ECG Interpretation in Primary Care Online Course

Author Dr Peter Stuart FACEM
Peer Review Dr J Treasure FRACGP, Dr J Bament (FRACGP)
Latest Review January 2025
Accreditation: RACGP (Activity Number 403822) & ACRRM (Activity Number: 39919) for the 2026-2028 triennium

Learning Outcomes

At the completion of the program participants should be able to:

1. Describe a clinically based approach to evaluation of the ECG in the emergency patient
2. Identify the characteristics associated with the normal P wave
3. Demonstrate how to determine rate on the ECG using the QRS complexes
4. Describe the characteristics of the normal ST segment
5. Identify the key factors used to classify an arrhythmia
6. Identify the ST / T wave changes associated with bundle branch block

Summary of the e-Learning Program

The e-learning is interactive and requires the clinician to consider a range of the clinical problems and scenarios and provide a response. At the end of each topic a summative quiz is used to evaluate learning and understanding of the topic material. There are six topics with a total course time of 7 hours.

The six topics are

1. Clinical Approach to ECG Interpretation
2. The P Wave
3. Examining the QRS Complex
4. Examining the ST Segment / T Wave
5. ECG Diagnosis of Arrhythmias
6. The ECG and Myocardial Ischaemia

Outline of the Program

1. Clinical Approach to ECG Interpretation

Module summary: In this first topic we review some of the physiology that we need for reading the ECG. This is kept very basic and should (I am hopeful) not cause confusion or stress. In the tutorial we introduce a simple three step approach to reading the ECG that will allow you to quickly "scan" an ECG to identify changes that provide a clue to serious underlying disease such as acute myocardial ischaemia, life threatening biochemical abnormalities and clinically significant arrhythmias. Later we explore each of the three steps in detail with examples to allow you to practice and become proficient in recognising ECG abnormalities associated with serious illness.

Interaction/Assessment:

- Chapter Reading: ABCDs of Emergency Medicine – Introduction to ECG Interpretation
- Video eTutorial : Approach to ECG Interpretation
- Video etutorial : A brief introduction to ECG Pathophysiology
- Interactive Clinical Casebook – Introduction to ECGs
- Topic Quiz – Introduction to ECG Interpretation

2. P Wave

Module summary: The ECG waveform begins with the P wave. The P wave reflects depolarisation of the atrium. Absence of the P wave or the presence of too many P waves provide vital clues to the presence of arrhythmias indicating disruption to the normal process of depolarisation in the heart.

Interaction/Assessment:

- Chapter Reading: ABCDs of Emergency Medicine: Examining the P Wave
- Interactive Clinical Casebook – P Wave
- Topic Quiz – P Wave (A)
- Topic Quiz – P Wave (B)

3. Examining the QRS Complex

Module summary: The QRS complex reflects depolarisation of the ventricles and normally has a width of less than 0.12 secs (equivalent to less than 3 small squares). The QRS complex provides us with information about the heart rate and about abnormal conduction through the electrical wiring of the heart (referred to in anatomical terms as the His-Purkinjie system).

Interaction/Assessment:

- Chapter Reading: ABCDs of Emergency Medicine: The QRS Complex
- Interactive Clinical Casebook – QRS Complex
- Topic Quiz – QRS Complex (A)
- Topic Quiz – QRS Complex (B)

4. Examining the ST Segment / T Wave

Module summary: The ST / T wave component of the ECG waveform reflects repolarisation of the ventricle. Abnormalities of the ST segment commonly result from abnormal depolarisation of the ventricle and injury or inflammation of myocardial tissue due to myocardial ischaemia or acute pericarditis. ST elevation or depression is by far the most important diagnostic feature on the ECG for acute myocardial ischaemia.

Interaction/Assessment:

- Chapter Reading: ABCDs of Emergency Medicine: Examining the ST/T Wave
- Interactive Clinical Casebook – ST Segment / T Wave
- Topic Quiz – ST / T Wave (A)
- Topic Quiz – ST / T Wave (B)

5. ECG Diagnosis of Arrhythmias

Module summary: This section explores fundamental principles for the assessment of the ECG rate and rhythm including determination of ventricular rate from the ECG and the classification of cardiac rhythms. We explore a system for classifying the rhythm into one of four categories. This enables you to significantly narrow down the diagnostic possibilities and aid in reaching a final diagnosis.

Interaction/Assessment:

- Chapter reading: ABCDs of Emergency Medicine: Approach to Cardiac Arrhythmias
- Video eTutorial: Approach to Cardiac Arrhythmias
- Interactive Clinical Casebook – A System for Rhythm Diagnosis
- Topic Quiz – Disorders of Rate and Rhythm

6. The ECG and Myocardial Ischaemia

Module summary: The ECG plays a central role in the evaluation of the patient with acute chest pain. The ST/T wave component of the ECG waveform reflects repolarisation of the ventricle. Abnormalities of the ST segment commonly result from abnormal depolarisation of the ventricle and injury or inflammation of myocardial tissue due to myocardial ischaemia or acute pericarditis. In this module we focus on the patterns of ECG changes associated with myocardial ischaemia arguably one of the most interesting and challenging areas of ECG Interpretation

Interaction/Assessment:

- Chapter reading: ABCDs of Emergency Medicine: ECG Changes in Ischaemia
- Video eTutorial: ECG in Myocardial Ischaemia 1
- Video eTutorial: ECG in Myocardial Ischaemia 2
- Interactive Clinical Casebook – ECG Changes in Myocardial Ischaemia
- Topic Quiz – ECG in Myocardial Ischaemia

7. Final Post Course Assessment Quiz

Final Course Quiz – ECG Interpretation in Primary Care