

# Sgarbossa- Down and Dirty

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# DISCLOSURE SLIDE

- I have no disclosures to announce

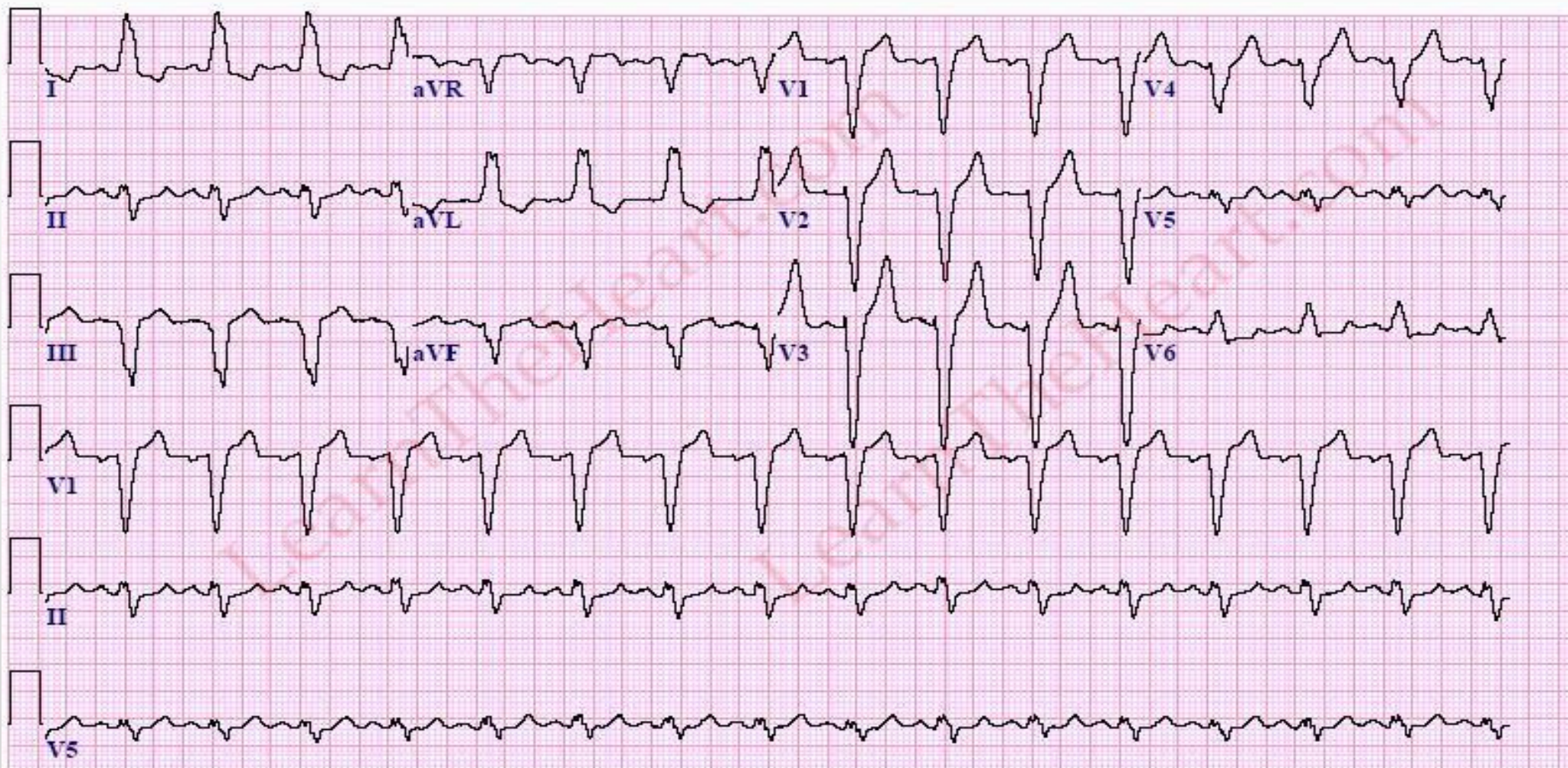
# Why Is This Important?

- LBBBs can be very difficult to interpret in the face of AMI or chest pain
- Can The Sgarbossa Criteria be used to help?
- STEMI called in the face of LBBB can be embarrassing (but it doesn't have to be)

# Quick Review-What is a LBBB?

- 200,000 new cases in the U.S. each year
- Most often found in older, sick hearts
- It is an electrical issue that results in the QRS to appear wide
- LBBB makes things much more difficult to diagnose a STEMI

# LBBB



# LBBB



# Why is This Important?

First Author <sup>Ref.</sup>	Year	No. of Patients With Occluded Culprit Artery/ Total With LBBB (%)	
		New or Presumed New LBBB	Old LBBB
Larson et al. <sup>12</sup>	2007	20/36 (56)	N/A
Chang et al. <sup>13</sup>	2009	4/55 (7)	7/136 (5)
Lopes et al. <sup>14</sup>	2011	60/98 (61)	N/A
Jain et al. <sup>15</sup>	2011	5/36 (14)	N/A
Total (n = 4)		89/225 (40)	7/136 (5)

# This Is the Down and Dirty

- I am not an expert
- After just one talk with me you will not be either
- Before I apply this criteria I like to use my gestalt to make sure it is appropriate
- **WE CAN STILL HELP OUR CARDIOLOGISTS AND OUR PATIENTS**



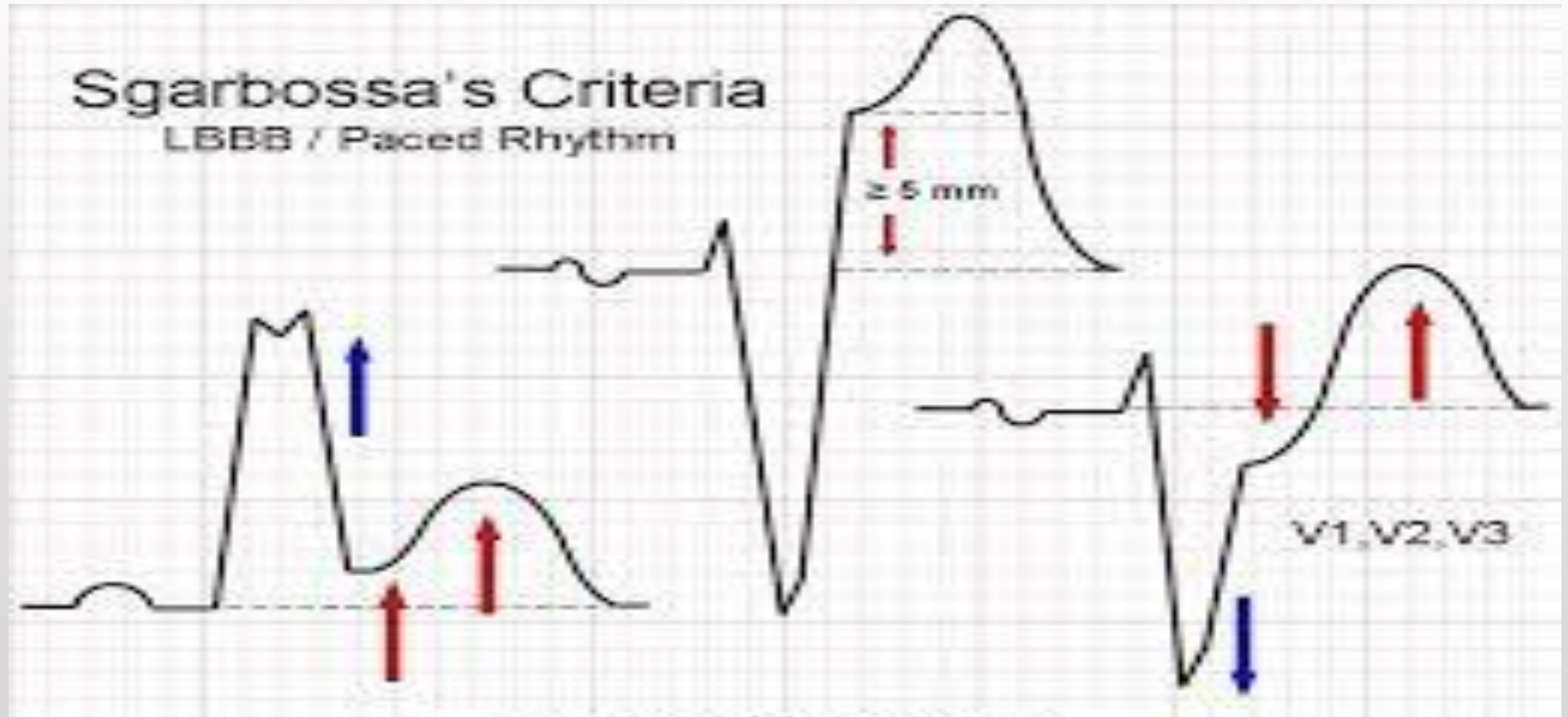
**Who (or what) is Sgarbossa's?**



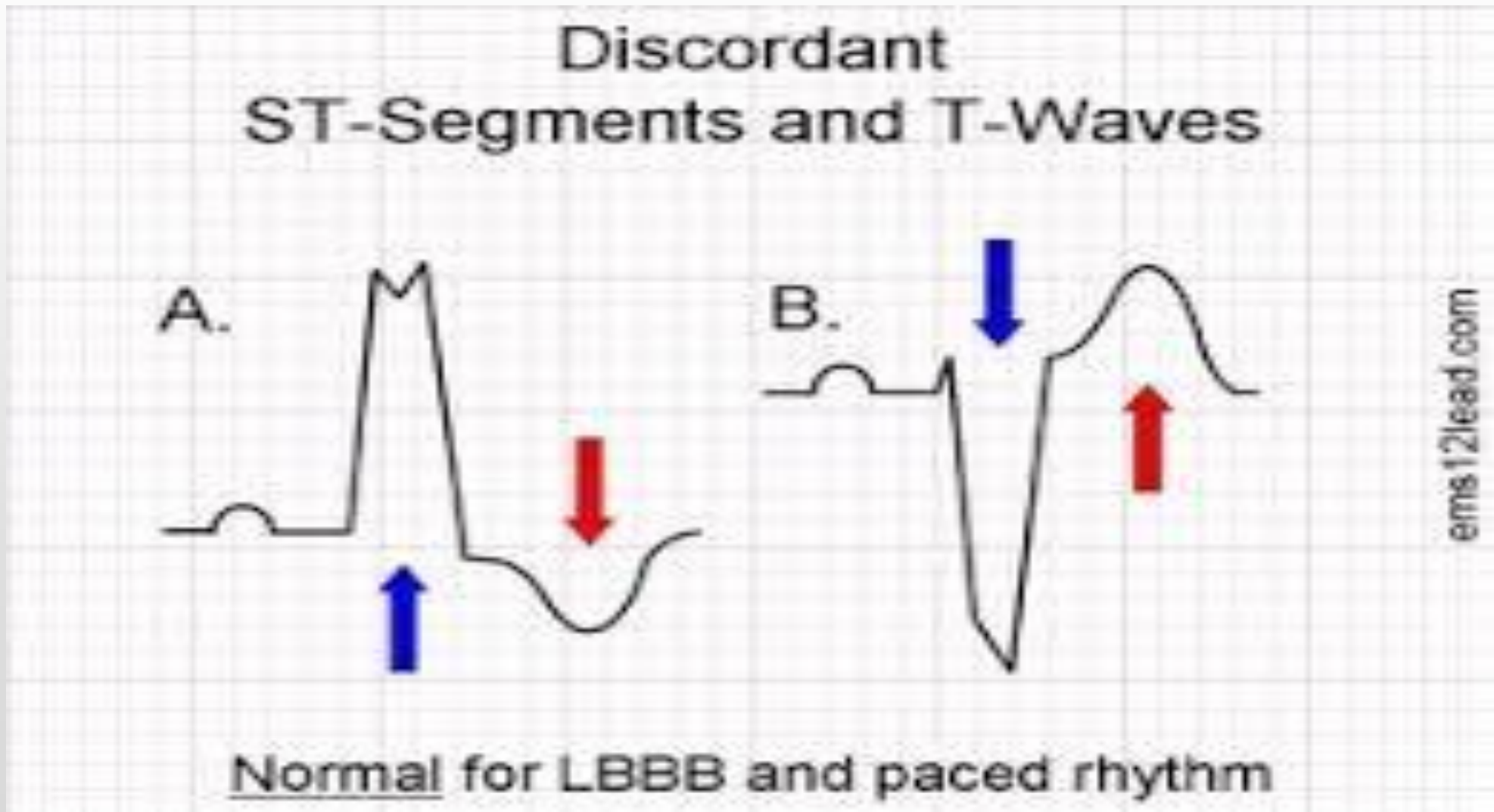
# Who (or what) is “Sgarbossa”?

- Dr. Elena Sgarbossa is a pretty cool cardiologist
- She asked if there were clues that could be found to identify AMI in the face of a LBBB
- She used data from the famous GUSTO-1 trial

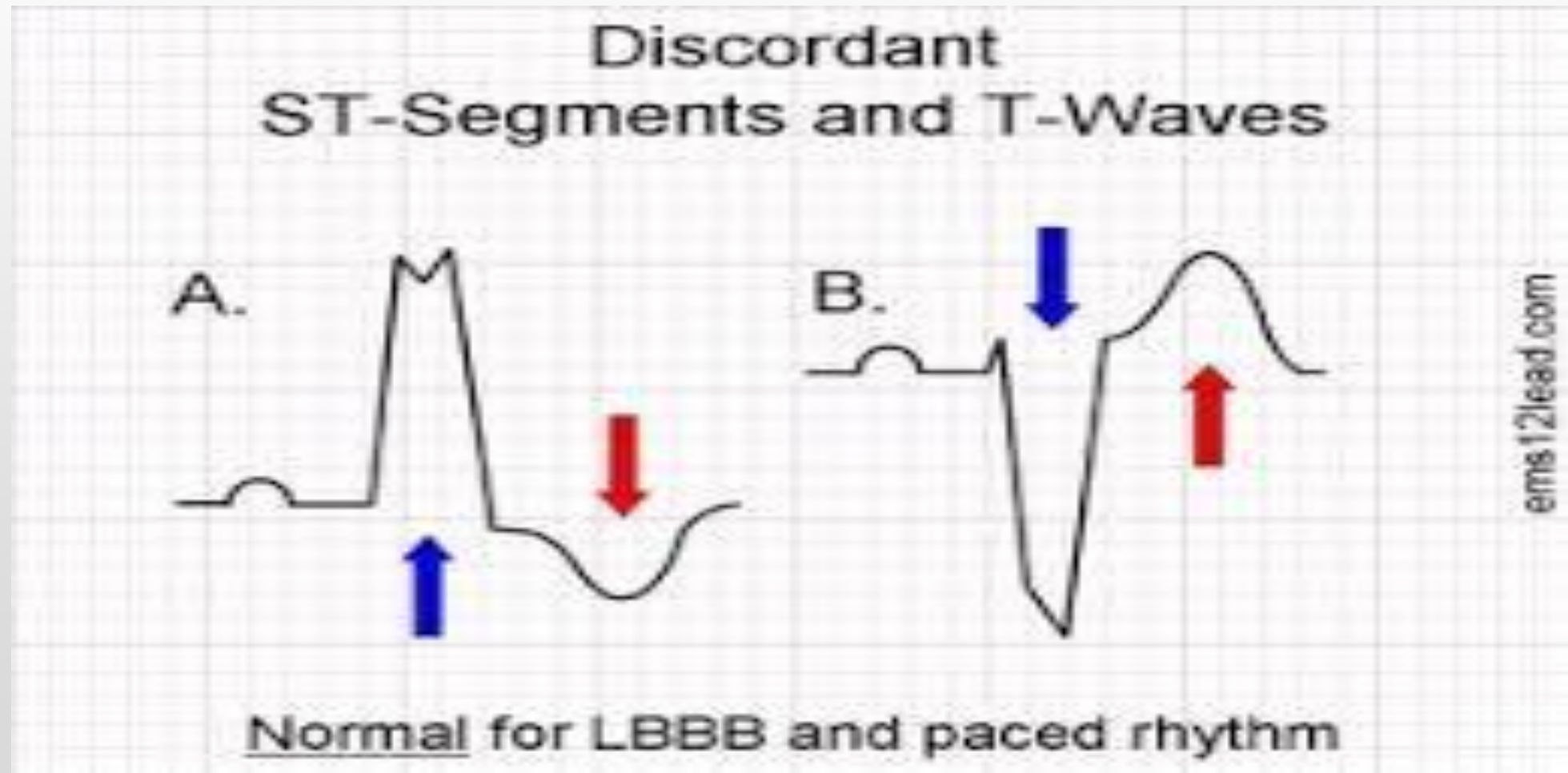
# This is What Dr. Sgarbossa Figured Out



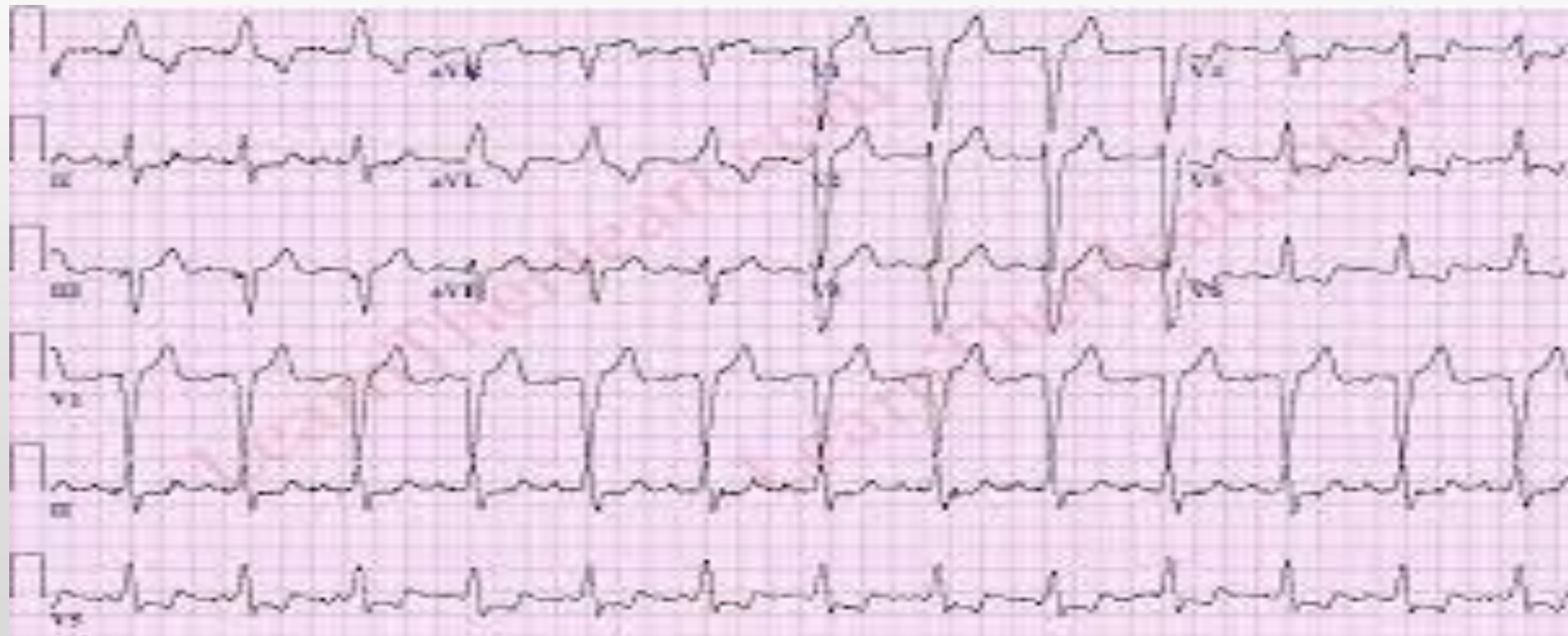
# One Single Concept That Changed My Practice



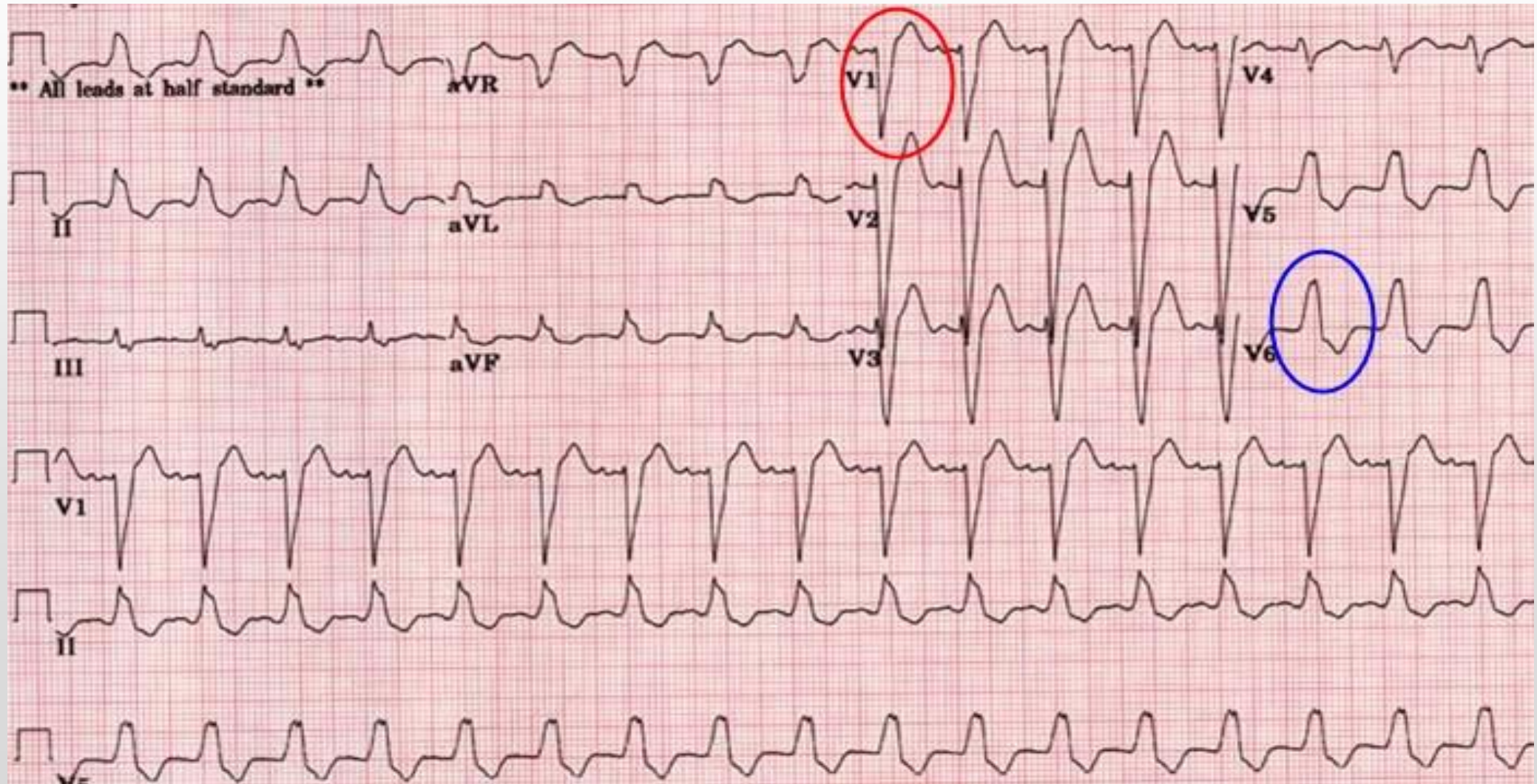
# Discordance is Good! (in moderation-more later)



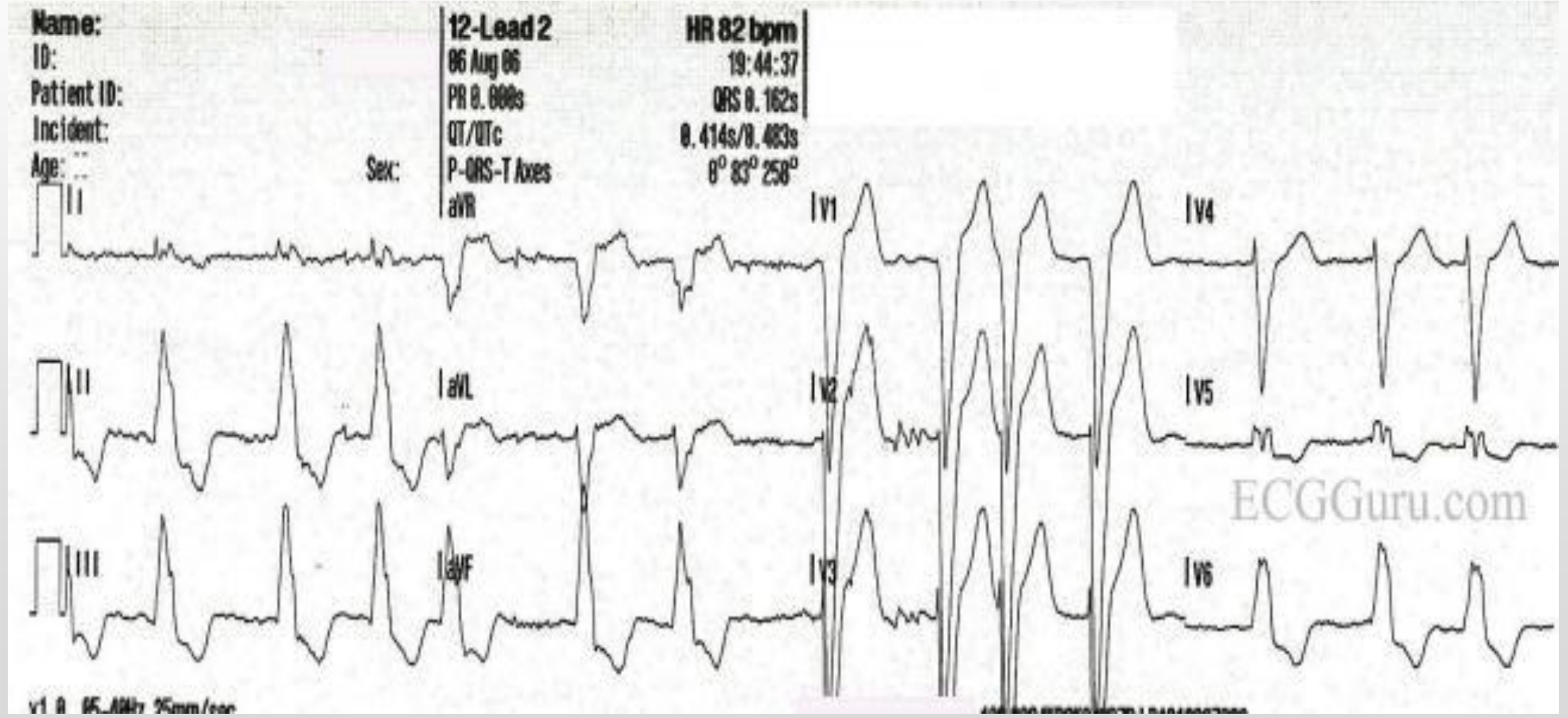
# A "Normal" LBBB



# Another Discordant LBBB

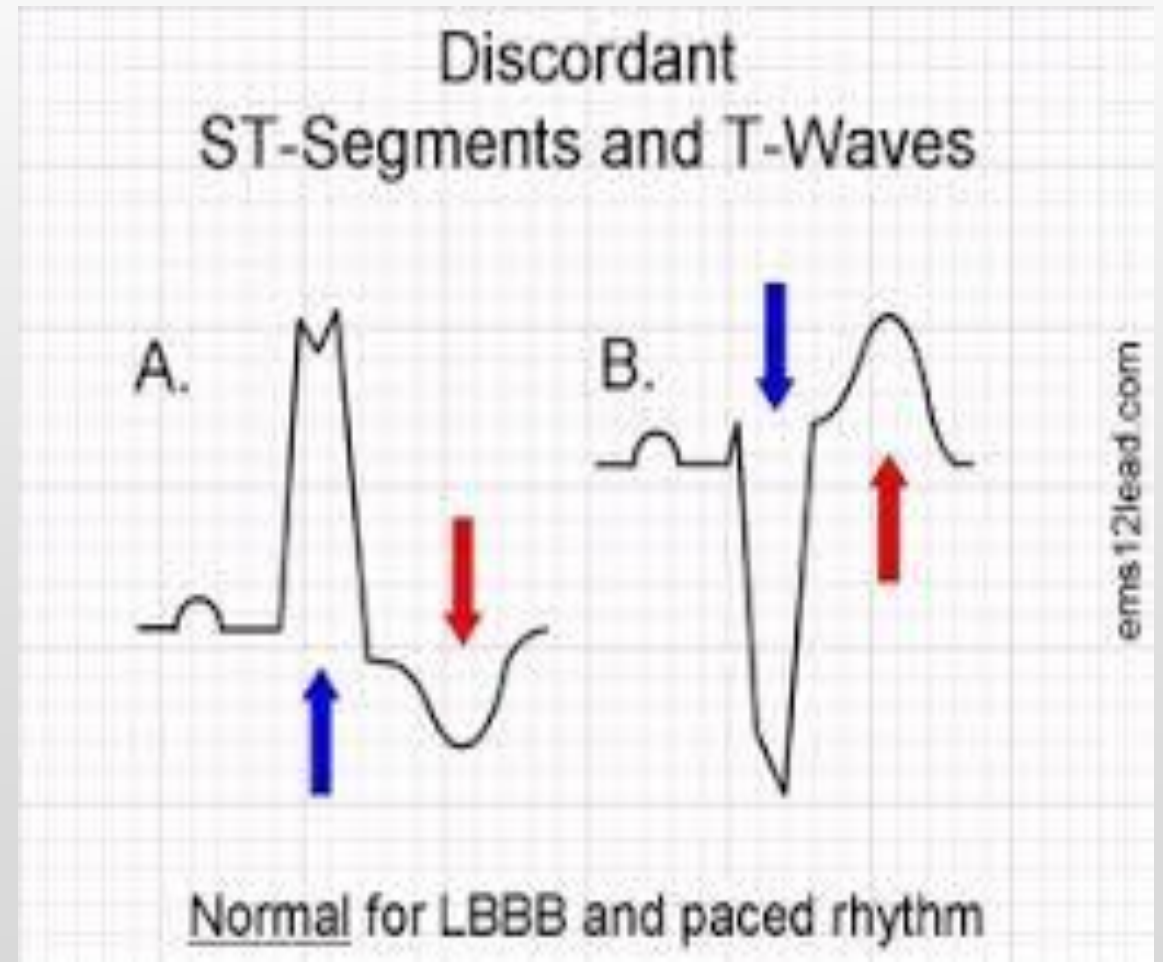
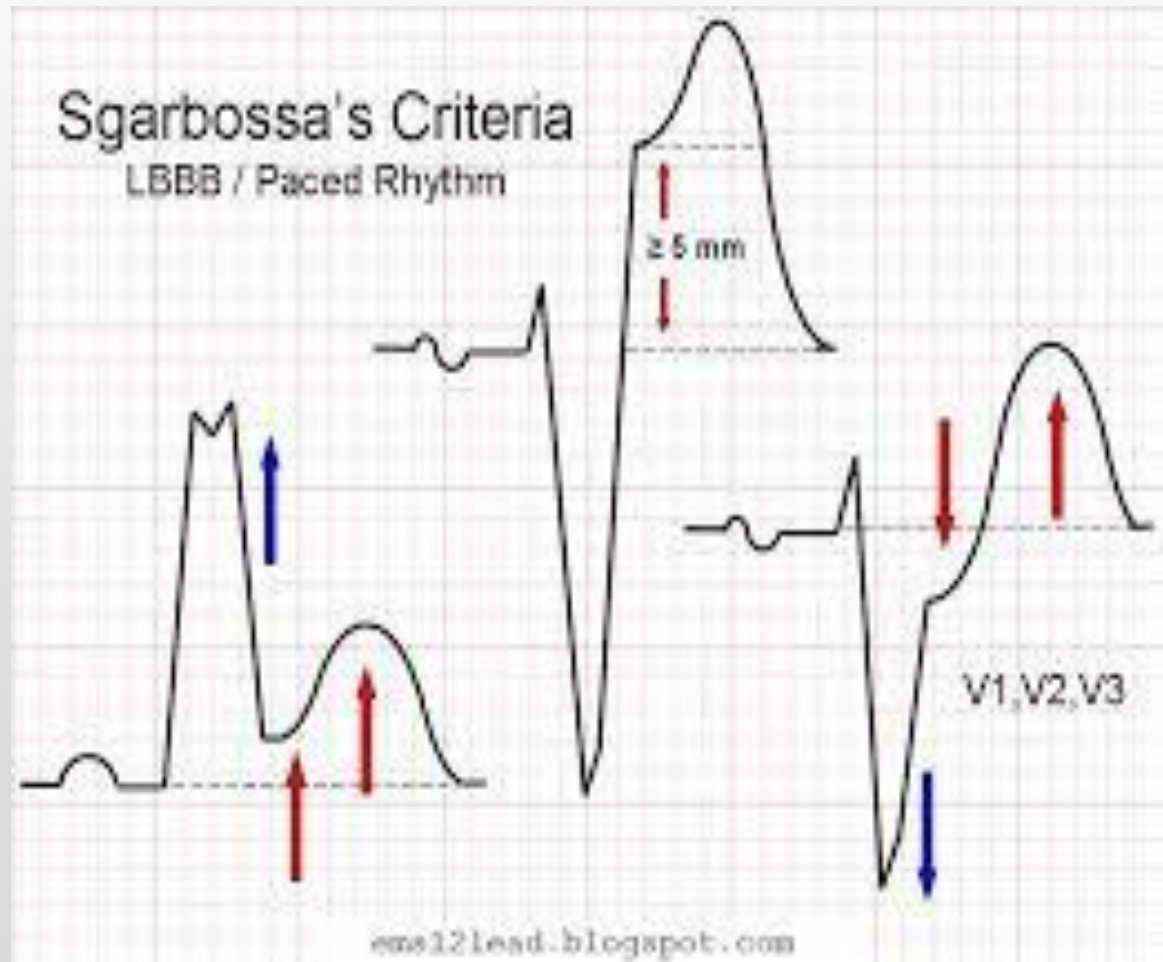


# We Like Discordance in the LBBB ECG





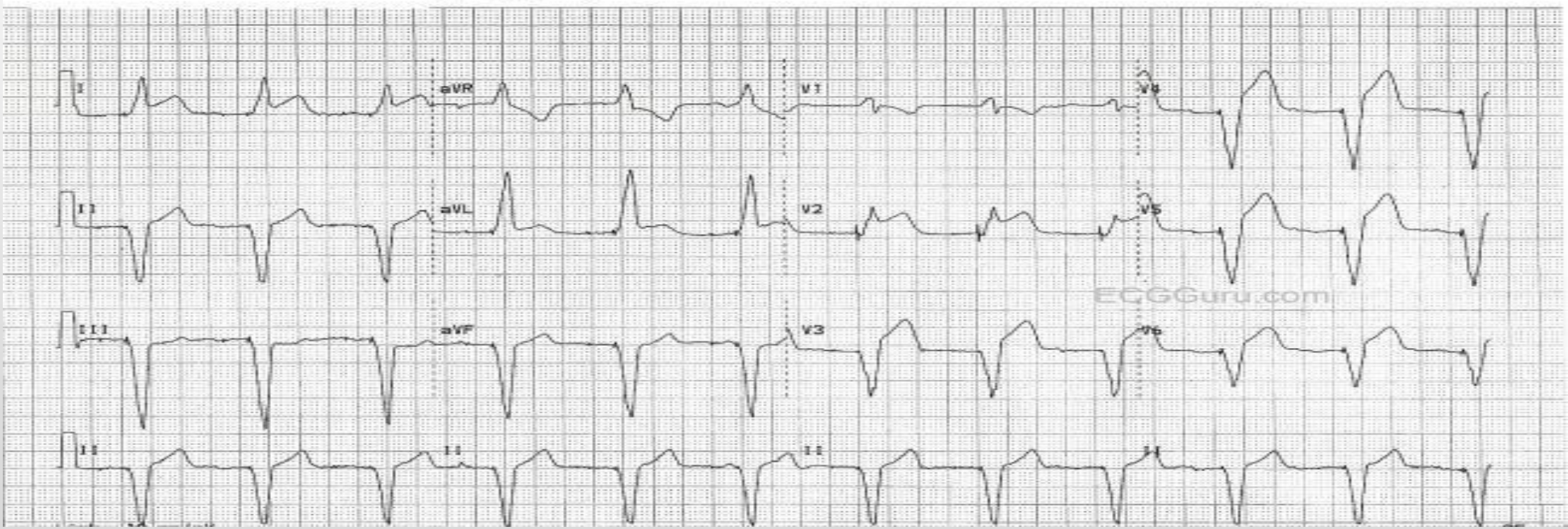
# But Wait- What is Concordance?



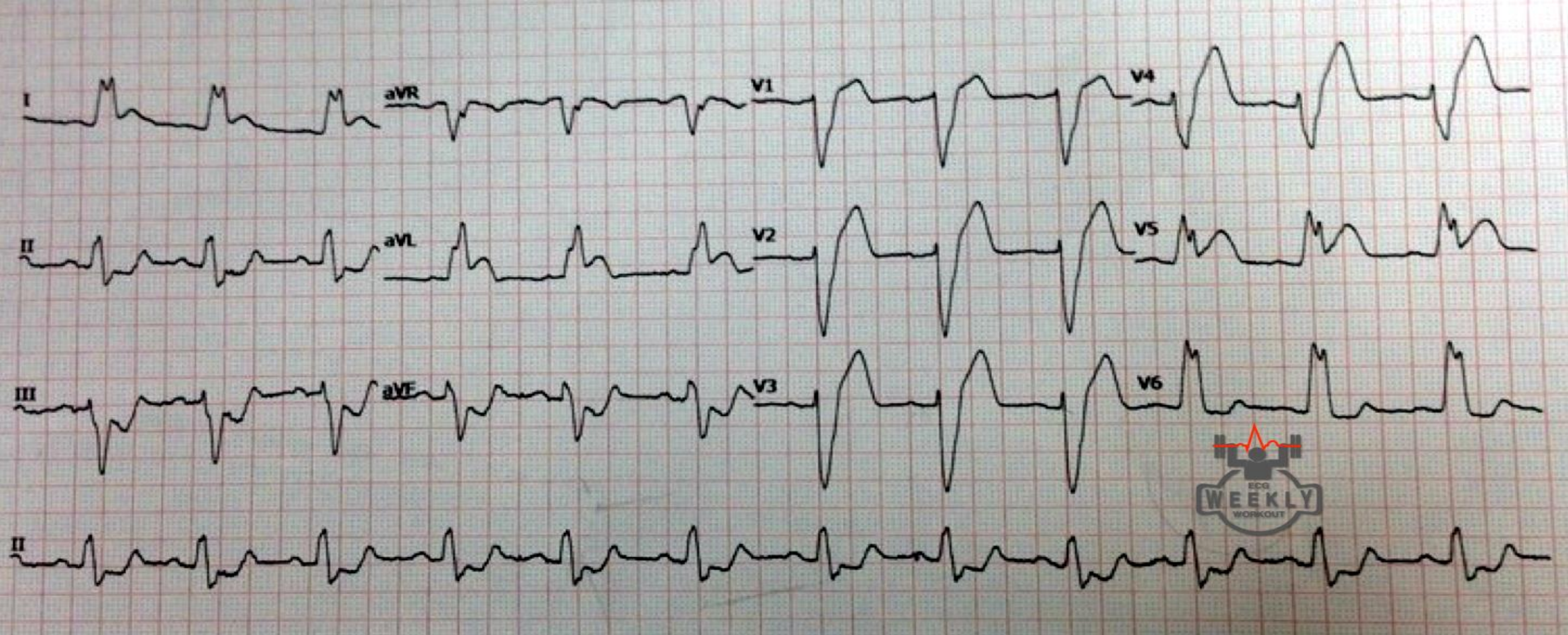
# For Today, In this Lecture-CONCORDANCE is BAD!

ventr. rate: 69  
--- Durations ---  
QRS: 162 ms  
--- Intervals ---  
PR : 860 ms  
PR :  
QT : 454 ms  
QTc: 469 ms  
QTd: 42 ms  
--- Axes ---  
P : \*  
QRS: -68 \*  
T : 24 \*

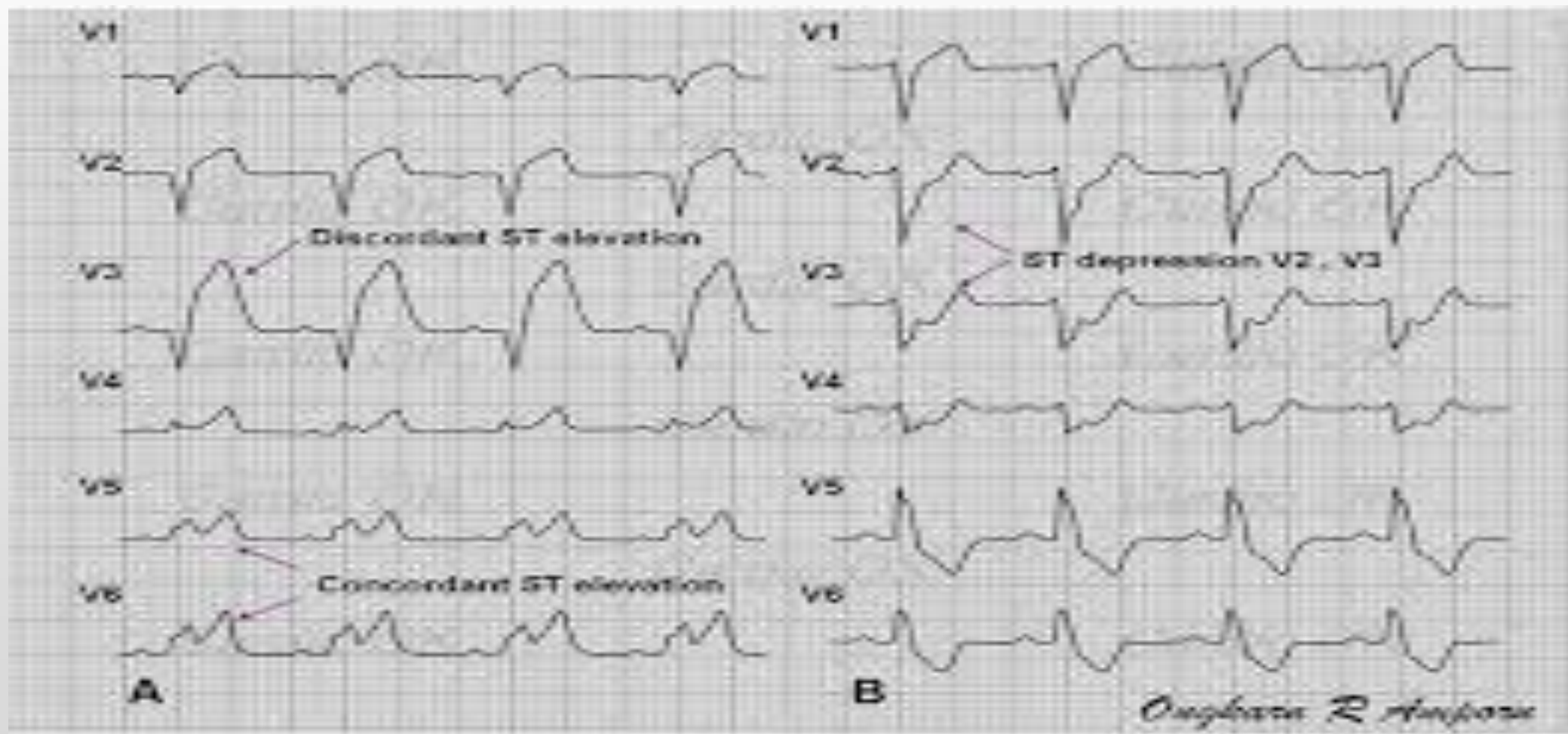
Pt with chest pain



# Concordance (BAD!)



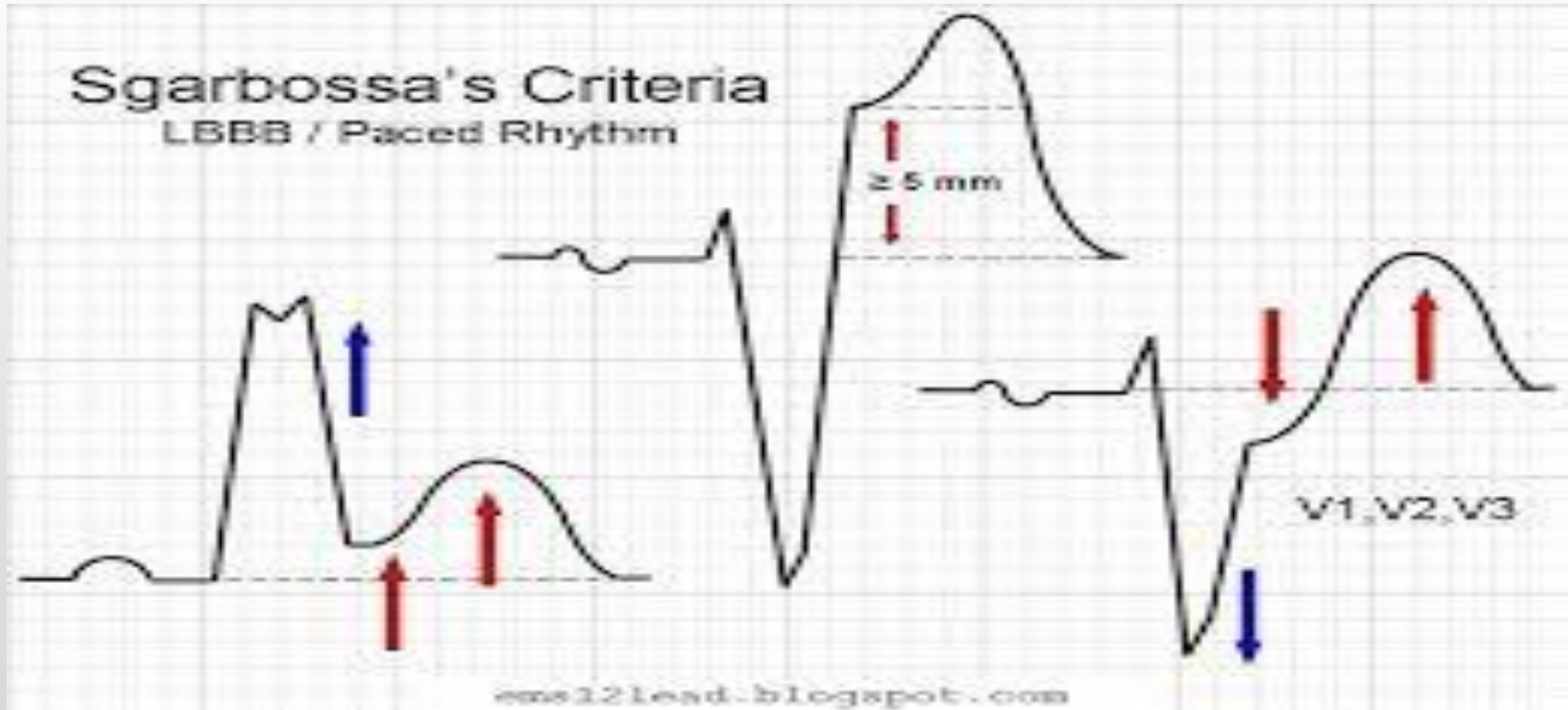
# My Favorite Slide



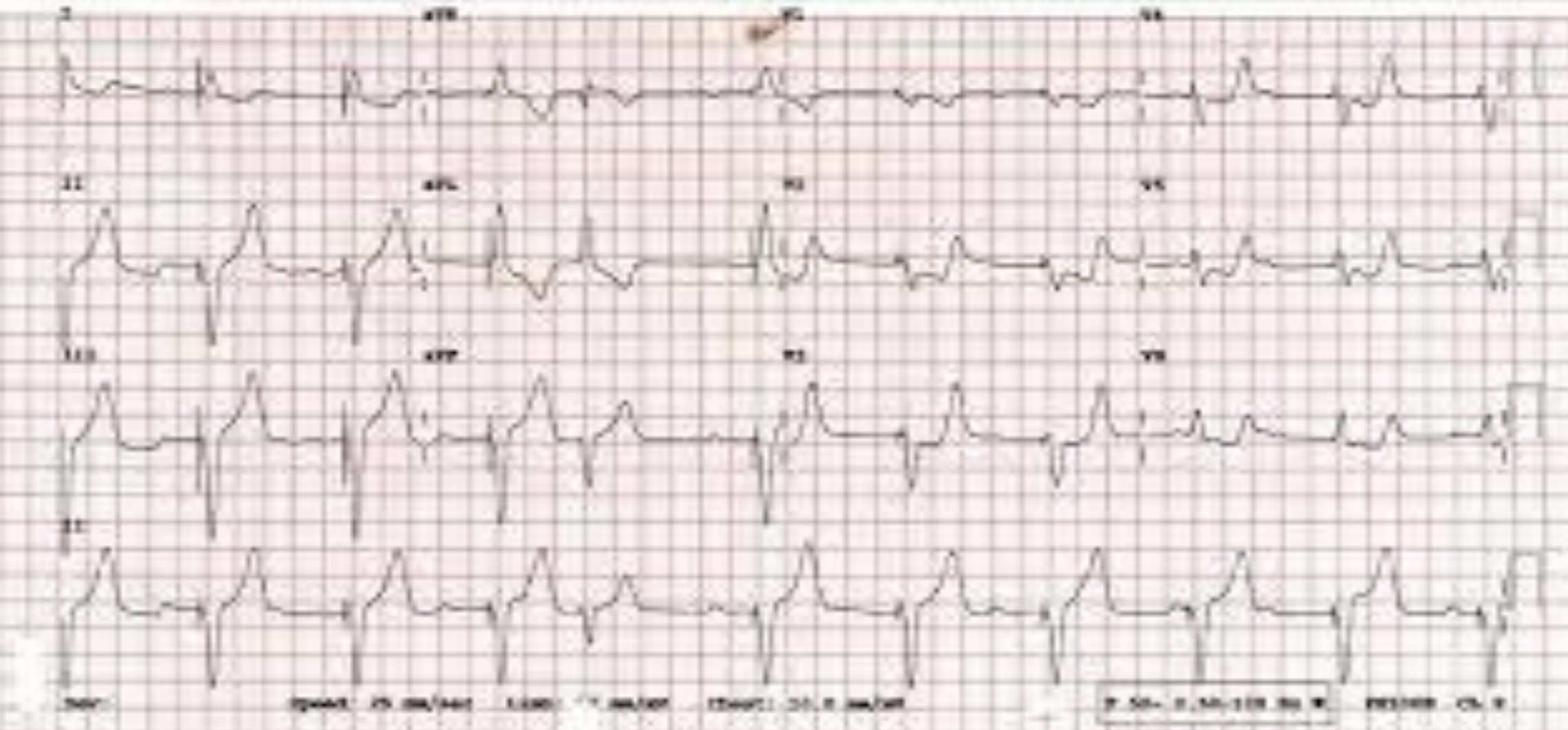
# So How Well Does this Concept of Concordance Perform?

- **90 % Specific**
- **36% Sensitive**
- **Not Bad Right?**

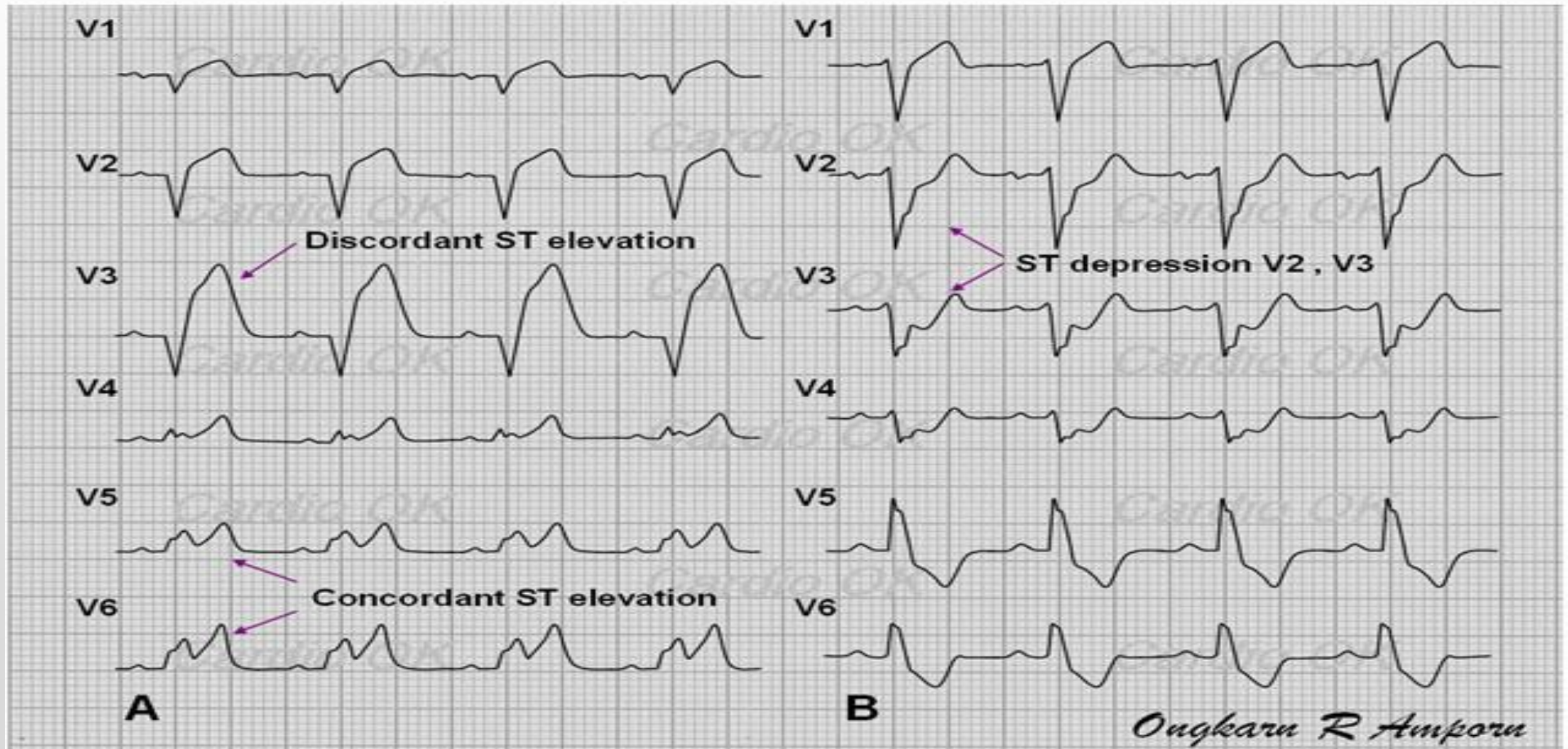
# But What About the Other Two Components of Dr. Sgarbossa's Criteria?



# Concordant Depression in V1, V2 and/or V3

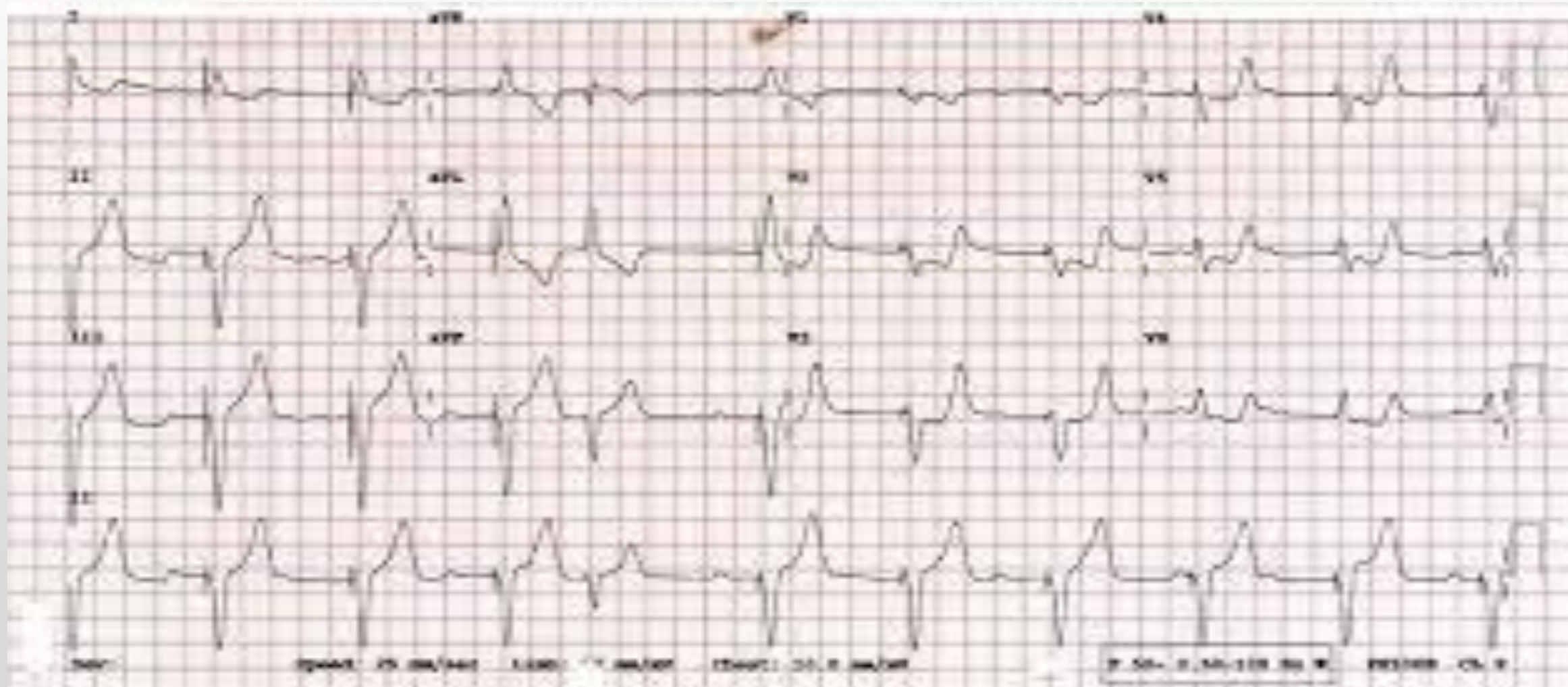


# Depression in V1,V2 and/or V3

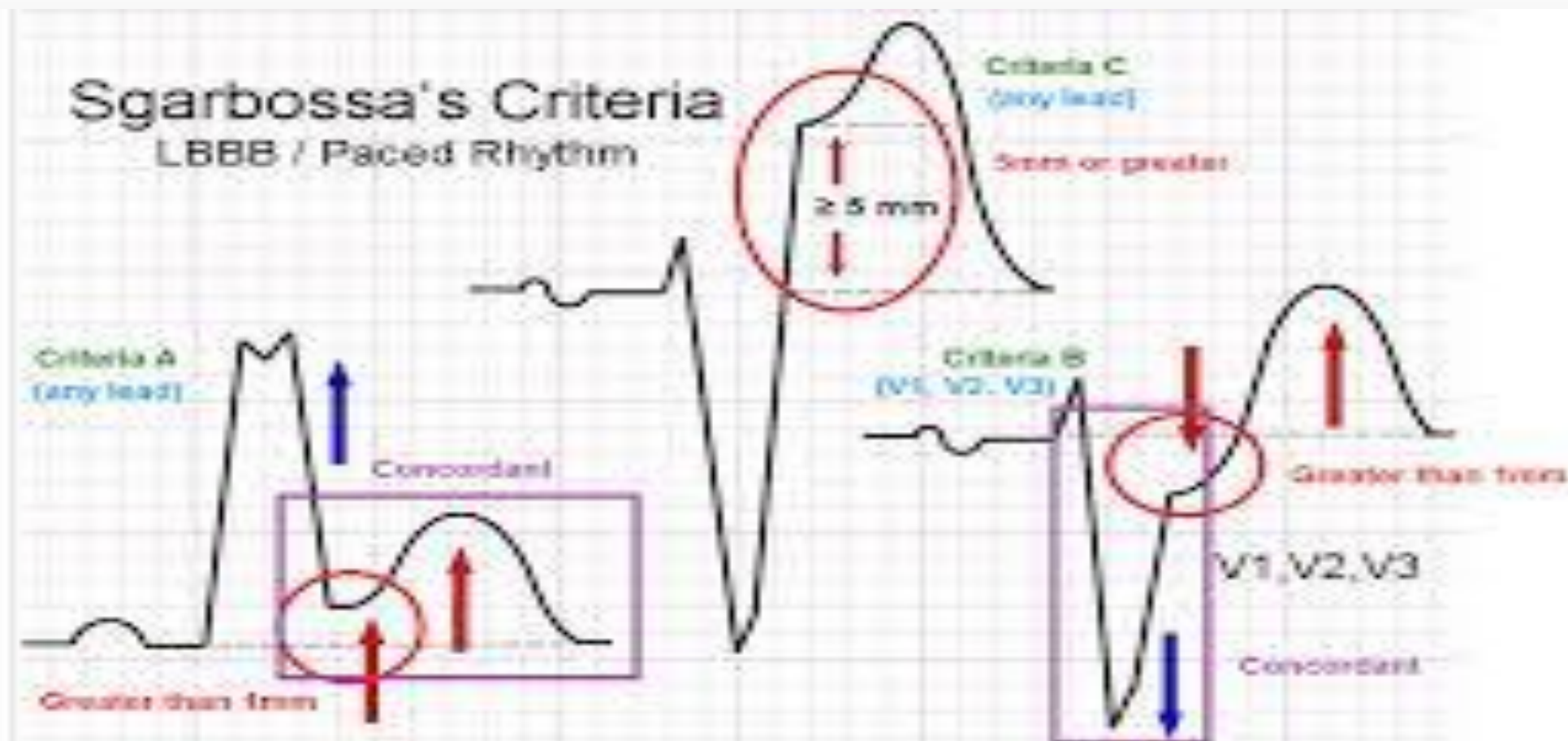




# Depression in V1,V2 and/or V3



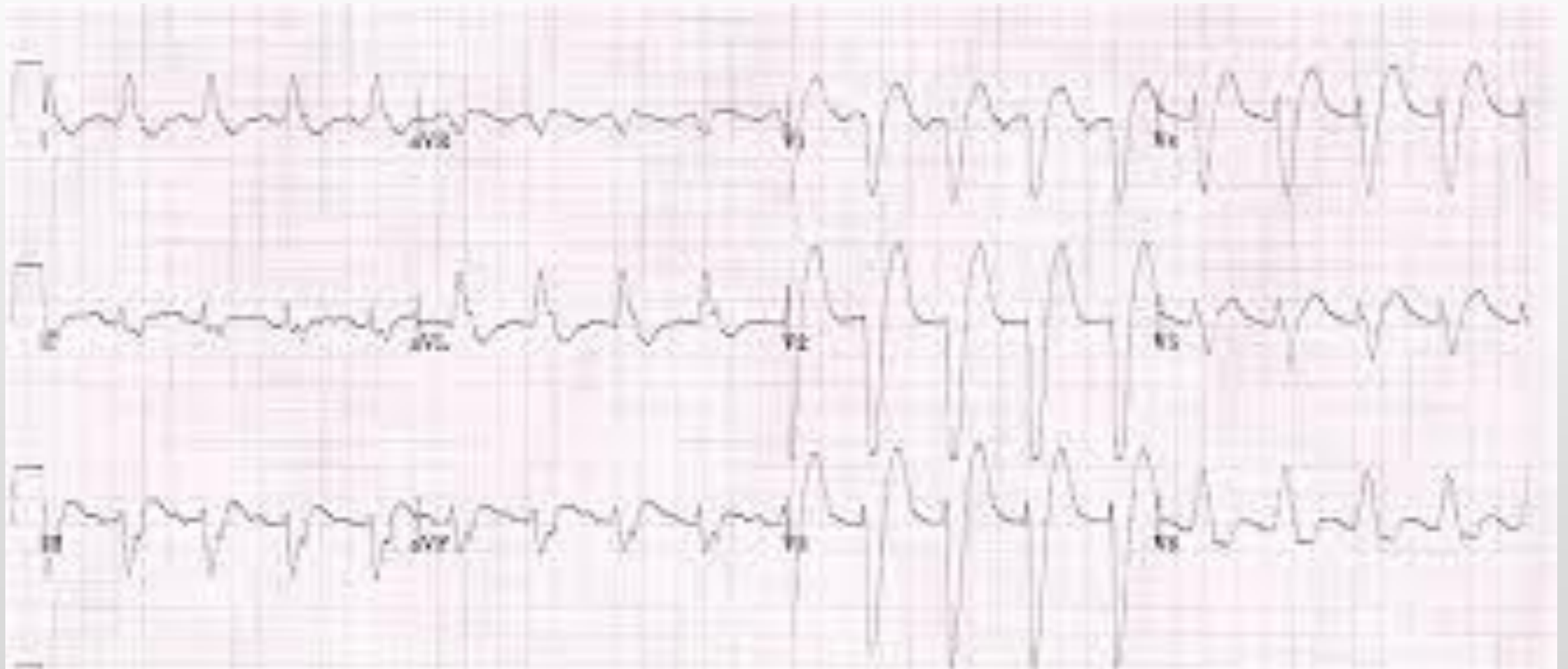
# The Third Sgarbossa Criterion



# I Call This “ST elevation out of proportion”

- What does that mean?
- For Dr. Sgarbossa it meant that the expected STE in a LBBB was greater than 5 mm
- It didn't work great but this is down and dirty right? Does it work in a pinch? Yes and no...

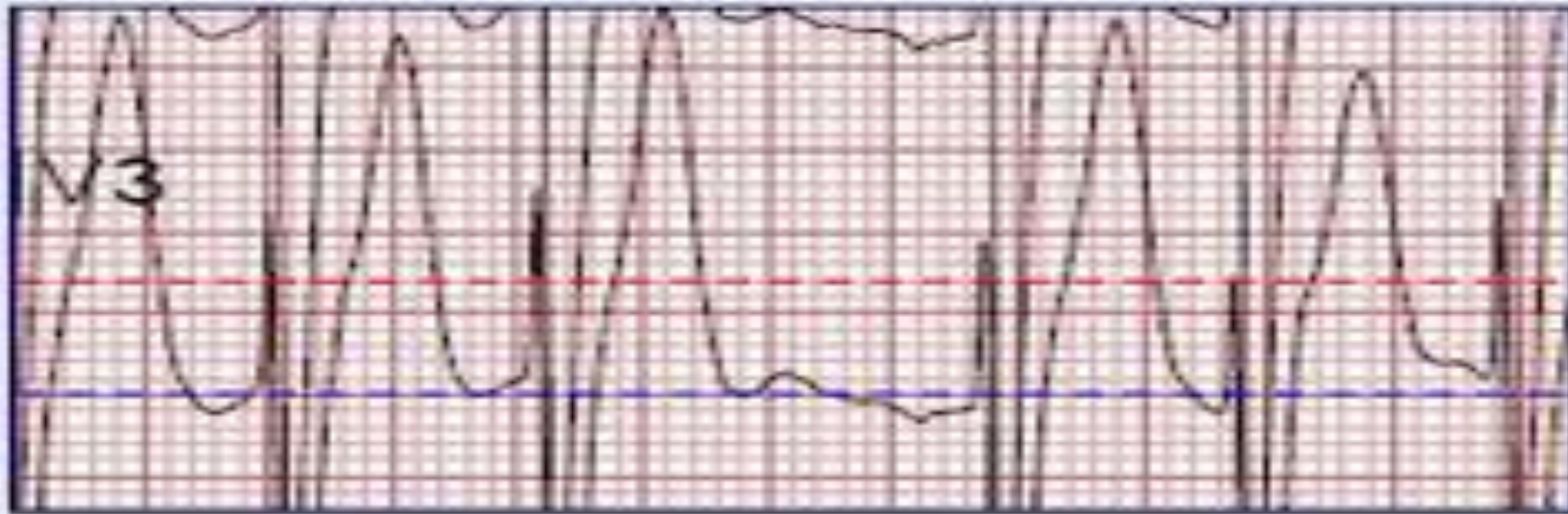
# STE “out of proportion”



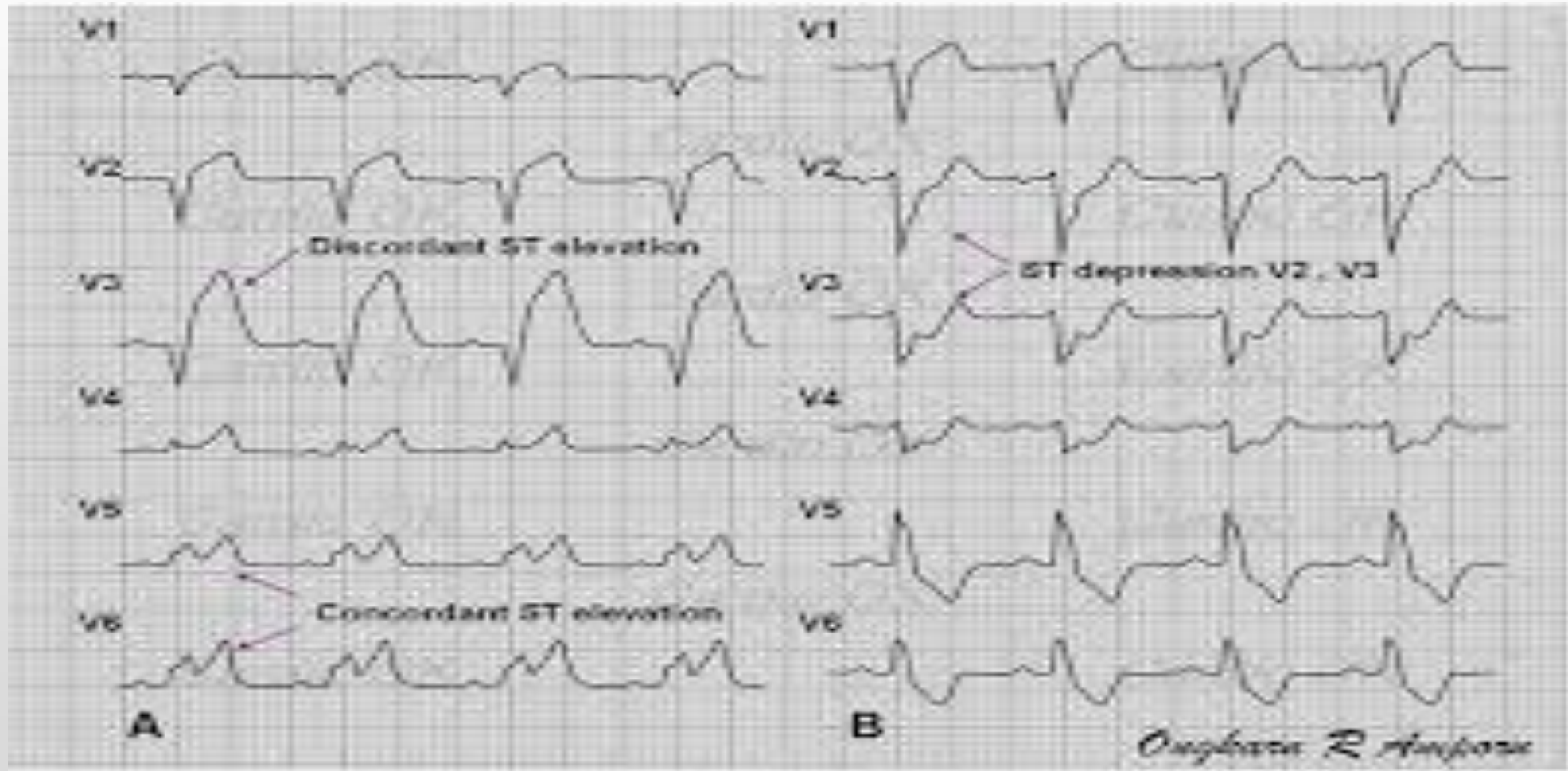
# STE “out of proportion”



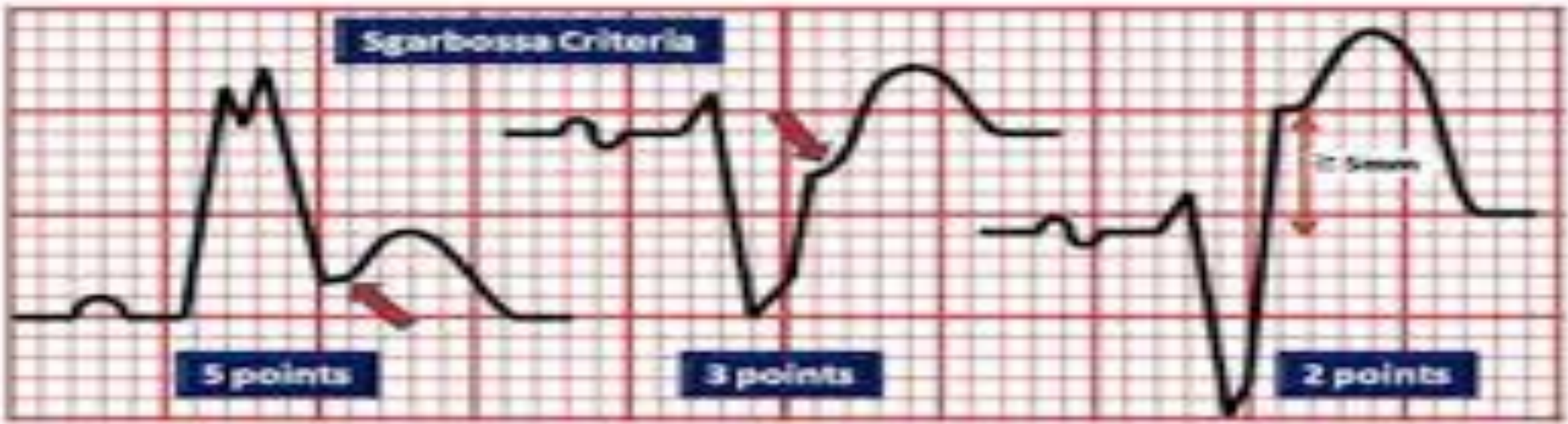
# STE “out of proportion”



# My Favorite Slide (again)



# So How Did Dr Sgarbossa Initially Use Her Score?



## Sgarbossa ECG Criteria for LBBB

Concordant STE $\geq 1$ mm	5 points
STD $\geq 1$ mm in V1 – V3	3 points
Discordant STE $\geq 5$ mm	2 points



# So How Many Points Are Bad?

- 5 points for concordance (remember I told you concordance is bad?)
- 3 points for ST depression in V1, V2 and/or V3
- 2 points for ST elevation greater than 5mm
- Greater than 3 points is considered significant (37% sensitive and up to 96% specific)

**Can I Tell a Story?**

# The Modified Sgarbossa Criteria

- Oh my goodness- my head hurts!

# Why the Modification?

**Sgarbossa's Criteria**  
LBBB

1 2 3

V1, V2, V3

**Stephen Smith, MD**

Autism Strategy Medicine

# What did Dr. Smith Modify?

- He did not modify this criteria just hurt my head
- He noticed that he could increase sensitivity and keep most of the specificity of Sgarbossa's original criteria by changing one thing
- But I just started getting the original concepts-why do I have to change?!

# Modified Sgarbossa Criteria

- Dr. Smith kept the name Sgarbossa in the criteria for two reasons
- Recognizable as the criteria looking at the LBBB in AMI
- To honor the work of Sgarbossa et al

# Busy Slide to Justify the Modified Criteria

**Table 1: NSTEMI Analysis**

	Sensitivity (95% CI)	Specificity (95% CI)
Original Sgarbossa	4 (0-23)	99 (94-100)
Modified Sgarbossa	63* (41-81)	88* (79-93)
Majority T-wave concordance (V5 or V6)	29* (13-51)	79* (70-86)
Majority T-wave concordance	46* (26-67)	64* (54-73)
Terminal T-wave concordance	79* (57-92)	47* (37-57)

\*p < 0.05 compared to Original Sgarbossa criteria

**Table 2: Any AMI (STEMI + NSTEMI) Analysis**

	Sensitivity (95% CI)	Specificity (95% CI)
Original Sgarbossa	37 (25-51)	99 (94-100)
Modified Sgarbossa	79 (66-88)	88 (79-93)
Modified Sgarbossa or Majority T-wave concordance	88** (76-95)	56** (46-66)
Modified Sgarbossa or Terminal T-wave concordance	91** (80-97)	43** (33-53)

\*\*p < 0.05 compared to Modified Sgarbossa criteria

# But I Don't Want to do it This Way!

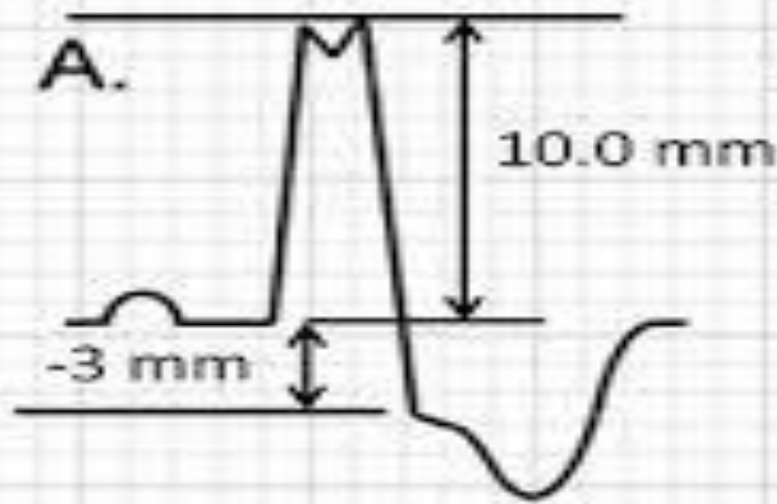
- At first this excuse rang true-after all this new thingy wasn't even validated-I am not doing it!
- But then something happened-Emergency Medicine and the Cardiologists validated the darn thing- ahh nuts...



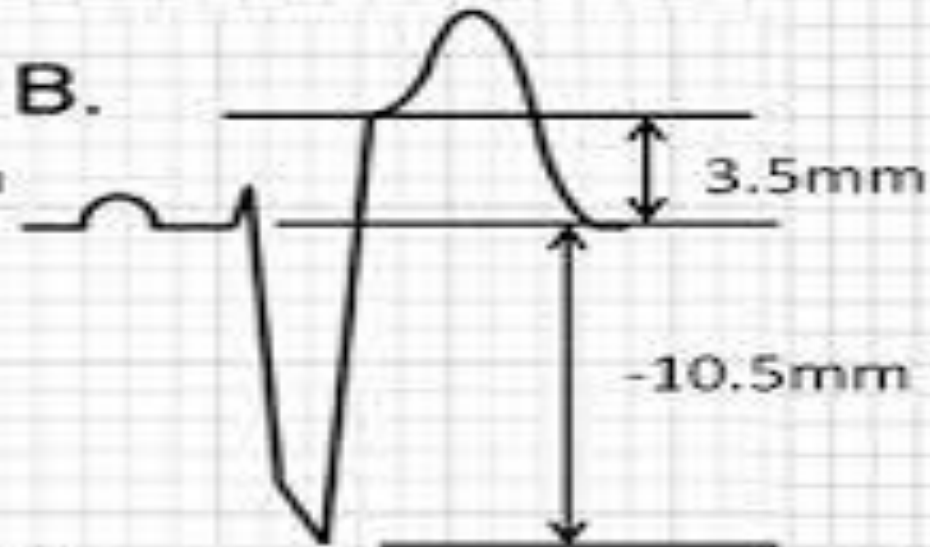
# So What Does Dr, Smith Want Us to Do?

- He took away the point system and noted that with his tool any one of the three criteria, if met, qualified the patient as a STEMI
- He took away the STE of 5mm or more and replaced that with a ratio of the STE/S-wave amplitude  $\geq 0.25$  or more
- So what in the heck does that mean?

# Modified Sgarbossa Criteria



$$\text{Ratio} = -3/10 = -0.30$$

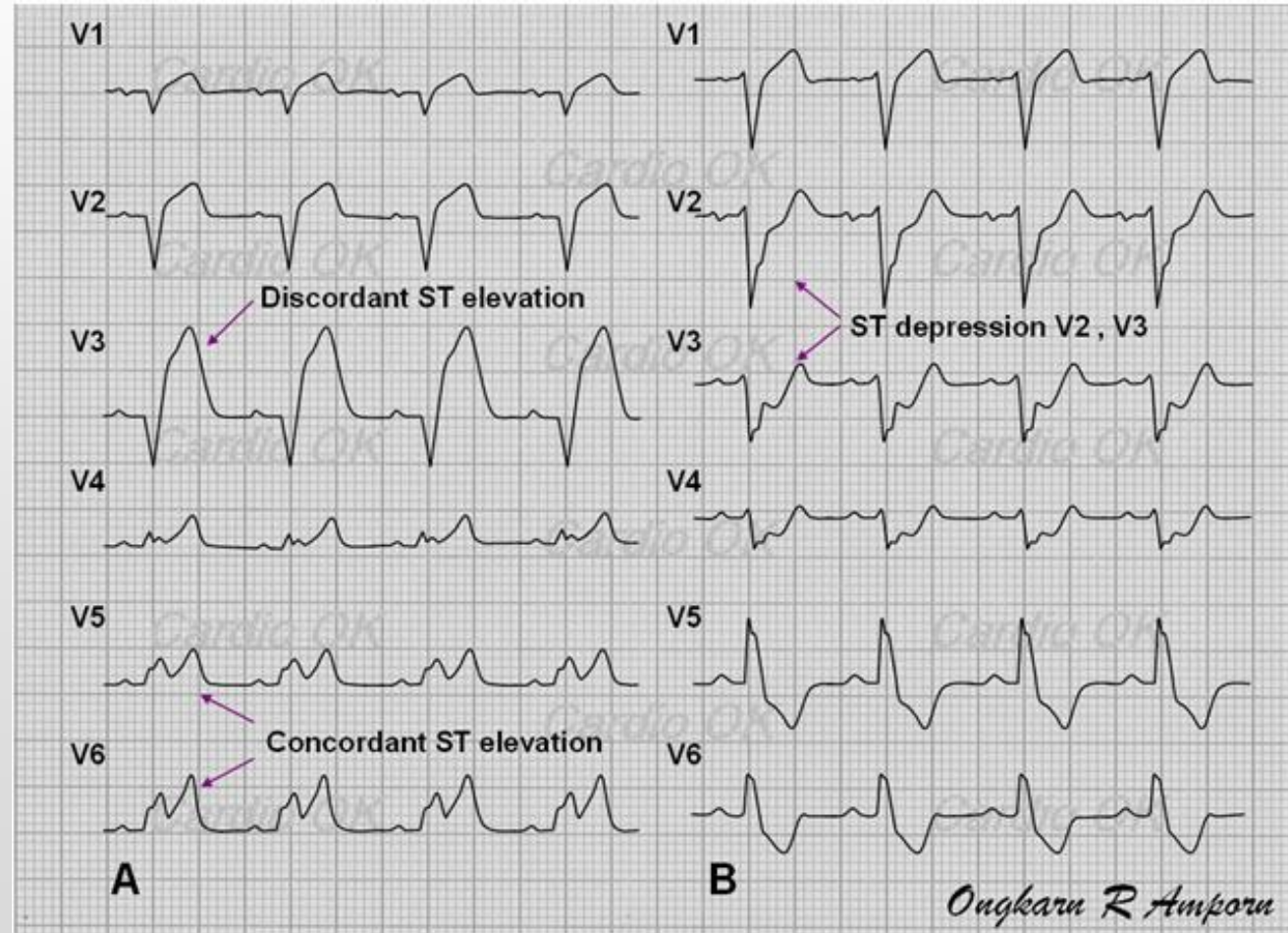


$$\text{Ratio} = 3.5/-10.5 = -0.33$$

# How Does This Perform?

- Turns out it performs pretty well
- Sensitivity went from 49% to 80%
- Specificity stayed amazing- 99% vs 100%
- The author's conclusion of the study to validate the Modified criteria: "The modified Sgarbossa criteria were superior to the original criteria for identifying ACO in LBBB."

# I Think I Have Some Work to do on my Favorite Slide!



Questions?

Thank You

