COMMUNITY REGIONAL
DIAGNOSTIC MEDICAL SONOGRAPHY PROGRAM

School Catalog

Student Handbook

2020

January 1, 2020 to December 31, 2020

Community Regional Medical Center
Diagnostic Medical Sonography Program
2823 Fresno Street ♦ Fresno, CA 93721
Phone: (559 459-2731 ♦ Fax: (559) 459-2935
Web: www.communitymedical.org

(BLANK PAGE)

TABLE OF CONTENTS

WELCOME AND INTRODUCTION

Welcome to the **CRMC Diagnostic Medical Sonography Program**! We, the sonography faculty and staff, congratulate you on your acceptance to the program. We look forward to sharing our knowledge and facilitating your career advancement in the field of cardiac sonography.

This handbook is designed to serve as a reference and resource for information relating to your student activities during your progress through the program. Please take the time to read it carefully. If you have any questions that are not answered in this book, please feel free to contact the program director for clarification or additional information.

As a student in the **CRMC Diagnostic Medical Sonography Program (DMSP)**, you represent CRMC and the DMS Program. The highest ethical and professional standards of conduct will be expected of you at all times. We, the faculty, wish you success as you expand your health career.

MISSION STATEMENT

WE, THE FACULTY OF CRMC'S DIAGNOSTIC MEDICAL SONOGRAGPHY PROGRAM, BELIEVE:

Learning is a common endeavor of instructor and learner – a process of acquiring skill, knowledge, understanding and appreciation through active participation, problem solving, and application of scientific principles to real and simulated situations. Learning is facilitated when there is comfortable interaction among the learners and between the instructor and the learner, allowing for experiences and ideas to be shared.

The learning environment should be one that respects individuality and is unrestricted by considerations of age, sex, race, creed, social or economic status, or handicap. Learning is enhanced by commendation for work well done, encouragement after failure, kind assistance whenever the need is a rigorous one, and involves a strong commitment on behalf of the student. Students are expected to continuously strive to improve their knowledge and skills by participating in educational and professional activities. The educational objective of the program is to provide information and experiences, which will encourage the development of a self-motivated individual to become a responsible, well-trained sonographer.

Consistent with the early foundations of Sonography education as a whole, this educational philosophy and practicing attitudes are evolved from and shared, especially with those of nursing and radiologic technology. We emphasize respect for all other medical, diagnostic and therapeutic disciplines and applaud the complimentary nature of their mutually supporting functions.

PROGRAM GOALS

- To prepare competent entry-level general sonographers in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains.
- To prepare competent entry-level adult cardiac sonographers in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains.
- To prepare competent entry-level pediatric cardiac sonographers in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains.
- To prepare competent entry-level vascular technologists in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains.

FACULTY

The Diagnostic Medical Sonography Program **Director and Instructor** is **Dr. Joy Guthrie**. Dr. Guthrie is an Assistant Professor of Medicine, UCSF-Fresno in Echocardiography. She is registered in all ten specialty areas offered by the American Registry of Diagnostic Medical Sonography and has recently passed the ACS credentialing exam offered by CCI. Dr. Guthrie has nineteen years of consecutive teaching experience for two CAAHEP accredited DMS programs. She has over 30 years of clinical experience and currently serves as Advanced Practice Sonographer at Community Regional Medical Center in Fresno, responsible for the technical oversight of all sonography services. Dr. Guthrie has a PhD in Public Health-Epidemiology and a Doctorate of Health Science (DHSc.). She is also the past President of the Society of Diagnostic Medical Sonography. Dr. Guthrie has over 100 diagnostic medical sonography program graduates (General, Adult Cardiac, Pediatric Cardiac, Vascular, and Advanced Cardiac) that are gainfully employed in the field of sonography (a 98% placement rate).

Dr. Douglas Helm is the **Medical Advisor** for our **General track**. He has over 35 years of experience, specializing in maternal and fetal medicine as well as obstetrics and gynecology. Dr. Helm received his medical degree from the University of Southern California and his board certification in Maternal-Fetal Medicine from the University of California, Irvine.

The **Medical Advisor** for our **Adult Cardiac** and **Advanced Cardiac tracks** is **Dr. Teresa Daniele**, Assistant Professor of Medicine, UCSF. Dr. Daniele specializes in cardiac consultation, nuclear cardiology and cardiac PET/CT. She is board certified in Cardiology, Nuclear Cardiology and Echocardiography and maintains a special interest in women's heart disease. Dr. Daniele received her medical degree from Ross University School of Medicine and completed her internal medicine residency at Brown University.

The **Medical Advisor** for our **Vascular track** is **Dr. Leigh Ann O'Banion,** an Assistant Clinical Professor, Department of Surgery, at the University of California San Francisco, Fresno. Dr. O'Banion is certified by the American Board of Surgery and has served as a faculty member in the UCSF Department of Surgery since 2017. Her clinical and didactic teaching involves educating, mentoring, and supervising medical students. Dr. O'Banion's focus includes vascular surgery, vascular trauma, and limb salvage.

Dr. Ana Coll is the **Medical Advisor** for our **Pediatric Cardiac track**. She is board certified in Pediatric Cardiology and specializes in diagnosing and treating cardiovascular issues affecting children of all ages. Dr. Coll graduated in 1994 from Venezuela's Escuela De Medicina medical school with honors, and has served both there and in the United States with distinction for over 25 years. She currently serves as the Chief of Pediatric Cardiology for UCSF-Fresno.

The **Clinical Coordinator** for the **General** and **Adult Cardiac tracks** is **Carla Savoia**, RDMS, RDCS, RVT. Carla is registered in multiple specialty areas and has over 25years of clinical experience. She also serves as a staff technologist at Community Regional Medical Center in Fresno.

The **Clinical Coordinator** for the **Pediatric Cardiac** and **Vascular tracks** is **Dr. Joy Guthrie** (see above).

The **Clinical Lab Instructor** for the **General Track** is **Debbie Wall**. Debby is currently enjoying her 37th year of ultrasound experience. Her credentials include RDMS (Abdomen, OB/Gyn, Pediatrics, Fetal Echo), and RVT. During most of her career, she has been both a formal and informal scanning instructor of sonographers throughout the western United States. She is currently employed at Community Regional Medical Center and St. Agnes Medical Center.

Emily Yang is the **Clinical Lab Instructor** for the **Adult Cardiac Track**. She is as graduate of the CRMC DMSP Cardiac Track and is working full-time in the CRMC Cardiology Department. She is registered by the ARDMS in Adult Echocardiography.

The DMSP and ACSP **Administrative Assistant** is **Michael Reinhold**. Michael is a long-time Central Valley native with a rich history of service to people from all walks of life. He has exceptional organizational skills, is proficient on the computer, has an extensive background in media production, and is an accomplished photographer.

DESCRIPTION OF PROFESSION

The Diagnostic Medical Sonographer/Vascular Technologist utilizes high frequency sound waves and other diagnostic techniques for medical diagnosis. The professional level of this health care service requires highly skilled and competent individuals who function as integral members of the health care team. The Diagnostic Medical Sonographer/Vascular Technologist must be able to produce and evaluate ultrasound images and related data that are used by physicians to render a medical diagnosis. They must acquire and maintain specialized technical skills and medical knowledge to render quality patient care. Our DMSP prepares graduates for United States Department of Labor Occupational Code #29-2032 (Diagnostic Medical Sonographer).

SCOPE OF PRACTICE

The Diagnostic/Vascular Technologist is a highly skilled individual qualified by academic and clinical experience to provide diagnostic patient services using ultrasound and related diagnostic techniques. The Diagnostic Medical Sonographer/Vascular Technologist is responsible for producing the best diagnostic information possible with the available resources. They acquire and evaluate data, while exercising discretion and judgment in performance of the clinical examination. The Diagnostic Medical Sonographer/Vascular Technologist is able to:

- Obtain, review, and integrate pertinent patient history, physical examination, and supporting clinical data to facilitate optimum diagnostic results.
- Perform diagnostic procedures by producing, accessing, and evaluating ultrasound images and related data that are used by physicians to render a medical diagnosis.
- Provide interpreting physicians with an oral or written summary of technical findings.
- Provide patient and public education and Promote principles of good health.

DESCRIPTION OF EDUCATIONAL PROGRAMS

The curriculum consists of classroom, laboratory, library research, and clinical practical experience. Laboratory sections are held on campus. The clinical education classes occur in two or more of the affiliate hospitals. The clinical component of the program requires attendance by the student outside the College calendar year.

General Track

This is an eighteen-month program with a combination of didactic and over 1700 clinical hours to prepare the student for entry level as a diagnostic medical sonographer. In addition, the students will be prepared to sit for the national registry examination offered by the American Registry of Diagnostic Medical Sonography (ARDMS) in physics, Abdominal, and Obstetrical/Gynecology. Each course

consists of homework assignments, quizzes, midterm, and a final exam. Additionally, a research paper, and case study project is included in the Abdominal, and Ob/Gyn courses.

The course requirements for the program including the time/days, lecture hours, and lab hours are included in the back of this catalog. Complete course outlines and syllabi are provided on the first day of each class.

Each student must complete all classes in the didactic program in conjunction with completing the clinical education component.

Adult Cardiac Track

This is an eighteen-month program with a combination of didactic and over 1700 clinical hours to prepare the student for entry level as a diagnostic cardiac sonographer for adults. In addition, the students will be prepared to sit for the national registry examination offered by the American Registry of Diagnostic Medical Sonography (ARDMS) in physics, and adult echocardiography.

Each course consists of homework assignments, quizzes, midterm, and a final exam. Additionally, a research paper, and case study project may be included.

The course requirements for the program including the time/days, lecture hours, and lab hours are included in this catalog. Complete course outlines and syllabi are provided on the first day of class.

Each student must complete all classes in the didactic program in conjunction with completing the clinical education component.

Pediatric Cardiac Track

This track is primarily an extension of the Adult Cardiac Track and is not designed as a stand-alone program.* The track is eighteen-weeks in length with a combination of didactic and clinical hours to prepare the student for entry level as a diagnostic cardiac sonographer for pediatric echocardiography. In addition, the students will be prepared to sit for the national registry examination offered by the American Registry of Diagnostic Medical Sonography (ARDMS) in pediatric echocardiography.

Students for Pediatric Cardiac Track, which is held during the eighteen weeks immediately following the completion of the Adult Cardiac Track, are chosen by the instructor for participation during the second course level of their Adult Cardiac Program. Students from the General Track are not eligible for the Pediatric Cardiac Track.

Each course consists of homework assignments, quizzes, midterm, and a final exam. Additionally, a research paper, and case study project may be included.

The course requirements for the program including the time/days, lecture hours, and lab hours are included in this catalog. Complete course outlines and syllabi are provided on the first day of class.

Each student must complete all classes in the didactic program in conjunction with completing the clinical education component.

*A limited number of preceptorships in Pediatric Echocardiography is available for credentialed adult echocardiographers. The cost of the program is $3,000.00 and acceptance is granted on a case-to-case basis. For more information, contact us via phone or email.

Vascular Track

This track is an extension of the General Track and is not a stand-alone program.* The track is eighteen-weeks in length with a combination of didactic and clinical hours to prepare the student for entry level as a vascular technologist. In addition, the students will be prepared to sit for the national registry examination offered by the American Registry of Diagnostic Medical Sonography (ARDMS) in vascular technology.

Students for Vascular Track, which is held during the eighteen weeks immediately following the completion of the General Track, are chosen by the instructor for participation during the second course level of their General Program. Students from the Adult Cardiac Track are not eligible for the Vascular Track.

Each course consists of homework assignments, quizzes, midterm, and a final exam. Additionally, a research paper, and case study project may be included.

The course requirements for the program including the time/days, lecture hours, and lab hours are included in this catalog. Complete course outlines and syllabi are provided on the first day of class.

Each student must complete all classes in the didactic program in conjunction with completing the clinical education component.

*A limited number of preceptorships in Advanced Vascular is available for credentialed sonographers. The cost of the program is $3,000.00 and acceptance is granted on a case-to-case basis. For more information, contact us via phone or email.

STANDARD FOR STUDENT ACHIEVEMENT

American Registry of Diagnostic Medical Sonographers Examination

Upon successful completion of the **CRMC Diagnostic Medical Sonography Program** students are eligible to take the American Registry of Diagnostic Medical Sonographers examination. Each application is assessed individually for eligibility by ARDMS.

Although every student is encouraged to apply and successfully pass the Registry examinations, the decision to take the examinations is made voluntarily by the individual student. Examinations incur costs, which are the responsibility of the student. Students are reminded that ability to hold a position as a sonographer may be dependent upon successful completion of credentialing examinations. Completion of the exam does not indicate in any way a state license to practice sonography.

STATE APPROVAL

Community Regional Medical Center (CRMC) is a private, not-for-profit institution and is approved to operate as an accredited institution by the California Bureau for Private Postsecondary Education (BPPE). Approval to operate means that CRMC has been found in compliance with the standards set forth in the California Private Postsecondary Education Act of 2009 (California Education Code, Title 3, Division 10, Part 59, Chapter 8) and Title 5, Division 7.5 – Private Postsecondary Education of the California Code of Regulations.

Any questions that a student may have regarding this catalog that have not been satisfactorily answered by the institution may be directed to the Bureau for Private Postsecondary Education at:

B.P.P.E. Mailing Address
P.O. Box 980818
West Sacramento, CA 95798-0818

B.P.P.E. Physical Address
2535 Capitol Oaks Drive, Suite 400
Sacramento, CA 95833

B.P.P.E. Phone Numbers
(888) 370-7589 or (916) 431-6959
Fax Number: (916) 263-1897
Website: www.bppe.ca.gov

PROGRAM CATALOG, BROCHURE, AND SCHOOL PERFORMANCE FACT SHEET

CRMC will provide a hardcopy of the school catalog to any person upon request. In addition, CRMC will provide student brochures to any interested person as well as prospective students prior to enrollment. The School Catalog will be updated every year.

As a prospective student, you are encouraged to review this catalog prior to signing an **Enrollment Agreement**. You are also encouraged to review the **School Performance Fact Sheet**, which must be provided to you prior to signing an Enrollment Agreement. These documents contain important policies and performance data for the institution.

ADMISSIONS/ENROLLMENT

Admission Prerequisites

PRIOR to becoming eligible for the program, the following prerequisites MUST be met with a cumulative college grade point average of 2.75 or higher:

- **A Bachelor's Degree** *(In any field of study)*

  --OR--

- **A two-year Allied Health Degree (with a license) in one of these six fields:**
  1. Registered Nurse
  2. Licensed Vocational Nurse
  3. Radiologic Technologist / Radiographer
  4. Respiratory Therapist
  5. Occupational Therapist
  6. Physical Therapist

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 or Composition)*
- **Communication Skills** *(This prerequisite may be met by a variety of courses including Speech or Group Discussion)*

Additional Requirements and Standards

For applicants accepted into the program, these requirements and standards must be met before the actual beginning of the cohort:

- Must successfully complete and pass a drug screening test and background check
- Must provide proof of U.S. citizenship
  - State photo ID license and social security card minimum
  - A visa is not proof of U.S. citizenship, and is not acceptable
- Must meet the physical minimum standard for a sonography job qualification
- Must be proficient in the written and verbal language of college level English
  - All course work, classes, and clinical work will be instructed in English only.
  - A prospective student must be able to fully understand the terms and conditions of the Enrollment Agreement in English prior to acceptance

Enrollment and acceptance will be based on all of the above criteria and the results of the panel interview. The top finalists will be selected for admission into the program. There will be 7-8 students accepted into the Adult Cardiac concentration and 7-8 students accepted into the General Sonography concentration. There will be 4-5 slots available in the Pediatric Cardiac concentration and 4-5 slots available in the Vascular concentration.

A.D.A TECHNICAL STANDARDS

The Sonographer must have sufficient strength, motor coordination, and manual dexterity to:

- Transport, move, lift, and transfer patients from a wheelchair or cart to a sonography table or bed.
- Move, adjust, and manipulate a variety of sonographic equipment, including the physical transportation of mobile sonographic machines, in order to complete examinations on the patient according to established procedure and standards of speed and accuracy.

The Sonographer must be capable of:

- Handling stressful situations related to technical and procedural standards and patient care situations.
- Providing physical and emotional support to the patient during the sonographic procedures, being able to respond to situations requiring first aid and providing emergency care to the patient in the absence of, or until the physician arrives.
- Communicating verbally in an effective manner in order to direct patients during sonographic examinations.
- Visually recognizing anatomy on a CRT screen.

- Reading and interpreting patient charts and requisitions for sonographic examinations.

The Sonographer must have the mental and intellectual capacity to:

- Calculate and select proper technical factors according to the individual needs of the patient and the requirements of the procedure's standards of speed and accuracy.
- Review and evaluate the recorded images on a CRT screen and archiving system for the purpose of identifying patient pathology if present, accurate procedural sequencing, completion of a diagnostic examination, and other appropriate and pertinent technical qualities.

The section above was published by the United States government in conjunction with the Americans with Disabilities Act (ADA). For more information: http://www.ada.gov/

LANGUAGE PROFICIENCY - GENERAL

The student must have the ability to read and write English at the level of a graduate of an American high school as demonstrated by the possession of a high school diploma, GED or passage of the California high school proficiency exam.

All enrollment-related documents, including the **Enrollment Agreement** and the **School Performance Fact Sheet**, are printed in English. If English is not your primary language, you have the right to retain an interpreter at your own cost to obtain a clear explanation of the terms and conditions of the **Enrollment Agreement**, including the cancellation and refund policies, and other enrollment related documents, in your primary language

All course instruction will be conducted using the English language.

LANGUAGE PROFICIENCY - FOREIGN STUDENTS

The Diagnostic Medical Sonography Program requires the completion of standardized testing in English language proficiency by any applicant who: 1) is currently living in a country (or a region of a country) where English is not the primary language, or 2) is currently residing legally in the United States but grew up in a country (or region of a country) where English is not the primary language.

Applicants in either of these two categories must demonstrate English proficiency by providing official transcripts demonstrating the minimum scores on the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS). These are the required passing scores:

	IELTS	TOEFL (iBT)
Overall Exam:	6	61
Writing:	5.5	13
Listening:	n/a	15
Reading:	5.5	15

For more information:
TOEFL: *http://www.toeflgoanywhere.org/*
IELTS: *https://www.ielts.org/*

INTERNATIONAL STUDENTS (VISA SERVICES)

Community Regional Medical Center is NOT approved to issue Visas to international students.

EVALUATION OF PRIOR CREDIT

Community Regional Medical Center does not accept prior credit earned for sonography coursework completed at other regionally accredited institutions, military schools, or foreign institutions to be applied towards our Diagnostic Medical Sonography Program. In addition, CRMC does not accept credits earned through examinations.

CRMC does not allow students to challenge courses, nor does it grant credit for experiential learning or previous experience.

ABILITY TO BENEFIT

"Ability to Benefit" is defined as the demonstrated aptitude to successfully complete the educational program and subsequently be employed. The Diagnostic Medical Sonography Program faculty has determined that 'ability to benefit' is demonstrated by:

- **A Bachelor's Degree** *(In any field of study)*
  --OR--
- **A two-year Allied Health Degree (with a license) in one of these four fields:**
  1. Registered Nurse
  2. Licensed Vocational Nurse
  3. Radiologic Technologist / Radiographer
  4. Respiratory Therapist
  5. Occupational Therapist
  6. Physical Therapist

PLUS: The completion of the following college-level courses (passed with a grade of 2.5 or higher):

- **Anatomy**
- **Physiology**
- **Medical Terminology**
- **General Physics**
- **Math**
- **English**
- **Communication Skills**

STATEMENT OF CHARGES – General Track

The student is responsible for the following tuition and fees pertaining to the program's required course of study completed during the designated enrollment period.

TUITION

Tuition	$22,950.00
TOTAL TUITION	**$22,950.00**

ADDITIONAL EXPENSES

Application Fee *(Nonrefundable)*	$50.00
Basic Life Support for Healthcare Professionals Class	$89.00
Physical & Immunizations*	$200.00
Uniforms*	$180.00
Books*	$1200.00
Background Clearance & Drug Screening	$66.00
Medical Document Management *(American DataBank)*	$30.00
Liability Insurance *(Purchased through SDMS)*	$60.00
SDMS Student Membership	$40.00
Student Tuition Recovery Fee (STRF)	$0.00
TOTAL ADDITIONAL EXPENSES	**$1915.00**

**Estimates – Prices Subject to Change*

LICENSING

ARDMS (Sonographic Principles & Instrumentation)	$200.00
ARDMS (Obstetrics & Gynecology or Abdomen)	$250.00
TOTAL LICENSING EXPENSES	**$450.00**

TOTAL PROGRAM EXPENSE* $25,315.00

TOTAL CHARGES FOR THE CURRENT PERIOD OF ATTENDANCE	$25,315.00
ESTIMATED TOTAL CHARGES FOR THE ENTIRE EDUCATIONAL PROGRAM	$25,315.00
TOTAL CHARGES THE STUDENT IS OBLIGATED TO PAY UPON ENROLLMENT	$5,800.00

STATEMENT OF CHARGES – Adult Cardiac Track

The student is responsible for the following tuition and fees pertaining to the program's required course of study completed during the designated enrollment period.

TUITION

Tuition	$22,950.00
TOTAL TUITION AND FEES	**$22,950.00**

ADDITIONAL EXPENSES

Application Fee *(Nonrefundable)*	$50.00
Basic Life Support for Healthcare Professionals Class	$89.00
Physical & Immunizations*	$200.00
Uniforms*	$180.00
Books*	$1200.00
Background Clearance & Drug Screening	$66.00
Medical Document Management *(American DataBank)*	$30.00
Liability Insurance *(Purchased through SDMS)*	$60.00
SDMS Student Membership	$40.00
Student Tuition Recovery Fee (STRF)	$0.00
TOTAL ADDITIONAL EXPENSES	**$1915.00**

**Estimates – Prices Subject to Change*

LICENSING

ARDMS (Sonographic Principles & Instrumentation)	$200.00
ARDMS (Adult Echocardiography)	$250.00
TOTAL LICENSING EXPENSES	**$450.00**

TOTAL PROGRAM EXPENSE* **$25,315.00**

TOTAL CHARGES FOR THE CURRENT PERIOD OF ATTENDANCE	$25,317.00
ESTIMATED TOTAL CHARGES FOR THE ENTIRE EDUCATIONAL PROGRAM	$25,317.00
TOTAL CHARGES THE STUDENT IS OBLIGATED TO PAY UPON ENROLLMENT	$5,800.00

STATEMENT OF CHARGES – Pediatric Cardiac or Vascular Track

This is an estimated Statement of Charges for a student enrolled in either the **Vascular or Pediatric Cardiac Extension Track:**

TUITION

Tuition	$3,000.00
TOTAL TUITION	**$3,000.00**

TOTAL PROGRAM EXPENSE* **$3,000.00**

**Estimates – Prices Subject to Change*

TOTAL CHARGES FOR THE CURRENT PERIOD OF ATTENDANCE	$3,000.00
ESTIMATED TOTAL CHARGES FOR THE ENTIRE EDUCATIONAL PROGRAM	$3,000.00
TOTAL CHARGES THE STUDENT IS OBLIGATED TO PAY UPON ENROLLMENT	$3,000.00

FINANCIAL AID

State & Federal Financial Aid

The institution does not participate in any federal or state financial aid programs.

Student Loans

In the event the student obtains a loan to pay for an educational program, the student will have the responsibility to repay the full amount of the loan plus interest, less the amount of any refund.

If the student is eligible for a loan guaranteed by the federal or state government and the student defaults on the loan, both of the following may occur:

- The federal or state government or a loan guarantee agency may take action against the student, including applying any income tax refund to which the student is entitled to reduce the balance owed on the loan.
- The student may not be eligible for any other federal student financial aid at another institution or other government assistance until the loan is repaid.

CANCELLATION/WITHDRAWAL/REFUND POLICIES

Student's Right to Cancel/Withdraw

The student may cancel their Enrollment Agreement at any time prior to midnight on the 7th (seventh) day following the date of their signature or the first day of class, whichever is later, and receive a refund of all fees paid (minus the application fee). The student must supply the Program Director with a signed letter informing the Program Director of their intent to withdraw from the program within the allotted acceptable time. Upon expiration of this cancellation period, all fees paid are subject to the refund policies outlined in this agreement.

Refund Policies

State of California Student Tuition Recovery Fund (STRF)

The State of California established the Student Tuition Recovery Fund (STRF) to relieve or mitigate economic loss suffered by a student in an educational program at a qualifying institution, who is or was a California resident while enrolled, or was enrolled in a residency program, if the student enrolled in the institution, prepaid tuition, and suffered an economic loss. Unless relieved of the obligation to do so, you must pay the state-imposed assessment for the STRF, or it must be paid on your behalf, if you are a student in an educational program, who is a California resident, or are enrolled in a residency program, and prepay all or part of your tuition.

You are not eligible for protection from the STRF and you are not required to pay the STRF assessment, if you are not a California resident, or are not enrolled in a residency program.

It is important that you keep copies of your enrollment agreement, financial aid documents, receipts, or any other information that documents the amount paid to the school. Questions regarding the STRF may be directed to the Bureau for Private Postsecondary Education, 2535 Capitol Oaks Drive, Suite 400, Sacramento, CA 95833, (916) 431-6959 or (888) 370-7589.

To be eligible for STRF, you must be a California resident or are enrolled in a residency program, prepaid tuition, paid or deemed to have paid the STRF assessment, and suffered an economic loss as a result of any of the following:

1. The institution, a location of the institution, or an educational program offered by the institution was closed or discontinued, and you did not choose to participate in a teach-out plan approved by the Bureau or did not complete a chosen teach-out plan approved by the Bureau.
2. You were enrolled at an institution or a location of the institution within the 120 day period before the closure of the institution or location of the institution, or were enrolled in an educational program within the 120 day period before the program was discontinued.
3. You were enrolled at an institution or a location of the institution more than 120 days before the closure of the institution or location of the institution, in an educational program offered by the institution as to which the Bureau determined there was a significant decline in the quality or value of the program more than 120 days before closure.
4. The institution has been ordered to pay a refund by the Bureau but has failed to do so.
5. The institution has failed to pay or reimburse loan proceeds under a federal student loan program as required by law, or has failed to pay or reimburse proceeds received by the institution in excess of tuition and other costs.
6. You have been awarded restitution, a refund, or other monetary award by an arbitrator or court, based on a violation of this chapter by an institution or representative of an institution, but have been unable to collect the award from the institution.

7. You sought legal counsel that resulted in the cancellation of one or more of your student loans and have an invoice for services rendered and evidence of the cancellation of the student loan or loans.

To qualify for STRF reimbursement, the application must be received within four (4) years from the date of the action or event that made the student eligible for recovery from STRF.

A student whose loan is revived by a loan holder or debt collector after a period of non-collection may, at any time, file a written application for recovery from STRF for the debt that would have otherwise been eligible for recovery. If it has been more than four (4) years since the action or event that made the student eligible, the student must have filed a written application for recovery within the original four (4) year period, unless the period has been extended by another act of law.

However, no claim can be paid to any student without a social security number or a taxpayer identification number.

CRMC DMS Program Student Refund Policy (California Resident)

If the student wishes to withdraw from the program they are to notify the program director of their wish to cancel the enrollment agreement or to withdraw from the institution and obtain a refund. The following procedure will apply to obtain a refund of tuition:

A student who withdraws from the CMC DMS Program will receive a refund of tuition, if one is due, within 30 days following the student's withdrawal. In the event that a student does not begin classes, all monies paid for tuition and fees, with the exception of the $50 application fee, are refundable. In addition, the student may withdraw from the program after instruction has started, and may be entitled to a refund if the student has completed 60% or less of the term of instruction. The following formula will be used to determine the amount of refund to the student: (term tuition divided by term hours) x term hours attended = the amount owed by the student. The refund will be the amount in excess paid by the student.

If the student has received federal student financial aid funds, the student is entitled to a refund of monies not paid from federal student financial aid program funds.

Fees will be refunded according to the refund percentage. An administrative fee of $100 will be assessed to any student who withdraws or goes on leave from the institution on or after the first day of the semester. Refunds are made within 30 days of the withdrawal date.

BANKRUPTCY

The institution does **not** have a pending petition in bankruptcy, is not operating as a debtor in possession, has not filed a petition within the preceding five years, or had a petition in bankruptcy filed against it within the preceding five years that resulted in reorganization under Chapter 11 of the United States Bankruptcy Code (11 U.S.C. Sec. 1101 et seq.)

ACCEPTANCE OF CREDITS FROM OTHER INSTITUTIONS

The prerequisite coursework credits will be accepted from any state or regionally accredited university. CLEP examination scores will also be accepted for credit. There are no admissions requirements for ability-to-benefit students. Specific coursework in sonography will not be accepted from another

college or university. The institution has not entered into an articulation or transfer agreement with any other college or university.

NOTICE CONCERNING TRANSFERABILITY OF CREDITS AND CREDENTIALS EARNED AT OUR INSTITUTION

The transferability of credits you earn at CRMC is at the complete discretion of an institution to which you may seek to transfer. Acceptance of certificate you earn in the Diagnostic Medical Sonography Program is also at the complete discretion of the institution to which you may seek to transfer. If the credits or certificate that you earn at this institution are not accepted at the institution to which you seek to transfer, you may be required to repeat some or all of your coursework at that institution. For this reason you should make certain that your attendance at this institution will meet your educational goals. This may include contacting an institution to which you may seek to transfer after attending CRMC to determine if your credits or certificate will transfer.

PLACEMENT SERVICES

The program does not provide a specific placement services, however, each student is provided a rotational clinical experience to allow prospective employers to work with the student within the confines of their respective educational program.

LOCATION OF CLASSES

All Diagnostic Medical Sonography Program classes are held at:

Community Regional Medical Center
Medical Imaging Department
Trauma Critical Care Building - 3rd Floor
2823 Fresno Street
Fresno, CA 93721

FACILITIES AND EQUIPMENT

The classroom and laboratory used for the Adult Cardiac Sonography Program are housed within the medical imaging department at Community Regional Medical Center. The equipment utilized within the program includes one Philips EPICA machine, two Philips IE 33 echocardiography machines, and one Agfa Heartlab PACS system.

LIBRARY RESOURCES

There are two Library sources; the Ultrasound Library is housed in the Program Directors office and has over 40 ultrasound references books, training DVDs, and registry review books/cards. This is available to all sonography students during working hours and books can be checked out after hours. The main hospital Library is accessible to all sonography students that are accompanied with a staff sonographer.

STUDENT SERVICES

Students enrolled in the CRMC Diagnostic Medical Sonography Program have access to the following services provided at the hospital: Workman's Compensation, Health and Wellness services, cafeteria, library, and access to continuing medical education programs offered to the staff of the Radiology and Cardiology Departments.

HOUSING

Community Regional Medical Center does not have dormitory facilities under its control and bears no responsibility to find or assist a student in finding housing.
The availability of housing near the medical center is favorable. The median home price in Fresno is $247,600. The 2019 cost of living index in Fresno County is 107.8 (the US average is 100). Retrieved on 11/12/2019 from: http://www.city-data.com/county/Fresno_County-CA.html#ixzz1A556bKsW

RECORD KEEPING: CUSTODIAN OF RECORDS

According to Article 9 of the act (94900) the following records will be kept in a locked file in the Program Director's office:

Academic Records

- The student's records include, but are not limited to, the name, address, telephone number, and e-mail address which will be organized both chronologically and alphabetically.
- The midterm and final exams, as well as the Final Grades
- The courses and units on which the certificate of Completion is based
- The grades earned by each student on all courses within the curriculum
- Health assessment, background check, immunization records, and proof of liability insurance.
- Transcripts are kept permanently by the school.

Financial Records

According to Article 9 of the act (94900) the financial records will be kept in a locked file in the Financial Department at Community Regional Medical Center.

GRIEVANCES

Students who are dissatisfied with actions taken by the Program Director may:

1. File a formal grievance with California's Bureau of Private Post-Secondary Education. For contact information, see the "State Approval" section of this catalog.
2. File a formal grievance with C.R.M.C. Vice President, Kudzi Machaca. As per the institution's regulations, depending on the nature of the grievance, the Vice President would either resolve the grievance or forward it to the Human Resources Department for further review.

COMPLAINTS

A student or any member of the public may file a complaint about this institution with the Bureau for Private Postsecondary Education by calling (888) 370-7589 or by filing a complaint form, which can be obtained on the bureau's Internet Web site http://www.bppe.ca.gov/.

COMMUNITY REGIONAL MEDICAL CENTER

DIAGNOSTIC MEDICAL SONOGRAPHY PROGRAM

Policies and Procedures

It is the intention of this handbook to provide the student with a clear understanding of the operations and policies of the **CRMC Diagnostic Medical Sonography Program**. Students are expected to comply with the policies and procedures contained within this handbook throughout their educational experience.

(BLANK PAGE)

Accidents:

Policy:
Any accident occurring during scheduled clinical program time must be reported to the clinical supervisor. All incidents will ultimately be reporter to the program director.

Procedure:

1. Following any incident where a student is involved, two incident report forms must be filled out by the student and clinical supervisor involved. A CRMC form as well as a site form needs to be completed. Copies of both forms are to be forwarded to the program director.

2. Students, who have been exposed to any hazardous substances, including blood or body fluids, will report this immediately as well as file incident reports with the program and clinical site.

Affirmative Action:

CRMC does not discriminate on the basis of sex, ethnicity, or handicap in the educational programs that it operates and is prohibited from discriminating in such a manner by law. All CRMC personnel and persons, vendors and organizations with whom the Hospital does business, are required to comply with all applicable federal and state statutes and regulations designed to promote affirmative action and equal opportunity.

Procedure:

1. Creating and sustaining a climate of equal opportunity is the responsibility of all those associated with the **CRMC Diagnostic Medical Sonography Program** including students.

2. If indicated, a student should report any complaint related to education and equal opportunity to the program director.

3. Hospital's equal opportunity statements apply in clinical settings.

A.R.D.M.S. Examinations:

Policy:

Registry fees are the student's responsibility; however, it is a program expectation that students will take the examinations in the specialties for which they qualify.

Procedure:

1. Students will be provided the necessary documentation to qualify them for Registry examinations.

2. Students will be counseled by the program director and faculty regarding studying to successfully pass credentialing examinations.

3. The ARDMS changes their requirements annually. It is the student's responsibility to inquire about the requirements that are in effect.

4. The ARDMS now has all examinations available on the computer. Students are not eligible to take these examinations until completion of the program. Application cannot be made until this date.

5. Information can be obtained from ARDMS, 1401 Rockville Pike, Suite 600, Rockville, MD 20852-140 1-800-541-9754.

6. The program writes a letter of authorization to the ARDMS on behalf of the student. This letter defines the specialties the student is eligible to take. Students who do not complete clinical training in designated specialties will not be eligible to take the exams in these specialties.

Attendance:

Policy:

Students accepted into the **CRMC Diagnostic Medical Sonography Program** are expected to attend all course lectures, clinical internship, and any other scheduled event that is part of the Program curriculum. Any student unable to attend during the program due to illness or an emergency must follow the procedure outlined below. Students will be responsible for obtaining any information presented and/or handed out during their absence.

Procedure:

1. In the event lecture is to be missed, the student must call the course instructor before class and notify them as to their absence.

2. If a clinical internship day is to be missed, the student must call the Program Director.

Books:

Policy:

Program officials select textbooks for the courses taught. Students are expected to purchase these books prior to the start of classes.

Procedure:

1. Textbooks in ultrasound are expensive, and the faculty does the best they can to minimize this cost.

2. Books are selected not just for the course in which they are required, but also for future reference to facilitate the ongoing learning of the student.

Clinical Case Study Days:

Policy:

The program requires students to attend Clinical Case Study Day(s) as part of their involvement and learning of ultrasound.

Procedure:

1. Sonography students in their clinical internship and their assigned partner present pathology investigated with ultrasound at the intern's clinical site.

2. The intern is responsible for selecting the pathology and preparing the cases to be shown. The intern must communicate this information at least one week prior to the presentation to the first year mentee.

3. The partner is responsible for researching the literature on the assigned pathology and preparing a 10-15 minute presentation on this subject.

4. All students are expected to conduct themselves professionally. There is to be no gum chewing, eating, or drinking during presentations.

5. Students are expected to be on time and to remain the full length of the presentations.

6. Students should NOT use Clinical Case Study Day for doctor or dentist's appointments or any other activity that prevents their full time attendance.

Students accepted into the **CRMC Diagnostic Medical Sonography Program (General)** are expected to attend all course lectures, case study days, clinical internship days and any other scheduled event that is part of the **CRMC Diagnostic Medical Sonography Program (General)** curriculum. Any student unable to attend during the program due to illness or an emergency must follow the procedure as outlined in the "Attendance" policy contained earlier in this document.

Communicable Diseases:

Policy:

Students may need to be restricted from clinical work settings during the incubation period of a communicable disease and/or during a known period of communicability.

Procedure:

1. Students with a suspected diagnosis of the following diseases must report the infection to the program director. Confirmation and treatment if desired or recommendation will be required:

   Chicken pox (required)
   Hepatitis-acute
   Measles (rubella)
   Scabies/Lice
   Tuberculosis

2. During a known period of communicability, students may not work in the clinical setting unless authorized to do so.

3. Students assigned to clinical settings may require restrictions if diagnosed or suspected of having the following communicable diseases:

   Conjunctivitis
   Hepatitis
   Influenza
   Herpes Zoter (shingles)
   Herpes Simplex (cold sores)
   Skin Infections

Herpes Whitlow (finger)

4. Non-immune students who have been accepted into the program should notify the program director following exposure to any of the following communicable diseases:

Chicken pox	rubella
Mumps	herpes zoter
Hepatitis (acute)	measles

5. Any time missed due to illness or any nature is considered absence and will be handled according to time off policies established by the program.

Confidentiality:

Policy:

Material contained in the student record will not be release to outside parties without the student's written consent for release in accordance with the Federal Privacy Act and the Family Educational Rights Act of 1974.

Information from patient records is highly confidential and is not to be discussed or passed on in any form for any purpose other than education.

Procedure:

1. Student academic and performance records are kept in a locked file in the Program Director's office. Students may review their own records with the program officials at any time.

2. Challenges to the student's record may be made only as to accuracy and not judgment, e.g. the accuracy of recording a grade but not the grade itself.

3. Program officials will provide only verification of attendance in the program to outside parties unless authorized by the student to do otherwise.

4. Any disclosure of confidential information regarding a patient**, including release of pathology or diagnosis to a patient**, could result in dismissal from the program.

Disciplinary:

Policy:

Students who are NOT in compliance with the policies and procedures of this manual are subject to disciplinary action.

Procedure:

1. Written warning: A confidential memo or letter will be addressed to the student describing the infraction. The Program Director will arrange a meeting with the student to discuss and determine a course of action to resolve the situation through the Remediation Process. A description of the infraction and the agreed upon course of action will be presented in writing to the student by the

Program Director. A copy of that document will then be forwarded to the Medical Director and a second copy placed in the student's file. A follow-up meeting will take place no longer than 2 weeks following this report to determine if further action is necessary.

2. Probation: A student may be placed on probation on the recommendation of the Program Director. The length of probation will be determined by the course of action necessary to remedy the infraction. The student will sign written and verbal notice of the probationary terms with a copy placed in their permanent file.

3. Students who feel that disciplinary action has been taken in an unfair manner are referred to the Program Director.

Dress Code:

Policy:

Students accepted into the program must wear dark blue scrubs at all times during the clinical internship.

The purpose of the dress code is to look professional in appearance at all times.
("Professional appearance" is at the discretion of the program director.)

Following is a list of "Don'ts." The list is based on clinical site expectations.

Do NOT wear:

1. Denim or fleece.
2. Loud stripes, prints, floral or neon colors.
3. Colored or patterned hose
4. Sandals, open-toed shoes
5. Athletic footwear with bright or contrasting colors, brand names, large logos or stripes.
6. T-shirts, jeans, jean-styled slacks, denim, fleece
7. Excessively high heels
8. Short skirts, shorts, stirrup pants, and spandex
9. Women may not wear more than one earring on each ear. Women may not wear earrings anywhere but their ears.
10. Large amounts of makeup, cologne, perfume, aftershave, or colored nail polish
11. Women with long hairstyles must wear it tied back, and hair must not interfere with patient contact. Nails must be short.
12. Men must always be clean-shaven and mustaches, and beards must be neat and well-trimmed.
13. Men's hair must be short and clean.
14. Men may not wear any earrings.
15. Men's business attire will include a dress shirt and tie. Pants must be of dress style (no jeans, denim or western styled pants). Footwear must also be of dress style. Cowboy boots and athletic footwear are not acceptable.
16. No gum chewing in clinical sites.

Procedure:

1. The program director or instructor is responsible for informing students if they are in conflict with the dress code.

2. Students who are not in compliance will be informed privately. They will be given one warning and may be asked to leave the clinical site. They may be sent home and asked to return more appropriately dressed.
3. Students who need more than one warning may be placed on probation.

Grading:

Policy:

The program uses a standard 4-point grading scale. The program requires a minimum academic and clinical grade of 2.0 in each course. All courses will be given a letter grade.

Procedure:

1. Students are provided with opportunities to accumulate their grade through quizzes and final examinations in each didactic course.

2. Students are provided a midterm assessment and final grade in each clinical course.

3. Grades received on competencies do not directly add to the final grade.

4. A grade of less than a 2.0 in any course is considered a failing grade.

5. The cumulative grade point average must be 2.0 or higher each course level for students in the **CRMC Diagnostic Medical Sonography Program** to remain in the program.

Graduation:

Policy:

The hospital conducts a graduation ceremony for the **CRMC Diagnostic Medical Sonography Program.** Students are expected to participate in these exercises. The program assists the graduating class in conducting a graduation ceremony at the conclusion of the program.

Procedure:

1. Each student is encouraged and expected to attend the graduation ceremony.

2. Each student may invite a limited number of friends and relatives to the graduation ceremony.

3. The program director is responsible for the content of the graduation ceremony, however, students may submit specific requests regarding speakers, music, food, etc.

4. Students must have completed all obligations in order to graduate. A resume must be on file, along with all successfully completed competencies.

Human Subjects for Non-Clinical Scanning:

Policy

Students in the Diagnostic Medical Sonography Program (all tracks) are asked to participate as models in the laboratory sessions for clinical training. The students are not required to participate as models. The student's grades will not be adversely affected should they refuse to participate as clinical models.

Infectious Disease (General):

Policy:

All students must wear protective devices, gloves, gowns, masks, etc., when performing examinations on patients with infectious disease.

Blood and body secretions such as semen, saliva, urine, tears, stool, emesis, sputnum, wound drainage, bile, and pleural or peritoneal fluid may contain the HIV or hepatitis virus. All should be considered infectious. Any tissue, biopsy, or patient specimen should also be handled with care, including wearing gloves.

Procedure:

1. All students must review requisitions for evidence of information regarding necessary precautions.

2. All students will review precautions to be taken with a supervising sonographer/physician before performing an examination on a patient with an infectious disease.

3. Any incidents involving blood or body fluid contamination should be reported to the clinical instructor, physician, and program officials.

Infectious Diseases (Bloodborne):

Policy:

Corporate Orientation will include an introduction to Infection Control as practiced at CMC. This will be completed prior to the beginning of assigned duties. Annual updates will be scheduled as needed according to mandates of SB 198 and Occupational Safety & Health Administration (OSHA).

Procedure:

1. During "General Orientation," new employees are given a broad presentation including information needed to conduct their defined role in the infection surveillance, prevention, and control program. New employee orientation covers the following topics:
   - Employee's role/responsibility with regards to Infection Control
   - Personal hygiene in the workplace and policy regarding artificial fingernails and fingernail length
   - Hand washing/Hand Hygiene as the single most important means of preventing nosocomial infections
   - Alcohol hand gel use
   - Standard, Contact, Respiratory Airborne and Respiratory Droplet Precautions

- TB Exposure Control Plan
  - Identification of suspected TB patients
  - Health department Suspect Case and Discharge Plan reports
  - Respiratory Protection; Fit-testing for TB masks as required
  - Negative air flow rooms
- Medical waste
- Blood-Borne Exposure Control Plan:
  - Copy and Explanation of CAL-OSHA Title 8. An accessible copy of the regulatory text of this standard and an explanation of its contents
  - Epidemiology and Symptoms. A general explanation of the epidemiology and symptoms of bloodborne diseases
  - Modes of Transmission. An explanation of the modes of transmission of bloodborne pathogens
  - CMC's Exposure Control Plan. An explanation of the plan and the means by which the employee can obtain a copy of the written plan
  - Risk Identification. An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and OPIM
  - Methods of Compliance. An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, administrative or work practice controls, personal protective equipment, and safe needle devices
  - Decontamination and Disposal. Information on the types, proper use, location, removal, handling, decontamination and disposal of personal protective equipment
  - Personal protective Equipment. An explanation of the basis for selection of personal protective equipment
  - Hepatitis B Vaccination. Information on the hepatitis B vaccine, including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge
  - Emergency. Information on the appropriate actions to take and persons to contact in an emergency involving blood or OPIM
  - Exposure Incident. An explanation of the procedure to follow if an exposure incident occurs, including the method of reporting the incident, and the medical follow-up that will be made available.
  - Post-Exposure Evaluation and Follow-Up. Information the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident
  - Signs and Labels. An explanation of the signs and labels and/or color coding required for medical waste
  - Interactive Questions and Answers. An opportunity for interactive questions and answers with the person conducting the training session.

2. Annual Update:
   - An infection control segment is included in the Computerized Annual Update training.
3. Periodic In-service:
   - Directors, managers, or supervisors may contact Infection Control to conduct in-services or information on special topics as needed.

Hepatitis B Vaccine

Policy:

CRMC Diagnostic Medical Sonography Program students are required to read the "Infectious Disease", "Blood Born Infectious Disease", and "Hepatitis B Vaccine" policies included in this handbook.

Procedure:

1. All students will be required to either receive the hepatitis B vaccine or sign the declination.
2. Students will be required to sign the declination while they are receiving the vaccine until the 3rd shot is received and documents are in their file.
3. The Liability Release and Declination is attached. A copy will be provided to students during their orientation.
4. All students are strongly urged to take this vaccine to protect them during their clinical training.

Information About Hepatitis B Vaccine

The Disease: Hepatitis B is a viral infection caused by the hepatitis B virus (HBV), which causes death in 1-2% of patients. Most people with hepatitis B recover completely, but approximately 5-10% ,become chronic carriers of the virus. Most of these people have no symptoms, but can continue to transmit the disease to others. Some may develop chronic active hepatitis and cirrhosis. HBV also appears to be causative factor in the development of liver cancer.

The Vaccine: Hepatitis B vaccine is produced from the plasma of chronic HBV carriers. The vaccine consists of highly purified, formalin-inactivated hepatitis B antigen (viral coating material). It has been extensively tested for safety in chimpanzees and for safety and efficiency in large-scale clinical trials with human subjects. A high percentage of healthy people who receive two doses of vaccine and a booster achieve high levels of surface antibody (anti-HBs) and protection against Hepatitis B. Persons with immune-system abnormalities, such as dialysis patients, have less response to the vaccine/but over half of those receiving it do develop antibodies. Full immunization requires three doses of vaccine over a six-month period, although some persons may not develop immunity even after three doses. There is no evidence that the vaccine has ever caused hepatitis B. However, persons who have been infected with HBV prior to receiving the vaccine may go on to develop clinical hepatitis in spite of immunization. The duration of immunity is unknown at this time.

Possible Vaccine Side Effects: The incidence of side effects is very low. No serious side effects have been reported with the vaccine. A few persons experience tenderness and redness at the site of injection. Low-grade fever may occur. Rush, nausea, joint pain and mild fatigue have also been reported. The possibility exists that more serious side effects may be identified with more extensive use.

COMMUNITY REGIONAL MEDICAL CENTER

Liability Release – Assumption of Risks Form

I have read the attached statement about hepatitis B and the hepatitis B vaccine. I have had an opportunity to ask questions and understand the benefits and risks of hepatitis B vaccination as well as the risks of not receiving the vaccination. I do not wish to receive the vaccination series at this time and voluntarily assume the risks inherent in not receiving the vaccine series and hereby further release Community Regional Medical Center, its officers, employees and agents from any and all liability, loss or damage that I may suffer or incur from whatever source in the event of any actual or potential exposure or infection due to my decision not to receive the vaccination.

Student Hepatitis B Vaccine Declination

I understand that due to my occupational exposure to blood or other potentially infectious materials. I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been advised of the importance of being vaccinated with hepatitis B vaccine from a licensed health care provider. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I want to be vaccinated with hepatitis B vaccine, I understand that I will need to receive the vaccination series from a license health care provider.

_____
Printed Name of Student

_____
Signature of Student, Parent/Guardian

_____
Date

_____
Signature of Witness

_____
Date

Leave of Absence:

The program allows for a leave of absence of no more than one month within the eighteen month program. The student must continue to communicate with the program director and attempt to complete assignments. If the extent of the leave is projected to be more than one month in duration, the student may either withdraw from the program or retake the course that was missed and complete the requisite clinical hours within the subsequent program.

Sick Leave

Policy:

Students enrolled in the first year of the program should strive to avoid being sick during class times and Clinical Case Study Days.

Procedure:

1. Students who are sick MUST phone the Program Director and the clinical site no later than 8:00 am on the day they are sick if it is a class or Clinical Case Study Day.
2. It is up to the faculty whether or not students can make up quizzes or tests for absence.
3. Students with children are not allowed to bring their sick children to class.

Jury Duty

Policy:

Jury duty is a civic obligation, and it is an individual's responsibility to serve when summoned. However, students called to serve should work with officials to defer service until program completion, whenever possible.

Procedure:

1. Students should report summons to the program director as soon as possible.

2. Program faculty will inform the student of the academic material that needs to be covered. All quizzes and exams will be given to the student to get caught up.

3. Clinical time missed in most cases cannot be made up. (All absences, regardless of reason, can result in the student becoming ineligible for ARDMS Board examinations during that year.)

Pregnancy

Policy:

It is the responsibility to notify the program director of the pregnancy.

Procedure:

1. The student must receive written permission from the physician to continue the program.

2. Pregnant students need to be aware that there is a high probability that their didactic year will be extended since required courses are only offered once a year.

3. Pregnant students will not be assigned to a shared diagnostic ultrasound medicine laboratory. A pregnant student may not participate in any ultrasound related study, which is conducted in a fluoroscopy, angiography, or cardiac catheterization room, or perform procedures on patients with radioactive implants.

4. An effort will be made by the program director and the associate faculty to insure that pregnant students are assigned to a "safe" work area. This may result in having to extend the student's internship as this is on a space available basis.

5. Students need to be aware that the biggest risk to the unborn occurs during the first trimester. Students need to be tested for pregnancy as soon as they feel there is a reason to be so that appropriate adjustments can be made.

Military Absence

Policy:

CRMC acknowledges the responsibility of men and women to fulfill service. This policy applies to military absence resulting from service in the United States Armed Forces or in a National Guard or Reserve units.

Procedure:

1. Students should notify the program director of the military status upon acceptance into the program.

2. A reservist may take excused leave time up to 10 days, and a leave of absence for any additional time off required; however the student and program director should attempt to have any non-emergent service deferred until after graduation.

3. Extended time off for reservist duty may result in ineligibility to write ARDMS boards in the year in which the student graduates.

4. Program faculty will work with the student to complete academic material missed during emergency leave; non-emergency military absence will require the student to receive academic material at the instructor's discretion.

5. Clinical time missed for emergency missed for emergency military absence may be excused if program officials feel the student's clinical performance has been adequate.

6. Time off for non-emergency absence may be required to be made up including returning after graduation, if necessary, on a space available basis.

Funeral Leave

Policy:

Students will be granted excused funeral leave when appropriate.

Procedure:

1. Requests for funeral leave should be submitted to the program director or coordinator by phone and followed up with an absence form.

2. Funeral leave will be excused for funerals of spouse, parents, child, grandparent and siblings. All other requests will be reviewed on an individual basis.

3. As a general rule, two days are allowed.

4. Any extended time may result in lengthening of the program and ineligibility to write ARDMS Boards.

Membership in Professional Organizations:

Policy:

Membership in the **Society of Diagnostic Medical Sonography (SDMS)** is required. Meetings sponsored by sonographic organizations are available locally, and attendance is also strongly encouraged. Faculty may require attendance if the subject matter is part of a course being taught. Students with faculty permission may also attend other meetings in the field of ultrasound.

Society of Diagnostic Medical Sonography
2745 Dallas Pkwy, Ste. 350
Plano, TX 75093-8730
(214) 473-8057 or (800) 229-9506
(214) 473-8563 (fax)

Procedure:

1. Approval for meeting attendance requiring absence should be requested in a timely manner and at least two weeks prior to the scheduled meeting.

2. Faculty will post and provide driving directions to all local meetings showing topics and speakers.

Moral and Ethical Behavior and Cheating:

Policy:

Immoral or unethical behavior will be cause for immediate probation, suspension, or dismissal. The unlawful manufacture, distribution, dispensation, possession, use, sale, disposal, introduction or transfer of drugs, alcohol, narcotics, or any other regulated substance will be grounds for immediate dismissal.

Procedure:

1. Students are expected to use verbal and written language, which does not intentionally demean members of society.

2. Students convicted of any criminal drug statute must notify the program director no later than 5 days after such a conviction. Note: This policy meets the requirements of the Drug-Free Workplace Act of 1988.

3. Sexual misconduct with a patient, staff, or student will result in disciplinary action.

4. You, the student, are expected to conduct yourself with integrity. If you cheat, or aid someone else in cheating, you violate a trust. Cheating includes, but is not limited to copying answers on tests on assignments, glancing at nearby test papers, swapping papers, stealing, plagiarizing, illicitly giving or receiving help on exams or assignments, using pre-marked tests or answer sheets, cribbing, or using texts, notebooks, copying, or any similar means to score an answer sheet. The following actions will be taken against anyone who engages in the above practices:

    - You will receive a grade of zero on the work (exam, assignment, lab, quiz, etc.) where the cheating occurred.

    - A report of the Incident Report will also be placed in your file. He/she may file a report in your permanent record or take further disciplinary action such as suspension or expulsion from the program.

Progression & Dismissal (Clinical Rotation):

Policy:

The program permits only students who can complete the clinical internship requirement. The program requires a minimum clinical internship of 1760 hours with a grade of 2.0 or above.

Procedure:

1. Students who earn a B-, C+ or C clinical grade are on probation and are informed regarding areas of weakness.

2. Students earning a B- or less are expected to improve their grade the next course level. They are put on probation until clear improvement is demonstrated.

3. For other reasons for program dismissal refer to policies on Tardiness, Smoking, Moral & Ethical Behavior, and Sexual Harassment.

Progression & Dismissal (General):

Policy:

The following is the published disciplinary action plan.

Procedure:

The program director may require disciplinary action, including the withdrawal of a student from the program, for a variety of reasons. Immediate dismissal from the program may be indicated, based on the severity of the infraction. Reasons include (but are not limited to) the following:

1. Disregard of program rules and regulations
2. Unsatisfactory performance

3. Insubordination
4. Misconduct
5. Neglect of duty
6. Breech of medical, legal or moral ethics
7. Theft of property from the hospital premises or college
8. Substance abuse
9. Use of, possession of, or intent to deliver controlled substances
10. Possession of or use of a firearm on hospital grounds
11. Failure to maintain the minimum required passing grade in all course work including clinical practicum
12. Breach of confidentiality
13. Willful destruction of/or defacement of property
14. Willful abuse of/or neglect of a patient, visitor, employee or other persons

Progression & Dismissal (Grades):

Policy:

The program permits only committed students that are confident they will fulfill the entire curriculum to ensure success. All students must earn a minimum academic grade of 2.0 in each course.

Procedure:

1. Students who have a GPA for the course of less than a 2.00 will be dismissed from the program.

2. Other reasons for dismissal: Refer to policies on Moral & Ethical Behavior, Cheating, and Sexual Harassment.

Sexual Harassment:

Policy:

Mutual respect, consideration, and courtesy are expected of everyone. Students have the right to pursue their education free from all forms of discrimination and conduct which can be considered harassing, coercive, or disruptive including sexual harassment.

Federal and state law prohibits sexual harassment. According to the requirements of both agencies, sexual harassment includes unwelcome sexual advances, requests for sexual favors, sexually motivated physical contact, and other verbal or physical conduct of sexual nature when:

- Submission to such conduct is made, either explicitly or implicitly, a term or condition of an individual's status;
- Submission to or rejection of such conduct by an individual is used as the basis for evaluation affecting such an individual;
- Such conduct is intended to or does interfere with an individual's work or creates an intimidating, hostile, or offensive work environment.

Procedure:

1. It is the responsibility of students who believe they have been harassed to report such behavior so the behavior can be investigated and appropriate action taken.

2. It is the responsibility of program officials, clinical staffs and faculty to immediately report to appropriate administration or department head any complaint of sexual harassment, which is brought to their attention.

3. It is the responsibility of the student to report any incidents of harassment they have witnessed or been informed of.

4. Investigation will be conducted under the aegis of administration responsible for monitoring the behavior of the individual accused of harassment. Investigation will include interviews with all relevant individuals.

5. Legal counsel, to discuss the findings will be recommended if warranted.

6. Administration will meet with the concerned student to discuss action.

7. If the investigation establishes that the alleged conduct did not occur, the complainant must be informed that false sexual harassment claims cannot be made without serious repercussions.

8. Retaliation against the student who brings charges will not be permitted.

9. Individuals involved who are dissatisfied with the outcome of action or investigation may appeal through the grievance policy.

Smoking:

Policy:

Smoking is prohibited in all medical facilities except in designated outside areas on the CRMC campus.

Procedure:

1. Compliance with all smoking rules is expected.

2. Failure to comply in clinical sites may result in being dismissed from the site.

3. Students also need to be mindful of the odors associated with smoking, and the impact this may have on patients.

Student Work:

Policy:

It is understood that all DMSP Sonography students may be employed in a clinical or non-clinical setting inside or outside regular education hours. This program is designed to accommodate a busy work

schedule and still complete this program. The student's responsibility is to ensure that the work does not interfere with assigned clinical and academic responsibilities.

Procedure:

1. Students may be allowed to be paid for work performed by direction or as part of the **CRMC Diagnostic Medical Sonography Program** after one full year of enrollment. Employment (to include both didactic and clinical hours) is not to exceed 40 hours per week.

2. Students who are employed while simultaneously completing clinical hours must be performing clinical hours in the concentration in which they are enrolled as students.

3. Students who work outside the program and do not maintain satisfactory academic and clinical grades may pay the consequences of poor performance as outlined in the dismissal policy.

Supervision:

Policy:

The Clinical Coordinator or Program Director assigned to the student provide general supervision of students during their assigned clinical internship.

Procedure:

1. The Clinical Coordinator or Program Director will provide direct supervision of clinical performance in the clinical area. Staff sonographers may also provide direction.

2. Students will be assigned 1760 hours or six full weeks of clinical internship to be completed at Community Regional Medical Center or other affiliate sites. The clinical oversight will be provided by the faculty member assigned to them. Students are expected to share any problems they are having at the time of these visits.

Tardiness:

Policy:

Students are required to be punctual for both didactic and clinical training.

Procedure:

1. Students who are late reporting to their clinical internship are warned once verbally. The second time they are tardy the program director will warn the student again. The third time the student is put on probation, and this may lead to program dismissal.

2. Students are expected to be in the classroom before the start of class. Students who are more than ten minutes late for class may be asked to leave.

3. Quizzes or exams are not lengthened for students who are tardy.

(BLANK PAGE)

Diagnostic Medical Sonography Program

GENERAL CLASS SCHEDULE

Cohort #5 - January 8, 2019 to July 24, 2020

	Start	End	Times	Day(s)	Lec. Hrs.	Lab Hrs.
1st Course Level - 9 Weeks						
Basic Ultrasound Physics	1/8/2019	3/4/2019	5:45p-10p	Tuesday	18	27
Introduction to Sonography	1/10/2019	3/7/2019	5:45p-10p	Thursday	18	27
Course Level Break - March 11 to March 15, 2019						
2nd Course Level - 18 Weeks						
Abdominal Sonography	3/19/2019	7/23/2019	5:45p-10p	Tuesday	36	36
Beginning Clinical Experience I	3/18/2019	7/26/2019	8a-3:00p	M,W,Th,F		504
Spring Break - April 15-19; Memorial Day - May 27; Independence Day, July 4						
Course Level Break - July 29 to August 2, 2019						
3rd Course Level - 18 Weeks						
Obstetrics and Gynecology	8/6/2019	12/3/2019	5:45p-10p	Tuesday	36	36
Beginning Clinical Experience II	8/5/2019	12/5/2019	8a-3:00p	M,W,Th,F		504
Labor Day - September 2; Veterans Day - Nov. 11; Thanksgiving Break - Nov. 28-29						
Course Level Break - December 9 to January 3, 2020						
4th Course Level - 9 Weeks						
Advanced Ultrasound Physics	1/9/2020	3/5/2020	5:45p-10p	Tuesday	27	
Advanced Clinical Experience I	1/6/2020	3/6/2020	8a-3:00p	M,W,Th,F		252
Superficial Structures	1/7/2020	3/3/2020	5:45p-10p	Thursday	9	27
Course Level Break - March 9 to March 13, 2020						
5th Course Level - 18 Weeks						
Integrative Study in Sonography	3/17/2020	7/21/2020	5:45p-10p	Tuesday	36	
Advanced Clinical Experience II	3/16/2020	7/24/2020	8a-3:00p	M,W,Th,F		504
Basics of Vascular Sonography	3/19/2020	7/23/2020	5:45p-10p	Thursday	27	27
Spring Break - April 6-10; Memorial Day - May 25; Independence Day - July 4						

Any clinical hours missed due to a holiday will be made up by arrangement.

There is a 30 minute lunch included for all clinical days assigned.

General Sonography
Course Level 1

BASIC ULTRASOUND PHYSICS

Course Description

This course covers basic principles and terminology of diagnostic ultrasound physics to include: a review of mathematical skills, transducers, beam dynamics and instrumentation. Hands-on instruction will be provided to introduce the student to necessary elementary skills in scanning as it pertains to the physical nature of ultrasound.

Course Content Outline

TOPICS
I. Introduction to Ultrasound and Elementary Principles A. Nature of ultrasound/definition of sound B. Frequency, wavelength, propagation speed C. Properties of ultrasound waves D. Review of mathematical units
II. Propagation of Ultrasound Through Tissues A. Speed of sound in tissues B. Reflection C. Refraction D. Attenuation
III. Image Features and Artifacts A. Definition of artifacts B. Reverberation, refraction C. Shadowing and enhancement D. Review artifacts on images
IV. Basic Physics and Instrumentation A. Ultrasound transducers 1. the piezoelectric effect 2. transducer construction and characteristics 3. focusing 4. beam width and lateral resolution 5. pulse duration and axial resolution 6. transducer B. Pulse Echo Instruments 1. characteristics 2. output power 3. receiver gain (TGC) 4. signal processing C. Image Storage and Display 1. scan converter 2. digital systems 3. resolution and field of view 4. display devices and controls 5. measurements of dimensions 6. recording techniques

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate knowledge of basic acoustical physics and ultrasound instrumentation
B. Employ a basic understanding of the propagation of ultrasound through tissues
C. Select the appropriate techniques for performed examinations
D. Adjust instrument controls to optimize image quality
E. Evaluate and compensate for acoustical artifacts
F. Prepare hard copy documentation of examination findings
G. Perform linear area, circumference and other related measurements from sonographic images

INTRODUCTION TO SONOGRAPHY

Course Description

This course is an overview of diagnostic medical sonography (DMS) and its role in health care delivery. Students will be oriented to the academic and administrative structure of the program, clinical affiliates, and to the profession as a whole. Ethical and legal responsibilities of the professional relative to health care delivery will be addressed. An introduction to the principles, instruments, and routine sonographic procedures will be emphasized. The laboratory portion of this course will include a hands-on orientation to the computerized equipment and instrumentation. An orientation in the use of the library and library materials will also be presented.

Course Content Outline

TOPICS
I. Introduction to the Diagnostic Sonography Program A. General information B. Clinical education centers C. Duties/responsibilities of the student sonographer
II. Professional Organizations A. Purpose, functions and activities B. National C. State
III. Professional Development A. Career mobility B. Career advancement C. Continuing education
IV. History A. Ultrasound
V. Hospital Organization A. Health care delivery system B. Hospital Information System (HIS) 1. Accessing information 2. Data bases C. Radiology Information System (RIS) – computer applications - DICOM D. Ultrasound Department E. Quality Assurance F. Record Keeping G. HIPPA Regulations
VI. Medical Terminology A. Sonographic medical terminology B. Pathophysiology C. Knowledge of LAB valves and correlation with other imaging studies
VII. The Sonographer and Patient Communication A. Professional ethics B. Patient's legal rights C. Confidentiality & privacy issues and patient computer records
VIII. General Patient & Operator Care

	A. Body mechanics, moving and transferring patients B. Patient Care
IX.	Exploring the Library A. Orientation to the library B. Availability of library/program reference material C. Understanding the differences between information and knowledge
X.	Basic operation and function of a computer and the ultrasound machine

Student Outcomes

At the end of this course, the student should be able to:

A. Use proper medical terminology specific to the sonography environment
B. Understand pathophysiology related to normal and abnormal patient condition.
C. Analyze the various program policies and provide a rational for their existence
D. Diagram the major duties/responsibilities of a student sonographer
E. Compare and contrast the functions of the various components of the health care system and their relationship with the sonography department
F. Relate purposes, functions and activities of the national professional organization
G. Compare and contrast the various career advancement opportunities available to the sonographer
H. Utilize and understand the basic operation and function of an ultrasound machine
I. Select and demonstrate proper principles of body mechanics applicable to patient care and employee well-being
J. Learn techniques for providing quality patient care in changing clinical environments
K. Name & describe the typical digital computer components and their functions
L. Describe common computer applications and related social and ethical problems/impact
M. Learn fundamental operation and concepts of work processing, spreadsheet, and/or database software applications
N. Understand the difference between information and knowledge
O. Understand the links among information centers and the access points available through technology and reference sources
P. Understand the basic structure of electronic databases and the strategies used to access them

ABDOMINAL SONOGRAPHY

Course Description

This course covers abdominal sonographic positioning and scanning protocol; related anatomy and physiology to include the retroperitoneum; pathology and clinical symptomology and how they relate to the sonographic appearance of these structures. Interpretation and critique of normal and abnormal anatomy with correlation of clinical, didactic and image information will be presented. The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting abdominal sonographic procedures.

Course Content Outline

TOPICS
I. Liver A. Anatomy B. Normal/pathology C. Technique
II. Biliary Tree A. Anatomy B. Indications C. Technique
III. Pancreas A. Anatomy B. Lab values C. Technique
IV. Spleen A. Anatomy B. Diffuse disease C. Technique
V. Urinary Tract A. Anatomy B. Lab values C. Obstructive uropathy D. Transplants E. Technique
VI. Retroperitoneum A. Anatomy B. Great vessels C. Adenopathy and masses D. Technique
VII. G.I. Tract A. Anatomy B. Technique

VIII. Miscellaneous
- A. Abscesses and other fluid collections
- B. Non-cardiac chest
- C. Invasive procedures

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform a sonographic examination of the abdomen
B. Conduct sonography examinations with proper utilization of real-time equipment for abdominal scanning
C. Differentiate and identify the sonographic appearance of normal abdominal anatomic structures
D. Differentiate and document abnormal sonographic diseases processes, pathology, and pathophysiology of abdominal structures
E. Modify the scanning protocol based on the sonographic findings and differential diagnosis

General Sonography
Course Level 2

BEGINNING CLINICAL EXPERIENCE I

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation for abdominal imaging is provided.

Course Content Outline

TOPICS
I. Orientation to Ultrasound Department A. Departmental policies and procedures B. Patient transportation procedures to and from department C. Computer operation of departmental application software D. Instrumentation of ultrasound equipment E. Location of equipment and supplies F. Hospital personnel
II. Evaluation of Ultrasound Orders A. Patient identification B. Verification of procedure(s) ordered C. Exam protocol & procedures
III. Establishing Patient Rapport A. Patient status evaluation 1. Cooperative/uncooperative 2. Trauma 3. Geriatric B. Explaining procedures
VI. Patient Preparation A. Disrobing B. Patient exam preparation
VII. Room Preparation A. Appearance/cleanliness B. Equipment/supplies
VIII. Interaction with Radiologist A.Exam presentation
IX. Core Competencies in Abdominal Sonography A. Exam 1. Scanning technique 2. Positioning skills 3. Equipment manipulation 4. Image acquisition/critique 5. Potential Artifacts 6. Patient interaction/preparation 7. Image orientation and identification

Student Outcomes

At the end of this course, the student should be able to:

Independently execute with minimal assistance, a normal complete abdominal examination to include liver, biliary tree, pancreas, spleen, kidneys, and aorta.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Select proper patient's positions
B. Prepare the equipment and accessory devices set-ups properly
C. Select the appropriate technical factors
D. Generate proper anatomical evaluations of ultrasound images
E. Select the proper technical factor adjustments to produce diagnostic images
F. Demonstrate the proper identification of images

General Sonography
Course Level 3

OBSTETRICS AND GYNECOLOGY

Course Description

This course presents a review of anatomy and physiology of the gravid and nongravid pelvis. Techniques of transabdominal and transvaginal preparation are introduced. Symptomology of the female patient with correlation to sonographic appearance of pathology are covered. First, second and third trimester obstetrical assessment are covered in depth.

Course Content Outline

TOPICS
I. Female Pelvis A. Normal/abdominal B. Physiology C. Techniques 1. Transabdominal 2. Transvaginal
. II. Gynecology A. General descriptive terms B. Uterine masses C. Ovarian masses
III. First Trimester Obstetrical Ultrasound A. Normal gestational sac/embryo B. Assessment of gestational age/maturity C. Lab values D. Pregnancy failures E. Ectopic pregnancies
IV. Second and Third Trimester Obstetrical Ultrasound A. Normal fetus B. Multiple pregnancies C. Placenta 1. Normal anatomy/position 2. Developmental changes 3. Previa/abruption D. Amniotic Fluid Volume E. Fetal anomalies F. Maternal disease G. Fetal death

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform obstetric and gynecologic sonographic examinations
B. Demonstrate the ability to utilize real-time equipment for transabdominal and endocavitary obstetric and gynecologic scanning
C. Differentiate sonographic appearance of normal anatomic structures of the female pelvic, including anatomical variants
D. Differentiate, identify and document abnormal sonographic disease processes, pathology, and

pathophysiology of the female pelvic structures
E. Discriminate between the appearance of normal maternal, embryonic and fetal anatomic structures during the first, second and third trimesters
F. Discriminate and appropriately document the sonographic appearance of obstetric abnormalities, diseases, pathology and pathophysiology
G. Demonstrate knowledge and understanding of the role of the sonographer in performing invasive procedures
H. Adapt the scanning protocol based on the sonographic findings and differential diagnosis
I. Create diagnostic images by utilizing given standards of acceptance
J. Critique the quality of sonographic images by utilizing given department standards

BEGINNING CLINICAL EXPERIENCE II

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation for obstetric and gynecological imaging, in addition to abdominal imaging is provided.

Course Content Outline

TOPICS
I. Orientation to Ultrasound Department A. Departmental policies and procedures B. Patient transportation procedures to and from department C. Computer operation of departmental application software D. Instrumentation of ultrasound equipment E .Location of equipment and supplies F. Hospital personnel
II. Evaluation of Ultrasound Orders A. Patient identification B. Verification of procedure(s) ordered C. Exam protocol & procedures
III. Establishing Patient Rapport A. Patient status evaluation 1. Cooperative/uncooperative 2. Trauma 3. Geriatric B. Explaining procedures
IV. Patient Preparation A. Disrobing B. Patient exam preparation
V. Room Preparation A. Appearance/cleanliness B. Equipment/supplies
VI. Interaction with Radiologist A. Exam presentation 1. Core Competencies in Abdominal Sonography 2. Exam 3. Scanning technique 4. Positioning skills 5. Equipment manipulation 6. Image acquisition/critique 7. Potential Artifacts 8. Patient interaction/preparation 9. Image orientation and identification

Student Outcomes

At the end of this course, the student should be able to:

Independently execute with minimal assistance, a normal complete gynecological and obstetrical examination to include transabdominal and endocavitary technique.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Assess proper patient preparation of the female pelvis
B. Select proper patient positions
C. Prepare the equipment set-up and accessory devices properly
D. Select the appropriate technical factors
E. Generate proper anatomical evaluations of ultrasound images
F. Select the proper technical factor adjustments to produce diagnostic images
G. Demonstrate the proper identification of images

General Sonography
Course Level 4

ADVANCED ULTRASOUND PHYSICS

Course Description

This course is a continuation of basic physics and instrumentation including continuous and pulsed wave Doppler. Basic principles of color flow imaging, advanced principles in medical ultrasound instrumentation, hemodynamics, bioeffects, artifacts, and sonographic quality control procedures are also covered.

Course Content Outline

TOPICS
I. Physical Principles of Doppler A. Doppler equation B. Doppler effect
II. Instrumentation A. Continuous wave and pulsed 54oppler 1. Differences 2. Advantages and disadvantages of each B. Duplex Instruments C. Spectral Analysis D. Basic of Color Flow Imaging 1. Advantages and limitations 2. Artifacts D. Power Doppler E. Tissue
III. Quality Assurance of Ultrasound Instruments A. General Concepts B. Parameters to be evaluated C. Preventative maintenance D. Record keeping
IV. Bioeffects and safety A. Bioeffects 1. Dosimetric quantities 2. Acoustic exposure 3. Intensity B. Experimental Biological Effects Studies C. In Vitro Studies D. Epidemiological Studies E. AIUM Statements

Student Outcomes

At the end of this course, the student should be able to:

A. Employ a basic understanding of the physical principles of the Doppler equation
B. Select the appropriate techniques for performing Doppler examinations
C. Adjust instrument controls to optimize image quality
D. Evaluate and compensate for acoustical Doppler artifacts
E. Prepare hard copy documentation of examination findings
F. Demonstrate knowledge and understanding of the interaction between ultrasound and tissue and the probability of biological effects
G. Distinguish between normal and abnormal continuous wave, pulse Doppler and basic color flow Doppler
H. Assess the basic parameters of quality assurance of ultrasound instruments

General Sonography
Course Level 4

ADVANCED CLINICAL EXPERIENCE I

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation for superficial structures is provided. Clinical experience in abdominal, obstetric and gynecological imaging is also provided.

Course Content Outline

TOPICS
I. Orientation to Ultrasound Department A. Departmental policies and procedures B. Patient transportation procedures to and from department C. Computer operation of departmental application software D. Instrumentation of ultrasound equipment E. Location of equipment and supplies F. Hospital personnel
II. Evaluation of Ultrasound Orders A. Patient identification B. Verification of procedure(s) ordered C. Exam protocol & procedures
III. Establishing Patient Rapport A. Patient status evaluation 1. Cooperative/uncooperative 2. Trauma 3. Geriatric B. Explaining procedures
IV. Patient Preparation A. Disrobing B. Patient exam preparation
V. Room Preparation A. Appearance/cleanliness B. Equipment/supplies
VI. Interaction with Radiologist A. Exam presentation
VII. Core Competencies in Superficial Structures Sonography A. Exam 1. Scanning technique 2. Positioning skills 3. Equipment manipulation 4. Image acquisition/critique 5. Potential Artifacts 6. Patient interaction/preparation 7. Image orientation and identification

Student Outcomes

At the end of this course, the student should be able to:

Upon completion of the course, the student should be able to independently execute with minimal assistance, normal complete examinations of the superficial structures to include thyroid, breast, testicular, and soft tissues sonographic examinations.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Select proper patient's positions
B. Prepare the equipment and accessory devices set-ups properly
C. Set up and complete invasive procedures
D. Select the appropriate technical factors
E. Generate proper anatomical evaluations of ultrasound images
F. Select the proper technical factor adjustments to produce diagnostic images
G. Demonstrate the proper identification of images

General Sonography
Course Level 4

SUPERFICIAL STRUCTURES

Course Description

This course covers basic positioning and scanning protocol of the superficial structures; related anatomy and physiology to include the neck, breast, and testes; pathology and clinical symptomology and how they relate to the sonographic appearance of these structures. Interpretation and critique of normal and abnormal anatomy with correlation of clinical didactic and image information will be presented. The laboratory component of this course will include demonstration and scanning exercises to provide a live lab experience in conducing superficial structure procedures.

Course Content Outline

TOPICS
I. Neck A. Thyroid/Parathyroid 1. Normal/abnormal 2. Lab values 3. Technique
II. Breast A. Normal/abnormal B. Correlation with Mammography C. Techniques
III. Testicular A. Normal/abnormal anatomy B. Techniques
IV. Soft Tissue A. Normal soft tissue anatomy B. Cysts, abscesses and other superficial lesions

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform sonographic examinations of superficial structures
B. Utilize real-time equipment for imaging superficial structures
C. Differentiate and identify the sonographic appearance of normal anatomic superficial structures
D. Recognize, identify and document abnormal sonographic disease processes, pathology, and pathophysiology of superficial structures
E. Demonstrate knowledge and understanding of the role of the sonographer in performing invasive procedures
F. Modify the scanning protocol based on the sonographic findings and differential diagnosis
G. Create diagnostic images by utilizing given standards of acceptance
H. Critique the quality of sonographic images by utilizing given department standards

General Sonography
Course Level 5

INTEGRATIVE STUDY IN SONOGRAPHY

Course Description

This course covers a comprehensive analysis and assessment of all previous diagnostic medical sonography instructional coursework in preparation for writing the national registry examination. Job market readiness skills will also be presented.

Course Content Outline

TOPICS
I. Ultrasound Physics and Instrumentation
II. Abdominal
III. Obstetrics
IV. Gynecology
IV. Basic Vascular Anatomy
V. Basic Vascular Sonographic Procedures
VI. Employment Preparation

Student Outcomes

At the end of the course, the student should be able to:

A. Analyze academic strengths and weakness and determine corrective measures necessary in order to achieve a passing score on a pre-registry written examination
B. Prepare one job resume and cover letter
C. Evaluate the various job opening listed and formulate and plan for obtaining employment

General Sonography
Course Level 5

ADVANCED CLINICAL EXPERIENCE II

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation of basic vascular sonography is provided. Clinical experience in abdominal, obstetric and gynecological, and superficial structures imaging is also provided.

Course Content Outline

TOPICS
I. Orientation to Ultrasound Department A. Departmental policies and procedures B. Patient transportation procedures to and from department C. Computer operation of departmental application software D. Instrumentation of ultrasound equipment E. Location of equipment and supplies F. Hospital personnel
II. Evaluation of Ultrasound Orders A. Patient identification B. Verification of procedure(s) ordered C. Exam protocol & procedures
III. Establishing Patient Rapport A. Patient status evaluation 1. Cooperative/uncooperative 2. Trauma 3. Geriatric B. Explaining procedures
IV. Patient Preparation A. Disrobing B. Patient exam preparation
V. Room Preparation A. Appearance/cleanliness B. Equipment/supplies
VI. Interaction with Radiologist A. Exam presentation
VII. Core Competencies in Vascular Sonography A. Exam 1. Scanning technique 2. Positioning skills 3. Equipment manipulation 4. Image acquisition/critique 5. Potential Artifacts 6. Patient interaction/preparation **7.** Image orientation and identification

Student Outcomes

At the end of the course, the student should be able to:

Execute with minor assistance a normal complete examination of the extracranial carotid system and lower venous system.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Select proper patient positions for the selected images
B. Prepare the equipment and accessory devices set-up properly
C. Select the appropriate technical factors
D. Generate proper anatomical evaluations of ultrasound images
E. Select the proper technical factor adjustments to produce diagnostic images
F. Produce a diagnostic doppler spectral wave form appropriate to the examination being performed
G. Demonstrate the proper identification of images

General Sonography
Course Level 5

BASICS OF VASCULAR SONOGRAPHY

Course Description

This course covers basic positioning and scanning protocol of the vascular system. Vascular terminology specific to the hemodynamics of the arterial venous and cerebrovascular application will be presented. Normal, abnormal, and pathologic states of the human vascular system with emphasis on the external carotid system and the venous systems of the lower extremities are included. The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting basic vascular procedures.

Course Content Outline

TOPICS
I. Testicular A. Normal/abnormal anatomy B. Techniques
II. Soft Tissue A. Normal soft tissue anatomy B. Cysts, abscesses and other superficial lesions
III. Extracranial Carotid Systems A. Anatomy and physiology B. Integrate color/doppler and spectral analysis C. Techniques
IV. Venous System A. Anatomy and physiology of the lower leg venous system B. Integrate color/doppler and spectral analysis C. Techniques

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform basic vascular sonographic examinations
B. Utilize real-time equipment for basic vascular imaging
C. Differentiate and identify the sonographic appearance of normal and abnormal vascular anatomy
D. Demonstrate basic knowledge and understanding of vascular physiology, pathophysiology, and hemodynamics in the different types of vascular diseases and dysfunctions
E. Modify the scanning protocol based on the sonographic findings and differential diagnosis
F. Evaluate basic normal and abnormal vascular flow patterns and wave forms
G. Create diagnostic images by utilizing given standards of acceptance
H. Critique the quality of sonographic images by utilizing given department standards

Diagnostic Medical Sonography Program

ADULT CARDIAC CLASS SCHEDULE

Cohort #5- January 8, 2019 to July 24, 2020

	Start	End	Times	Day(s)	Lec. Hrs.	Lab Hrs.
1st Course Level - 9 Weeks						
Basic Ultrasound Physics	1/8/2019	3/4/2019	5:45p-10p	Tuesday	18	27
Introduction to Sonography	1/10/2019	3/7/2019	5:45p-10p	Thursday	18	27
Course Level Break - March 11 to March 15, 2019						
2nd Course Level - 18 Weeks						
Echocardiography	3/21/2019	7/25/2019	5:45p-10p	Thursday	18	27
Beginning Clinical Experience I	3/18/2019	7/26/2019	8a-3:00p	M,Tu,W,F		504
Spring Break - April 15-19; Memorial Day - May 27; Independence Day - July 4						
Course Level Break - July 29 to August 2, 2019						
3rd Course Level - 18 Weeks						
Cardiac Physiology & Principles (1st 9 weeks)	8/8/2019	10/3/2019	5:45p-10p	Thursday	36	36
Advanced Echocardiography (2nd 9 weeks)	10/10/2019	12/4/2019	5:45p-10p	Thursday	18	18
Beginning Clinical Experience II	8/5/2019	12/5/2019	8a-3:00p	M,Tu,W,F		504
Labor Day - September 2; Veterans Day - Nov. 11; Thanksgiving Break - Nov. 28-29						
Course Level Break - December 9 to January 3, 2020						
4th Course Level - 9 Weeks						
Advanced Ultrasound Physics	1/9/2020	3/5/2020	5:45p-10p	Tuesday	27	
Advanced Clinical Experience I	1/6/2020	3/6/2020	8a-3:00p	M,Tu,W,F		252
Course Level Break - March 9 to March 13, 2020						
5th Course Level - 18 Weeks						
Integrative Study in Sonography	3/17/2020	7/21/2020	5:45p-10p	Tuesday	36	
Advanced Clinical Experience II	3/16/2020	7/24/2020	8a-3:00p	M,Tu,W,F		504
Basics of Vascular Sonography	3/19/2020	7/23/2020	5:45p-10p	Thursday	27	27
Spring Break - April 6-10; Memorial Day - May 25; Independence Day - July 4						

Any clinical hours missed due to a holiday will be made up by arrangement.

There is a 30 minute lunch included for all clinical days assigned.

BASIC ULTASOUND PHYSICS

Course Description

This course covers basic principles and terminology of diagnostic ultrasound physics to include: a review of mathematical skills, transducers, beam dynamics and instrumentation. Hands-on instruction will be provided to introduce the student to necessary elementary skills in scanning as it pertains to the physical nature of ultrasound.

Course Content Outline

TOPICS
I. Introduction to Ultrasound and Elementary Principles A. Nature of ultrasound/definition of sound B. Frequency, wavelength, propagation speed C. Properties of ultrasound waves D. Review of mathematical units
II. Propagation of Ultrasound Through Tissues A. Speed of sound in tissues B. Reflection C. Refraction D. Attenuation
III. Image Features and Artifacts A. Definition of artifacts B. Reverberation, refraction C. Shadowing and enhancement D. Review artifacts on images
IV. Basic Physics and Instrumentation A. Ultrasound transducers 1. The piezoelectric effect 2. Transducer construction and characteristics 3. Focusing 4. Beam width and lateral resolution 5. Pulse duration and axial resolution 6. Transducer B. Pulse Echo Instruments 1. Characteristics 2. Output power 3. Receiver gain (TGC) 4. Signal processing C. Image Storage and Display 1. Scan converter 2. Digital systems 3. Resolution and field of view 4. Display devices and controls 5. Measurements of dimensions 6. Recording techniques

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate knowledge of basic acoustical physics and ultrasound instrumentation
B. Employ a basic understanding of the propagation of ultrasound through tissues
C. Select the appropriate techniques for performed examinations
D. Adjust instrument controls to optimize image quality
E. Evaluate and compensate for acoustical artifacts
F. Prepare hard copy documentation of examination findings
G. Perform linear area, circumference and other related measurements from sonographic images

Adult Cardiac Sonography
Course Level 1

INTRODUCTION TO SONOGRAPHY

Course Description

This course is an overview of diagnostic medical sonography (DMS) and its role in health care delivery. Students will be oriented to the academic and administrative structure of the program, clinical affiliates, and to the profession as a whole. Ethical and legal responsibilities of the professional relative to health care delivery will be addressed. An introduction to the principles, instruments, and routine sonographic procedures will be emphasized. The laboratory portion of this course will include a hands-on orientation to the computerized equipment and instrumentation. An orientation in the use of the library and library materials will also be presented.

Course Content Outline

TOPICS
I. Introduction to the Diagnostic Sonography Program A. General information B. Clinical education centers C. Duties/responsibilities of the student sonographer
II. Professional Organizations A. Purpose, functions and activities B. National C. State
III. Professional Development A. Career mobility B. Career advancement C. Continuing education
IV. History A. Ultrasound
V. Hospital Organization A. Health care delivery system B. Hospital Information System (HIS) 1. Accessing information 2. Data bases C. Radiology Information System (RIS) – computer applications - DICOM D. Ultrasound Department E. Quality Assurance F. Record Keeping G. HIPPA Regulations
VI. Medical Terminology A. Sonographic medical terminology B. Pathophysiology C. Knowledge of LAB valves and correlation with other imaging studies
VII. The Sonographer and Patient Communication A. Professional ethics B. Patient's legal rights C. Confidentiality & privacy issues and patient computer records

IX.	Exploring the Library A. Orientation to the library B. Availability of library/program reference material C. Understanding the differences between information and knowledge
X.	Basic operation and function of a computer and the ultrasound machine

Student Outcomes

At the end of this course, the student should be able to:

A. Use proper medical terminology specific to the sonography environment
B. Understand pathophysiology related to normal and abnormal patient condition.
C. Analyze the various program policies and provide a rational for their existence
D. Diagram the major duties/responsibilities of a student sonographer
E. Compare and contrast the functions of the various components of the health care system and their relationship with the sonography department
F. Relate purposes, functions and activities of the national professional organization
G. Compare and contrast the various career advancement opportunities available to the sonographer
H. Utilize and understand the basic operation and function of an ultrasound machine
I. Select and demonstrate proper principles of body mechanics applicable to patient care and employee well-being
J. Learn techniques for providing quality patient care in changing clinical environments
K. Name & describe the typical digital computer components and their functions
L. Describe common computer applications and related social and ethical problems/impact
M. Learn fundamental operation and concepts of work processing, spreadsheet, and/or database software applications
N. Understand the difference between information and knowledge
O. Understand the links among information centers and the access points available through technology and reference sources
P. Understand the basic structure of electronic databases and the strategies used to access them

Adult Cardiac Sonography
Course Level 2

ECHOCARDIOGRAPHY

Course Description

This course covers an introduction to acoustical physics and instrumentation, echocardiographic positioning and scanning protocol including 2D, M-mode, Color Flow, and Doppler Imaging; related anatomy, hemodynamics, and physiology to include ventricular function, intracardiac anatomy, valvular anatomy and function; pathology and clinical symptomology and how they relate to the sonographic appearance of these structures. Interpretation and critique of normal and abnormal anatomy with correlation of clinical, didactic, and image information will be presented. The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting echocardiographic procedures.

Course Content Outline

I. Introduction to the Basics A. Acoustical Physics B. Ultrasound Instrumentation
II. Heart A. Anatomy B. Normal/Pathology C. Hemodynamics
III. Imaging Techniques A. Two-Dimensional (2D) B. M-mode C. Color Flow D. Doppler
IV. Transthoracic Views A. Parasternal B. Apical C. Suprasternal D. Subcostal
V. Aortic Valve A. Anatomy B. Pathology C. Technique
VI. Mitral Valve A. Anatomy B. Pathology C. Technique
VII. Tricuspid Valve A. Anatomy B. Pathology C. Technique

VIII. Pulmonic Valve A. Anatomy B. Pathology C. Technique
IX. Cardiac Atria and Ventricles A. Anatomy B. Cardiomyopathies C. Function
X. Pericardium A. Anatomy B. Pathology C. Technique
XI. Pediatric Echo A. Technique B. Congenital Pathology

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform an echocardiographic examination
B. Utilize real-time equipment for cardiac imaging
C. Differentiate and identify sonographic appearance of normal cardiac anatomic structures
D. Recognize and identify the cardiac disease processes and pathophysiology as it relates to imaging
E. Modify the scanning protocol based on the echocardiographic findings and differential diagnosis

Adult Cardiac Sonography
Course Level 2

CARDIAC PHYSIOLOGY & PRINCIPLES

Course Description

This course covers cardiac physiology and cardiac physics as it relates to echocardiography. The emphasis will describe the effects of pressure, loading, and volume as they relate to the following disease states: heart failure, shock, valvular stenosis and regurgitation, intracardiac shunts, pulmonary disease, pericardial disease, and cardiomyopathies. Hemodynamics, Spectral Doppler, and Color Flow technologies will be described. The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting echocardiographic procedures.

Course Content Outline

I. Heart
   A. Anatomy
   B. Normal/ Pathology
   C. Hemodynamics

II. Basic Cardiac Embryology
   A. Heart tube
   B. Septation
   C. Chambers
   D. Aortic Arches

III. Congenital Defects
   A. Cyanotic Lesions
   B. Noncyanotic Lesions

IV. Cardiac Evaluation Methods
   A. Anatomy
   B. Pathology
   C. Technique

V. Principles of Cardiac Hemodynamics
   A. Physiology- Changes in Disease States
   B. Pathology
   C. Pressure and Flow

VI. Principles and Instrumentation
   A. Velocity
   B. Wave Equation
   C. Propagation Speeds

VII. Propagation of Ultrasound Through Tissues
   A. Attenuation
   B. Reflection
   C. Refraction
   D. Scattering

VIII. Ultrasound Transducers

A. Anatomy B. Cardiomyopathies C. Function
IX. Doppler A. Pulsed Wave B. Continuous Wave C. Artifacts
X. Bioeffects and Safety A. ALARA Principle B. Ultrasound Intensity

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform an advanced echocardiographic examination
B. Utilize real-time equipment for cardiac imaging
C. Differentiate and identify disease states as it relates to increased pressure, volume overload, valvular
D. Recognize and identify the cardiac disease processes and pathophysiology as it relates to imaging
E. Modify the scanning protocol based on echocardiographic findings and differential diagnosis

Adult Cardiac Sonography
Course Level 2

BEGINNING CLINICAL EXPERIENCE I

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation for cardiac imaging is provided.

Course Content Outline

I. Orientation to Ultrasound Department
   A. Departmental policies and procedures
   B. Patient transportation procedures to and from department
   C. Computer operation of departmental application software
   D. Instrumentation of ultrasound equipment
   E. Location of equipment and supplies
   F. Hospital personnel

II. Evaluation of Ultrasound Orders
   A. Patient identification
   B. Verification of procedure(s) ordered
   C. Exam protocol & procedures

III. Establishing Patient Rapport
   A. Patient status evaluation
      1. Cooperative/uncooperative
      2. Trauma
      3. Geriatric
   B. Explaining procedures

IV. Patient Preparation
   A. Disrobing
   B. Patient exam preparation

V. Room Preparation
   A. Appearance/cleanliness
   B. Equipment/supplies

VI. Interaction with Cardiologist
   A. Exam presentation

VII. Core Competencies in Echocardiography
   A. Exam
      1. Scanning technique
      2. Positioning skills
      3. Equipment manipulation
      4. Image acquisition/critique
      5. Potential Artifacts
      6. Patient interaction/preparation
      7. Image orientation and identification

Student Outcomes

At the end of this course, the student should be able to:

Independently execute with minimal assistance, a normal complete echocardiographic examination to include intracardiac anatomy and great vessel orientation.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Arrange the patient's position correctly
B. Set up the equipment and accessory devices properly
C. Select the appropriate technical factors
D. Evaluate the proper anatomical evaluation on ultrasound images
E. Estimate the proper adjustment in technical factors to produce diagnostic images
F. Demonstrate proper scan identification

Adult Cardiac Sonography
Course Level 3

ADVANCED ECHOCARDIOGRAPHY

Course Description

This course covers advanced echocardiographic sonographic positioning and scanning protocol including transthoracic, transesophageal, pediatric, and fetal echocardiography; related anatomy and physiology to include cardiac pathology and clinical symptomology and how they relate to the sonographic appearance of these structures. Interpretation and critique of normal and abnormal anatomy with correlation of clinical, didactic and image information will be presented. The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting echocardiographic sonographic procedures.

Course Content Outline

I. Heart A. Anatomy B. Normal/ Pathology C. Hemodynamics
II. Imaging Techniques A. Two-Dimensional (2D) B. M-mode C. Color Flow D. Doppler E. Pediatric Echo F. Fetal Echo G. Contrast Echo H. Stress Echo
III. Transthoracic Views A. Parasterna B. Apical C. Suprasternal D. Subcostal
IV. Aortic Valve A. Anatomy B. Pathology C. Technique
V. Mitral Valve A. Anatomy B. Pathology C. Technique
VI. Tricuspid Valve A. Anatomy B. Pathology C. Technique

VII. Pulmonic Valve A. Anatomy B. Pathology C. Technique
VIII. Cardiac Atria and Ventricles A. Anatomy B. Cardiomyopathies C. Function
IX. Pericardium A. Anatomy B. Pathology C. Technique
X. Pediatric Echo A. Technique B. Congenital Pathology

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform an advanced echocardiographic examination
B. Utilize real-time equipment for advanced cardiac imaging
C. Differentiate and identify sonographic appearance of normal cardiac anatomic structures
D. Recognize and identify the cardiac disease processes and pathophysiology as it relates to advanced cardiac imaging
E. Modify the scanning protocol based on advanced echocardiographic findings and differential diagnosis

Adult Cardiac Sonography
Course Level 3

BEGINNING CLINICAL EXPERIENCE II

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework is provided. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation for echocardiographic imaging.

Course Content Outline

I. Orientation to Ultrasound/Cardiology Departments
   A. Departmental policies and procedures
   B. Patient transportation procedures to and from department
   C. Computer operation of departmental application software
   D. Instrumentation of ultrasound equipment
   E. Location of equipment and supplies
   F. Hospital personnel

II. Evaluation of Ultrasound Orders
   A. Patient identification
   B. Verification of procedure(s) ordered
   C. Exam protocol & procedures

III. Establishing Patient Rapport
   A. Patient status evaluation
      1. Cooperative/uncooperative
      2. Trauma
      3. Geriatric
   B. Explaining procedures

IV. Patient Preparation
   A. Disrobing
   B. Patient exam preparation

V. Room Preparation
   A. Appearance/cleanliness
   B. Equipment/supplies

VI. Interaction with Cardiologist
   A. Exam presentation

VII. Core Competencies in Echocardiography
   A. Exam
      1. Scanning technique
      2. Positioning skills
      3. Equipment manipulation
      4. Image acquisition/critique
      5. Potential Artifacts
      6. Patient interaction/preparation
      7. Image orientation and identification

Student Outcomes

At the end of this course, the student should be able to:

Independently execute with minimal assistance, a normal complete echographic examination to include 2D, M-Mode, Color and Spectral Doppler.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Evaluate proper patient preparation
B. Arrange the patients position correctly
C. Set up the equipment and accessory devices properly
D. Select the appropriate technical factors
E. Evaluate the proper anatomical evaluation on ultrasound images
F. Estimate the proper adjustment in technical factors to produce diagnostic images
G. Demonstrate proper film identification

Adult Cardiac Sonography
Course Level 4

ADVANCED ULTRASOUND PHYSICS

Course Description

This course is a continuation of basic physics and instrumentation including continuous and pulsed wave Doppler. Basic principles of color flow imaging, advanced principles in medical ultrasound instrumentation, hemodynamics, bioeffects, artifacts, and sonographic quality control procedures are also covered.

Course Content Outline

TOPICS
I. Physical Principles of Doppler A. Doppler equation B. Doppler effect
II. Instrumentation A. Continuous wave and pulsed Doppler 1. Differences 2. Advantages and disadvantages of each B. Duplex Instruments C. Spectral Analysis D. Basic of Color Flow Imaging 1. Advantages and limitations 2. Artifacts E. Power Doppler F. Tissue
III. Quality Assurance of Ultrasound Instruments A. General Concepts B. Parameters to be evaluated C. Preventative maintenance D. Record keeping
IV. Bioeffects and safety A. Bioeffects 1. Dosimetric quantities 2. Acoustic exposure 3. Intensity B. Experimental Biological Effects Studies C. In Vitro Studies D. Epidemiological Studies E. AIUM Statements

Student Outcomes

At the end of this course, the student should be able to:

A. Employ a basic understanding of the physical principles of the Doppler equation
B. Select the appropriate techniques for performing Doppler examinations
C. Adjust instrument controls to optimize image quality
D. Evaluate and compensate for acoustical Doppler artifacts
E. Prepare hard copy documentation of examination findings
F. Demonstrate knowledge and understanding of the interaction between ultrasound and tissue and the probability of biological effects
G. Distinguish between normal and abnormal continuous wave, pulse Doppler and basic color flow Doppler
H. Assess the basic parameters of quality assurance of ultrasound instruments

Adult Cardiac Sonography
Course Level 4

ADVANCED CLINICAL EXPERIENCE I

Course Description

This course provides continued clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation for cardiac imaging is provided.

Course Content Outline

I. Orientation to Ultrasound Department
   A. Departmental policies and procedures
   B. Patient transportation procedures to and from department
   C. Computer operation of departmental application software
   D. Instrumentation of ultrasound equipment
   E. Location of equipment and supplies
   F. Hospital personnel

II. Evaluation of Ultrasound Orders
   A. Patient identification
   B. Verification of procedure(s) ordered
   C. Routine and non-routine exam protocol & procedures

III. Establishing Patient Rapport
   A. Patient status evaluation
   B. Pathologic condition
   C. Explaining procedures

IV. Patient Preparation Accommodations
   A. Disrobing
   B. Patient exam preparation

V. Room Preparation
   A. Appearance/cleanliness
   B. Special equipment/supplies

VI. Interaction with Cardiologist
   A. Pathological exam presentation

VII. Core Competencies in Echocardiography with an Emphasizes on Pathology
   A. Exam
      1. Scanning technique
      2. Positioning skills
      3. Equipment manipulation
      4. Image acquisition/critique
      5. Potential Artifacts
      6. Patient interaction/preparation
      7. Image orientation and identification

Student Outcomes

At the end of this course, the student should be able to:

A. Execute an abnormal complete echocardiographic examination to include intracardiac anatomy and great vessel orientation and
B. Execute M-Mode, 2D techniques
C. Execute Spectral Doppler analysis and color flow techniques.

Adult Cardiac Sonography
Course Level 5

INTEGRATIVE STUDY IN SONOGRAPHY

Course Description

This course covers a comprehensive analysis and assessment of all previous diagnostic medical sonography instructional coursework in preparation for writing the national registry examination. Job market readiness skills will also be presented.

Course Content Outline

TOPICS
I. Ultrasound Physics and Instrumentation
II. Abdominal
III. Obstetrics
IV. Gynecology
V. Basic Vascular Anatomy
VI. Basic Vascular Sonographic Procedures
VII. Employment Preparation

Student Outcomes

At the end of this course, the student should be able to:

A. Analyze academic strengths and weakness and determine corrective measures necessary in order to achieve a passing score on a pre-registry written examination
B. Prepare one job resume and cover letter
C. Evaluate the various job opening listed and formulate and plan for obtaining employment

Adult Cardiac Sonography
Course Level 5

ADVANCED CLINICAL EXPERIENCE II

Course Description

This course provides clinical experience for advanced application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation for cardiac imaging is provided.

Course Content Outline

I. Orientation to Ultrasound Department
   A. Departmental policies and procedures
   B. Patient transportation procedures to and from department
   C. Computer operation of departmental application software
   D. Instrumentation of ultrasound equipment
   E. Location of equipment and supplies
   F. Hospital personnel

II. Evaluation of Ultrasound Orders
   A. Patient identification
   B. Verification of procedure(s) ordered
   C. Exam protocol & procedures

III. Establishing Patient Rapport
   A. Patient status evaluation
      1. Cooperative/uncooperative
      2. Trauma
      3. Geriatric
   B. Explaining procedures

IV. Patient Preparation
   A. Disrobing
   B. Patient exam preparation

V. Room Preparation
   A. Appearance/cleanliness
   B. Equipment/supplies

VI. Interaction with Cardiologist
   A. Exam presentation

VII. Final Competencies in Echocardiography
   A. Exam
      1. Scanning technique
      2. Positioning skills
      3. Equipment manipulation
      4. Image acquisition/critique
      5. Potential Artifacts
      6. Patient interaction/preparation
      7. Image orientation and identification

Student Outcomes

At the end of this course, the student should be able to:

A. Execute a normal complete echocardiographic examination to include intracardiac anatomy and great vessel orientation
B. Execute advanced M-Mode, 2D techniques
C. Execute advanced quantitative spectral Doppler analysis and color flow techniques

BASICS OF VASCULAR SONOGRAPHY

Course Description

This course covers basic positioning and scanning protocol of the vascular system. Vascular terminology specific to the hemodynamics of the arterial venous and cerebrovascular application will be presented. Normal, abnormal, and pathologic states of the human vascular system with emphasis on the external carotid system and the venous systems of the lower extremities are included. The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting basic vascular procedures.

Course Content Outline

TOPICS
I. Testicular A. Normal/abnormal anatomy B. Techniques
II. Soft Tissue A. Normal soft tissue anatomy B. Cysts, abscesses and other superficial lesions
III. Extracranial Carotid Systems A. Anatomy and physiology B. Integrate color/doppler and spectral analysis C. Techniques
IV. Venous System A. Anatomy and physiology of the lower leg venous system B. Integrate color/doppler and spectral analysis C. Techniques

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform basic vascular sonographic examinations
B. Utilize real-time equipment for basic vascular imaging
C. Differentiate and identify the sonographic appearance of normal and abnormal vascular anatomy
D. Demonstrate basic knowledge and understanding of vascular physiology, pathophysiology, and hemodynamics in the different types of vascular diseases and dysfunctions
E. Modify the scanning protocol based on the sonographic findings and differential diagnosis
F. Evaluate basic normal and abnormal vascular flow patterns and wave forms
G. Create diagnostic images by utilizing given standards of acceptance
H. Critique the quality of sonographic images by utilizing given department standards

(BLANK PAGE)

Diagnostic Medical Sonography Program

PEDIATRIC CARDIAC CLASS SCHEDULE

Cohort #5 - January 6 to December 11, 2020

	Start	End	Times	Day(s)	Lec. Hrs.	Lab Hrs.
6th Course Level - 9 Weeks						
Advanced Congenital Heart Physics/Physiology	1/9/2020	10/8/2020	5-6 pm	Thursday	9	0
Pediatric and Fetal Echocardiography Techniques	1/9/2020	10/8/2020	6-10pm	Thursday	18	18
Advanced Ped-Fetal Clinical Experience I	1/6/2020	10/9/2020	8-3:30	M,T,W,F		252
Labor Day - September 7						
No Course Level Break						
7th Course Level - 9 Weeks						
Adult Congenital Post-Surgical Echocardiography	10/15/2020	12/9/2020	5-6pm	Thursday	9	0
Advanced Pediatric and Fetal Echocardiography	10/15/2020	12/9/2020	6-10pm	Thursday	18	18
Advanced Pediatric and Fetal Clinical Experience II	10/12/2020	12/11/2020	8-3:30pm	M,T,W,F		252
Veteran's Day - November 11, Thanksgiving - November 26						

Any clinical hours missed due to a holiday will be made up by arrangement.

There is a 30 minute lunch included for all clinical days assigned.

Pediatric Cardiac Sonography
Course Level 6

ADVANCED CONGENITAL HEART PHYSICS/PHYSIOLOGY

Course Description

This course covers advanced physics and congenital heart physicology related to pre and post natal circulation, maternal risk factors, and hemodynamic changes associated with both normal and congenital heart disease. Advanced cardiac physics as applied to echocardiographic techniques and measurements will be applied. In depth coverage of cardiac measurements in fetal and pediatric echocardiography will be covered. Cardiac physiology to include cardiac pathology and clinical symptomology and how they relate to the sonographic appearances will be included.

Course Content Outline

TOPICS
I. Pre and Post natal circulation A. Normal/abnormal anatomy B. Techniques
II. Hemodynamics A. Prenatal circulation B. Postnatal circulation
III. Bioeffects and Advanced Cardiac Physics A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/doppler and spectral analysis C. Artifacts/ Imaging pitfalls/Techniques
IV. Cardiac Measurements A. Cardiac measurements in normal and abnormal patients B. Integrate color/Doppler and spectral analysis C. Techniques

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to differentiate between fetal and postnatal circulation and vary protocols related to changes in hemodynamics.
B. Apply advanced cardiac physic principles related to congenital heart disease
C. Recognize and identify the cardiac disease processes and pathophysiology as it relates to imaging and pressure gradients.
D. Modify the scanning protocol based on the echocardiographic findings and differential diagnosis in both pediatric and fetal echocardiographic examinations.
E. Set up the equipment and accessory devices properly specifically with the ALARA principle in mind.

Pediatric Cardiac Sonography
Course Level 6

PEDIATRIC AND FETAL ECHOCARDIOGRAPHY TECHINQUES

Course Description

This course covers the normal anatomy, sonographic views, and Doppler measurements needed to perform a pediatric and fetal echocardiogram. Normal fetal and pediatric anatomy will be covered. Basic shunts, and noncomplex fetal and pediatric pathologic cases will be discussed. In depth coverage of cardiac measurements in fetal and pediatric echocardiography will be covered. Cardiac physiology to include cardiac pathology and clinical symptomology and how they relate to the sonographic appearance of these structures is included.

Course Content Outline

TOPICS
I. Fetal Echocardiography A. Normal/abnormal anatomy B. Techniques
II. Pediatric Echocardiography A. Normal/abnormal anatomy B. Techniques
III. Fetal Echo protocol A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/Doppler and spectral analysis C. Imaging pitfalls, body habitus, positioning D. Complete fetal echo protocol including all cardiac measurements
IV. Pediatric Echo protocol A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/Doppler and spectral analysis C. Imaging pitfalls, body habitus, positioning D. Complete fetal echo protocol including all cardiac measurements

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to differentiate between fetal and postnatal circulation
B. Assess maternal and fetal circulation through the umbilical artery, ductus venosus, ductus arteriosus and direction of intraatrial flow through the foramen ovale.
C. Recognize and identify the cardiac disease processes and pathophysiology as it relates to imaging and pressure gradients specific to fetal and pediatric patients.
D. Modify the scanning protocol based on the echocardiographic findings and differential diagnosis with the understanding of fetal and pediatric physiology and flow patterns.
E. Set up the equipment and accessory devices properly
F. Evaluate the proper anatomical evaluation on ultrasound images
G. Independently execute with minimal assistance, a normal complete pediatric and fetal echocardiographic examination to include intracardiac anatomy and great vessel orientation according to the set competency criteria.

ADVANCED PEDIATRIC-FETAL CLINICAL EXPERIENCE I

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation of pediatric and fetal echocardiography is provided. Clinical experience related to NICU clinical practices, care of the maternal and pediatric patient, and specialized report writing techniques will also be provided .

Course Content Outline

TOPICS
I. Fetal Echocardiography A. Normal/abnormal anatomy B. Techniques
II. Pediatric Echocardiography A. Normal/abnormal anatomy B. Techniques
III. Fetal Echo protocol A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/Doppler and spectral analysis C. Imaging pitfalls, body habitus, positioning D. Complete fetal echo protocol including all cardiac measurements
IV. Pediatric Echo protocol A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/Doppler and spectral analysis C. Imaging pitfalls, body habitus, positioning D. Complete fetal echo protocol including all cardiac measurements

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to differentiate between fetal and postnatal circulation
B. Assess maternal and fetal circulation through the umbilical artery, ductus venosus, ductus arteriosus and direction of intraatrial flow through the foramen ovale.
C. Recognize and identify the cardiac disease processes and pathophysiology as it relates to imaging and pressure gradients specific to fetal and pediatric patients.
D. Modify the scanning protocol based on the echocardiographic findings and differential diagnosis with the understanding of fetal and pediatric physiology and flow patterns.
E. Set up the equipment and accessory devices properly
F. Evaluate the proper anatomical evaluation on ultrasound images
G. Independently execute with minimal assistance, a normal complete pediatric and fetal echocardiographic examination to include intracardiac anatomy and great vessel orientation according to the set competency criteria.

Pediatric Cardiac Sonography
Course Level 7

ADVANCED CONGENITAL POST-SURGICAL ECHOCARDIOGRAPHY

Course Description

This course covers the surgical repair methods currently available for congenital heart disease. The material will be presented as pre and post surgical for a thorough understanding of the anatomy, hemodynamics, and rationale for each type of repair. Both pediatric and adult congenital echocardiography post surgical repair will be included. The focus will be on the advances in surgical opportunities and the need for echocardiography from the fetus to adulthood. The echocardiographer's role and knowledge base along the entire spectrum of care will be emphasized. In depth coverage of cardiac measurements in pediatric and adult congenital echocardiography will be covered with specific emphasis of post surgical shunts, baffles, stents and grafts. Cardiac physiology to include cardiac pathology and clinical symptomology and how they relate to the sonographic appearance of these structures.

Course Content Outline

TOPICS
I. Pediatric Echocardiography A. Basic congenital heart defects and surgical repair B. Sonographic Techniques
II. Pediatric Echocardiography A. Complex congenital heart defects and surgical repair B. Sonographic Technique
III. Fetal Echo A. Ductal dependent lesions that will require emergent surgical repair
IV. Adult Congenital Echocardiography A. Emerging ongoing surgical repairs B. Lifelong care of patients with congenital heart disease.

Student Outcomes

At the end of this course, the student should be able to:

A. Describe which surgical repair aligns with which congenital heart defect
B. Learn which defects require multiple surgical repairs
C. Know the importance of patient and family counseling regarding the pros and cons of surgical repair
D. Have in depth knowledge of shunts, baffles, grafts, stents, and transplantation options
E. Understand the importance of adult congenital heart clinic over general adult echo post surgical care

Pediatric Cardiac Sonography
Course Level 7

ADVANCED PEDIATRIC AND FETAL ECHOCARDIOGRAPHY

Course Description

This course covers the anatomy, sonographic views, and Doppler measurements needed to perform an abnormal and/or complex pediatric and fetal echocardiogram. Normal fetal and pediatric anatomy will be understood prior to starting this course. Complex fetal and pediatric pathologic cases will be learned. In depth coverage of cardiac measurements in fetal and pediatric echocardiography needed to assess abnormal cardiac cases will be included. Cardiac physiology to include cardiac pathology and clinical symptomology and how they relate to the sonographic appearance of these structures will be included.

Course Content Outline

TOPICS
I. Fetal Echocardiography A. Normal/abnormal anatomy/complex congenital heart disease B. Techniques
II. Pediatric Echocardiography A. Normal/abnormal anatomy/complex congenital heart disease B. Techniques
III. Fetal Echo protocol A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/Doppler and spectral analysis C. Imaging pitfalls, body habitus, positioning D. Complete abnormal fetal echo protocol including all cardiac measurements
IV. Pediatric Echo protocol A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/Doppler and spectral analysis C. Imaging pitfalls, body habitus, positioning D. Complete abnormal pediatric echo protocol including all cardiac measurements

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to differentiate between fetal and postnatal circulation in abnormal cases.
B. Assess maternal and fetal circulation through the umbilical artery, ductus venosus, ductus arteriosus and direction of intraatrial flow through the foramen ovale in normal and abnormal exams.
C. Recognize and identify the cardiac disease processes and pathophysiology as it relates to imaging and pressure gradients specific to fetal and pediatric patients with complex congenital heart disease.
D. Modify the scanning protocol based on the echocardiographic findings and differential diagnosis with the understanding of fetal and pediatric physiology and flow patterns.
E. Set up the equipment and accessory devices properly
F. Evaluate the proper anatomical evaluation on ultrasound images

G. Independently execute with minimal assistance, an abnormal complete pediatric and fetal echocardiographic examination to include intracardiac anatomy and great vessel orientation according to the set competency criteria.

ADVANCED PEDIATRIC-FETAL CLINICAL EXPERIENCE II

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation of pediatric and fetal echocardiography is provided. Clinical experience related to NICU clinical practices, care of the maternal and pediatric patient, and specialized report writing techniques will also be provided.

Course Content Outline

TOPICS
I. Fetal Echocardiography A. Normal/abnormal anatomy B. Techniques
II. Pediatric Echocardiography A. Normal/abnormal anatomy B. Techniques
III. Fetal Echo protocol A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/Doppler and spectral analysis C. Imaging pitfalls, body habitus, positioning D. Complete fetal echo protocol including all cardiac measurements
IV. Pediatric Echo protocol A. ALARA Principle related to maternal, fetal, and pediatric patients B. Integrate color/Doppler and spectral analysis C. Imaging pitfalls, body habitus, positioning D. Complete fetal echo protocol including all cardiac measurements

Student Outcomes

At the end of this course, the student should be able to:

Execute with minor assistance a normal and abnormal complete pediatric and fetal echocardiogram and type a normal preliminary pediatric and fetal echocardiographic report to present to the interpreting cardiologist for interpretation.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Select proper patient positions for the selected images
B. Prepare the equipment and accessory devices set-up properly
C. Select the appropriate technical factors
D. Generate proper anatomical evaluations of ultrasound images
E. Select the proper technical factor adjustments to produce diagnostic images
F. Produce a diagnostic doppler spectral wave form appropriate to the examination being performed
G. Demonstrate the proper identification of images
H. Prepare a preliminary typed report to be presented to the interpreting cardiologist.

Diagnostic Medical Sonography Program

VASCULAR CLASS SCHEDULE

Cohort #5 - January 6 to December 11, 2020

	Start	End	Times	Day(s)	Lec. Hrs.	Lab Hrs.
6th Course Level - 9 Weeks						
Advanced Doppler Physics & Cardiovascular Physiology	1/7/2020	10/6/2020	5-6 pm	Tuesday	9	0
Advanced Cerebrovascular Procedures, UE Doppler & Physiologic Testing	1/7/2020	10/6/2020	6-10pm	Tuesday	18	18
Advanced Vascular Clinical Experience I	1/6/2020	10/9/2020	8-3:30	M,W,TH,F		252
Labor Day - September 7						
No Course Level Break						
7th Course Level - 9 Weeks						
Advanced Abdominal Vascular Procedures	10/13/2020	12/8/2020	5-7 pm	Tuesday	9	9
Advanced LE Doppler & Physiologic Testing	10/13/2020	12/8/2020	7-10pm	Tuesday	9	18
Advanced Vascular Clinical Experience II	10/12/2020	12/11/2020	8-3:30	M,W,TH,F		252
Veteran's Day - November 11, Thanksgiving - November 26						

Any clinical hours missed due to a holiday will be made up by arrangement.

There is a 30 minute lunch included for all clinical days assigned.

ADVANCED DOPPLER PHYSICS & CARDIOVASCULAR PHYSIOLOGY

Course Description

This course covers advanced application of Doppler physics and cardiovascular physiology. The overall emphasis will be on hemodynamic considerations in peripheral vascular, cerebrovascular, and abdominal vascular disease. Additionally, physics and instrumentation in Doppler and B-mode ultrasonography, spectral analysis and blood flow imaging, and contrast imaging will be covered.

Course Content Outline

TOPICS
I. Advanced Vascular Physics and Hemodynamics A. Doppler effect and artifacts B. Pressure gradients C. Waveform analysis
II. Cardiovascular Physiology A. Normal vascular and cardiac anatomy B. Cardiac physiology's effect on vascular hemodynamics
III. Disease/Pathology Effects on the Vascular system A. Diabetes B. Hypertension C. Cardiac Disease D. Obesity E. Smoking F. Genetics G. Adjunct Imaging
IV. Venous vs. Arterial Disease A. Anatomy and physiology B. Color spectral analysis

Student Outcomes

At the end of the course, the student should be able to:

A. Understand principles of the hemodynamics of blood circulation in a normal patient
B. Understand principles of vascular hemodynamics in the diseased patient
C. Understand the Doppler findings in both normal and diseased states
D. Explain the importance of Doppler angulation and proper Doppler assessment of Spectral Analysis
E. Determine the utilization of contrast in vascular disease assessment.
F. Have an in depth understanding of the following principles:
- Recognize the presence of imaging artifacts
- Imaging instruments
- Record images using digital storage
- Use a linear array transducer
- Use a phased array transducer
- Quality assurance/ Statistics
- Compute statistics on lab data to document accuracy of testing
- Perform validation studies (e.g., review venograms and/or arteriograms)

ADVANCED CEREBROVASCULAR PROCEDURES, UE DOPPLER & PHYSIOLOGIC TESTING

Course Description

This course covers the anatomic and physiologic principles that influence the investigation of the vascular supply to the brain and upper extremities. This will include extensive coverage of carotid, vertebrovascular, Transcranial Doppler, Upper extremity physiologic testing, and Upper extremity duplex imaging. The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting advanced vascular procedures.

Course Content Outline

TOPICS
I. Extra and intracranial Systems A. Anatomy and physiology B. Color/Spectral Doppler analysis C. Carotid and Vertebral pathology D. Transcranial Doppler evaluation E. Protocol and techniques
II. Upper Extremity Venous System A. Normal vascular anatomy B. Color/Spectral Doppler analysis C. Venous physiology and pathology D. Protocol and techniques
III. Upper Extremity Arterial System A. Anatomy and physiology B. Color/Spectral Doppler analysis C. Arterial physiology, pathology and pressure assessment D. Upper Extremity Physiologic Testing E. Protocol and techniques

Student Outcomes

By the end of the course, the student should be able to:

A. Demonstrate the ability to perform advanced vascular sonographic examinations
B. Utilize real-time equipment for advanced vascular imaging
C. Differentiate and identify the sonographic appearance of normal and abnormal cerebrovascular, intracranial, and upper extremity vascular anatomy
D. Demonstrate basic knowledge and understanding of vascular physiology, pathophysiology, and hemodynamics in the different types of vascular diseases and dysfunctions
E. Modify the scanning protocol based on the sonographic findings and differential diagnosis
F. Evaluate normal and abnormal vascular flow patterns and wave forms
G. Create diagnostic images by utilizing given standards of acceptance
H. Critique the quality of sonographic images by utilizing given department standards

ADVANCED VASCULAR CLINICAL EXPERIENCE I

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation of advanced vascular sonography is provided. Clinical experience in abdominal, obstetric and gynecological, and superficial structures imaging is also provided.

Course Content Outline

TOPICS
I. Extra & Intracranial Exams A. Normal/abnormal anatomy B. Protocols & techniques C. Color/spectral analysis
II. Upper Extremity Venous Exams A. Normal/abnormal anatomy B. Protocol & techniques C. Color/spectral analysis
III. Upper Extremity Arterial Exams A. Normal/abnormal anatomy B. Protocol & techniques C. Color/spectral analysis D. Physiologic Testing E. Pressure analysis

Student Outcomes

By the end of the course, the student should be able to:

Execute with minor assistance a normal complete examination of the extracranial carotid system, TCD, and upper extremity upper arterial and venous systems.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Select proper patient positions for the selected images
B. Prepare the equipment and accessory devices set-up properly
C. Select the appropriate technical factors
D. Generate proper anatomical evaluations of ultrasound images
E. Select the proper technical factor adjustments to produce diagnostic images
F. Produce a diagnostic doppler spectral wave form appropriate to the examination being performed
G. Demonstrate the proper identification of images

ADVANCED ABDOMINAL VASCULAR PROCEDURES

Course Description

This course covers the anatomic and physiologic principles that influence the investigation of the vascular supply to the abdominal organs. This will include extensive coverage of the abdominal aorta, abdominal aortic grafts and endostents, hepatoportal system, renal arterial duplex exams, and examination of the splanchic vessels.The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting advanced vascular procedures.

Course Content Outline

TOPICS
I. Advanced Abdominal Aorta Systems A. Anatomy and physiology B. Color/Spectral Doppler analysis C. Pathology, graft and endostents D. Graft/stent Duplex evaluation E. Protocol and techniques
II. Renal Arterial System A. Normal vascular anatomy B. Color/Spectral Doppler analysis C. Renal Graft evaluation D. Protocol and techniques
III. Hepatoportal and Mesenteric Systems A. Anatomy and physiology B. Color/Spectral Doppler analysis C. Hepatoportal physiology, pathology and TIPS D. Mesenteric physiology & pathology E. Protocol and techniques

Student Outcomes

At the end of this course, the student should be able to:

A. Demonstrate the ability to perform advanced abdominal vascular sonographic examinations
B. Utilize real-time equipment for advanced vascular imaging
C. Differentiate and identify the sonographic appearance of normal and abnormal abdominal vascular anatomy
D. Demonstrate basic knowledge and understanding of vascular physiology, pathophysiology, and hemodynamics in the different types of vascular diseases and dysfunctions in the abdominal aorta, hepatoportal systems, renal vasculature, and splanchic vessels.
E. Modify the scanning protocol based on the sonographic findings and differential diagnosis
F. Evaluate basic normal and abnormal vascular flow patterns and wave forms
G. Create diagnostic images by utilizing given standards of acceptance
H. Critique the quality of sonographic images by utilizing given department standards

ADVANCED LE DOPPLER AND PHYSIOLOGIC TESTING

Course Description

This course covers the anatomic and physiologic principles that influence the investigation of the vascular supply to the lower extremities. This will include extensive coverage of the lower extremity vascular anatomy, lower extremity physiologic testing, and lower extremity duplex imaging. Comparison with other imaging including CTA will be covered. The laboratory component of this course will include demonstration and scanning exercises to provide a "live lab" experience in conducting advanced vascular procedures.

Course Content Outline

TOPICS
I. Lower Extremity Systems A. Anatomy and physiology B. Color/Spectral Doppler analysis C. Inflow and outflow pathology D. Graft Duplex evaluation E. Protocol and techniques
II. Lower Extremity Venous System A. Normal vascular anatomy B. Color/Spectral Doppler analysis and Physiologic Testing for insufficiency C. Venous physiology and pathology D. Protocol and techniques
III. Lower Extremity Arterial System A. Anatomy and physiology B. Color/Spectral Doppler analysis C. Arterial physiology, pathology and pressure assessment D. Lower Extremity Physiologic Testing E. Protocol and techniques

Student Outcomes

At the end of the course, the student should be able to:

A. Demonstrate the ability to perform advanced lower extremity physiologic and duplex examinations
B. Utilize real-time equipment for advanced vascular imaging
C. Differentiate and identify the sonographic appearance of normal and abnormal vascular anatomy
D. Demonstrate basic knowledge and understanding of vascular physiology, pathophysiology, and hemodynamics in the different types of vascular diseases and dysfunctions in the lower extremity vessels
E. Modify the scanning protocol based on the sonographic findings and differential diagnosis
F. Evaluate basic normal and abnormal vascular flow patterns and wave forms including both arterial, venous, and venous examinations.
G. Create diagnostic images by utilizing given standards of acceptance
H. Critique the quality of sonographic images by utilizing given department standards
I. Obtain knowledge in physiologic testing of the lower extremities.

ADVANCED VASCULAR CLINICAL EXPERIENCE II

Course Description

This course provides clinical experience for application of theoretical principles and concepts covered in previous and current didactic coursework. Clinical experience in patient care and handling, scanning techniques, instrumentation, work efficiency and image evaluation of advanced vascular sonography is provided. Clinical experience in abdominal, obstetric and gynecological, and superficial structures imaging is also provided.

Course Content Outline

TOPICS
I. Advanced Abdominal Vasculature (Mesenteric, Hepatoportal, Renal) A. Normal/abnormal anatomy B. Protocols & techniques C. Color/spectral analysis D. Aortic Grafts E. TIPS
II. Lower Extremity Venous Exams A. Normal/abnormal anatomy B. Protocol & techniques C. Color/spectral analysis D. Venous Insufficiency
III. Lower Extremity Arterial Exams A. Normal/abnormal anatomy B. Protocol & techniques C. Color/spectral analysis D. Physiologic Testing w/without exercise E. Pressure analysis F. Grafts

Student Outcomes

At the end of the course, the student should be able to:

Execute with minor assistance a normal complete examination of the abdominal vasculature, physiologic testing and duplex exam of the lower extremity vascular system.

The competency criteria used to evaluate the student will ensure that the student will be able to:

A. Select proper patient positions for the selected images
B. Prepare the equipment and accessory devices set-up properly
C. Select the appropriate technical factors
D. Generate proper anatomical evaluations of ultrasound images
E. Select the proper technical factor adjustments to produce diagnostic images
F. Produce a diagnostic doppler spectral wave form appropriate to the examination being performed
G. Demonstrate the proper identification of imagesaDVANC