR portables are a huge hit for all healthcare providers working with an x-ray technologist. Tim Sisco, on radiogytoday.net, made a good point that using DR for trauma cases is very convenient for doctors to see the image. This allows them to make an immediate decision. Using a cassette would require it to be developed before the doctors can even look at it and decide what to do for the patient. Mobile DR shows image immediately on the portable machine and can be sent over to PACS system. Sometimes it is more convenient for the technologist to go to the patient's room portably rather than the patient going to the radiology department when an exam is ordered. The machine has a set kV and mAs for each algorithm selected, but the technologist has

the option to adjust it according to patient size and condition. Because DR does post-processing on its own after the image is taken, it does not require a high technique for a diagnostic image. DR portables are also important to nurses placing a PICC line. They do their work then order a portable chest x-ray to check the line placement. Depending on where it is, they can make a quick decision to adjust it or leave it how it is.

For the past several years x-ray has remained the same with no breakthrough changes. There have been little adjustments here and there to make the machines and systems more efficient, but nothing major. With the way x-ray has always evolved, it probably will see a big change and become different with years to come. It could be along the lines of making the technologists' job easier or saving even more patient dose than DR already does. An article called "X-rays of the Past, Present, and Future" states "Researchers in Singapore claim that x-ray might change in the next few years." The same article also mentioned, "According to a new finding, a sheet of graphene can be used to generate surface waves known as plasmons when struck with photons from a laser beam." This means the radiation emitted from that will be lower dose to the patient. The article also says studies are in progress to possibly have an x-ray that results in more color. This would help out radiologist tremendously in diagnostic findings. It goes on to say, "A medipix chip can measure images over a period of time and take very thin image slices so that x-ray movies can be possible." This seems very interesting because it likely would be a lower dose to the patient than getting a CT, but it would be a very similar process. According to Rachael Bennett, from an article called "Mobile Digital Radiography Driving Efficiency," mobile DR also will continue to evolve. Companies always will be coming out with longer battery life and more durable machines. Maybe even lighter equipment eventually will be developed.

X-ray has come very far with making it more efficient and safer to use for technologists and patients. Even though some of the discoveries were not the best for patient care along the way, it led to DR which is the best type to use at this point. New discoveries coming up will change the way technologists and radiologists work. It will be interesting to see what there is to come.

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LEGISLATIVE UPDATE

Fee cap increase

The Kansas Board of Healing Arts is considering raising the statutory caps and fees for many healthcare professions. One reason for increasing fees is the cost of the K-TRACS system, which tracks controlled substance prescriptions. The KSRT disagrees with increasing the fees to benefit this program because radiologic technologists are not responsible for prescribing medications and it has not been clearly articulated as to why radiologic technologist licensees should be responsible for funding this program. The society also is concerned that raising the caps would give the Board of Healing Arts an open door to raise fees to cover other costs unrelated to radiologic technologists.

Currently, the statutory cap for radiologic technologists is $80; however the proposed cap of $300 represents a near four-fold increase all at once. The KSRT feels this will be detrimental to membership and will not be received well among the LRT professionals in the state.

Senate Bill 341

Senate Bill 341 seeks to expand the scope of practice of licensed naturopathic doctors to include the utilization of non-diagnostic ultrasound or fluoroscopy in the performance of services.

KSRT understands that accredited doctoral programs in naturopathic medicine require students to complete a mere 3 to 5 credits in radiography, radiology or diagnostic imaging. The society believes licensed naturopathic doctors are not educationally prepared or clinically competent to use fluoroscopic equipment or perform fluoroscopy procedures in their practice.

In a letter to the Kansas Senate Committee on Public Health and Welfare, the KSRT suggested a revision to the bill striking fluoroscopy but still allowing non-diagnostic ultrasound to be used by licensed naturopathic doctors.

APPLICATION FOR MEMBERSHIP

THE KANSAS SOCIETY OF RADIOLOGIC TECHNOLOGISTS

By submitting this form, you are agreeing to abide by the Bylaws of the Kansas Society of Radiologic Technologists. You are also acknowledging the information submitted is correct and accurate. **Dues must accompany this application.**

FULL NAME_____ _____ _____ _____
First Middle Initial Last Credentials

_____ _____ _____ _____
Street City State Zip

DOB _____ _____ _____ Email _____
Month Day Year

Phone Number (_____) _____ Date of application_____

Check membership category.

_____ **ACTIVE MEMBER: DUES $50.00/Year**
Certified by ARRT and Member of ASRT and practicing in the field of radiologic technology.
MUST SUBMIT COPIES OF ARRT AND ASRT CARDS

_____ **ASSOCIATE A MEMBER: DUES $50.00/Year**
Certified by ARRT and practicing in the field of radiologic technology.
COPY OF ARRT CARD MUST BE SUBMITTED.

_____ **ASSOCIATE B MEMBER: DUES $50.00/Year**
Persons practicing in the field of radiologic technology not certified by the American Registry of Radiologic Technologists and are not registry eligible; or, those persons interested in promoting the purposes and functions of the KSRT, but are not eligible for Active, Associate A, Life, Senior or Student membership.

_____ **SENIOR MEMBER: DUES $25.00/Year**
Certified by ARRT and 65 years old or more.
SEND COPIES OF ARRT CARD AND BIRTH CERTIFICATE OR DRIVER'S LICENSE.

_____ **STUDENT MEMBER: (STATUS APPLIES TO PRIMARY PROGRAM OF STUDY) DUES $25.00/Year**
Enrolled in an approved school of radiography for a MINIMUM of 24 months.

PRESENT EMPLOYMENT or SCHOOL: _____

STUDENTS ONLY: Date of Enrollment_____ Anticipated Date of Graduation_____

Continuous Renewal_____ New applicant _____ *(PLEASE CHECK ONE)*

******Graduate Bridge Program: Certificate must be returned with membership renewal application and dues stated on certificate. Valid for primary program of study.******

The KSRT values our volunteers! Which of the following would you be interested in volunteering for?

Circle all that apply: Committee Officer Speaker

"The Rotating Anode" is available electronically for all new members.

I would like to contribute to the Scholarship Fund for the amount of $ _____ in addition to my dues. This DOES NOT qualify as a charitable deduction OR professional expense for tax purposes.

PLEASE RETURN TO:

Denise K. Orth Executive Secretary, KSRT 1702 Mermis Court Hays, KS 67601 KSRT.exsec@gmail.com
Pay with PayPal or make checks/money orders payable to the KSRT. No partial dues accepted.
$25.00 CHARGE FOR ALL CHECKS RETURNED FOR INSUFFICIENT FUNDS!

KANSAS SOCIETY OF RADIOLOGIC TECHNOLOGISTS
Scholarship Application
Deadline is Feb. 1

I. Applicant Certification

I certify that I am a U.S. citizen, U.S. national or U.S. permanent resident, that this application information provided is true and correct to the best of my knowledge. I understand that any false statements made herein will void this application, and I will be ineligible for support from the KSRT Scholarship Fund. I hereby authorize the release of all information contained in this application packet as may be required to determine my eligibility for a scholarship. I hereby waive my rights to review any documents pertaining to my scholarship application once submitted.

_____ _____
Signature of Applicant Date

II. KSRT Member

I am a member. Years of membership_____ I am sending in my membership now.

III. Personal Information

Mr. Ms. Name _____
Last First MI

Mailing Address _____
Number/Street (Apt#) City State Zip

E-mail _____

Phone (_____) _____

ARRT Certifications_____ ARRT #:_____

IV. Educational Information

Radiologic Science Program _____
Name of Institution City/State

Program Director _____

Email Address_____Phone (_____)_____

Anticipated Graduation date _____ / _____ GPA_____
Month Year

Program Type

○ Certificate Program
○ Associate degree program
○ Bachelor's program

Area/Concentration

○ Medical Imaging
○ Nuclear Medicine
○ Vascular
○ Radiation Therapy
○ Sonography
○ Other _____

V. Letter of recommendation

Name: _____
Position: _____
Email address: _____

VI. Essay

Please provide a one-page typed essay describing why you deserve this scholarship. For objectivity purposes, do not include any statements that would identify your school/instructors or yourself. The essay shall be 12 point font Arial with single spacing and 1-inch margins.

Applications will not be considered if not complete. Please submit application and transcript to:
Denise Orth, KSRT Executive Secretary
1702 Mermis Ct., Hays, KS 67601

ADDRESS SERVICE REQUESTED

KANSAS SOCIETY OF
RADIOLOGIC TECHNOLOGISTS
1702 MERMIS CT.
HAYS, KS 67601

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