



HEALTH PROFESSIONS COUNCIL OF SOUTH AFRICA
THE PROFESSIONAL BOARD FOR RADIOGRAPHY AND CLINICAL TECHNOLOGY
GUIDELINES FOR THE TRAINING OF
ELECTROCARDIOGRAPHY (ECG) TECHNICIANS

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ELECTROCARDIOGRAPHY (ECG) TECHNICIANS TRAINING REQUIREMENTS AND GUIDELINES FOR ACCREDITATION

GENERAL INFORMATION

JOB DESCRIPTION: ELECTROCARDIOGRAPHY (ECG) TECHNICIAN

The term ECG technician is used to describe the basic grade of operation in this field. An ECG technician is defined as a person who is capable of carrying out routine ECG recordings without direct supervision but not in independent private practice. Routine procedures include performing of an ECG procedure on adults and paediatric individuals.

REQUIREMENTS FOR ADMISSION TO TRAINING

The minimum requirement is a Senior Certificate or recognised equivalent qualification. Successful completion of examinations at this level in biology and/or physical science and/or mathematics is desirable but not essential.

STUDENT REGISTRATION

Student - ECG Technicians must register with Council by submitting the application form for registration as a student together with the registration fee and required documentation at the commencement with training.

Registration for the full period of training is mandatory for entry to the examination.

EXAMINATIONS

The Education Committee of the Professional Board will appoint a moderator and examiner for the examination for ECG technicians on an annual basis. A national examination paper will be drawn up by the examiner and moderator for the annual theoretical and practical examinations to be conducted once per year for trainee ECG technicians.

Training units are required to notify the Professional Board by 1 October annually (closing date for the examination) if candidates are eligible for the examination. Applications for registration for the examination must be accompanied by a letter from the training unit indicating that the unit is currently registered as a training unit and complies with all the requirements for the training of ECG technicians. In the letter the model of equipment currently being used, the name of the clinical tutors in the unit as well as patient numbers during the period in question should also be stated as well as confirmation that the student had received training and supervision on a regular basis.

Applicants will not retain credit for papers passed during previous examinations. Both the theoretical and practical examination have to be passed during the same examination period.

The letter of the Professional Board in which arrangements regarding the examination are reflected together with the examination fee determined by the Board should reach the Registrar at least two weeks before the examination. Alternatively, a copy of the letter referred to above together with a copy of the bank deposit slip indicating that the examination fee was deposited into the Council's bank account number 0610-000-169 at any branch of ABSA Bank may be emailed to RCTExams@hpcsa.co.za for attention of the Education and Training Division.

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GUIDELINES FOR ACCREDITATION OF ECG TRAINING UNITS

APPLICATIONS FOR ACCREDITATION

Units interested in training ECG Technicians must apply in writing to the Professional Board via the Education and Training Division. An application for accreditation must include the names and registration numbers of training staff, an indication of the available equipment and infrastructure, patient numbers, ten ECG recordings recorded during the preceding six months as well as an undertaking that training will comply with the guidelines set out in this document.

An ECG unit must use standard ECG equipment and perform ECG to currently accepted international standards, in accordance with “**A Scientific Statement From the American Heart Association Electrocardiography and Arrhythmias Committee, Council on Clinical Cardiology; the American College of Cardiology Foundation; and the Heart Rhythm Society Endorsed by the International Society for Computerized Electrocardiology¹**”, provided that the following criteria are met:

PERSONNEL STRUCTURE OF THE UNIT:

A trainee technician must work under the direct supervision of:

1. A Graduate Clinical Technologist/Clinical Technologist registered with the Professional Board in the category Cardiology and employed on a **full-time** basis by the Unit;

or

2. An ECG Technician registered with the Professional Board in that capacity for at least two years, employed on a **full-time** basis by the Unit.

No more than two students should be permitted per registered clinical technologist or technician as set out in 1 and 2 above.

PATIENT POPULATION AND NUMBERS

The unit should serve both adult and paediatric populations and patient numbers should be such that the trainee is able to personally record no less than 300 ECG tests during the one-year training period.

CLINICAL TRAINING

Theoretical instruction must take place by means of informal lectures or formal training courses.

Registration for the full period of clinical training is mandatory for entry to the examination.

At the end of the 12-month training period the trainee ECG technician shall apply in writing to the Professional Board for permission to do a final examination. This application must be accompanied by a report from the supervising Technologist/Technician confirming that the applicant complies with the training requirements.

The final examination must include a theoretical and a practical examination conducted by the Professional Board. The moderator has to moderate the examination papers prior to the examination to ensure that the entire content of the syllabus is covered.

Once the individual answer sheets have been moderated final marks expressed as a percentage for both the theoretical and the practical examinations will be made available by the Professional Board. Successful applicants will be registered as ECG technicians. A pass mark of 50% is required for both the theoretical and practical examinations.

The Education and Training Division will supply further information on receipt of written requests.

TRAINING SYLLABUS AND EXAMINATION

The Training Unit must follow the National approved syllabus contained in this document.

THE CARDIOVASCULAR SYSTEM. ANATOMY AND PHYSIOLOGY

- Location and external layers of the heart
- Internal structures of the heart: chambers, valves and blood vessels
- Blood flow through the heart and coronary arteries
- Depolarisation and repolarisation
- Basic electrophysiology and the normal conduction system
- Components of the ECG
- ECG leads and their orientation to the heart and coronary arteries

INDICATIONS FOR ECG

ECG EQUIPMENT

- Components of the portable ECG machine
- Types of ECGs
- Signal acquisition
- Calibration
- Types of leads
- ECG paper

QUALITY ASSURANCE AND TROUBLE-SHOOTING IN ECG TESTING

- Calibration
- Interference
- Wandering baseline
- Artifact
- Faulty equipment

ECG PROCEDURE

- Professionalism and ethics
- Skin preparation
- Lead placement in three, five and twelve lead configurations
- Recording

REFERENCE VALUES AND BASIC INTERPRETATION STRATEGIES FOR ECG

- Normal reference values for adults and paediatrics
- Basic interpretation strategies for the following arrhythmia:
 - Sinus bradycardia
 - Sinus tachycardia
 - Atrial fibrillation
 - Ventricular ectopy
 - Ventricular fibrillation

- ST-segment depression and elevation
- Complete atrioventricular heart block

GLOSSARY, SYMBOLS AND ABBREVIATIONS USED IN ECG

References and compulsory reading

1. Rowlands A, Sargent A. The ECG Workbook (Paperback, 4th edition).
2. Coviello J (ed). ECG Interpretation made incredibly easy! (6th edition). Lipincott Williams & Wilkins.
3. [Recommendations for the Standardization and Interpretation of the Electrocardiogram](#). The Electrocardiogram and Its Technology: A Scientific Statement From the American Heart Association Electrocardiography and Arrhythmias Committee, Council on Clinical Cardiology; the American College of Cardiology Foundation; and the Heart Rhythm Society *Endorsed by the International Society for Computerized Electrocardiology*. Paul Kligfield, MD, FAHA, FACC, Leonard S. Gettes, MD, FAHA, FACC, James J. Bailey, MD, Rory Childers, MD, Barbara J. Deal, MD, FACC, E. William Hancock, MD, FACC, Gerard van Herpen, MD, PhD, Jan A. Kors, PhD, Peter Macfarlane, DSc, David M. Mirvis, MD, FAHA, Olle Pahlm, MD, PhD, Pentti Rautaharju, MD, PhD, and Galen S. Wagner, M. Available online.

COMMUNICATION WITH THE PROFESSIONAL BOARD FOR RADIOGRAPHY AND CLINICAL TECHNOLOGY

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