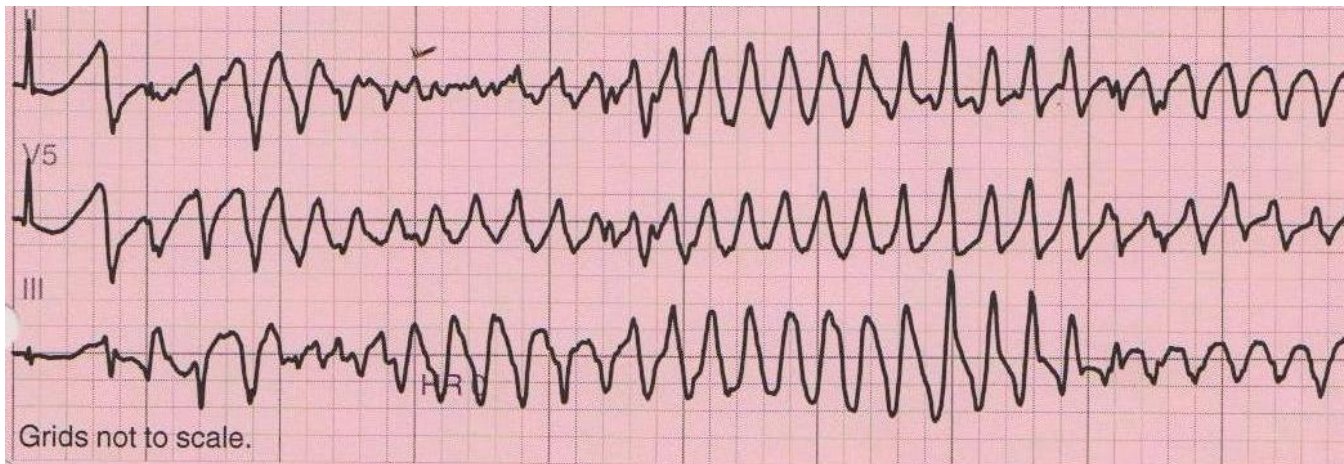


# ECG Diagnoses Not To Be Missed



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MA(Cantab) MBBS FRCP PhD

Consultant Interventional Cardiologist

# Dr Mrinal Saha

Appointed 2010

Angioplasty, stents  
Heart valve disease  
Palpitations  
Heart failure

# ECG analysis: a systematic approach

Is it regular or irregular

What is the rate

Can you see P waves

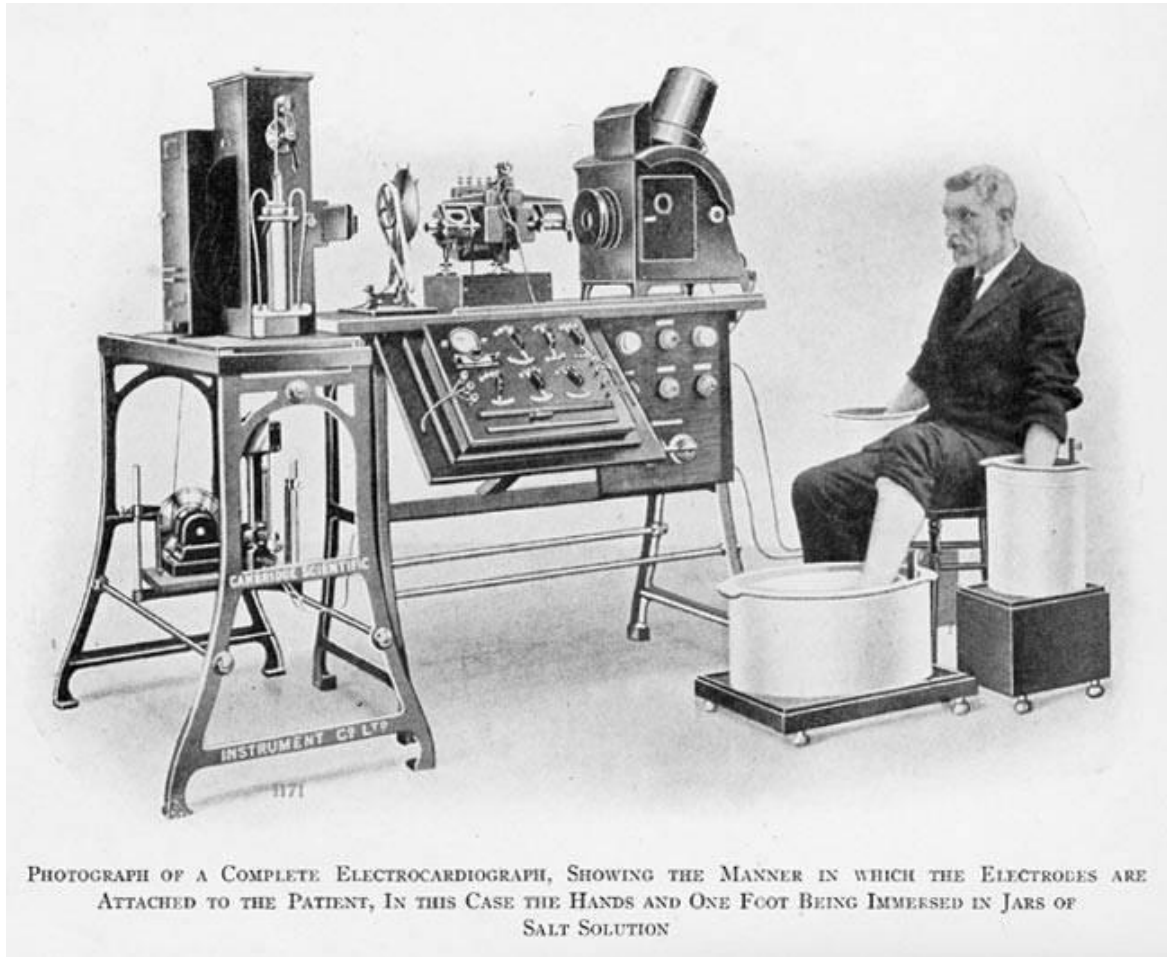
Are the P waves followed by a QRS

Is the QRS narrow or wide

What are the ST segments doing

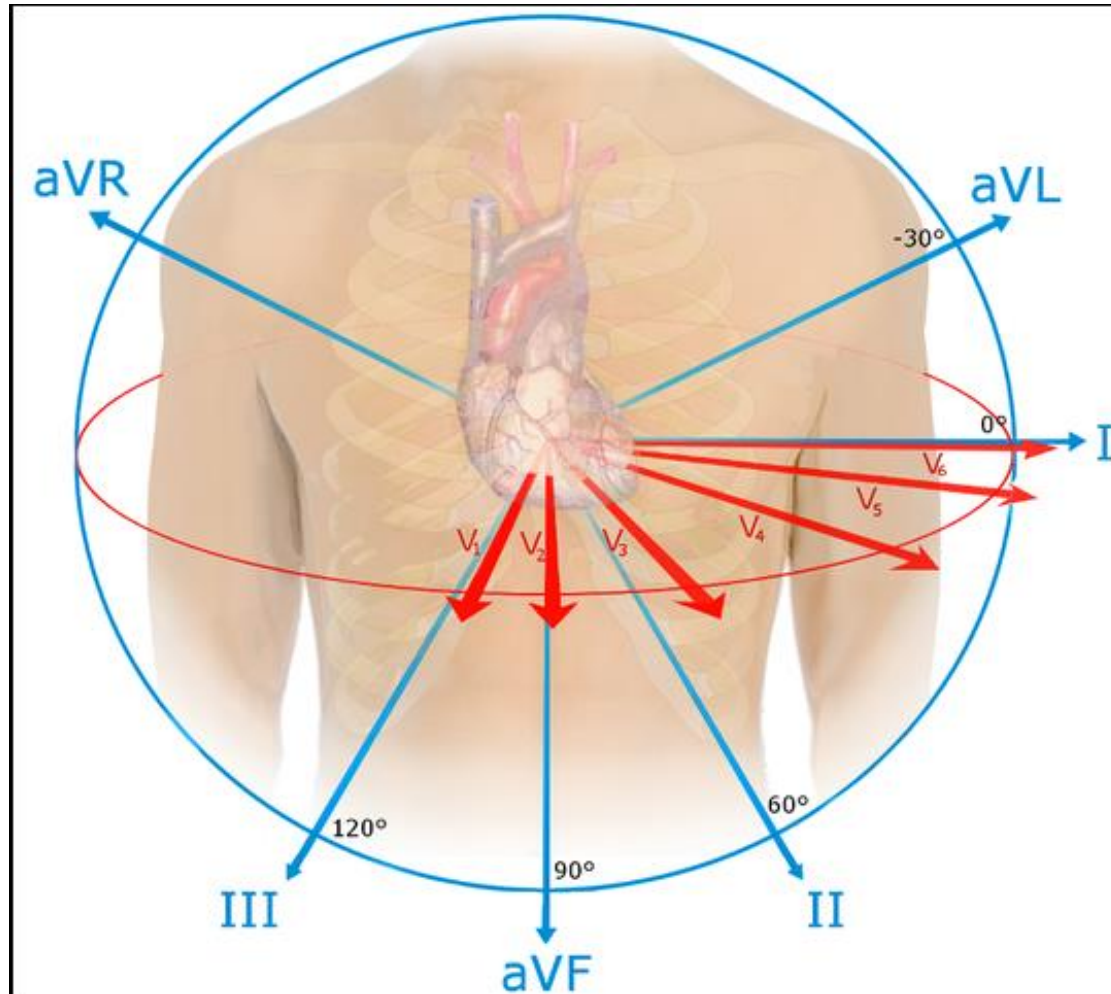
**PATTERN RECOGNITION**

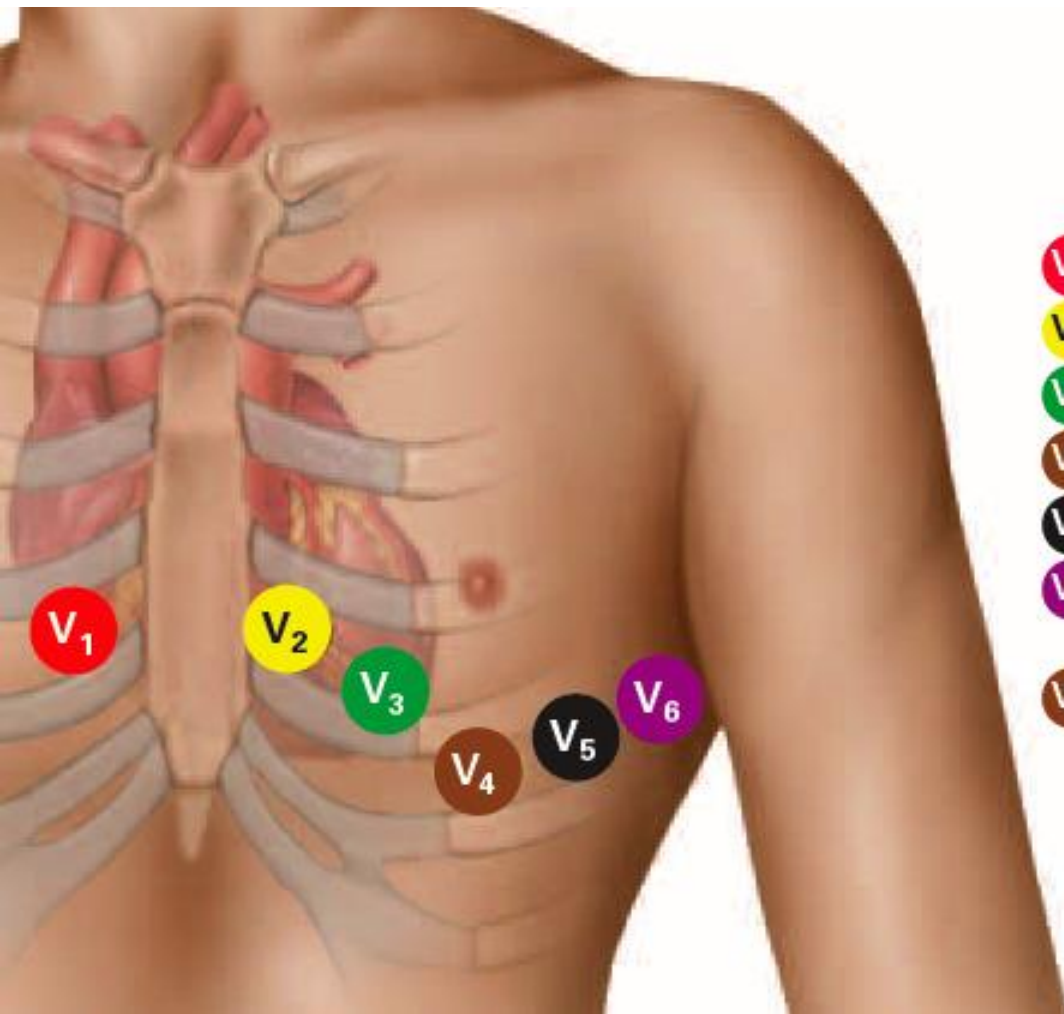
# Obtaining an accurate ECG



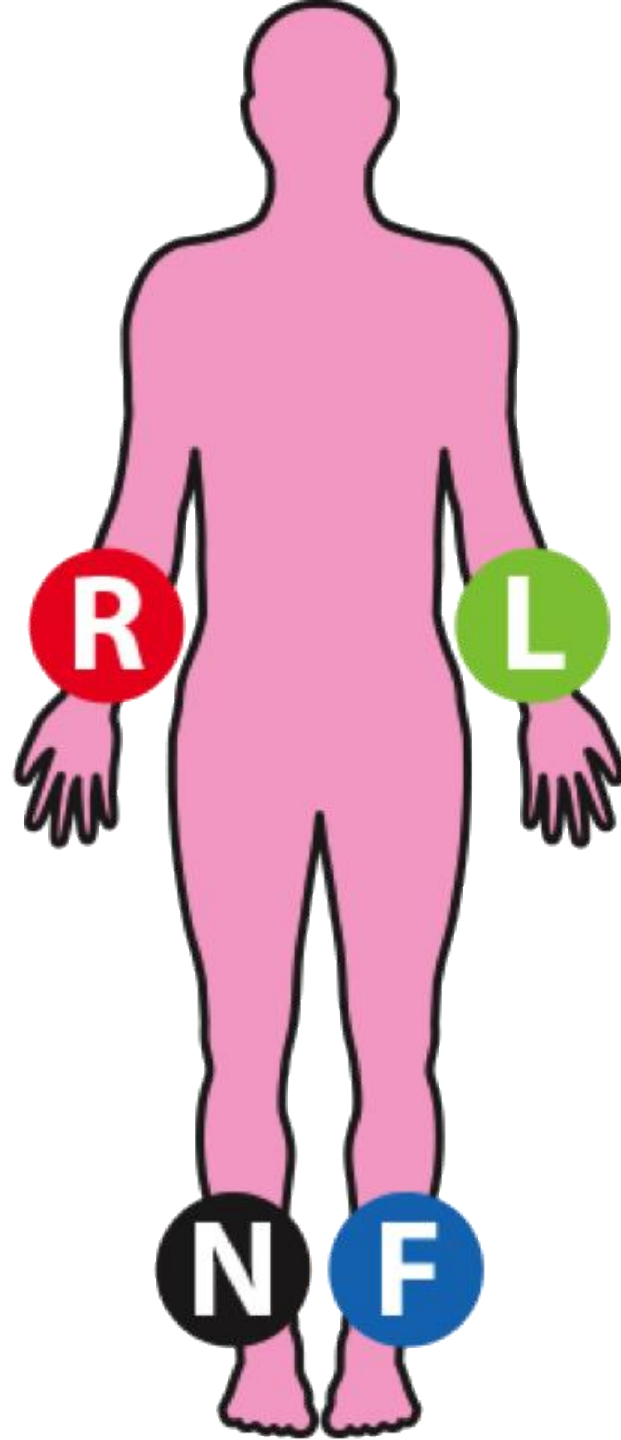
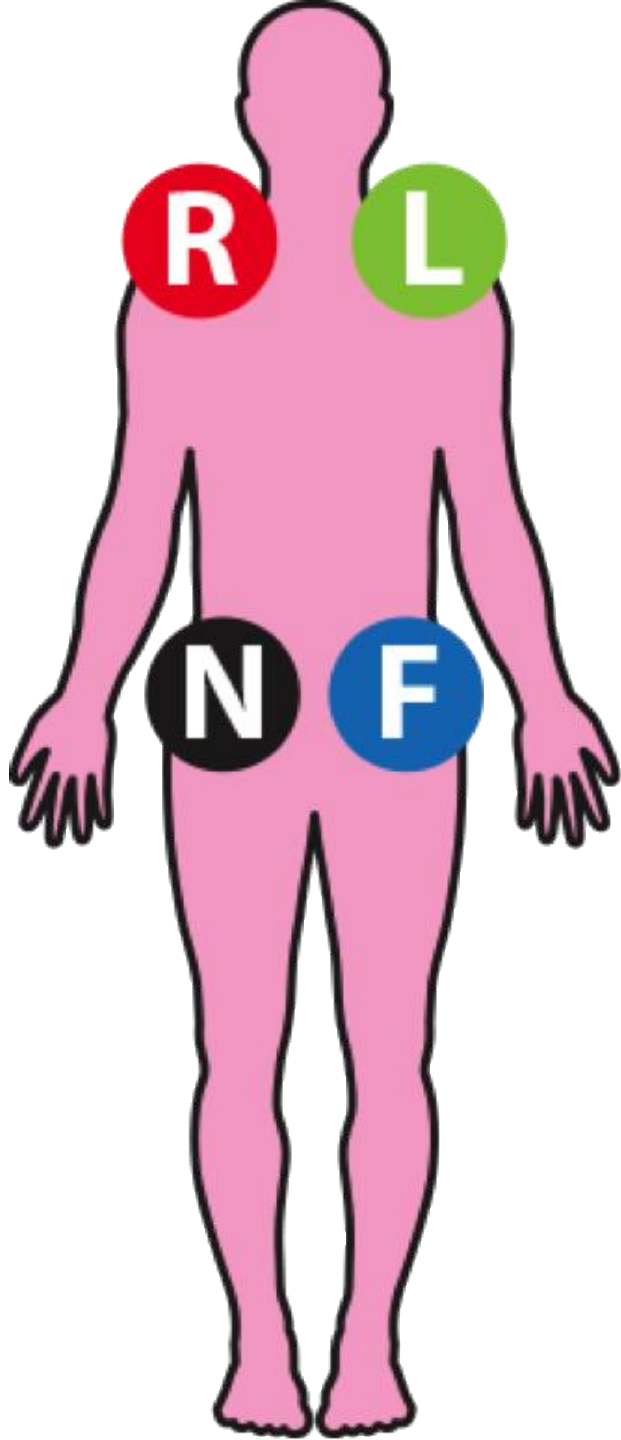


# Lead Placement

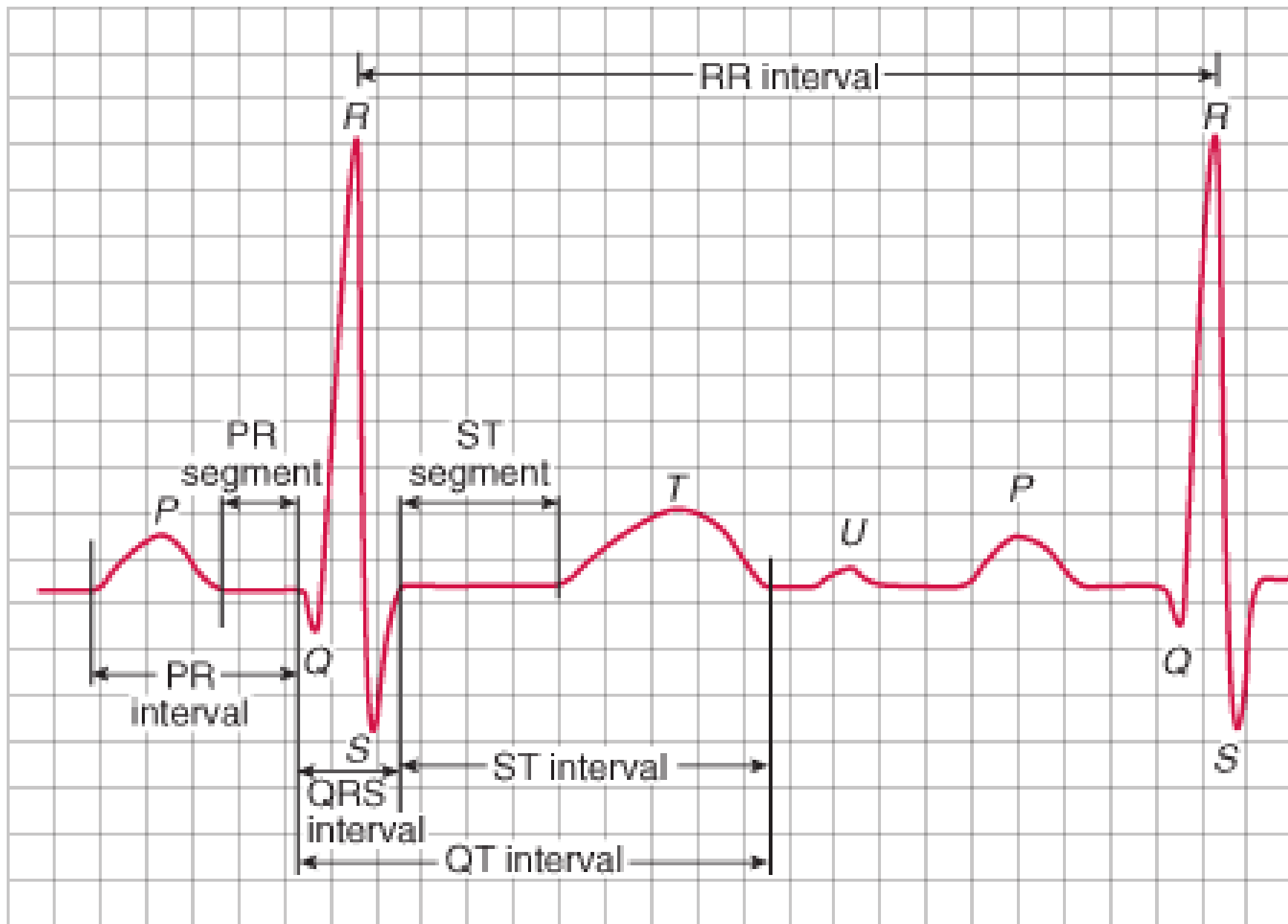




- V<sub>1</sub>** 4<sup>th</sup> intercostal space to the right of the sternum
- V<sub>2</sub>** 4<sup>th</sup> intercostal space to the left of the sternum
- V<sub>3</sub>** directly between the leads V<sub>2</sub> & V<sub>4</sub>
- V<sub>4</sub>** 5<sup>th</sup> intercostal space at midclavicular line
- V<sub>5</sub>** level with V<sub>4</sub> at left anterior axillary line
- V<sub>6</sub>** level with V<sub>5</sub> at left midaxillary line  
*(directly under the midpoint of the armpit)*
- V<sub>4R</sub>** 5<sup>th</sup> intercostal space,  
right midclavicular line

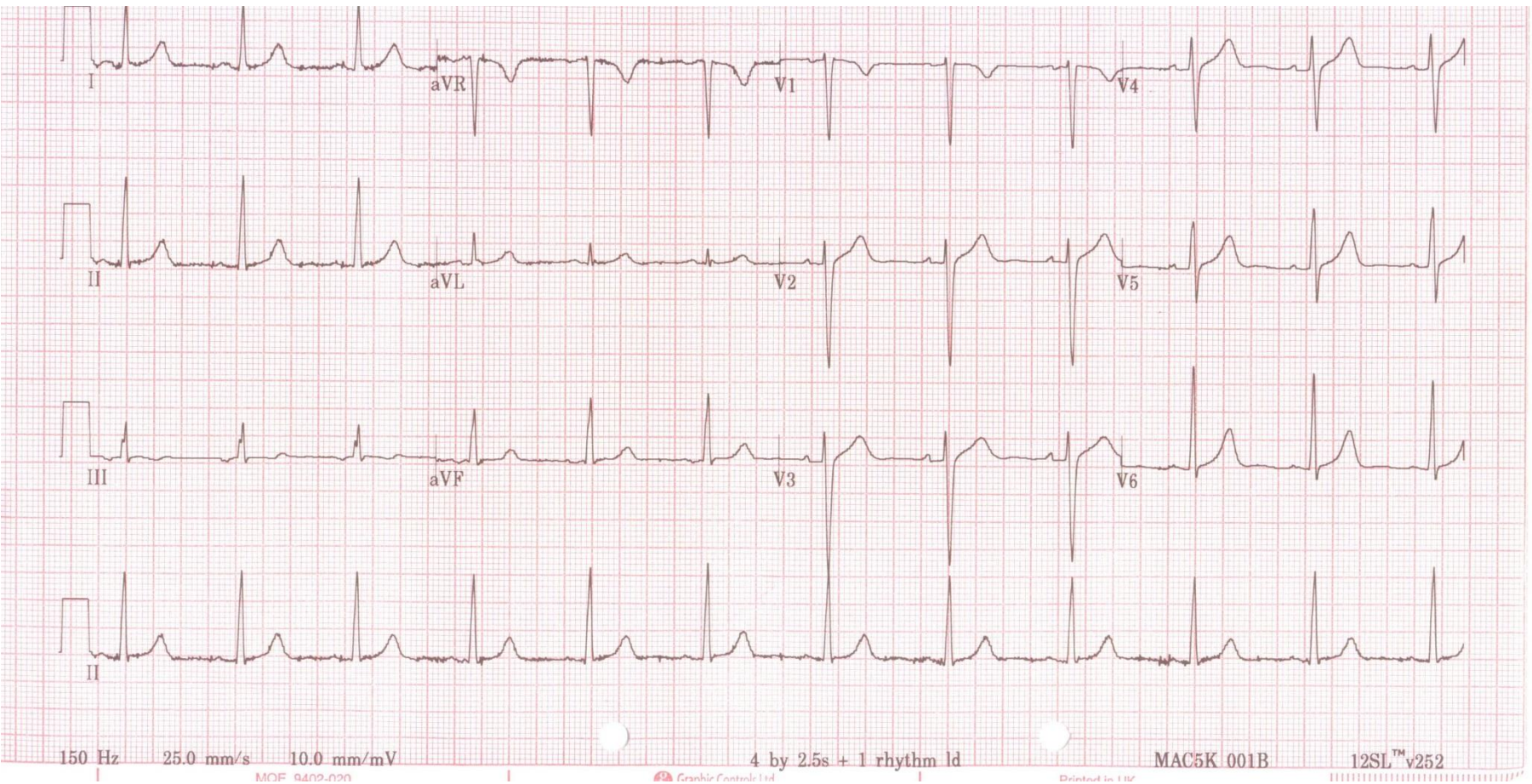


mm/sec.



mm/mV 1 square = 0.04 sec/0.1mV





150 Hz 25.0 mm/s 10.0 mm/mV

MOF 9492-029

4 by 2.5s + 1 rhythm ld

Graphic Controls Ltd

Printed in UK

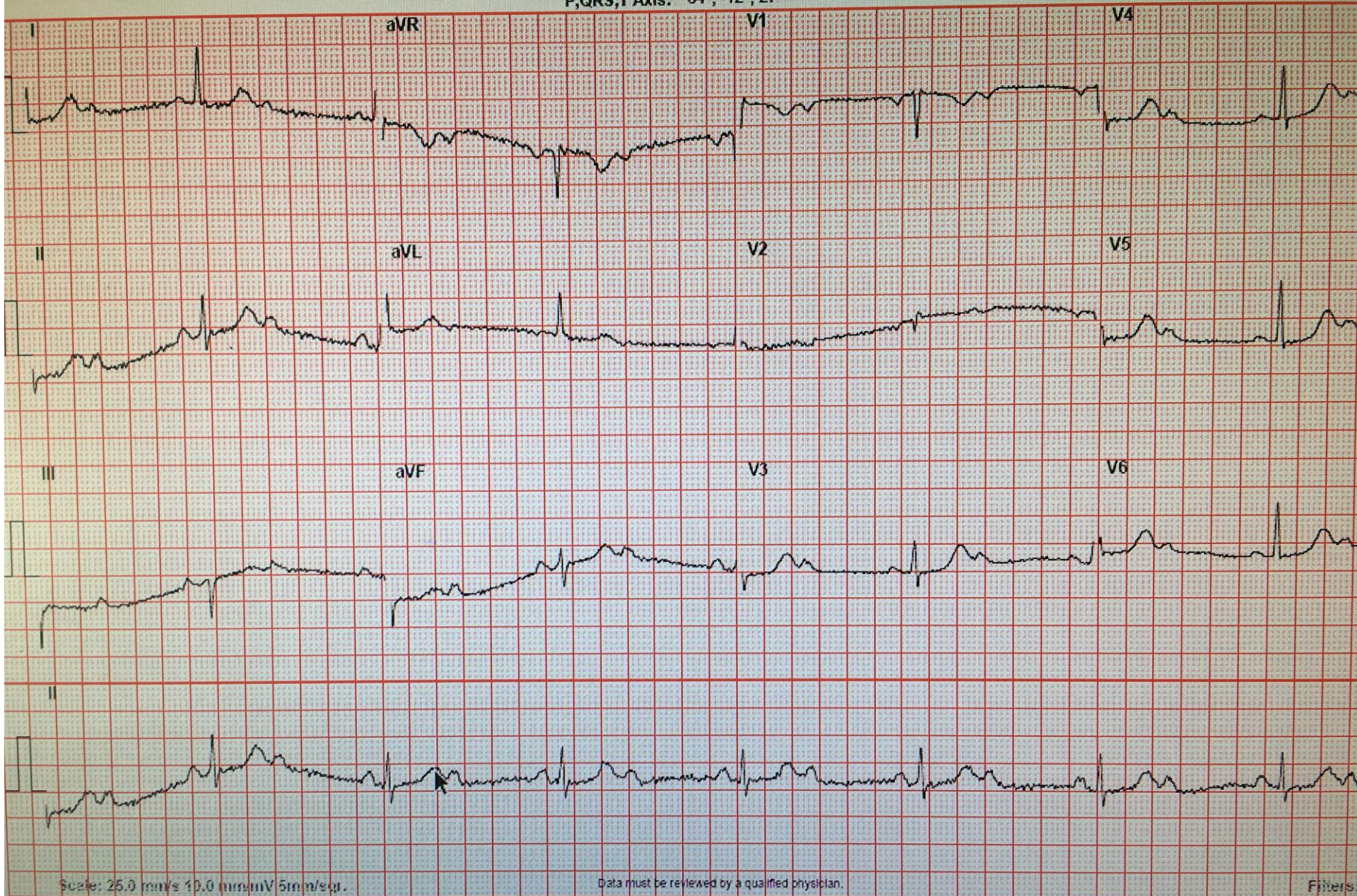
MAC5K 001B

12SL™ v252



ht: 0 lbs

QTc Interval: 405 ms  
P, QRS, T Axis: 64°, -12°, 27°



Scale: 25.0 mm/s 10.0 mm/mV 5mm/sqr.

Data must be reviewed by a qualified physician.

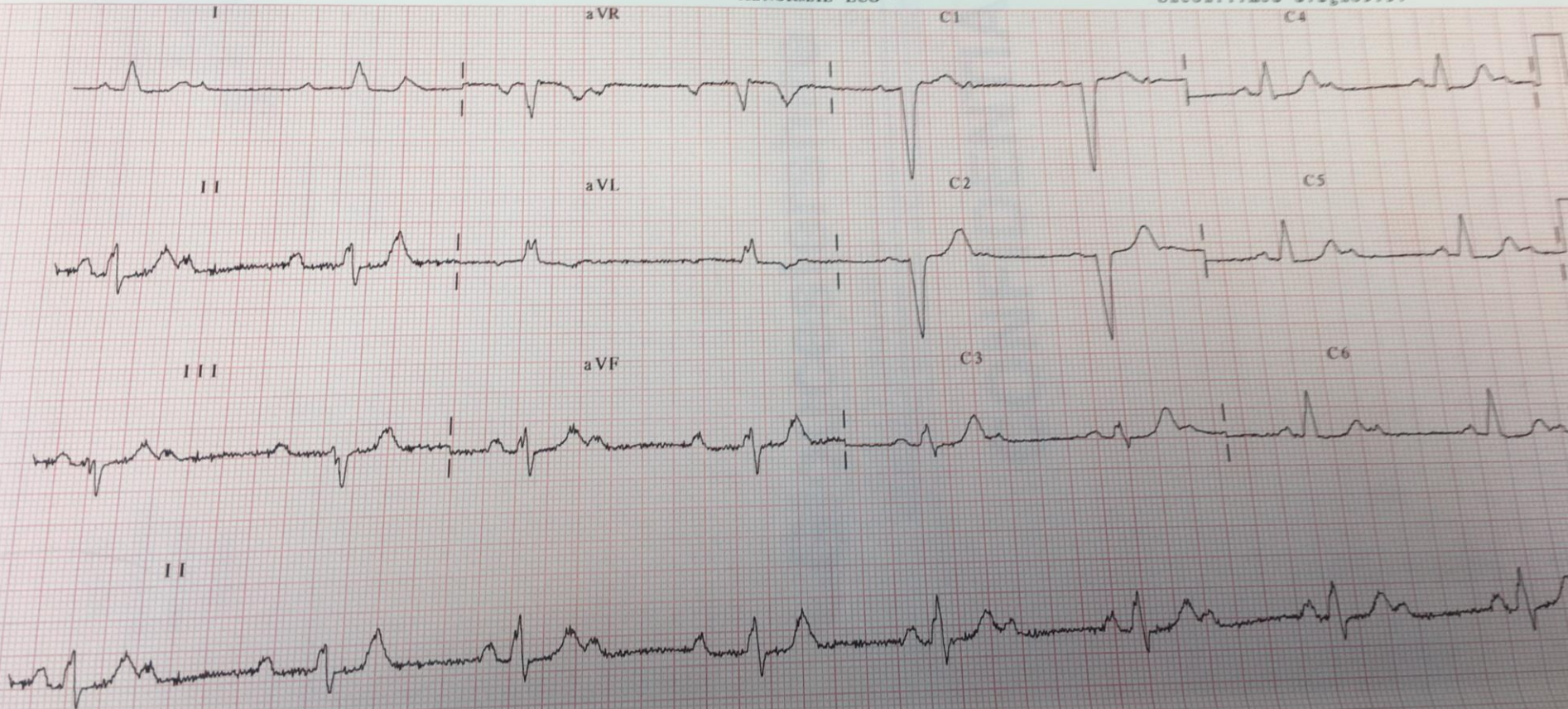
Filters:



T 73

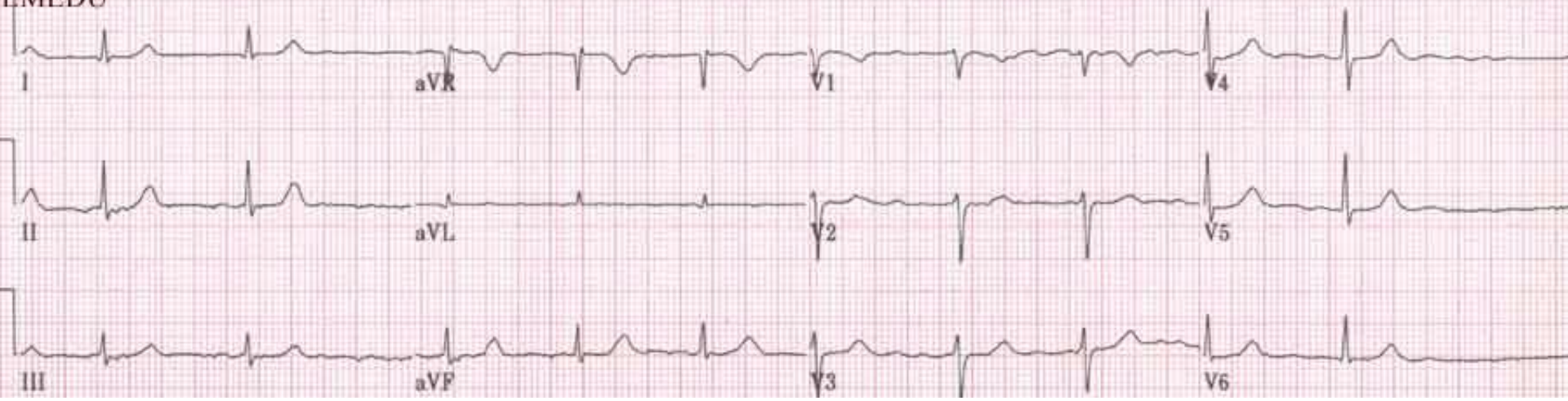
- ABNORMAL ECG -

Unconfirmed diagnosis.



25 mm/s 10 mm/mV 0.05 Hz - 100 Hz HP7

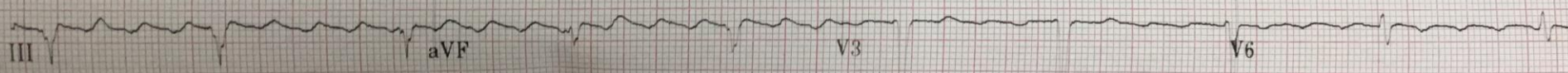
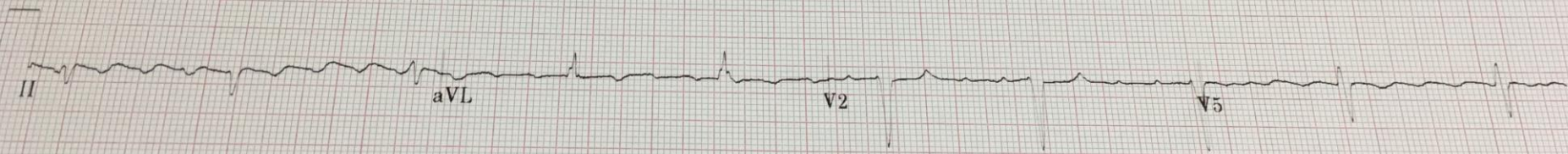
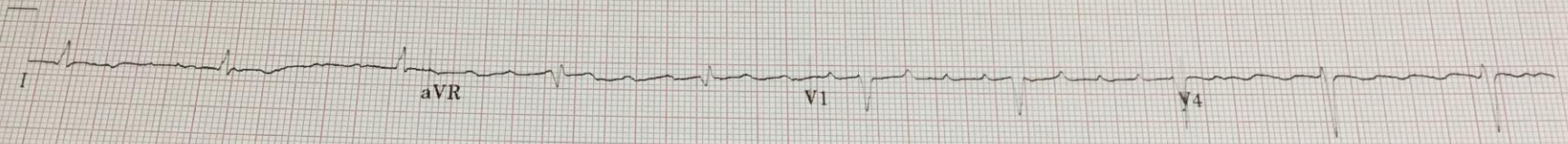
EMEDU

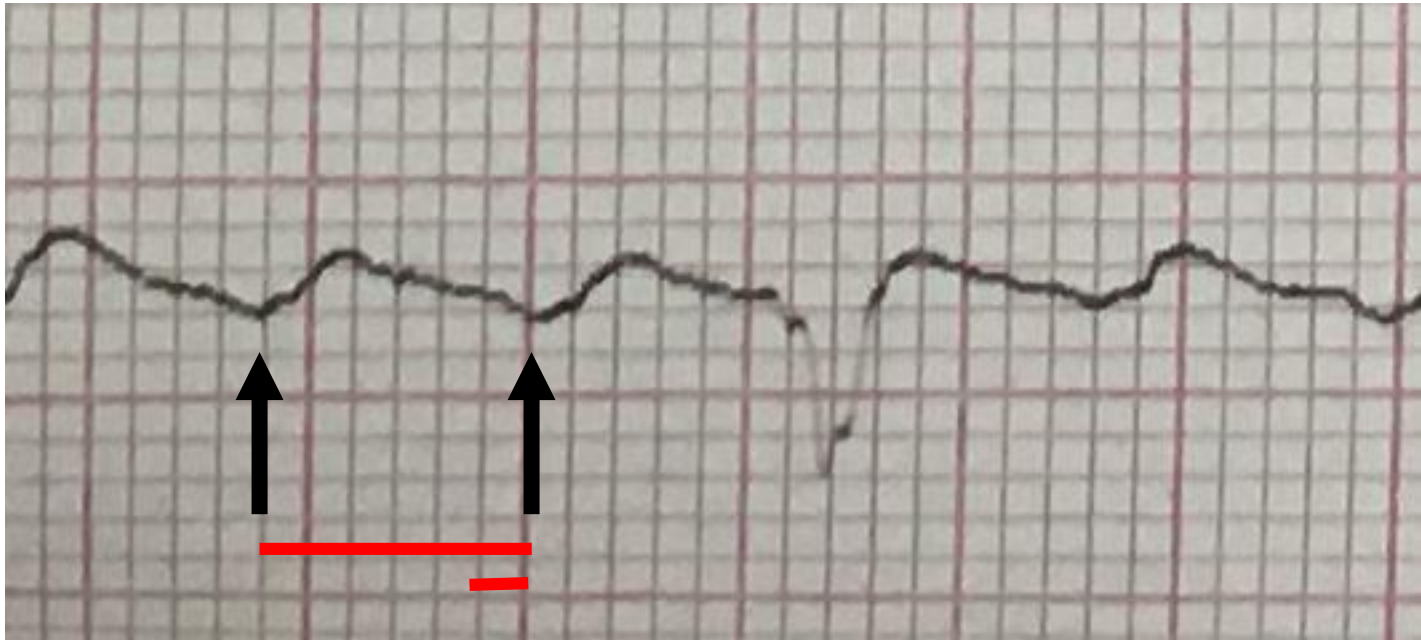




Referred by: CW2

Unconfirmed





1 small square = 40ms

6 small square = 240ms

$$\text{Flutter rate} = \frac{60,000}{240} = 250/\text{min}$$





# ATRIAL FLUTTER

# ATRIAL FIBRILLATION

SA node

SA node

AV node

AV node

RV

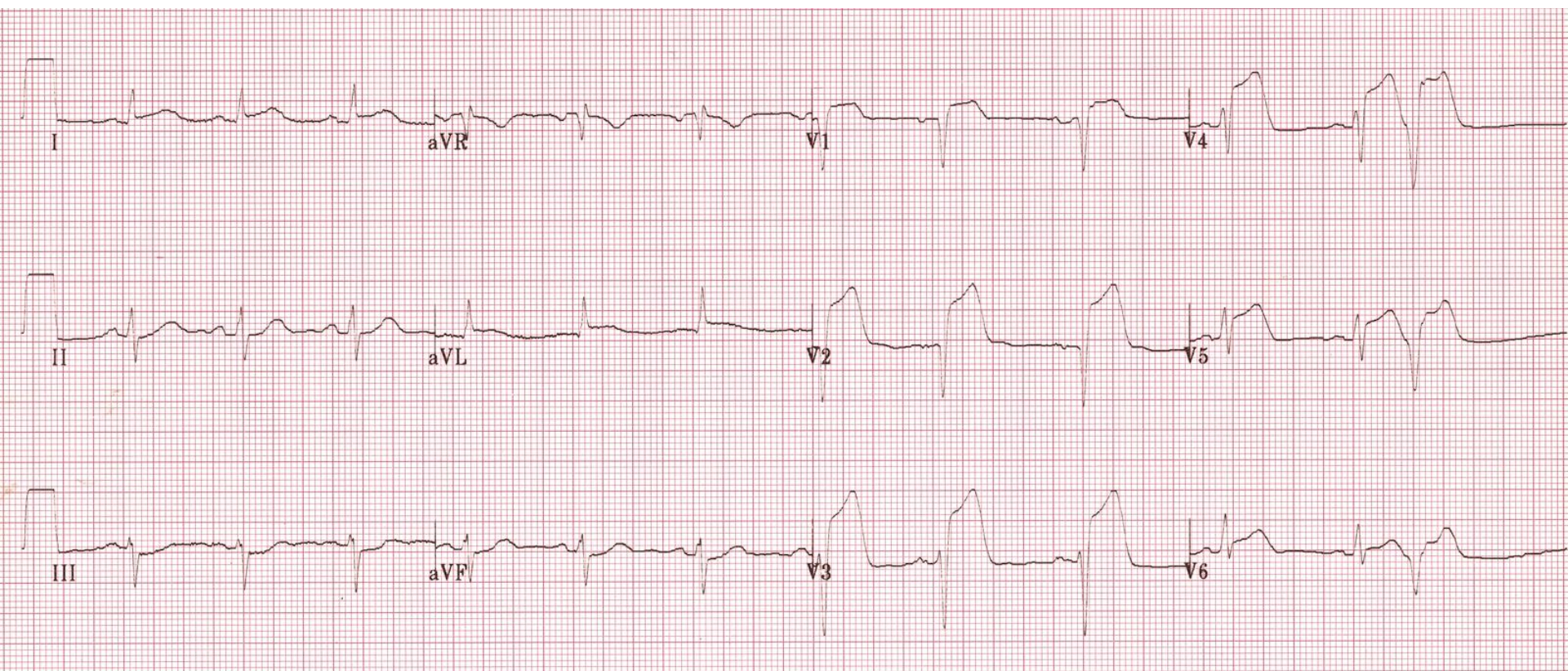
LV

RV

LV









2-Sep-1957

Male Caucasian

Vent. rate 60 bpm

PR interval 164 ms

QRS duration 100 ms

QT/QTc 414/414 ms

P-R-T axes 87 77 67

Normal sinus rhythm

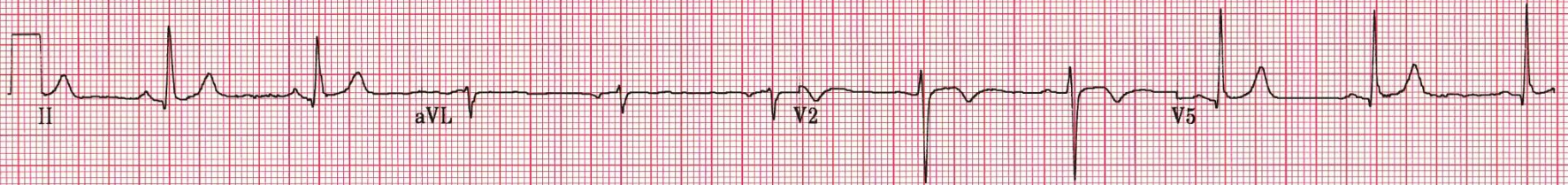
Normal ECG

*Routine*

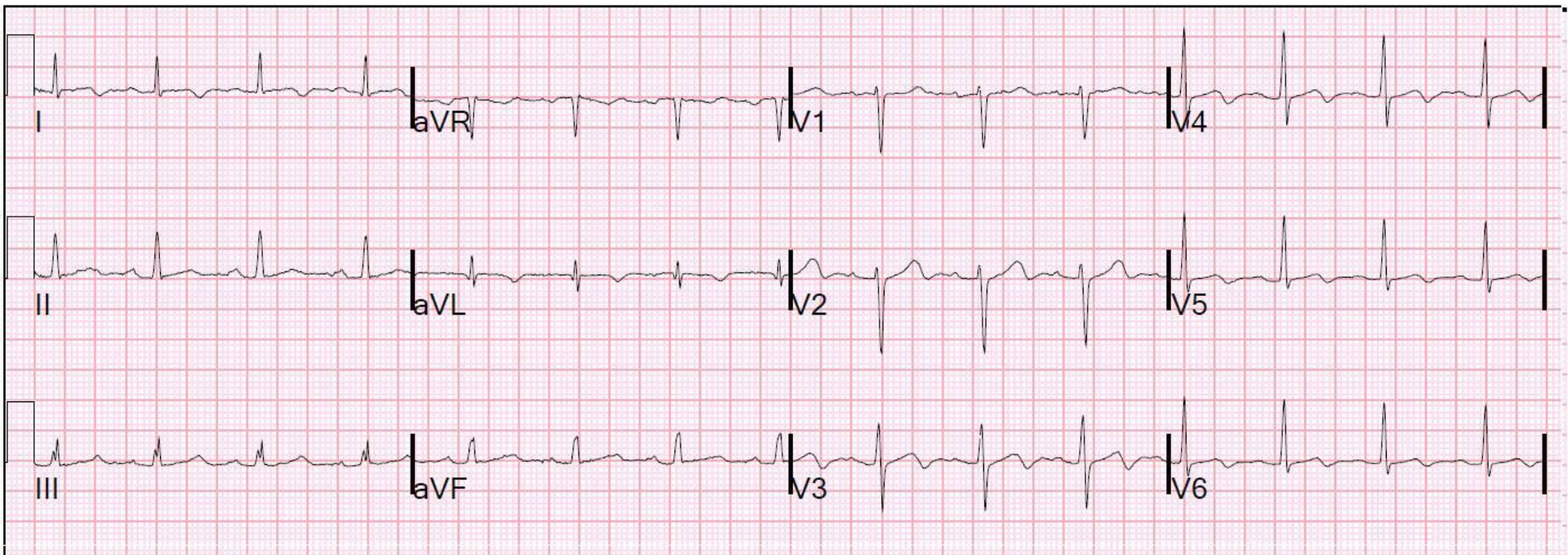
Technician: CC

Referred by: CWI

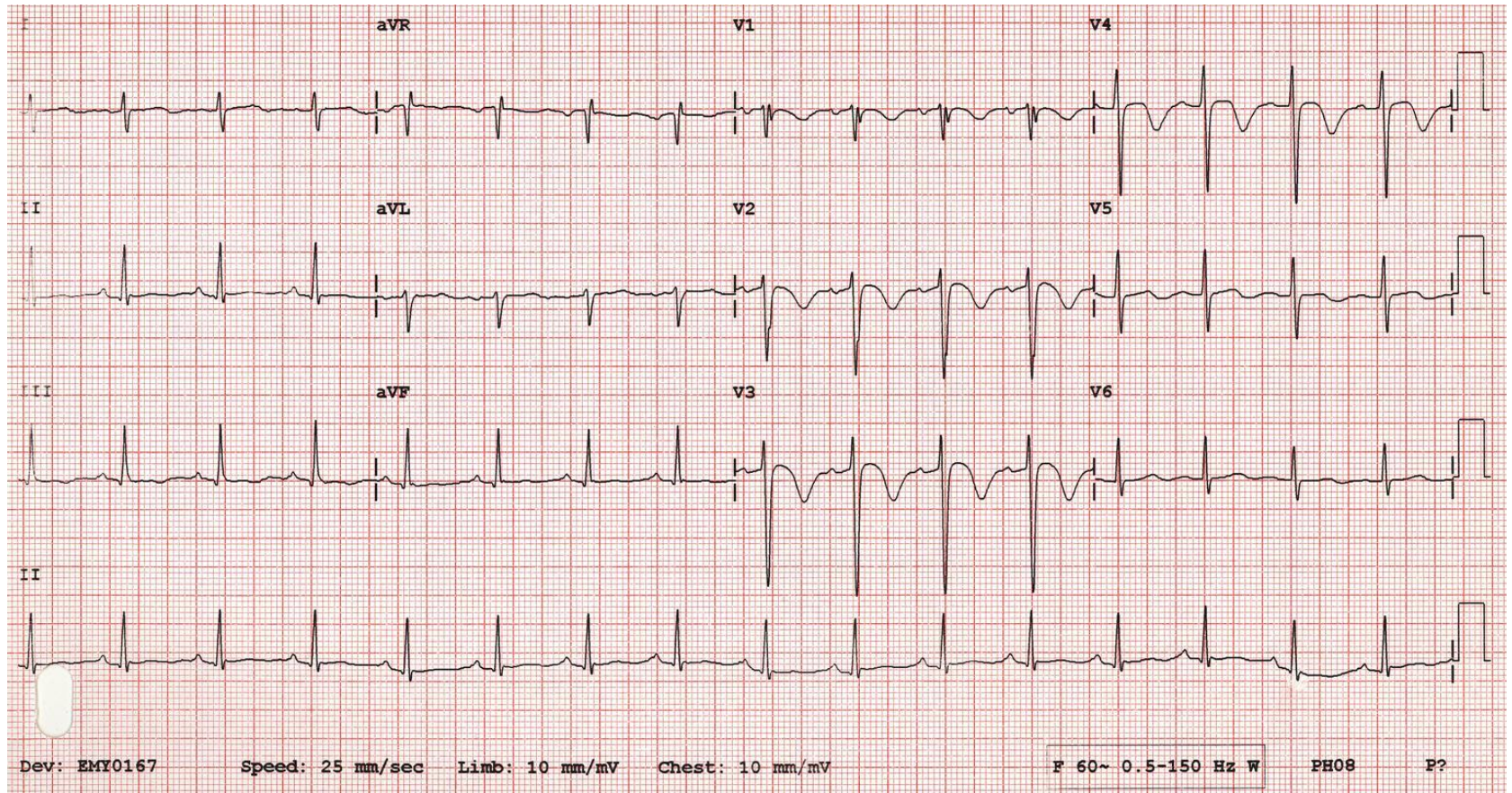
Unconfirmed





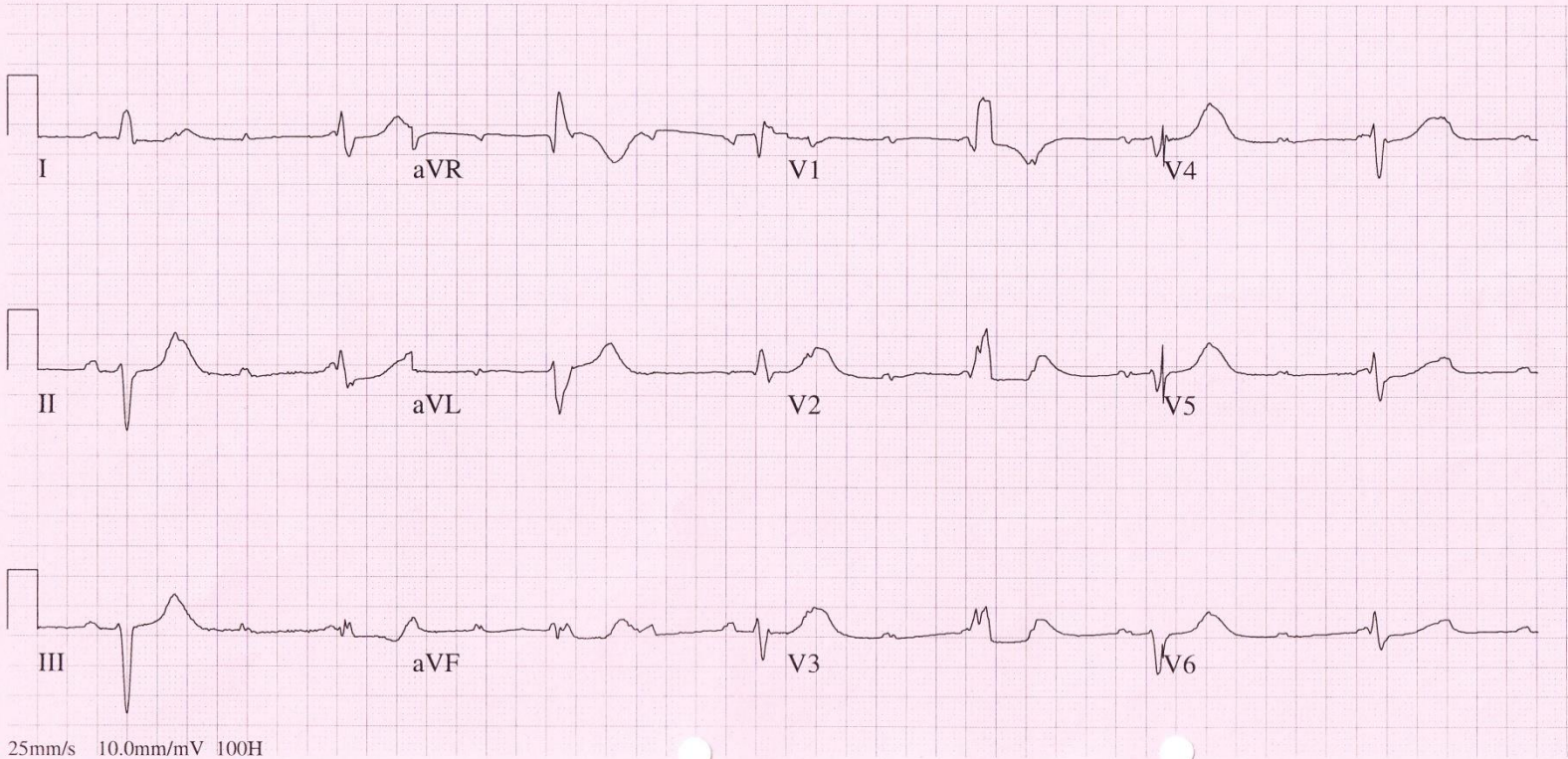








Unconfirmed



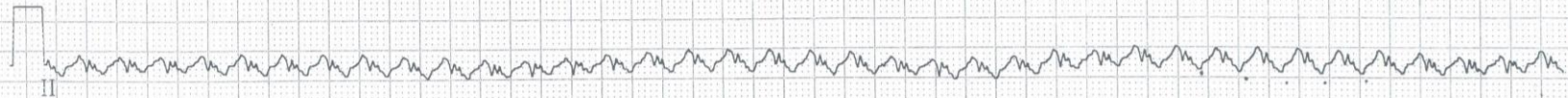
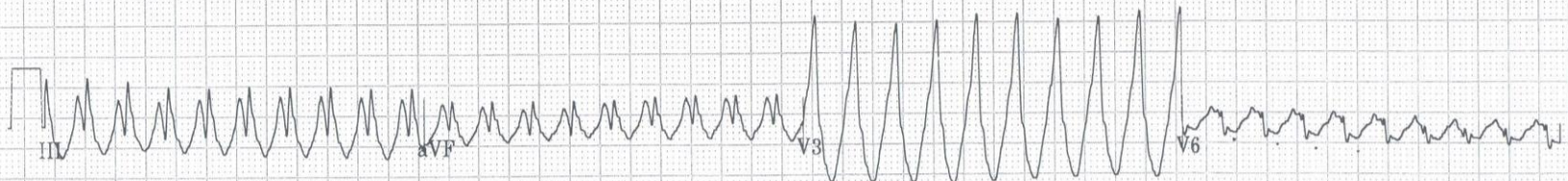
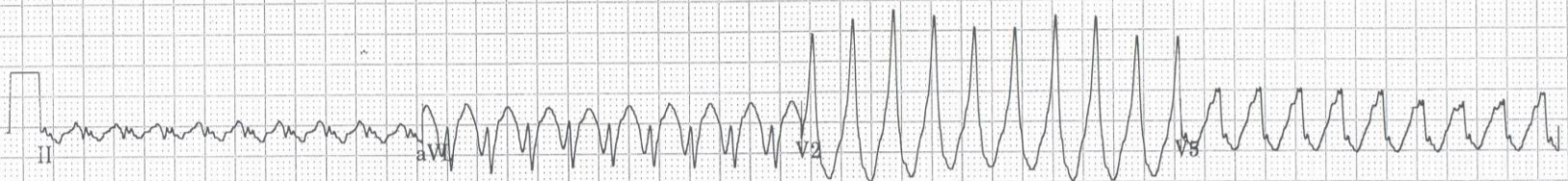
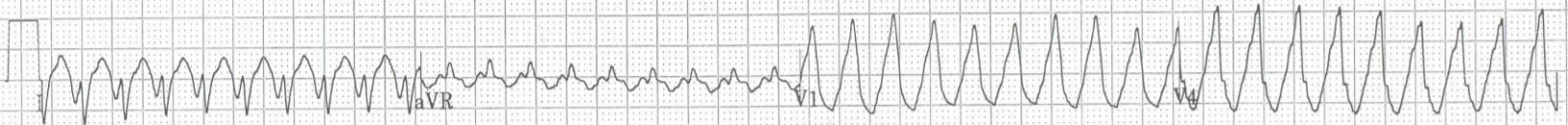
25mm/s 10.0mm/mV 100H  
GEMS Information Technologies



Test ind:

Referred by:

Unconfirmed



150 Hz

25.0 mm/s

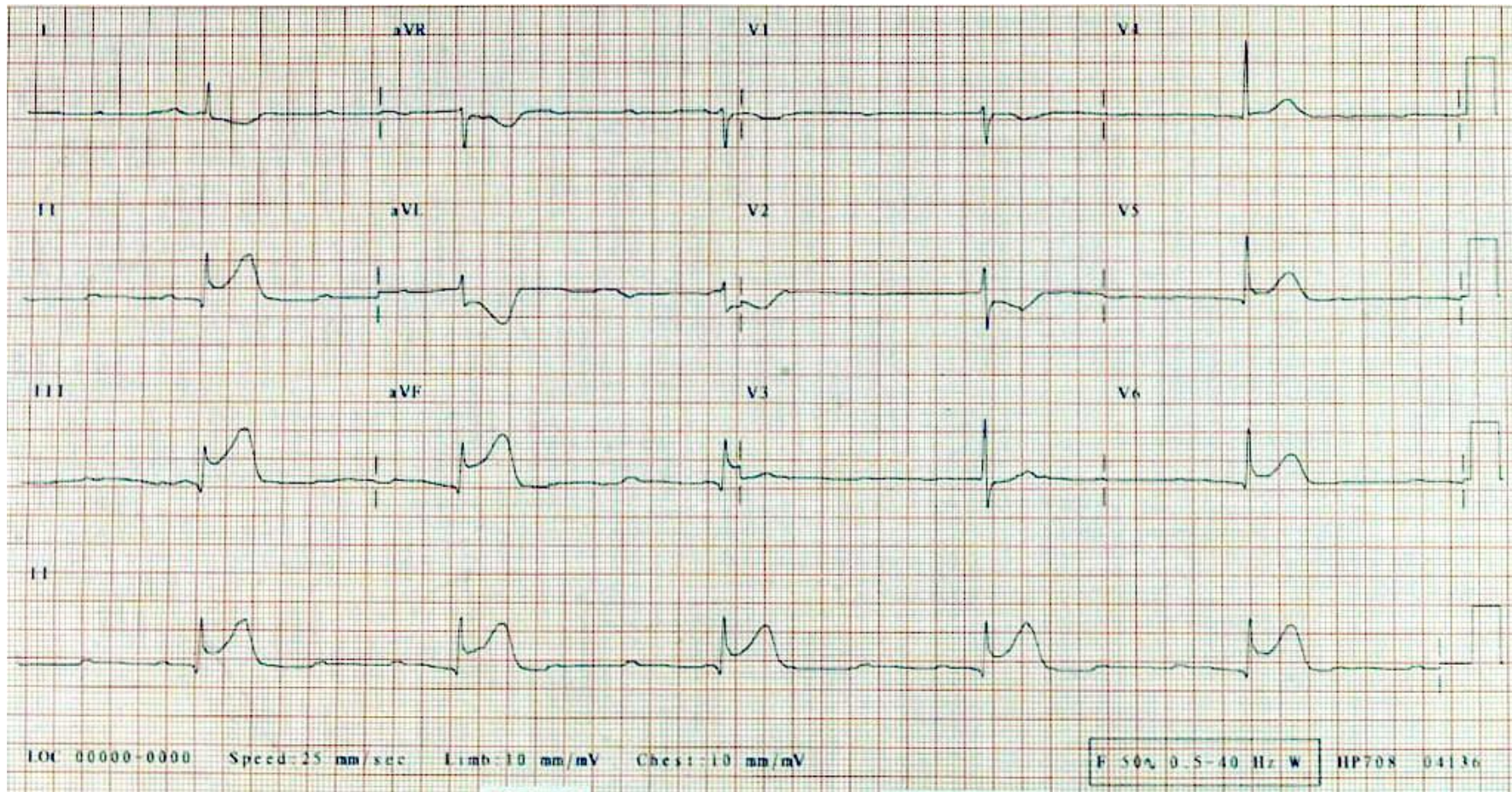
10.0 mm/mV

4 bv 2.5s + 1 rhythm id

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12SI™ v252











II

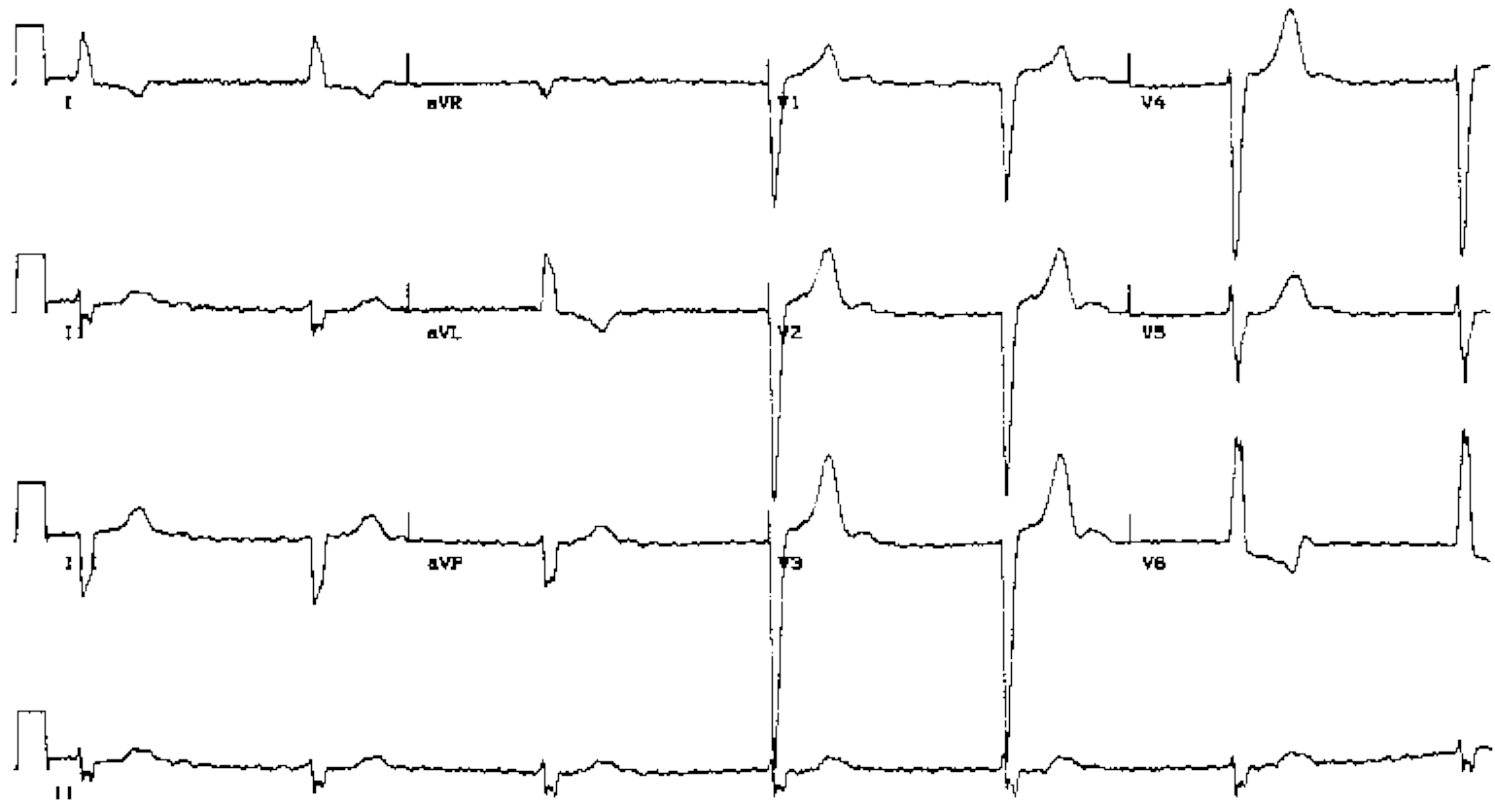
V5

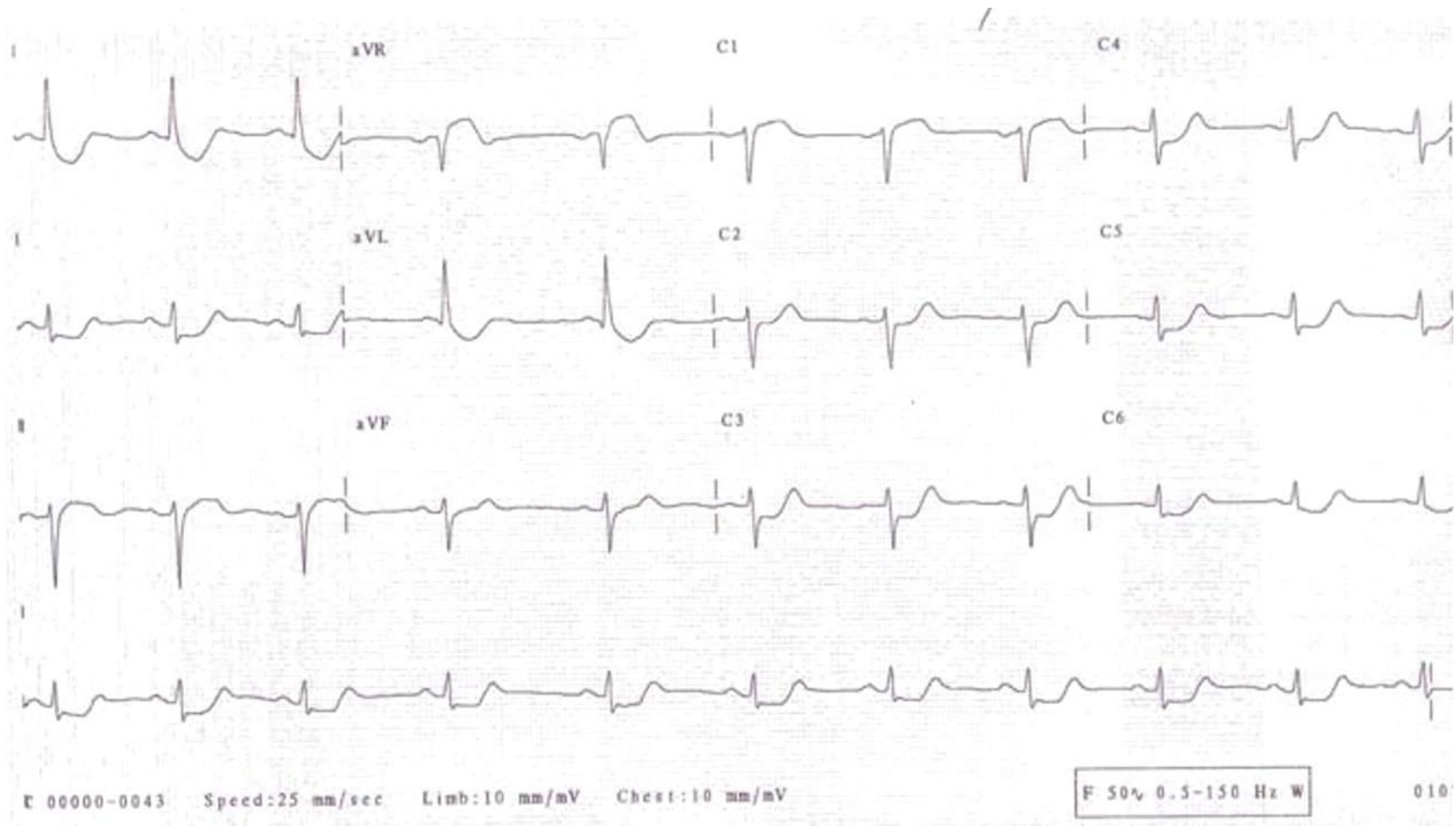
III

HR 0

Grids not to scale.



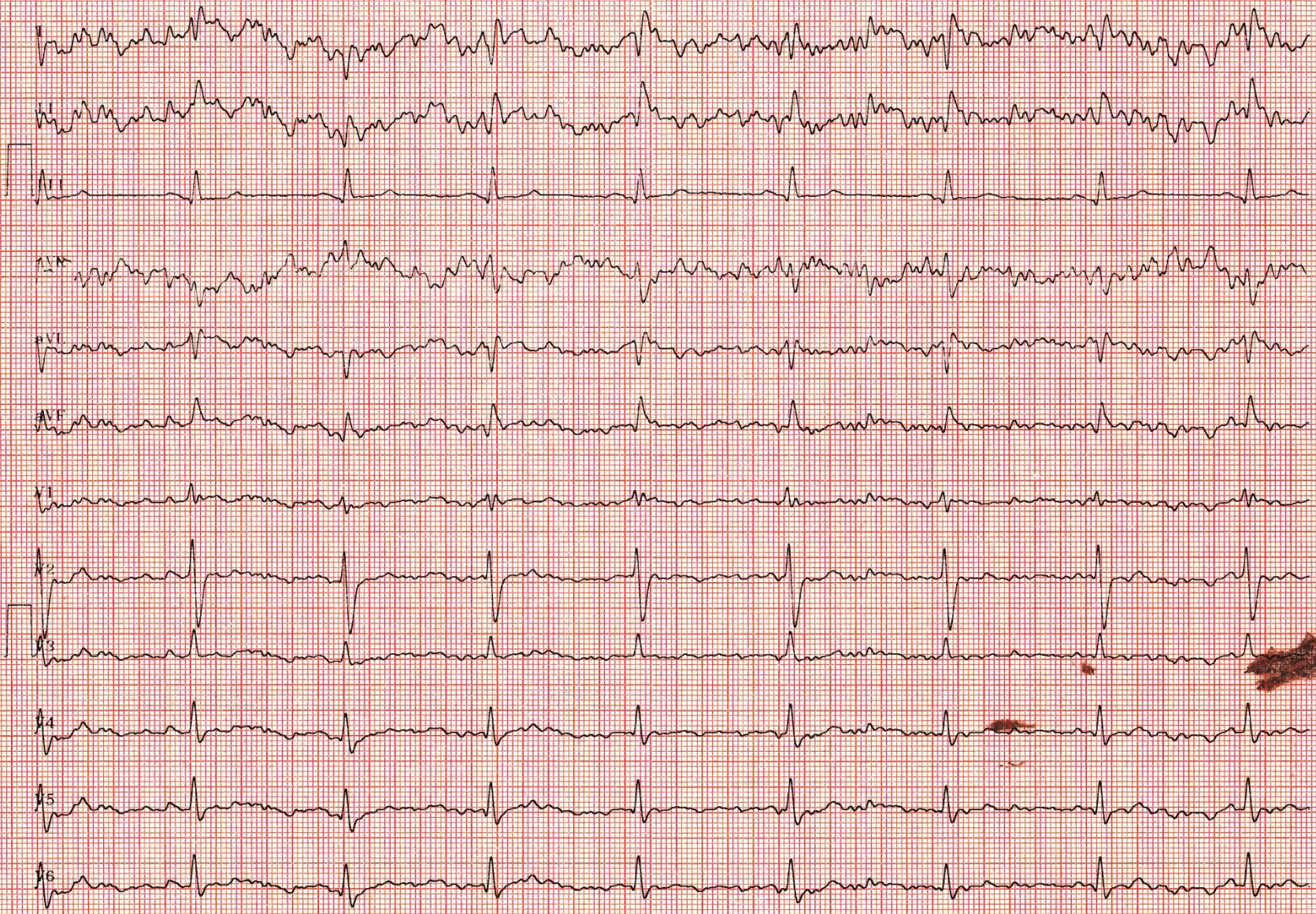




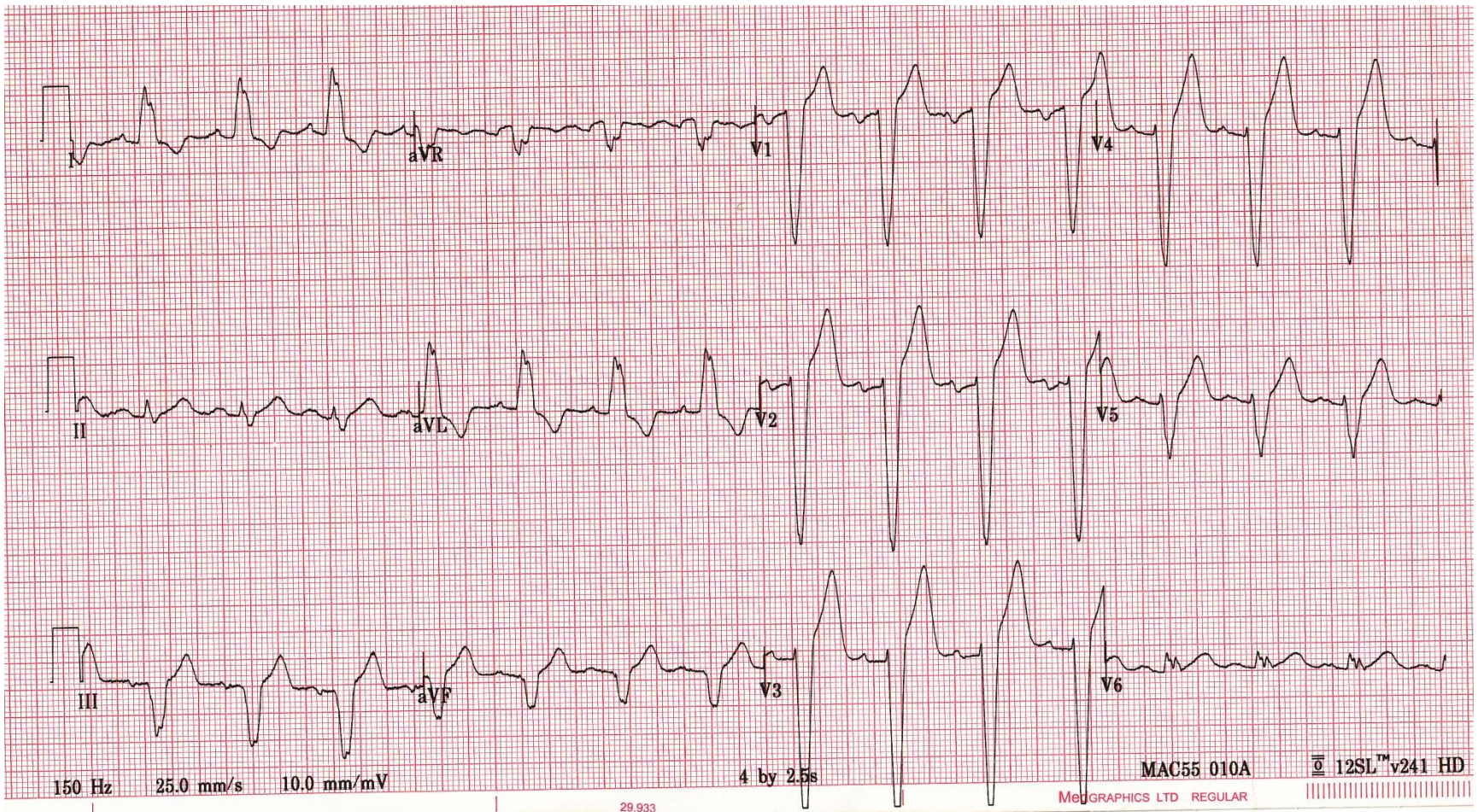


ID :  
Name :

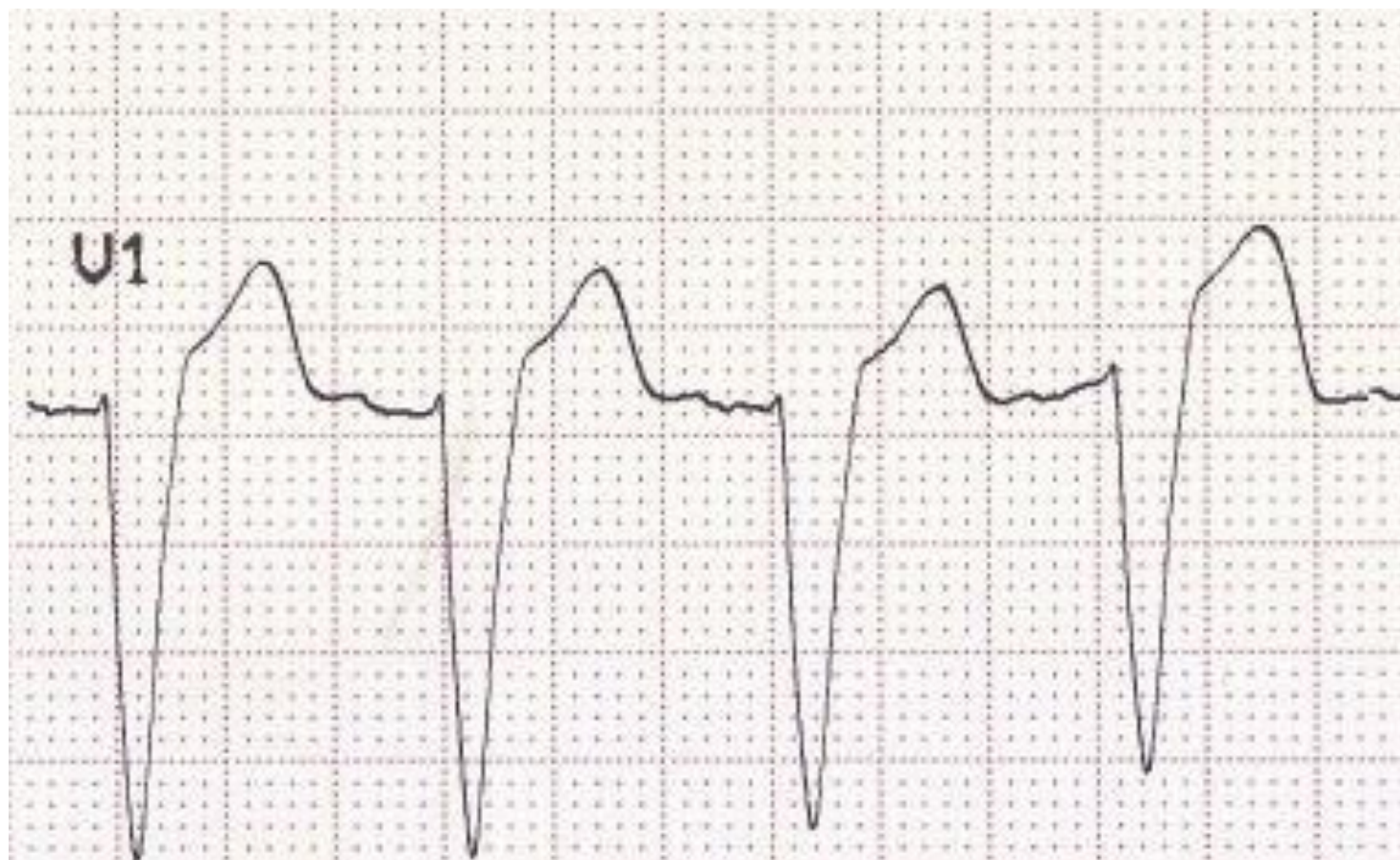
Heart Rate: 51bpm

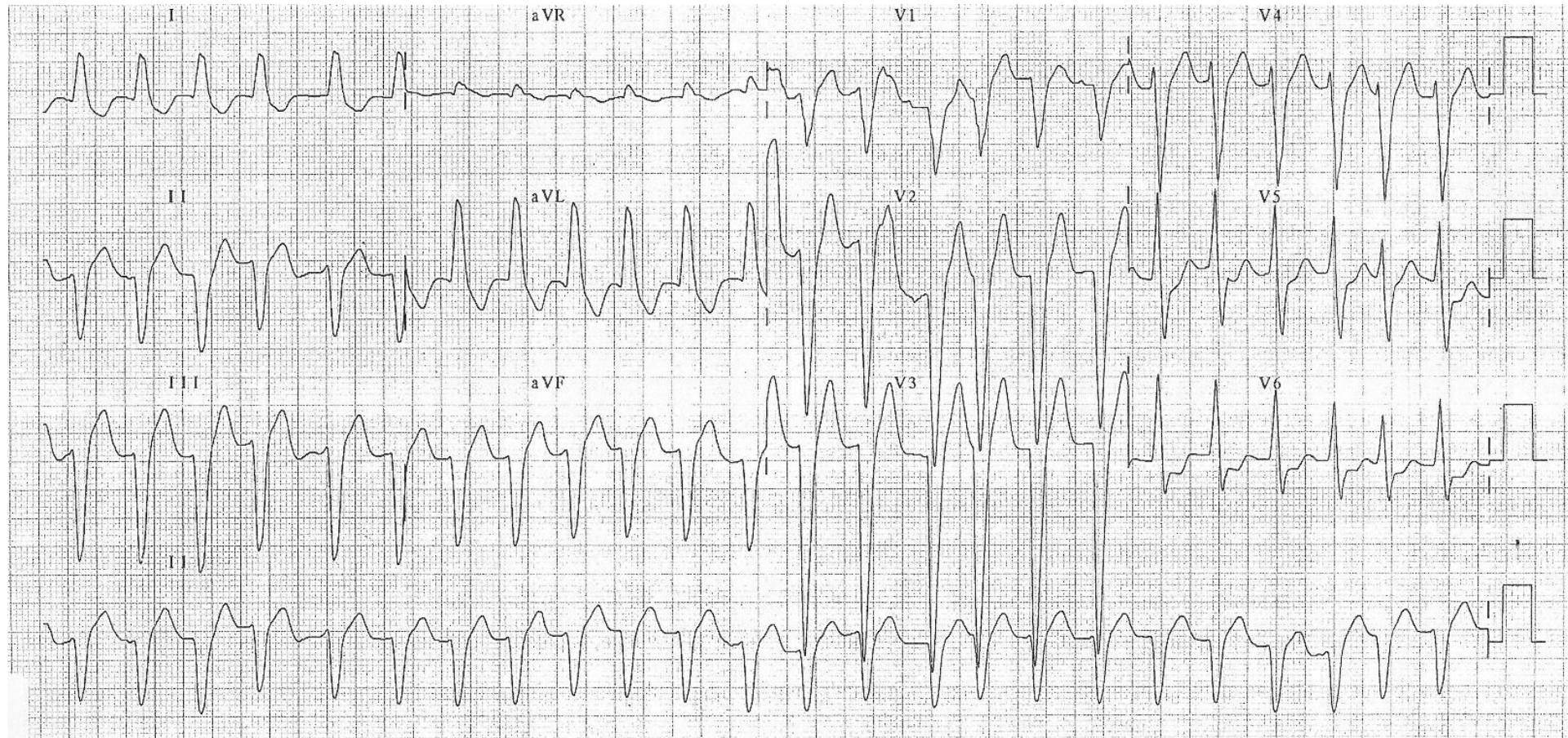














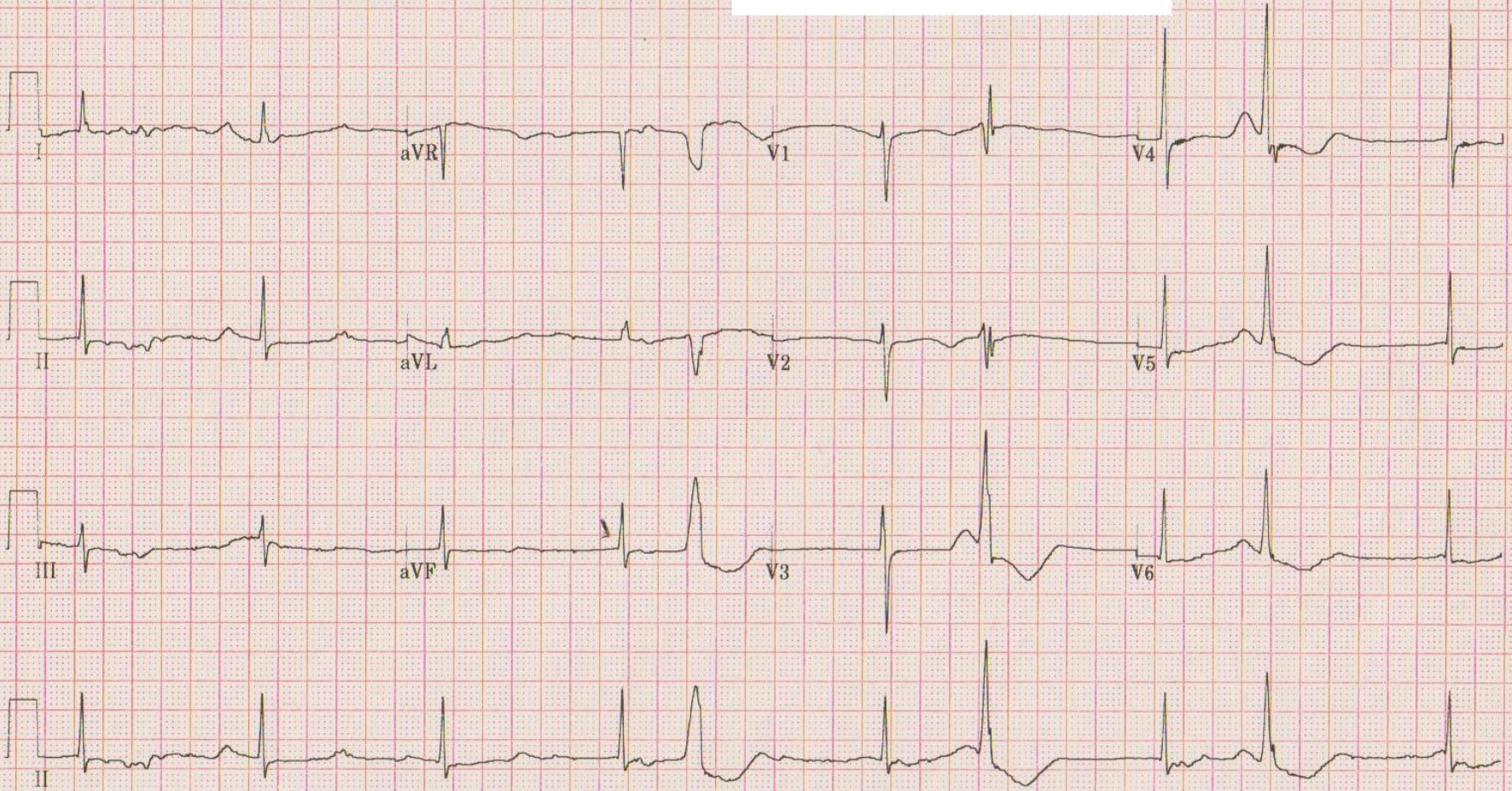
Vent. rate 57 bpm  
PR interval \* ms  
QRS duration 150 ms  
QT/QTc 672/654 ms  
P-R-T axes \* 32 13

Undetermined rhythm  
Nonspecific intraventricular block  
Abnormal ECG

Technician:  
Test ind:

2

Referred by:



150 Hz 25.0 mm/s 10.0 mm/mV

4 by 2.5s + 1 rhythm la

MAC5K 001B

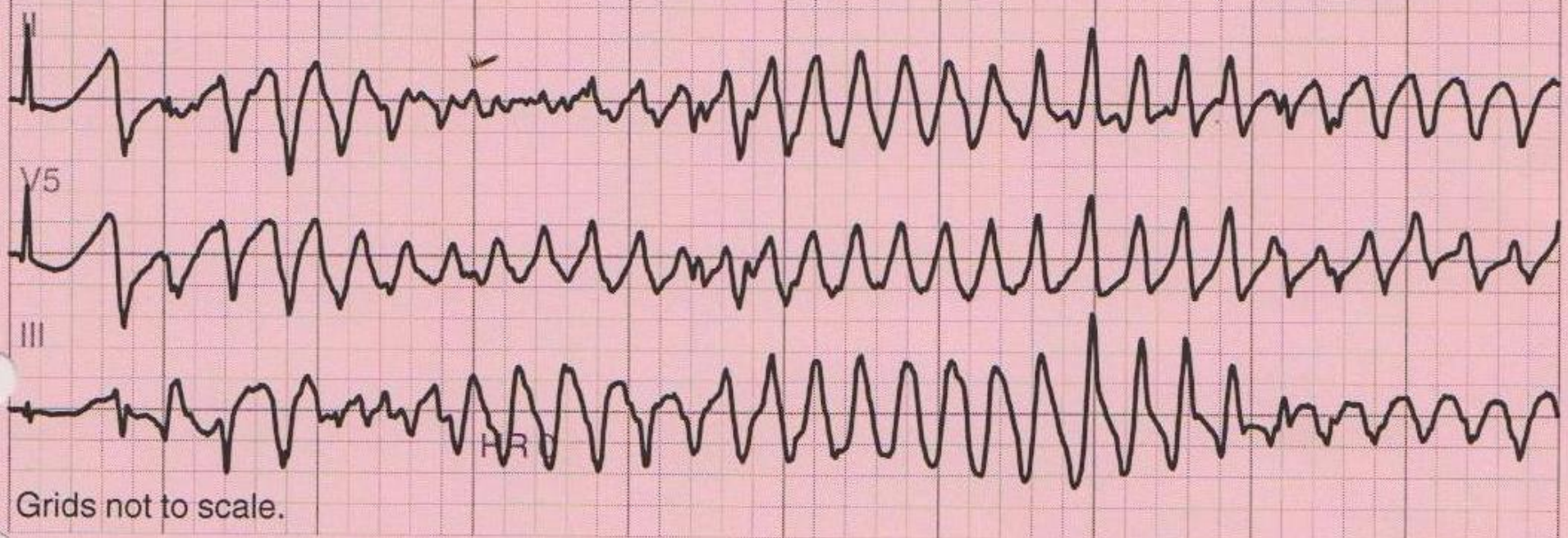
12SL™ v252



2-Jan-2011 07:43:19

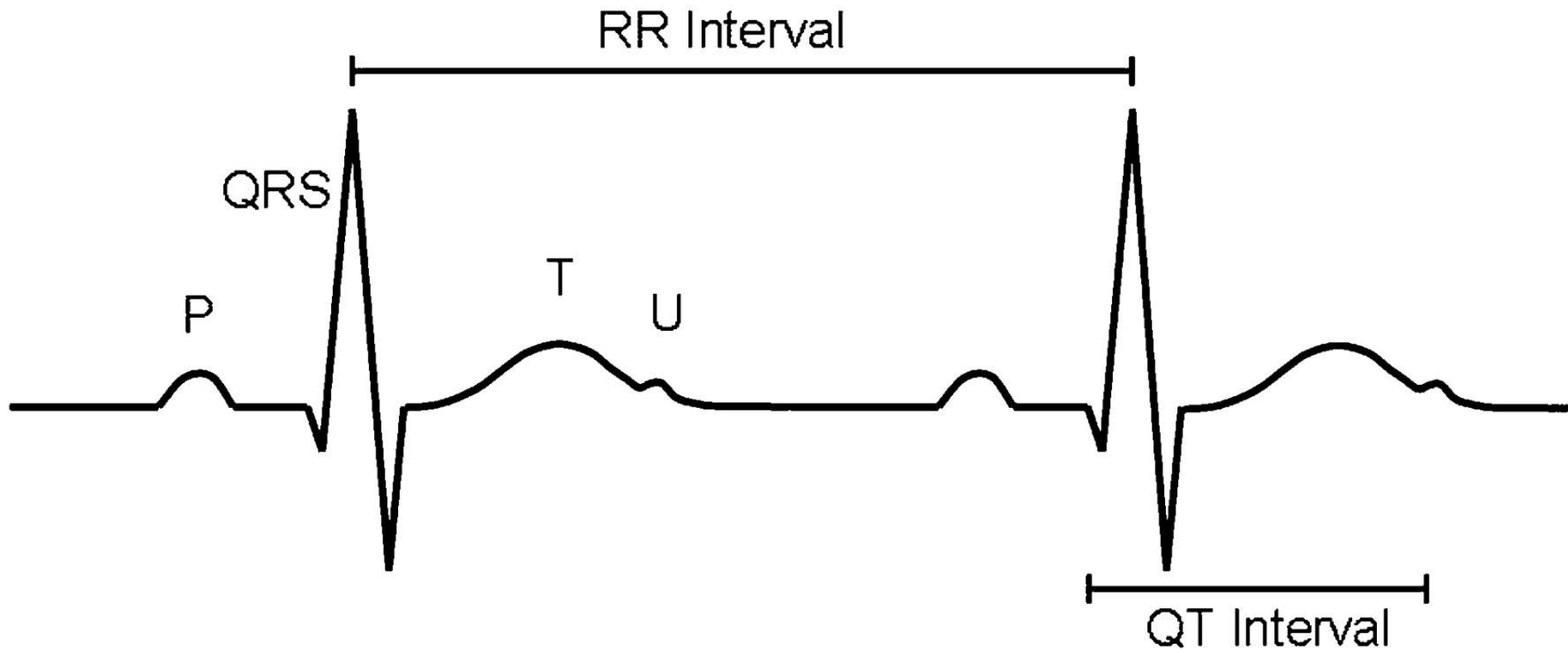
V TACH

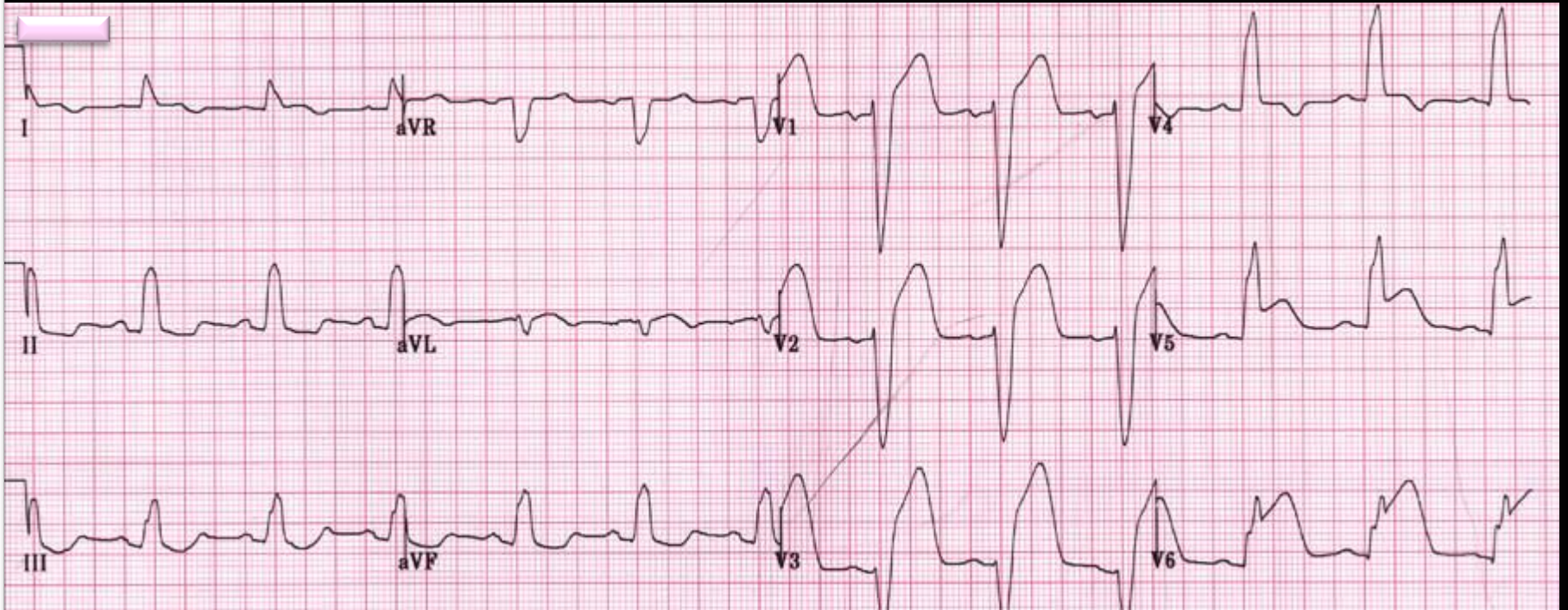
CCUIBED06



## Bazett's Formula

$$QTc = \frac{QT}{\sqrt{RR}}$$





Thank you for listening

[drmrinalsaha.com](http://drmrinalsaha.com)