

Oregon Tech
Medical Imaging Technology Department
Echocardiography Program
2020-2021

II. Program Purpose, Educational Objectives, and Student Learning Outcomes

The Echocardiography faculty agreed to adopt the student learning outcomes as suggested by the Joint Review Committee on Education in Diagnostic Medical Sonography (JRCDMS).

Echocardiography Program Purpose

The Oregon Tech Bachelor of Science program in Echocardiography provides students with the knowledge, clinical skills, values and behaviors to become competent cardiac sonographers.

Minimum Expectations: The program will meet the following goal, defining minimum expectations:

"To prepare competent entry-level adult cardiac sonographers in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains"

Echocardiography Program Educational Objectives

1. The program prepares students to utilize diagnostic techniques, sound judgment and good decision making to provide patient services.
2. The program communicates the importance of being credentialed (RDCS, RCS) in the profession of echocardiography.
3. The program prepares students who think critically, communicate effectively and exemplify professional ethics.
4. The program conveys the importance of becoming lifelong learners and responsible citizens.

Expected Program Student Learning Outcomes

Graduates from this program will be able to:

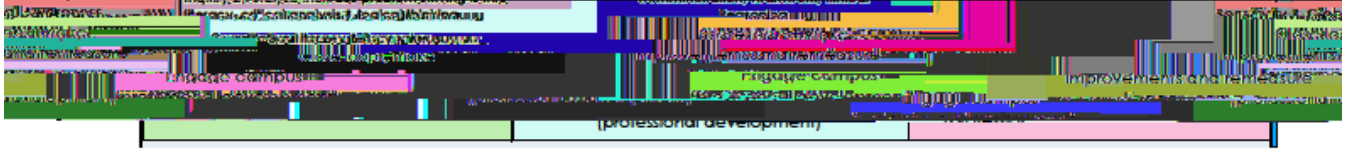
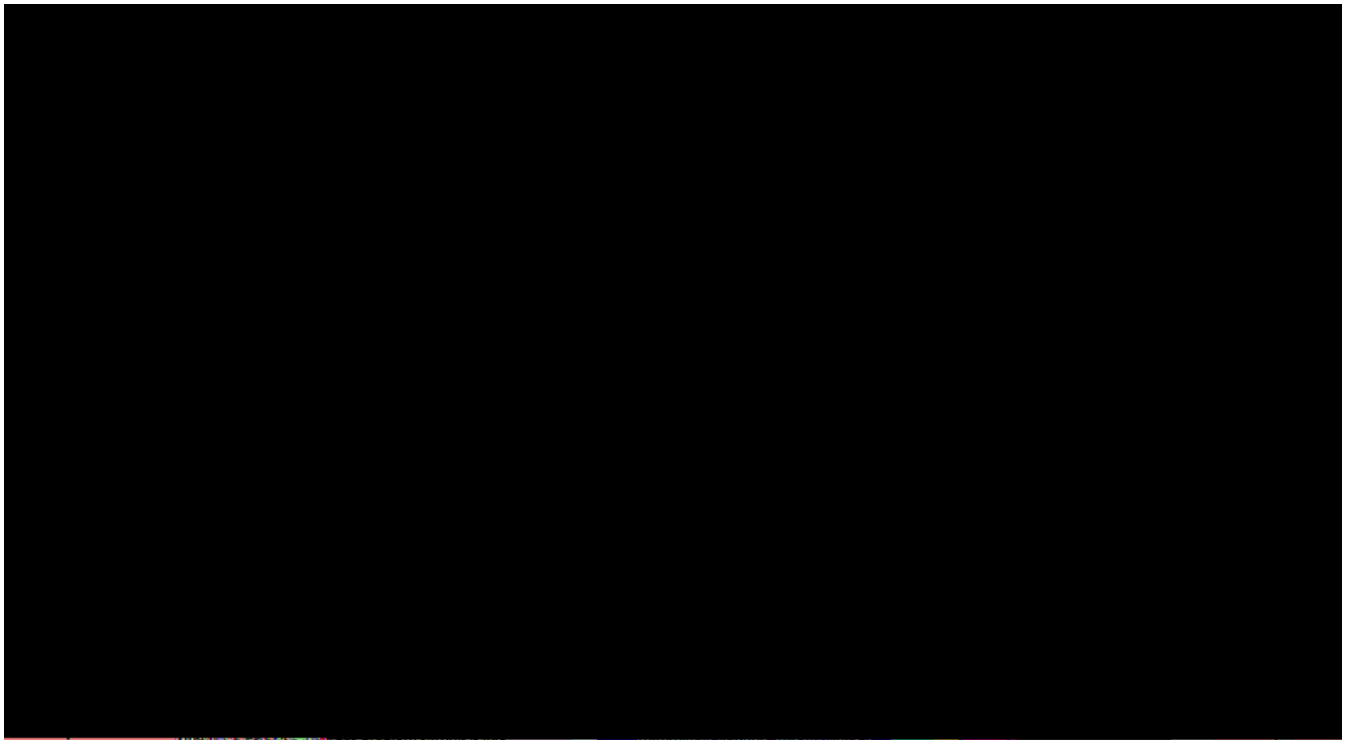
1. Demonstrate the ability to communicate effectively in oral, written and visual forms.
2. Demonstrate the ability to work effectively in teams.
3. Demonstrate an ability to provide basic patient care and comfort.
4. Demonstrate professional judgment, decision, and ethics.
5. Demonstrate knowledge and understanding of human gross anatomy, sectional anatomy, and normal and abnormal cardiovascular anatomy.
6. Demonstrate knowledge and understanding of cardiovascular physiology, pathology, and pathophysiology.
7. Demonstrate knowledge and understanding of cardiovascular physical principles and instrumentation.
8. Demonstrate knowledge and understanding of clinical echocardiographic diagnostic procedures and testing.
9. Demonstrate an understanding of diverse cultural and humanistic traditions in the global society.

Additional Student Learning Opportunities

Three-Year Cycle for Assessment - Echocardiography Student Learning Outcomes

Echocardiography Degree Student Learning Outcomes Assessment Schedule	2016-17	2017-18	2018-19	2019-20	2020-21	2021-2022
1. The student will demonstrate the ability to communicate effectively in oral, written and visual forms.	X(1)			X(1)		
2. The student will demonstrate the ability to work effectively in teams.	X(4)			X(4)		
3. The student will demonstrate an ability to provide basic patient care and comfort.		X			X	
4. The student will employ professional judgment and discretion, including ethics.			X(3)			X
5. The student will demonstrate knowledge and understanding of human gross anatomy sectional anatomy and normal and abnormal cardiovascular anatomy.	X			X		
6. The student will demonstrate knowledge and understanding of cardiovascular physiology, pathology, and pathophysiology.		X(2)			X	
7. The student will demonstrate knowledge and understanding of cardiovascular physical principles and instrumentation		X(5)			X	
8. The student will demonstrate knowledge and understanding of clinical echocardiography diagnostic procedures and testing			X			X
9. The student will demonstrate an understanding of diverse cultural and humanistic traditions in the global society.			X(6)			X

Table #1. Echocardiography Degree Assessment Cycle (number) indicates a PSLO that incorporates proposed ESLO's. The PSLO/ESLO pattern is undergoing revision.



IV. Summary of 2020-21 Assessment Activities

A. ESLO #2: Oregon Tech students will engage in a process of inquiry and analysis.

Definition: Inquiry and analysis consists of posing meaningful questions about situations and systems, gathering, and evaluating relevant evidence, and articulating how that evidence justifies decisions and contributes to students' understanding of how the world works.

Criteria for Inquiry and Analysis Assessment

- x The following are criteria used in the assessment of student work:
 - o Identify: Identify a meaningful question or topic of inquiry.
 - o Investigate: Critically examine existing knowledge and views on the question or topic of inquiry.
 - o Support: Collect evidence based on the methodology or principles of discipline.
 - o Evaluate: Critically analyze and distinguish evidence obtained.
 - o Conclude: Come to a judgment based on evidence and understand the limitations and implications of that judgment.
- x The Inquiry and Analysis ISLO Assessment was performed during the spring term of the echocardiography junior year. Assignments utilizing Differential Diagnosis were carried out as part of the Echocardiography Externship Prep class (ECH 38) utilizing case studies presented during the Echocardiography Externship Prep course. See full description of the ESLO design, and the Assessment Rubric (Table A1) in Appendix B.

ESLO #2 2020-2021 Outcomes – Direct Assessment

Performance Criteria	Assessment Method	Measure Scale	Minimum Acceptable Performance	Results-% with Target or higher
Identification	differential diagnosis assignment	1-4 Scale	75% with a score of 3.0 or better	82%
Investigate	. differential diagnosis assignment.	1-4 Scale	75% with a score of 3.0 or better	82%
Support	differential diagnosis assignment..	1-4 Scale	75% with a score of 3.0 or better	94%

based on imaging provided, the performance was universally of a higher level, with completely acceptable performance based on the assignment criteria. These outcomes were particularly heartening, as they demonstrated retention of basic programmatic material, and an ability to apply that material in a methodical manner within a clinical situation.

- x Most successful was the support section, with identification of additional imaging information that would assist in narrowing down or defining pathology utilized in the exercise.
- x The Evaluation and Conclude phases failed to meet expectations. It is felt that at this point, more than assessing the students, the assessment perhaps is more valuable in evaluation of the actual structure of the exercise, exercise implementation and the placement or timing of the exercise within the assessment. Evaluation also identifies the need to make or incorporate Differential Diagnosis a stronger part of the Echocardiography Program.
- x The following points therefore need to be made:
 - o The basic structure was modified from that used in 2017, where an additional initial exercise where students designed a decision tree was used. That potentially could be put back in as a "warm-up" assignment.
 - o Finding newer examples of case studies/pathologies, with clearer images and more clearly focused imaging patterns or protocols would be invaluable.
 - o There was a disconnect between students' listing possible pathologies, and their identification of the actual MAIN pathology that was the focus of the exercise. The assessment exercise needs to be given within, or closer to teaching all junior Core imaging classes Echo 333, where the pathology that is utilized would have recently been covered.
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with sophomore echocardiography and vascular students. The faculty rate the proficiency of students using the performance criteria described in Table #2 below.

Performance Criteria	Assessment Methods	Measurement Scale	Minimum Acceptable Performance	Results
Understands Ultrasound Scope of Practice	Exam1	% Scale per # of questions used	80% with 80% or higher	89.5%
Anticipates/responds to patient needs.	Exam2	% Scale per # of questions used	80% with 80% or higher	94.7%
Knowledge of Universal Precautions	Exam3	% Scale per # of questions used	80% with 80% or higher	94.7%
Knowledge of HIPAA Policies	HIPAA Quiz	% Scale per # of questions used	80% with 80% or higher	89.5%

Table #2. PSLO #3, MIT 225 exam results, Spring 2021

- x Students performed above expectations in all categories for PSLO #3. Most students, this course is the first formal introduction to the deeper issues they will face while working with real patients on externship and in full time employment in the echocardiography field. Students usually observe these issues while on campus and during rotations at Sky Lakes Medical Center, but how they will be affected by situations will be determined while on externship and when they are employed.
- x As a result of the data, the OIT Echocardiography program faculty has decided to continue the same in-depth coverage in this course to prepare students for the realities they would face in the field.

Direct Assessment #2

The faculty assessed this outcome in ECHO 420 from the 2020-2021 academic year using student competencies for echocardiography as assessed by industry. The faculty rated the proficiency of students using the performance criteria described in Table #3 below.

Performance Criteria	Assessment Methods	Measure Scale	Minimum Acceptable Performance	Results % with Target or higher
Knowledge of Universal Precautions	Student Competency Evaluation #3, a.	1 – 100% Scale	90% with 90% or higher	100%
Anticipates/ responds to patient needs.	Student Competency Evaluation #3, b.	1 – 100% Scale	90% with 90% or higher	100%
Knowledge of HIPAA Policies	Student Competency Evaluation #3, d.	1 – 100% Scale	90% with 90% or higher	100%
Performs Within the Echocardiography Scope of Practice	Student Competency Evaluation #3, e.	1 – 100% Scale	90% with 90% or higher	100%

Table #3. PSLO #3, ECHO420 extern competencies results

- x Students performed above the level of minimum acceptable performance criteria.
- x As a result of the data from the last cycle where PSLO #3 was assessed, the performance level in this assessment cycle was increased to 90% with a target of 90% performance or higher. Within individual competency scores, there were occasional scores at 85%, but those occurred generally in the first quarter of Externship when students are first introduced to actual hospital patient settings. Past the first quarter, scores are universally 90% or higher.

Indirect Assessment #1

The faculty assessed this outcome in ECHO 420 from the student 2020 exit surveys asking them to rate how well the OIT Echocardiography program and their extern site prepared them for this learning outcome #3. The students rated their proficiency using the performance criteria described in Table #4 below.

Performance Criteria	Assessment Methods	Measure Scale	Minimum Acceptable Performance	Results -% with Target or higher
Student rating of how OIT prepared them for outcome #3.	Exit Survey	1 – 4 Scale	80% with a score of 3.0 or better	89.5%
Student rating of their final proficiency in outcome #3.	Exit survey	1 – 4 Scale	80% with a score of 3.0 or better	100%

Table#4. PSLO#3 ECHO420 students self-assessment results

- x Students rated OIT fairly closely, in some individual cases, the preparation provided by OIT was rated higher than that provided by

Performance Criteria	Assessment Methods	Measure Scale	Minimum Acceptable Performance	Results-% with Target. or higher
Evaluates evidence from patient history and physical	Final Practical	% scale of correct	80% with 80% or higher	100%

Performance Criteria	Assessment Methods	Measure Scale	Minimum Acceptable Performanc e	Results -% with Target or higher
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Performance Criteria	Assessment Methods	Measure Scale	Minimum
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Performance Criteria	Assessment Methods	Measure Scale	Minimum Acceptable Performance	Results -% with Target Av. or higher
Student rating of how OIT prepared them for outcome #7.	Exit Survey	% scale per category	80% with a score of 3.0 or better	94.7% Exter

Plans for improvement: Based on feedback from clinical externship sites, increase or modify simulated patient care scenarios within the Echo 225 course. Provide new scenarios to students in the Echo 388 Externship Preparation course.

Programmatic Student Learning Outcome #6: The student will demonstrate knowledge and

Appendix A-2019-2022 Program Assessment Report Curriculum Map

Echocardiography B.S.

Curriculum Map

Table A1 Curriculum Map

Three-year Cycle for Assessment of Program Learning Outcomes

STUDENT LEARNING OUTCOME	2019-20	2020-21	2021-22
1. Demonstrate the ability to communicate effectively in oral, written and visual forms.	F, P, C		
2. Demonstrate the ability to work effectively in teams.	F, P, C		
3. Demonstrate an ability to provide basic patient care and comfort.		F, P, C	
4. Demonstrate professional judgment, discretion, and ethics.			F, P, C
5. Demonstrate knowledge and understanding of human gross anatomy, sectional anatomy, and normal and abnormal cardiovascular anatomy.	F, P, C		
6. Demonstrate knowledge and understanding of cardiovascular physiology, pathology, and pathophysiology.		F, P, C	
7. Demonstrate knowledge and understanding of cardiovascular physiology principles and instrumentation.		F, P, C	
8. Demonstrate knowledge and understanding of clinical echocardiographic diagnostic procedures and testing.			F, P, C
9. Demonstrate an understanding of diverse cultural and humanistic traditions in the global society.			F, P, C

*Assessment of Program Student Learning Outcomes (2 Directs, 1 Indirect)

*Assessment of Communication Essential Student Learning Outcome (1 Direct Oral, 1 Direct Written)

F - Foundation

P - Practice

C - Capstone

Freshman Year N/A

Sophomore Year

	BIO 220	BIO 346	BIO 347
OIT -BECH 2016-17.1 Demonstrate the ability to communicate effectively in oral, written and visual forms.			
OIT -BECH 2016-17.2 Demonstrate the ability to work effectively in teams.			
OIT -BECH 2016-17.3 Demonstrate an ability to provide basic patient care and comfort.			
OIT -BECH 2016-17.4 Demonstrate professional judgment, discretion, and ethics.			
OIT -BECH 2016-17.5 Demonstrate knowledge and understanding of human gross anatomy, sectional anatomy, and normal and abnormal cardiovascular anatomy.			

OIT -BECH 2016-17.7 Demonstrate knowledge and understanding of cardiovascular physical principles and instrumentation.		F	P
OIT -BECH 2016-17.8 Demonstrate knowledge and understanding of clinical echocardiographic diagnostic procedures and testing			F
OIT -BECH 2016-17.9 Demonstrate an understanding of diverse cultural and humanistic traditions in the global society.			

OIT -ESLO 201617.1.A

OIT -BECH 2016-17.3 Demonstrate an ability to provide basic patient care and comfort.

	ECHO 333	ECHO 334	ECHO 376
OIT -BECH 2016-17.1 Demonstrate the ability to communicate effectively in oral, written and visual forms.	P	P	
OIT -BECH 2016-17.2 Demonstrate the ability to work effectively in teams.	P		
OIT -BECH 2016-17.3 Demonstrate an ability to provide basic patient care and comfort.	P	P	
OIT -BECH 2016-17.4 Demonstrate professional judgment, discretion, and ethics.			
OIT -BECH 2016-17.5 Demonstrate knowledge and understanding of human gross anatomy, and normal and abnormal cardiovascular anatomy.	P	P	

OIT -BECH 2016-17.6 Demonstrate knowledge and understanding of cardiovascular physiology, pathology, and pathophysiology.			
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OIT -BECH 2016-17.7 Demonstrate knowledge and understanding of cardiovascular physical principles and instrumentation.

OIT -BECH 2016-17.9Demonstrate an

structured as follows

- i.

Investigate
(Imaging sets #1
and #2)
Identification
selection of
additional
information and
imaging needed

1 Pt
If the student correctly
answers with 1 of the choices
listed under "High
Proficiency".

2 Pts
If the student correctly
answers with 2 of the 5
choices listed under "High
Proficiency".

3 Pts
If the student answers
with 3 of the 5 choices
listed under "High
Proficiency".

4 Pts
If the student answers
with at least 4 additional
imaging modalities and/or
imaging windows
or views from the following choices:

- x CF Doppler of the MV
- x CF Doppler of the TV
- x Gradient of TV Insufficiency
- x M-mode of the MV
- x M-mode of the AV
- x Apical views (4Ch, 2 Ch)
- x CW Doppler of the AV/LVOT
- x PW Doppler "walked" through the LV/LVOT
- x CW Doppler of the AV LVOT with
Valsalva/Amyl Nitrate
- x PW Doppler of the Pulmonary Veins
- x ViO (m)6. Td - oaã a (m)6. tra ViO (m)6. Td <0078(36-

Evaluate

Conclude

Identification of the pathology provided.

Reflection statement.

0-1 Pt

Correct identification of pathology provided.

Minimal reflection statement or demonstration of gained insight on integration of the concept of differential diagnosis.

2 Pts

Correct identification of pathology provided.

Reflection statement

demonstrates mod66Ron iatriolf(ta)14.2 (te)14J 0.016.3 (sf 11.2 (te)14.2 (m 132.9C /P 01 ())as4.6 5 (s