



# ECHO20003 *Fetal Echocardiography*

## Term 2 - 2017

Profile information current as at 29/04/2024 02:24 pm

All details in this unit profile for ECHO20003 have been officially approved by CQU University and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

## General Information

### Overview

Both echocardiographers and sonographers require expertise in fetal echocardiography. This unit will cover fetal cardiac structure, function, pathophysiology and scanning techniques at an advanced level. During this unit you will progress through standard heart views to focus on the ultrasound appearance and Doppler haemodynamics of congenital and acquired cardiac abnormalities and common syndromes. You will develop the ability to recognise fetal arrhythmias. You will acquire knowledge of advanced imaging techniques tailored to fetal echocardiography including spatio-temporal imaging correlation (STIC), 3 / 4-D colour Doppler, tissue Doppler imaging (TDI) and some common cardiac physiological measurements.

### Details

Career Level: *Postgraduate*

Unit Level: *Level 9*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

### Pre-requisites or Co-requisites

Pre-requisite: Students must be enrolled in EITHER CV69 Bachelor of Echocardiography (Cardiac Physiology) / Graduate Diploma of Echocardiography OR CV83 Master of Medical Ultrasound

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

### Offerings For Term 2 - 2017

- Distance

### Attendance Requirements

All on-campus students are expected to attend scheduled classes - in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

### Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

## Class and Assessment Overview

### Recommended Student Time Commitment

Each 6-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

### Class Timetable

#### [Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

#### [Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

### Assessment Overview

#### 1. **Online Quiz(zes)**

Weighting: 30%

#### 2. **Portfolio**

Weighting: 30%

#### 3. **Written Assessment**

Weighting: 40%

### Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

## CQUniversity Policies

**All University policies are available on the [CQUniversity Policy site](#).**

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

## Previous Student Feedback

### Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

#### Feedback from Student evaluation "Have your say" and emails.

**Feedback**

Students feedback concerning unit content, lecture notes, response to email enquiries and textbook were excellent.

**Recommendation**

Ensure unit content, lecture notes and textbook remain current. Continue prompt response to emails.

#### Feedback from Student evaluation "Have your say" and emails.

**Feedback**

Students appreciated the opportunity to discuss learning material and interact on the online tutorials platform.

**Recommendation**

Continue online tutorials.

#### Feedback from Student evaluation "Have your say" and emails.

**Feedback**

Students would like to see a change in the assessment items.

**Recommendation**

Number and content of assessment items will be reviewed for unit delivery in 2017.

## Unit Learning Outcomes

**On successful completion of this unit, you will be able to:**

1. Differentiate the aetiology and Doppler haemodynamics of fetal cardiac abnormalities
2. Contrast typical 2-D and Doppler fetal echocardiographic views used to assess the fetal heart.
3. Evaluate existing and emerging technology and diagnostic parameters in fetal echocardiography
4. Apply practical skills and critical thinking to fetal cardiac assessment

Linked to National and International Standards

1. ASAR Accreditation Standards for Cardiac Sonography - critical practice Unit 8 - Cardiac
2. European Association of Cardiovascular Imaging Core Syllabus
3. American Registry for Cardiac Sonography Core Syllabus

## Alignment of Learning Outcomes, Assessment and Graduate Attributes



### Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes			
	1	2	3	4
1 - Online Quiz(zes) - 30%	•	•		
2 - Portfolio - 30%	•			•
3 - Written Assessment - 40%		•	•	

### Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes			
	1	2	3	4
1 - Knowledge	○	○	○	○
2 - Communication	○	○	○	○
3 - Cognitive, technical and creative skills	○	○	○	○
4 - Research			○	
5 - Self-management				○
6 - Ethical and Professional Responsibility			○	○
7 - Leadership				
8 - Aboriginal and Torres Strait Islander Cultures				

### Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes							
	1	2	3	4	5	6	7	8
1 - Online Quiz(zes) - 30%	○	○	○					
2 - Portfolio - 30%	○	○	○		○	○		
3 - Written Assessment - 40%	○	○	○	○		○		

## Textbooks and Resources

### Textbooks

ECHO20003

#### Prescribed

#### **A Practical Guide to Fetal Echocardiography: Normal and Abnormal Hearts**

Edition: 3rd (2016)

Authors: Alfred Abuhamad and Rabih Chaoui

Wolters Kluwer

Philadelphia , USA

ISBN: 9781451176056

Binding: Hardcover

[View textbooks at the CQUniversity Bookshop](#)

### IT Resources

#### You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)

## Referencing Style

All submissions for this unit must use the referencing style: [American Psychological Association 6th Edition \(APA 6th edition\)](#)

For further information, see the Assessment Tasks.

## Teaching Contacts

**Ann Quinton** Unit Coordinator

[a.quinton@cqu.edu.au](mailto:a.quinton@cqu.edu.au)

## Schedule

### Week 1 - 10 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Human heart embryology-part 1 <ul style="list-style-type: none"><li>• The primordial heart tube</li><li>• Looping of the heart tube</li><li>• Atrial and ventricular septation</li></ul>	Lecture notes and lecture	Zoom session

### Week 2 - 17 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Human heart embryology-part 2 <ul style="list-style-type: none"><li>• Aortic arch</li><li>• Development of heart valves</li><li>• Anomalies of coronary arteries</li><li>• The fetal circulation</li></ul>	Lecture notes and lecture	MCQ quiz

### Week 3 - 24 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
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Screening views and fetal echocardiography of the normal fetal heart

- Assessing fetal lie, determining fetal right and left
- Position, axis, situs, size
- Segmental anatomy of the fetal heart
- Detailed cardiac sonographic anatomy

Chapters 6-10  
Lectures

Zoom session

#### Week 4 - 31 Jul 2017

Module/Topic	Chapter	Events and Submissions/Topic
Common cardiac physiological measures	Chapters 12-14 Lectures	MCQ quiz
• Colour Doppler		
• Pulsed Doppler		
• Cardiac function and measurements		

#### Week 5 - 07 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Abnormalities of the 4 chamber view	Chapter 18 Lectures	Zoom session
• Ventricular septal defects		
• Atrial septal defects		
• Atrioventricular septal defects		

#### Vacation Week - 14 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Break week		

#### Week 6 - 21 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Left sided heart anomalies	Chapters 21, 22, 23, 29 Lectures	MCQ quiz
• Hypoplastic left heart syndrome		
• Aortic stenosis (critical and mild)		
• Coarctation of the aorta		
• Interrupted aortic arch		
• Right aortic arch		
• Double aortic arch		
• Aberrant subclavian artery		

#### Week 7 - 28 Aug 2017

Module/Topic	Chapter	Events and Submissions/Topic
Right sided heart anomalies	Chapter 19, 20, 24 Lectures	Zoom session
• Hypoplastic right heart syndrome		
• Pulmonary stenosis		
• Pulmonary atresia with intact ventricular septum		
• Tricuspid atresia with VSD (Chapter 19, p288-295)		
• Ebstein anomaly		
• Tricuspid valve dysplasia		

#### Week 8 - 04 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Conotruncal anomalies	Chapter 25, 26,27, 28 Lectures	MCQ quiz
• Tetralogy of Fallot		
• Complete transposition of the Great Arteries (TGA)		
• Congenitally corrected TGA		
• Double outlet right ventricle		
• Common arterial trunk		

#### Week 9 - 11 Sep 2017

Module/Topic	Chapter	Events and Submissions/Topic
Fetal heterotaxy <ul style="list-style-type: none"> <li>• Left atrial isomerism</li> <li>• Right atrial isomerism</li> <li>• Situs inversus</li> </ul> Anomalies of systemic and pulmonary venous connections	Chapters 30 and 31 Lecture	Zoom session
<b>Week 10 - 18 Sep 2017</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Fetal arrhythmias <ul style="list-style-type: none"> <li>• Irregular heart rhythm</li> <li>• Bradycardia</li> <li>• Tachycardia</li> </ul>	Chapter 33 Lecture	MCQ quiz  <b>Portfolio</b> Due: Week 10 Friday (22 Sept 2017) 4:00 pm AEST
<b>Week 11 - 25 Sep 2017</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Cardiac tumours Pericardial effusions Cardiomyopathies	Chapter 32 Lecture	Zoom session  <b>Online Quiz(zes)</b> Due: Week 11 Monday (25 Sept 2017) 4:00 pm AEST
<b>Week 12 - 02 Oct 2017</b>		
Module/Topic	Chapter	Events and Submissions/Topic
New technologies <ul style="list-style-type: none"> <li>• STIC</li> <li>• 3D/4D</li> <li>• Tissue Doppler Imaging</li> </ul>	Chapter 15	
<b>Review/Exam Week - 09 Oct 2017</b>		
Module/Topic	Chapter	Events and Submissions/Topic
		<b>Written Assessment</b> Due: Review/Exam Week Friday (13 Oct 2017) 4:00 pm AEST
<b>Exam Week - 16 Oct 2017</b>		
Module/Topic	Chapter	Events and Submissions/Topic

## Term Specific Information

Dr Ann Quinton BAppSc(MRS), GradDip (ultrasound), MAppSc (ultrasound), PhD (medicine), GradCert (Higher Education) is the unit coordinator for Fetal Echocardiography ECHO20003. Ann has worked clinically in fetal medicine units performing obstetric ultrasound and fetal echocardiography. She continues to work part-time clinically, performs research and lectures extensively nationally and internationally in the field of fetal echocardiography. The best way to contact Ann is via email: [a.quinton@cqu.edu.au](mailto:a.quinton@cqu.edu.au) or ph:+61 2 9324 5008 as she is often in labs with students.

Mr Christopher Kramer is an echocardiographer and experienced academic who is also teaching into this unit. Chris Kramer BA, ACS, RDCS, FASE, is an Advanced Cardiac Sonographer and Program Director for the School of Diagnostic Medical Sonography at Aurora St. Luke's Health Care in Milwaukee Wisconsin, USA. He is active in the American Society of Echocardiography as a member of the Sonographer Counsel, Board Member of the Joint Review Committee on Education in Diagnostic Medical Sonography and is a team member on the American Registry of Diagnostic Medical Sonography writing and mentoring group. Chris has been in the field of echocardiography for the past 13 years, with interests in sonography education, quality and new technology. His writing includes articles in 3D echocardiography, athletic conditioning and left ventricular assist devices. Chris is a core member of the National Education Curriculum writing group on cardiac sonography education and leadership. He trained at the Mayo Clinic in Rochester, Minnesota and worked for the Mayo Clinic Arizona after graduation. As Chris resides in Milwaukee USA, there may be delay in his responses to questions. Chris can be contacted on email: [c.kramer@cqu.edu.au](mailto:c.kramer@cqu.edu.au)

Access to the internet is required to undertake and complete this unit.

There will be readings and tutorials provided on the unit Moodle site, however you will need to purchase the prescribed textbook to complete this unit.

## Assessment Tasks

### 1 Online Quiz(zes)

#### Assessment Type

Online Quiz(zes)

#### Task Description

- There will be five (5) multiple choice online Moodle quizzes which will be released on the Monday in weeks 2, 4, 6, 8 and 10. Each quiz is due for completion one week later on the following Monday of week 3, 5, 7, 9 and 11 respectively.
- Each quiz will test the knowledge obtained from the previous 2 weeks unit work.
- Each quiz will have six (6) multiple choice questions, each question will be worth 1 mark. Each quiz is worth 6% of your total grade giving a total of 30% of your total grade.
- The pass rate is a cumulative mark of 50%.
- Each quiz will open at 8am on the Monday and close at 4pm the following Monday.

#### Number of Quizzes

5

#### Frequency of Quizzes

Fortnightly

#### Assessment Due Date

Week 11 Monday (25 Sept 2017) 4:00 pm AEST

Please note that this is the due date for the final online Moodle quiz. Please refer to the schedule for the dates of each quiz

#### Return Date to Students

Students will receive their fortnightly score once all students have completed the quiz

#### Weighting

30%

#### Minimum mark or grade

You must obtain a cumulative 50 % of the maximum marks available in the test to achieve a passing grade.

#### Assessment Criteria

Answers will be either correct or incorrect and will be tabulated by the Moodle online unit system.

Students must achieve a **cumulative** pass rate of 50% across the five quizzes to pass this component.

#### Referencing Style

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

#### Submission

Online

#### Learning Outcomes Assessed

- Differentiate the aetiology and Doppler haemodynamics of fetal cardiac abnormalities
- Contrast typical 2-D and Doppler fetal echocardiographic views used to assess the fetal heart.

#### Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills

### 2 Portfolio

#### Assessment Type

Portfolio

#### Task Description

Routine assessment of the fetal heart is usually performed by following screening guidelines that have been published by professional bodies, for example the International Society of Obstetrics and Gynecology (ISUOG). Guidelines for fetal echocardiography assessment have also been published (see papers uploaded on the unit Moodle site). Referral for



suspected abnormal fetal heart or recognition of an abnormal fetal heart from the screening views should result in the initiation of extended fetal echocardiography views which may include 2D (images and measurements), m-mode assessing rhythm, rate and dimensions, 3D/4D ultrasound, colour Doppler imaging (CDI) and pulsed Doppler (PD) ultrasound imaging with measurements. These techniques are used to confirm no abnormality detected or to help in obtaining a diagnosis and/or exclude any further pathology.

For this assessment item you will put together a portfolio of one normal fetal heart and one abnormal fetal heart using:

1. A normal fetal heart from the second or third trimester you have scanned yourself or sourced (source referenced), and
2. An abnormal fetal heart from the second or third trimester you have scanned yourself, or have been involved in, or sourced (source referenced).

You will create a PowerPoint presentation comparing and contrasting your normal and abnormal images and clinical history. As you will be comparing and contrasting the two fetal hearts, ensure both cases are from the same trimester of pregnancy. The presentation will be suitable for a multi-disciplinary team educational meeting. You will ensure that all identifying information will be removed from the images and patient history.

There will be five sections to the presentation:

1. Title of presentation, your name, student number and unit details (1 slide)
2. Patient histories (2 slides)
3. Imaging (include 10-24 images +/- video clips) including critique of image quality and an explanation of technical factors used for assessment. You will label the images for educational purposes. It is expected you will demonstrate the anatomical ultrasound planes in 2D and CDI, and correct placement of PD and 2D and/or m-mode callipers for measurements (12 slides maximum, 2 images per slide maximum)
4. Diagnosis (this includes aetiology, echocardiography findings, differential diagnosis, patient management, other testing and follow-up). Use your knowledge of 2D screening views and extended views, segmental sequential analysis, m-mode, CDI, PD and possibly 3D/4D sonography to explain how to interrogate the fetal heart and arrive at a diagnosis. By evaluating the fetal hearts you will report recommendations on the ultrasound views/techniques that would be used or are of no use for reaching a diagnosis for the normal and abnormal fetal heart (7 slides maximum)
5. References (2 slides)

The presentation should be written so the message is clearly conveyed, the information can be generalised and will be relevant to other practitioners.

The presentation should have no more than 24 slides, use a minimum of 24 point font size and would be suitable for a 25 minute presentation which could be uploaded for teaching purposes onto a website or presentation at a conference. Referencing font size can be smaller to allow the referencing to fit into the presentation and fit onto two slides at the end of the presentation. Excess slides and/or unreadable font size will result in a 10% reduction in marks.

In the absence of an approved extension via the unit moodle site there will be a 5% reduction in marks per day for late submissions.

### **Assessment Due Date**

Week 10 Friday (22 Sept 2017) 4:00 pm AEST

### **Return Date to Students**

Week 12 Friday (6 Oct 2017)

### **Weighting**

30%

### **Minimum mark or grade**

50%

### **Assessment Criteria**

- Layout of portfolio which leads the reader through the development of knowledge
- Correct usage of spelling, scientific, medical and fetal echocardiography pathological terminology
- Succinct and relevant description of patient history, aetiology, echocardiography findings, other testing, patient management and follow-up
- Accurate and complete description of the normal and abnormal fetal hearts and explanation of the techniques used to reach a diagnosis
- Correct and complete referencing

### **Referencing Style**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

**Submission**

Online

**Learning Outcomes Assessed**

- Differentiate the aetiology and Doppler haemodynamics of fetal cardiac abnormalities
- Apply practical skills and critical thinking to fetal cardiac assessment

**Graduate Attributes**

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Self-management
- Ethical and Professional Responsibility

### 3 Written Assessment

**Assessment Type**

Written Assessment

**Task Description**

This task is designed so you can evaluate existing or emerging technology or diagnostic parameters in fetal echocardiography. You will research a topic that is related to fetal echocardiography and interests you. The topic can include but is not limited to:

- New or existing technology available on or potentially used on ultrasound machines
- New or existing technology available with other imaging or diagnostic modalities
- New or existing technology or diagnostic parameters available in the field of genetics
- New or existing diagnostic parameters in fetal echocardiography
- New or existing safe patient care in fetal echocardiography
- New or existing quality practice in fetal echocardiography

You need to have the following outline: Title, unstructured Abstract (200 words), Introduction, Body, Conclusion, References. Headings and subheadings may be used within the text to guide the reader through the chosen topic. Images, diagrams and tables may be used to illustrate points and must be correctly referenced. Diagrams and tables must be original and the source material referenced. Images that are not the author's own work must be referenced. Within the body of the paper you need to include information about the following:

- Principles involved in the technology, diagnostic parameters, safe patient care or quality practice
- Advantages
- Disadvantages
- Current or potential use in fetal echocardiography

Information should be drawn from scientific journal articles and current textbooks. Referencing must be done using the APA system.

Word limit is 2000 words +/-10%.

There will be a 10% reduction in marks for exceeding the word limit. Images, diagrams, tables and the reference list are not included in the word limit.

In the absence of an approved extension via the unit moodle site there will be a 5% penalty per day for late submissions.

**Assessment Due Date**

Review/Exam Week Friday (13 Oct 2017) 4:00 pm AEST

**Return Date to Students**

Exam Week Friday (20 Oct 2017)

**Weighting**

40%

**Minimum mark or grade**

50%

**Assessment Criteria**

- Layout of report which leads the reader through the development of knowledge
- Correct use of spelling, grammar and technological terminology
- Accurate and complete description of new or existing technology, diagnostic parameters, safe patient care or quality practice which includes a discussion of principles involved, the advantages, disadvantages, and assessment of current or potential use in fetal echocardiography

- Use of images, tables or diagrams to illustrate points
- Correct and complete referencing

### **Referencing Style**

- [American Psychological Association 6th Edition \(APA 6th edition\)](#)

### **Submission**

Online

### **Learning Outcomes Assessed**

- Contrast typical 2-D and Doppler fetal echocardiographic views used to assess the fetal heart.
- Evaluate existing and emerging technology and diagnostic parameters in fetal echocardiography

### **Graduate Attributes**

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research
- Ethical and Professional Responsibility

## Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

### What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

### Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

### Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

### What can you do to act with integrity?



#### Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



#### Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



#### Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem