APPENDIX 2

LETTERS TO THE BOARD AND CIS WORKGROUP

(Received during the CIS Workgroup proceedings)
To the State of Maryland Cardiovascular Invasive Specialist Workgroup:

From time to time, Cardiovascular Credentialing International (CCI) is contacted by stakeholders seeking CCI’s assistance in informing them of specialty certification as it pertains to non-radiologic technologists who provide support during the use of fluoroscopy during cardiac catheterization and cardiac electrophysiology procedures.

CCI’s Registered Cardiovascular Invasive Specialist (RCIS) credential and Registered Cardiac Electrophysiology Specialist (RCES) credential have become internationally recognized as the credentials which truly represent an individual's fundamental knowledge of all aspects pertaining to the field of cardiovascular technology. RCIS and RCES credential holders are educationally prepared and clinically competent to operate the cardiac lab x-ray system under the supervision of cardiologists/Electrophysiologists who are licensed and qualified to provide said supervision. In addition, the non-radiologic knowledge and skills RCIS and RCES credential holders possess are essential to the safe and high-quality performance of invasive cardiac imaging. The Society for Cardiovascular Angiography and Interventions (SCAI) and Heart Rhythm Society (HRS) discuss the need for professionals with these skills and knowledge in their published best practice documents. Copies are enclosed for your review.

For over 40 years, credentialed cardiovascular specialists working in cardiac catheterization and electrophysiology labs have demonstrated a thorough understanding of how imaging chain components and radiation safety features optimize fluoroscopic imaging quality and keep radiation exposure as low as reasonably achievable. However, radiation safety is just one concern on a long list of patient care and safety concerns in cardiac catheterization and electrophysiology labs. Today's credentialed invasive cardiovascular specialists also have in-depth knowledge of electrocardiography, hemodynamics, cardiac physiology, cardiac pharmacology, electrophysiology and sterile technique. Competence in these areas is indicated by earning the RCIS or RCES credentials.

Over 7,000 individuals have earned the RCIS credential (145 in the state of Maryland). The RCES credential was launched in 2007 and over 700 individuals have earned this cardiovascular specialty credential (12 in the state of Maryland). The Commission on Accreditation of Allied Health Education Programs (CAAHEP) recognizes the field of Cardiovascular Technology and accredits educational programs for this profession. Currently, Howard Community College is the only accredited program in Maryland. There are five programs in the surrounding states of VA and PA. Cardiovascular Technology Programs offer graduates an Associate in Science Degree in Cardiovascular Technology, making them eligible for the RCIS and RCES Registry examinations upon conferring their degree.

In addition to graduates of dedicated invasive cardiovascular programs, other associate professionals may qualify to sit for the RCIS or RCES credentialing examinations. The qualifications for these professionals require formal education in a healthcare related discipline and additional work experience in the field of invasive cardiovascular technology. Among this demographic group a significant percentage had previously earned licensure as a Registered Nurse (RN), as Radiologic Technologists (RT), or as Respiratory Therapists (RRT). Of the credential holders in the state of Maryland, 4% reported holding the RT designation and 3% reported being a RN.

There are currently seven (7) states that currently regulate invasive cardiovascular specialists. They are:

- Arkansas
- Delaware
- Indiana
- Ohio
- South Carolina
Each state has taken a different approach but have successfully established rules and policies that appropriately regulate this profession allowing qualified and credentialed cardiovascular specialists to work in their scope and do so in a matter that ensures safety and optimal care of the patient. The most common requirement in these states is to require that the individual has demonstrated their knowledge through a standard and reliable process offered through an independent credentialing organization, such as CCI, American Registry Radiologic Technologists (ARRT), or the National Board for Respiratory Care (NBRC). These non-governmental agencies or associations certify that an individual has met certain predetermined standards specified by that profession for specialty practice which include qualifying for and passing a valid and reliable examination. Their purpose is to assure the public that an individual has demonstrated knowledge and acquired skills in a particular specialty.

In conclusion, we thank you for taking the time to read this correspondence and the material attached. We applaud your support of the field of Cardiovascular Technology and the support of the professionals who have chosen this field as their occupation. Please do not hesitate to contact our offices (phone 919-863-9489 or email jnoel@cci-online.org) if we can be of any further assistance in this matter.

Best regards,

[Signature]

Jerel Noel, CAE
Executive Director

Enclosures:
- CCI Overview for Registered Cardiovascular Invasive Specialist examination
- CCI Overview for Registered Cardiac Electrophysiologist Specialist examination
- Society for Cardiovascular Angiography and Interventions (SCAD) Consensus Statement Best Practices in Cardiac Cath Lab
- Heart Rhythm Society (HRS) Consensus Statement on Lab Standards-images
June 27, 2018

Ms. Sandi Van Horn  
Cardiovascular Invasive Specialists (CIS) Workgroup  
Maryland Board of Physicians  
4201 Patterson Avenue  
Baltimore, MD 21215  
Via email: sandi.vanhorn@maryland.gov

Dear Ms. Van Horn:

The American Society of Radiologic Technologists, a national professional association representing more than 154,000 medical imaging and radiation therapy technologists including more than 2,600 in Maryland welcomes the opportunity to provide comments to the Board of Physicians regarding non-radiologic technologist personnel seeking to perform fluoroscopy in the cardiac catheterization laboratory.

As published in the ASRT Cardiac Interventional and Vascular Interventional Technology Practice Standards adopted by the ASRT House of Delegates, ASRT believes that radiologic technologists who have completed the appropriate primary certification from the American Registry of Radiologic Technologists and have attained post-primary certification from ARRT in cardiac interventional radiography or who are certified by Cardiovascular Credentialing International as registered cardiovascular invasive specialists best demonstrate educational preparation and clinical competency to assist the licensed practitioner in the performance of cardiovascular invasive procedures using fluoroscopy.

ASRT believes that all health care providers performing, or assisting in the performance of fluoroscopically guided interventional procedures to be formally educated in radiation physics, radiation safety, radiation protection, the safe operation of fluoroscopy equipment and image acquisition. Cardiac catheterization laboratory standards should place strong emphasis on patient and personnel safety by carefully detailing the qualifications for personnel assisting in the performance of fluoroscopy and defining the role of the cardiovascular invasive specialist and other health care personnel who are not radiologic technologists assisting with cardiac and vascular interventional procedures.

As the national organization representing the radiologic technology profession, ASRT encourages the Maryland Board of Physicians to continue to examine this issue closely, keeping the safety of the patient and patient-care team performing fluoroscopy procedures at the forefront of their discussions. ASRT supports policies that require individuals who perform or assist in the performance of fluoroscopically guided imaging procedures to meet the education and certification standards contained in the ASRT Practice Standards. ASRT appreciates the opportunity to share our position with the Maryland Board of Physicians. If you have any questions, please contact me at gmmorrison@asrt.org or ASRT Vice President of State Advocacy & Government Relations Christine Lung at cjlung@asrt.org.

Sincerely,

Greg Morrison, M.A., R.T.(R), CNMT, CAE  
Associate Executive Director

Cc: Sandra Moore (semoores@jhmi.edu)
Cardiovascular Invasive Specialist Workgroup
Maryland Board of Physicians
4201 Patterson Avenue
Baltimore, MD 21215

Dear Workgroup Members:

We are writing to express our strong support for licensing Registered Cardiovascular Invasive Specialists (RCIS’s) in Maryland. Maryland hospitals are experiencing a staffing crisis in our cardiac catheterization laboratories (cath labs). Licensing RCIS’s would provide much needed relief and support for these critical services.

Maryland has a shortage of experienced cardiac cath lab technologists. A cardiac cath lab is a busy, 24/7 service requiring around the clock staffing. Ensuring the highest level of care for our patients requires hospitals to maintain a robust cardiac staff, including an adequate pool of cardiac trained technologists. The technologist works under the supervision the cardiologist. Currently, Maryland cath labs must use general technologists with little to no training specific to cardiac catheterization prior to employment. Hiring trained cardiac techs requires an extensive, multi-year investment in on the job training or poaching an experienced tech from another hospital – exacerbating the shortage. Many hospitals are forced to use staffing agencies – an option that is both expensive and inefficient.

RCIS’s are technologists specifically trained to work in cath labs. RCIS’s receive extensive specialized training in: cardiovascular assessments, cardiac anatomy, hemodynamics, x-ray theory and safety, cardiovascular pharmacology, and cardiovascular and diagnostic procedures. In addition to technological skills training, RCIS’s receive instruction on the medical theory behind cardiac procedures, providing a deeper understanding of the work performed. RCIS’s are credentialed by Cardiovascular Credentialing International, an independent not-for-profit credentialing agency established in 1968.
Unfortunately, the RCIS credential is not recognized in Maryland. Despite having an accredited RCIS program at Howard Community College, graduates cannot use their degree to its full extent in the state. They can, however, seek employment in surrounding jurisdictions, including Virginia, Pennsylvania, and Washington D.C. Recognizing the RCIS credential in Maryland can resolve a serious staffing issue for hospitals and retain more of our trained workforce in the state.

As representatives of hospitals across Maryland, we recognize that establishing a new medical licensure should be done with thorough deliberation. We understand the Board’s commitment to ensuring patient safety and maintaining adequate oversight of medical practitioners. Working collaboratively we can create an RCIS license in Maryland that provides adequate educational and training requirements and includes all necessary provisions for medical licensure. We feel confident that establishing an RCIS license in Maryland will maintain the highest standard of care, improve patient experience, and alleviate a serious burden on hospitals.

For these reasons, we strongly support the Maryland Board of Physicians establishing an RCIS license, enabling Maryland hospitals to employ these well trained medical professionals.

Sincerely,

Andrew R. Nicklas
Director, Government Relations
Adventist HealthCare

Donna L. Jacobs
Senior Vice President, Government, Regulatory Affairs and Community Health
University of Maryland Medical System

Peggie Townsend
Vice President, Government Affairs
MedStar Health

Jennifer Witten
Director of Government Relations
Maryland Hospital Association

Martha Nathanson
Vice President, Government Relations and Community Development
Life BridgeHealth

Craig F. Rosendale, MBA, CHC
Vice President & Chief Compliance Officer
Frederick Regional Health System

Valerie R. Lehman
Senior Manager, Institute for Healthy Aging and Government Relations
Anne Arundel Medical Center

Lori Franklin
Director of Government Relations
Saint Agnes Healthcare
July 31, 2018

Ms. Sandi Van Horn  
Cardiovascular Invasive Specialists (CIS) Workgroup  
Maryland Board of Physicians  
4201 Patterson Avenue  
Baltimore, MD 21215  
Via email: sandi.vanhorn@maryland.gov

Dear Ms. Van Horn:

The American Society of Radiologic Technologists, a national professional association representing more than 154,000 medical imaging and radiation therapy technologists including more than 2,600 in Maryland welcomes the opportunity to provide comments to the Board of Physicians regarding non-radiologic technologist personnel seeking to perform fluoroscopy in the cardiac catheterization laboratory.

To reiterate ASRT's position as expressed in our letter of June 27, 2018, ASRT believes that radiologic technologists who have completed the appropriate primary certification from the American Registry of Radiologic Technologists and who have attained post-primary certification from ARRT in cardiac interventional, vascular interventional or cardiovascular interventional radiography or who have completed the appropriate primary certification from the American Registry of Radiologic Technologists and who have attained post-primary certification as registered cardiovascular invasive specialists from Cardiovascular Credentialing International best demonstrate educational preparation and clinical competency to assist the licensed practitioner in the performance of cardiovascular invasive procedures using fluoroscopy.

ASRT believes that all health care providers performing, or assisting in the performance of fluoroscopically guided interventional procedures to be formally educated in radiation physics, radiation safety, radiation protection, the safe operation of fluoroscopy equipment and image acquisition. Entry-level radiographers certified by ARRT have completed upwards of 400 hours of didactic and clinical education in these areas. Cardiac catheterization laboratory standards should place strong emphasis on patient and personnel safety by carefully detailing the qualifications for personnel assisting in the performance of fluoroscopy and defining the role of the cardiovascular invasive specialist and other health care personnel who are not radiologic technologists assisting with cardiac and vascular interventional procedures.

ASRT continues to encourage the Maryland Board of Physicians to examine this issue closely, keeping the safety of the patient and patient-care team performing fluoroscopy procedures at the forefront of their discussions. ASRT supports policies that require individuals who perform or assist in the performance of fluoroscopically guided imaging procedures to meet the education and certification standards contained in the ASRT Practice Standards. ASRT appreciates the opportunity to share our position with the Maryland Board of Physicians. If you have any questions, please contact me at gmorrison@asrt.org or ASRT Vice President of State Advocacy & Government Relations Christine Lung at cjlung@asrt.org.

Sincerely,

[Signature]

Greg Morrison, M.A., R.T.(R), CNMT, CAE  
Associate Executive Director

Cc: Sandra Moore (samoore@jhu.edu)
August 7, 2018

Dear Ms. Van Horn,

The Maryland Society of Radiologic Technologists is strictly against allowing any non-radiologic technologist personnel to perform any fluoroscopy procedures in the cardiac catherization laboratory.

Any individual who will be performing or assisting with any fluoroscopic guided interventional procedures must be formally educated in radiation physics, radiation safety, radiation biology, image production and the safe operation of fluoroscopic equipment. Only formally educated and properly trained technologists who have completed the appropriate primary certification from the American Registry of Radiologic Technologists are qualified to assist the physician in the performance of cardiovascular invasive procedures using fluoroscopy. Not only is this the stance of the Maryland Society of Radiologic Technologists, but it is the stance of the American Society of Radiologic Technologists and the American Registry of Radiologic Technologists.

The MSRT appreciates the opportunity to share our stance on this important issue and we encourage the Maryland Board of Physicians to examine this matter very closely keeping patient safety and the safety of all health care professionals at the most important concern.

Warm regards,

Debbie Lam

Debbie Lam MSED R.T. (R) (CT)
Vice President
MSRT
August 7, 2018

Maryland Board of Physicians
Attention: Invasive CVT Workgroup
4201 Patterson Avenue
Baltimore, MD 21215

The Registered Cardiovascular Invasive Specialist (RCIS) is a health care professional that, through the utilization of specialized equipment and under the direction of a qualified physician, assists in procedures on patients resulting in accurate diagnosis and/or optimal treatment of congenital or acquired heart disease while maintaining maximum patient safety and comfort and adhering to ALARA. The RCIS credential administered by Cardiovascular Credentialing International (CCI), has been recognized as the cardiac cath lab credential of choice by the American College of Cardiology (ACC) and by The Society for Cardiovascular Angiography and Interventions (SCAI) to ensure the maintenance of high standards in invasive cardiac laboratories.

CCI was asked to provide clarifications from our June 6, 2018 letter that provided an overview of the RCIS and the importance of registered non-radiologic technologists who provide support to physicians during the use of fluoroscopy during cardiac catheterization procedures. Below are CCI’s responses:

How does CCI test for x-ray (and related content areas) competency?
The validation of certification exams depends primarily on evidence that the content of the exam adequately represents the job (called content validity). CCI develops our examination in line with standards for validation enforced under widely accepted test development standards for certification examinations. These standards require a certification exam to focus on the level of knowledge, skills, and abilities necessary to assure the public that a person can competently perform the job. Content validity is measured by the degree to which the items on the examination are representative of the range of knowledge and skills required to competently carry out the job. CCI involves subject matter experts in all parts of the validation process. To qualify as a subject matter expert, a person must have direct, up-to-date experience with the job, and enough experience to be familiar with all of the tasks covered on the exam.

Through a formal job analysis, the current RCIS examination outline/blueprint was determined. The RCIS examination has a total of 150 scored items. At this time, questions related to radiation safety and use make up about 10% of the content covered on the RCIS examination. The content areas include:

- Preparing procedure room (e.g., set up equipment, QC, QA)
- Ensuring radiation safety (e.g., time, distance, shielding)
- Positioning radiographic equipment (e.g., C-arm, pan table, angles and views)
- Acquiring and understanding radiographic images

To continually assure quality and relevance, CCI conducts reviews of the RCIS examination program every 4 to 5 years to ensure that it continues to be relevant to what a RCIS does on a daily basis. We began an update of the RCIS job analysis in 2017. As part of this effort, the percentage of questions relative to radiation safety and use will be approximately 16% of the examination when CCI starts administering this new content outline beginning July 1, 2019. Content areas on the updated outline include:

- Preparing procedure/control room (e.g., set up equipment, radiation safety, sterile technique, QC, QA)
- Ensuring radiation safety (e.g., time, distance, shielding, ALARA)
CCI

- Assisting in performing radiographic procedures (e.g., set-up, positioning, operation)
- Acquiring/understanding radiographic images (e.g., cardiac, peripheral vascular)

In addition, to being able to perform the tasks, a RCIS should have knowledge that is needed in order to perform the tasks identified. This knowledge related to fluoroscopic imaging includes:

1. **X-Ray Generation and Radiation Physics/Safety**
   a. X-ray Tube Components and Imaging Chain
   b. Radiation Production, Radiation Units, Characteristics and Physics
   c. Principles, Positioning and Operation of the Fluoroscopic System
   d. Digital Imaging Systems and Flat Panels

2. **Radiation Biology & Protection**
   a. Cellular Biology Overview
   b. Biological Effects of Radiation
   c. Radiation Safety/Radiation Protection (Patients and Personnel)
   d. Dose Reduction Techniques
   e. Radiation Exposure Monitoring
   f. Limits for Exposure to Ionizing Radiation
      i. ALARA
      ii. Sentinel Event

3. **Quality Assurance**

4. **Image Analysis and Digital Imaging**

The complete overviews of the RCIS examination can be viewed online at www.cci-online.org/rcis.

Provide clarification from a previous letter that CVTs "operate the cardiac lab x-ray system under the supervision of a cardiologist...." The level of operation needs to be clarified...ie: does the RCIS step on the peddle or perform other duties (energize the x-ray equipment, change mag settings, collimate shutters)?

The current Scope of Practice for RCIS's developed and maintained by the Alliance of Cardiovascular Professionals describes the procedures, actions, and processes that a registered CVT must perform to demonstrate that they are educationally prepared and clinically competent to undertake by passing the CCI RCIS examination.

As it relates to operating cardiac lab radiation systems under the supervision of a physician, CCI's RCIS exam clearly assesses competency in this area from the standpoint of moving the table, panning, C-arm positioning and related dose reduction techniques.

Please do not hesitate to contact our offices (phone 800-326-0268 or email jnoel@cci-online.org) if we can be of any further assistance in this matter.

Best regards,

Jerel Noel, CAE
Executive Director
Statement

Of

Jason Lee, Radiologist Assistant

Regarding: Invasive Cardiovascular Professionals performing Fluoroscopy

August 8th, 2018

My name is Jason Lee. I’m a Radiologist Assistant from Laurel, Maryland, practicing as a Radiologist Assistant at Johns Hopkins University. I’m also a member of the Maryland Society of Radiologic Technologists.

I have over 21 years of experience in Radiology and have been fortunate enough to work in multiple specialties including Radiography, Computed Tomography, Magnetic Resonance Imaging, Interventional Radiology, as well as Fluoroscopy. I have been practicing as a Radiologist Practitioner Assistant/Radiologist Assistant, a Radiology based Physician Extender, since 2005.

Prior to pursuing a degree as a Radiologist Practitioner Assistant/Radiologist Assistant, I had to have a degree in Radiologic Technology plus five years of experience within the scope of practice. I subsequently had two more years of additional education and clinical training prior to being able to perform procedures on a physician extender level. Courses included extensive Anatomy, Physiology, Pharmacology, Ethics, and Radiation protection.

At this moment in time, I do not endorse RCIS performing fluoroscopic procedures. I believe that a program endorsing a formatted structured education including additional courses and hands-on clinical experience should be required prior to performing these functions, especially fluoroscopy. Prior to performing fluoroscopy I personally believe they need more education in Radiation Biology and Protection, Radiation Physics, as well as Image Production.

Radiation protection for the patients we serve is of utmost importance!

Regards,

Jason Lee, Radiologist Assistant

Johns Hopkins University
Dear Mr. Fisher,

As a fellow of the American College of Radiology, and a lifelong interventional radiologist, I can assure you that radiation protection is very important to me. I have lectured around the world about this exact topic, particularly as it applies to interventional radiology, and have studied in depth the methodologies that are used to protect both patients and operators. I have had many opportunities to observe and work with technologists in the heart catheterization laboratories for the last 4 decades. I have taught cardiologists how to do coronary angiographic and heart catheterization studies, and in recent years have worked on complex patients in conjunction with interventional cardiologists.

In the heart catheterization laboratory, the technologist serves two critical functions. Firstly, and probably most importantly, the technologist is an integral member of the heart catheterization "clinical" team, assisting the interventional cardiologist and heart catheterization nurses in the performance of the procedure and in the monitoring of the patient to make sure that the procedure is safe and efficient. Secondly, they help move the patient, the table and the C-arm to make sure that the patient's anatomy is appropriately displayed and that radiation exposure is minimized. Their training for these purposes is intense and extensive. It involves hours of laboratory and didactic instruction in cardiac physiology, cardiac anatomy, cardiac pathology, the tools and methodologies of cardiac intervention, and also includes instruction in the mechanics and physics of x-ray production by the C-arms that are used in a heart catheterization laboratory. They learn how radiation exposure can be controlled and monitored so that the patient and the operators can perform the procedure safely. In our survey of programs that we accredit as the Joint Review Committee on CardioVascular Technology (JRC-CVT), the numbers of hours of instruction that is dedicated exclusively to radiation biology, radiation protection, and radiation physics that the students receive averages over 16 hours. That does not include the many hours of radiation science that are taught in short 2 or 3 minute discussions in conjunction with courses that focus on the C-arm and coronary angiography. Many of the training programs estimate that students hear about some aspect of radiation science for up to 45 to 60 hours in total. In addition, all students in every program are tested on elements of radiation science at several points during their instruction and all students in every program must take a final, comprehensive exam on radiation science. The credentialing examination that is performed by CCI to give these students either the RCIS or RCES credential includes only a small sample of the radiation science questions that are asked during the course of the instructional programs. I think it is important to realize that the combined cardiac and radiologic training of the RCIS and RCES technologists is of immense benefit to the
cardiologists who are performing these critical exams and interventions. These technologists are highly trained and extremely competent. In my experience, they know at least as much and frequently much more about radiation production and protection with an operating room or cardiology interventional suite C-arm than most of the radiology technologists who work in the same facility.

If there were any reason for me to believe that the invasive, heart catheterization training programs were not doing an adequate job of training their students in how to effectively minimize operator and patient radiation exposure, I would have long ago demanded that we make a change in our JRC-CVT standards. However, in my review of the many invasive programs that we credential, I have never in my 14 years on the JRC-CVT found one program that does not feel that the portion of their curriculum that deals with radiation protection is of critical importance and treats it appropriately. I urge you strongly to consider the RCIS and RCES credentials as sufficient for designation of these highly trained technologists as qualified to participate under the supervision of a cardiologist in the delivery of radiation to patients in the heart catheterization laboratory.

If you would like any further details about our survey of the programs or the usual elements of radiation science instruction, please feel free to contact me or the administrative director of the JRC-CVT.

Sincerely,

David W Hunter, M.D.
FACR, FSIR and Professor Emeritus of Interventional Radiology at the University of Minnesota Hospital and Clinic.
Previous Chair of the JRC-CVT
September 20, 2018

Dr. Yemisi Koya
Chair, Cardiovascular Invasive Specialist Workgroup
Maryland Board of Physicians
4201 Patterson Avenue
Baltimore, Maryland 21215

Dear Dr. Koya:

We are writing to express how important the work the Cardiovascular Invasive Specialist Workgroup is doing and to strongly encourage the group to come to a consensus and issue recommendations that will ultimately alleviate the workforce shortage our hospitals are experiencing in the cardiac catheterization laboratories.

To maintain a world-class healthcare system in the state of Maryland, we must ensure that patients have access to the care they need. Part of ensuring access to care is ensuring we have an adequate supply of trained medical staff. Without an adequate number of trained professionals, services for patients will be reduced, placing more people at risk of not receiving the care they need. For cardiac catheterization labs in Maryland, this means ensuring hospitals have enough personnel trained in cardiovascular technology.

Hospitals from across the state agree that there are too few technologists trained in cardiac catheterization and that they need cardiovascular invasive specialists to fill the void. Currently, hospitals must resort to staffing agencies to find qualified candidates – this is expensive, inefficient and diminishes quality. Allowing cardiovascular invasive specialists to work to the full extent of their training in Maryland will alleviate this critical personnel shortage.
We truly appreciate the important work you and the workgroup are doing on behalf of our State. We look forward to hearing a final recommendation that supports Maryland’s healthcare system and ensures Maryland patients have access to the quality care they deserve.

If we can be of any assistance, please do not hesitate to contact us directly.

Sincerely,

Craig J. Zucker  
State Senator

Bonnie L. Cullison  
State Delegate