

# **Sop on Performing a 12-Lead Electrocardiogram (ECG)**

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# Standard Operating Procedure (SOP) for Performing a 12-Lead Electrocardiogram (ECG)

Issued By  
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## 1. Purpose

To provide a standardized and accurate method for recording a 12-lead electrocardiogram (ECG) to assess cardiac electrical activity and aid diagnosis.

## 2. Scope

This SOP applies to medical students, nurses, and healthcare professionals performing ECGs in hospital and primary care settings.

## 3. Responsibilities

### 3.1 Medical Students

- Assist in the preparation of the patient and equipment
- Ensure correct electrode placement under supervision
- Maintain patient comfort and privacy
- Identification and interpretation of basic abnormalities

### 3.2 Nursing Staff

- Perform ECG recording using the standard 12-lead technique
- Ensure correct lead placement
- Identify obvious abnormalities and report

### 3.3 Medical Officers

- Indication for ECG
- Interpret ECG findings according to clinical context
- Initiate appropriate management or referral

## 4. Safety Consideration

- Perform hand hygiene before and after the procedure
- Confirm correct patient identity
- Ensure patient is relaxed and at rest
- Maintain privacy and dignity
- Check ECG machine and cables for safety

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- Avoid movement or talking during recording to reduce artifacts
- Stop procedure if patient develop distress (e.g. chest pain, dizziness)

## 5. Indication

- Chest pain or suspected acute coronary syndrome
- Palpitation or arrhythmias
- Syncope or dizziness
- Shortness of breath of cardiac origin
- Electrolyte imbalance suspicion
- Pre-operative cardiac assessment
- Routine monitoring in known cardiac disease

## 6. Contraindication

- No absolute contraindication
- Relative: Severe agitation  
Refusal  
Inability to lie still

## 7. Equipment Required

- 12-lead ECG machine



- ECG Electrodes



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- Conductive gel



- Alcohol swabs/gauze



- Razor (if excessive chest hair present)



- Gloves



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- Patient identification labels



## 8. Patient Preparation

- Explain procedure clearly and obtain consent
- Confirm patient identity.
- Ensure privacy



- Position patient supine, relaxed, arms at sides, legs uncrossed

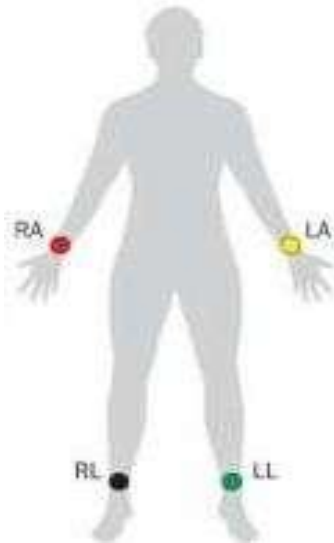


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- Expose chest, wrist, and ankles
- Remove jewellery or metal objects that may interfere
- Clean skin with alcohol; shave hair if necessary for electrode contact
- Ensure patient is warm and comfortable to reduce muscle artefact

## 9. Electrode Placement (Standard 12-Lead System)

### 9.1 Limb Leads

- RA: Right arm
- LA: Left arm
- RL: Right leg
- LL: Left leg



### 9.2 Chest (Precordial) Leads

- V1: 4<sup>th</sup> intercostal space, right sternal border
- V2: 4<sup>th</sup> intercostal space, left sternal border
- V3: Midway between V2 and V4

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- V4: 5<sup>th</sup> intercostal space, midclavicular line,
- V5: 5<sup>th</sup> intercostal space, Anterior axillary line,
- V6: 5<sup>th</sup> intercostal space, Midaxillary line

## 10. Procedure

- Turn on ECG machine and check calibration (25 mm/s, 10mm/mV, standard)
- Apply conductive gel to each electrode site to improve skin contact
- Attach electrodes correctly as per placement



- Ensure good skin contact and minimal movement



- Instruct patient –
  - “Please remain still”
  - “Do not talk or move during recording
  - “Breath normally”
- Record ECG tracing (minimum 10 seconds)
- Check for artefacts; repeat, if necessary
- Label ECG with –
  - Patient name and Age
  - Age
  - Date and time
  - Operator name
- Print and store ECG in patient record



## 11. Infection Control

- Perform hand hygiene before and after the procedure
- Use disposable electrodes when possible
- Clean reusable leads after each patient
- Follow standard precautions

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## 12. Complications (Rare)

- Skin irritation from electrodes
- Discomfort or anxiety
- Misdiagnosis due to poor lead placement or artefact

## 13. Quality Control

- Ensure correct lead placement
- Minimize electrical interference
- Confirm calibration before recording
- Repeat ECG if tracing is unclear

## 13. Documentation

- Attach ECG printout to patient file
- Record indication for ECG
- Document any technical difficulties

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