CVT A250: ADVANCED ECHOCARDIOGRAPHY

Item	Value
Curriculum Committee Approval Date	04/12/2023
Top Code	121300 - Cardiovascular Technician
Units	3 Total Units
Hours	54 Total Hours (Lecture Hours 54)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S)

Course Description

Advanced theory, equipment, and procedures in echocardiography, including Doppler, color flow Doppler in adults and pediatric. Further development of techniques and evaluation of disease states using exercise stress, TEE, pharmacological stress, and contrast echocardiographic studies. PREREQUISITE: CVT A200 and CVT A205. COREQUISITE: CVT A255. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Integrate and evaluate advanced cardiac 2D/Doppler hemodynamic measurements by identifying abnormal cardiac structures to include congenital heart defects.

Course Objectives

- 1. Correlate and apply the principles of ultrasound physics, instrumentation and imaging safety to diagnostic cardiovascular imaging.
- 2. Identify correct transducer positioning for image and Doppler flow acquisition.
- 3. Correlate Doppler waveforms associated with cardiac valves and structures.
- 4. Perform and evaluate Doppler measurements for accuracy and diagnostic quantification.
- 5. Perform mathematical equations to correlate pathology from cardiac valves and structures.
- 6. Demonstrate ability to identify TEE images and pathologies illustrated.
- 7. Evaluate and score Stress images for cardiac wall motion abnormalities.
- 8. Distinguish normal calculations from improper measurements. *
- 9. Classify congenital heart defects in the appropriate categories
- 10. Differentiate normal cardiac anatomy from congenital heart disease.

Lecture Content

Review of principles, instrumentation and physics relating to 2D/ Doppler and color flow Doppler. Video and slides on pulse and continuous wave spectral and color flow Doppler. Doppler interrogation of cardiac valves and quantification calculations. Prosthetic valve pathology and shunt flow interrogation/calculations. Video and computer modules displayed from the websites specific to echocardiography. Cardiomyopathy Doppler flow patterns and pressures assessments. Review of weeks 1 through 6. Transesophageal echocardiograhpy (TEE) anatomy orientation and pathology evaluation. Video and slides. Stress echocardiograhpy, pharmacological stress and wall motion evaluation and quantification. Digital case studies illustrating pathologies, indications and diagnostic importance. Interventional echocardiograhpy using contrast agents, pericardial centesis utilization echo for needle guidance and intra coronary vascular echocardiograhpy. Classify Congenital defects and heart disease in neonates/pediatrics, advanced imaging techniques and assessments. Video/slides/hand-outs. Comprehensive semester and Registry (ARDCS) Review.

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)

Instructional Techniques

1. Equipment and imaging demonstrations 2. Board illustrations 3. Digital slide examples 4. Questions/discussion sessions 5. Paired/ group exercises

Reading Assignments

Students will spend 3hours weekly on reading assignments.

Writing Assignments

On average students will spend 1 hour weekly calculating measurements

Out-of-class Assignments

Students will spend 3hours weekly on homework assignments.

Demonstration of Critical Thinking

1. Comprehensive multiple choice, fill-in, and short answer exams2. Problem solving in cardiac calculations exercises3. Registry Examination Review Question assignments

Required Writing, Problem Solving, Skills Demonstration

Measurement and calculations of Doppler interegation and related mathmatical equations. Technologist reports and preliminary diagnostic comments for physicians review.

Eligible Disciplines

Cardiovascular technology: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required King Dewitt, Susan BS, RDCS, RCS. Echocardiography… From a Sonographers Perspective, 7TH ed. Georgia: Copyright, 2018 Rationale: The notebook along with the workbook provides a balanced, chronological presentation of information. 2. Required Richard A. Palma BS,ACS,RCS,RDCS. Echolcardiographerss Pocket Reference, ed. Phoenix Arizona: Arizona Heart Foundation, 2020 Rationale: .

Other Resources

1. Ultrasound Imaging Equipment (M-mode/2D/3D and Doppler/Color Flow Doppler). Digital storage portable drives. 2. Ultrasound Imaging Calipers