

MARYLAND HIGHER EDUCATION COMMISSION  
ACADEMIC PROGRAM PROPOSAL

PROPOSAL FOR:

- NEW INSTRUCTIONAL PROGRAM  
 SUBSTANTIAL EXPANSION/MAJOR MODIFICATION  
 COOPERATIVE DEGREE PROGRAM  
 WITHIN EXISTING RESOURCES or  REQUIRING NEW RESOURCES

(For each proposed program, attach a separate cover page. For example, two cover pages would accompany a proposal for a degree program and a certificate program.)

Howard Community College  
Institution Submitting Proposal

Fall 2016  
Projected Implementation Date

Lower Division Certificate  
Award to be Offered

Diagnostic Medical Sonography Vascular  
Title of Proposed Program

5207-02  
Suggested HEGIS Code

51.0910  
Suggested CIP Code

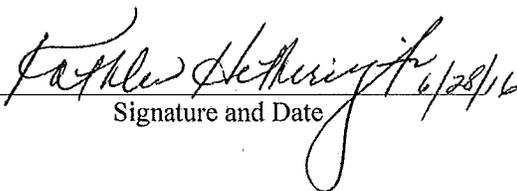
Health Sciences  
Department of Proposed Program

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Signature and Date

President/Chief Executive Approval

Date

Date Endorsed/Approved by Governing Board

**Proposal to  
Maryland Higher Education Commission**

**A. Centrality to institutional mission statement and planning priorities:**

- 1. Provide a description of the program, including each area of concentration (if applicable), and how it relates to the institution's approved mission.**

The vascular sonography certificate program is designed for students who are currently registered sonographers who desire to gain an additional skill set in vascular sonography. Students must be nationally credentialed diagnostic medical sonographers in a specialty other than vascular sonography when they apply to the program. Students will earn a Diagnostic Medical Sonography (DMS) certificate upon completion. Upon graduation, students will be eligible to apply for national ultrasound registry examinations for vascular technology.

This certificate prepares students to meet the theoretical, technical, and clinical responsibilities associated with the vascular sonography field. To be eligible for this certificate, a student must be assigned either by an employer or by the DMS clinical coordinator to a vascular ultrasound setting. The clinical environment provides ample observation and practice in a setting that allows the student sonographer to interact with other health professionals to ensure quality diagnostic ultrasound imaging. Graduates may apply to take a national certification examination for vascular sonography.

Current registered general or cardiac sonographers often are required to gain additional knowledge of how to perform vascular ultrasound. However, there are limited educational opportunities available that will allow sonographers to gain both the knowledge and experience required to adequately prepare for national certification in vascular sonography. Benefits to such cross-training include augmented skills and better chances of securing or retaining employment. This certificate program supports Howard Community College's (HCC) mission of providing pathways to success as it will provide a means for HCC DMS general and cardiac degree program graduates and other registered sonographers in the community to obtain an additional skill set in the vascular ultrasound specialty area, thus enhancing employment marketability and opportunities for career success.

- 2. Explain how the proposed program supports the institution's strategic goals and provide evidence that affirms it is an institutional priority.**

***Support for Strategic Goal 1: Student success, completion, and lifelong learning***

The vascular sonography certificate program promotes student success by offering a means to gain an additional skill set that is highly valued in the ultrasound profession and that will lead to expanded employment opportunities and enhanced job security. The program supports the college goal of completion as it encourages current DMS degree program students to graduate and gain their national certifications in order to take advantage of their guaranteed placement in the certificate program. Finally, the DMS vascular sonography certificate provides an extension of current knowledge for practicing sonographers, thus supporting the college goal of lifelong learning.

***Support for Strategic Goal 2: Organizational excellence***

The vascular sonography certificate program supports the strategic goal of organizational excellence by allowing HCC to stay on the cutting edge of desired program offerings. During 2015, the DMS program conducted a survey of registered sonographers working at 15 existing program clinical sites. The purpose of the survey was to determine interest in a certificate-level program offering that would provide training designed for the acquisition of an additional ultrasound specialty certification.

A majority of sonographers indicated a desire to attend a training program like the proposed vascular sonography certificate program. Having such a program in place at an accelerated pace of six months

for completion will be a unique offering for HCC that other area sonography schools do not currently have. Other area certificate programs take 13-14 months to complete. Other DMS programs do not have a certificate option and only offer a two-year degree program. Because of its unique combination of accelerated learning and comprehensive instruction in both didactic and clinical components, HCC will become the college of choice for ultrasound professionals seeking to expand their skill set.

**Support for Strategic Goal 3: Building and sustaining partnerships**

The vascular sonography certificate program supports the building of new partnerships with the practicing DMS community by allowing students to use their current jobs or to identify their own clinical sites that may then be contracted with our DMS program for use by future students. In addition, the program works to sustain existing clinical partnerships by supplying a pool of qualified vascular sonographers to meet the emerging needs in the local ultrasound workforce. Also, by allowing clinical rotations through currently contracted sites, the program will provide enhanced opportunities for both students seeking the certificate and clinical sites who have expressed the desire for more student contact.

**B. Adequacy of curriculum design and delivery to related learning outcomes consistent with Regulation .10 of this chapter:**

**1. Provide a list of courses with title, semester credit hours and course descriptions, along with a description of program requirements.**

This certificate prepares students for success in the field of vascular sonography. By requiring a combination of didactic, practical, and vascular-specific clinical educational experiences, students will have ample opportunities to develop critical knowledge and skills required to ensure quality diagnostic ultrasound imaging. Graduates may apply to take a national certification examination for vascular sonography.

<b>Vascular Certificate DMS Courses</b>		<b><u>Credits</u></b>
DMSU-181	Vascular Ultrasound I	3
DMSU-282	Vascular Ultrasound II	3
DMSU-241	Diagnostic Medical Sonography Certificate Program Externship I	1
DMSU-242	Diagnostic Medical Sonography Certificate Program Externship II	4
DMSU-243	Diagnostic Medical Sonography Certificate Program Externship III	1
DMSU-261	ARDMS Registry Seminar*	1
<b>Total</b>		<b>13</b>

*\*This course is not required for students who can provide proof of successfully passing the ARDMS Sonography Principles and Instrumentation (SPI) registry examination.*

*Admission to the Diagnostic Medical Sonography Vascular Certificate program is based upon successful completion of an entrance exam, proof of current national sonography registry certification in a specialty area other than vascular sonography, and proof of recent professional practice in a clinical setting. Applicants must provide proof of recent professional practice by submitting an Employer Sponsorship Form. Recent professional practice must have occurred no more than two years prior to admission to this certificate program.*

*DMSU-241, DMSU-242, and DMSU-243 – Students will be expected to participate in three clinical semesters requiring 17 hours per week over a total of 21 weeks. These clinical experiences are in addition to regular scheduled class time. Health clearance will be required prior to the start of the first clinical rotation. Clinical rotation sites may be provided by current employers of students only if these sites are contracted clinical providers for the DMS program. Alternatively, students may be placed at current program sites by the DMS*

*clinical coordinator. Clinical externships may be paid or unpaid experiences; however, the DMS program neither guarantees nor arranges for paid externships with its clinical partners.*

## **Course Descriptions**

### **DMSU-181 Vascular Ultrasound I (3 credits)**

This course focuses on the carotid, peripheral, vascular, arterial, and venous Doppler ultrasound exams. The principles of the vascular physical examination, proper instrumentation for each type of ultrasound, as well as anatomy, hemodynamics, patient history, clinical manifestations, non-invasive techniques, and interpretation will be discussed. The students will have the opportunity to reinforce the theory taught in lecture with hands-on scanning in the lab component to this class. This course is required to complete the vascular concentration of the diagnostic medical sonography program.

### **DMSU-282 Vascular Ultrasound II (3 credits)**

This course focuses on the carotid, peripheral, vascular, arterial, and venous Doppler ultrasound exams. The principles of the vascular physical examination, proper instrumentation for each type of ultrasound, as well as anatomy, hemodynamics, patient history, clinical manifestations, non-invasive techniques, and interpretation will be discussed. The students will have the opportunity to reinforce the theory taught in lecture with hands-on scanning in the lab component to this class. This course is required to complete the vascular concentration of the diagnostic medical sonography program.

### **DMSU-241 Diagnostic Medical Sonography Certificate Program Externship I (1 credit)**

This course provides an observation of the clinical duties performed in an ultrasound department as well as basic instruction and scanning experience in abdominal, obstetrical, gynecological, small parts, vascular, echocardiography, and/or other aspects of sonography. Attendance at an assigned clinical affiliate is required. This course is required to complete the Diagnostic Medical Sonography Certificate program.

### **DMSU-242 Diagnostic Medical Sonography Certificate Program Externship II (4 credits)**

This course provides an observation of the clinical duties performed in an ultrasound department as well as basic instruction and scanning experience in abdominal, obstetrical, gynecological, small parts, vascular, echocardiography, and/or other aspects of sonography. Attendance at an assigned clinical affiliate is required. This course is required to complete the Diagnostic Medical Sonography Certificate program.

### **DMSU-243 Diagnostic Medical Sonography Certificate Program Externship III (1 credit)**

This course provides an observation of the clinical duties performed in an ultrasound department as well as basic instruction and scanning experience in abdominal, obstetrical, gynecological, small parts, vascular, echocardiography, and/or other aspects of sonography. Attendance at an assigned clinical affiliate is required. This course is required to complete the Diagnostic Medical Sonography Certificate program.

### **DMSU-261 ARDMS Registry Seminar (1 credit)**

This course provides a review of the didactic knowledge and clinical skills necessary to prepare students for the American Registry for Diagnostic Medical Sonography (ARDMS) exam and for successful employment opportunities in diagnostic medical sonography.

## **2. Describe the educational objectives and intended student learning outcomes.**

The educational objectives for the DMS vascular sonography certificate program are listed below. By the end of the program, the student is expected to:

1. Prepare for employment as an entry-level diagnostic medical sonography professional.

2. Exhibit the characteristics of a professional sonographer when working in a clinical setting through appropriate communication and conduct.
3. Demonstrate proper patient preparation and exam documentation of sonographic findings to produce high quality diagnostic information and optimize patient care.
4. Prepare to take and pass the ARDMS ultrasound physics and/or specialty-related registry examinations.

The learning outcomes expected of students in the vascular sonography certificate program include the following. By the end of the program, the student will be able to:

1. Apply knowledge of fluid dynamics when interpreting vascular ultrasound images.
2. Describe the hemodynamic changes that occur in arterial and venous systems.
3. Identify the risk factors, signs, and symptoms associated with arterial and venous vascular diseases.
4. Utilize noninvasive vascular testing to assess arterial and venous circulation.
5. Perform protocol scanning and accurately identify diagnostic findings for cerebrovascular, peripheral, and abdominal vascular ultrasound examinations.
6. Correlate vascular ultrasound findings with results from other imaging modalities.
7. Describe current treatment options for arterial and venous diseases.
8. Demonstrate appropriate work ethic, communication skills, and patient care qualities characteristic of a professional vascular sonographer.
9. Apply to sit for a national registry certification examination for vascular sonography.

**3. Discuss how general education requirements will be met, if applicable.**

Students must have successfully completed the following courses (or their equivalents) prior to enrollment in the DMS vascular certificate program:

		<u>Credits</u>
BIOL-101	General Biology I	4
BIOL-203	Anatomy and Physiology I	4
BIOL-204	Anatomy and Physiology II	4
ENGL-121	College Composition	3
MATH-141	College Algebra	3
PHYS-101	Technical Physical Science	4
PSYC-101	General Psychology	3
SPCH-110	Interpersonal Communication	<u>3</u>
		28

**4. Identify any specialized accreditation or graduation certification requirements for this program and its students.**

There are no accreditation requirements for this program and its students as all applicants must already have graduated from a Commission on Accreditation of Allied Health Education Programs (CAAHEP)-accredited institution and must currently hold a specialty certification. Having current registry status will enable students to qualify for an additional vascular certification after successful completion of the program.

**C. Critical and compelling regional or statewide need as identified in the State Plan:**

**1. Demonstrate demand and need for the program in terms of meeting present and future needs of the region and the State in general based on one or more of the following:**

**The need for advancement and evolution of knowledge**

The HCC vascular sonography certificate program serves market demands of the region and the State. To define this need, a recent search of several online job sites was conducted. Criteria were entered to narrow the search so results focused on ultrasound jobs either requiring vascular certification or preferring vascular certification in addition to other specialty certifications. In addition, searches were performed for vascular sonography jobs located in an area covering Maryland, West Virginia, the District of Columbia, and Virginia. Overall, more than 50 job postings were identified with full-time, part-time, or PRN opportunities. The fact that almost half of these jobs requested multiple certifications including vascular sonography supports the need for existing sonographers to advance their knowledge to include the vascular ultrasound specialty.

**Societal needs including expanding educational opportunities and choices for minority and educationally disadvantaged students at institutions of higher education**

The DMS vascular sonography certificate program will offer expanded educational opportunities that facilitate a rapid acquisition of skills. Students will benefit from coursework designed to prepare them for an additional national certification that will enhance graduates' prospects for employment and job retention. Overall, the HCC vascular sonography certificate program provides a unique offering specifically designed to meet the needs of the current sonography workforce, thus reducing the amount of time required for program completion as compared to other certificate programs in the region. Less time spent learning an additional specialty, combined with a comprehensive educational program involving lecture, lab, and clinical components taught by fully credentialed instructors allows students to achieve high-quality and more efficient results that other local programs are not offering.

**2. Provide evidence that the perceived need is consistent with the Maryland State Plan for Postsecondary Education.**

Goal 1: MARYLAND WILL ENHANCE ITS ARRAY OF POSTSECONDARY EDUCATION INSTITUTIONS AND PROGRAMS, WHICH ARE RECOGNIZED NATIONALLY AND INTERNATIONALLY FOR ACADEMIC EXCELLENCE, AND MORE EFFECTIVELY FULFILL THE EVOLVING EDUCATIONAL NEEDS OF ITS STUDENTS, THE STATE, AND THE NATION

**Goal 1** of the 2013 Plan is to maintain and strengthen a system of postsecondary education institutions recognized nationally for academic excellence and effectiveness in fulfilling the educational needs of students and the economic and societal development needs of the state and the nation.

The DMS vascular sonography certificate program provides an enhanced postsecondary offering that meets the educational needs of students and relates to existing needs of the sonographer job market. Since the current ultrasound work environment values sonographers with proven aptitude as well as certification in multiple specialty areas, the certificate program will play a crucial role in cross-training students so they are more fully prepared to fill positions requiring multiple skill sets.

**D. Quantifiable & reliable evidence and documentation of market supply & demand in the region and State:**

**1. Present data and analysis projecting market demand and availability of openings in a job market to be served by the new program.**

Vascular sonographers work in the ultrasound and medical imaging department in various medical facilities. Careers for vascular sonographers are available in hospitals, physicians' offices, medical imaging clinics, diagnostic and interventional laboratories, and mobile services.

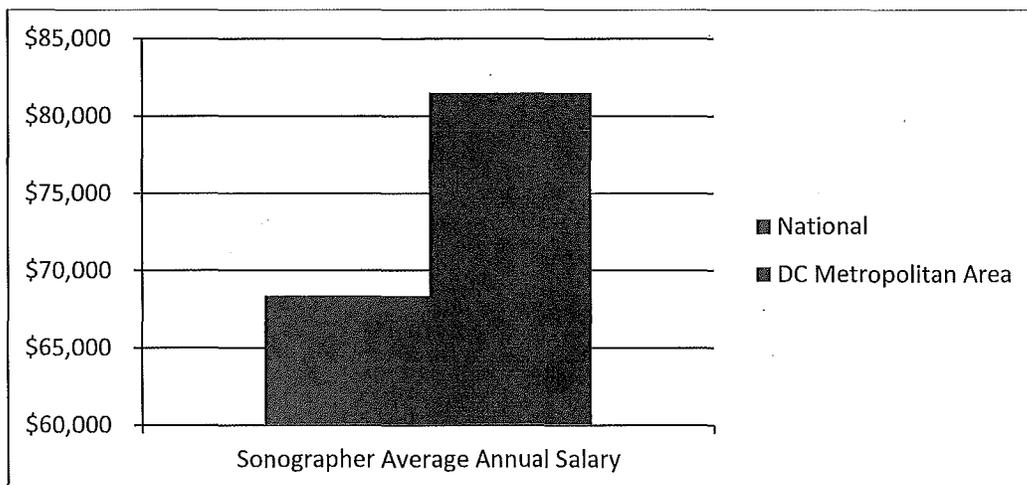
According to the U.S. Bureau of Labor Statistics (BLS), most diagnostic medical sonographers and cardiovascular technologists and technicians, including vascular technologists, work full time. Most diagnostic imaging workers were employed in hospitals in 2012, while others worked in healthcare settings such as physician's offices and medical and diagnostic laboratories ([www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm](http://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm)).

Additional statistics pertaining to expected job growth as provided by the BLS state that diagnostic medical sonographers, a category that includes vascular sonographers, are expected to experience a 39% growth in employment opportunities from 2012-2022 which is faster than the average growth predicted for all occupations.

The main growth areas are expected to be in employment of sonographers in physicians' offices and in medical and diagnostic laboratory settings due to the recent shift toward providing outpatient care whenever possible. Diagnostic medical sonographers of all types, including vascular technologists, will continue to be needed to provide diagnosis and treatment options due to the increasing number of aging adults more likely to require vascular diagnoses and interventions, expanded access to health insurance, and increased public access to medical care.

According to the BLS Occupational Outlook Handbook, certified diagnostic medical sonographers are expected to have the best job opportunities. In addition, increased job opportunities are present for sonographers certified in more than one specialty ([www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm#tab-6](http://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm#tab-6)).

The BLS also reports that the average national wage for all diagnostic medical sonographers in 2014 was \$32.88 per hour while the median annual wage for diagnostic medical sonographers was \$68,390. A search of employment statistics by state included information gathered in the expanded DC-VA-MD-WV metropolitan area that showed there were approximately 930 employed sonographers in the region as of May 2014. The hourly mean wage for sonographers in this area was \$39.18 which is higher than the national average of \$32.88. The annual mean wage for this region was \$81,500 which, again, is much higher than the national average of \$68,390.



**2. Discuss and provide evidence of market surveys that clearly provide quantifiable and reliable data on the educational and training needs and the anticipated number of vacancies expected over the next 5 years.**

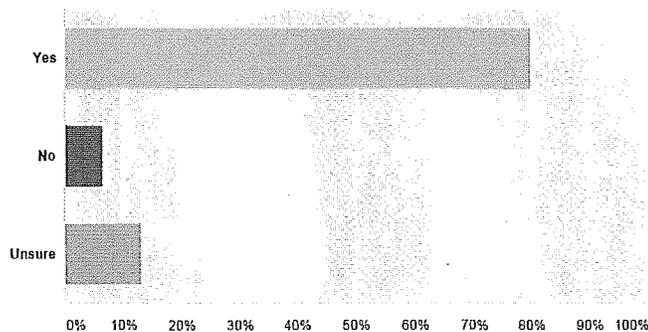
During 2015, the DMS program conducted a survey of clinical sonographers based on the premise that existing registered sonographers currently have limited options for educational opportunities that will allow them to gain enough experience in another ultrasound specialty area to gain certification. The survey results were meant to explore the feasibility of establishing a program to meet these needs, to help define program concentration areas, and to assist with eventual instructional design. The attached full report of the survey results (Appendix A) represents the first step taken toward the development of a professional certificate-level DMS program. Highlights are presented here.

The survey results represented views of certified sonographers from all three major ultrasound disciplines: cardiac, general, and vascular sonography. The participant responses were gathered from a sample of current DMS program clinical sites and represented 10 of the 15 sites asked to distribute the survey to their employees.

Interesting findings include a majority of sonographers (80%) indicated a desire to attend a training program specifically designed to cross-train them in another specialty ultrasound area. In terms of the preferred time requirements of such a program, participants were almost evenly split between wanting a two-year program with part-time clinical instruction and a one-year program with a more intensive full-time clinical component. One participant provided a comment that working full-time would interfere with being able to attend the option with a full-time clinical expectation. The HCC vascular certificate program would be able to meet all of these needs by offering an accelerated six-month completion track, flexibility of scheduling coursework and lab experiences during evening and weekend hours, and limited required clinical time of only 16 hours per week. These features would meet the needs of the working student.

**Would you or your employees be interested in attending a training program specifically designed to allow for the addition of another ultrasound specialty area to your/their professional skills?**

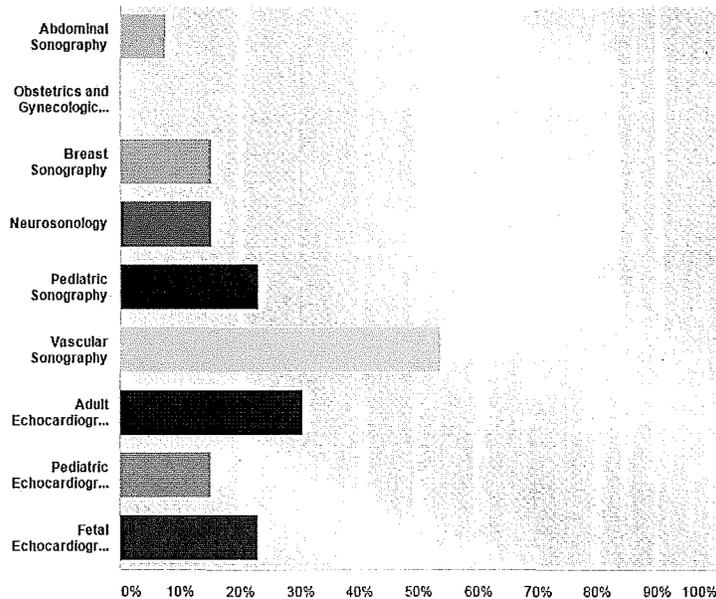
Answered: 15 Skipped: 0



In terms of which specialty areas would be considered for additional certifications, the majority (54%) of participants selected vascular sonography as their preferred choice. The HCC vascular certificate program would meet this expressed need. The next most popular option was adult echocardiography which was preferred by 31% of participants. Beyond those choices, there was equal interest (23%) in specialties such as fetal echocardiography and pediatric sonography as well as equal interest (15%) in pediatric echocardiography, neurosonology, and breast sonography topics.

**If you gained another ultrasound certification, which specialty/specialties would you consider? (Check all that apply)**

Answered: 13 Skipped: 2



Ultrasound certification requires an ultrasound physics exam in addition to a specialty exam. Among those sonographers who would be interested in obtaining American Registry for Diagnostic Medical Sonography (ARDMS) credentials in a new specialty area, some currently registered sonographers would need to take the ARDMS physics SPI exam. More than a third of the sonographers surveyed (40%) would require a preparation course to get ready for the SPI exam. Potential explanations for the 53% who replied that they would not need an SPI preparation course include already having passed the SPI exam or not understanding the ARDMS requirement for this exam despite the fact that a registered sonographer may have already passed a previous version of the physics exam that was called the Ultrasound Physics and Instrumentation (UPI) exam. Anyone who has passed the UPI exam and is seeking a new specialty registry must pass the SPI exam. The HCC vascular certificate program provides a registry review course specifically designed to meet this need.

Regardless of which new area of interest is studied, most sonographers (94%) agreed that is important for a certificate program to include the hands-on clinical experience needed to be registry eligible. To that end, more than a third of participants (40%) work at job sites that can offer hands-on cross-training in other specialty areas. However, most participants (67%) remain unsure if their job sites can offer a six-month full-time clinical externship. Because these sites already work with our DMS program for part-time clinical rotations, it is already known that these opportunities exist and this was not included as a survey question.

**E. Reasonableness of program duplication:**

- 1. Identify similar programs in the State and/or the same geographic area. Discuss the similarities and differences between the proposed program and others in the same degree to be awarded.**

Similar ultrasound programs in the area include offerings at Montgomery College, University of Maryland Baltimore County (UMBC), and Johns Hopkins School of Medical Imaging (JHMI). Besides HCC, the only other program that offers an associate of applied science (AAS) degree in diagnostic medical sonography is Montgomery College. The length of time for the degree program at

Montgomery College is the same as at HCC as both require degree students to spend two full years on full-time didactic and clinical education for completion. Neither Montgomery College nor HCC currently offer a certificate-level program for returning students.

Both UMBC and JHMI offer certificate programs only. Both of these colleges have accelerated programs that require full-time status and include a combination of both didactic and clinical instruction. Likewise, both programs require applicants to already have an associate's degree; however, applicants from other disciplines besides ultrasound are able to apply for acceptance. As such, these programs are not designed solely to expand the skill set of currently registered sonographers. In terms of timing for completion, both programs are similar as UMBC requires 13.5 months and JHMI requires 14 months. Concentrations offered in the UMBC certificate program include general, vascular, and cardiac sonography. Concentrations offered in the JHMI certificate program include general and vascular sonography.

Unlike the programs offered at UMBC and JHMI, the one at HCC is specifically designed to assist DMS degree program graduates and currently registered sonographers in gaining an additional specialty. Admission to the HCC DMS vascular certificate program is based upon a student's successful completion of a CAAHEP-accredited DMS program, proof of current national registry certification, and proof of recent professional practice in a clinical setting. Graduation from a CAAHEP-accredited program must have taken place no more than 10 years prior to admission to the certificate program. Applicants must provide proof of recent professional practice that must have occurred no later than two years prior to admission to the certificate program.

Because the HCC admission requirements are more tailored to serve the existing ultrasound professional community, the program is able to offer an accelerated learning track that will require only six months to complete rather than the longer programs offered by UMBC and JHMI. This is possible because the admission requirements facilitate a student's immediate study of the vascular specialty area without having to take preliminary foundational courses such as introduction to ultrasound, sectional anatomy, pathophysiology, or ultrasound physics courses which are designed for students studying the field for the first time. Certificate students will have already taken these courses and will demonstrate their capability to work in a clinical environment as a certified sonographer through proof of their education, registry status, and professional practice.

Similar to the certificate programs at UMBC and JHMI, the one at HCC will include a combination of both didactic and clinical coursework. The didactic courses are necessary to provide students with the theoretical and laboratory practice needed for professional knowledge of vascular sonography application, practice, and interpretation. The clinical courses will provide students the opportunity to further develop their vascular skills in a clinical setting working on real patients and with other health care professionals in a team environment. Verification of this clinical experience is required when graduates from the program apply to sit for the ARDMS national vascular technology certification exam.

**F. Relevance to Historically Black Institutions (HBIs)**

Because of the small number of ultrasound programs in the area, the vascular certificate program is not anticipated to have any impact on the implementation or maintenance of high-demand programs at HBIs. In addition, the program is not anticipated to impact the uniqueness, institutional identities, nor missions of HBIs.

**G. If proposing a distance education program, please provide evidence of the Principles of Good Practice (as outlined in COMAR 13B.02.03.22C).**

The vascular certificate program will not be a distance education program.

**H. Adequacy of faculty resources (as outlined in COMAR 13B.02.03.11).**

The DMS program faculty who will teach vascular sonography certificate program courses have the proper national credential of Registered Vascular Technologist (RVT), have worked or are currently working in clinical settings, and have years of experience teaching vascular sonography lecture, lab, and clinical courses in DMS degree programs. Both faculty have advanced degrees and have been working with the HCC DMS program since its inception. The following table summarizes the vascular program faculty credentials.

Name	Appointment Type	Degree	Title	Status	Courses Will Teach
James Hwang, MD, MPH, RDMS, RVT, RDCS	12-month	MD MPH	Associate Professor	Full-time	DMSU-181 DMSU-282
Matt Theis, RVT	Hourly	AAS (DMS) BS (Engineering)	Instructor	Part-time	DMSU-141 DMSU-142 DMSU-143

**I. Adequacy of library resources (as outlined in COMAR 13B.02.03.12).**

Much more than a collection of books, the library is a tremendous resource for all HCC students, faculty, staff, and the Howard County community. Our knowledgeable and helpful staff are available to help students with class research, connect them to the right resources, and even suggest books that will entertain them when they're not in class. The library offers both online and print publications, as well as quick, efficient, and courteous service.

Open seven days a week in the fall and spring semesters, the library is outfitted with group study rooms, quiet zones, silent areas, and seating areas for comfortable reading. We also have computer labs, a group viewing room, and group computing spaces.

Key library resources and services include databases to search for articles, research/course guides for subject areas and specific courses, and assistance finding books, ebooks, DVDs, video tapes, and CDs.

**J. Adequacy of physical facilities, infrastructure and instructional equipment (as outlined in COMAR 13B.02.03.13).**

The HCC DMS lab is well equipped with a variety of ultrasound machines capable of vascular scanning. Imaging equipment includes Philips iU22 and iE33 models, a Toshiba Aplio 500, and GE Logic P6, Logic E9, and Voluson i ultrasound machines. All of these machines have a variety of preset applications for vascular imaging facilitating instruction of peripheral, abdominal, and cerebrovascular diagnostic ultrasound exams. In addition, the DMS program has a CorVascular noninvasive vascular testing unit that allows students to perform non-imaging vascular testing such as segmental pressures and Doppler studies. With five scan bays, a bank of six computers for viewing of exams, and 10 work desks, the DMS program lab has ample room to accommodate several students for studying, lectures, and scanning practice purposes.

**K. Adequacy of financial resources with documentation (as outlined in COMAR 13B.02.03.14).**

<b>TABLE 1: RESOURCES</b>					
<b>Resource Categories</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
1. Reallocated Funds	0	0	0	0	0
2. Tuition/Fee Revenue (c + g below)	\$9464	\$14742	\$15288	\$15834	\$16458
a. Number of F/T Students	0	0	0	0	0
b. Annual Tuition/Fee Rate	0	0	0	0	0
c. Total F/T Revenue (a x b)	0	0	0	0	0
d. Number of P/T Students	4	6	6	6	6
e. Credit Hour Rate	13	13	13	13	13
f. Annual Credit Hour Rate	\$182	\$189	\$196	\$203	\$211
g. Total P/T Revenue (d x e x f)	\$9464	\$14742	\$15288	\$15834	\$16458
3. Grants, Contracts & Other External Sources	0	0	0	0	0
4. Other Sources	0	0	0	0	0
<b>TOTAL (Add 1 – 4)</b>	<b>\$9464</b>	<b>\$14742</b>	<b>\$15288</b>	<b>\$15834</b>	<b>\$16458</b>

**Revenue and Fees**

The projected tuition and fees listed here for Year 1 are based on the published 2016 HCC tuition rate per credit of \$132 plus a \$50/credit lab fee for the certificate program total of 13 credit hours. For years 2-5, anticipated tuition and fees are adjusted to include a 4% increase for each year.

The projected enrollment is based on reported levels of interest by current students in the DMS program general concentration as well as in the clinical community as described in the survey results provided in the main MHEC proposal. The main limitation on student enrollment will be the number of clinical site placements that can be contracted for student rotations. Vascular student enrollment in the DMS degree program has not risen above six (6) students since the program began. This has been a manageable number for the degree program and active recruiting to expand the number of vascular clinical sites is in progress. This will ensure enough clinical placements to accommodate the extra certificate students.

**TABLE 2: EXPENDITURES**

<b>Expenditure Categories</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>
1. Faculty (b + c below)	0	0	0	0	0
a. # FTE	0	0	0	0	0
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0
2. Admin. Staff (b + c below)	0	0	0	0	0
a. # FTE	0	0	0	0	0
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0
3. Support Staff (b + c below)	0	0	0	0	0
a. # FTE	0	0	0	0	0
b. Total Salary	0	0	0	0	0
c. Total Benefits	0	0	0	0	0
4. Equipment	0	0	0	0	0
5. Library	0	0	0	0	0
6. New or Renovated Space	0	0	0	0	0
7. Other Expenses	\$1512	\$1572	\$1634	\$1699	\$1766
<b>TOTAL (Add 1 – 7)</b>	<b>\$1512</b>	<b>\$1572</b>	<b>\$1634</b>	<b>\$1699</b>	<b>\$1766</b>

**Other Expenses**

The HCC DMS Vascular Certificate program will require a part-time instructor to assist with course labs. The figures provided account for one part-time instructor paid for four (4) lab hours of work during a full semester (14 weeks). The expenditures for Year 1 are based on an hourly pay rate of \$27. From this starting point, additional expected expenditures for Years 2-5 include a 4% increase in the hourly pay per year.

**L. Adequacy of provisions for evaluation of program (as outlined in COMAR 13B.02.03.14).**

Evaluation/assessment is conducted at both the program level and the course level at HCC. Every program and course offered by the college is evaluated once every five years as prescribed by the vice president of academic affairs. The Learning Outcomes Assessment office assists faculty in

course, program, and general education evaluation. At the course level, student evaluations (Individual Development and Educational Assessment (IDEA) surveys) are administered every semester; results are monitored by division deans. The IDEA survey process provides statistical measures along with written responses from students. Courses and faculty members needing improvement, as determined by the division dean, are brought to the attention of the course coordinator who, in concert with the dean, develops a plan for improvement. Additionally, faculty are observed, at intervals specified the division dean, by a full-time faculty member assigned by the dean.

At the program level, each dean determines the schedule of program assessment for their division. Program assessment is a comprehensive evaluation covering areas such as program outcomes, student learning outcomes, faculty, library resources, facilities resources, advising, student organizations, and improvement action steps.

**M. Consistency with the State's minority student achievement goals (as outlined in COMAR 13B.02.03.15).**

HCC maintains an open door policy of admission. Persons who have the maturity and ability to benefit from the college's learning programs will be admitted on a space-available basis without regard to race, sex, age, religion, ethnic background, marital status, sexual orientation, political persuasion, or disability. No student will be denied initial admission to the college on the basis of previous educational experience, except as prescribed by law.

HCC provides an environment that is inclusive and supportive for all constituencies in its community. Differences in age, gender, sexual orientation, race, religion, ethnic backgrounds, and ability/disability are respected. The college values equal rights, equal access, and equal treatment. Diversity is a focal concern in all aspects of the college including, but not limited to, recruitment and hiring practices, faculty and staff training opportunities, professional development offerings, selective admissions programs, student enrollment, public relations, and student activities.

HCC's Affirmative Action definition is as follows: HCC's affirmative action includes proactive steps to recruit and retain minorities. In recruiting, the college advertises with sources directed specifically at minority candidates in order to improve the diversity of the candidate pool. For the current workforce, the college has a comprehensive diversity plan which includes objectives to improve knowledge of and sensitivity to minority issues, and aids in the retention of minorities.

The Board of Trustees of HCC has committed the college to an ongoing diversity program and to regularly review progress towards the objectives of the Diversity Plan. The objectives include "ensuring that each recruitment makes a reasonable effort to seek out applicants from underrepresented groups in order to provide a diverse applicant pool" and "meeting educational needs that promote sensitivity and value diversity by proactively identifying areas in which programs may be needed and encouraging the development and continual improvement of a curriculum of inclusion."

**N. Relationship to low productivity programs identified by the Commission:**

The vascular certificate program is not directly related to an identified low productivity program.

## References

Bureau of Labor Statistics (2014-2015). *Occupational Outlook Handbook*. Retrieved from <http://www.bls.gov/ooh/healthcare/diagnostic-medical-sonographers.htm>

Bureau of Labor Statistics (2015). Overview of BLS Wage Data by Area and Occupation. Retrieved from <http://www.bls.gov/bls/blswage.htm>

Ultrasound Technician Center (n.d.). Sonography Technician Salary Overview. Retrieved from <http://www.ultrasoundtechniciancenter.org/salary/overview.html>

## Appendix A

### Survey Regarding Proposed DMS Certificate Program

#### Background

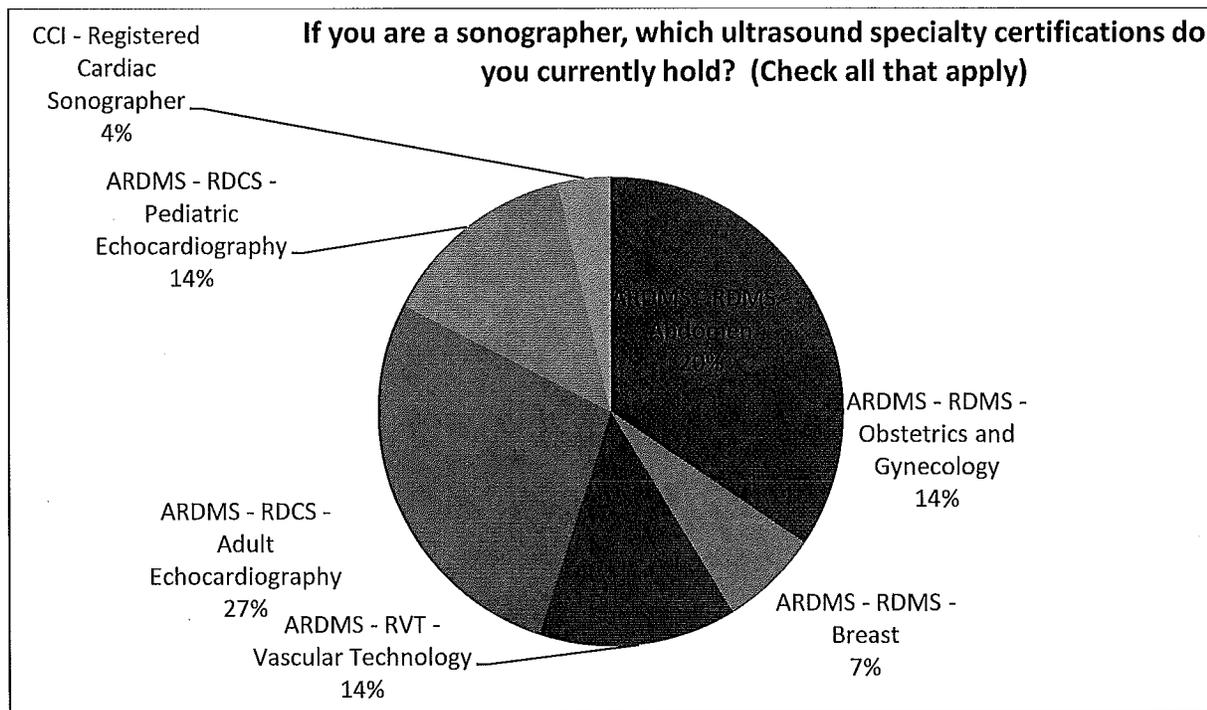
Existing registered sonographers currently have limited options for educational opportunities that will allow them to gain enough experience in another ultrasound specialty area to gain certification. The survey results presented here are meant to explore the need for such a program, to help define program concentration areas, and to assist with eventual instructional design. This report represents the first step in the development of a professional certificate level DMS program.

The 14 survey responses represented sonographers from 10 out of the 15 clinical sites surveyed. Participants were asked to provide their current credentials in addition to specialty certifications they are interested in obtaining. Potential program options were considered including whether or not there is a need for an ultrasound physics refresher course component which is linked to a separate required registry exam before full specialty certification may be granted. In addition, participants were asked about potential opportunities for cross-training and gaining significant clinical experience at their individual sites.

Surveys were distributed on paper and results were entered into the SurveyMonkey online system for ease of reporting. Participants were asked to complete the surveys honestly and to the best of their ability. Survey results were collected and analyzed to produce this report.

#### Results

##### Question 1:



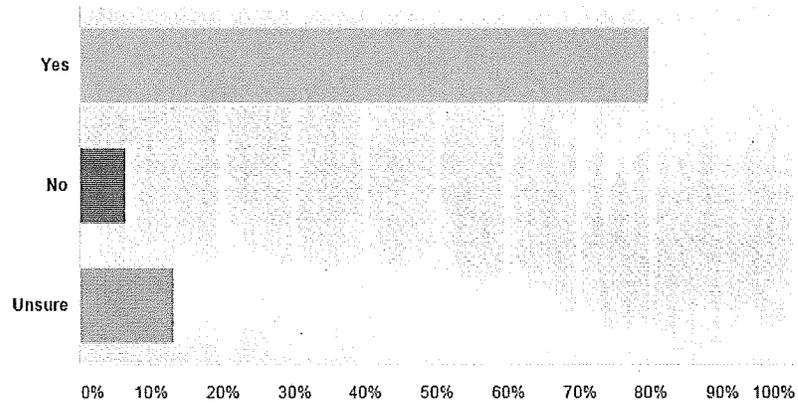
Of the 15 survey responses, 13 survey respondents had professional certification registries through the American Registry for Diagnostic Medical Sonography (ARDMS). Of the total 15 participants, 57% were sonographers with current ARDMS certification in Adult Echocardiography, 43% were registered by the ARDMS for Abdominal Sonography, 29% were registered by ARDMS in Obstetrics and Gynecology, 29% had Vascular Technology ARDMS certification, 29% had ARDMS Pediatric Echocardiography certification, 14% were certified by the ARDMS in Breast Sonography. Only 7% of participants held a

Registered Cardiac Sonographer certification that was granted by Cardiovascular Credentialing International (CCI). One survey respondent did not answer this question.

**Question 2:**

**Would you or your employees be interested in attending a training program specifically designed to allow for the addition of another ultrasound specialty area to your/their professional skills?**

Answered: 15 Skipped: 0

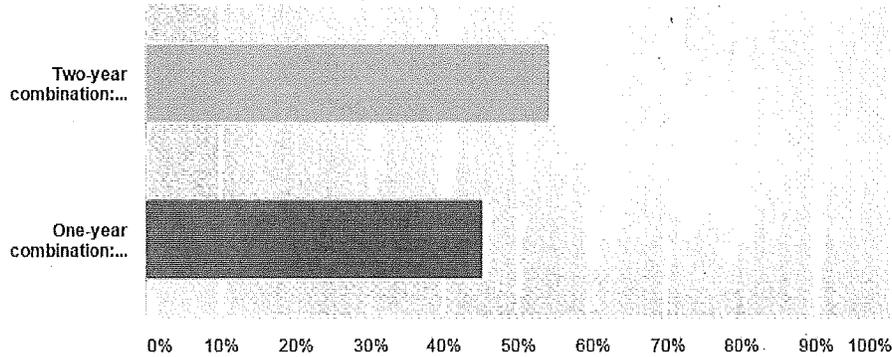


Twelve of the 15 survey participants (80%) responded that they would be interested in attending a training program designed to allow for the addition of another ultrasound specialty area to their current skill set. Two other participants (13%) were unsure if they were interested in such a program. One respondent (6%) indicated they were not interested in such a program.

**Question 3:**

**If you were considering a certificate level ultrasound program for yourself or your employees, which program structure would be most appealing to you? (Check all that apply)**

Answered: 11 Skipped: 4

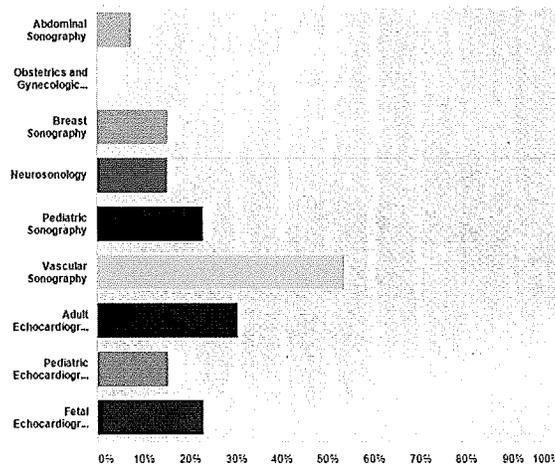


In response to which program structure would be most appealing, the 11 participants who answered the question directly were almost evenly divided between preferring a two-year option with part-time clinical requirements and a one-year option with six months of full-time clinical requirements. Of the four that did not answer the question directly, two participants were unsure which program would be more appealing and two participants did not reply to this question.

**Question 4:**

**If you gained another ultrasound certification, which specialty/specialities would you consider? (Check all that apply)**

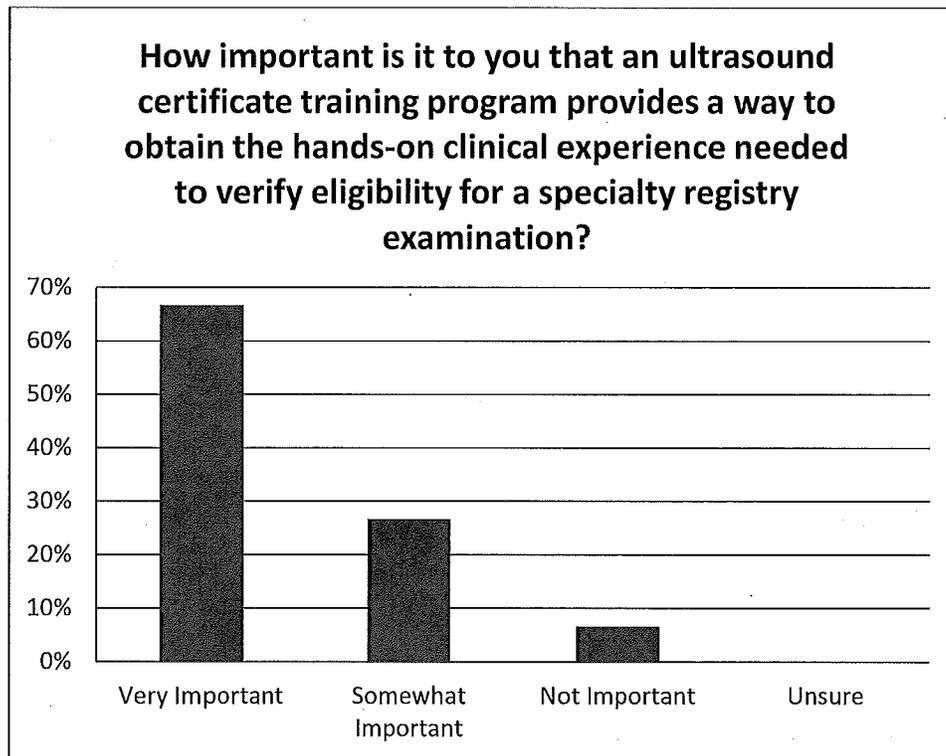
Answered: 13 Skipped: 2



When asked which additional ultrasound specialty certifications they would like to obtain, 54% of participants indicated vascular sonography, 31% selected Adult Echocardiography, 23% chose Pediatric Sonography, 23% indicated Fetal Echocardiography, 15% chose Breast Sonography, 15% selected Neurosonology, 15% selected Pediatric Echocardiography, and 8% chose Abdominal Sonography. The

only specialty area not selected as an area of interest by any of the participants was Obstetric and Gynecologic Sonography. Two out of the 15 survey participants skipped this question.

**Question 5:**

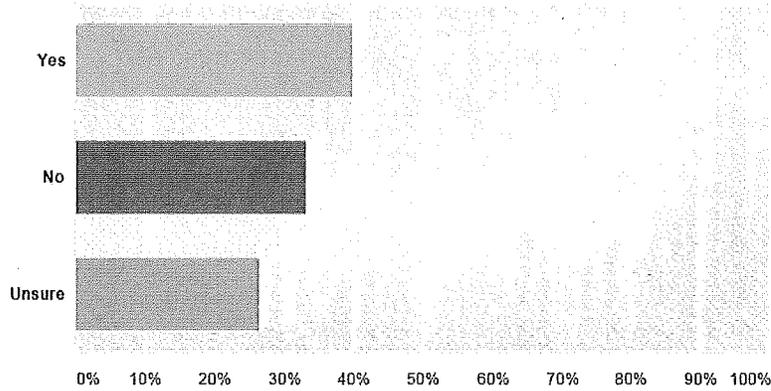


Participants were asked to rank the importance of acquiring the hands-on clinical experience necessary for registry exam eligibility. The majority of participants (94%) indicated that this was a very important (67%) or somewhat important (27%) component to an ultrasound certificate training program. Only one participant indicated that this was not important and that accounted for 7% of the responses.

**Question 6:**

**Does your current job offer cross-training so sonographers can gain hands-on experience in an ultrasound specialty other than their current credentialed areas?**

Answered: 15 Skipped: 0

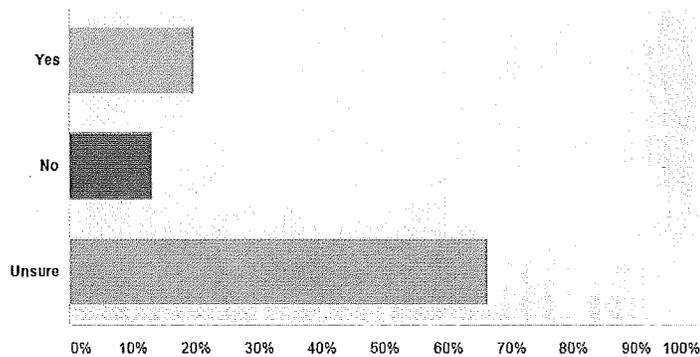


When asked if their current jobs offer hands-on cross-training opportunities in specialty areas other than their current certifications, 40% of participants responded that this was available. Another 33% of participants indicated that this was NOT available at their jobs and 27% of participants were unsure.

**Question 7:**

**Would your current job be willing to be the site for a 6 month full-time clinical externship for a registered sonographer wishing to gain practical scanning experience in a new specialty area?**

Answered: 15 Skipped: 0

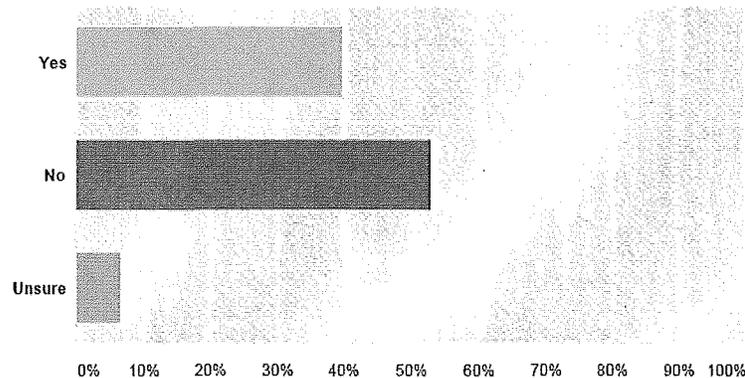


When asked if their current jobs would be willing to be a site for a 6 month full-time clinical externship the majority (67%) of survey respondents were unsure. However, 20% indicated that their jobs would be willing. Another 13% indicated that their jobs would NOT be willing to be a clinical site for these circumstances.

## Question 8:

**Would you require a course to prepare you for the ARDMS Sonography Principles and Instrumentation (SPI) board exam if you were to return for training in a new ultrasound specialty?**

Answered: 15 Skipped: 0



The final survey question gauged whether or not participants would need a separate course to prepare for the ARDMS Sonography Principles and Instrumentation (SPI) board exam. This is important because ARDMS certification requires a minimum of two exams, the SPI and one specialty exam. Currently registered sonographers may need to re-certify the ultrasound physics portion in order to gain a new specialty certification according to ARDMS requirements. Of the survey participants, 54% indicated that they would NOT need an SPI course. However, 40% of respondents replied that they would need an SPI course in addition to the specialty and clinical portions of a certificate program. Another 6% were unsure.

### Findings

The survey results represented views of certified sonographers from all three major ultrasound disciplines: cardiac, general, and vascular sonography. The participant responses were gathered from a sample of current DMS program clinical sites and represented 10 of the 15 sites asked to distribute the survey to their employees.

Interesting findings include a majority of sonographers (80%) indicating a desire to attend a training program specifically designed to cross-train them in another specialty ultrasound area. In terms of the preferred time requirements of such a program, participants were almost evenly split between wanting a two-year program with part-time clinical instruction and a one-year program with a more intensive full-time clinical component. One participant provided a comment that working full-time would interfere with being able to attend the option with a full-time clinical expectation.

In terms of which specialty areas would be considered for additional certifications, the majority (54%) of participants selected Vascular Sonography as their preferred choice. The next most popular option was Adult Echocardiography which was preferred by 31% of participants. Beyond those choices, there was equal interest (23%) in specialties such as Fetal Echocardiography and Pediatric Sonography as well as equal interest (15%) in Pediatric Echocardiography, Neurosonology, and Breast Sonography topics.

Ultrasound certification requires an ultrasound physics exam in addition to a specialty exam. Among those sonographers who would be interested in obtaining ARDMS credentials in a new specialty area, some currently registered sonographers would need to take the ARDMS physics SPI exam. More than a third of the sonographers surveyed (40%) would require a preparation course to get ready for the SPI exam. Potential explanations for the 53% who replied that they would NOT need an SPI preparation

course include already having passed the SPI exam or not understanding the ARDMS requirement for this exam despite the fact that a registered sonographer may have already passed a previous version of the physics exam that was called the Ultrasound Physics and Instrumentation (UPI) exam. Anyone who has passed the UPI exam and is seeking a new specialty registry must pass the SPI exam.

Regardless of which new area of interest is studied, most sonographers (94%) agreed that is important for a certificate program to include the hands-on clinical experience needed to be registry eligible. To that end, more than a third of participants (40%) work at job sites that can offer hands-on cross-training in other specialty areas. However, most participants (67%) remain unsure if their job sites can offer a 6 month full-time clinical externship. Because these sites already work with our DMS program for part-time clinical rotations, it was already known that these part-time opportunities exist and this was not included as a survey question.

### **Conclusion and Recommendations**

Based on the survey results, the development of a certificate level DMS program specifically designed for existing registered sonographers is a desirable idea among sonographers at several of our DMS clinical sites. A preference for training in vascular sonography was expressed as well as the need for a significant clinical component to be included as part of the certificate program. In addition, the findings indicate that some of the surveyed clinical sites may be willing to provide clinical experiences for program students.

It is recommended that the DMS program continue to explore the addition of a certificate program as an option for currently registered sonographers. In particular, offering vascular sonography may result in the highest interest and potential enrollments. Next steps would include developing program goals and objectives, evaluating current DMS courses for possible inclusion in the certificate program as well as developing any new courses required. To ensure optimal student success toward their career goals, implementation of an SPI preparation course either in the program or through the HCC office of continuing education should be considered.