



# ECHO20003 *Fetal Echocardiography*

## Term 2 - 2019

Profile information current as at 26/04/2024 12:49 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), 3D and 4D 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 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 - 2019

- Online

### 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: 50%

#### 2. **Portfolio**

Weighting: 50%

### 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 Have Your Say

**Feedback**

Students enjoyed the use of real life examples of fetal congenital heart disease which helped reinforce their learning.

**Recommendation**

Retain and source further examples of fetal congenital heart disease cases to use during lectures and Zoom tutorials.

#### Feedback from Have Your Say

**Feedback**

Students appreciated the challenge provided by the detailed lectures and learning.

**Recommendation**

Continue to provide detailed and challenging learning. Review the learning material to ensure it is current.

#### Feedback from Have Your Say and email

**Feedback**

Students would like the quizzes to be assessable. They commented they would prefer to be able to provide more information in the form of speaker notes in the portfolio.

**Recommendation**

Review assessment item types and requirements.

## 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 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 - Portfolio - 50%	•	•	•	•
2 - Online Quiz(zes) - 50%	•	•		•

### 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 - Portfolio - 50%	○	○	○		○	○		
2 - Online Quiz(zes) - 50%	○	○	○					

## 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

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)
- Computer with microphone and camera to attend zoom tutorials

## Referencing Style

All submissions for this unit must use the referencing style: [Vancouver](#)

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 - 15 Jul 2019

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>	Prescribed textbook: A Practical Guide to Fetal Echocardiography: Normal and Abnormal Hearts 3rd Ed. 2016. Abuhamad A & Chaoui R. Chapter 3	Zoom session Tuesday 7.00-8.00pm

### Week 2 - 22 Jul 2019

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>		Online quiz, released Monday 9am and open for one week

### Week 3 - 29 Jul 2019

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
- First trimester heart screening

Chapters 6-10

Zoom session Tuesday 7.00-8.00pm

#### Week 4 - 05 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Common cardiac physiological measures		
<ul style="list-style-type: none"> <li>• Colour Doppler</li> <li>• Pulsed Doppler</li> <li>• Cardiac function and measurements</li> </ul>	Chapters 12-14	Online quiz, released Monday 9am and open for one week

#### Week 5 - 12 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Abnormalities of the 4 chamber view		
<ul style="list-style-type: none"> <li>• Ventricular septal defects</li> <li>• Atrial septal defects</li> <li>• Atrioventricular septal defects</li> </ul>	Chapter 18	Zoom session Tuesday 7.00-8.00pm

#### Vacation Week - 19 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Break week		

#### Week 6 - 26 Aug 2019

Module/Topic	Chapter	Events and Submissions/Topic
Left sided heart anomalies		
<ul style="list-style-type: none"> <li>• Hypoplastic left heart syndrome</li> <li>• Aortic stenosis (critical and mild)</li> <li>• Coarctation of the aorta</li> <li>• Interrupted aortic arch</li> <li>• Right aortic arch</li> <li>• Double aortic arch</li> <li>• Aberrant subclavian artery</li> </ul>	Chapters 21, 22, 23, 29	Online quiz, released Monday 9am and open for one week

#### Week 7 - 02 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Right sided heart anomalies		
<ul style="list-style-type: none"> <li>• Hypoplastic right heart syndrome</li> <li>• Pulmonary stenosis</li> <li>• Pulmonary atresia with intact ventricular septum</li> <li>• Tricuspid atresia with VSD</li> <li>• Ebstein anomaly</li> <li>• Tricuspid valve dysplasia</li> </ul>	Chapter 19 (p288-295), 20, 24	Zoom session Tuesday 7.00-8.00pm

#### Week 8 - 09 Sep 2019

Module/Topic	Chapter	Events and Submissions/Topic
Conotruncal anomalies		
<ul style="list-style-type: none"> <li>• Tetralogy of Fallot</li> <li>• Transposition of the Great Arteries (TGA)</li> <li>• Congenitally corrected TGA</li> <li>• Double outlet right ventricle</li> <li>• Common arterial trunk</li> </ul>	Chapter 25, 26,27, 28	Online quiz, released Monday 9am and open for one week

#### Week 9 - 16 Sep 2019

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	Zoom session Tuesday 7.00-8.00pm
<b>Week 10 - 23 Sep 2019</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Fetal arrhythmias <ul style="list-style-type: none"> <li>• Irregular heart rhythm</li> <li>• Bradyarrhythmias</li> <li>• Tachyarrhythmias</li> </ul>	Chapter 33	Online quiz, released Monday 9am and open for one week
<b>Week 11 - 30 Sep 2019</b>		
Module/Topic	Chapter	Events and Submissions/Topic
Cardiac tumours Pericardial effusions Cardiomyopathies	Chapter 32	Zoom session Tuesday 7.00-8.00pm
<b>Week 12 - 07 Oct 2019</b>		
Module/Topic	Chapter	Events and Submissions/Topic
New technologies <ul style="list-style-type: none"> <li>• Spatio-temporal image correlation (STIC)</li> <li>• 3D/4D</li> <li>• Tissue Doppler Imaging</li> </ul>	Chapter 15	Online quiz, released Monday 9am and open for one week  <b>Portfolio</b> Due: Week 12 Friday (11 Oct 2019) 4:00 pm AEST
<b>Review/Exam Week - 14 Oct 2019</b>		
Module/Topic	Chapter	Events and Submissions/Topic
		<b>Online quizzes</b> Due: Review/Exam Week Monday (14 Oct 2019) 9:00 am AEST
<b>Exam Week - 21 Oct 2019</b>		
Module/Topic	Chapter	Events and Submissions/Topic

## Term Specific Information

Associate Professor Ann Quinton BAppSc(MRS), GradDip(Ultrasound), MAppSc(Ultrasound), PhD(medicine), Gradcert(Higher Education), AMS is the unit coordinator for Fetal Echocardiography ECHO20003. Ann has worked clinically in fetal medicine units performing obstetric ultrasound and fetal echocardiography scans. Ann 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 or Ph: 02 9324 5008 as she is often in labs with students. Ann is based on the Sydney, NSW campus.

Mr Christopher Kramer BA, ACS, RDCS, FASE is also teaching into this unit. Chris is an advanced cardiac sonographer, experienced academic 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 of Diagnostic Medical Sonography and is a team member on the American Registry of Diagnostic Medical Sonography writing and mentoring group. Chris has worked in the field of echocardiography for the last 15+ years, with interests in sonography education, quality and new technology. His writings include articles on 3D echocardiography, athletic conditioning, and left ventricular assist devices. Chris trained at the Mayo Clinic in Rochester, Minnesota and worked for the Mayo Clinic in Arizona after graduation. Chris resides in Milwaukee, WI, USA.

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 textbook to take full advantage of the learning provided in this unit.

## Assessment Tasks

### 1 Online quizzes

**Assessment Type**

Online Quiz(zes)

**Task Description**

There will be six (6) online Moodle quizzes which will be released on Monday at 9am in weeks 2, 4, 6, 8, 10 and 12. Each quiz is due for completion one week later on the following Monday at 9am in weeks 3, 5, 7, 9, 11 and exam/review week respectively. Each quiz will test the knowledge obtained from the previous two weeks unit work. The quizzes will assess your understanding of the concepts delivered in this unit. Image viewing questions may be included. You will be required to be familiar with embryology and normal and pathological sonographic imaging of the fetal heart. Each quiz will be open for 60 minutes (allowing six (6) minutes per question) and only ONE attempt is allowed. Once started the quiz cannot be paused or restarted. As each quiz is online and open book, you will find it useful if you have produced your own notes and are familiar with the unit information.

Each quiz will have six (6) multiple choice and four (4) short answer questions. The multiple choice questions will be worth 1 mark each, the short answer questions will be worth 2 marks each giving a total of 14 marks per quiz.

The pass is a cumulative mark of 50%.

**Number of Quizzes**

6

**Frequency of Quizzes**

Fortnightly

**Assessment Due Date**

Review/Exam Week Monday (14 Oct 2019) 9:00 am AEST

**Return Date to Students**

Exam Week Monday (21 Oct 2019)

**Weighting**

50%

**Minimum mark or grade**

50%

**Assessment Criteria**

Answers will be either correct or incorrect.

Students must achieve a cumulative pass mark of 50% across the six quizzes to pass this component.

**Referencing Style**

- [Vancouver](#)

**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
- Apply critical thinking to fetal cardiac assessment.

**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, colour Doppler imaging (CDI), pulsed Doppler (PD) ultrasound imaging with measurements and 3D/4D ultrasound. These techniques are used to confirm a normal scan or to help in obtaining a diagnosis of congenital heart disease and/or exclude any further pathology.

For this assessment item you will put together a presentation of an abnormal fetal heart ultrasound study using: An abnormal fetal heart study from the first, second or third trimester you have scanned yourself, or have been involved in, or sourced (source referenced).

You will create a PowerPoint presentation demonstrating the clinical history, ultrasound images, discussion about the heart anomaly and a "take home message" that will list the full complement of imaging techniques needed to make a diagnosis. You will critique your images and detail extra ultrasound imaging that was or could have been done to help with the diagnosis. The presentation will be suitable for a multi-disciplinary team educational meeting. You will ensure that all identifying information is 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 history (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 and structures within 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 calipers for measurements (12 slides maximum, 2 images per slide maximum)
4. Management (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 ultrasound to explain how to interrogate the fetal hearts and arrive at a diagnosis (6 slides).
5. By evaluating the fetal heart your conclusion (take home message) will report recommendations on the ultrasound views/techniques that should be used to reach a diagnosis for the chosen heart anomaly (1 slide)
6. References (2 slides) (smaller font size can be used if needed for the reference slides)

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

The presentation should have no more than 24 slides, use a minimum of 24 point font size (exception is reference slides) and should be suitable for a 25 minute presentation which could be uploaded for teaching purposes onto a website or presentation at a conference. The reference font size can be smaller to allow the references 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 12 Friday (11 Oct 2019) 4:00 pm AEST

### **Return Date to Students**

Exam Week Friday (25 Oct 2019)

### **Weighting**

50%

### **Minimum mark or grade**

50%

### **Assessment Criteria**

- Layout of presentation which leads the reader through the development of knowledge
- Correct usage of spelling, scientific, medical and fetal echocardiography terminology
- Succinct and relevant description of patient history, aetiology, echocardiography findings, other testing, patient management and follow-up
- Accurate and complete description of the abnormal fetal heart and explanation of the techniques used
- Concluding slide explaining imaging needed to make a diagnosis
- Correct and complete referencing
- A detailed rubric is available on the unit Moodle site

### **Referencing Style**

- [Vancouver](#)

### **Submission**

Online

## Submission Instructions

Please upload as Powerpoint presentation, maximum file size 100MB

## 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
- Evaluate existing and emerging technology and diagnostic parameters in fetal echocardiography
- Apply critical thinking to fetal cardiac assessment.

## Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Self-management
- 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