

# EKG Conference

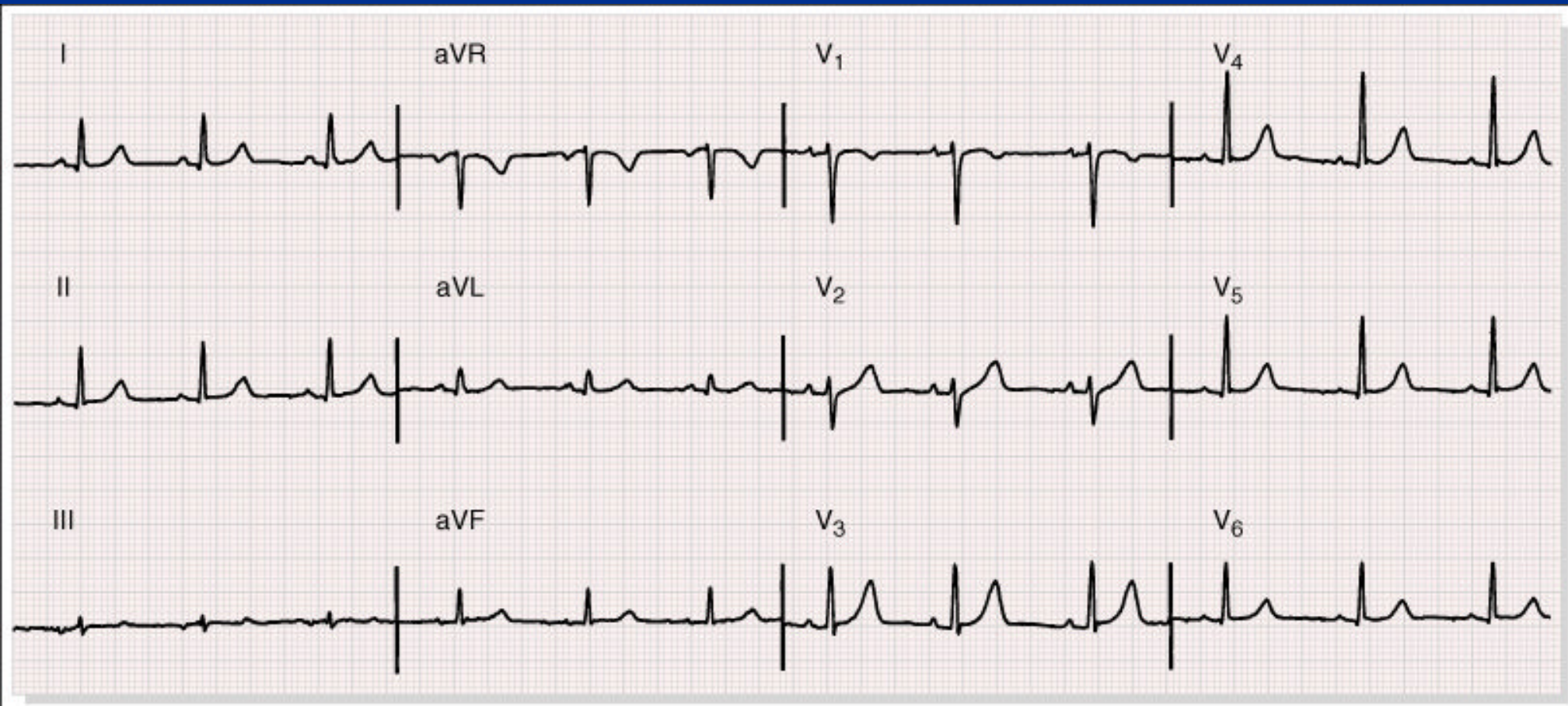
September 6, 2007

David Stultz, MD

Southwest Cardiology, Inc.



# Normal EKG



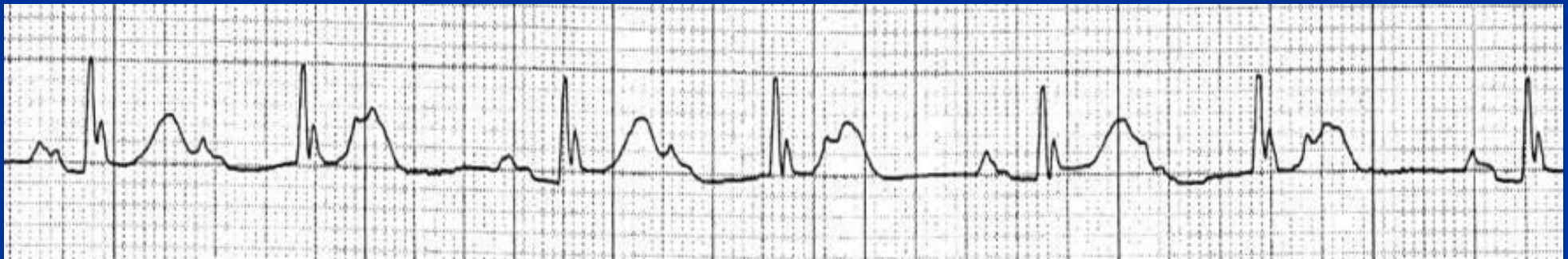
# Review from prior sessions

- 1<sup>st</sup> Degree AV block
- $>200$  ms from onset of P wave to onset of QRS



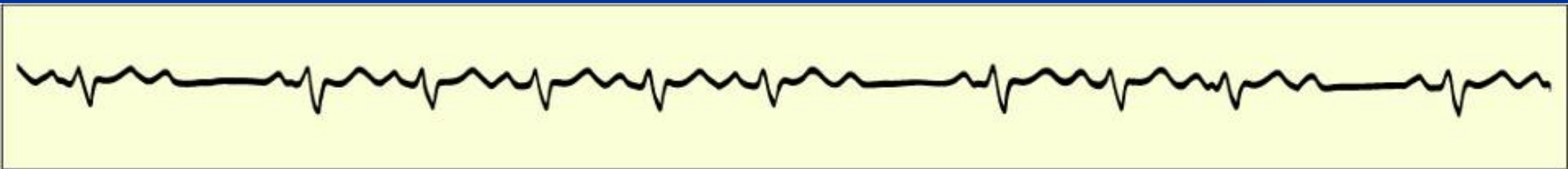
# 2<sup>nd</sup> Degree AV Block Type 1 - Wenkebach

- P-R interval prolongs until QRS is dropped



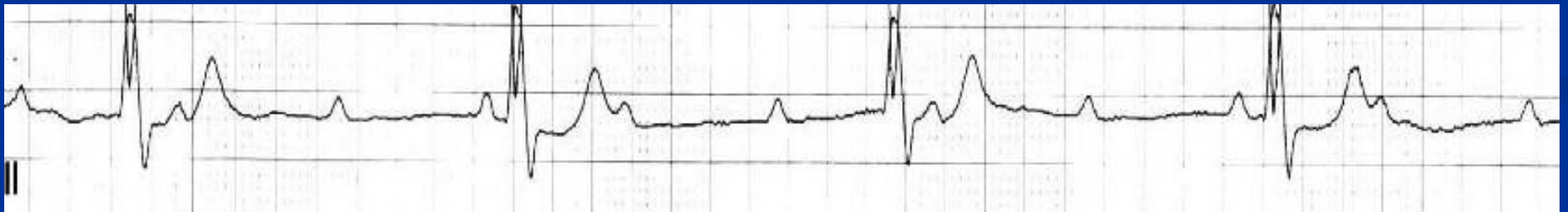
# 2<sup>nd</sup> Degree Heart Block Type 2

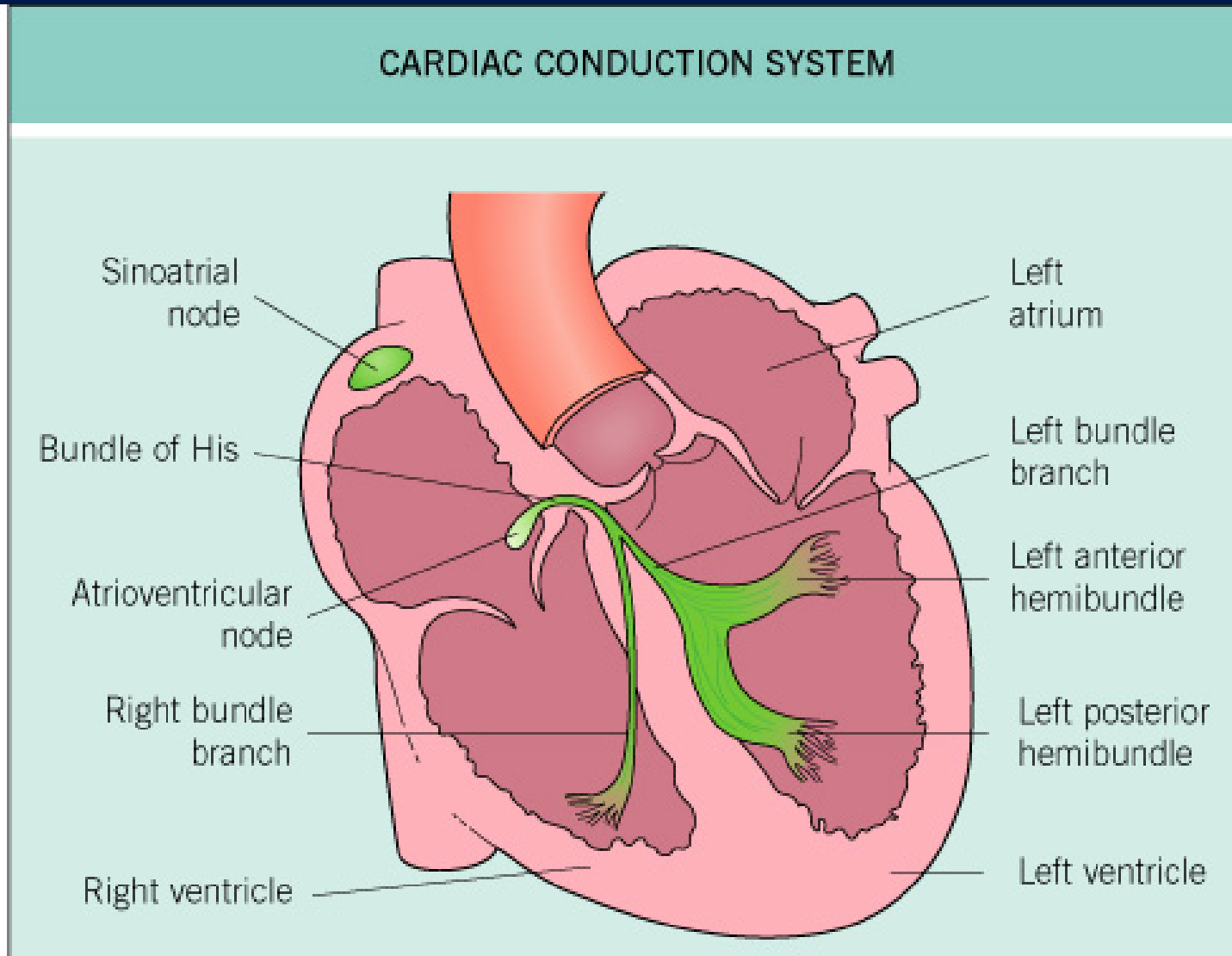
- PR interval remains constant, QRS drops unexpectedly



# 3<sup>rd</sup> degree Heart Block

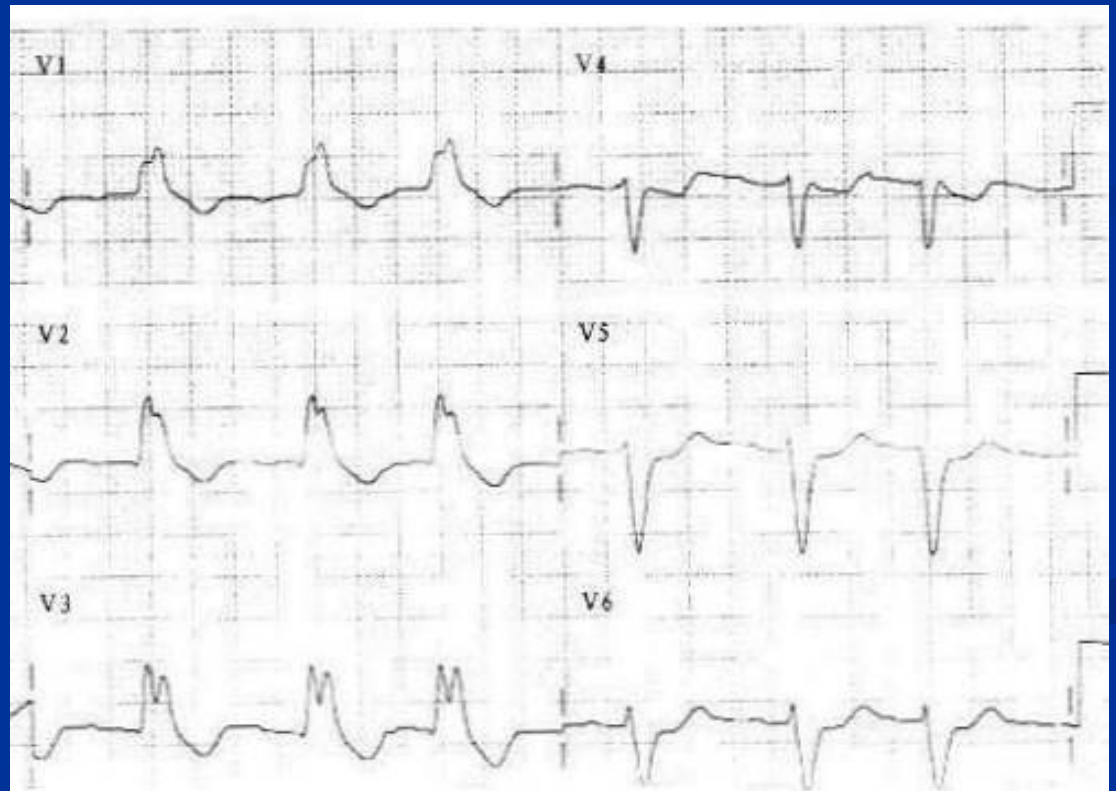
- P rate faster than QRS rate
- No correlation between P's and QRS





# Bundle Branch Blocks

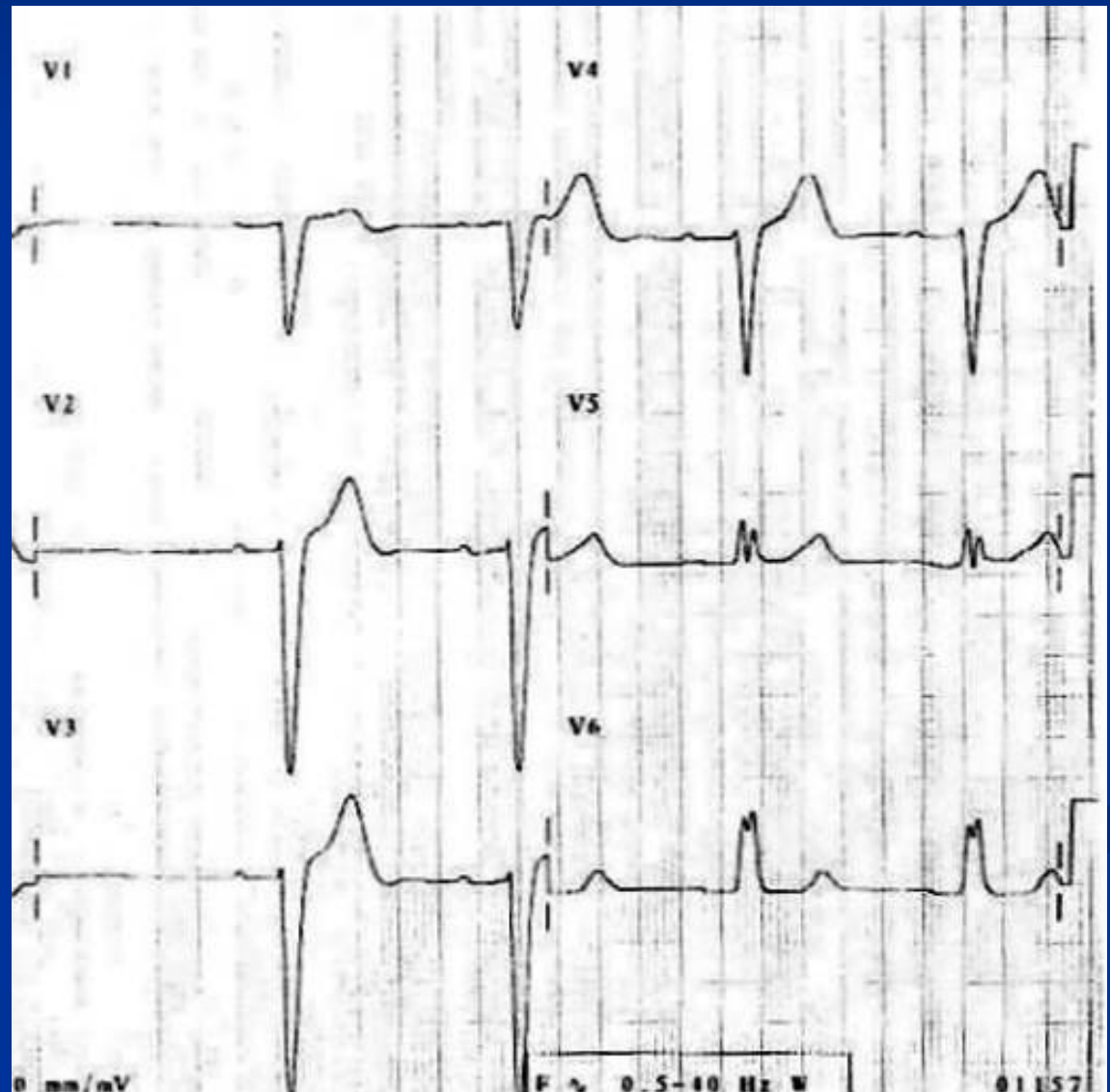
- Right Bundle Branch Block
  - QRS duration  $>120\text{ms}$  (3 small boxes)
  - rsR' in V1
  - 'Rabbit Ears'



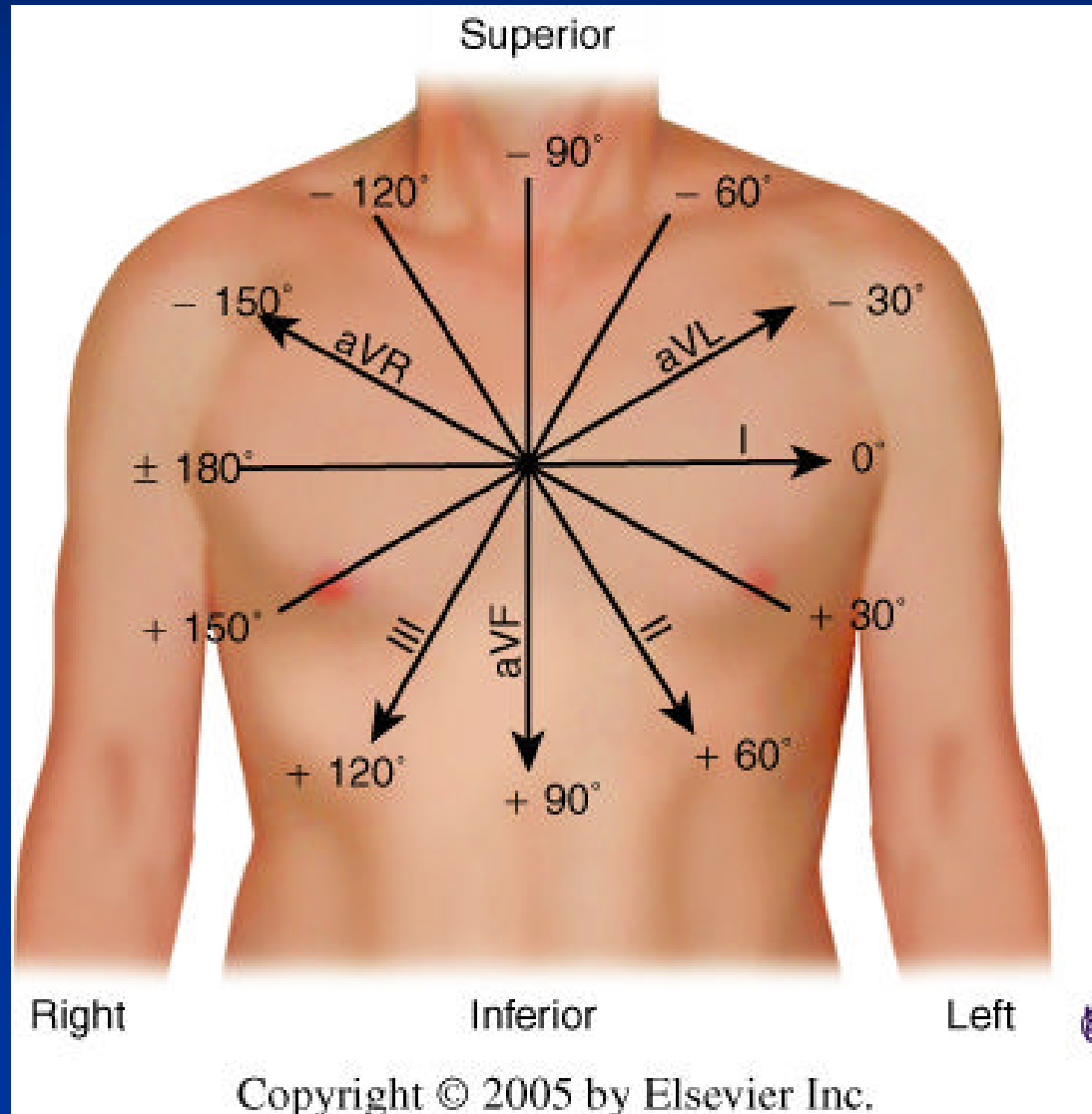


# Bundle Branch Blocks

- Left Bundle Branch Block
  - QRS duration >120ms (3 small boxes)
  - R in V6

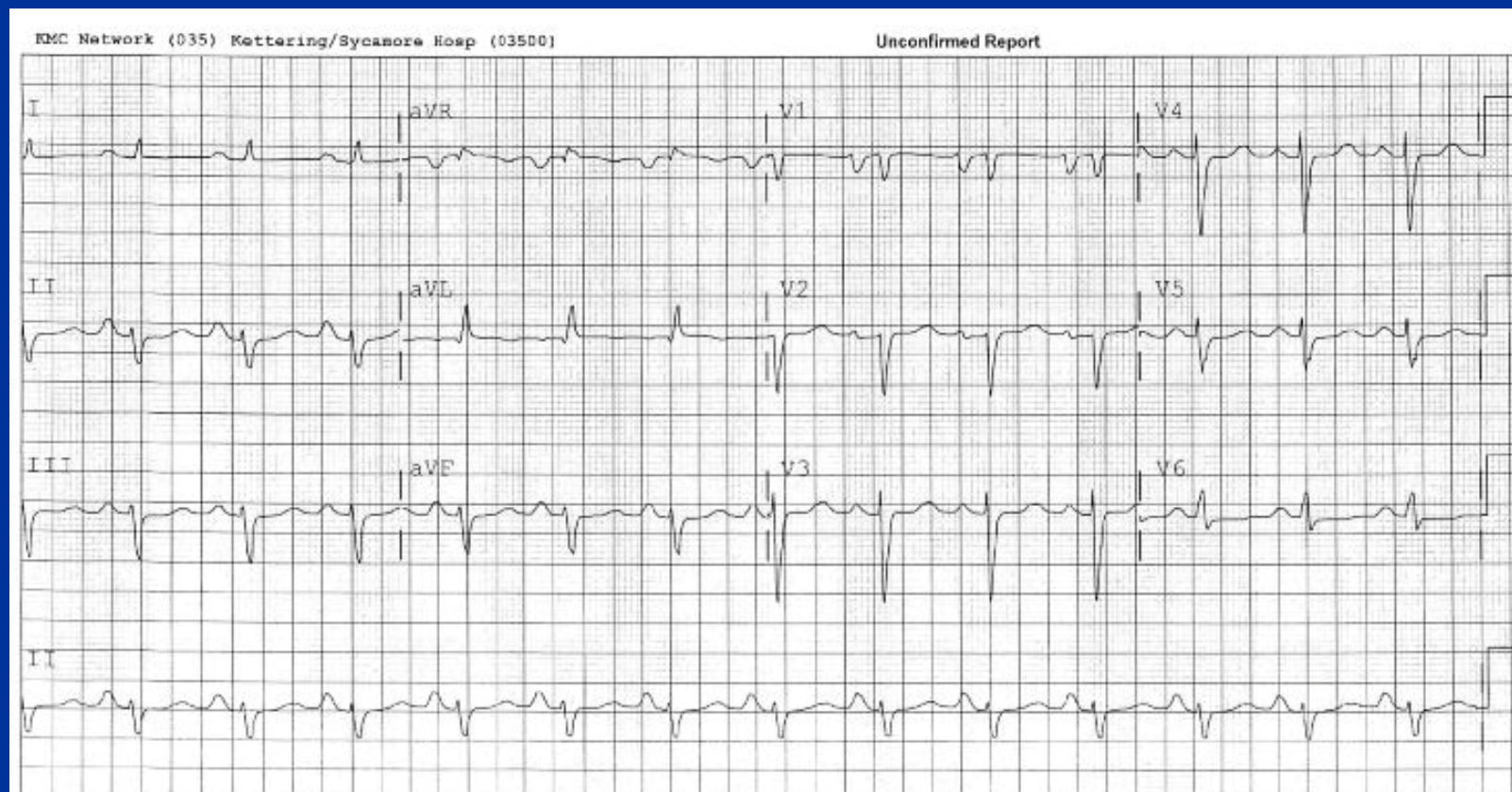


# Axis

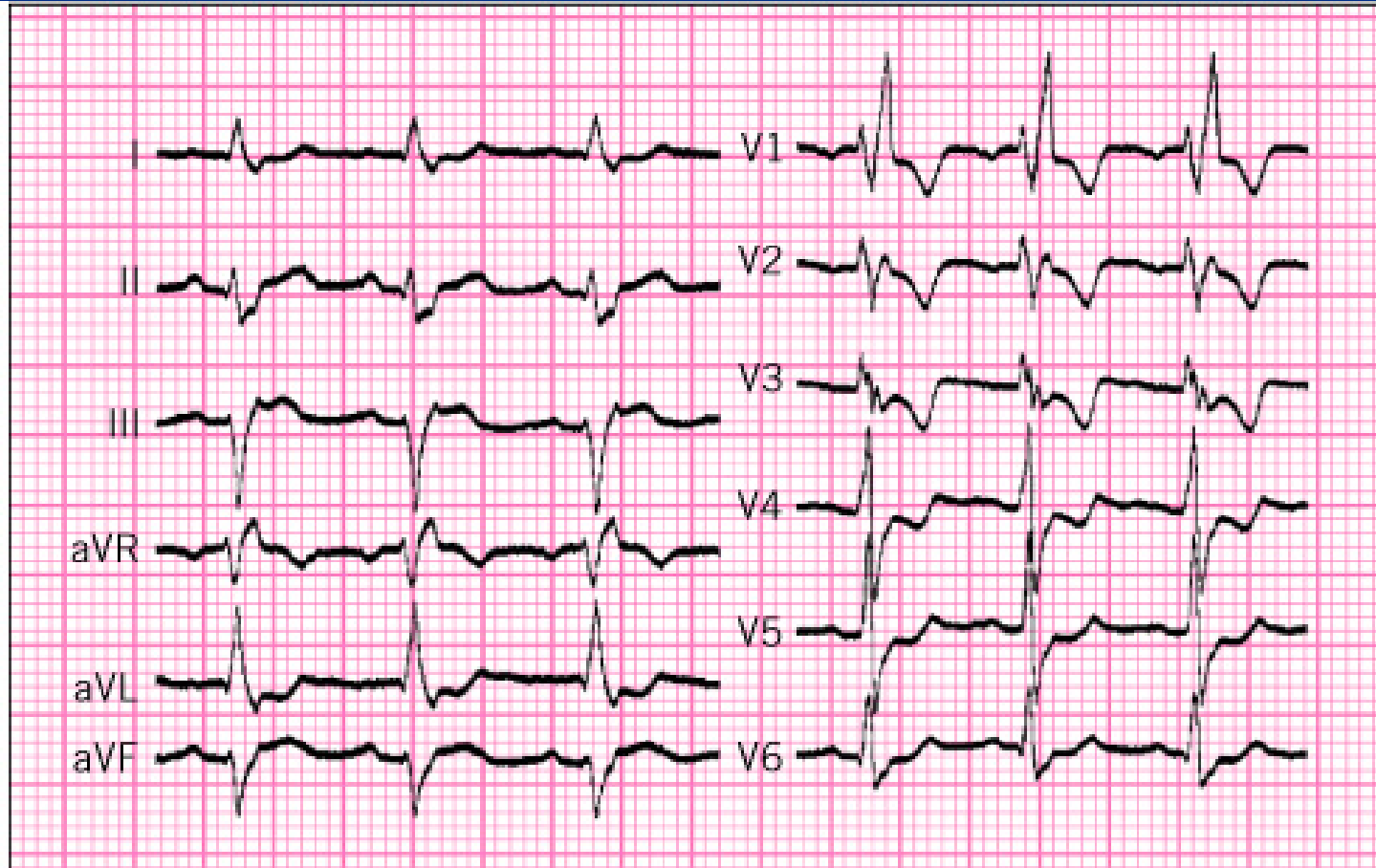


# Left Anterior Fascicular Block

- Frontal Axis -45 to -90 degrees
- QRS <120ms
- rS pattern in II, III, aVF (inferior leads)



# LAFB + RBBB



# Left Posterior Fascicular Block

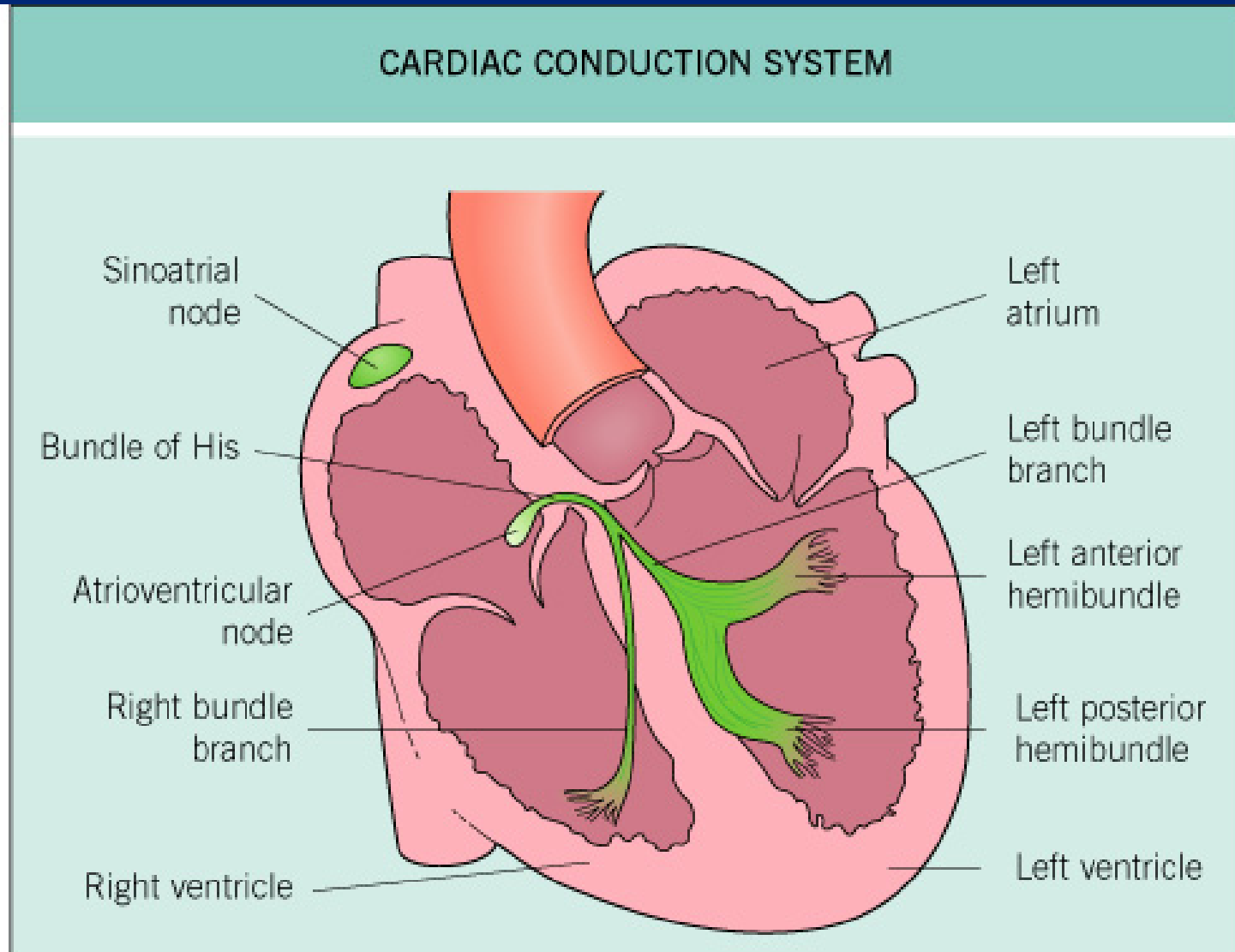
- Frontal Axis  $\pm 120$  degrees (typically right axis deviation)
- QRS  $< 120$ ms
- RS pattern I, qR pattern in II, II, aVF (inferior leads)



# EKG Rhythms

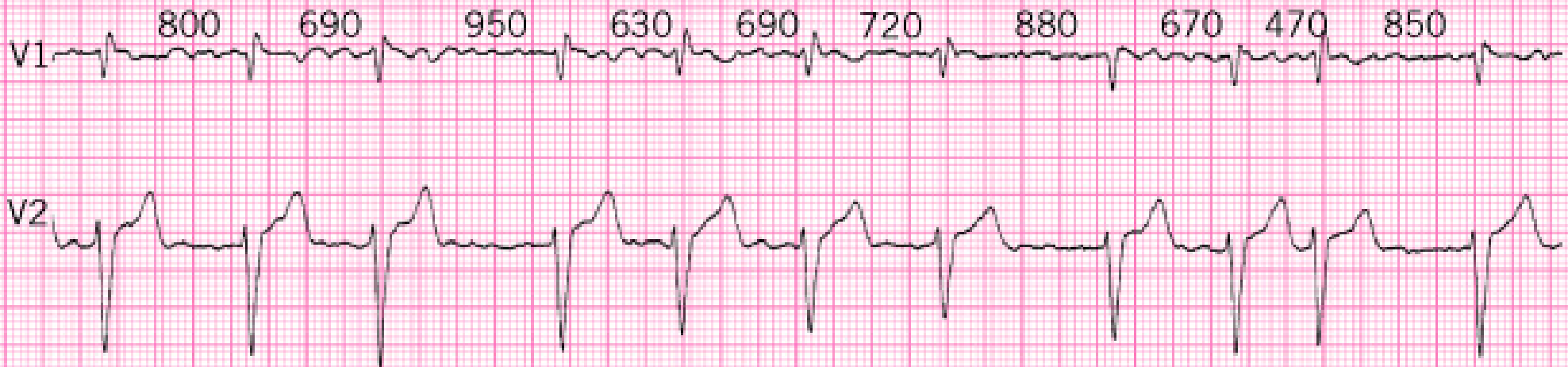
- Sinus rhythm
  - Typically upright P waves in the inferior leads
- Atrial fibrillation
- Atrial flutter
- Multifocal atrial tachycardia
- “SVT” (AVNRT)
- VT

# Sinus Rhythm

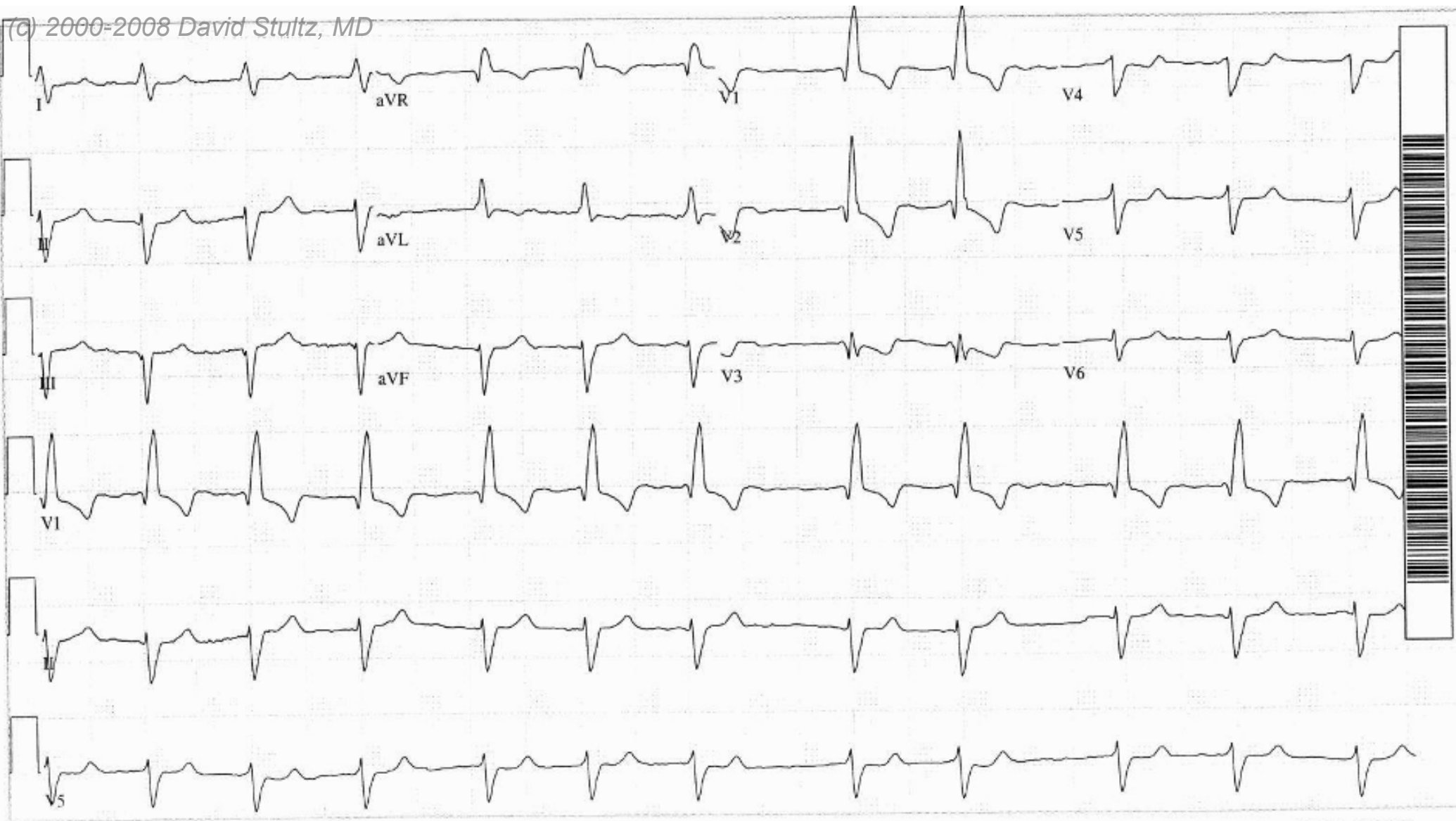


# Atrial Fibrillation

- No distinct P waves
- Irregularly irregular

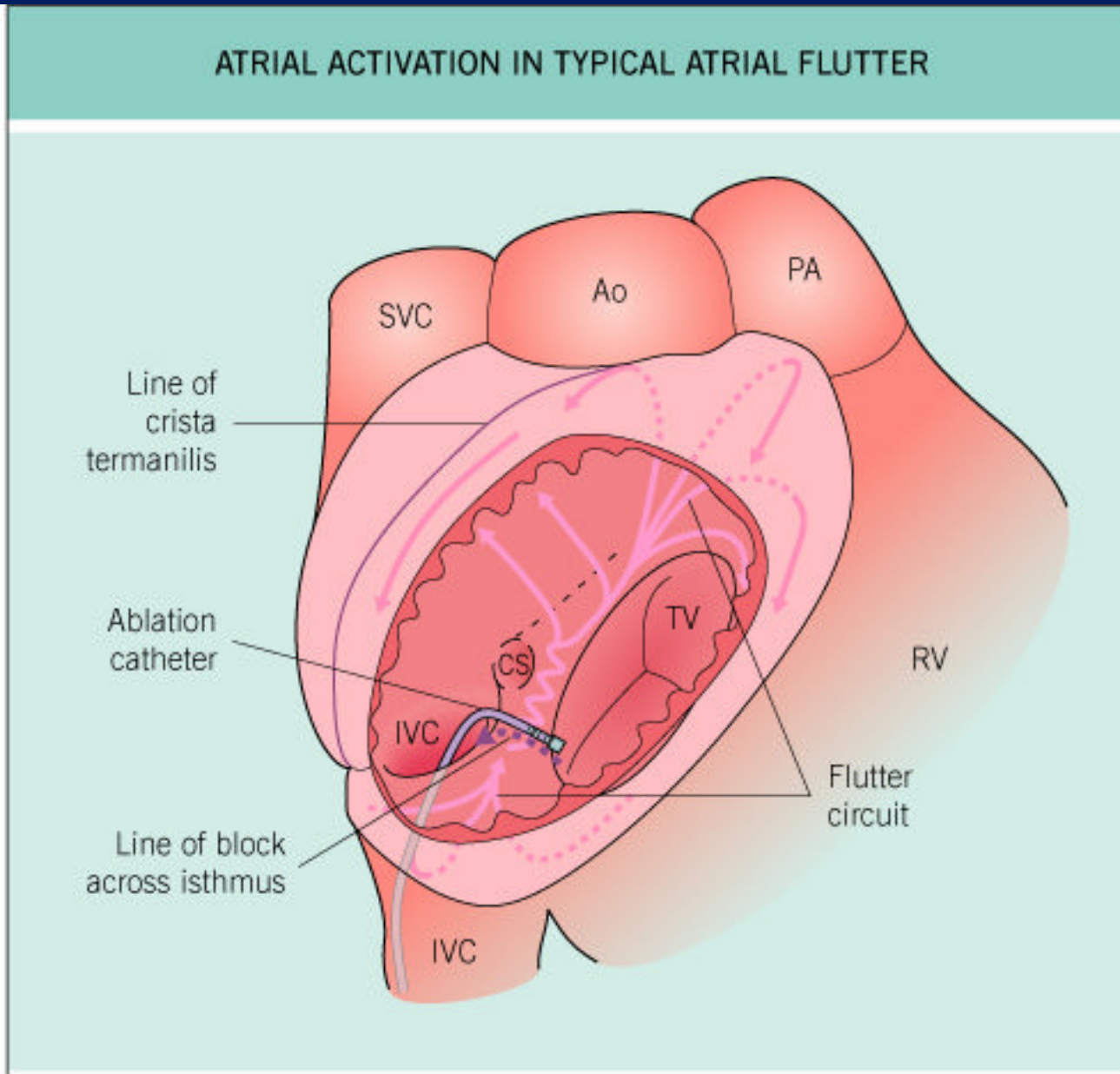






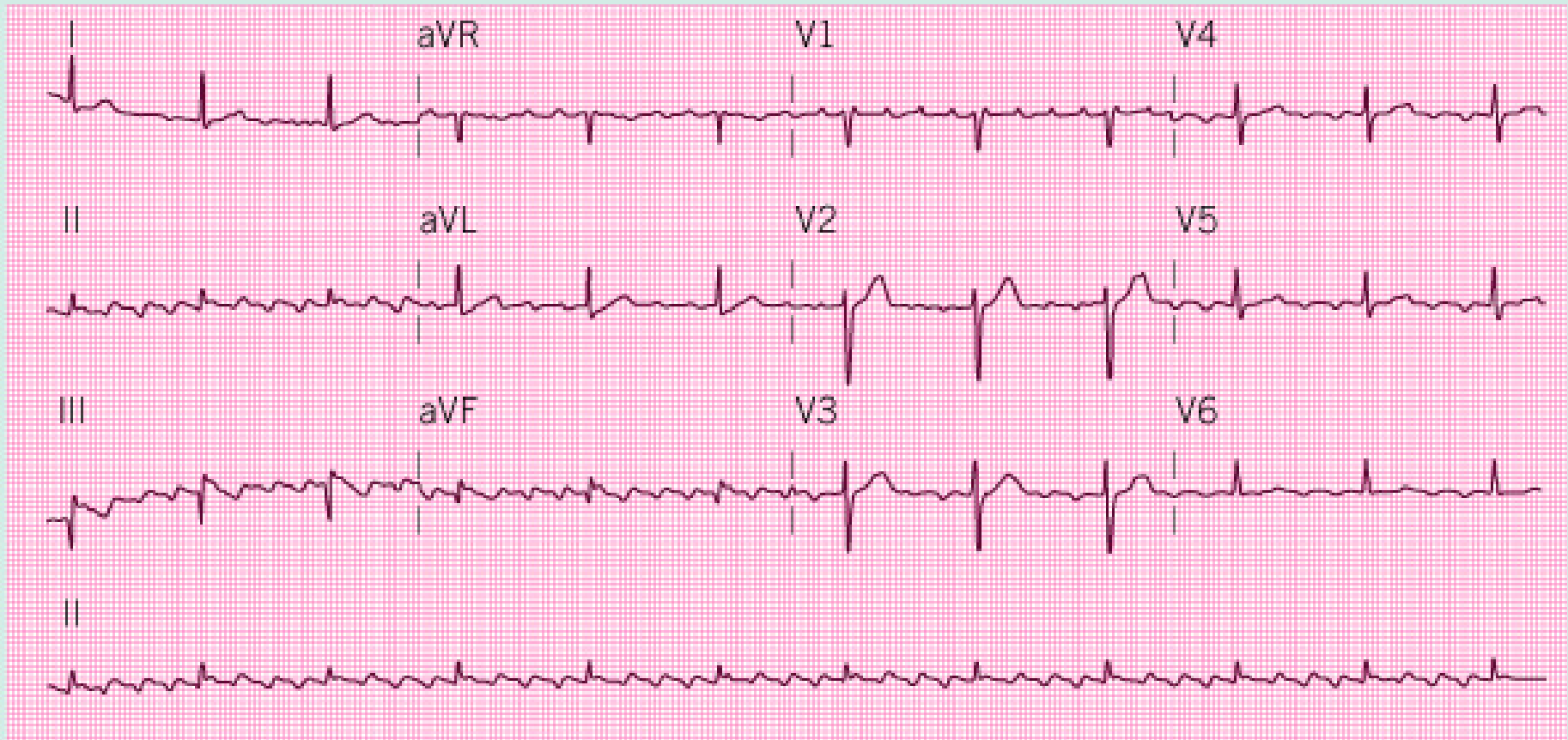
Atrial Fibrillation  
LAFB  
RBBB

# Mechanism of Typical Atrial Flutter

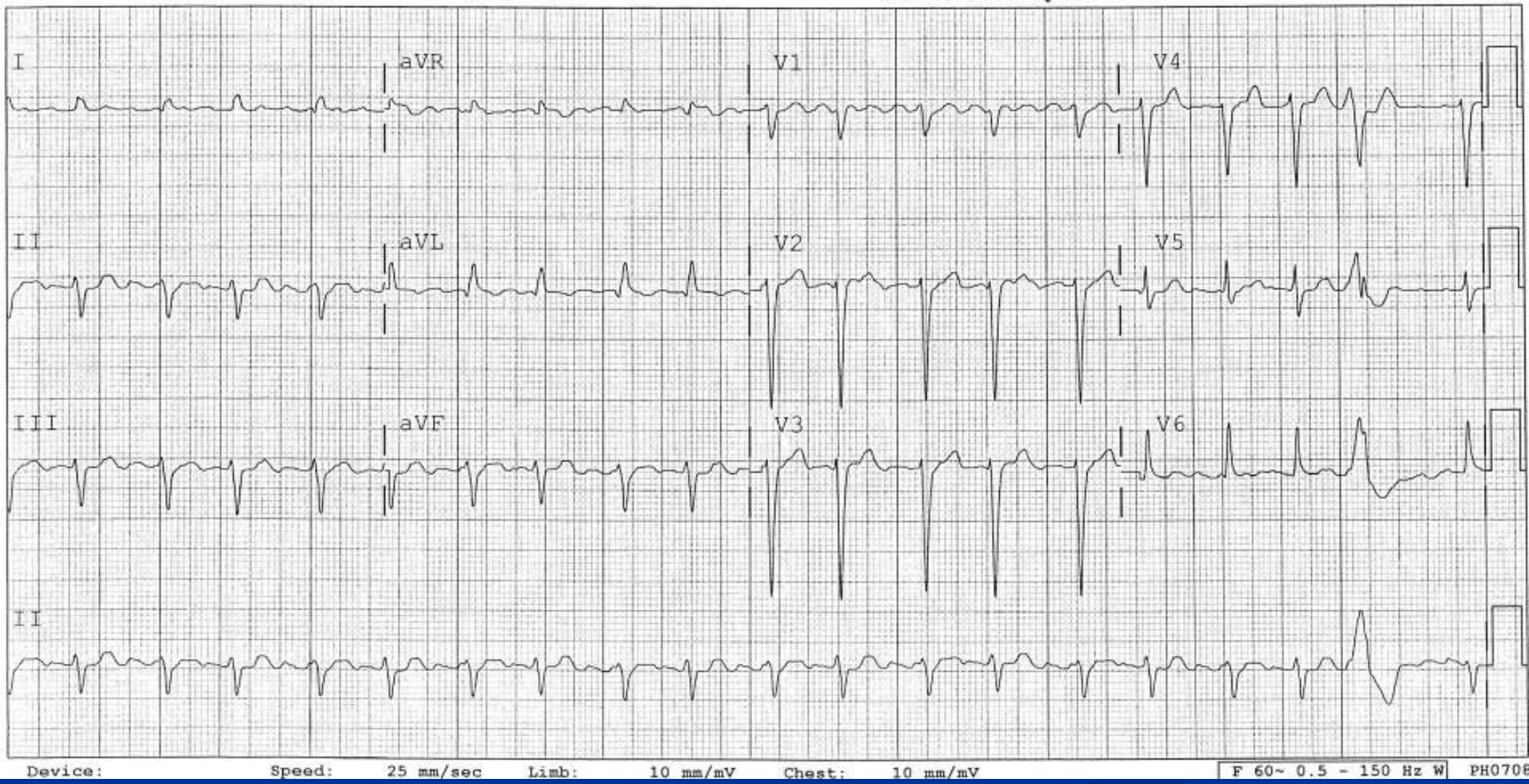


# Typical Atrial Flutter

## ELECTROCARDIOGRAM OF TYPICAL ATRIAL FLUTTER



# Atrial Flutter

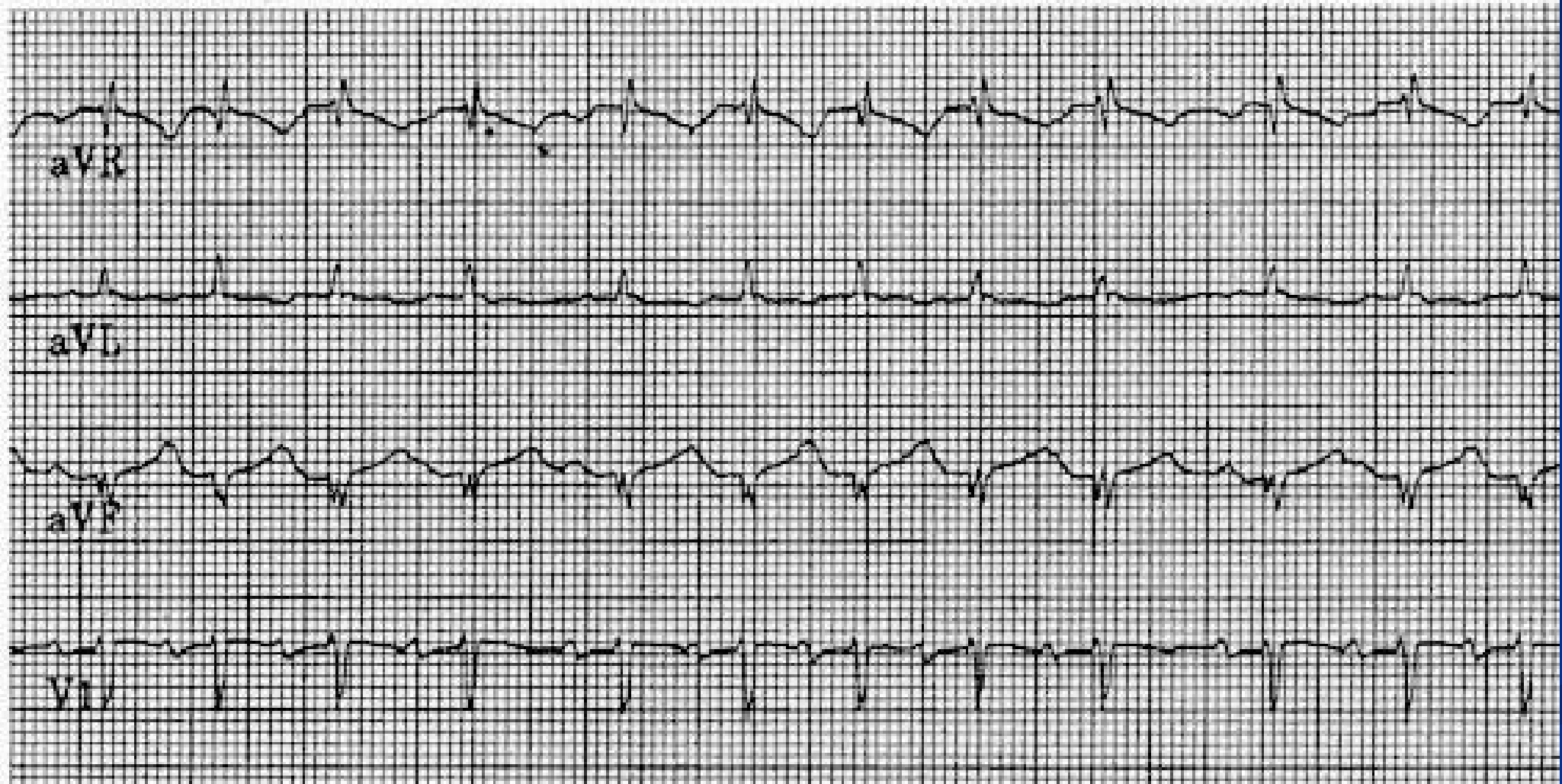


2:1 and 3:1 conduction, PVC, LAFB

# Multifocal Atrial Tachycardia

- Variable atrial foci
- Usually associated with hypoxia or pulmonary disease
- Due to enhanced automaticity or triggered activity
- 3 P wave morphologies with variable P-R intervals, rate  $>100$

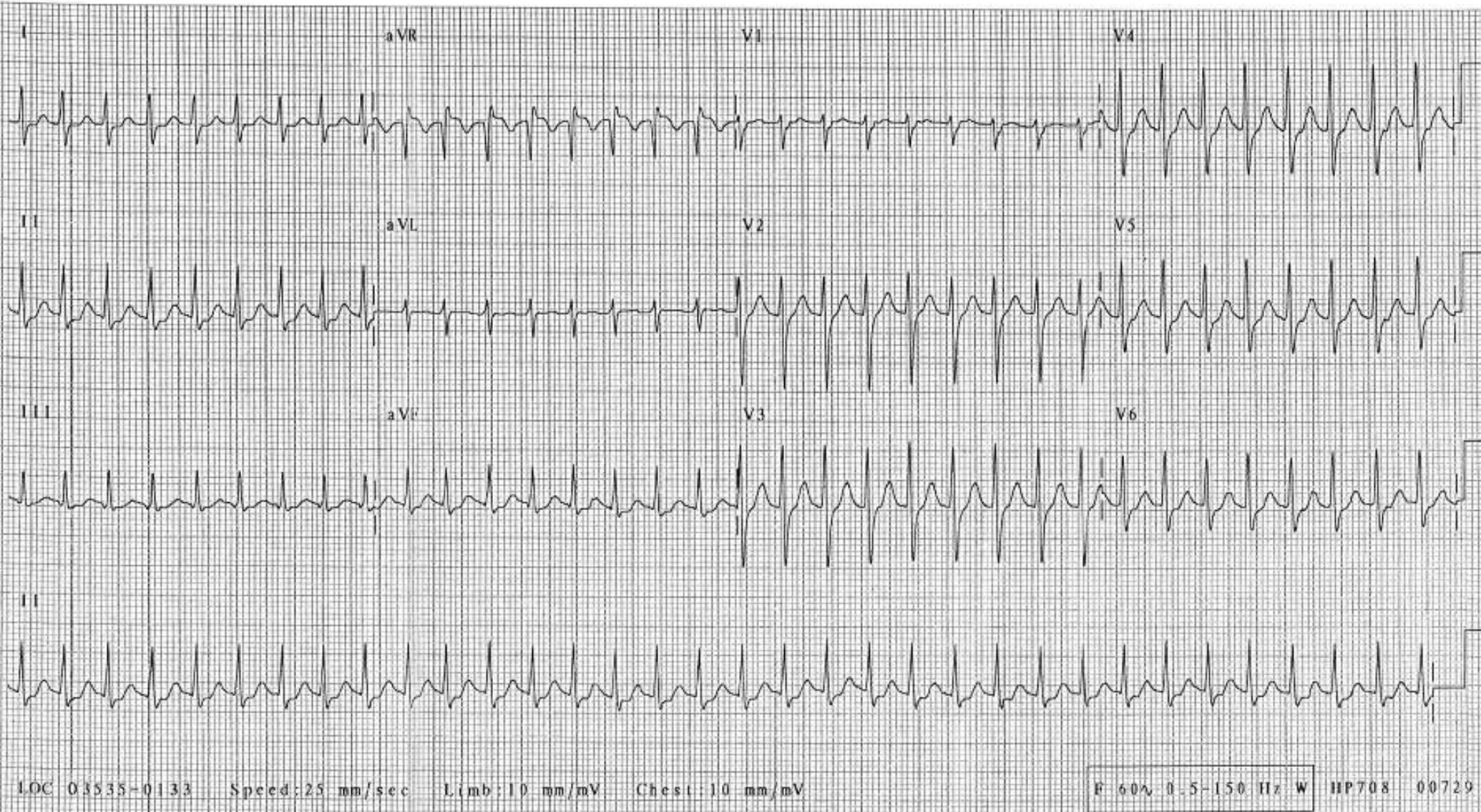
# MAT



# SVT

- Supraventricular tachycardia
- Most common type is AV nodal re-entrant tachycardia
- Regular, narrow complex tachycardia
- P waves?

# SVT





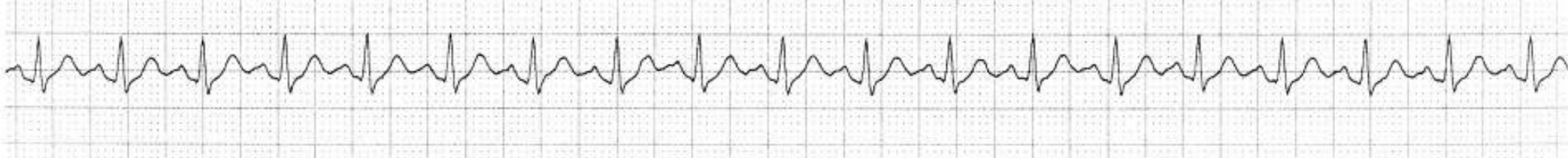
# Telemetry – SVT -> NSR

RM 7 2/4/07 21:15:03 | ALARMS SUSPENDED ALL ARRH ALRMS OFF HR -?- UNKNOWN ECG RHYTHM PULSE 202 PVC 0 NBP 113/71 (87) RESP

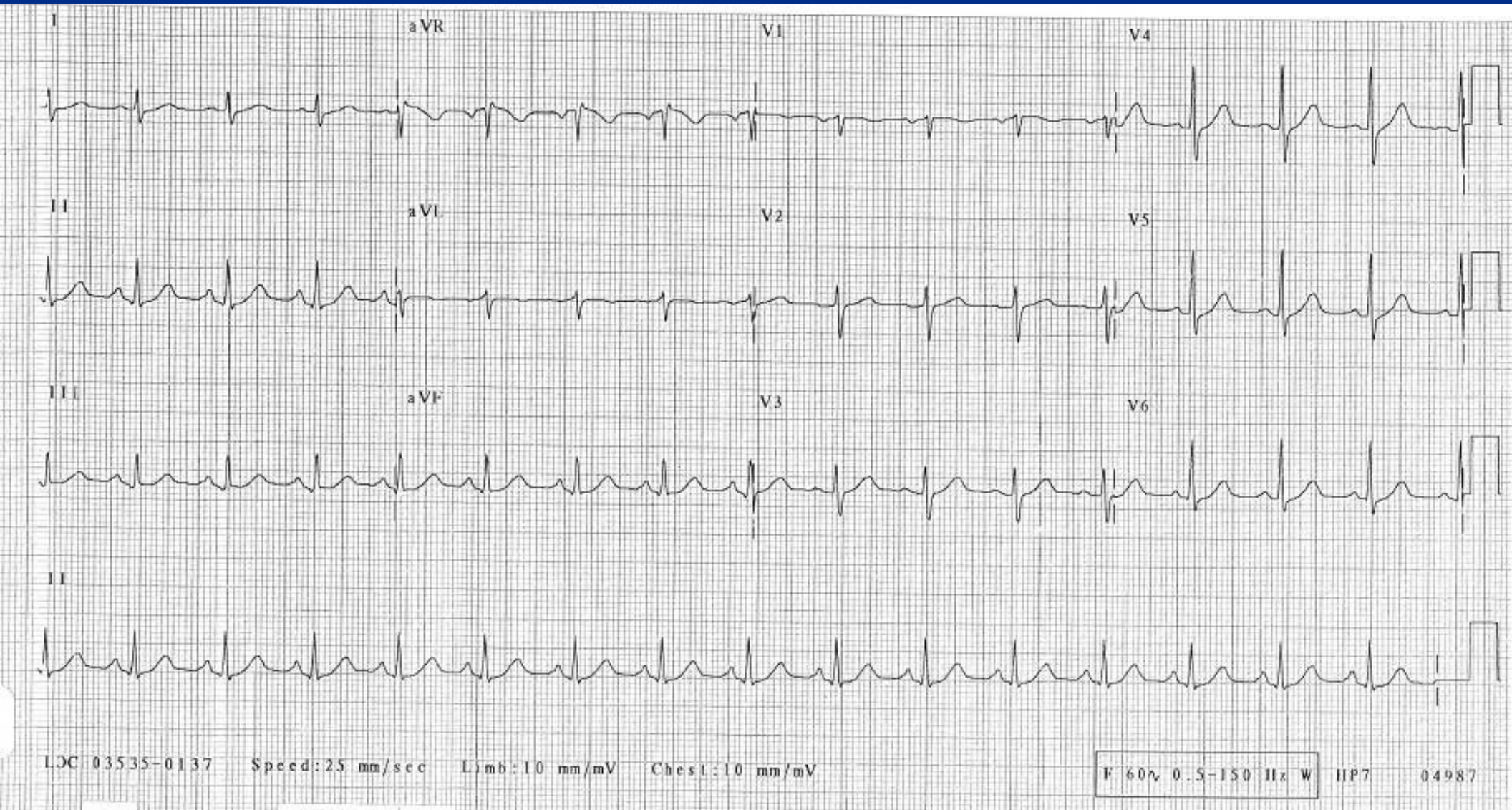


INTERPRETATION \_\_\_\_\_ SIGNATURE \_\_\_\_\_  
RATE \_\_\_\_\_ PR INTERVAL \_\_\_\_\_ QRS \_\_\_\_\_ ALARM LIMITS SET \_\_\_\_\_

RM 7 2/4/07 21:16:03 | HR 138 UNKNOWN ECG RHYTHM PAUSE 1 PULSE 138 | PVC 1 NBP 113/71 (87) RESP 23 %SpO2 98 25 mm/sec



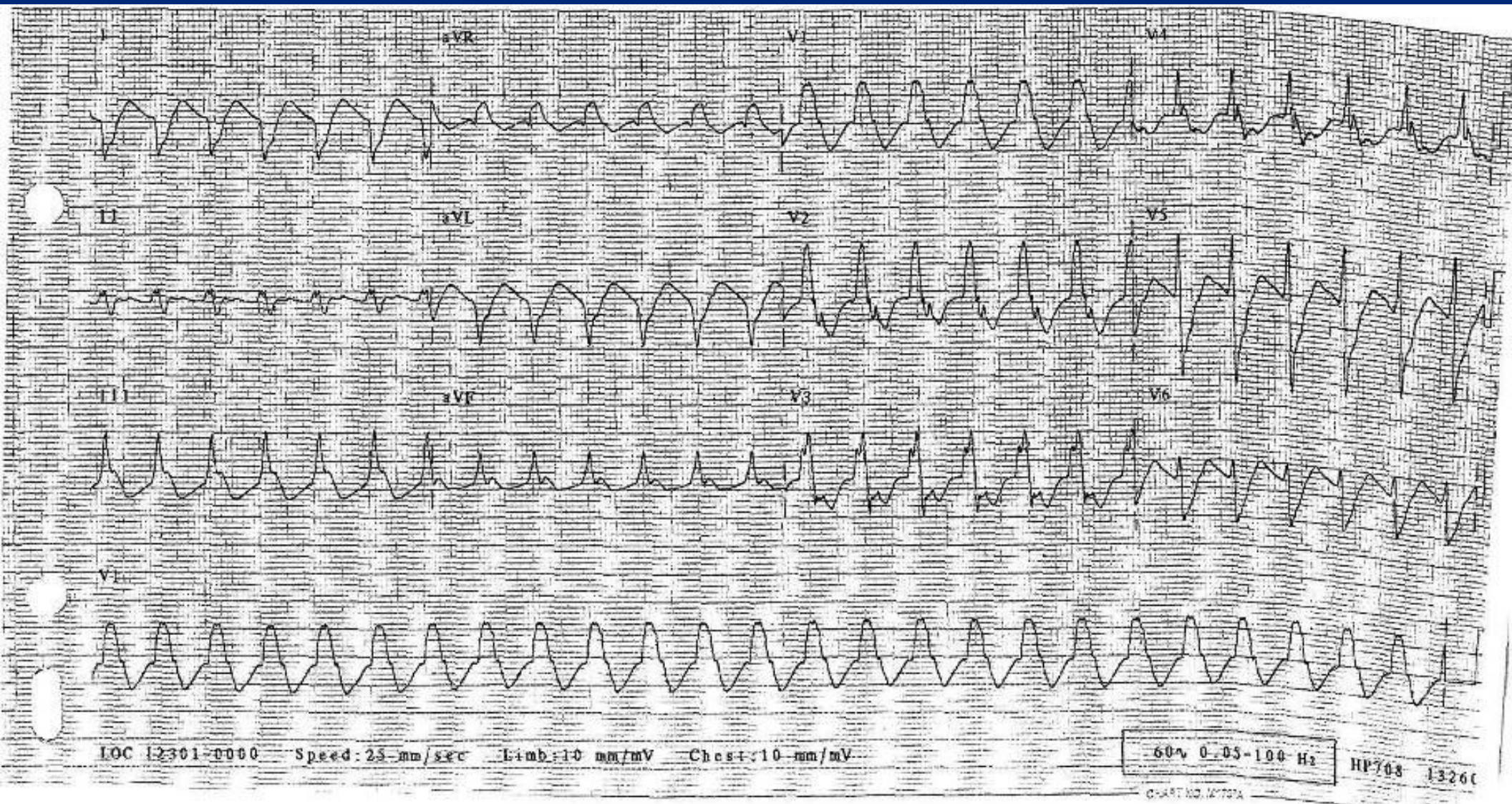
# Sinus rhythm



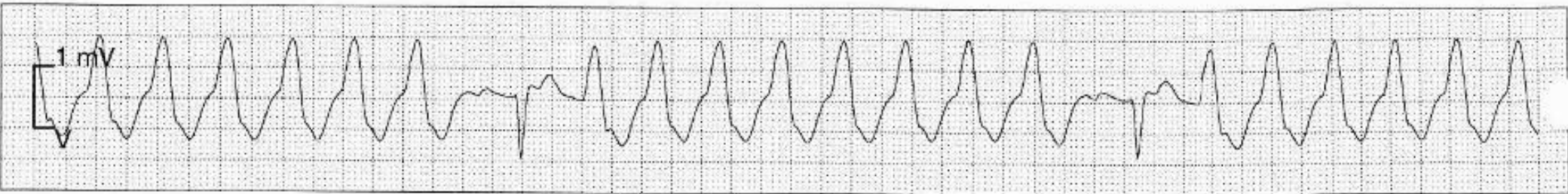
# Ventricular Tachycardia

- Wide Complex
- Tachycardic ( $>100$  beats/minute)
- Fusion/Capture beats
  
- May be hemodynamically stable or unstable
- Do not assume that a wide complex regular tachycardia is “SVT with aberrancy”

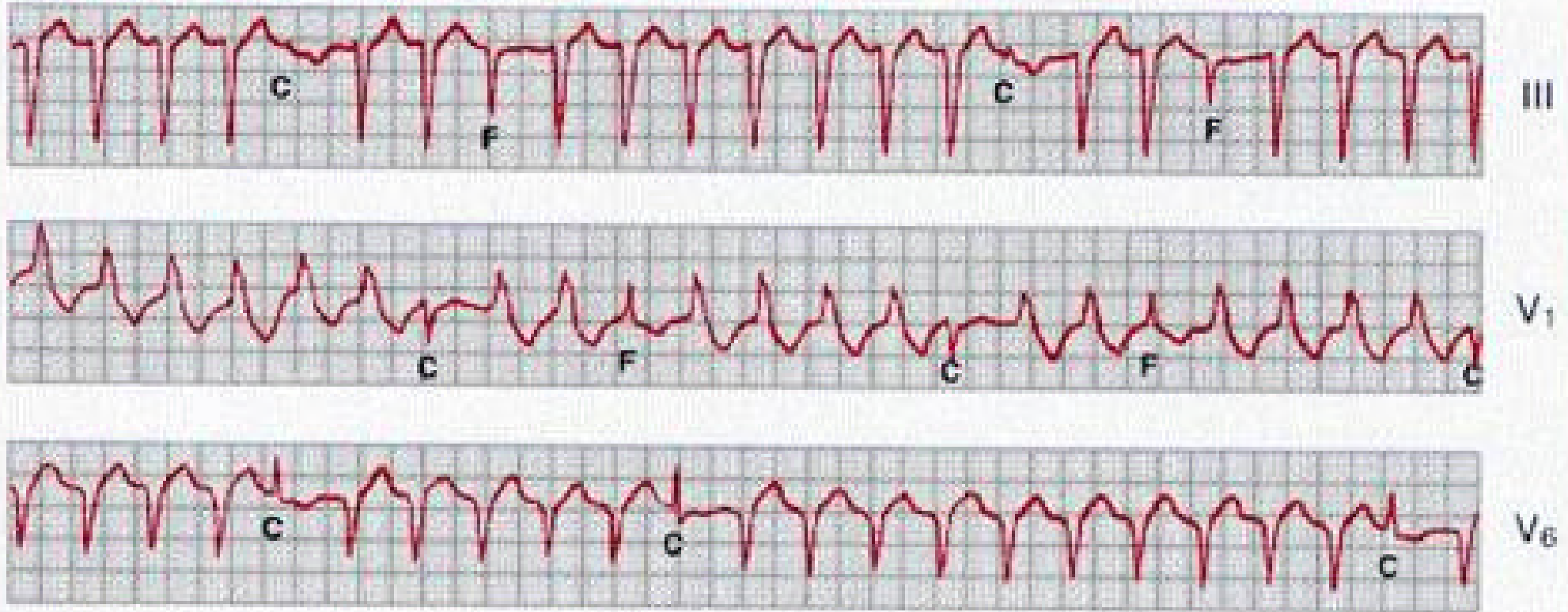
# VT



# VT terminated by Shock note fusion beats

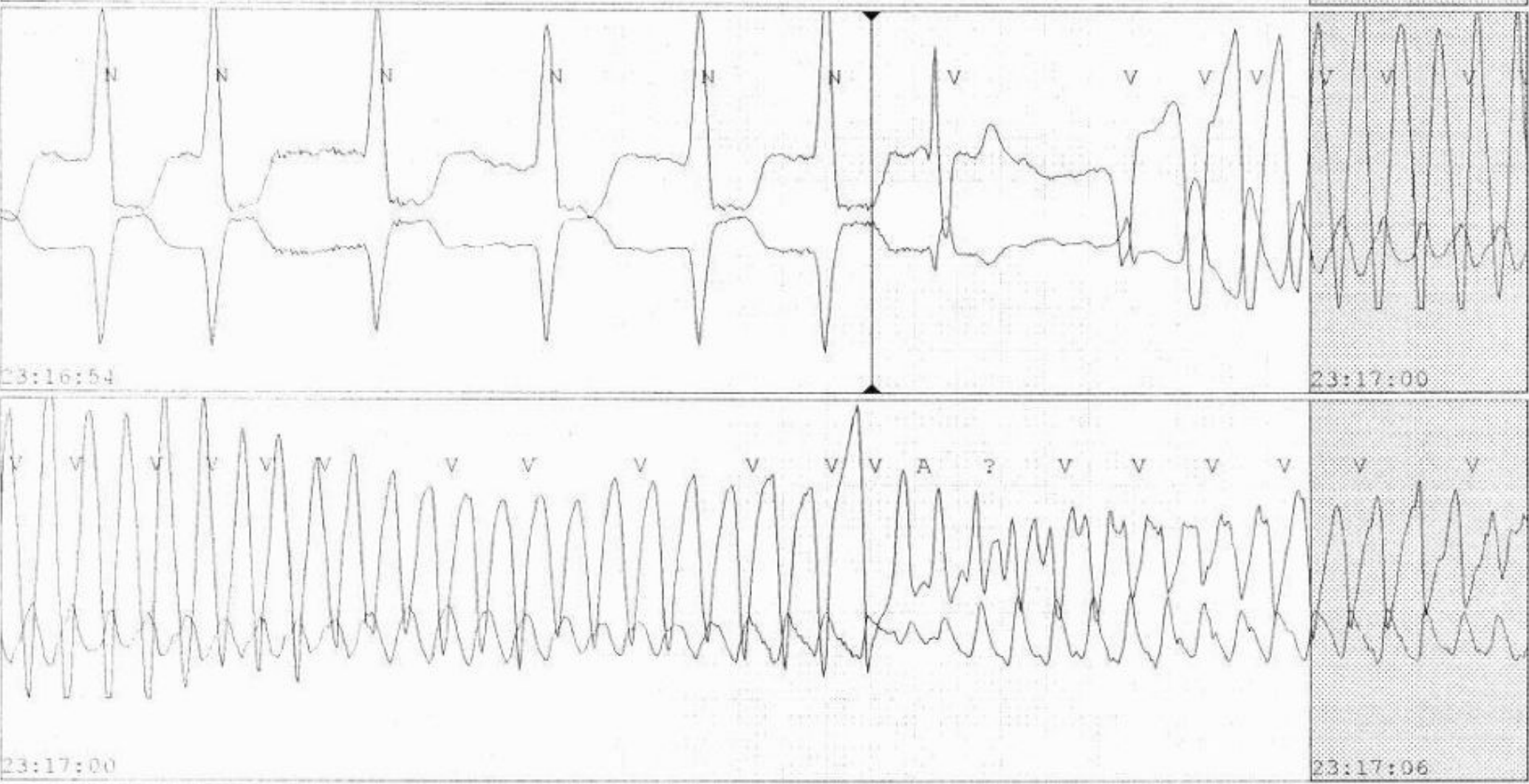


# Fusion and Capture Beats



During the course of a tachycardia characterized by widespread, abnormal QRS complexes, the presence of fusion beats and capture beats provides maximum support for the diagnosis of VT

# Torsades de Pointes Polymorphic VT



Initiation of polymorphic VT  
Long-short-long cycle

17 years  
Male  
Room:  
Vent. rate 211 bpm  
PR interval \* ms  
QRS duration 150 ms  
QT/QTc 322/603 ms  
P-R-T axes \* -52 116

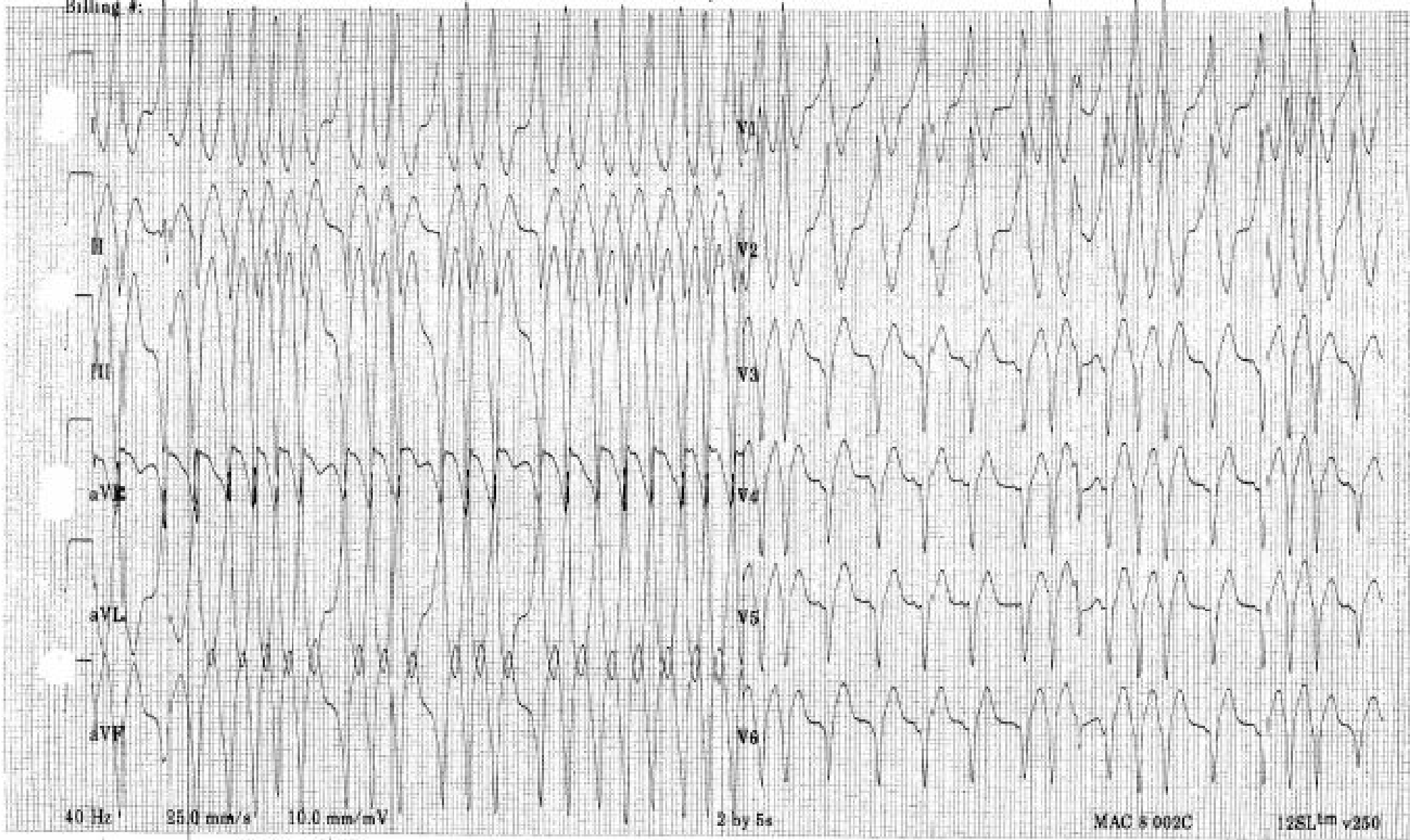
•Atrial Fibrillation with WPW

Technician:

Referred by:

Unconfirmed

Billing #:



40 Hz 25.0 mm/s 10.0 mm/mV

2 by 5s

MAC 5 002C

12SL™ v250