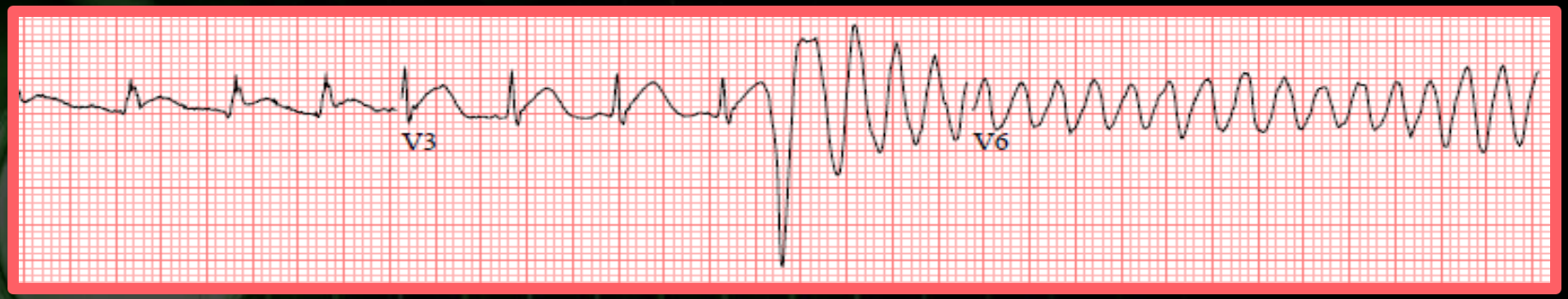
"Remember That Patient You Saw Last Night?!"

Pitfalls in the Diagnosis of ACS



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Department of Emergency Medicine
University of Maryland School of Medicine
Baltimore, Maryland

Disclosures

No affiliations with industry.

No financial conflicts of interest.

"Remember That Patient You Saw Last Night?!"

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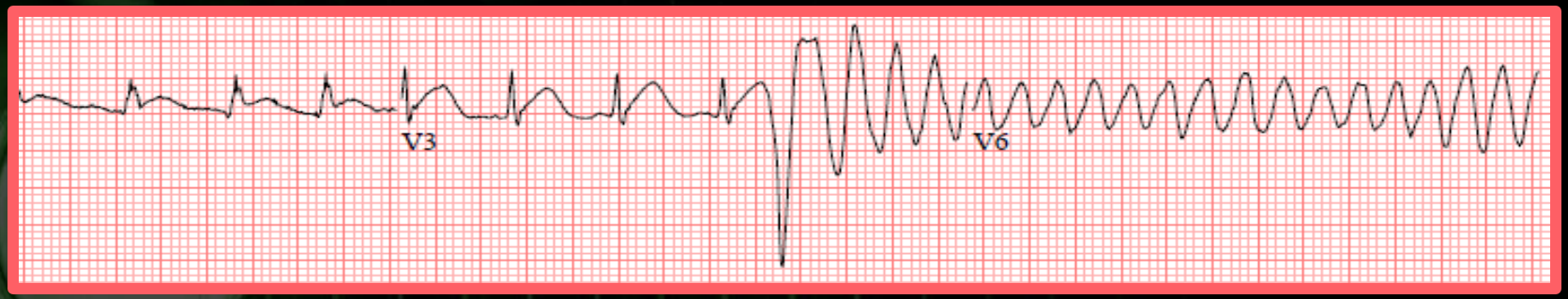

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Why We Miss ACS?

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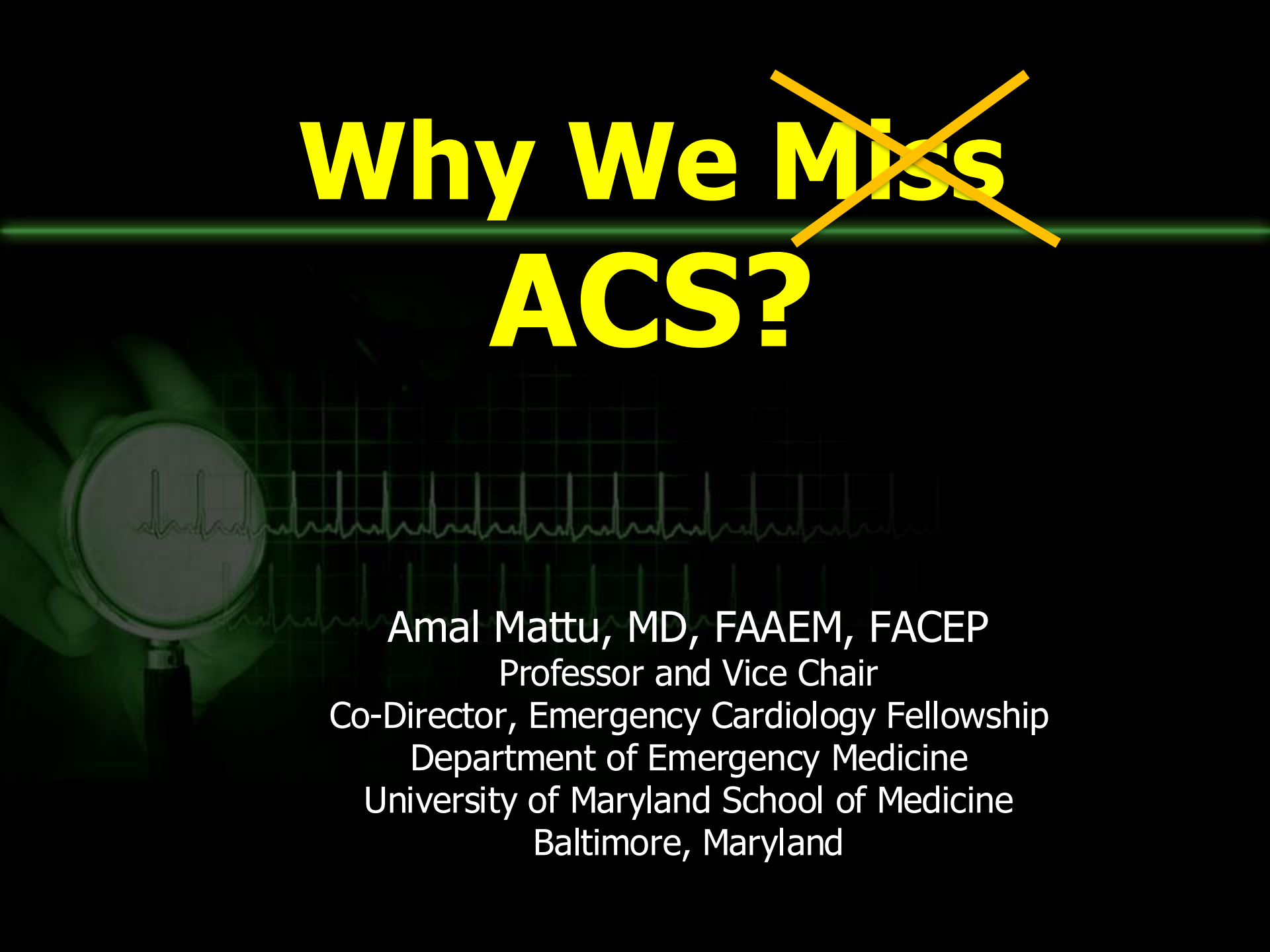
Why We ~~Miss~~ ACS?



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Get Sued For Why We Miss ACS?

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Objectives

- To discuss…
  - What subtleties must you know to better protect your patients.

Objectives

- To discuss…
  - What subtleties must you know to better protect your patients.
  - What must you know to better protect yourself.


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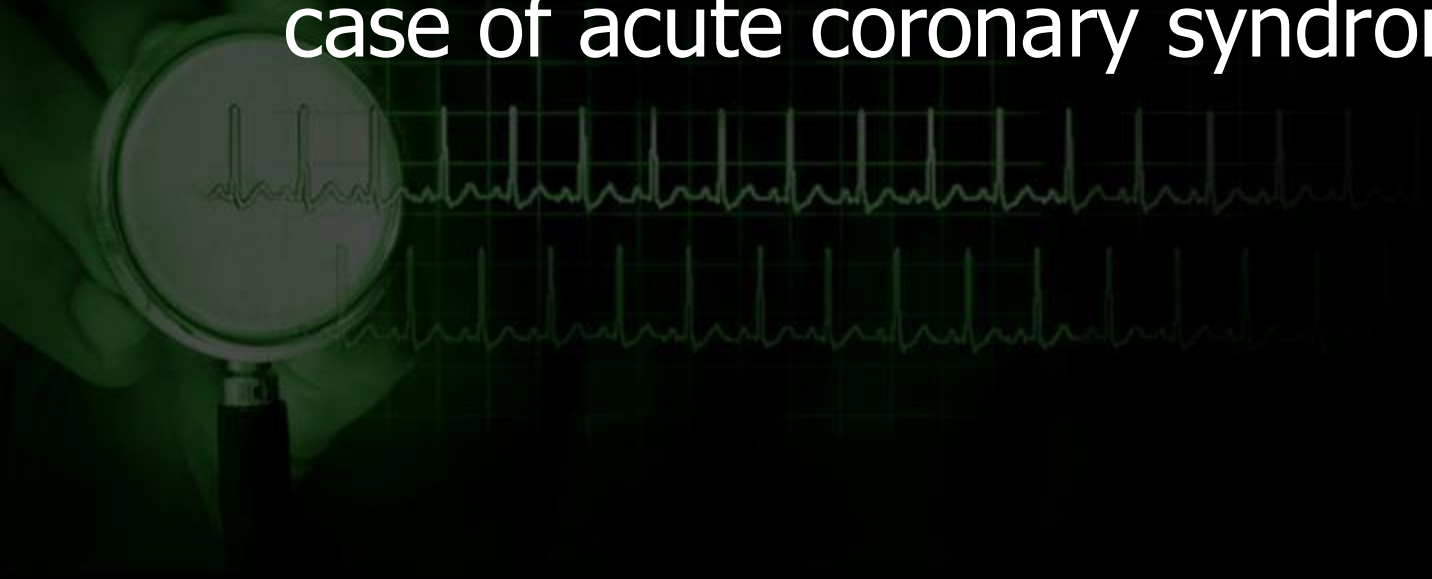
Rules of Cardiology

Rules of Cardiology

- Number 1: You cannot diagnose every case of acute coronary syndrome.



Rules of Cardiology

- Number 2: You can’t change rule #1

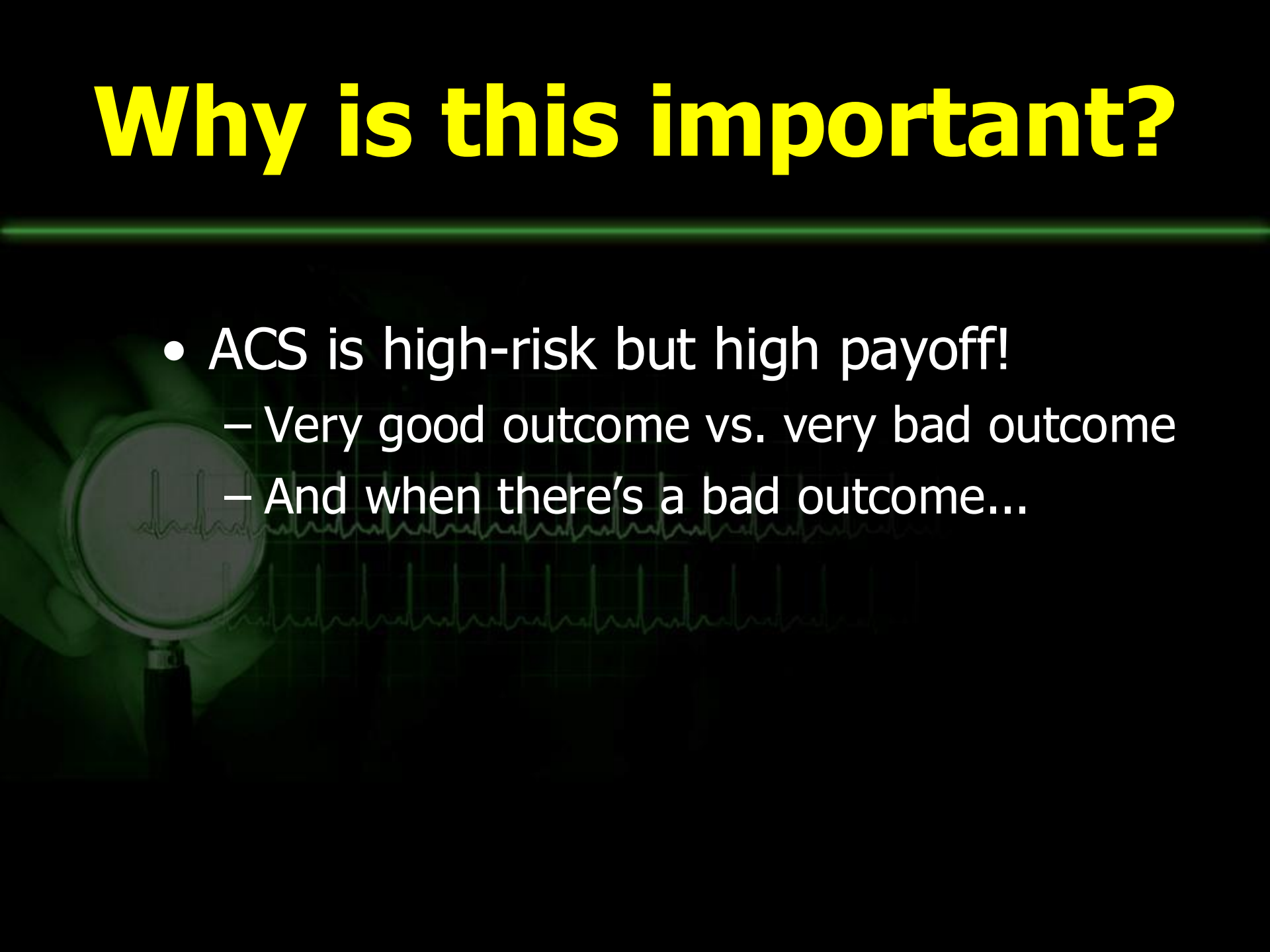
Why is this important?

Why is this important?

- ACS is high-risk but high payoff!
  - Very good outcome vs. very bad outcome

Why is this important?

- ACS is high-risk but high payoff!
  - Very good outcome vs. very bad outcome
  - And when there's a bad outcome...



Why is this important?

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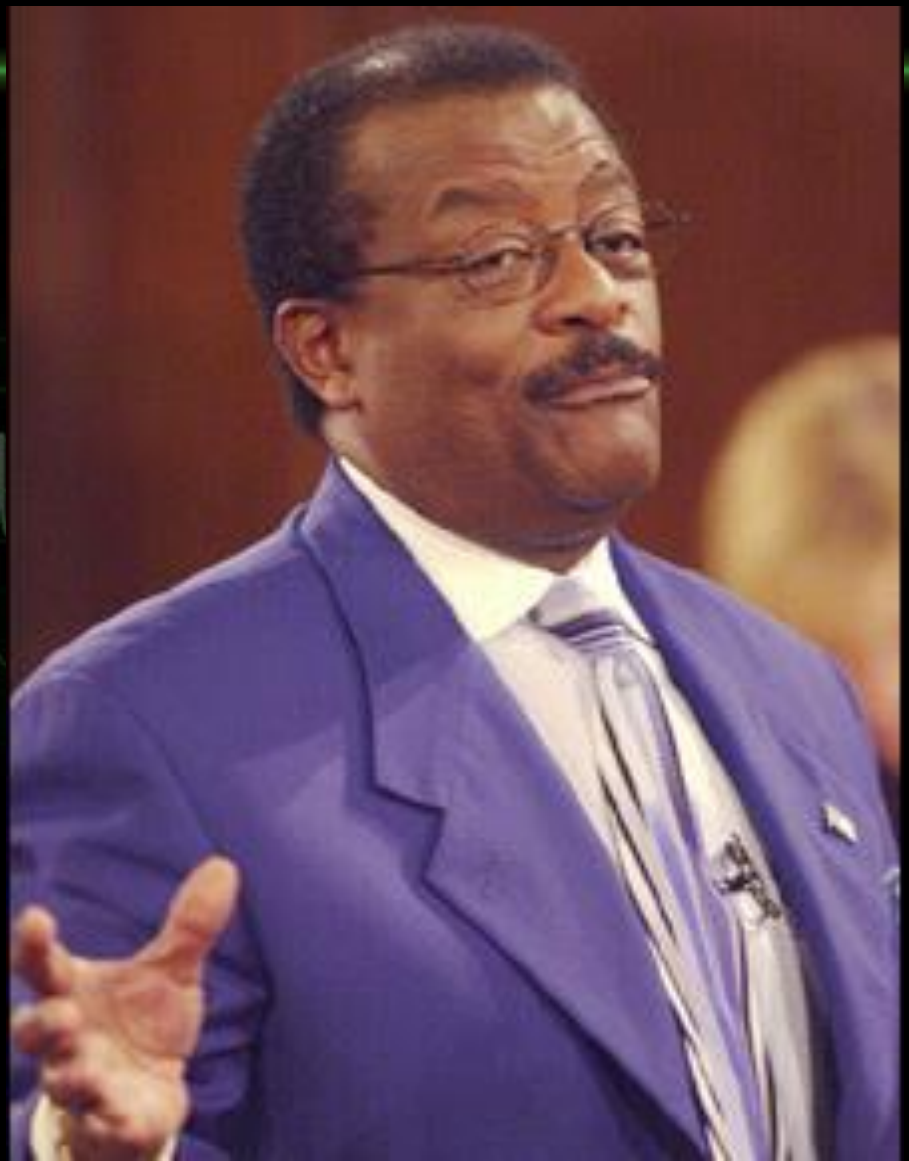

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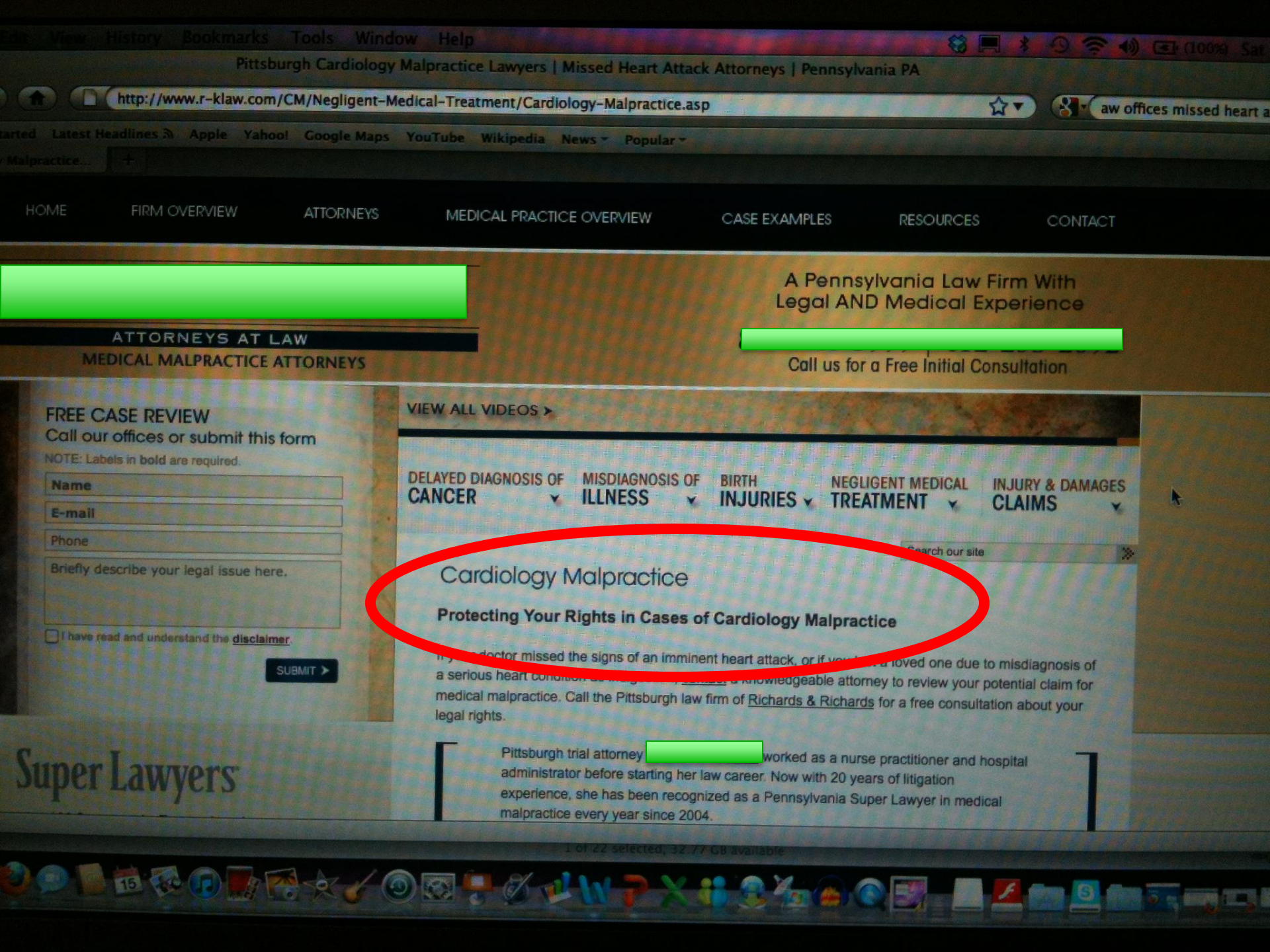
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http://www.r-klaw.com/CM/Negligent-Medical-Treatment/Cardiology-Malpractice.asp
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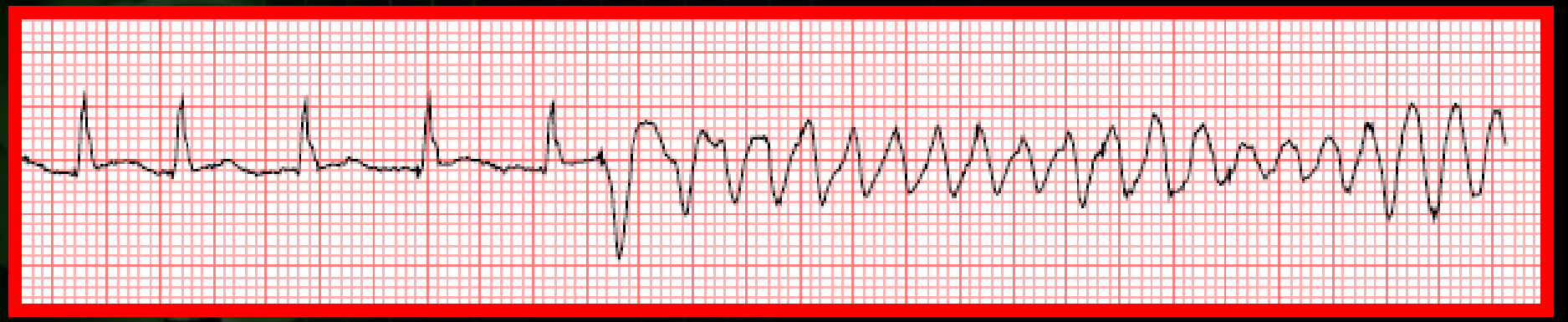
Why is this important?

- Missed ACS accounts for 20% of malpractice dollars paid out in EM

Why is this important?

- Missed ACS accounts for 20% of malpractice dollars paid out in EM
- The majority of cases involve failure to recognize concerning features in the history
- 25-50% of cases involve ECG misreads

Pitfalls in the Dx of ACS

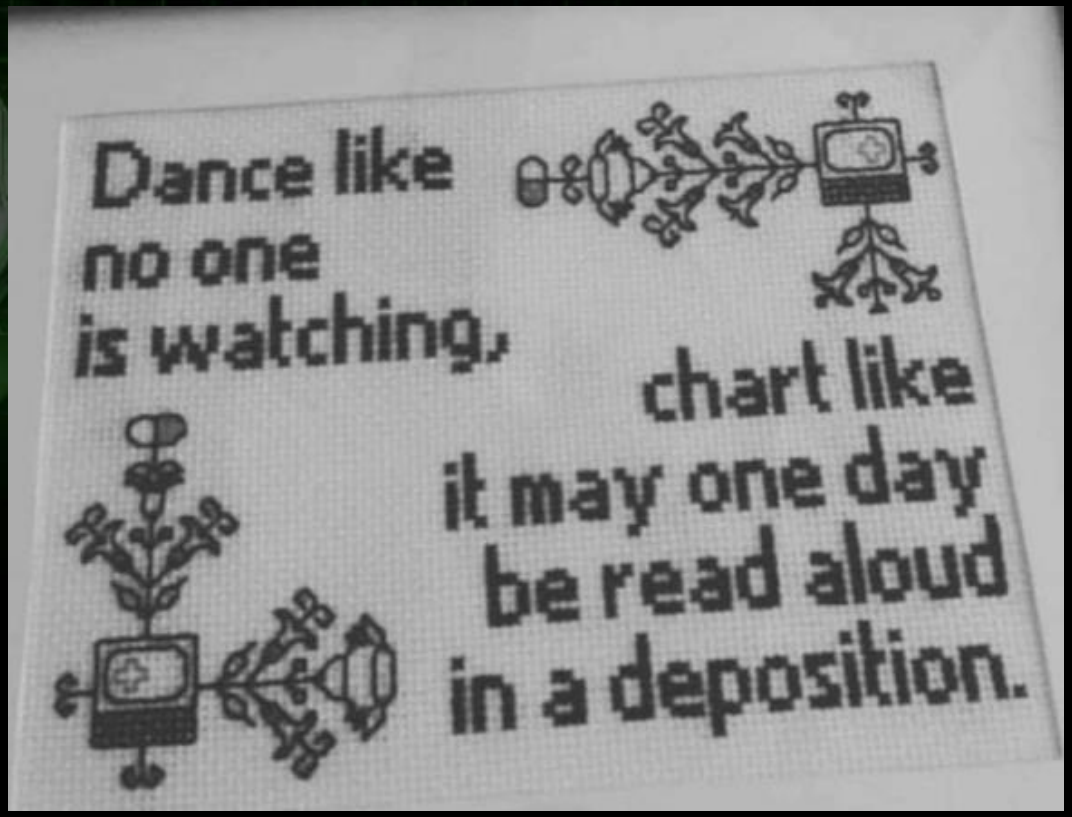


The History

Why are we missing ACS?

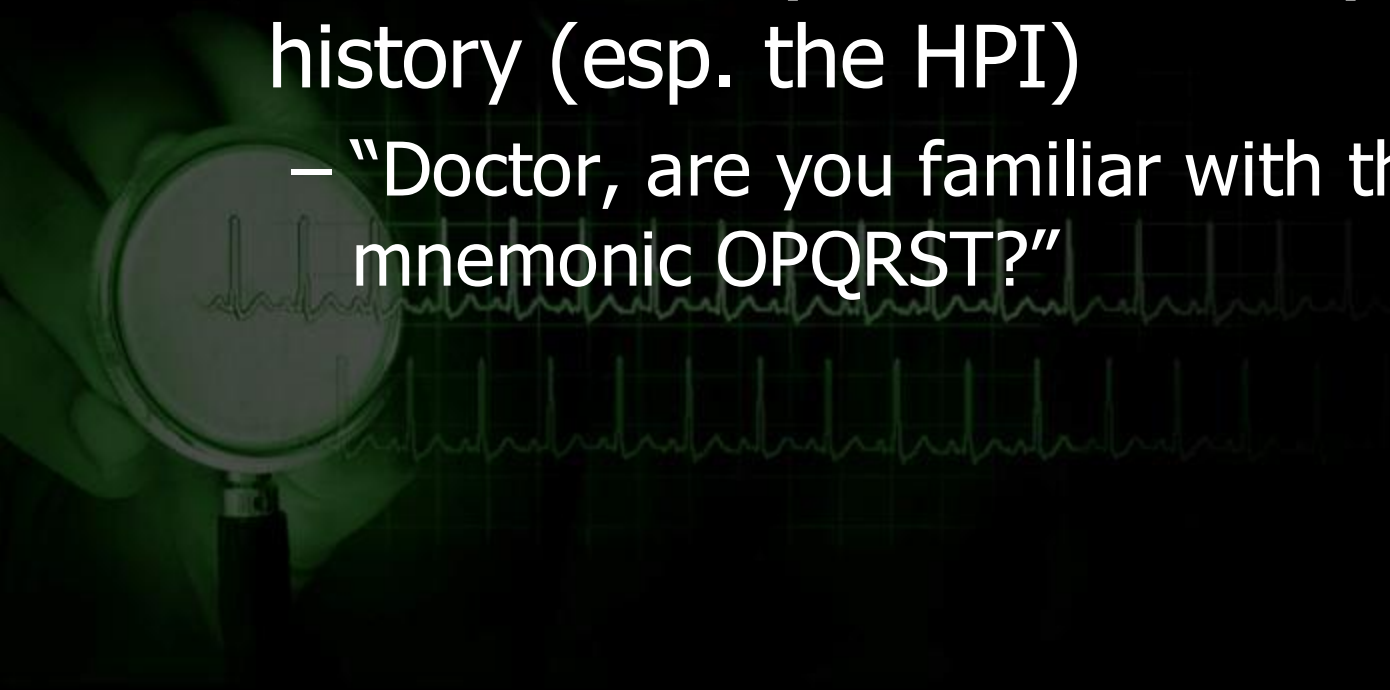
Why are we missing ACS?

- Failure to do (and document) a good history (esp. the HPI)



Why are we missing ACS?

- Failure to do (and document) a good history (esp. the HPI)
  - "Doctor, are you familiar with the mnemonic OPQRST?"



Why are we missing ACS?

- Failure to do (and document) a good history (esp. the HPI)
  - "Doctor, are you familiar with the mnemonic OPQRST?"
  - "Doctor, why is it important to do a good history?"

Why are we missing ACS?

- Failure to do (and document) a good history (esp. the HPI)
  - "Why is it important to ask about...
    - the **o**nset?"
    - the **p**recipitating factors?"
    - the **q**uality?"
    - the **r**adiation?"
    - the **s**everity?"
    - the **t**iming?"

Why are we missing ACS?

- **OLDCAAAR** HPI for patients with CP
  - **O**nset
  - **L**ocation
  - **D**uration
  - **C**haracter
  - **A**lleviating/aggravating factors
  - **A**ctivity at onset
  - **A**ssociated Sx's
  - **R**adiation

Why are we missing ACS?

- Caveats
  - We understand that…
  1. We don't document everything we ask/do
  2. HPI is only one component of any ADP
     - Only 20% of the HEART score

BUT…

Why are we missing ACS?

- Caveats
  - We understand that…
  1. We don't document everything we ask/do
  2. HPI is only one component of any ADP
     - Only 20% of the HEART score

BUT…

- Good documentation of a good Hx might keep you out of trouble in the first place

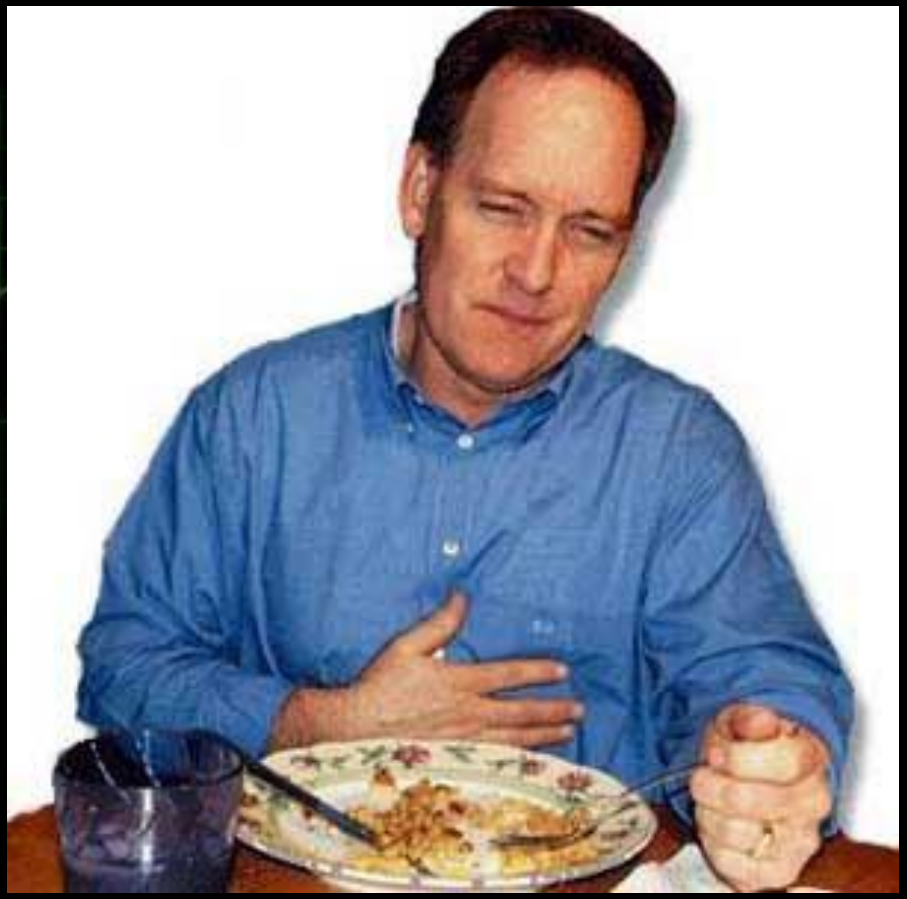
"Even though the plaintiff has fully recovered, just think how much he could enjoy his health if you make him rich."

Why are we missing ACS?

- What's the most common misdiagnosis?

Why are we missing ACS?

- Misdiagnosis as reflux



Why are we missing ACS?

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Why are we missing ACS?

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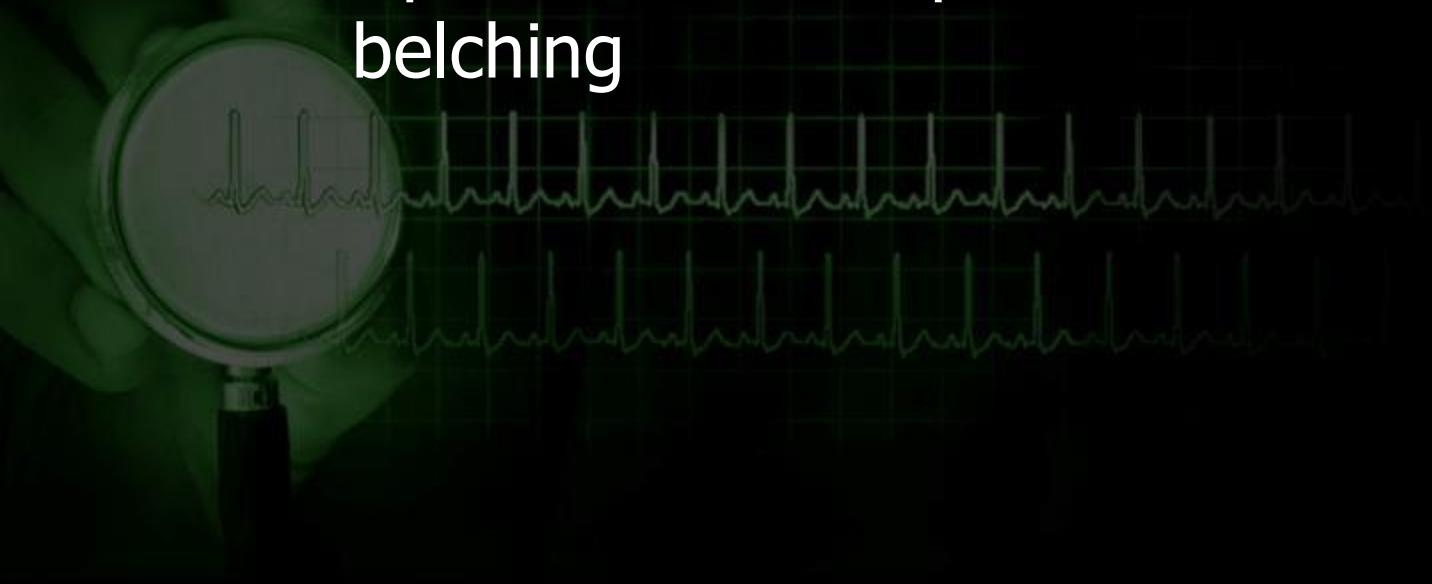
  - Up to 50% of MI patients have increase in belching



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  - 8% of patients report their ACS pain began during a meal
  - GERD and ACS frequently co-exist

Why are we missing ACS?

Why are we missing ACS?

- Failure to appreciate ACS in young pts.

Young Patients and Atherosclerosis

- Age
  - ACS is typically reported > 55yo.

Young Patients and Atherosclerosis

- Age
  - Young patients
    - 123,000 AMIs per year in patients 29-44yo.
    - 5-10% of AMIs occur in patients < 45yo.
    - minority are related to cocaine use

Young Patients and Atherosclerosis

- Autopsy studies — Korean/Vietnam wars
- Joseph, et al (*J Am Coll Cardiol*, 1993)
  - Autopsy study of 111 patients (< 35yo., avg. age 26yo.), victims of non-cardiac trauma

Young Patients and Atherosclerosis

- Autopsy studies — Korean/Vietnam wars
- Joseph, et al (*J Am Coll Cardiol*, 1993)
  - Autopsy study of 111 patients (< 35yo., avg. age 26yo.), victims of non-cardiac trauma
    - evidence of atherosclerosis in 78%
    - 20% had LAD or "significant" 2- and 3- vessel involvement
    - 9% had > 75% narrowing in at least one vessel


HEART ATTACK CAFE
DEEP FRIED
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Cheese Crisps
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Young Patients and Atherosclerosis

- Marsan, et al (Acad Emerg Med, 2005)
  - 1023 patients 24-39yo. presenting with CP
  - Cocaine users excluded
  - 98% available for 30-day follow-up

Young Patients and Atherosclerosis

- Marsan, et al (Acad Emerg Med, 2005)
  - 1023 patients 24-39yo. presenting with CP
  - Cocaine users excluded
  - 98% available for 30-day follow-up
    - 5.4% ruled in for ACS
    - 2.2% had an adverse cardiac event (death, MI, need for PCI or CABG)

Young Patients and Atherosclerosis

Young Patients and Atherosclerosis

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ACCESSORIES NOT INCLUDED

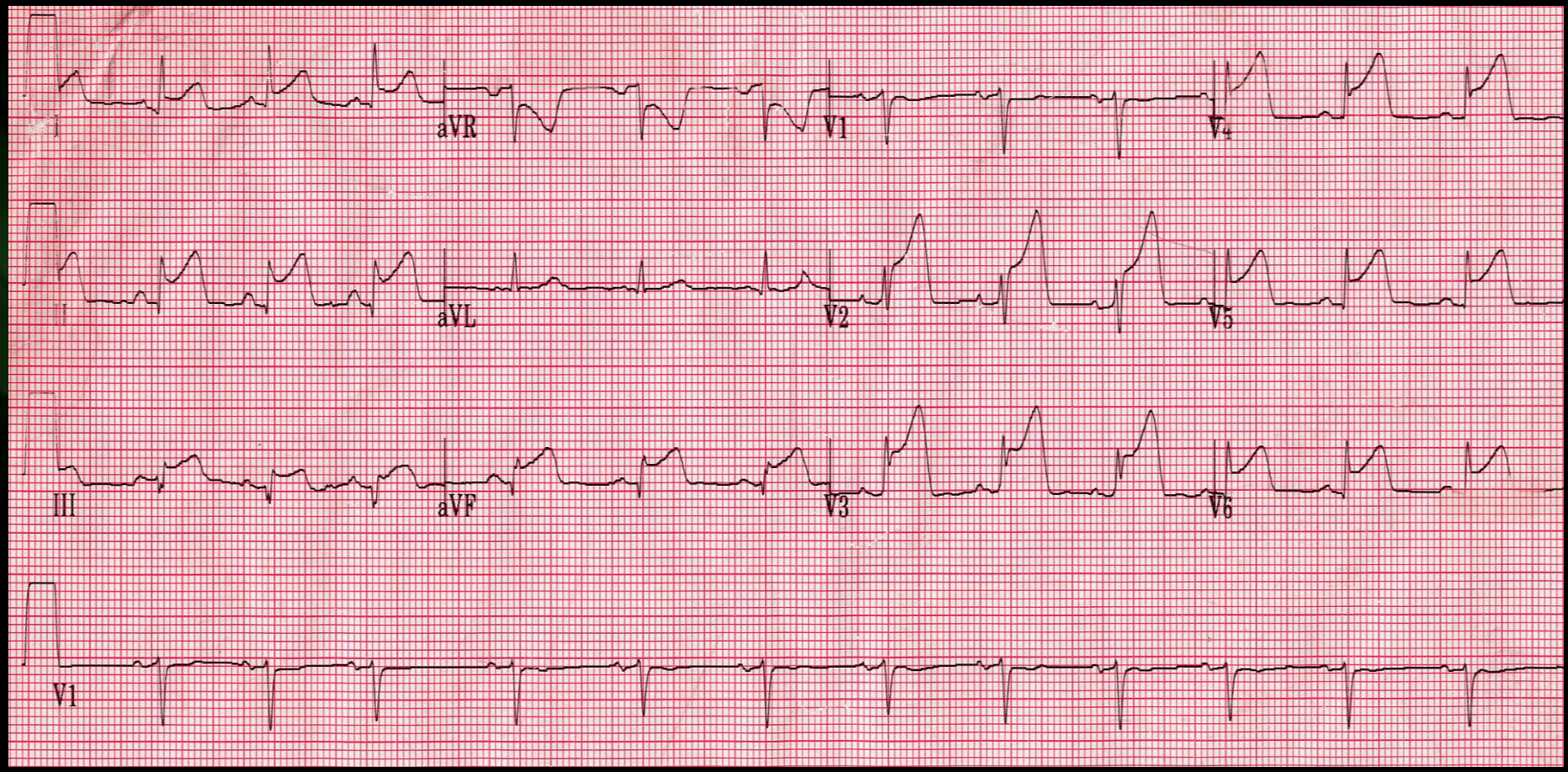
Young Patients and Atherosclerosis

- "…in 2009, pediatricians wrote children in the U.S. at least 2.8 million prescriptions for drugs to lower cholesterol; nearly 2.3 million of them were for statins."

(ConsumerReports.org, June 2010)

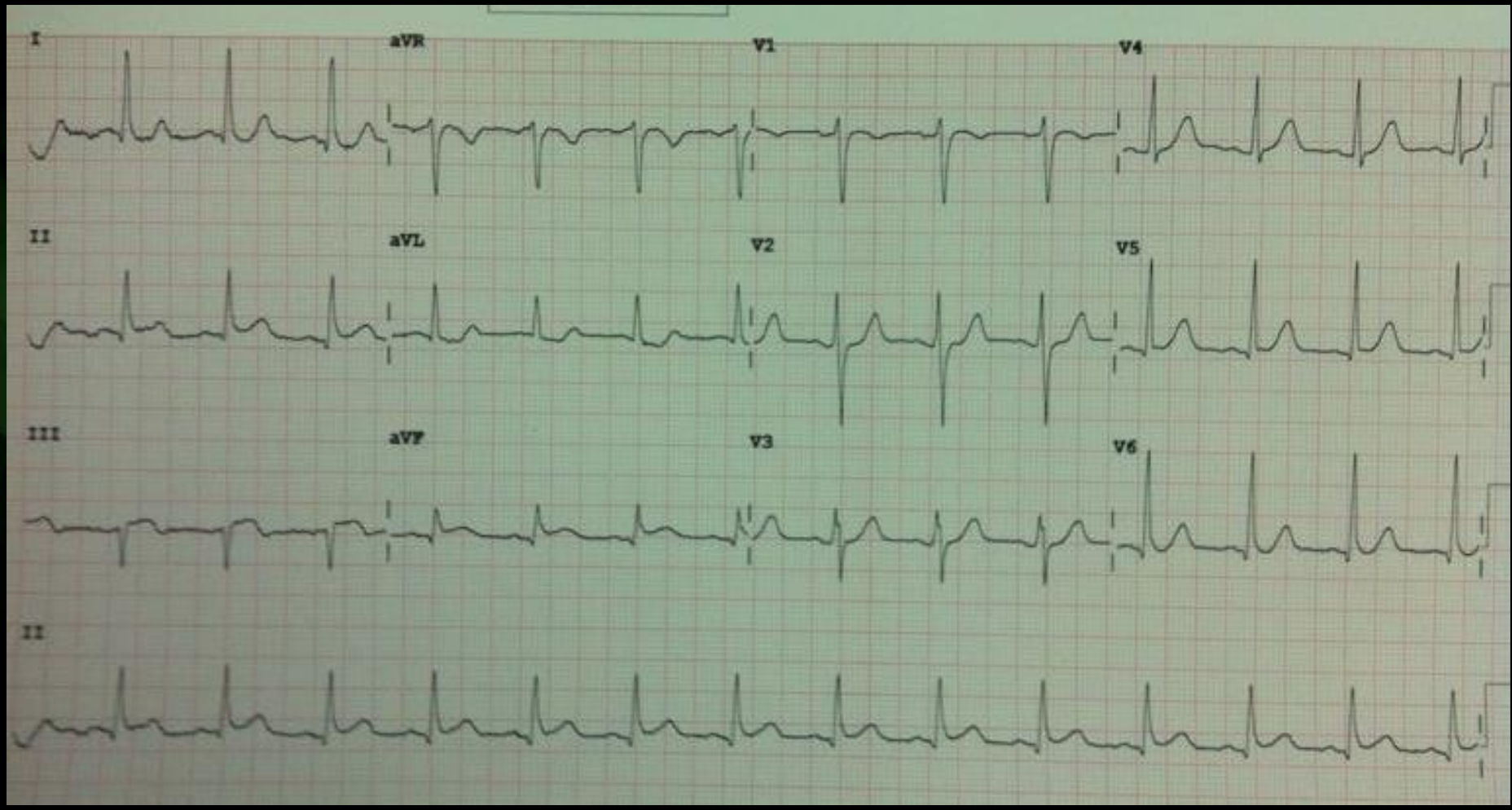
27 yo M with CP, initial dx pericarditis bc no CRFs

Courtesy Dr. Al Sacchetti



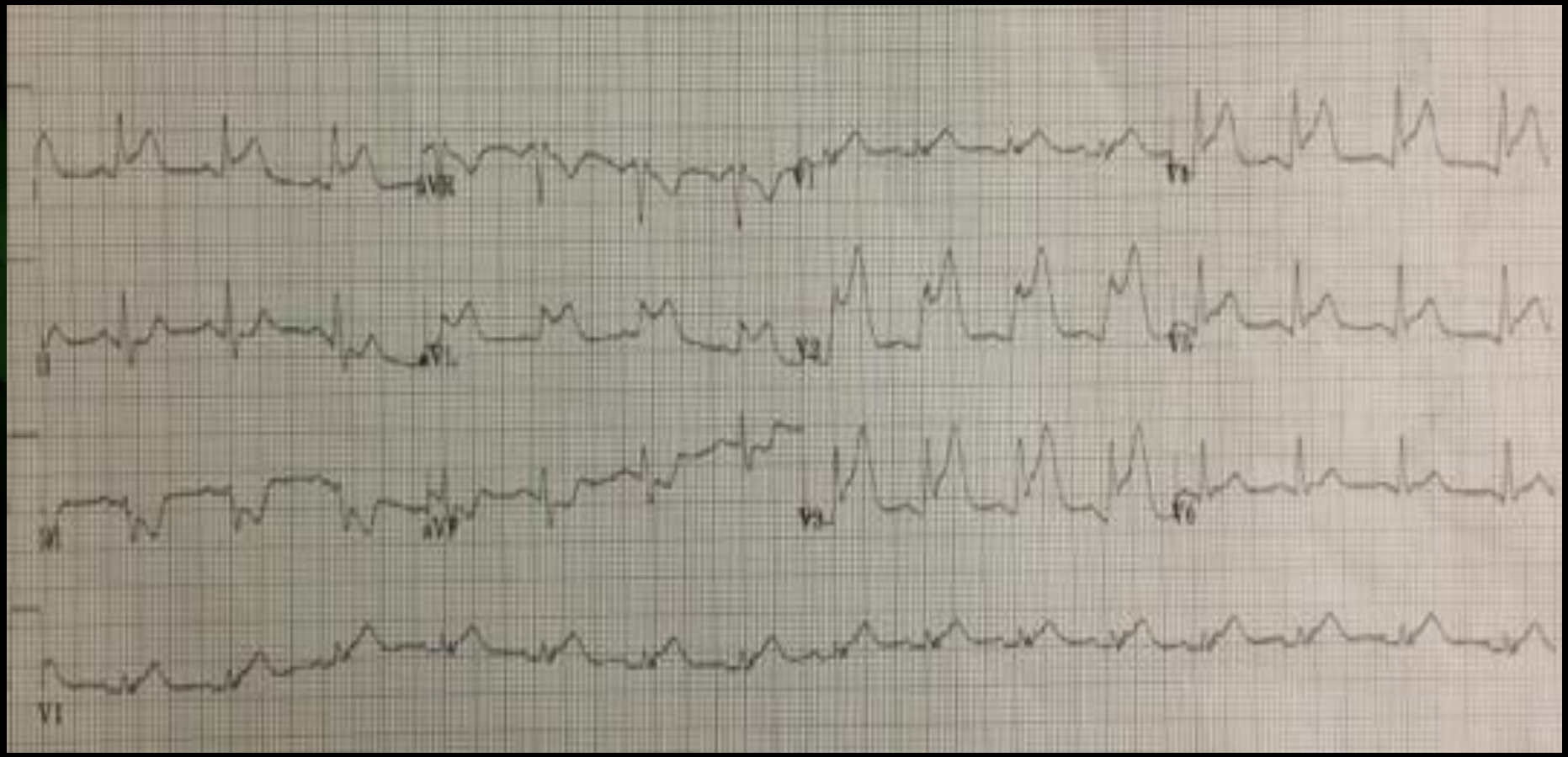
30 yo M misDx'd as pericarditis by consultant bc of age, no CRFs

Dr. Hasdan AlMaateeq



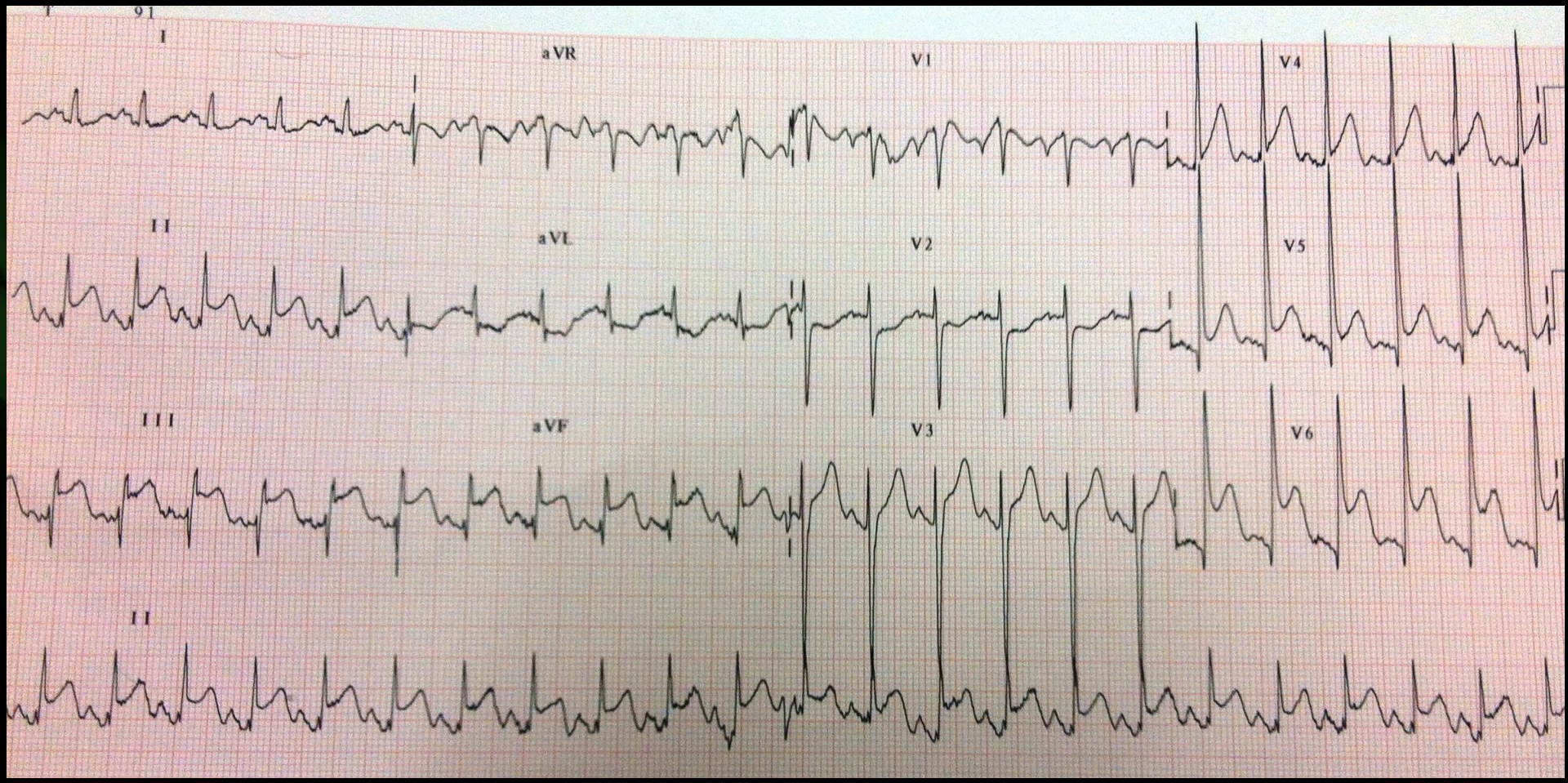
24 yo M with vom & CP after a new workout

Courtesy Dr. Steven Gentile



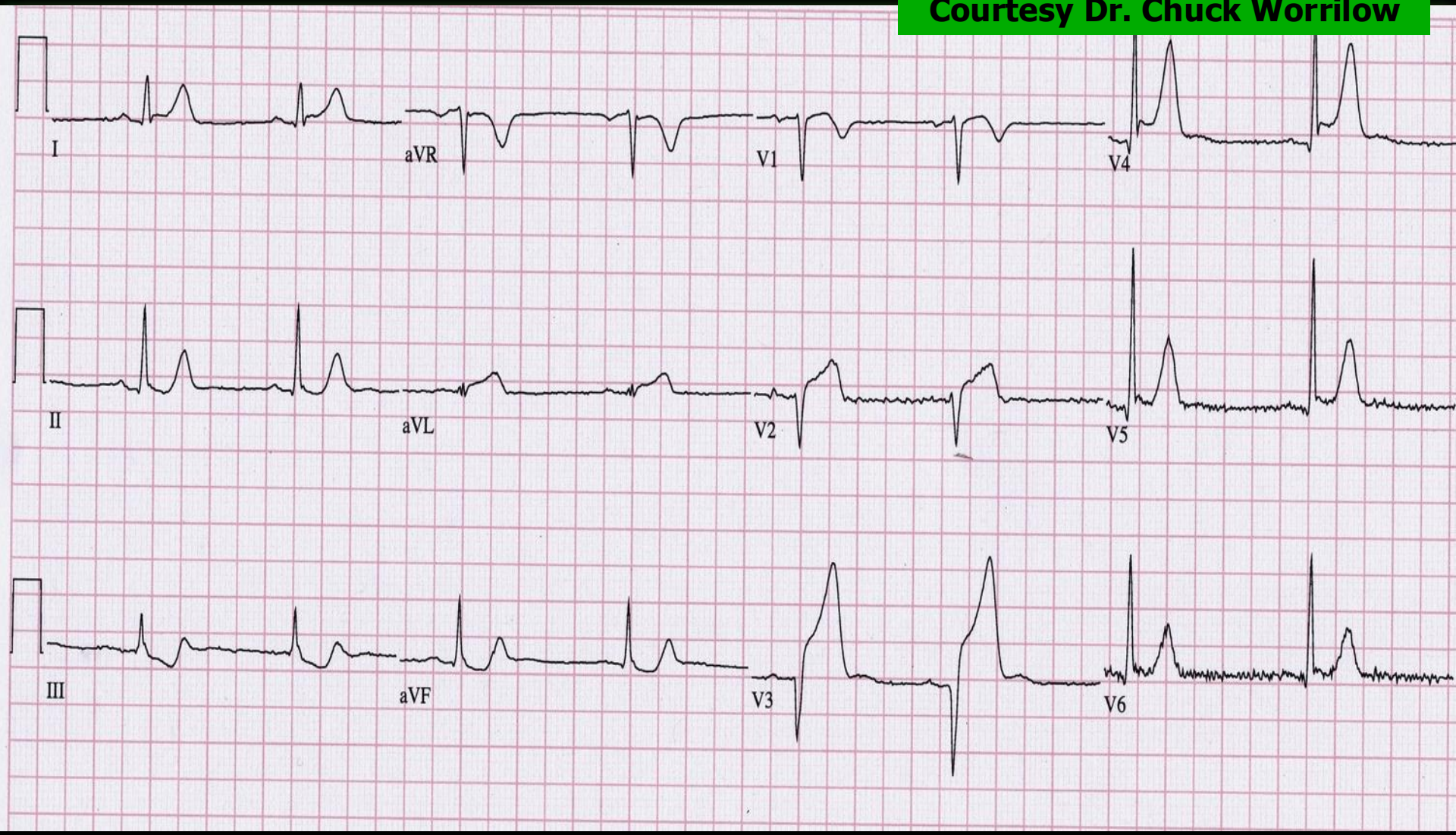
29 yo F with severe chest pain (HIV +)

Courtesy Dr. Lara Goldstein

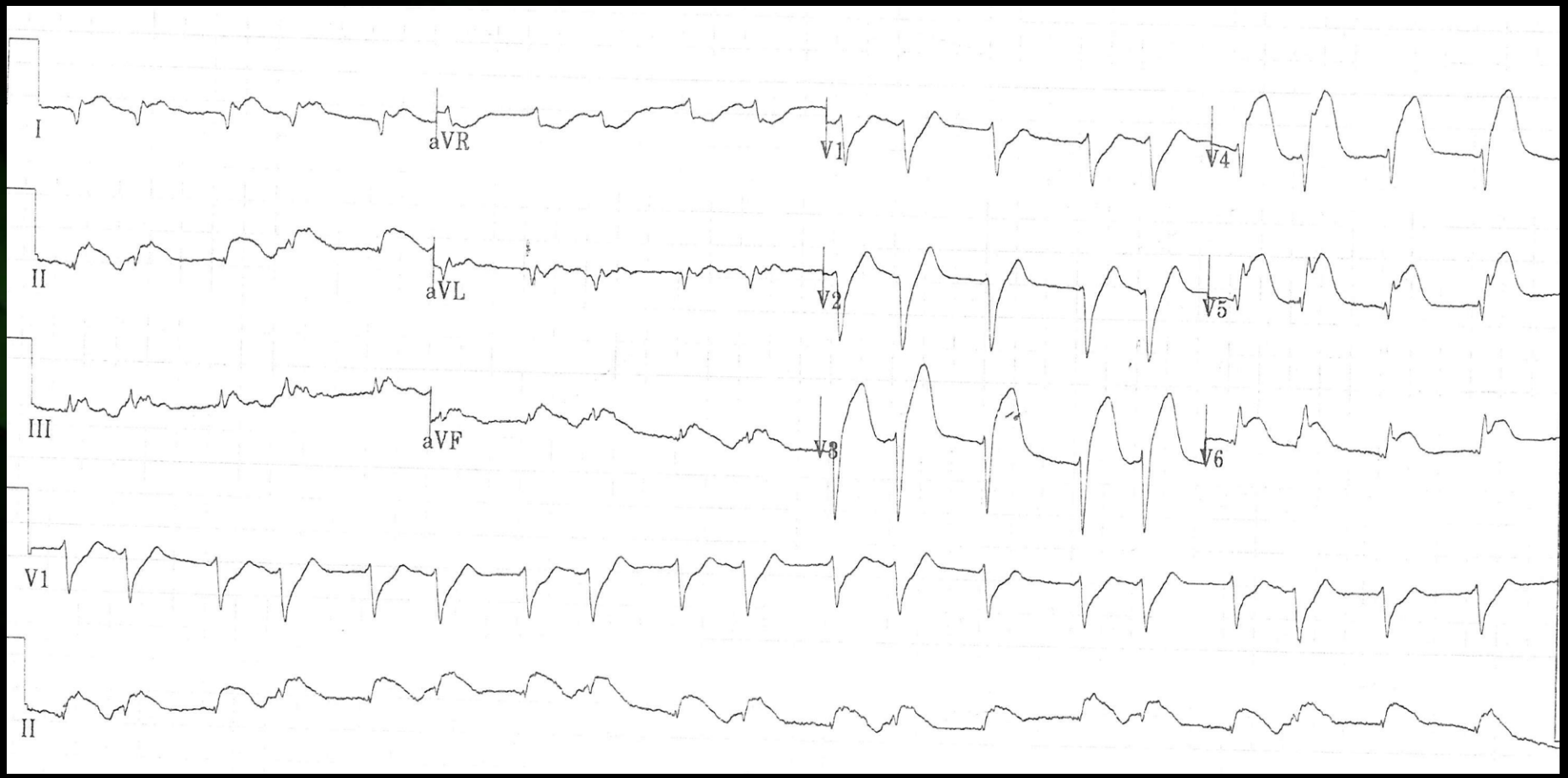


25 yo man with chest pain (smoker, DM)

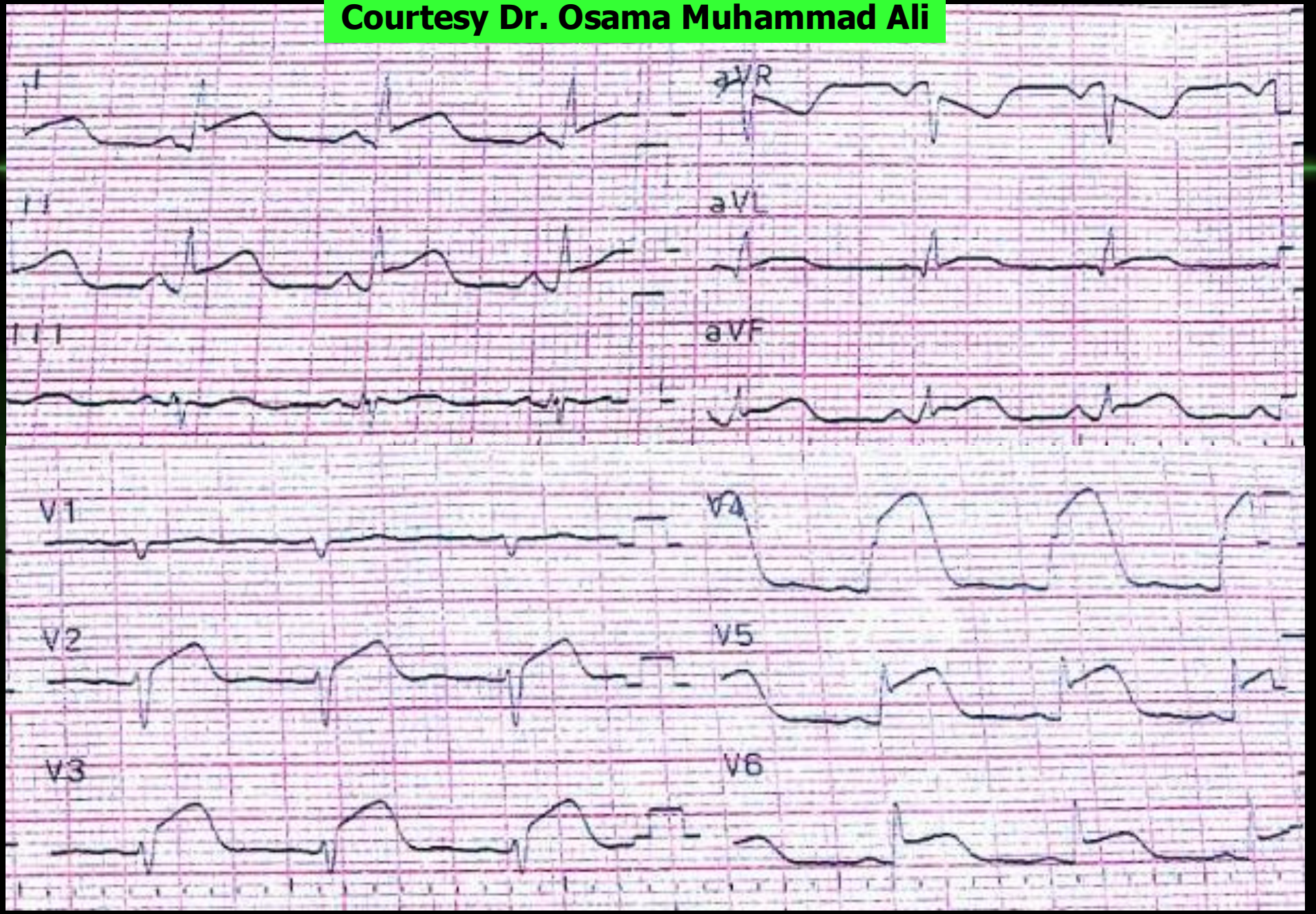
Courtesy Dr. Chuck Worrilow



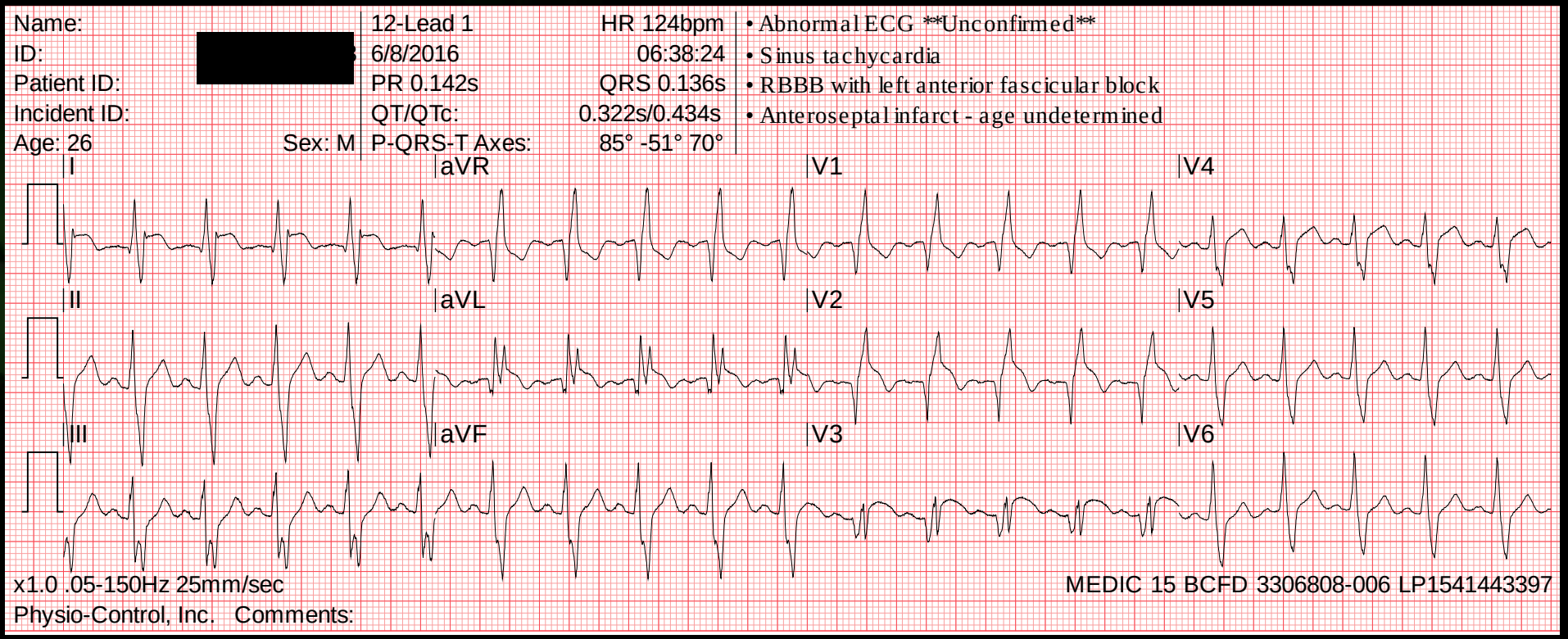
23 yo M police officer, steroid use for bodybuilding, died



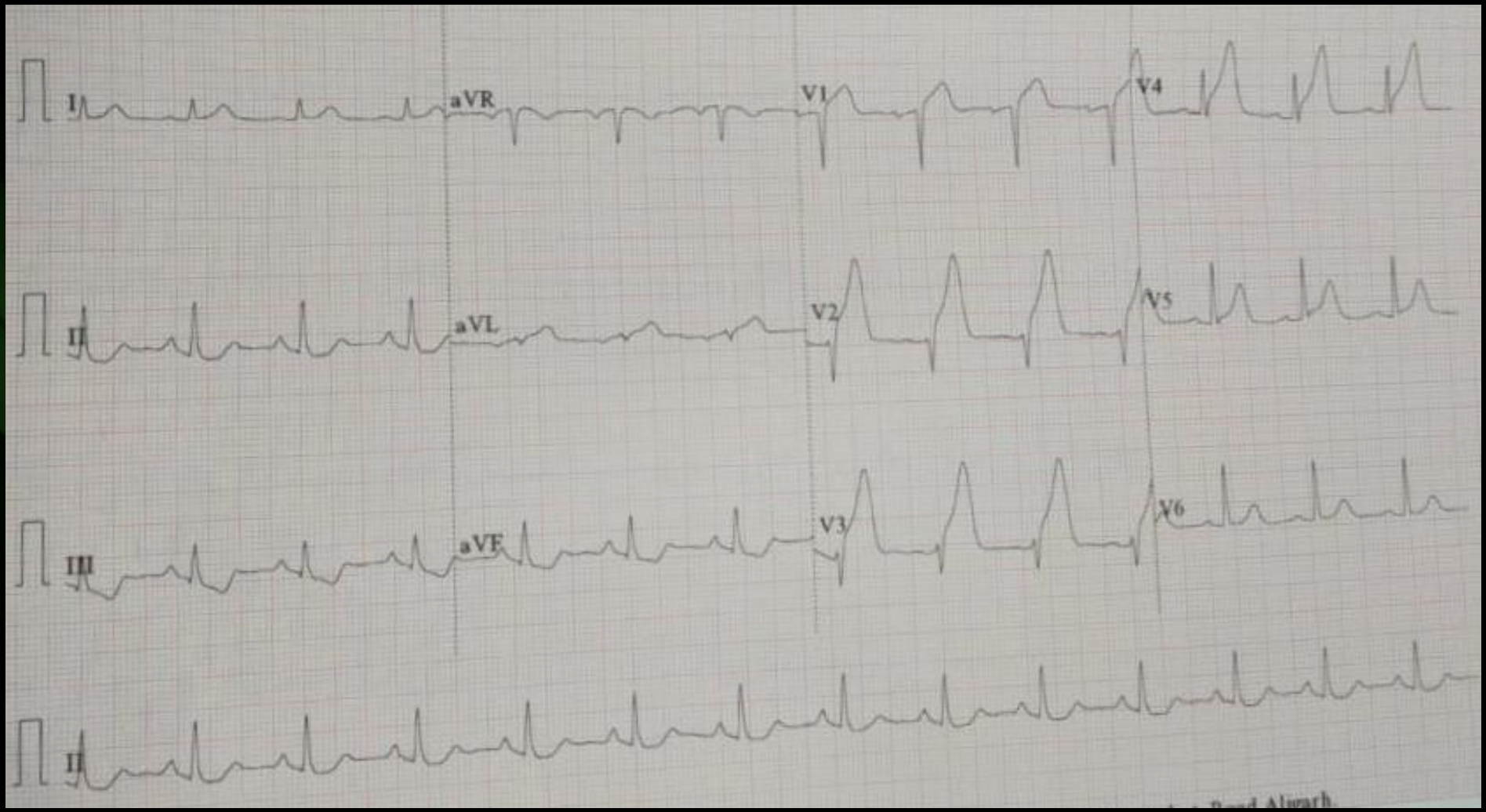
26 yo M with 100% LAD
Courtesy Dr. Osama Muhammad Ali



26 yo M, 100% LAD



28 yo M, 100% LAD



Young Patients and Atherosclerosis

- **Key point!**
  - Don’t discount the risk of ACS purely because of a patient’s age!


Just Because You Did It
Doesn't Mean You're Guilty.
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Why are we missing ACS?

Why are we missing ACS?

- Failure to appreciate ACS and atypical presentations in women

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CJC 2014

Canadian Journal of Cardiology 30 (2014) 814–819

Clinical Research

Nonatherosclerotic Coronary Artery Disease in Young Women

ELSEVIER

Canadian Journal of Cardiology 30 (2014) 721–728

CJC 2014

Review

Time to Standardize and Broaden the Criteria of Acute Coronary Syndrome Symptom Presentations in Women

John G. Canto, MD, MSPH,[a] Elizabeth A. Canto,[b] and Robert J. Goldberg, PhD[c]

[a] *Watson Clinic, Lakeland, Florida, USA*

[b] *All Saints' Academy, Winter Haven, Florida, USA*

[c] *University of Massachusetts Medical School, Worcester, Massachusetts, USA*

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THE PRESENT AND FUTURE

STATE-OF-THE-ART REVIEW

JACC 2015

Emergence of Nonobstructive Coronary Artery Disease

A Woman's Problem and Need for Change in Definition on Angiography

CrossMark

AHA Scientific Statement

Circulation 2016

Acute Myocardial Infarction in Women

A Scientific Statement From the American Heart Association

AHA Scientific Statement

Circulation 2016

Preventing and Experiencing Ischemic Heart Disease as a Woman: State of the Science

A Scientific Statement From the American Heart Association

Education in Heart

ACUTE CORONARY SYNDROMES

Heart 2016

Gender differences in coronary heart disease

Gender differences in outcomes in patients with acute coronary syndrome in the current era: A review

Eur Heart J: Acute Cardiovasc Care 2016

Acute Coronary Syndrome: The Risk to Young Women

Beatrice Ricci, MD, PhD; Edina Cenko, MD, PhD; Zorana Vasiljevic, MD, PhD; Goran Stankovic, MD, PhD; Sasko Kedev, MD, PhD; Oliver Kalpak, MD, PhD; Marija Vavlukis, MD, PhD; Marija Zdravkovic, MD, PhD; Sasa Hinic, MD, PhD; Davor Milicic, MD, PhD; Olivia Manfrini, MD; Lina Badimon, MD, PhD; Raffaele Bugiardini, MD

J Am Heart Assoc 2017

Comparison of Electrocardiographic Characteristics in Men Versus Women ≤ 55 Years With Acute Myocardial Infarction (a Variation in Recovery: Role of Gender on Outcomes of Young Acute Myocardial Infarction Patients Substudy)

José A. Barrabés, MD, PhD[a,*], Aakriti Gupta, MD[b,c], Andreu Porta-Sánchez, MD, MSc[a], Kelly M. Strait, MS[b], J. Gabriel Acosta-Vélez, MD[a], Gail D'Onofrio, MD, MS[d], Rosa-Maria Lidón, MD[a], Mary Geda, MSN[e], Rachel P. Dreyer, PhD[b,d], Nancy P. Lorenze, DNSc[b], Judith H. Lichtman, PhD, MPH[f], John A. Spertus, MD, MPH[g], Héctor Bueno, MD, PhD[h], and Harlan M. Krumholz, MD, SM[b,i]

Am J Cardiol 2017

Editor's Choice-Sex differences in young patients with acute myocardial infarction: A VIRGO study analysis

European Heart Journal: Acute Cardiovascular Care
2017, Vol. 6(7) 610–622

DOI: 10.1177/2048872616661847
journals.sagepub.com/home/acc
SAGE

Emily M Bucholz[1,2,3], Kelly M Strait[4], Rachel P Dreyer[4,5], Stacy T Lindau[6], Gail D'Onofrio[7], Mary Geda[8], Erica S Spatz[4,5], John F Beltrame[9], Judith H Lichtman[2], Nancy P Lorenze[4], Hector Bueno[10] and Harlan M Krumholz[4,5,11,12]

Eur Heart J: Acute Cardio Care 2017

Education in Heart

Management of acute coronary syndromes: special considerations in women

Stephanie M Madonis,[1] Kimberly A Skelding,[2] Madhur Roberts[3]

Heart 2017

Sex Differences in Treatments, Relative Survival, and Excess Mortality Following Acute Myocardial Infarction: National Cohort Study Using the SWEDEHEART Registry

Oras A Alabas, BSc, MSc, PhD; Chris P Gale, BSc(HONS), MBBS, PhD, MEd, MSc; Marlous Hall, MSc, PhD; Mark J. Rutherford, BSc(HONS), PhD; Karolina Szummer, MD, PhD; Sofia Sederholm Lawesson, MD, PhD; Joakim Alfredsson, MD, PhD; Bertil Lindahl, MD, PhD; Tomas Jernberg, MD, PhD

J Am Heart Assoc 2017

Circulation

ORIGINAL RESEARCH ARTICLE

Sex Differences in the Presentation and Perception of Symptoms Among Young Patients With Myocardial Infarction

Evidence from the VIRGO Study (Variation in Recovery: Role of Gender on Outcomes of Young AMI Patients)

Circulation
February 20, 2018

Received: 19 December 2018 | Revised: 13 February 2019 | Accepted: 20 February 2019

DOI: 10.1002/clc.23165

CLINICAL CARDIOLOGY WILEY

REVIEW

Emerging misunderstood presentations of cardiovascular disease in young women

Renee P. Bullock-Palmer[1] | Leslee J. Shaw[2] | Martha Gulati[3]

Clinical Cardiology 2019

Circulation

February 19, 2019

ORIGINAL RESEARCH ARTICLE

Twenty Year Trends and Sex Differences in Young Adults Hospitalized With Acute Myocardial Infarction

The ARIC Community Surveillance Study

Circulation

February 19, 2019

EDITORIAL

Myocardial Infarction in Young Women

An Unrecognized and Unexplained Epidemic

ESC European Society of Cardiology

European Heart Journal (2020) **41**, 1328–1336
doi:10.1093/eurheartj/ehz898

CLINICAL REVIEW
Clinical update

Sex and gender in cardiovascular medicine: presentation and outcomes of acute coronary syndrome

Ahmed Haider[1,2], Susan Bengs[1,2], Judy Luu [3], Elena Osto [4,5], Jolanta M. Siller-Matula[6,7], Taulant Muka[8], and Catherine Gebhard [1,2,6]*

Review

Coronary artery disease and acute coronary syndrome in women

Julinda Mehilli [1,2], Patrizia Presbitero[3]

Heart 2020

ORIGINAL STUDIES

Gender Disparities in Cardiac Catheterization Rates Among Emergency Department Patients With Chest Pain

Steenblik, Jacob MPH, MHA, BSN*; Smith, Alison MD, MPH*; Bossart, Christopher S. MD†; Hamilton, David S. Sr MD‡; Rayner, Thomas MD§; Fuller, Matthew MD*; Carlson, Margaret MPH*; Madsen, Troy MD*

Author Information

Critical Pathways in Cardiology: June 2021 - Volume 20 - Issue 2 - p 67-70
doi: 10.1097/HPC.0000000000000247

Crit Pathways in Cardiol 2021

Circulation

AHA/ACC CLINICAL PRACTICE GUIDELINE

2021 AHA/ACC/ASE/CHEST/SAEM/SCCT/SCMR Guideline for the Evaluation and Diagnosis of Chest Pain

A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines

Writing Committee Members*

Martha Gulati, MD, MS, FACC, FAHA, Chair†; Phillip D. Levy, MD, MPH, FACC, FAHA, Vice Chair†; Debabrata Mukherjee, MD, MS, FACC, FAHA, Vice Chair†; Ezra Amsterdam, MD, FACC†; Deepak L. Bhatt, MD, MPH, FACC, FAHA†; Kim K. Birtcher, MS, PharmD, AACC‡; Ron Blankstein, MD, FACC, MSCCT§; Jack Boyd, MD†; Renee P. Bullock-Palmer, MD, FACC, FAHA, FASE, FSCCT†; Theresa Conejo, RN, BSN, FAHA‖; Deborah B. Diercks, MD, MSc, FACC¶; Federico Gentile, MD, FACC#; John P. Greenwood, MBChB, PhD, FSCMR, FACC**; Erik P. Hess, MD, MSc†; Steven M. Hollenberg, MD, FACC, FAHA, FCCP††; Wael A. Jaber, MD, FACC, FASE‡‡; Hani Jneid, MD, FACC, FAHA§§; José A. Joglar, MD, FAHA, FACC‡; David A. Morrow, MD, MPH, FACC, FAHA†; Robert E. O'Connor, MD, MPH, FAHA†; Michael A. Ross, MD, FACC†; Leslee J. Shaw, PhD, FACC, FAHA, MSCCT†

American Heart Association.

Clinical paper

Sex disparities in management and outcomes of cardiac arrest complicating acute myocardial infarction in the United States

Dhiran Verghese[a,b,1], *Sri Harsha Patlolla*[c,1], *Wisit Cheungpasitporn*[d], *Rajkumar Doshi*[e], *Virginia M. Miller*[f,g], *Jacob C. Jentzer*[h,i], *Allan S. Jaffe*[h], *David R. Holmes*[h], *Saraschandra Vallabhajosyula*[j,*]

***Resuscitation* 2022**

Sex-Specific Considerations in the Presentation, Diagnosis, and Management of Ischemic Heart Disease

JACC Focus Seminar 2/7

JACC 2022

Sade Solola Nussbaum, MD,[a] Sonia Henry, MD,[b] Celina Mei Yong, MD, MBA, MSc,[c] Stacie L. Daugherty, MD,[d] Roxana Mehran, MD,[e] Athena Poppas, MD[a]

Sex Related Differences in the Treatment of ST-Segment Elevation Acute Myocardial Infarction in Patients Aged <55 years

Marta Lorente-Ros, MD[a,*], Amisha Patel, MD, MS[a], José A. Lorente, MD, PhD[b,c,d], and Esteban López-de-Sá, MD, PhD[e,f]

Am J Cardiol 2022

Early Coronary Atherosclerosis in Women With Previous Preeclampsia

Maria G. Hauge, MD,[a,b] Peter Damm, MD, DMSc,[a,b] Klaus F. Kofoed, MD, DMSc,[b,c,d] Anne S. Ersbøll, MD, PhD,[a] Marianne Johansen, MD, PhD,[a] Per E. Sigvardsen, MD, PhD,[c] Mathias B. Møller, MD,[c] Andreas Fuchs, MD, PhD,[c] Jørgen T. Kühl, MD, DMSc,[c] Børge G. Nordestgaard, MD, DMSc,[b,e] Lars V. Køber, MD, DMSc,[b,c] Finn Gustafsson, MD, DMSc,[b,c] Jesper J. Linde, MD, PhD[c]

JACC 2022

Why are we missing ACS?

- Failure to appreciate ACS and atypical presentations in women

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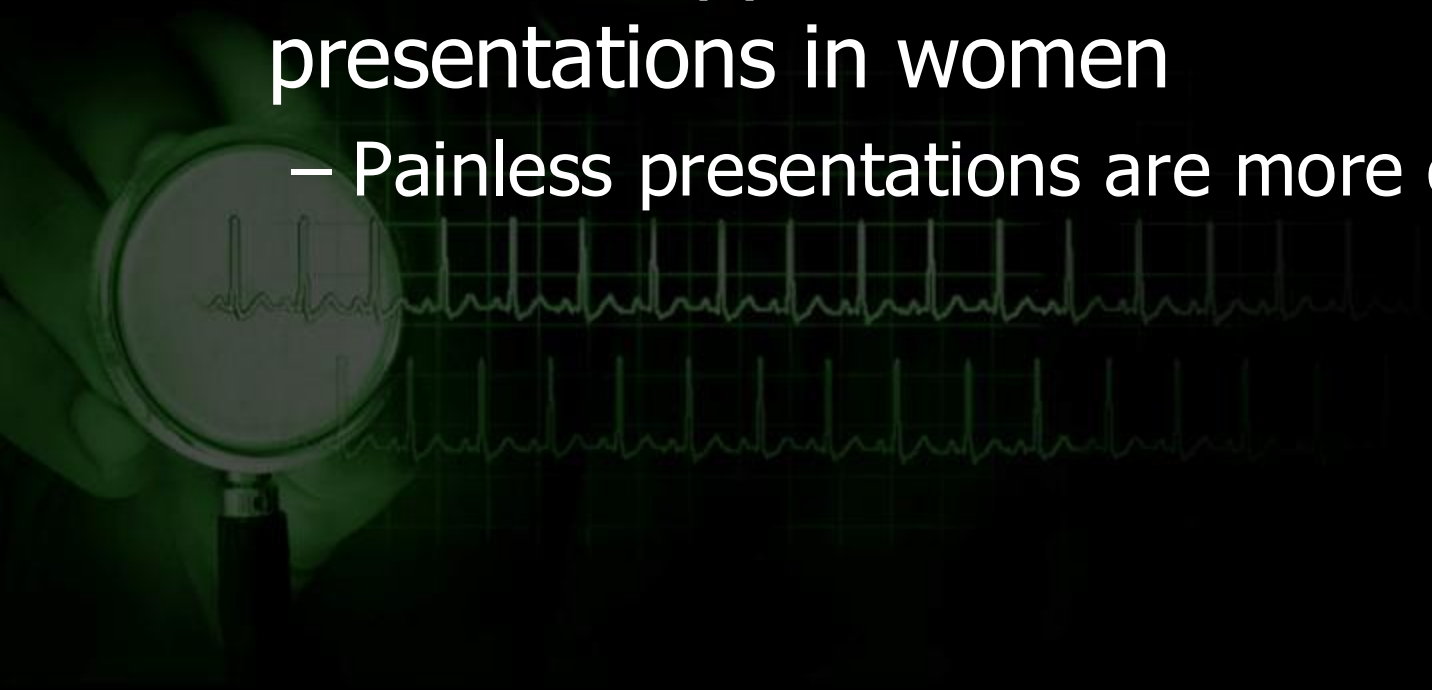
  - Painless presentations are more common



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  - Unexplained dyspnea, flu-like symptoms, indigestion, malaise, fatigue, weakness
    - More symptoms than men...leads to misDx!

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  - These points apply to younger women as well as older

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  - McSweeney, Circulation 2003
    - Unusual prodromal Sx's

Why are we missing ACS?

- Failure to appreciate ACS and atypical presentations in women
  - McSweeney, Circulation 2003
    - Unusual prodromal Sx's
      - Chest discomfort 30% (only!)
      - Dyspnea 42%
      - Sleep disturbance 48%
      - Fatigue 71%

Why are we missing ACS?

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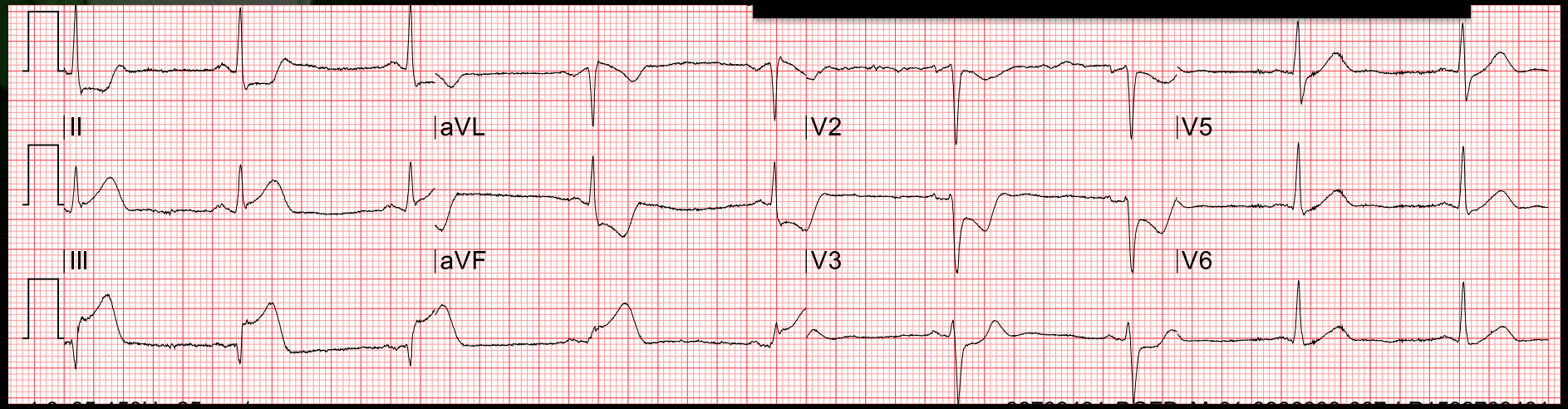

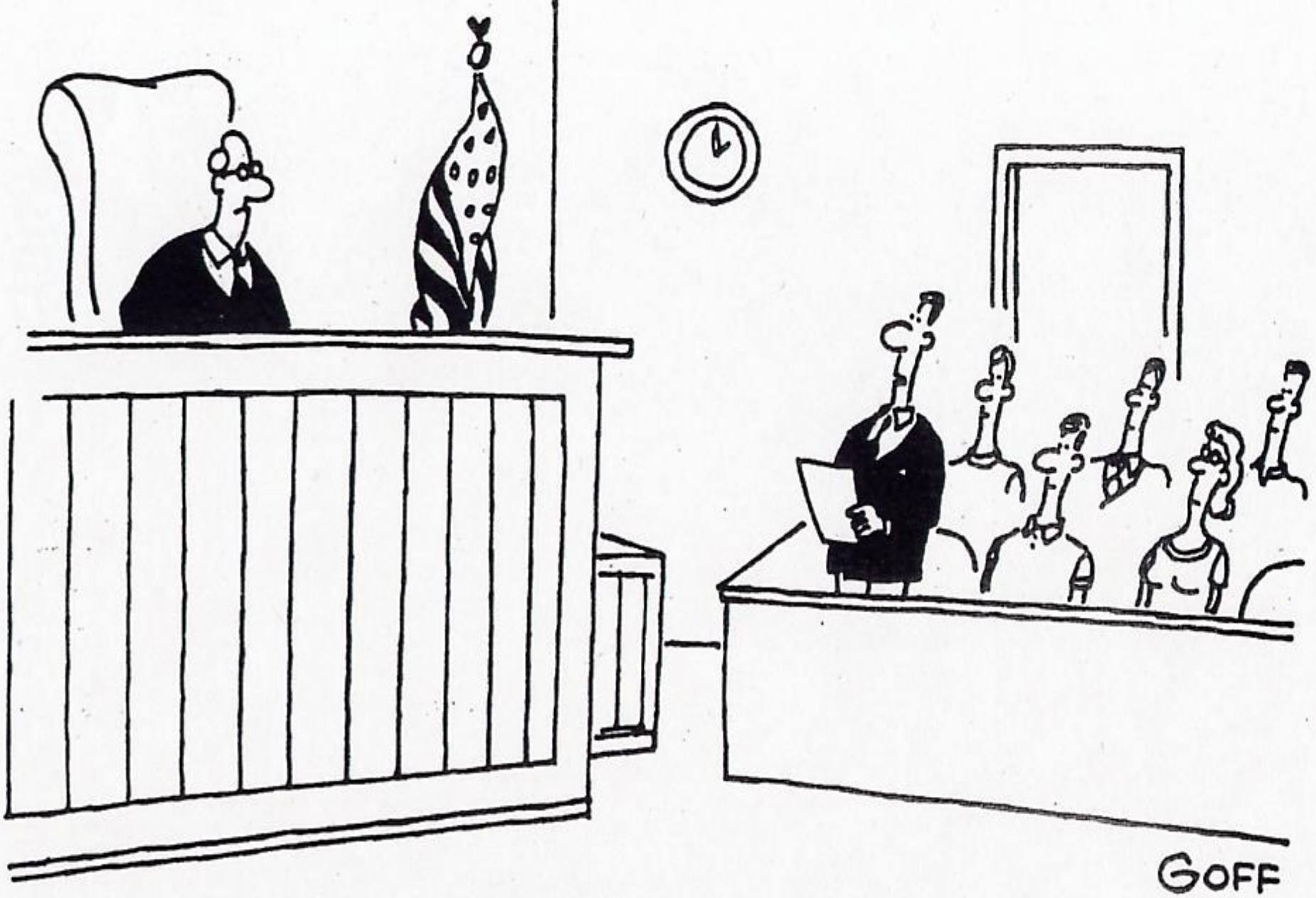

"Your honor, before we settle on a judgment amount, we'd like to know how much money there is in the universe."

Why are we missing ACS?

- Over-reliance on TNs

Cardiac Biomarkers

Clinical Review & Education

JAMA 2015;314:1955-1965.

The Rational Clinical Examination

Does This Patient With Chest Pain Have Acute Coronary Syndrome?

The Rational Clinical Examination Systematic Review

Alexander C. Fanaroff, MD; Jennifer A. Rymer, MD, MBA; Sarah A. Goldstein, MD; David L. Simel, MD, MHS; L. Kristin Newby, MD, MHS

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Biomarker-negative ACS still exists!

Why are we missing ACS?

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  - A GOOD history
  - Scrutiny of the ECG
  - TNs

  - Not just TNs!

Why are we missing ACS?

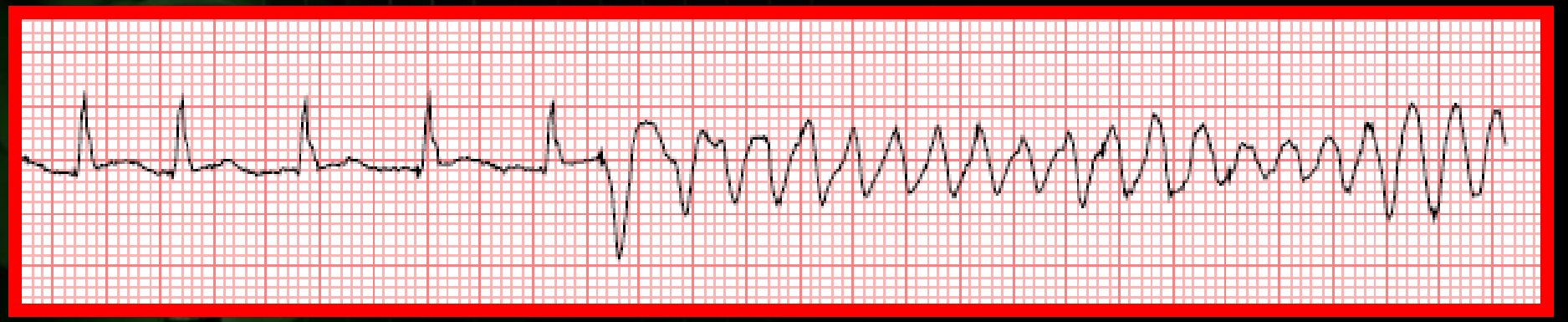
- Diagnosis of ACS requires 3 components
  - A GOOD history
  - Scrutiny of the ECG
  - TNs

  - Not just TNs!

  - **EVERY validated ADP incorporates all 3**

Courtesy Dr. Alon Duby (U.K.)

Pitfalls in the Dx of ACS



The ECG

Why are we missing ECGs?

- 25-50% of cases involve ECG misreads
- My experience: > 50% involve ECG misreads that are not "arguable"

Why are we missing ECGs?

- Over-reliance on the computer interpretation
  - Especially "normal" and "nonspecific"

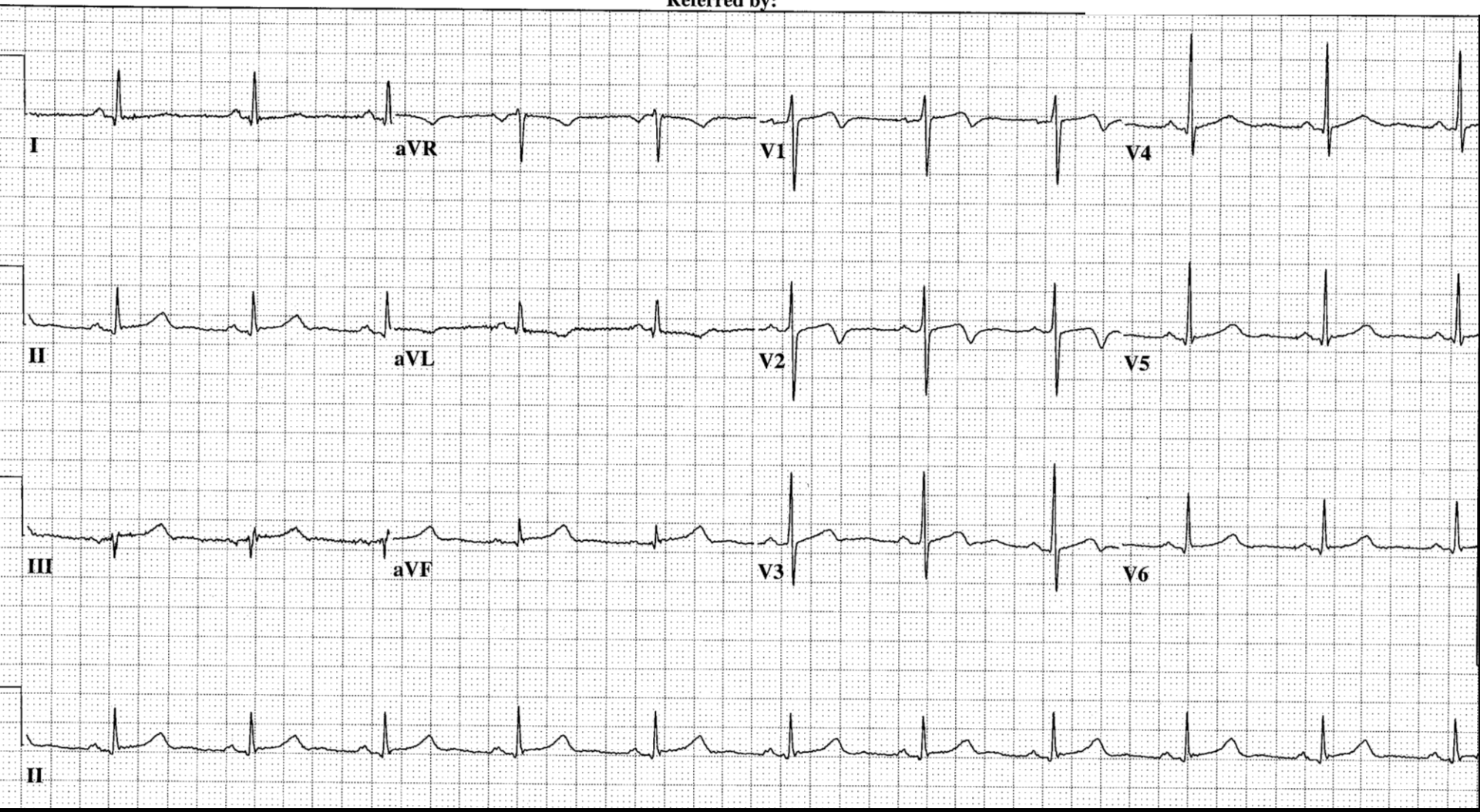
Vent. rate	65	BPM
PR interval	142	ms
QRS duration	76	ms
QT/QTc	440/457	ms
P–R–T axes	22 23	82

Normal sinus rhythm
Nonspecific T wave abnormality
Abnormal ECG

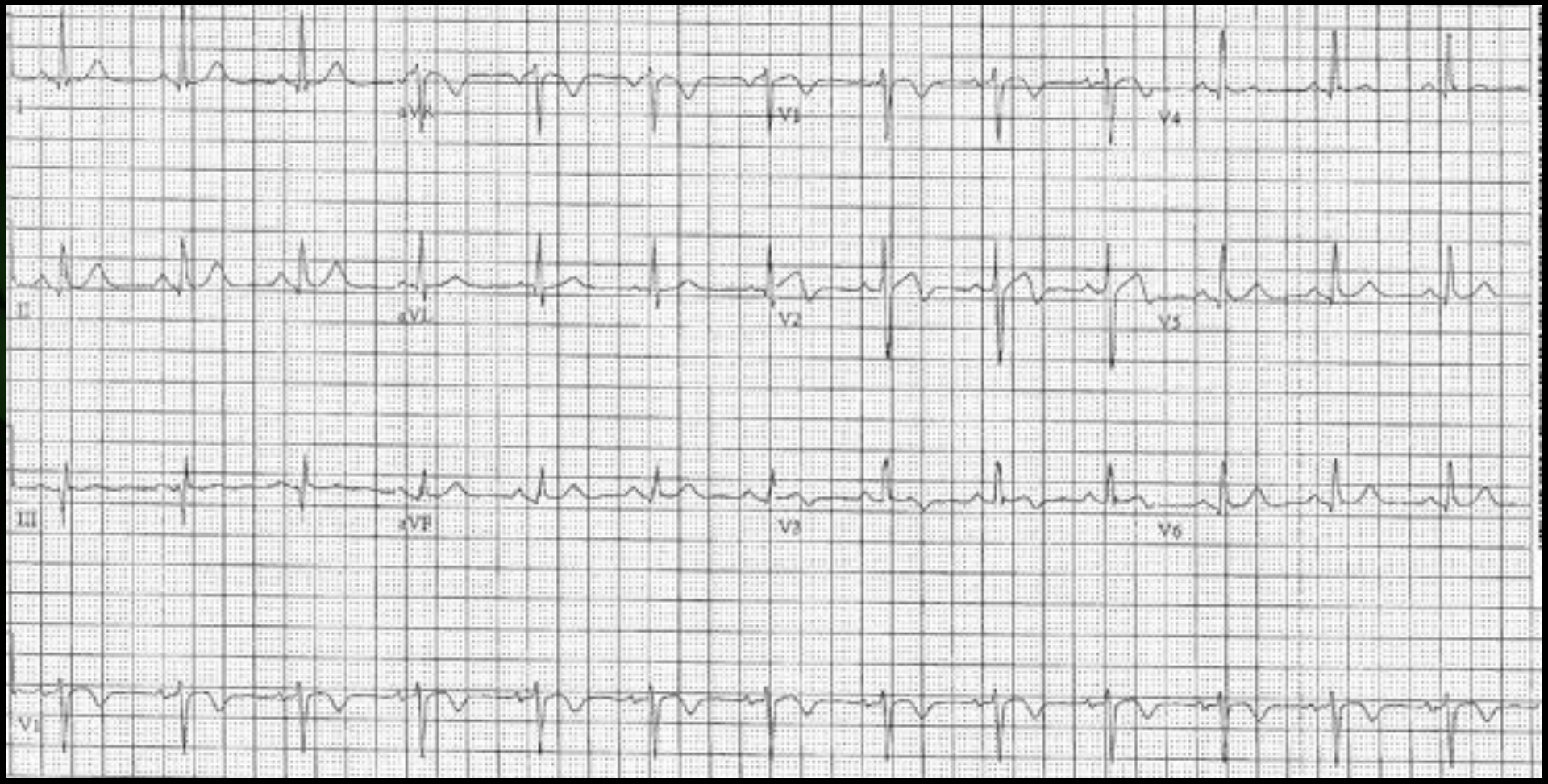
Loc:80

Test ind:CP

Referred by:

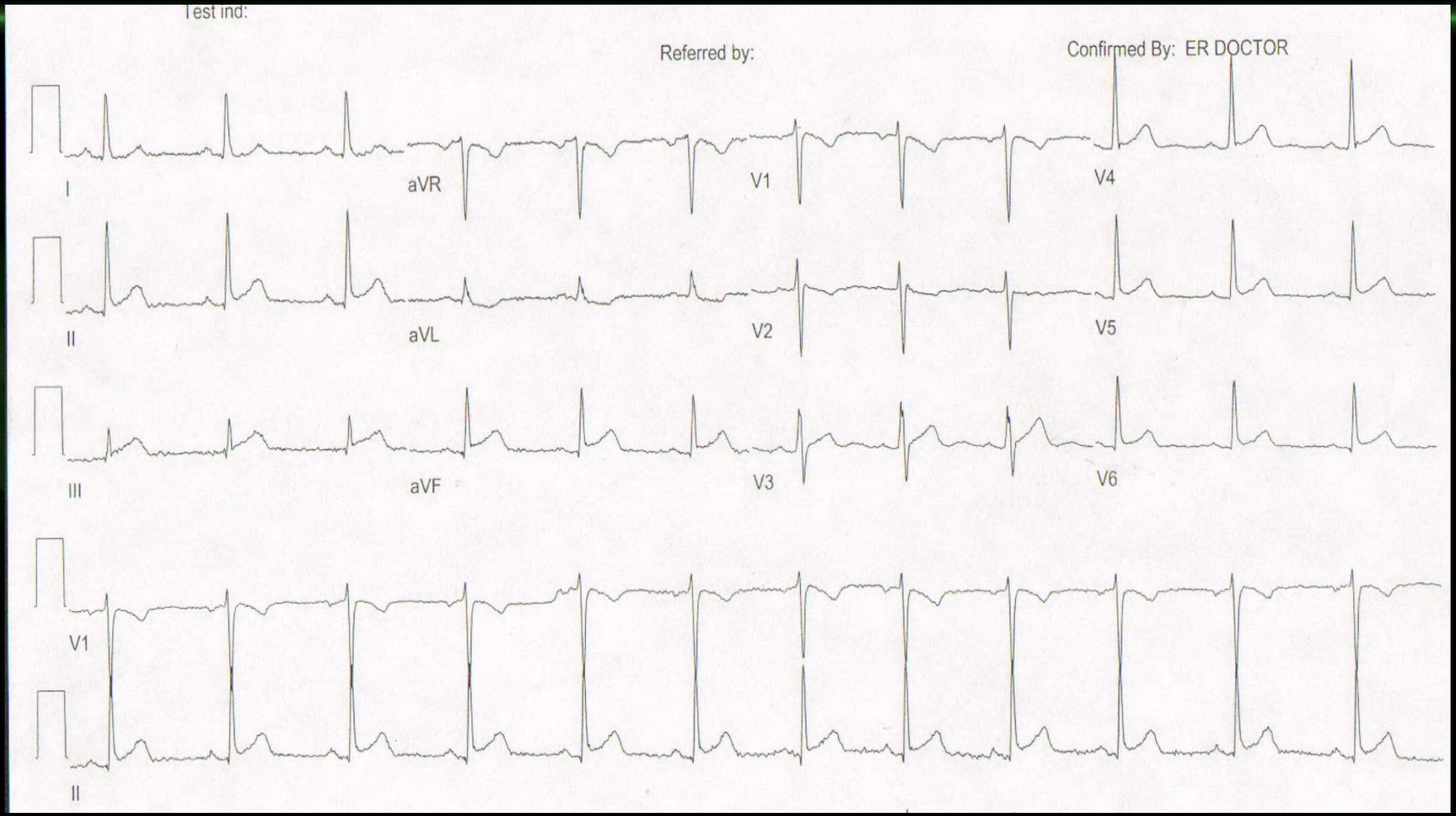


"Non-specific"



27 yo M with mild CP

Courtesy Anna Marie Allen, MD



#1

27 yr
Male Caucasian

Room:
Loc:3

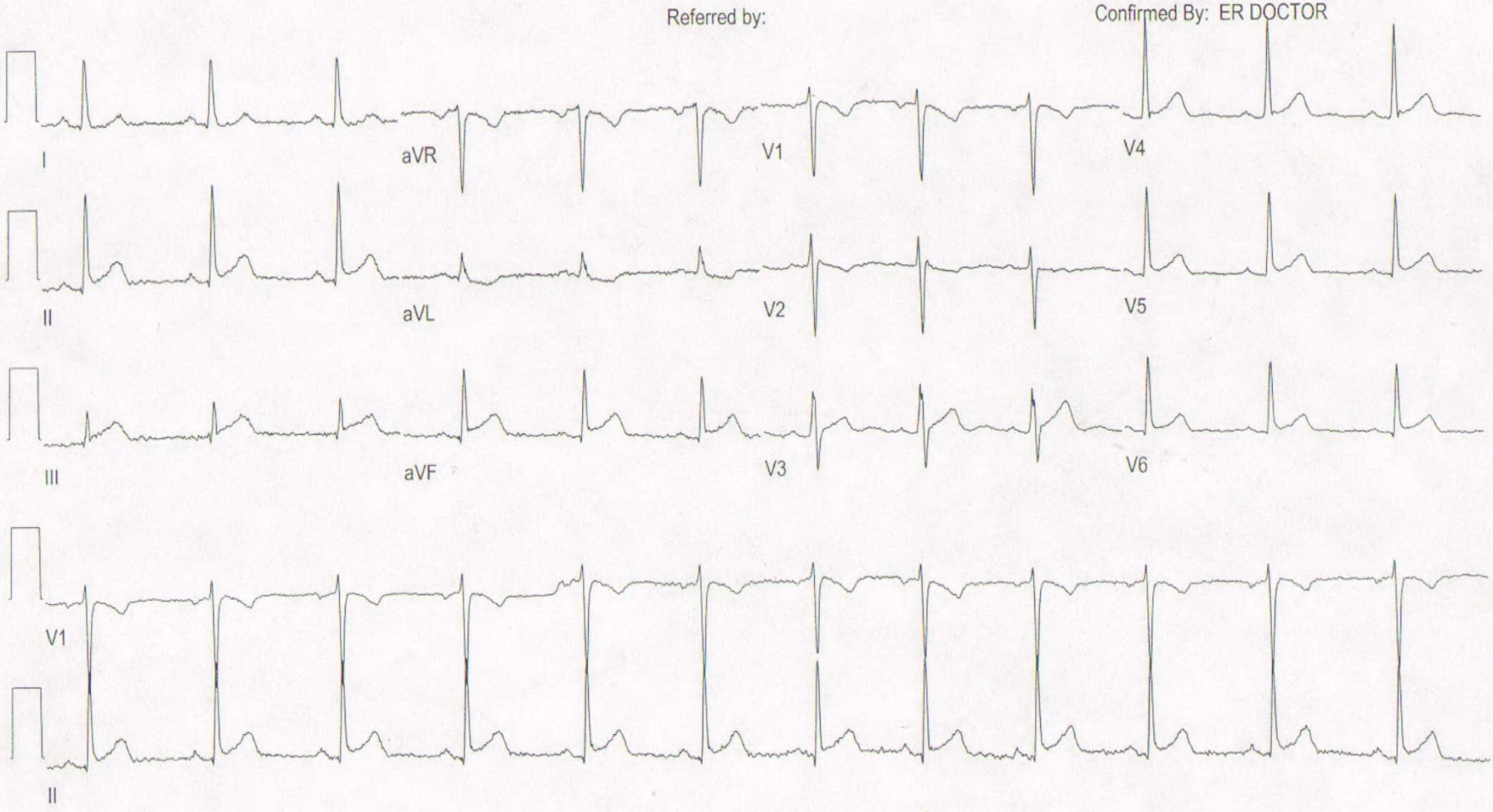
Vent. rate	73	BPM
PR interval	148	ms
QRS duration	80	ms
QT/QTc	356/392	ms
P-R-T axes	41 47	69

Normal sinus rhythm
Early repolarization
Normal ECG
No previous ECGs available
Obtained in accordance with ER protocol. Interpretation may be found in ER note
Confirmed by DOCTOR, ER (4050), [redacted] 1/30/2011 11:15:26 AM

Technician:
Test ind:

Referred by:

Confirmed By: ER DOCTOR



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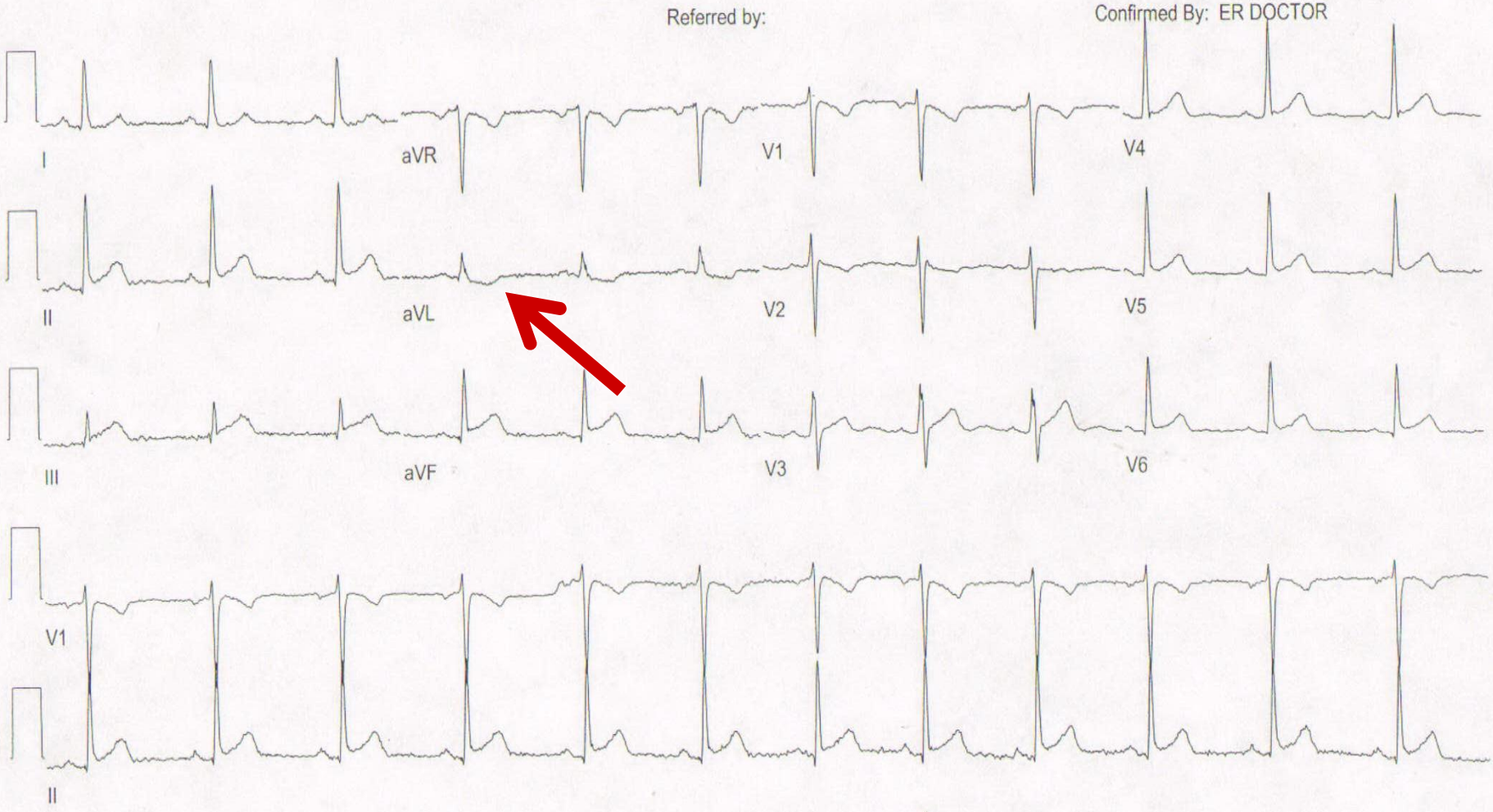
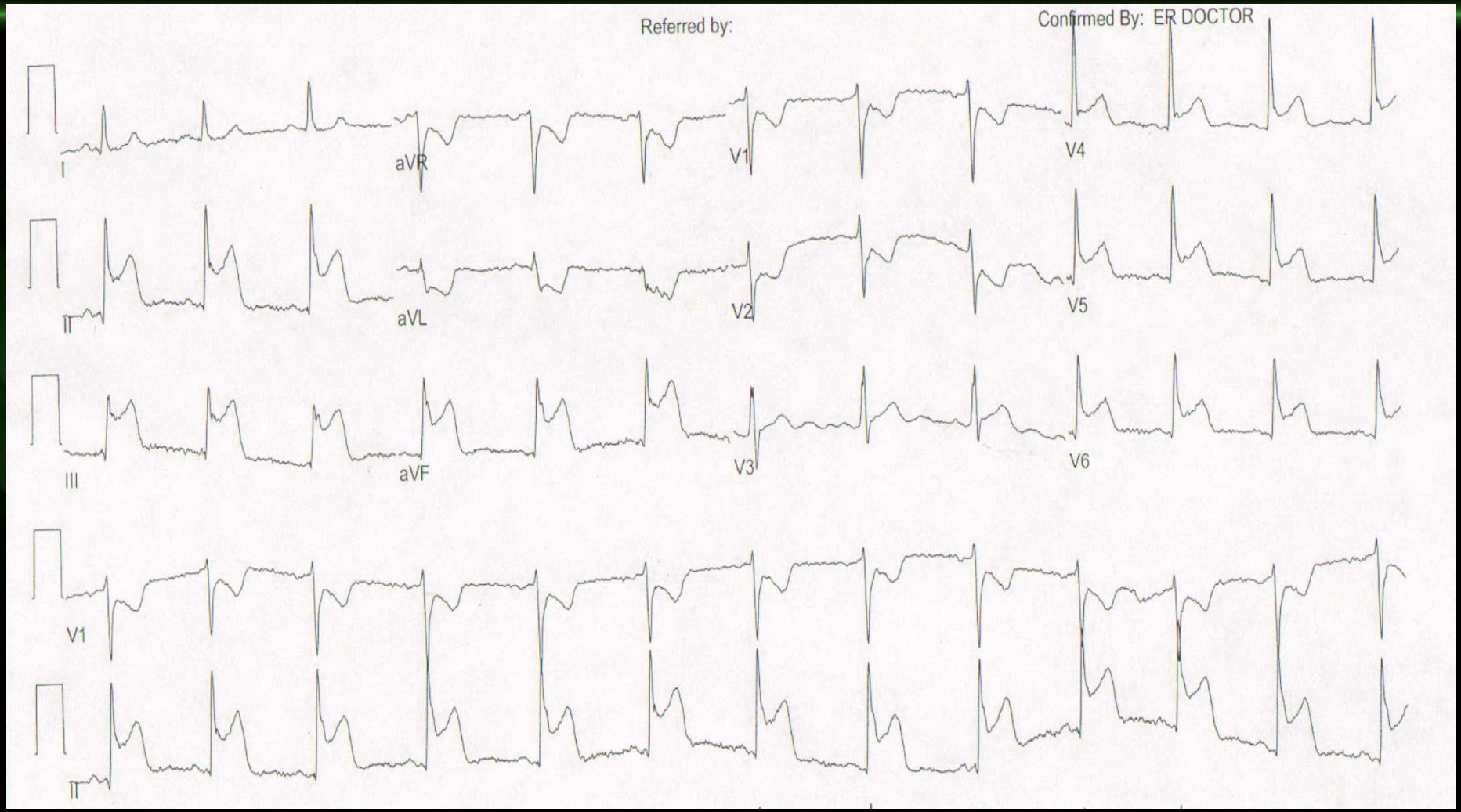


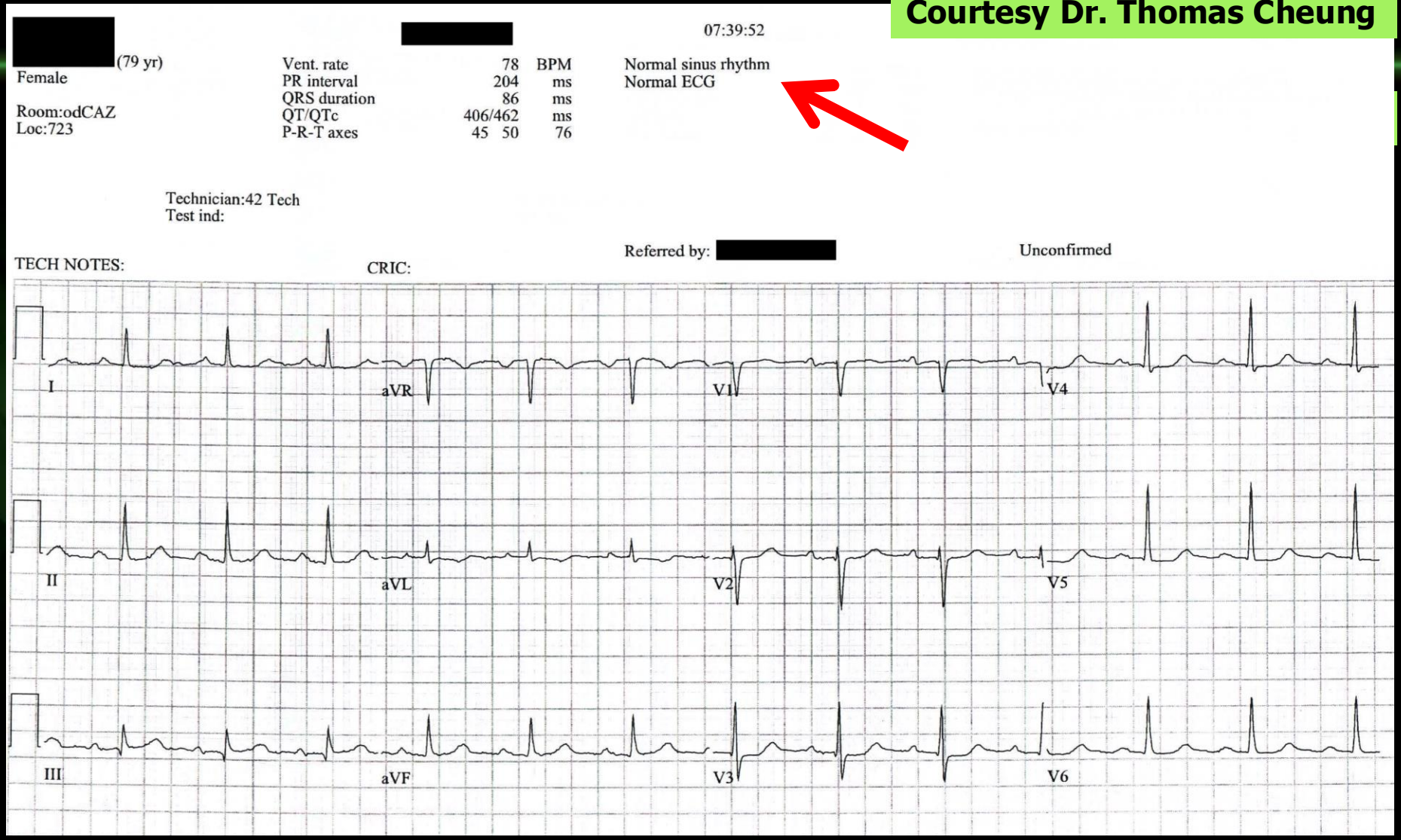
Worsening chest pain

Courtesy Anna Marie Allen, MD



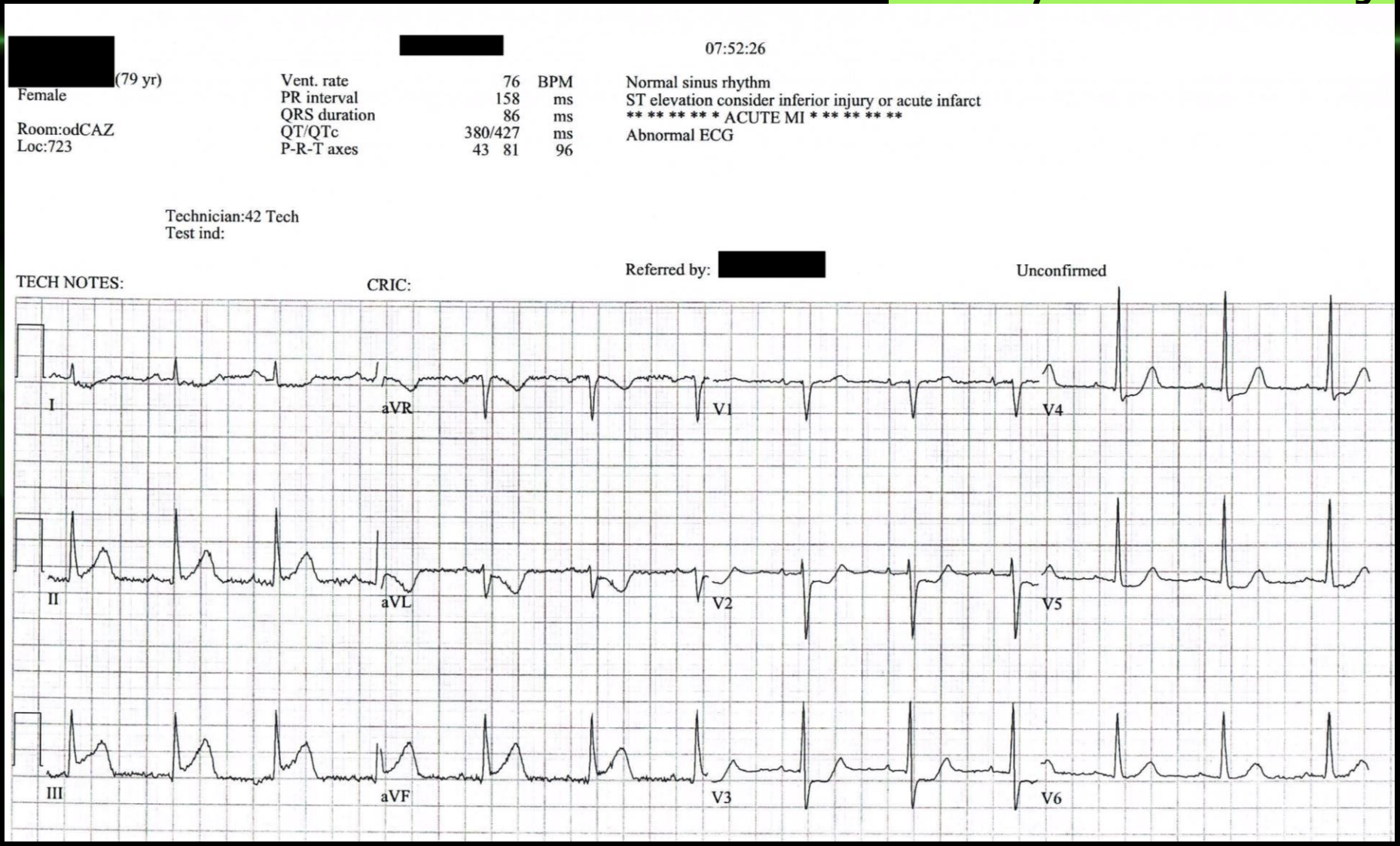
79 yo W with CP

Courtesy Dr. Thomas Cheung

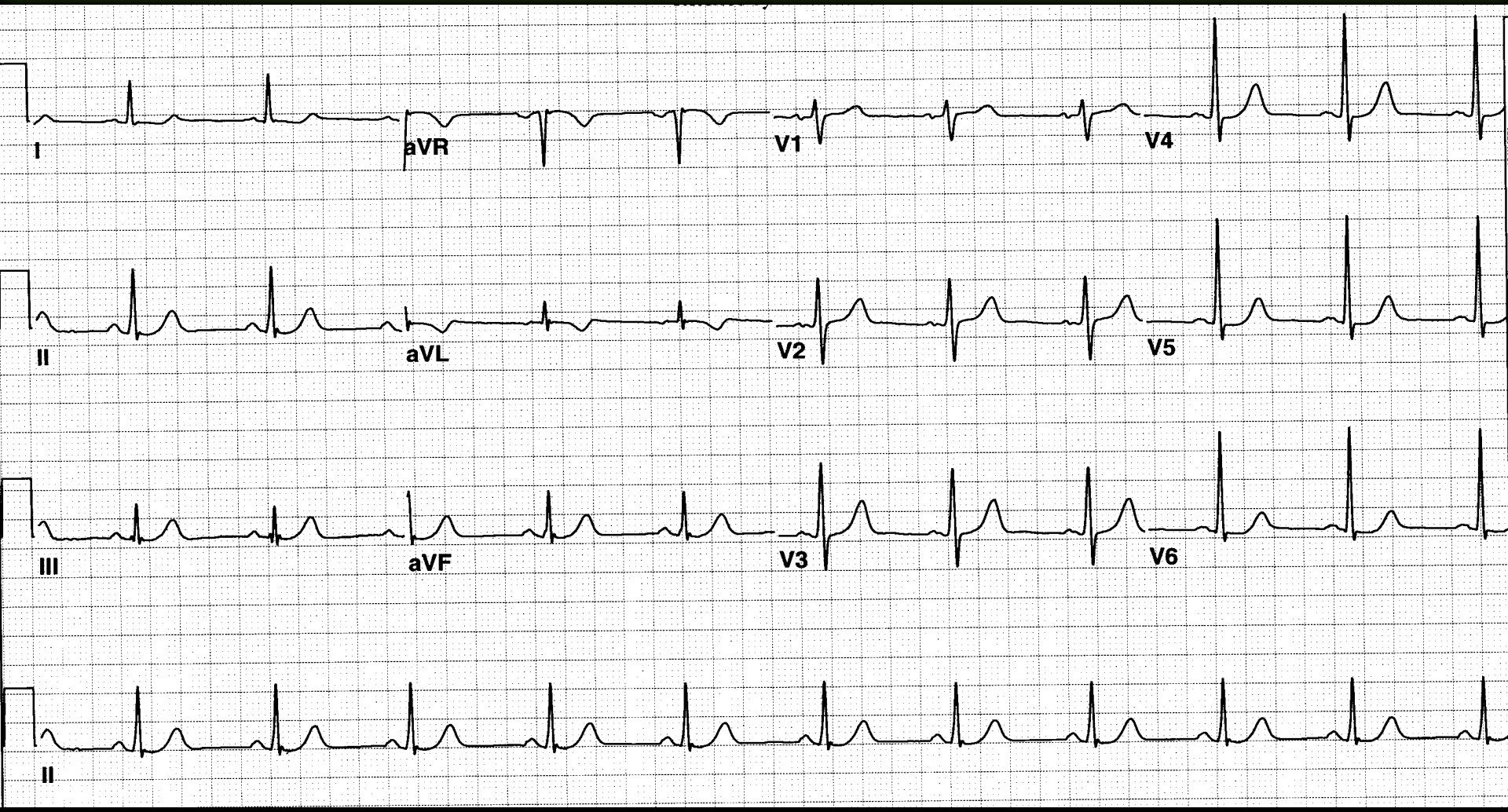


13 min later…

Courtesy Dr. Thomas Cheung



56 yo M with CP



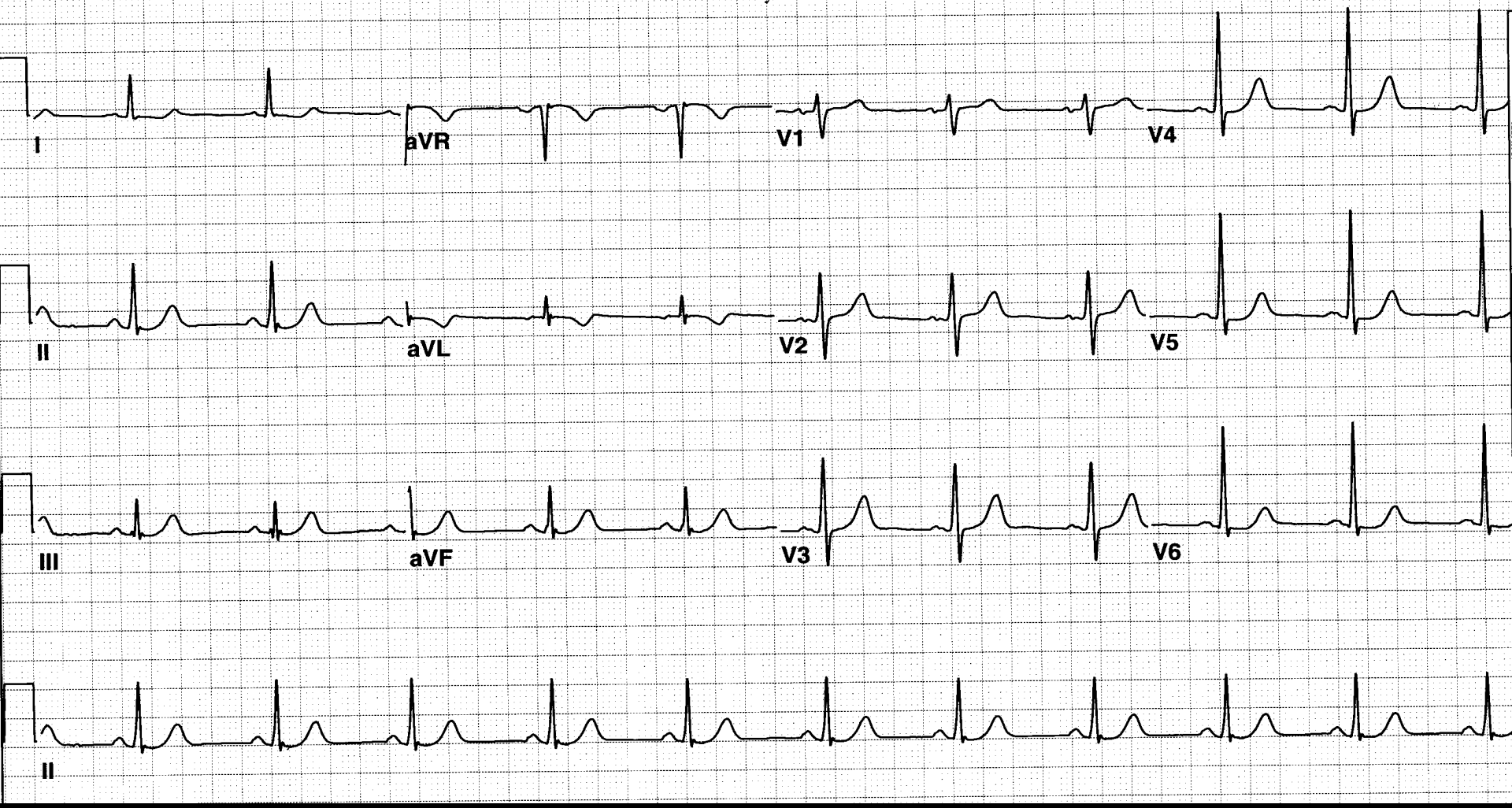
[redacted]

Vent. rate	66	BPM
PR interval	134	ms
QRS duration	92	ms
QT/QTc	396/415	ms
P-R-T axes	67 47	76

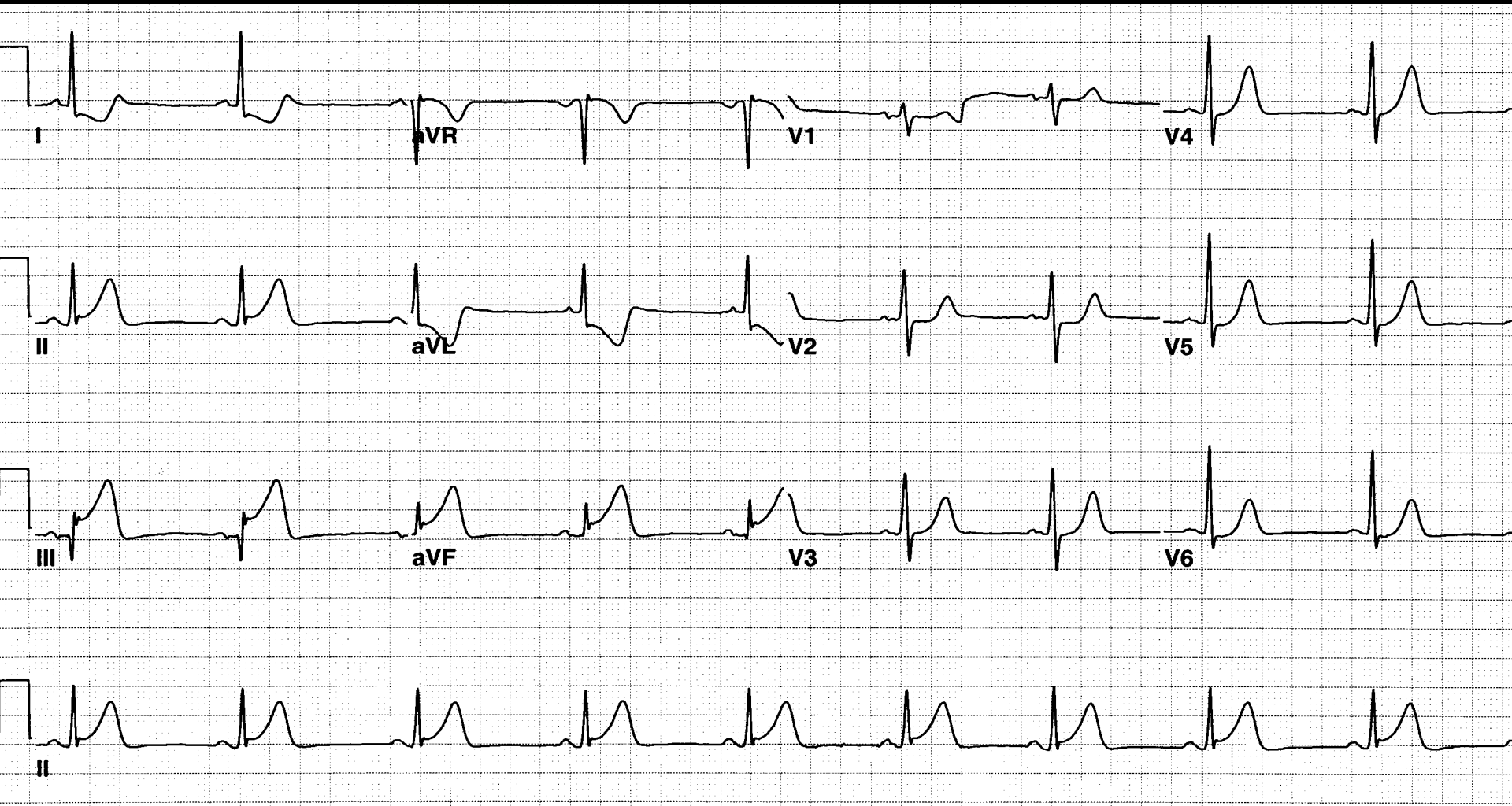
SINUS BRADYCARDIA
NORMAL ECG
WHEN COMPARED WITH ECG OF [redacted]
INFERO-LATERAL ST-T ABNORMALITIES NO LONGER PRESENT

Loc:80

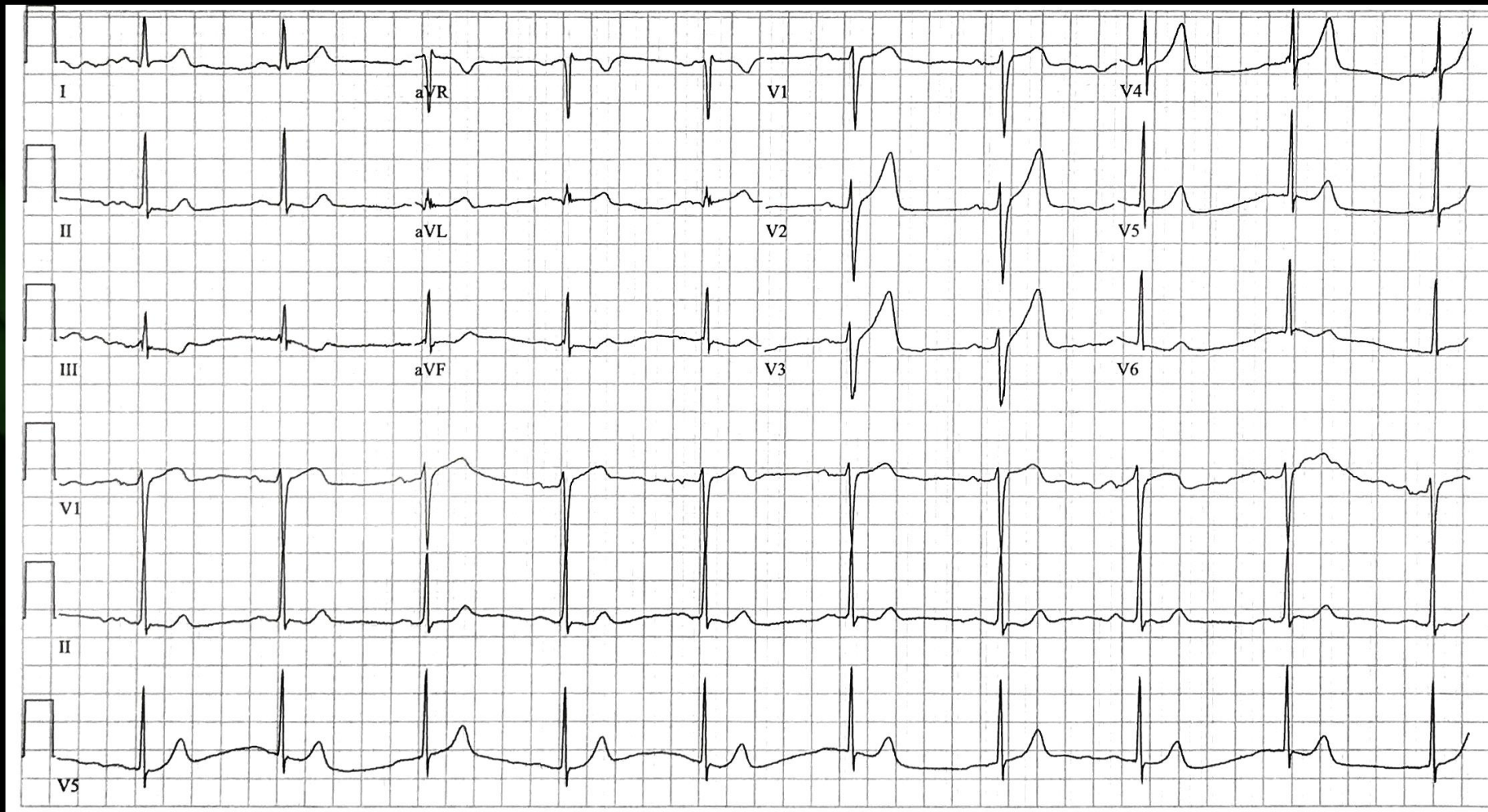
Referred by: [redacted]



ECG #2 45 min later



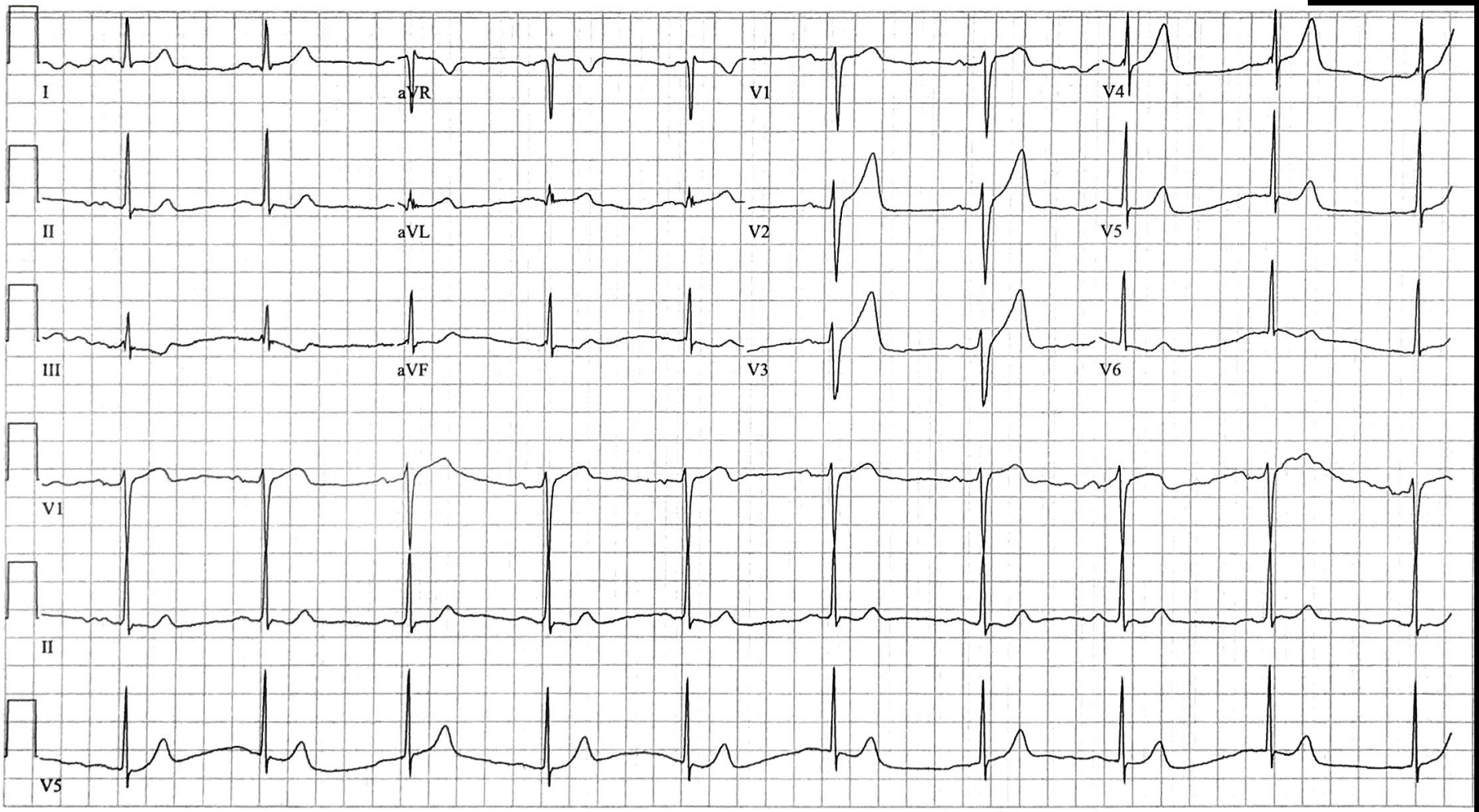
32 yo M with rising TNs, 95% LMCA



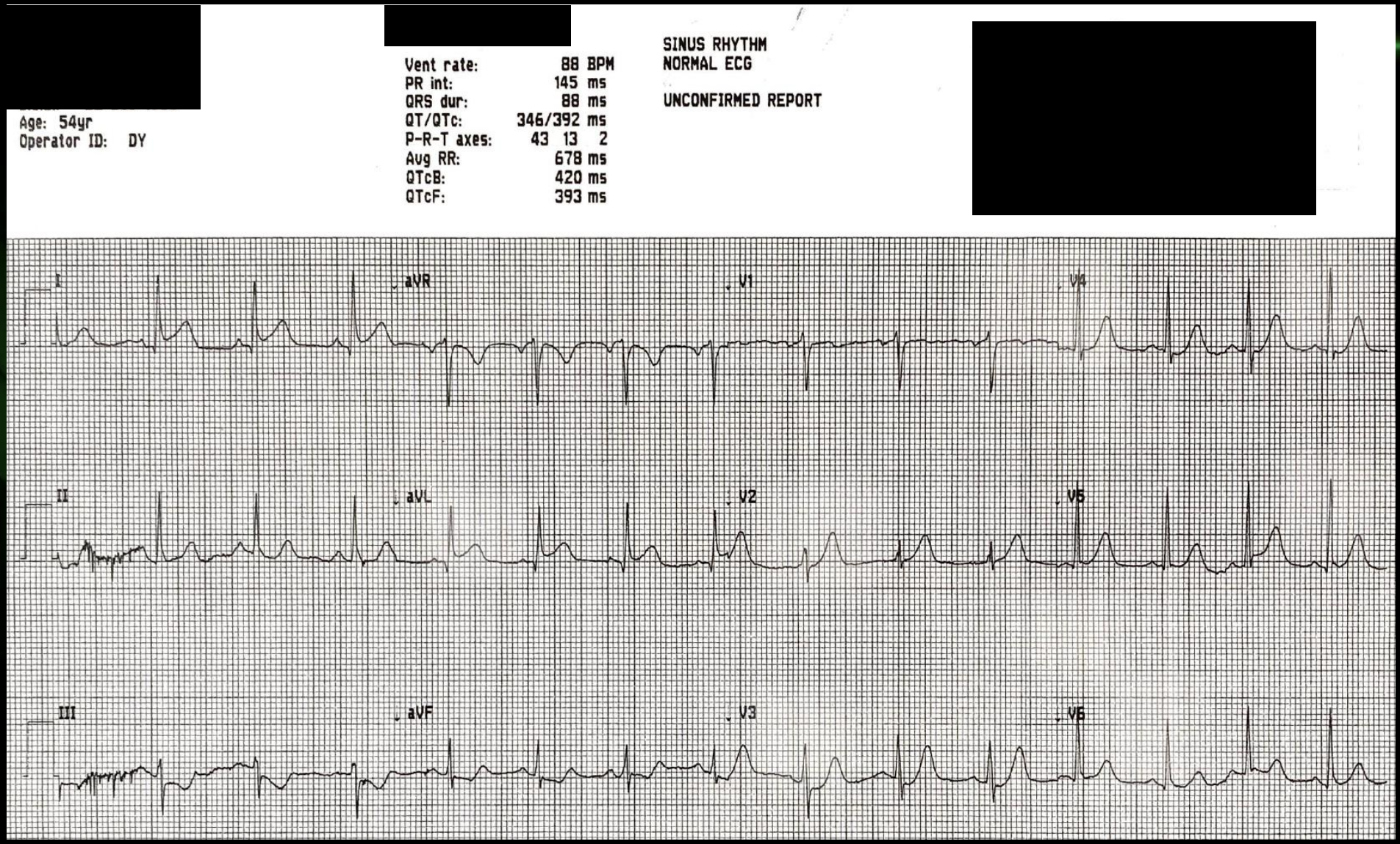
Vent. rate	59	BPM	Sinus bradycardia
PR interval	190	ms	Otherwise Normal ECG
QRS duration	96	ms	No previous ECGs available
QT/QTc	400/396	ms	
P-R-T axes	29 49	4	

Technician: KJ
Test ind:Chest Pain

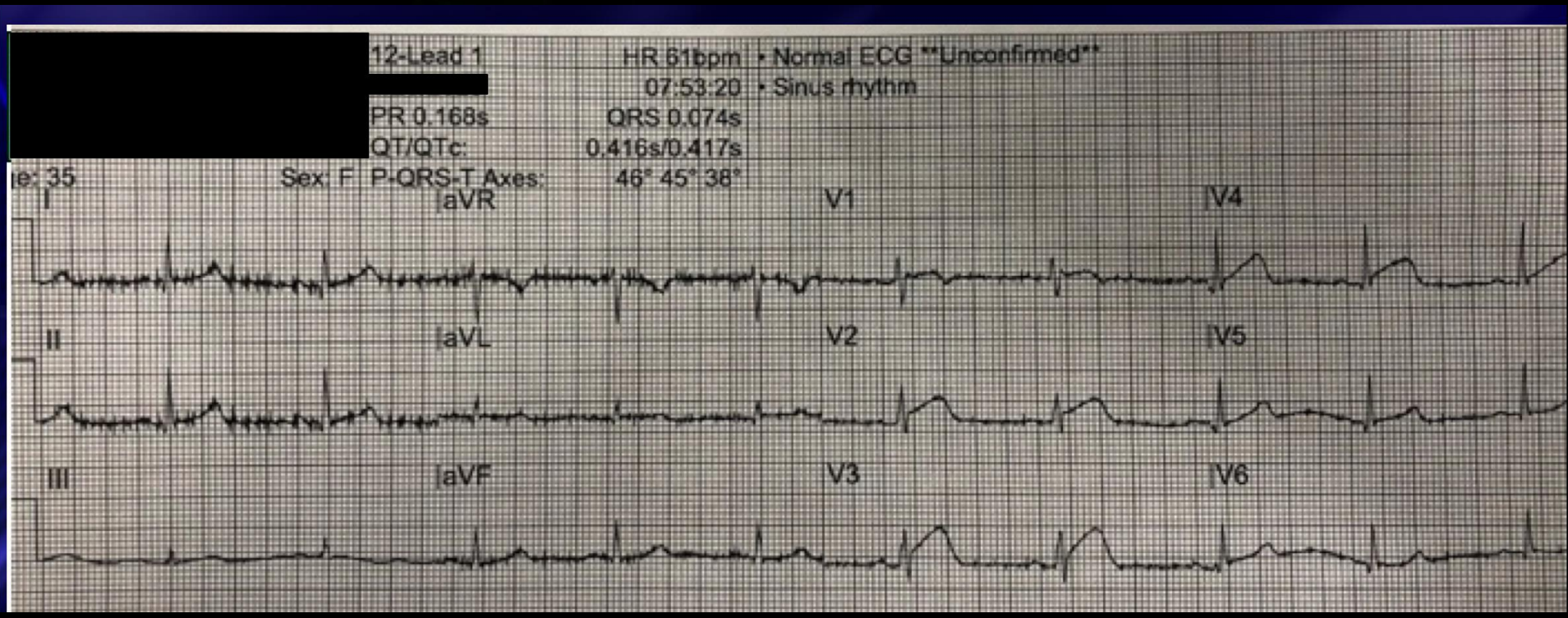
Unconfirmed



STEMI → 2nd diagonal occlusion



95% LAD


[redacted]
12-Lead 1
HR 61bpm
Normal ECG **Unconfirmed**
07:53:20
Sinus rhythm
PR 0.168s
QRS 0.074s
QT/QTc:
0.416s/0.417s
e: 35
Sex: F
P-QRS-T Axes:
46° 45° 38°
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6

[redacted]

Room:
Loc:43

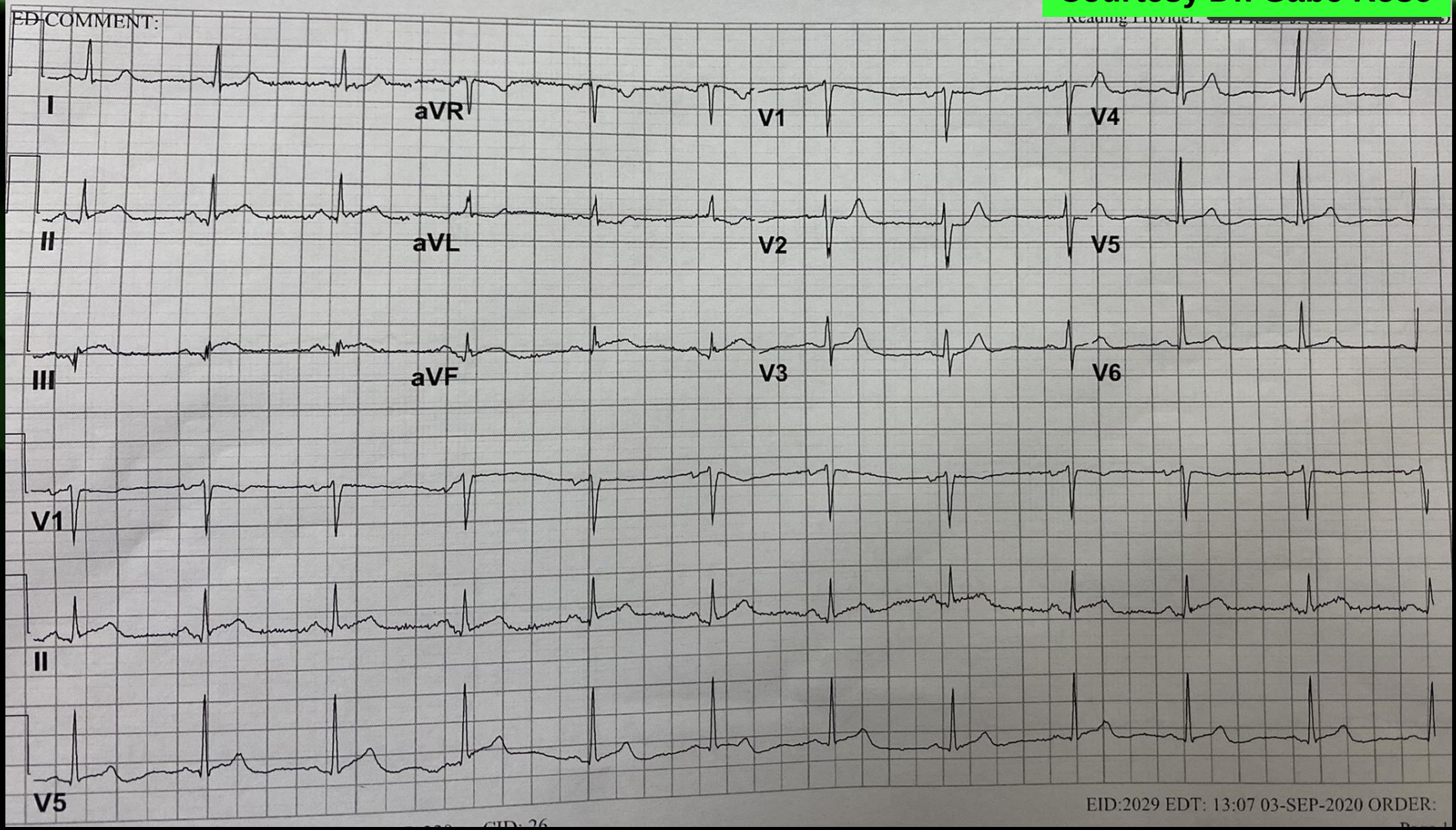
Vent. rate	68	BPM
PR interval	154	ms
QRS duration	78	ms
QT/QTc	360/382	ms
P-R-T axes	55 29	64

Normal sinus rhythm
Normal ECG

Technician: T988019
Test ind:

100% RCA occlusion

Courtesy Dr. Gabe Rose

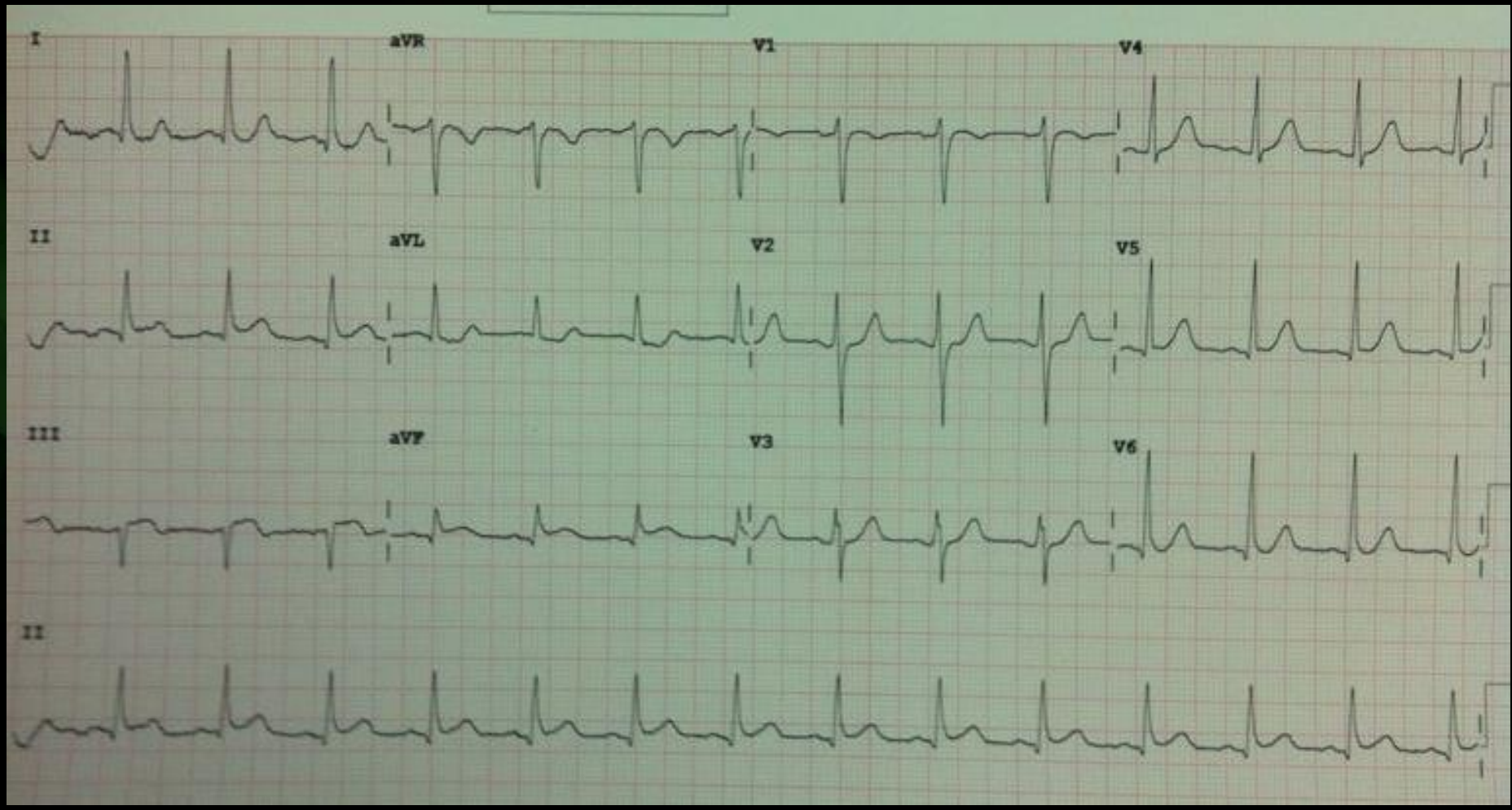


Why are we missing ECGs?

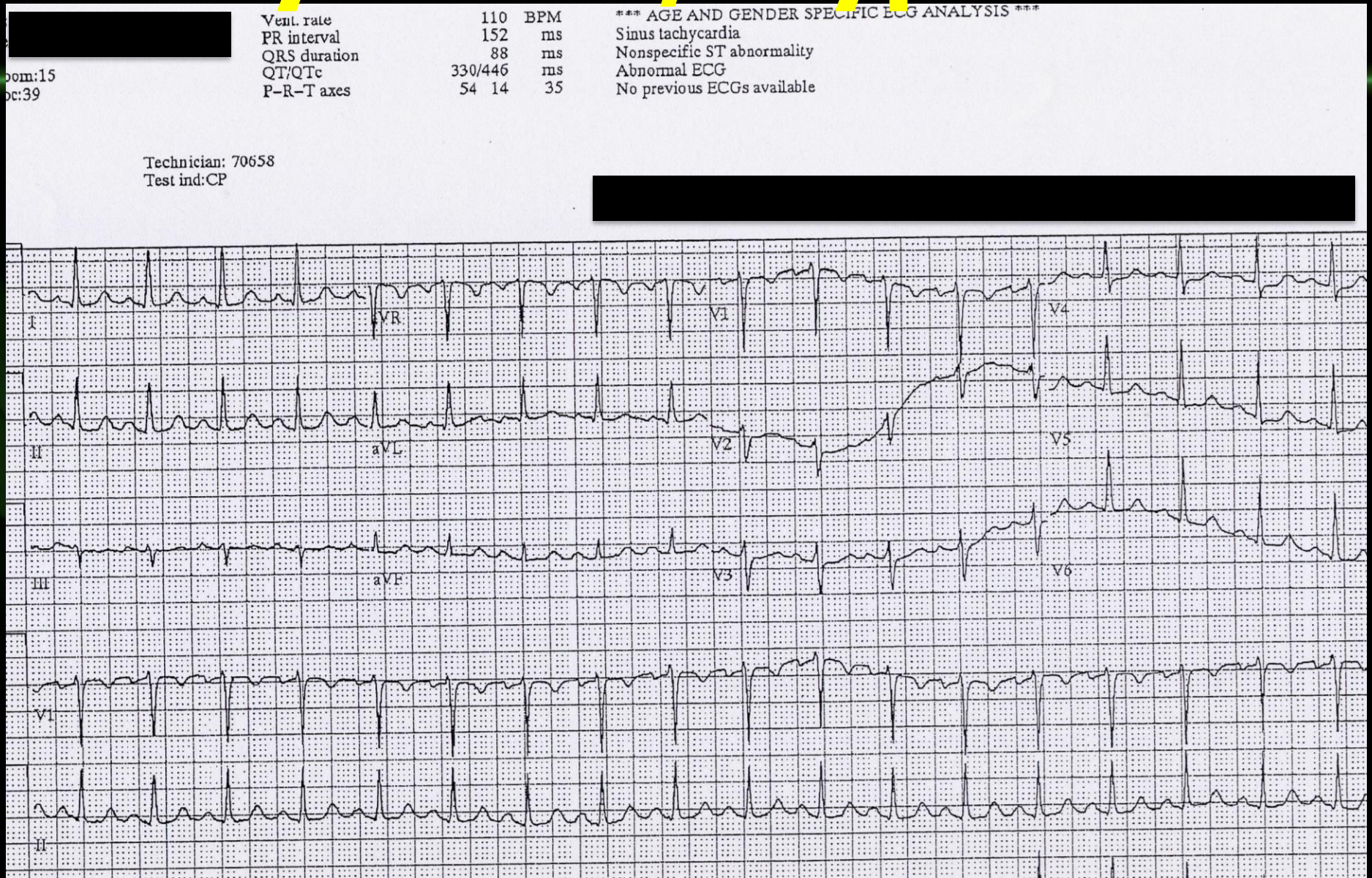
- Lack of scrutiny of the ECG and premature closure due to atypical presentation
  - Especially in young patients and women

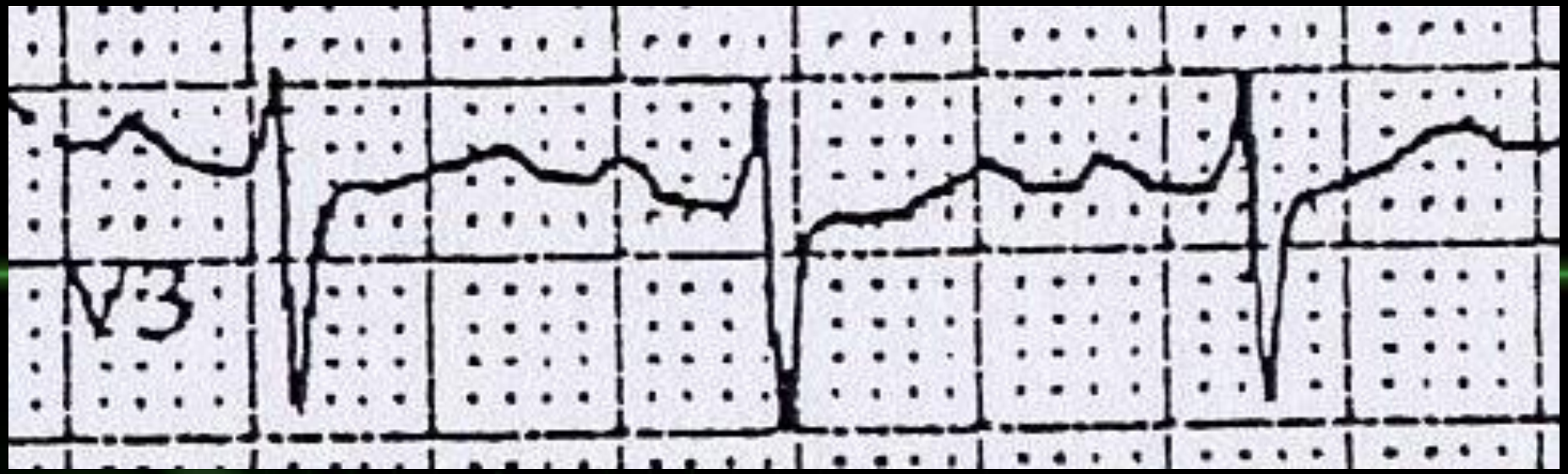
30 yo M misDx'd as pericarditis by consultant bc of age, no CRFs

Dr. Hasdan AlMaateeq

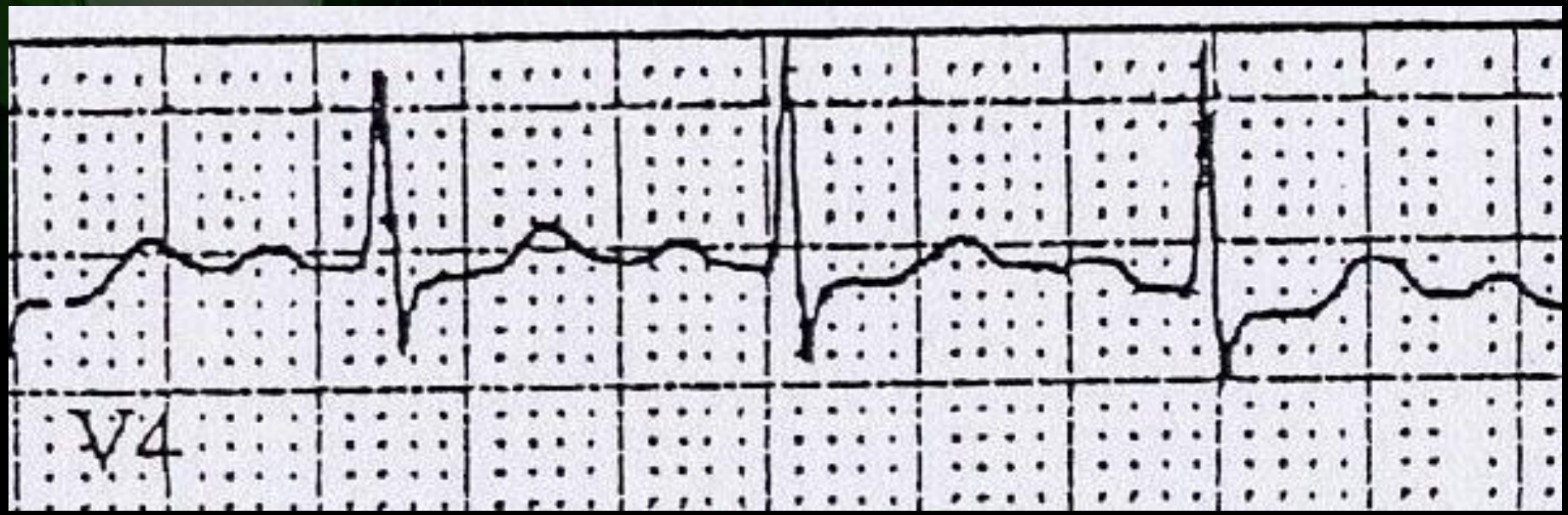


45 yo W w/atypical CP





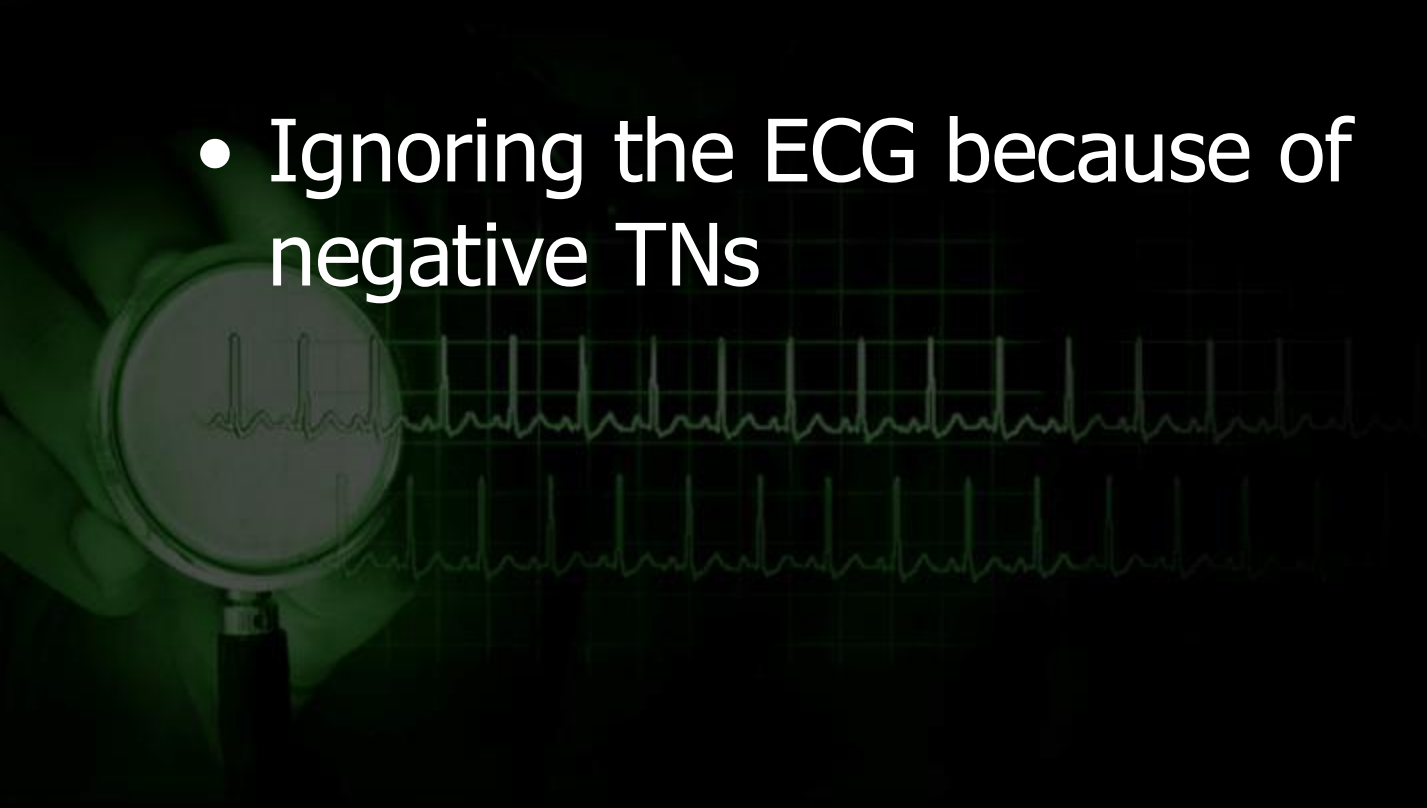
"The LAD leads"




NEED CASH
FOR ALCOHOL
RESEARCH

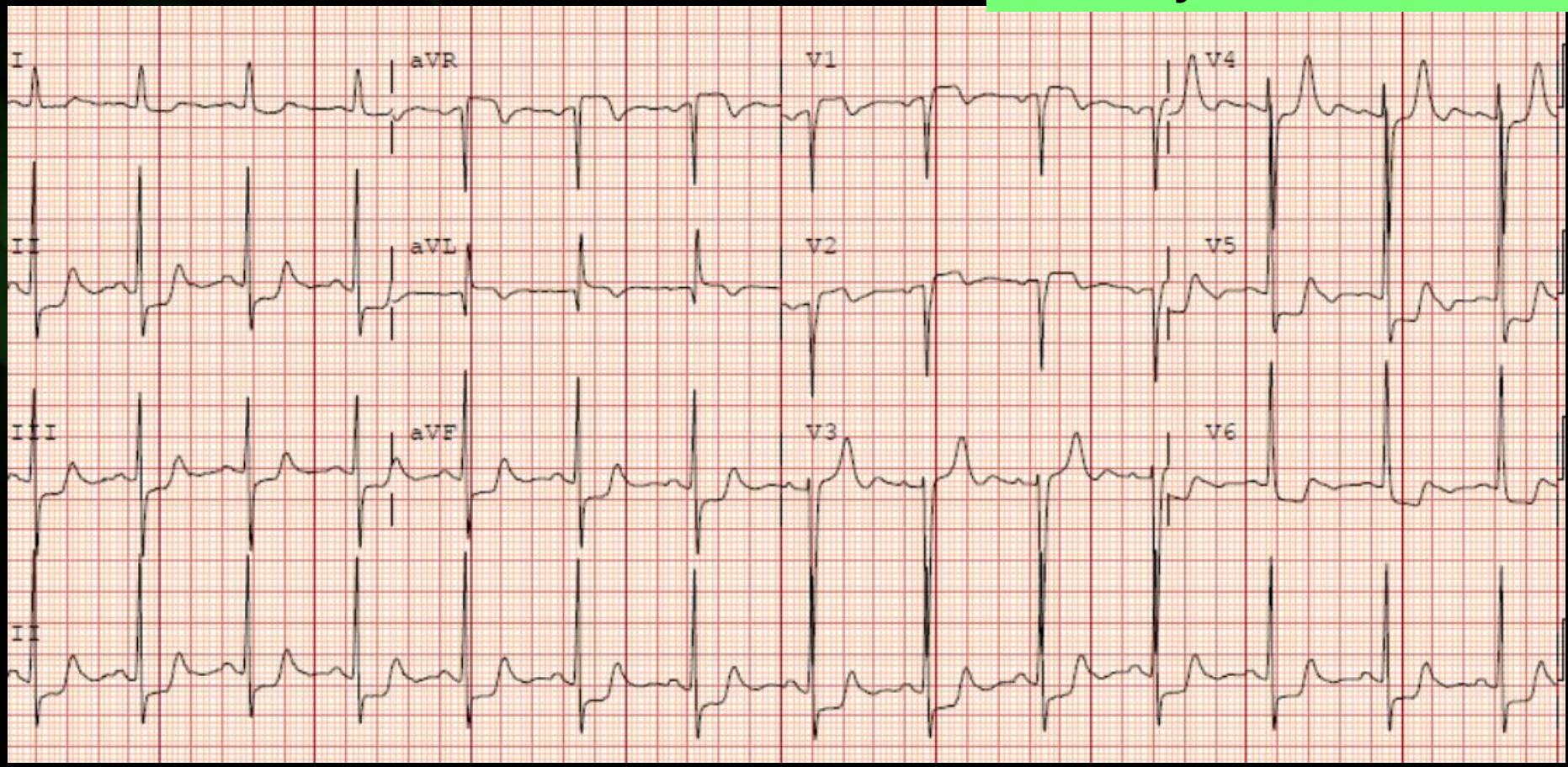
Why are we missing ECGs?

- Ignoring the ECG because of negative TNs



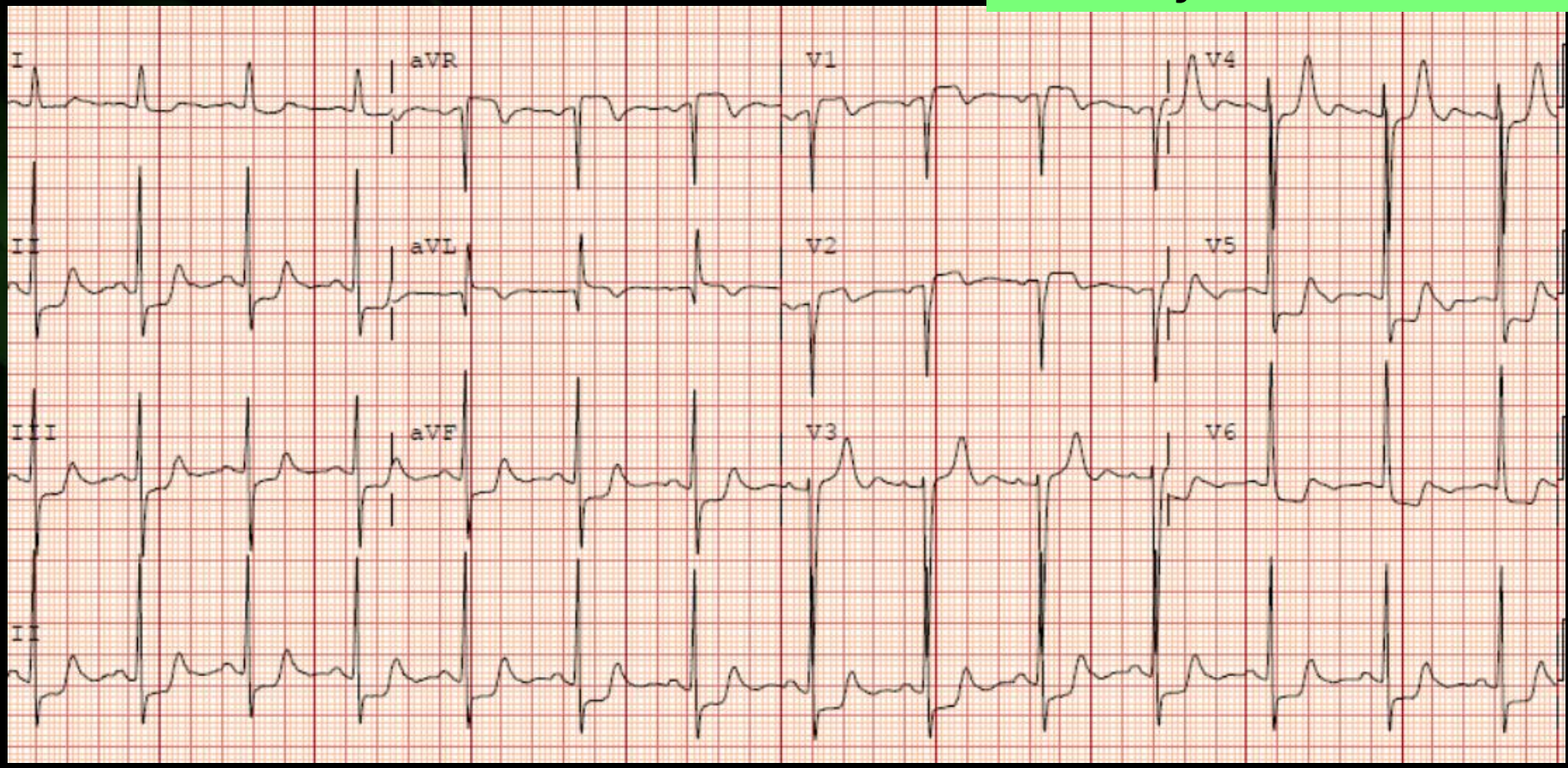
90 yo W w/CP, N, SOB; all ST abnls new

Courtesy Dr. Robert Ford

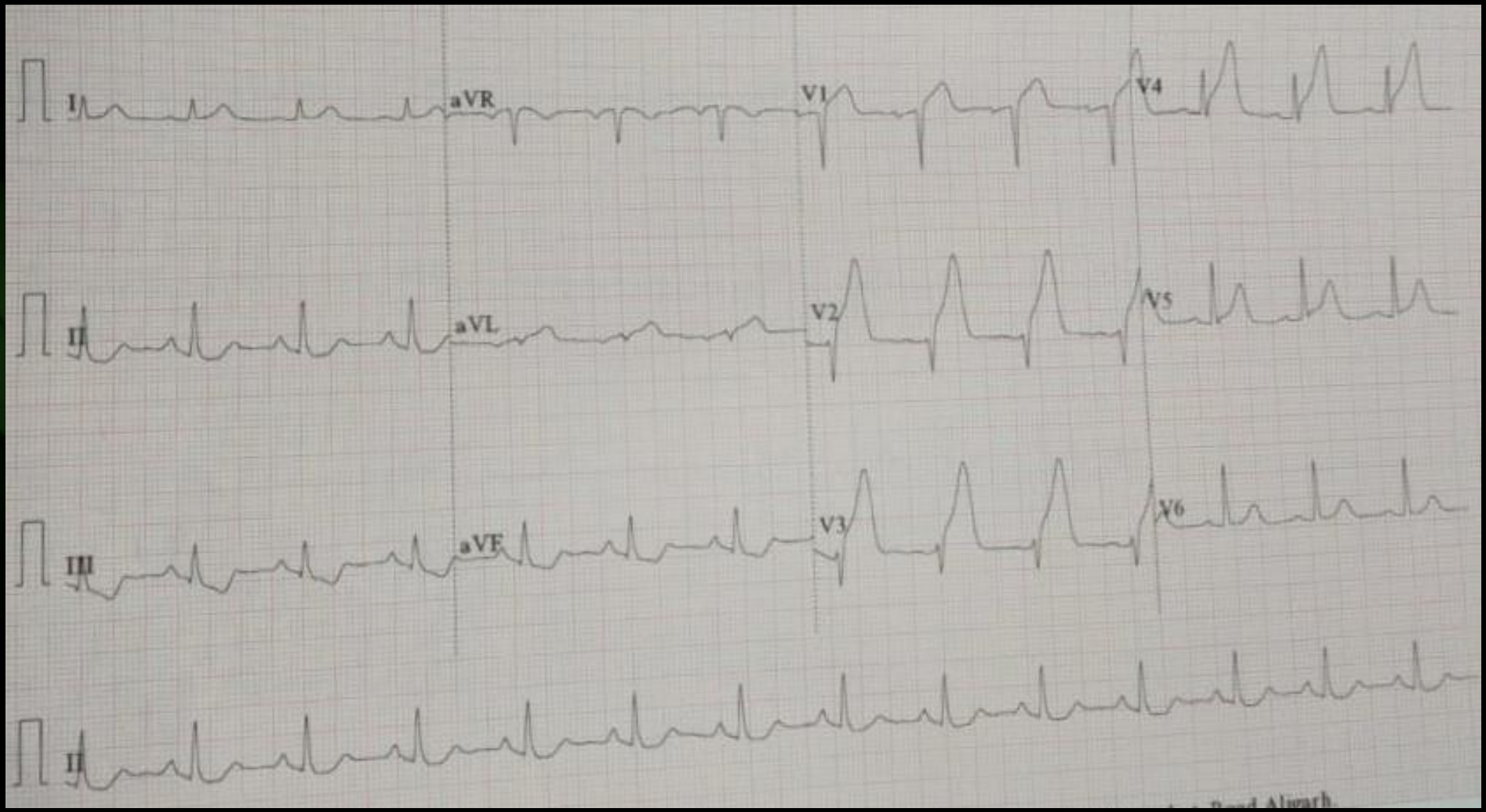


90 yo W w/CP, N, SOB; all ST abnls new; TN neg x 2

Courtesy Dr. Robert Ford



1-2 hrs CP, neg TN#1




Soon Fatt
CHINESE TAKE AWAY

Why are we missing ECGs?

Cereal ECG Testing

Why are we missing ECGs?

- Failure to repeat the ECG…

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  - If the first ECG is poor quality

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- Failure to repeat the ECG…
  - If the first ECG is poor quality
  - If ongoing concerning Sx's
    - ACC/AHA guidelines recommend serial ECGs every 15-30 min for the first hour if there are concerning Sx's and initial ECG is non-dx'ic

Why are we missing ECGs?

- Failure to repeat the ECG…
  - If the first ECG is poor quality
  - If ongoing concerning Sx's
    - ACC/AHA guidelines recommend serial ECGs every 15-30 min for the first hour if there are concerning Sx's and initial ECG is non-dx'ic
    - 15-20% of STEMIs are dx'd on the repeat ECG!


SPEED LIMIT
ENFORCED BY
AIRCRAFT

Takehome Points: *The History*

- Do and document a good hx
- Do not exclude ACS purely based on...
  - Reflux Sx's
  - Age
  - Female gender
  - Abdominal pain
  - Negative TNs

Takehome Points: *The ECG*

- Scrutinize the ECG
- Don’t trust the computer interpretation
- Get serial ECGs when the Hx is concerning but the first ECG is non-diagnostic


Thanks!
amalmattu@comcast.net