



Community Regional Medical Center – Fresno, CA

ADVANCED CARDIOVASCULAR SONOGRAPHY PROGRAM

Thank you for your strong interest in our **Advanced Cardiovascular Sonography Program** through Community Regional Medical Center. We are excited about the possibility of you joining us for our 2026-27 cohort. In response to your request, let me take just a moment to acquaint you with the particulars of our program.

OVERVIEW

About the Program

The CRMC Advanced Cardiovascular Sonography Program (Cardiac and Vascular learning concentrations) has been developed in response to the Cardiology and Vascular profession request and need to create a career track for sonographers who practice at an advanced level in the echocardiography or vascular laboratory. The objective of this educational program is to prepare graduates who are committed to improving lab quality and efficiency through preparing preliminary imaging assessments; performing advanced echocardiography or vascular exams; mentoring fellows, students, residents, and staff; developing and implementing educational plans; facilitating continuous quality improvement; and coordinating cardiac or vascular ultrasound research.

About the Hospital – Community Regional Medical Center

We provide central California residents with the highest level of care available in the region. Our affiliation with University of California San Francisco Medical School – one of the top medical schools in the nation – gives you access to some of the brightest medical specialists in the country. And our ongoing investment in technology offers you leading-edge treatments. We're known for having the only Level I trauma and comprehensive burn center between Sacramento and Los Angeles and for having the region's first Lung Nodule program designed to expedite care for lung cancer patients.

We were the first hospital in the world to offer Generation 4 CyberKnife technology for treating cancer and our one-of-a-kind Central California Neuroscience Institute brings together clinical experts in brain tumors, stroke, dementia, Parkinson's Disease, Alzheimer's and more.

As a leader in cardiac services, we are one of the few hospitals in the nation chosen to administer the HeartMate II, a life-saving heart pump for patients waiting for a heart transplant. CRMC is proud to support our IAC Cardiology and Vascular labs.

We are one of the busiest birthing centers in California and have the largest Level III neonatal intensive care unit in the Valley. Our combined expertise in both adult and newborn medicine makes our hospital the only in the area where recovering mothers and critically ill babies can stay together for the treatments they need.

Licensing & Accreditation

Community Regional Medical Center's Advanced Cardiovascular Sonography Program is licensed in California by the Bureau for Private Postsecondary Education. It is programmatically accredited by the Commission on Accreditation of Allied Health Programs (CAAHEP) (Cardiac learning concentration only). Community Regional Medical Center is accredited by The Joint Commission.

Program Design

The hybrid program design will be utilized. The didactic component will be delivered online with minimal ZOOM instruction. Three weeks of the clinical internship (120 hours) will be completed at Community Regional Medical Center in Fresno, CA. The other 120 clinical internship hours will be completed via distance learning (ZOOM) instruction and assigned projects).

FACULTY

Program Director/Principal Instructor

Joy Guthrie, PhD., ACS, RDMS, RDCS, RVT

Medical Advisor/Instructor

Teresa Daniele, MD

Cardiologist

Cardiac Learning Concentration

Medical Advisor/Instructor

Leigh Ann O'Banion, MD

Vascular Surgeon

Vascular Learning Concentration

Administrative Assistant

Jasmin Valdovinos



COURSE DESCRIPTIONS

Rev. 12/2/24

CARDIAC LEARNING CONCENTRATION

ACS 001 Physics and Instrumentation

Course length: 5 weeks

Course Description: This course will provide an extensive review of Ultrasound Physics and Instrumentation. Topic will include advanced hemodynamics, Doppler equation, spectral analysis and color flow imaging, 3D (TTE and TEE), Harmonics, contrast agents, biological effects, image acquisition and storage, quality control, equipment selection, image optimization, and recent advances in technology and ultrasound techniques.

ACS 002 *Advanced Cardiac Hemodynamics and Pathophysiology*

Course length: 5 weeks

Course Description: This course will provide an extensive review of Cardiac Hemodynamics, Physics, and Doppler principles. Advanced Physics, Instrumentation, and emphasis on flow related principles for image optimization will be reviewed. Cardiac hemodynamic instruction will include review of the cardiac cycle, ventricular function, autonomic nervous system, reflex and humoral control of the circulation, vascular and coronary flow, valvular heart disease and exercise physiology.

ACS 003 *Congenital Cardiovascular Disease*

Course length: 5 weeks

Course Description: Extensive review of both normal anatomy and congenital heart disease will be covered as noted by fetal echocardiography, pediatric echocardiography, and adult congenital echocardiography. Maternal and fetal risk factors, indications for fetal echocardiography, and care from fetal through adulthood will be covered. Topics to be covered include embryology, segmental intracardiac anatomy, cardiac chambers and septation, valve anatomy and dynamics, coronary artery anatomy, conotruncal abnormalities, situs abnormalities, and mediastinal structures.

ACS 004 *Acquired Cardiovascular Disease*

Course length: 5 weeks

Course Description: This course will provide an extensive review of acquired cardiovascular disease including: Valvular heart disease, ischemic heart disease, prosthetic valve disease, pericardial disease, cardiac trauma, cardiac masses, radiation heart disease, and diseases of the aorta.

ACS 005 *Instructional Techniques*

Course length: 5 weeks

Course Description: This course is designed to prepare the learner to present case studies, power point lectures, and facilitate educational sessions at your place of employment or when providing oversight of students. The student will prepare a power point lecture to be presented at an educational session during the clinical internship. Adult learning strategies, empowerment of employees or students, and educational integration into the echocardiographic laboratory will also be covered. Situational learning will also include scenarios related to department issues, i.e. disruptive behavior, noncompliance, protocol implementation, and quality assurance. Additional instruction in patient historical assessment, physical exam with incorporation of hemodynamic information, and chart review will be covered.

ACS 006 *IAC Accreditation Preparedness*

Course length: 5 weeks

Course Description: This course is designed to either prepare for IAC accreditation or facilitate the maintenance of an IAC accredited echocardiographic laboratory. The facility, staff, and physician compliance will be covered as well as an extensive review of the IAC quality assurance forms. The student will prepare for a mock quality assurance review and will present this during one of the clinical internship visits.

ACS 007 *Cardiovascular Pharmacology*

Course length: 5 weeks

Course Description: This course is a review of the most common pharmacologic agents utilized in the treatment of cardiovascular disease. Topics will include antihypertensives, diuretics, ACE inhibitors, Angiotension Receptor blockers, Calcium channel blockers, Antiarrhythmics, antiplatelet/anticoagulants, chronotropic and Inotropic agents, nitrates, Local anesthetics, prostaglandin, and vasopressors. The didactic component will be accompanied by an onsite Pharmacology instruction by one of our pharmacologists.

ACS 008 *Medical/Surgical Treatment of Cardiovascular Disease*

Course length: 5 weeks

Course Description: This course provides an extensive review of medical and surgical treatment of cardiovascular disease. This course presents a knowledge based approach to student learning. Various disease processes will be assigned to each student. The students will research medical journals, clinical trials, and established methods to discover the latest and most clinically relevant and accepted medical and /or surgical repair for the assigned topics. The student will present the results to the other students and faculty during the group clinical internship. Topics will include prosthetic valves, balloon valvuloplasty, TEE for hemodynamic monitoring, transcatheter aortic valve implantation, mitral repair, closure of prosthetic paravalvular leaks, surgical options in cardiomyopathies, device closures, myocardial biopsies, and other related topics.

ACS 009 *Clinical Trials and IRB Methodology*

Course length: 5 weeks

Course Description: This course is designed to prepare the learner for IRB submission, evaluating clinical trials related to the student's topic of interest, and performing a literature review. CITI training will be completed and a sample IRB application will be completed. Topics will include responsibilities and organization of research, clinical trial design, clinical trial study protocols, research clinical sites, statistical analysis, data handling and management, quality assurance, regulatory consideration, IRB application process, sample size, and subjects training.

ACS 010 *Research Methods and Biostatistics*

Course length: 5 weeks

Course Description: This course is an introduction to research methods and biostatistics. The learner will develop a research question, define the variables, write the code for the analysis, and define the methodology that will best answer the clinical question. Topics will include population surveys, hypothesis testing, outcomes research, randomized vs. nonrandomized methods, blinded, double blinded and nonblinded, simulations, and multiple biostatistical analysis methods of testing variables.

ACS 011 *Advanced Echocardiographic Modalities*

Course length: 5 weeks

Course Description: This course will provide an extensive review of advanced echocardiographic modalities. Topics will include Contrast echocardiography, myocardial perfusion, contrast vascular applications, 3D and 4D imaging techniques, 3D quantification, 3D volume imaging, heart failure assessment, strain imaging, and cardiac resynchronization.

ACS 012 *Comparative Imaging Analysis*

Course length: 5 weeks

Course Description: This course explores the strengths and weaknesses of echocardiography with comparison to other imaging modalities such as x-ray, cardiac catheterization, cardiac MRI, and cardiac nuclear medicine. This course will prepare the learner for the ancillary rotations provided during the clinical internship. Topics include coronary angiography and coronary artery imaging, rest and exercise electrocardiography and echocardiography, nuclear cardiology, MRI, and overall role of complementary imaging modalities in various conditions including CAD, myocardial diseases, valvular heart disease, diseases of the aorta, and congenital heart disease.

ACS 013 *Advanced Cardiac Sonographer Credentialing Exam Review (1)*

Course Length: 5 Weeks

Course Description: This course is designed to prepare the learner for the Advanced Cardiac Sonographer credentialing examination. This course will review the entire previous curriculum and provide a mock examination at the completion of the course. The entire ACS curriculum as outlined in Standards and Guidelines document of the Advanced Cardiovascular Sonography (CAAHEP) will be reviewed prior to graduation.

ACS 014 Healthcare Budgeting and Financial Management

Course Length: 5 Weeks

Course Description: This course offers an explanation of basic accounting concepts, including cash flow, operating costs, capital expenditures, and revenue and reimbursement. This will provide financial information in the context of health care including working with vendors to procure needed equipment for the hospital or healthcare setting. There will be real life examples provided to assist the Advanced Vascular Sonographer the needed skills to effectively manage their financial resources on a day-to-day basis, providing guidance for essential tasks such as preparing budgets, managing their department, and making decisions around financial issues.

ACS 015 Advanced Cardiac Sonographer Credentialing Exam Review (2)

Course Length: 5 Weeks

Course Description: This course is designed to prepare the learner for the Advanced Cardiac Sonographer credentialing examination. This course will review the entire previous curriculum and provide a mock examination at the completion of the course. The entire ACS curriculum as outlined in Standards and Guidelines document of the Advanced Cardiovascular Sonography (CAAHEP) will be reviewed prior to graduation.

ACS 016 Advanced Cardiac Sonographer Credentialing Exam Review (3)

Course Length: 5 Weeks

Course Description: This course is designed to prepare the learner for the Advanced Cardiac Sonographer credentialing examination. This course will review the entire previous curriculum and provide a mock examination at the completion of the course. The entire ACS curriculum as outlined in Standards and Guidelines document of the Advanced Cardiovascular Sonography (CAAHEP) will be reviewed prior to graduation.

ACS CL Clinical Internship (1-6)

Course length: 240 hours

Course Description: Three required synchronous weeks with the entire class will be scheduled at Community Regional Medical Center. Week one is orientation and introduction to the program and skills needed to complete the respective online coursework. Week two will be at the six-month mark to allow for onsite instruction by the Medical Director and Program Director, required group presentations, advanced echocardiographic techniques, and onsite image critique and analysis education. The last week will be the final clinical competencies and final proctored examination. The three remaining weeks are scheduled in an asynchronous fashion to be arranged between the individual student and the faculty. During these three weeks, the students will have assigned tasks with the sonography students, cardiac sonographers and the UCSF cardiac Fellows. In addition, the student will complete ancillary rotations through nuclear medicine, fetal echocardiography, NICU, adult congenital, and cardiac MRI.

ACS IC1 Image Critique and Analysis 1 (1-6)

Course length: 25 weeks (two hours per week)

Course Description: The focus of this course is to review a minimum of 250 echocardiographic cases with emphasis on protocol only. The student will apply a given protocol template to the review of these cases as to whether the case, does or does not, adhere to the established protocol. Image critique is of great importance to the advancement of the cardiac sonographer. This exercise will ensure the learner has a sharp recognition of protocol adherence. The template will be applied to the cases at the student's respective place of employment and will be ongoing. The image critique and analysis will be compared to the final interpretation by the interpreting physician to quantify degree of accuracy. The student will log the hours and cases using a de-identified methodology and will be reported to the faculty. The clinical competency will be tested by the faculty during the onsite clinical internship.

ACS IC2 *Image Critique and Analysis 2 (1-6)*

Course length: 25 weeks (two hours per week)

Course Description: The focus of this course is to review a minimum of 250 echocardiographic cases with emphasis on pathology recognition and reporting. The student will apply a given report template to the review of these cases as either normal or pathology using a systematic approach. Pathology recognition and analysis is of great importance to the advancement of the cardiac sonographer. This exercise will ensure the learner has a sharp recognition of both normal and abnormal cases. The template will be applied to the cases at the student's respective place of employment and will be ongoing. The image critique and analysis will be compared to the final interpretation by the interpreting physician to quantify degree of accuracy. The student will log the hours and cases using a de-identified methodology and will be reported back to the faculty. The clinical competency will be tested by the faculty during the onsite clinical internship.



COURSE DESCRIPTIONS

Rev. 2/8/24

VASCULAR LEARNING CONCENTRATION

AVS 001 *Physics and Instrumentation*

Course length: 5 weeks

Course Description: This course will provide an extensive review of Ultrasound Physics and Instrumentation. Topic will include advanced hemodynamics, Doppler equation, spectral analysis and color flow imaging, 3D techniques, Harmonics, contrast agents, biological effects, image acquisition and storage, quality control, equipment selection, image optimization, and recent advances in technology and ultrasound techniques.

AVS 002 *Vascular Hemodynamics and Pathophysiology*

Course length: 5 weeks

Course Description: This course will provide an extensive review of Vascular Hemodynamics, Physics, and Doppler principles. Advanced Physics, Instrumentation, and emphasis on flow related principles for image optimization will be reviewed. Vascular hemodynamic instruction will include review of the autonomic nervous system, reflex and humoral control of the circulation, vascular flow profiles, peripheral vascular resistance, vascular reserve, effects of hydrostatic pressure and venous stasis, vascular flow states and pre and post exercise physiology. The effects of risk factors on vascular assessment will also be discussed.

AVS 003 *Perioperative and Surgical Technique and Medical Chart Review*

Course length: 5 weeks

Course Description: This course provides an extensive overview of perioperative patient assessment, aseptic technique, operating room safety, anesthetic medications, needle safety, mock code and emergency and critical care procedures. The emphasis will be on the Advanced Vascular Sonographer role in interventional and surgical procedures. Additional instruction in patient historical assessment, physical exam with incorporation of hemodynamic information, and chart review will be covered.

AVS 004 *Acquired Vascular Disease*

Course length: 5 weeks

Course Description: This course will provide an extensive review of the risk factors, pathologic mechanism of disease, and typical signs and symptoms of acquired cerebrovascular, peripheral vascular, and abdominal vascular disease. Topics will include recognition of stroke symptoms, vascular steal phenomenon, correlation of lab values with vascular disease, trophic changes, clinical assessment of patient prior to imaging as well as recognizing acquired vascular disease by 2D, color flow, and spectral analysis across the entire systemic circulation.

AVS 005 *Instructional Techniques*

Course length: 5 weeks

Course Description: This course is designed to prepare the learner to present case studies, power point lectures, and facilitate educational sessions at your place of employment or when providing oversight of students. The student will prepare a power point lecture to be presented to the faculty online during asynchronous clinical internship. Adult learning strategies, empowerment of employees or students, and educational integration into the vascular laboratory will also be covered. Situational learning will also include scenarios related to department issues, i.e. disruptive behavior, noncompliance, protocol implementation, and quality assurance.

AVS 006 *IAC Accreditation Preparedness*

Course length: 5 weeks

Course Description: This course is designed to either prepare for IAC accreditation or facilitate the maintenance of an IAC accredited vascular laboratory. The facility, staff, and physician compliance will be covered as well as an extensive review of the IAC quality assurance forms. The student will prepare for a mock quality assurance review and will present this during one of the clinical internship visits.

AVS 007 *Vascular Pharmacology*

Course length: 5 weeks

Course Description: This course is a review of the most common pharmacologic agents utilized in the treatment of cardiovascular disease. Topics will include antihypertensives, antihyperlipidemics, diuretics, ACE inhibitors, Angiotension Receptor blockers, Calcium channel blockers, antiplatelet/anticoagulants, chronotropic and Inotropic agents, nitrates, Local anesthetics, prostaglandin, and vasopressors and other pharmacologic agents.

AVS 008 *Medical/Surgical Treatment of Vascular Disease*

Course length: 5 weeks

Course Description: This course provides an extensive review of medical and surgical treatment of Vascular disease. This course presents a knowledge based approach to student learning. Various disease processes will be assigned to each student. The students will research medical journals, clinical trials, and established methods to discover the latest and most clinically relevant and accepted medical and /or surgical repair for the assigned topics. The student will present the results to the other students and faculty online. Topics will include carotid endarterectomy, vascular bypass grafts, interventional balloon procedures, Dialysis grafts, direct and indirect aneurysm repair, and laser ablation techniques.

AVS 009 *Clinical Trials and IRB Methodology*

Course length: 5 weeks

Course Description: This course is designed to prepare the learner for IRB submission, evaluating clinical trials related to the student's topic of interest, and performing a literature review. CITI training will be completed and a sample IRB application will be completed. Topics will include responsibilities and organization of research, clinical trial design, clinical trial study protocols, research clinical sites, statistical analysis, data handling and management, quality assurance, regulatory consideration, IRB application process, sample size, and subjects training.

AVS 010 *Research Methods and Biostatistics*

Course length: 5 weeks

Course Description: This course is an introduction to research methods and biostatistics. The learner will develop a research question, define the variables, write the code for the analysis, and define the methodology that will best answer the clinical question. Topics will include population surveys, hypothesis testing, outcomes research, randomized vs. nonrandomized methods, blinded, double blinded and nonblinded, simulations, and multiple biostatistical analysis methods of testing variables.

AVS 011 *Advanced Vascular Techniques*

Course length: 5 weeks

Course Description: This course will provide an extensive review of advanced Vascular modalities. Topics will include contrast vascular applications, dialysis grafts, vascular grafts, 3D and 4D imaging techniques, Transcranial Doppler, pre and post-surgical imaging.

AVS 012 *Comparative Imaging Analysis*

Course length: 5 weeks

Course Description: This course explores the strengths and weaknesses of vascular Duplex exams with comparison to other imaging modalities such as x-ray, cardiac catheterization, MRA, and Computed Tomography Angiography, Interventional Radiology. This course will prepare the learner for the ancillary rotations at their respective place of employment.

AVS 013 *Healthcare Budgeting and Financial Management*

Course Length: 5 Weeks

Course Description: This course offers an explanation of basic accounting concepts, including cash flow, operating costs, capital expenditures, and revenue and reimbursement. This will provide financial information in the context of health care including working with vendors to procure needed equipment for the hospital or healthcare setting. There will be real life examples provided to assist the Advanced Vascular Sonographer the needed skills to effectively manage their financial resources on a day-to-day basis, providing guidance for essential tasks such as preparing budgets, managing their department, and making decisions around financial issues.

AVS 014 *Advanced Vascular Sonographer Mock Credentialing Exam Review (1)*

Course Length: 5 Weeks

Course Description: This course is designed to prepare the learner for a simulated Advanced Vascular Sonographer credentialing examination. This course will review the entire previous curriculum and provide a mock examination at the completion of the course.

AVS 015 Advanced Vascular Sonographer Mock Credentialing Exam Review (2)

Course Length: 5 Weeks

Course Description: This course is designed to prepare the learner for a simulated Advanced Vascular Sonographer credentialing examination. This course will review the entire previous curriculum and provide a mock examination at the completion of the course. The entire AVS curriculum will be reviewed prior to graduation.

COST

Tuition & Fees

Tuition	\$8,000.00
TOTAL TUITION AND FEES.....	\$8,050.00

Additional Expenses

Application Fee	\$50.00
Books*	\$1037.61
Materials*	\$50.00
CA Student Tuition Recovery Fee	4.57
TOTAL ADDITIONAL EXPENSES.....	\$1,142.18

TOTAL PROGRAM EXPENSE*	\$9,142.18
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**Estimate – Price Subject to Change*

These fees do not include travel and lodging fees which are the sole responsibility of the student. These fees will vary depending on the place of residence of each student. There are three weeks (Monday through Friday) required residencies during this program.

PREREQUISITES

Cardiac Learning Concentration

- Applicant must have a Bachelor's Degree (Master's preferred) (*In any field of study*)
- Applicant must be a credentialed sonographer in Adult Echocardiography (RDCS or RCS)
- Applicant must have a minimum of three years of clinical experience in an echocardiography laboratory
- In ADDITION, the following courses MUST have been passed with a cumulative grade of 2.5 or higher, with no individual grade lower than 2.0:
 - Anatomy (This course must include a lab.)
 - Physiology (This course must include a lab.)
 - Medical Terminology
 - General Physics (This course does NOT need to include a lab.)
 - Math (Algebra or higher. Statistics will also suffice.)
 - English (This prerequisite may be met by a variety of courses including Grammar, Composition, etc.)
 - Communication Skills (This prerequisite may be met by a variety of courses including Speech, Group Discussion, etc.)
- Applicants must be able to complete the required onsite clinical internship of 120 hours (three weeks) in Fresno, CA.

Vascular Learning Concentration

- Applicant must have a Bachelor's Degree (Master's preferred) (*In any field of study*)
- Applicant must be a credentialed sonographer in Vascular Technology (RVT or RVS)
- Applicant must have a minimum of three years of clinical experience in a vascular laboratory
- In ADDITION, the following courses MUST have been passed with a cumulative grade of 2.5 or higher, with no individual grade lower than 2.0:
 - Anatomy (This course must include a lab.)
 - Physiology (This course must include a lab.)
 - Medical Terminology
 - General Physics (This course does NOT need to include a lab.)
 - Math (Algebra or higher. Statistics will also suffice.)
 - English (This prerequisite may be met by a variety of courses including Grammar, Composition, etc.)
 - Communication Skills (This prerequisite may be met by a variety of courses including Speech, Group Discussion, etc.)
- Applicants must be able to complete the required onsite clinical internship of 120 hours (three weeks) in Fresno, CA.

DATES & APPLICATIONS

Dates for the Next ACSP Cohort

The next cohort will begin in January, 2026, and conclude in July, 2027.

Applications and Deadlines

Applications for the next cohort will be available on our website in January, 2025. They must be submitted no later than September 30, 2025.

Important Note: We are not a Federal Student Aid (FSA) eligible educational institution. Therefore, our students cannot take advantage of its grant, loan, work study, and G.I. Bill programs. We cannot issue IRS Form 1098-T for obtaining education-related tax credits and our students do not qualify for the deferment of their previous student loans.

MORE INFORMATION

To access more information regarding the **Community Regional Medical Center ADVANCED CARDIOVASCULAR SONOGRAPHY PROGRAM** please visit our website:

<https://www.communitymedical.org/for-healthcare-professionals/sonography-programs>

It will be very important for you to give special attention to our **Frequently Asked Questions** link!

https://www.communitymedical.org/getmedia/a5611630-c88f-4053-96b8-8694ebc32f01/2022_ACSP_FAQs.pdf

For answers to your specific questions:

- **Call the ACSP office: (559) 459-2731**
- **Send an email message to: FresnoACSP@communitymedical.org**