



Certificate in Electrocardiography

The Certificate in Electrocardiography is awarded by the Society to candidates who satisfy the examiners of their clinical competence to record safely and accurately a 12-lead resting electrocardiogram, and on their understanding of the features which distinguish an abnormal from a normal electrocardiogram.

The syllabus leading to the Certificate in Electrocardiography is designed to encourage accurate recording of the 12-lead resting electrocardiogram in line with safe and responsible working practices according to SCST Clinical Guidelines by consensus.

The syllabus prescribes the following areas of supporting knowledge and understanding expected of the successful candidate:

- a) Medical and technical terminology applicable to the subject area.
- b) Essential anatomy and physiology of the heart and circulation as relevant to electrocardiography.
- c) Problems encountered in the recording of a 12-lead resting electrocardiogram and their solutions.
- d) Features of the normal 12-lead resting electrocardiogram and the recognition of some common abnormalities.

The examination paper is in two parts

Paper One – Anatomy and Physiology-

Paper Two – Electrocardiographic Instrumentation, Technique and -ECG Interpretation-

Paper Two contains an **Essential ECG Interpretation Section**

This section will comprise three 12-lead ECG-s taken from the following list:-

- Complete heart block
- Left bundle branch block
- Right bundle branch block
- Ventricular fibrillation
- Atrial fibrillation
- Ventricular tachycardia
- Acute ST elevation myocardial infarct

Candidates will be required to identify which of these findings is demonstrated in each of the three ECGs.

The questions are multiple choice.

It is essential to pass this section in order to successfully pass the whole paper.

SYLLABUS

ANATOMY and PHYSIOLOGY OF THE CARDIOVASCULAR SYSTEM:

Knows the structure and function of the heart, the anatomy of the blood vessels and the roles of the different types of vessels in the circulatory system.

General structure and function of the heart including:

- the role of the heart in the circulation of blood
- valves and supporting apparatus
- chambers
- main coronary arteries and veins
- great veins and arteries
- pericardium

Basic anatomy and function of the specialised conduction system:

- Sinus node
- Atrioventricular node
- Bundle of His
- Left and right bundle branches
- Purkinje fibres

Pathology of the Cardiovascular System

Understands common pathological terms and, where applicable, associated electrocardiographic features.

- Atherosclerosis
- Atheroma
- Ischaemia
- Angina pectoris
- Unstable angina
- Prinzmetal's angina
- ST-elevation and non-ST elevation myocardial infarction
- Acute coronary syndrome
- Heart failure
- Oedema
- Hypertension
- Atrial and ventricular septal defects
- Cyanosis
- Coarctation of the aorta
- Valvular stenosis and regurgitation
- Pericarditis
- Ventricular Hypertrophy
- Hypothermia
- Pericardial Effusion
- Dextrocardia

ELECTROCARDIOGRAPHIC INSTRUMENTATION, TECHNIQUE AND ECG INTERPRETATION

Understands the function of the controls of the ECG machine

- Paper speed
- Gain
- Filters

Understands care of the equipment

- Care of recording paper
- Care of leads and cables

Understands electrodes

- Care of electrodes
- Application of and connection to electrodes

Practical electrocardiography

Is able to record the electrocardiogram accurately from all types of patient:

- Choice of appropriate leads for a particular patient category (e.g., adult / paediatric)
- Preparation of patient: positioning, relaxation and dignity
- Preparation of electrode sites to give optimum electrode contact and to minimise artefact e.g. muscle tremor, AC interference etc.
- Accurate positioning of electrodes
- Setting of controls

Recording and follow-up

Is able to record a resting electrocardiogram from patients of all ages and including a patient who:

- is unconscious
 - has language or communication difficulty
 - is infectious or at risk of infection
 - has a physical disability including amputation
 - is visually impaired
 - is hearing impaired
 - is uncooperative
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- Evaluation of the recording to assess the need for re-recording, as appropriate
 - Recognition and elimination or reduction of artefacts
 - Labelling of completed recordings as appropriate
 - Cleaning, preparation and storage of equipment as applicable to control of infection procedures

Electrocardiographic interpretation: recognises the features and variations of the electrocardiogram and makes appropriate measurements:

- Waveform components (P, Q, R, S, T and U)
- Relationship of the electrocardiogram to the electrical events of the heart.

- Relationship of the electrical events to the mechanical events of the cardiac cycle.
- Definitions and normal ranges of PR interval, QRS duration and QT interval
- Calculation of the heart rate from the electrocardiogram
- Hexaxial reference system

The normal electrocardiogram and common abnormalities:

- The appearance of the normal resting electrocardiogram including normal variations in relation to age, state of activity, body build and ethnic origin

Rhythms arising from the sinus node:

- Normal sinus rhythm
- Sinus arrhythmia
- Sinus tachycardia
- Sinus bradycardia
- Sinus arrest

Supraventricular tachyarrhythmias

- Atrial premature beats
- Atrial flutter-
- Atrial fibrillation
- Supraventricular tachycardia
- AV nodal (junctional rhythm)

Conduction abnormalities

- Ventricular pre-excitation (Wolff-Parkinson-White syndrome)
- Left and right bundle branch blocks
- 1st degree atrio-ventricular (AV) block
- 2nd degree AV block: Mobitz I (Wenckebach), Mobitz II and 2:1 block
- 3rd degree (complete) AV block

Rhythms arising from the ventricles:

- Ventricular escape beats
- Ventricular premature beats
- Ventricular tachycardia-
- Ventricular fibrillation-
- Ventricular standstill (asystole)

The electrocardiogram associated with an artificial cardiac pacemaker:

- Identification of pacemaker stimulus on the electrocardiogram
- Differentiation between atrial and ventricular pacing