The Rotating Anode
SUMMER 2017

Table of Contents

Board of Directors ....................... 2
Committees ............................ 2
President’s Letter ....................... 3
Executive Committee Minutes ......... 3
Board of Directors Minutes ........... 4

In Memoriam ............................. 5
Cystic Fibrosis ......................... 5-8
Fall Symposium Update ............... 7
KSRT Application ...................... 10
Scholarship Application .............. 11
**KSRT BOARD OF DIRECTORS**

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Email/Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chairman of the Board</td>
<td>Kyle Ibarra, RT(R)(MR)</td>
<td><a href="mailto:ibarrakb@gmail.com">ibarrakb@gmail.com</a></td>
</tr>
<tr>
<td>President</td>
<td>Janie Ward, MS Ed, RT(R)(M)</td>
<td><a href="mailto:wardjanie48@gmail.com">wardjanie48@gmail.com</a></td>
</tr>
<tr>
<td>Past President</td>
<td>Jen Smith, BSJ, BS, RT(R)(M)(CT)</td>
<td><a href="mailto:jen.smith.trr@gmail.com">jen.smith.trr@gmail.com</a></td>
</tr>
<tr>
<td>President-Elect</td>
<td>Toni Caldwell, BA, RT(R)</td>
<td><a href="mailto:mmcaldwell@aol.com">mmcaldwell@aol.com</a></td>
</tr>
<tr>
<td>Vice President</td>
<td>Maci Jones, RT(R)</td>
<td><a href="mailto:maci.jones.mj@gmail.com">maci.jones.mj@gmail.com</a></td>
</tr>
<tr>
<td>Secretary-Treasurer</td>
<td>Harmony Ibarra, RT(R)(CT)</td>
<td><a href="mailto:hiradct@gmail.com">hiradct@gmail.com</a></td>
</tr>
<tr>
<td>Director at Large</td>
<td>Dawn Williams, RT(R)</td>
<td><a href="mailto:dawnwilliams08@gmail.com">dawnwilliams08@gmail.com</a></td>
</tr>
<tr>
<td>Education Chair</td>
<td>Megan Rucker, Ms.Ed., LRT(R)(M)(CT)</td>
<td><a href="mailto:meganrucker86@gmail.com">meganrucker86@gmail.com</a></td>
</tr>
<tr>
<td>Professional Development Chair</td>
<td>Kaitlyn Kurtz</td>
<td><a href="mailto:kmkurtz@mail.fhsu.edu">kmkurtz@mail.fhsu.edu</a></td>
</tr>
<tr>
<td>ASRT Senior Delegate</td>
<td>Melinda Chiroy, RT(R)(T)(CT)</td>
<td><a href="mailto:melindachiroy@yahoo.com">melindachiroy@yahoo.com</a></td>
</tr>
</tbody>
</table>

**KSRT COMMITTEE CHAIRS AND APPOINTMENTS**

<table>
<thead>
<tr>
<th>Committee/Chair</th>
<th>Name</th>
<th>Email/Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bylaws</td>
<td>Jen Smith, BSJ, BS, RT(R)(M)(CT)</td>
<td><a href="mailto:jen.smith.trr@gmail.com">jen.smith.trr@gmail.com</a></td>
</tr>
<tr>
<td>Fellows</td>
<td>Janie Ward, MS Ed, RT(R)(M)</td>
<td><a href="mailto:wardjanie48@gmail.com">wardjanie48@gmail.com</a></td>
</tr>
<tr>
<td>Legislative</td>
<td>Toni Caldwell, BA, RT(R)</td>
<td><a href="mailto:mmcaldwell@aol.com">mmcaldwell@aol.com</a></td>
</tr>
<tr>
<td>Membership</td>
<td>Maci Jones, RT(R)</td>
<td><a href="mailto:maci.jones.mj@gmail.com">maci.jones.mj@gmail.com</a></td>
</tr>
<tr>
<td>Nominations</td>
<td>Jeff Vaughn, MS, RT(R)</td>
<td><a href="mailto:vaughnjf@yahoo.com">vaughnjf@yahoo.com</a></td>
</tr>
<tr>
<td>Media Coordinator</td>
<td>Megan Rucker, Ms.Ed., LRT(R)(M)(CT)</td>
<td><a href="mailto:meganrucker86@gmail.com">meganrucker86@gmail.com</a></td>
</tr>
<tr>
<td>Scholarship</td>
<td>Melinda Chiroy, RT(R)(T)(CT)</td>
<td><a href="mailto:melindachiroy@yahoo.com">melindachiroy@yahoo.com</a></td>
</tr>
<tr>
<td>Profess. Development Vice Chair</td>
<td>Susan Dumler, MS, RT(R)(M)(CT) (MR)</td>
<td><a href="mailto:skdumler@gmail.com">skdumler@gmail.com</a></td>
</tr>
<tr>
<td>Education Co-Chair</td>
<td>Jeff Vaughn, MS, RT(R)</td>
<td><a href="mailto:vaughnjf@yahoo.com">vaughnjf@yahoo.com</a></td>
</tr>
<tr>
<td>Symposium Chair</td>
<td>Vacant</td>
<td></td>
</tr>
<tr>
<td>Historian</td>
<td>Doug Billings, BA, RT(R),CNMT</td>
<td><a href="mailto:dougbillings1625@gmail.com">dougbillings1625@gmail.com</a></td>
</tr>
<tr>
<td>Editor, <em>The Rotating Anode</em></td>
<td>Jen Smith, BSJ, BS, RT(R)(M)(CT)</td>
<td><a href="mailto:jen.smith.trr@gmail.com">jen.smith.trr@gmail.com</a></td>
</tr>
<tr>
<td>Executive Secretary</td>
<td>Denise Orth, MS, RT(R)(M)</td>
<td><a href="mailto:ksrt.exsec@gmail.com">ksrt.exsec@gmail.com</a></td>
</tr>
<tr>
<td>Mentees: President, Past President, Secretary-Treasurer</td>
<td>All vacant</td>
<td></td>
</tr>
</tbody>
</table>

Interested in contributing to *The Anode*?
Contact: Jen Smith
Email: jen.smith.trr@gmail.com
(Please put *Anode* in the subject line)

Editor: Jen Smith
BSJ, BS, RT(R)(M)(CT)

Official Publication of the Kansas Society of Radiologic Technologists
Denise Orth, Executive Secretary
1702 Mermis Ct.
Hays, KS 67601
Dear KSRT members,

The KSRT Board of Directors and committees are hard at work striving to act as your voice and represent you. It has become apparent the membership no longer wishes to support a fall symposium. Therefore we will not be offering that method of getting continuing education this fall. We have been discussing how to serve you better and working on ways to offer continuing education. Would anyone be interested in us coming to your work and perhaps giving a lecture offering an hour of continuing education? Or do you have some ideas we haven’t thought of to get some education hours?

The board strives to serve our membership in many ways. Legislatively we are constantly watching and working with those that will help us progress our profession in a positive way. An example of this is the MARCA Bill. (The Medicare Access to Radiology Care Act of 2017 was introduced in the Senate on March 29 by Sen. John Boozman of Arkansas, and introduced into the House of Representatives on April 5 by Rep. Pete Olson of Texas. These bills propose a law that amends the Medicare reimbursement policy and supervision levels for radiologist assistants to align them with state radiologist assistant laws.)

We also offer scholarships to our student members but ALSO our technologist members. Just go to the web site www.ksrad.org and look under the “Students” tab.

So many good technologists have volunteered their time to serve you and the KSRT. If there is something we can improve on, please contact me or anyone on the board. I wish you all a great summer.

Janie Ward, MS, RT(R)(M)
President of the KSRT

EXECUTIVE COMMITTEE MEETING MINUTES
June 17, Newman University

Voting members present: Kyle Ibarra, chairman (via phone); Jen Smith, immediate past president; and Janie Ward, president.
Non-voting member: Maci Jones, vice president.
Executive secretary: Denise Orth.

Establish a quorum: A quorum has been established.
Approval of minutes: Janie Ward moves to approve the minutes and Jen Smith seconded the motion. Motion passed.

Financial report:
Denise Orth presented the financial report through May 31. The report showed income of $37,188.77 and expenses of $42,301.16. The net worth report as of May 31 showed a checking account balance of $3,868.63 and certificates of deposit worth $58,584.61 for a total net worth of $62,453.24. Janie Ward moves to approve the financial report as given. Jen Smith seconded. Motion passed.

Old business:
Affiliate Development Program: The preliminary action plan was sent to the ASRT. A survey will need to be sent out via Survey Monkey and/or Google app to survey all members with a one month response time. Two surveys, one to members and one to non-members. ASRT staff asked about financial needs for reimbursement. Discussed the potential to use the ASRT’s programs for conference calls. Janie Ward will contact the ARRT, ASRT and KBoHA to obtain email addresses of technologists in Kansas. Put surveys on the KSRT website, Twitter, and Facebook to get information to all rad techs. Jen Smith will create the survey and will gather questions, feedback will be due by July with the surveys being sent out in August.
Insurance: The invoice from West Bend insurance has been paid and will renew in March 2018. Discussed potential reimbursement from ASRT.

Google Apps: Kyle provided an update concerning costs, $3,200 fee plus $5 monthly fee per user for 12 users will be $600 per year. It was decided to have the board of directors members to be the users and not include the committee chairs. Kyle will continue to look into this and will report back at next board meeting.

New business: Kansas Hospital Association to be discussed during full board of directors meeting. Adjournment at 11:03 a.m.
Voting members in attendance: Janie Ward, president; Kyle Ibarra, chairman of the board; Harmony Ibarra, secretary-treasurer; Jen Smith, immediate past president; Maci Jones, vice president; Dawn Williams, director at large; Toni Caldwell, president-elect and legislative chair; Katilyn Kurtz, professional development chair; Kelly Tate, student representative; non-voting member: Denise Orth, executive secretary.

Call to order: The meeting was called to order at 11:10 a.m.

Establishment of a quorum: Denise Orth established a quorum.

Approval of the previous minutes: Toni Caldwell moved to accept the previous minutes, Katilyn Kurtz seconded the motion. Motion passed.

Approval of the consent agenda: Jen Smith moved to accept the consent agenda, Toni Caldwell seconded the motion. Motion passed.

Consent agenda:

Fellows: Nothing to report.

Education: The 2017 annual convention in Mulvane had 118 registered attendees. Expenses totaled $10,526.95 and income of $9,683.00, resulting in a total deficit of $843.95. The 2018 annual convention will be April 6-7 at the Bluemont Inn in Manhattan. Megan Rucker is in search of speakers.

Membership: The society has 319 members at present.

Western area representative: Western area hospitals of Kansas have signed a contract with Shared Imaging for MRI services.

Legislative: Toni Caldwell has attended the Board of Healing Arts meeting, has completed CRTA and ASRT conference calls, spoken with Hein Law regarding lobbyist contract, has been re-elected as a CRTA representative for Kansas, and continues to monitor the MAR-CA legislation. Oklahoma and Missouri will continue to work to achieve licensure into 2018.

Past president: Jen Smith is working on strategic plan for the Affiliate Development Plan. Lapel pins for the ASRT House of Delegates meeting have been purchased.

Anode editor: Post-convention issue has been produced and mailed. Next Anode deadline will be July 1.

Senior ASRT delegate: Nothing to report.

Chairman of the board: A conference room at Geary Community Hospital has been booked for the student symposium on Oct. 27. Information regarding KSRT becoming an allied member of the Kansas Hospital Association has been sent to the board of directors. Kyle Ibarra will attend the ASRT Annual Governance and House of Delegates with Jen Smith, Kelly Tate, and Miriam Sears.

Old business:

Google apps: Tabled to next board of directors meeting in the fall.

Hein Law contract: Toni Caldwell moved to extend the lobbying contract with Hein Law. Jen Smith seconded the motion. Motion passed.

Website picture: Please send Megan Rucker a picture for the KSRT website.

Affiliate Development Program: We have submitted an action plan to ASRT and are developing a survey to distribute to members and non-members.

Monthly phone check-in: Janie Ward will send out an email blast to the board for monthly updates.

2017 annual convention: Catering was the biggest expense.

2018 annual convention: The 2018 annual convention will be April 6-7 at the Bluemont Inn in Manhattan.

KSRT CD: The last certificate of deposit is worth $36,502.33. Jen Smith move to investigate a new CD to purchase for $40,000. Toni Caldwell seconded the motion. Motion passed. Denise Orth will investigate and report back.

Student symposium: The student symposium will be Oct. 27 at Geary County Hospital in Junction City.

Fall symposium: Toni Caldwell proposed to eliminate the fall symposium and instead go directly to hospitals to provide continuing education. Janie Ward will send out an announcement to the membership asking for information regarding what the members would like.

KHA: Kyle Ibarra has been in touch with the Kansas Hospital Association regarding KSRT becoming an allied member. Discussion was tabled until the next board meeting.

New business:

Memorial for Sister Rebecca Martinez: Sister Rebecca Martinez was a long-time KSRT member who recently died. Toni Caldwell moved to make a contribution of $50 to the retirement fund of the Sisters of St. Joseph, Jen Smith seconded the motion. The motion passed.

For the good of the order:

Anode deadline was July 1.

Announcements:

The next board of directors meeting is tentatively scheduled for Sept. 30, location still to be determined. Denise Orth will be reaching out for info to help update the policies and procedures. Look for an email this summer.

Toni Caldwell ask that we contact our local legislature to support MARCA bill.

Adjournment: Harmony Ibarra moved to adjourn the meeting. Maci Jones seconded the motion. Meeting adjourned at 12:06 p.m.
THE APPEARANCE OF CYSTIC FIBROSIS
By Annemarie Hamersky, Newman University
First place essay

Abstract
Cystic fibrosis is a disease that affects thousands of families across the world. Some have never heard or witnessed what it can do to a family. For others, it is an everyday reality. I grew up with a family very close to my heart that was battling this disease with all three of their children, one of whom was in my class. Cystic fibrosis has variations on how it affects the body and the person. There are also different ways to view and monitor the disease and how it affects the body with the help of radiology.

Introduction
I grew up in a small town in Kansas about a half hour away from Wichita. This town is very close and supportive of its members. There was a family who had twins, a boy and a girl, and another boy a few years younger. When the twins were born, the parents thought their babies were perfectly healthy. Then they started noticing things that seemed to be wrong. Some of their symptoms were foul-smelling stools, little weight gain, and a chronic cough. The parents took the twins to their doctor to see what was going on. The doctor decided to do a sweat test, which came back positive for cystic fibrosis. The parents were young and had no idea they were carriers of this disease. They did not even know this disease existed and now it was going to be their lives. It was a very scary time for them, as I imagine it is for a lot of families who found out news like this. They were hesitant to have more children, but a few years later they got pregnant with a boy. He was also diagnosed with cystic fibrosis. Fortunately, the parents knew there was a possibility and had doctors check him after birth. The probability of carrier parents having a child with cystic fibrosis is one out of four. The probability of carrier parents having a child who is also a carrier of the gene but does not have cystic fibrosis is two out of four. The probability of carrier parents having a child who is not a carrier and does not have cystic fibrosis is one out of four. The probability that their twins would both have cystic fibrosis was one out of four times one out of four, or one out of sixteen. Now add in the additional probability, one out of four, of their third child having cystic fibrosis. The probability of all three of their children having cystic fibrosis is one out of sixty-four.

Cystic fibrosis is a recessive genetic disease of the exocrine glands involving the lungs, pancreas, and several sweat glands. The disorder results from mutations of the cystic fibrosis transmembrane conductance regulator (CFTR) gene located on chromosome 7. These mutations cause defects in the production and function of the CFTR glycoprotein. More than 1,600 variations of CFTR gene mutations have been identified. A majority, about 70, of cystic fibrosis patients have the amino acid 508 defect. This defect occurs when the CFTR protein is missing 3 base pairs at position 508 on the CFTR protein, which codes for the amino acid phenylalanine. Phenylalanine is essential in nutrition. The child inherits cystic fibrosis by inheriting one defective gene from each parent. The parents probably do not have the disease but have a single defective gene that is passed down to the child. Families all around the world face the realities of cystic fibrosis every day. Cystic fibrosis has an incidence of 1 in 2,000 births. According to the Cystic Fibrosis Foundation there are 30,000 children and adults with cystic fibrosis in the United States and 70,000 worldwide. Cystic fibrosis is the most common autosomal recessive genetic disorder among whites. In the United States, nearly 5% of the population carries the defective CFTR gene. There are also a high number of people who remain asymptomatic carriers.

Continued on Page 6

IN MEMORIAM
Sister Rebecca Martinez (Beatrice Valentine), 97, was born Feb. 14, 1920, in Wichita, KS, to Lucio and Rebecca Martinez and entered eternal life May 24, 2017. She was the eldest in a family of six children. Her education began at Waco Elementary School, continuing at St. Patrick’s School, St. Mary’s Cathedral High School and Sacred Heart College (now Newman University) in Wichita. After two years attending to family responsibilities, she entered the Congregation of St. Joseph, receiving the habit March 19, 1942, and making final vows in August 1947. During those years she began her professional training to become a registered radiologic technologist, passing the boards in 1944. During this ministry she worked in hospitals in Winfield, Parsons and Wichita, including St. Joseph Hospital where she ministered for 55 years. Upon retirement, she remained at that hospital as a volunteer until she moved to Marian Hall at Mt. St. Mary’s Convent in 2005, continuing her ministry in prayer. She was preceded in death by her parents, Lucio and Rebecca, her brother, Lucio F. and her sisters, Mary Martinez, Eloise Helwig and Rosaline A. Stafford. In addition to members of her religious community, she is survived by her brother, Laurence B. Martinez, and five nieces and seven nephews.

The Homecoming and wake service was May 29 and the Mass of Christian burial was May 30 at Mt. St. Mary’s Convent, in Wichita. Memorial contributions in her name may be made to Dear Neighbor Ministries Inc. or to the Retirement Fund of the Sisters of St. Joseph, 3700 E. Lincoln Wichita, KS 67218.
There is a wide range of symptoms that cystic fibrosis patients may experience. Common symptoms are very salty-tasting skin, wheezing or shortness of breath, poor growth and weight gain even though they have a good appetite, persistent coughing, frequent lung infections, and male infertility. Heavy secretions of abnormally thick mucus are excreted into the lungs and cause progressive clogging of the bronchi and bronchioles, leading to frequent and progressive pulmonary infections. A main manifestation of this disease is a chronic cough. As pulmonary dysfunction progresses and chronic infections occur, the patient may also suffer from pulmonary hypertension, bronchiectasis, and cor pulmonale. Pulmonary disease with repeated bouts of pneumonia and pancreatic insufficiency are the major clinical manifestations. Recent advances in treatment have extended life expectancy. Over 90% of children diagnosed with cystic fibrosis will live to their teens. The estimated median survival age of children born in the 1990s will be 40 years or more. Radiographically, hyperinflation is present, with an interstitial pattern showing thickening around the bronchi and scarring from the pneumonia and repeated bouts of infection. The radiograph may also demonstrate atelectasis due to mucus plugging of the bronchi, bronchiectasis, and consolidation in the middle and upper lungs.

Body
Screening at birth is very common for newborns. The majority of cystic fibrosis patients are diagnosed by the age of 2. In some cases, patients are not diagnosed until adulthood. If doctors see symptoms of cystic fibrosis, they would need to complete a genetic test and a sweat chloride test. To confirm diagnosis, the doctor would need a clinical evaluation at a Cystic Fibrosis Foundation-accredited care center. In order to stay on top of this disease, people of all ages diagnosed with cystic fibrosis need to follow a regular treatment plan. There are health and nutrition plans to ensure the patient is receiving all of the necessary nutrients available. There are enzymes to help the body with the absorption of the available nutrients. There are also drug plans to help clear the thick mucus from airways and reduce inflammation. Antibiotics are also prescribed to treat lung infections as well as therapies that target the defective cystic fibrosis transmembrane conductance regulator protein in cystic fibrosis to improve the symptoms of the disease.

If you knew this family, you never would have thought they were battling such a terrible disease with all three of their children. The parents made sure their children lived full lives and did not let their disease hold them back. The twins were sicker than their younger brother. All three of them took medication, enzymes, did lung treatments, and wore a vest to help loosen up the mucus. They had yearly exams at KU Medical Center in Kansas City, Missouri. The parents did not hesitate to do anything and everything they could for their children. They made sure their children had all of the lung treatments, enzymes and vests to ensure they were getting what they needed. As the twins grew, the cystic fibrosis got worse. The girl eventually needed a lung transplant. Her uncle was more than willing to donate part of his lung for her. The lung transplant was successful, but she was unable to get better. She passed away at 16 years old. It devastated the whole town. Her family knew this was a possibility, but they hoped it would never become a reality. Years went by with ups and downs, but both boys were doing well. The oldest brother graduated high school; they had a moment of silence for his sister. A few months later he passed away while in the process of getting a lung transplant. Death is an unwanted reality with this disease as it is with many other diseases. The third child is 22 years old and doing great. His cystic fibrosis is only in his pancreas and has yet to move to his lungs, like it originally was in his brother and sister. As I mentioned earlier, there are different mutations of the cystic fibrosis. The most common is the amino acid 508 defect. The third child is in the 70% of cystic fibrosis patients with this defect. There are some clinical trials that are developing drugs that help with the specific mutations, and this mutation is one of them. These foundations are very close to a breakthrough for this disease.

Pancreatic disease is found in most cystic fibrosis patients. “When loss-of-function mutations are present on both alleles (children inherit a single allele for each location on a gene from each parent), pancreatic insufficiency usually results.” Obstruction of the pancreas begins in utero, which causes destruction and functional loss of the exocrine pancreas at birth or early infancy. Pancreatic exocrine insufficiency affects 85% to 90% of patients. This insufficiency limits the pancreas from delivering sufficient enzymes necessary to digest nutrients. Ultrasonography is the safest imaging technique for monitoring pancreatic disease.

Radiography can help in the diagnosis and monitoring of cystic fibrosis. Radiologic modalities used to diagnose or follow up thoracic cystic fibrosis invariably include chest radiography and CT of the thorax. CT of the sinuses or abdomen is occasionally used, as are nuclear medicine studies, ultrasonography, and angiography. Chest radiographs are a common exam for cystic fibrosis patients with mild lung disease. Chest radiography is preferred because of the low dose required for the examination and they help indicate lung disease. The average effective dose for a postero-anterior and lateral chest radiography projection is 0.2 mSv. Pediatric patients do not routinely have lateral chest projections performed unless specified by their doctor. These pediatric patients are generally examined supine, while older children and adults are examined upright. The chest radiographs of children born with cystic fibrosis seem normal at birth, but begin to show changes quickly. Patients
whose cystic fibrosis disease is under control and well-managed may be told by their doctor to have a chest radiograph every two to four years. I know at the Via Christi Family Practice, there are CF days and patients come in for their yearly chest radiograph. When we x-ray these patients, we wear a mask and gown to help keep the patient as safe as possible. Radiologists use scoring systems to monitor the severity and development of the disease. The most commonly used system in the United States is the Brasfield, or Birmingham, system. It assesses air trapping, linear markings, nodular cystic lesions, general severity, and large lesions. “The first 4 elements are scored 0-4, where 0 is used if the finding is not present, and 4 is used if the finding is severe. The points are totaled then subtracted from 25. A normal chest radiographic finding receives a score of 25. The minimum score for the most severe changes in CF is 3.”

Several studies have suggested that computed tomography is more helpful at recognizing subtle changes and localized disease, than conventional chest radiographs. “Pulmonary manifestations of cystic fibrosis disease may be evident on CT images before any symptoms develop and before other studies, such as spirometry or chest radiographs, indicate abnormalities.” During clinical trials, computed tomography has been used as a measuring tool for cystic fibrosis outcomes. It is more specific than lung function tests for determining endpoints in longitudinal studies. Computed tomography also has a grading scale called the Bhalla system. This is a 25-point merit system, and the scores can be interchanged with a Brasfield score in clinical classification systems. The presence, extent, and severity of bronchiectasis, peribronchial thickening, mucus plugging, atelectasis or consolidation, and emphysema are documented. “The radiation exposure associated with CT raises concerns about stochastic effects and could limit the modality’s utility in assessing respiratory disease associated with cystic fibrosis when multiple CT scans are necessary. Stochastic risks include carcinogenesis and genetic effects to the unborn offspring of the irradiated patient. The CT technologist can control some of the parameters, such as x-ray tube voltage, tube current/exposure time, and pitch ratio. The use of filters and noise-reduction filters, improved detector geometry, and automatic tube current modulation can aid in reducing dose. Low-dose protocols, automatic patient centering in the gantry, and reducing the number of images per scan are widespread strategies used to reduce radiation exposure.”

The effective dose for standard chest CT examinations ranges from about 1.7 mSv in newborns to approximately 5.4 mSv in adults. When chest radiographs do not have enough information for doctors to know the patient’s state in full detail, computed tomography is the first imaging choice to follow up with.

Initial reports suggested that MRI could be useful in the assessment of cystic fibrosis because of its ability to depict early mucus plugs and differentiate mucoid impaction from atelectasis or shadows caused by flowing blood. Subsequent studies showed that chest radiography is superior to MRI in assessing air-containing structures and hyperinflation. MRI can also be used to differentiate between hilar enlargement due to large nodes and enlargement due to large pulmonary arteries. Mucus plugging may be easily depicted by MR because of the high T2-weighted signal of fluid. Magnetic resonance imaging has a major advantage for pediatric patients who might require several imaging studies throughout their life. These patients will not receive any exposure to ionizing radiation. “MR with contrast also can provide excellent data on vascular abnormalities, ventilation and perfusion issues, and respiratory mechanics.” Another advantage of MR is the better tissue contrast characterization compared to CT. Even though MR does not provide as specific information about certain imaging features as CT does, it is still an extremely useful imaging modality. A problem that most cystic fibrosis patients face is some degree of sinus impairment. This can be shown by opacification on conventional radiographs. “Obstruction of the sinus ostium can cause mucoceles to form; mucoceles are sacs containing mucus that can completely fill a sinus.” The problem with imaging the sinuses with conventional radiographic imaging is that radiologists cannot distinguish inflammatory from infectious paranasal sinus disease. There are other methods, like CT scans and MR images, which can help evaluate for the presence of true infection. “Chronic sinusitis is demonstrated on CT by opacified maxillary sinuses, medial bulging of the maxillary sinus medial wall, possible anteromedial displacement of the nasal uncinated process because of polyps, and hypoplastic frontal or sphenoid sinuses.”

“Positron emission tomography is a highly sensitive modality that can detect abnormalities regardless of tissue thickness.” Its main use right now is in clinical trials for cystic fibrosis. Positron emission tomography may also be a “useful tool for imaging regional lung inflammation.” The PET examination follows injection of the contrast agent 18F-fluorodeoxyglucose. The monitoring of the uptake of this contrast agent helps identify the disease status and therapy response. PET and CT scans can be combined to produce PET-CT scans. These examinations are helpful for identifying localized centers of active inflammation or infection that are not visible with CT by itself. An advantage of PET-CT scanning is the availability of a more detailed view of the location and size of the diseased region of tissue. Advantages of one method are also accompanied by disadvantages. This is when the health care team must decide if the outcome outweighs the effects. The radiation exposure of PET-CT is a concern, as it is with CT. The technologist should use low-dose CT protocols along with a lower dose of FDG to maintain image quality. “Studies have shown that the level of
aerosol uptake differs between control subjects and those with cystic fibrosis. 1 Doctors are still learning how PET-CT can help with the treatment of cystic fibrosis patients.

Ultrasonography is also used in the monitoring of cystic fibrosis. The primary use of ultrasonography is to detect and establish the presence and makeup of pleural fluid. 1 Due to the amount of air found in the normal lung, ultrasonography is not otherwise used for lung imaging. 1 The air in the lung prevents the sound wave from transmitting through the lung tissue. 1 Using ultrasonography “can help distinguish a subpleural mass from atelectasis in a pediatric patient when the chest radiograph shows opacification within the hemithorax.” 1 It is also useful in determining solid from cystic pleural collections and assesses the pleural drainage. 1 Dietrich et al. have reported the use of high-resolution mediastinal sonography in assessing the total lymph node volume in the paratracheal region and in using the aortopulmonary window as a marker of inflammatory disease activity in cystic fibrosis patients. 8

Nuclear imaging studies gather information about perfusion and ventilation. 1 Doctors perform these studies primarily to evaluate regional lung function in children. 1 “Radionuclide lung scans are performed using radioactive gases such as xenon 133m, xenon 127, or krypton 81m, or with a radioactive aerosol such as technetium 99m.” 1 Tc macro aggregated albumin most often is used to assess pulmonary blood flow. 1

Due to the advances in treatment and monitoring of cystic fibrosis, the life expectancy of these patients is improving drastically. Before the mid-20th century, pediatric patients died at a young age from malnutrition and lung disease. 1 As of 2007, the predicted median survival age was 37.4 years. 1 The most fatal problems in patients with cystic fibrosis are chronic restrictive and obstructive pulmonary diseases. 1 Patients with cystic fibrosis frequently undergo medical imaging examinations beginning at a young age to help diagnose the disease and its manifestations and monitor pathologic changes. 1

Since patients are living longer and have had more exposure to ionizing radiation, there are possibilities that they will develop malignancies. 1 These malignancies are specified to thoracic, digestive tract, kidney, and thyroid cancer, as well as lymphoma. 1 The female organs and tissues are more radiosensitive, therefore; there is a higher incidence risk ratio for all cancers in women with cystic fibrosis. 1 Even though there is a higher mortality and morbidity in patients with cystic fibrosis from respiratory causes, there are complications that arise in the gastrointestinal tract as well. 1 Diagnostic imaging is necessary to monitor these manifestations as well. A recent study reported 42.7 of radiologic imaging examinations for cystic fibrosis patients were directed at the abdomen-pelvic region. 1 A significantly higher radiation dose than thoracic imaging is required in order to achieve standard diagnostic images. 1

“Bronchial arteriography is used to diagnose and treat respiratory complications that result in significant hemoptysis in patients with cystic fibrosis. About 1% of children and 5% to 61% of adults with cystic fibrosis have this complication.” 1

Conclusion
Reducing radiation exposure is a major concern for the health care team of cystic fibrosis patients. Some actions that can be taken to achieve this are using specific low-dose cystic fibrosis protocols for imaging a child’s smaller body habitus, minimizing unnecessary supra-apical and infra-pulmonary imaging on CT scans to reduce exposure to the thyroid and abdominal regions. 1 Technologists should be using thyroid and breast shields in pediatric patients having radiographic and CT exams done. 1 Some other strategies to consider are the use of automatic tube current modulation, iterative reconstruction techniques, and noise reduction filters. 1 “There are new low-dose CT scans that can reduce exposure by almost 75%.” 1 Although computed tomography scans gather a lot useful information for cystic fibrosis patients, it is critical to make sure the information is not available from an alternative imaging modality that offers lower or no radiation exposure. 1 Alternative methods would be MR imaging or ultrasonography. 1 Cumulative dose for cystic fibrosis patients can be monitored from within the digital studies or examination reports and recorded in the patient’s medical record. 1

Cystic fibrosis is a disease that becomes the reality for families every day. The growing awareness of this disease is helping to raise funds to aid in discovering a cure. I personally hope this day comes sooner rather than later.

References
Because of diminishing participation in past years, there will be no Fall Symposium educational conference this year. The board plans to bring continuing education lectures to individual facilities. Stay tuned for more information.
APPLICATION FOR MEMBERSHIP

THE KANSAS SOCIETY OF RADIOLOGIC TECHNOLOGISTS

I hereby make application for membership in the Kansas Society of Radiologic Technologists and, if accepted, I agree to support the bylaws and the Society and to promote the aims of this organization as outlined therein. Dues must accompany this application.

FULL NAME

______________________________
______________________________
______________________________
______________________________
First          Middle Initial          Last          Credentials          Maiden

______________________________

Street

DOB

Month  Day  Year

______________________________

Email

City

State

Zip

______________________________

Phone Number


☐ ACTIVE MEMBER: Certified by ARRT and Member of ASRT and practicing in the field of radiologic technology.

COPYIES OF ARRT AND ASRT CARDS MUST BE ENCLOSED.

DUES: $50.00/Year

☐ ASSOCIATE A MEMBER: Certified by ARRT and practicing in the field of radiologic technology.

COPY OF ARRT CARD MUST BE ENCLOSED.

DUES: $50.00/Year

☐ ASSOCIATE B MEMBER: 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.

SEND COPY OF ARRT CARD AND BIRTH CERTIFICATE OR DRIVER'S LICENSE.

DUES: $25.00/Year

☐ SENIOR MEMBER: Certified by ARRT and 65 years old or more.

DUES: $25.00/Year

☐ STUDENT MEMBER: Enrolled in an approved school of radiography for a MINIMUM of 24 months.

DUES: $25.00/Year

STATUS APPLIES TO PRIMARY PROGRAM OF STUDY

Name of School

Date of Enrollment

Anticipated Date of Graduation

PRESENT EMPLOYMENT (or School)

My application dues in the amount of $_________ are enclosed. I understand my annual dues includes a subscription to "THE ROTATING ANODE". This

Date of application

New applicant

Continuous Renewal

SIGNATURE

(PLEASE CHECK ONE)

***Graduate Bridge Program: Certificate

FISCAL YEAR OF THE K.S.R.T. RUNS JUNE 1 - MAY 31

MEMBERSHIP YEAR WILL RUN 12 MONTHS FROM DATE APPLICATION AND PAYMENT IS RECEIVED.

Are you interested in serving on a committee, as an officer or an educational speaker for the KSRT?

Please indicate with YES or NO.

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.evsec@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!

Check out our website for additional information & calendar of events:   www.ksrad.org
KANSAS SOCIETY OF RADIOLOGIC TECHNOLOGISTS
Scholarship Application

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/Administrator __________________________
  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 _____________

Transcript: Official Sealed Transcript Needed or proof of ARRT certification

V. 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” margins.

Applications will not be considered if not complete. Please submit application, letter of recommendation from supervisor or program director or a letter of professional recommendation, and official transcript or proof of ARRT certification to: Denise Orth, KSRT - Executive Secretary, 1702 Mermis Ct., Hays, KS 67601