Bradycardia

MATT BEECROFT, MD

Goals

- Beyond atropine and pacing
- Don’t let them DIE
- Systematic approach
  - Fast or slow?*
  - Narrow or wide?
  - Regular or irregular?

Case #1 – What you see matters

- 65 yo old male with exertional near-syncope and palpitations
- Otherwise quite healthy
- Former paramedic
- No chest pain, but was out of breath
- He's fine at rest

ID:000237664 06-JAN-2019 12:26:16 Providence Reg Med Cnt Everett

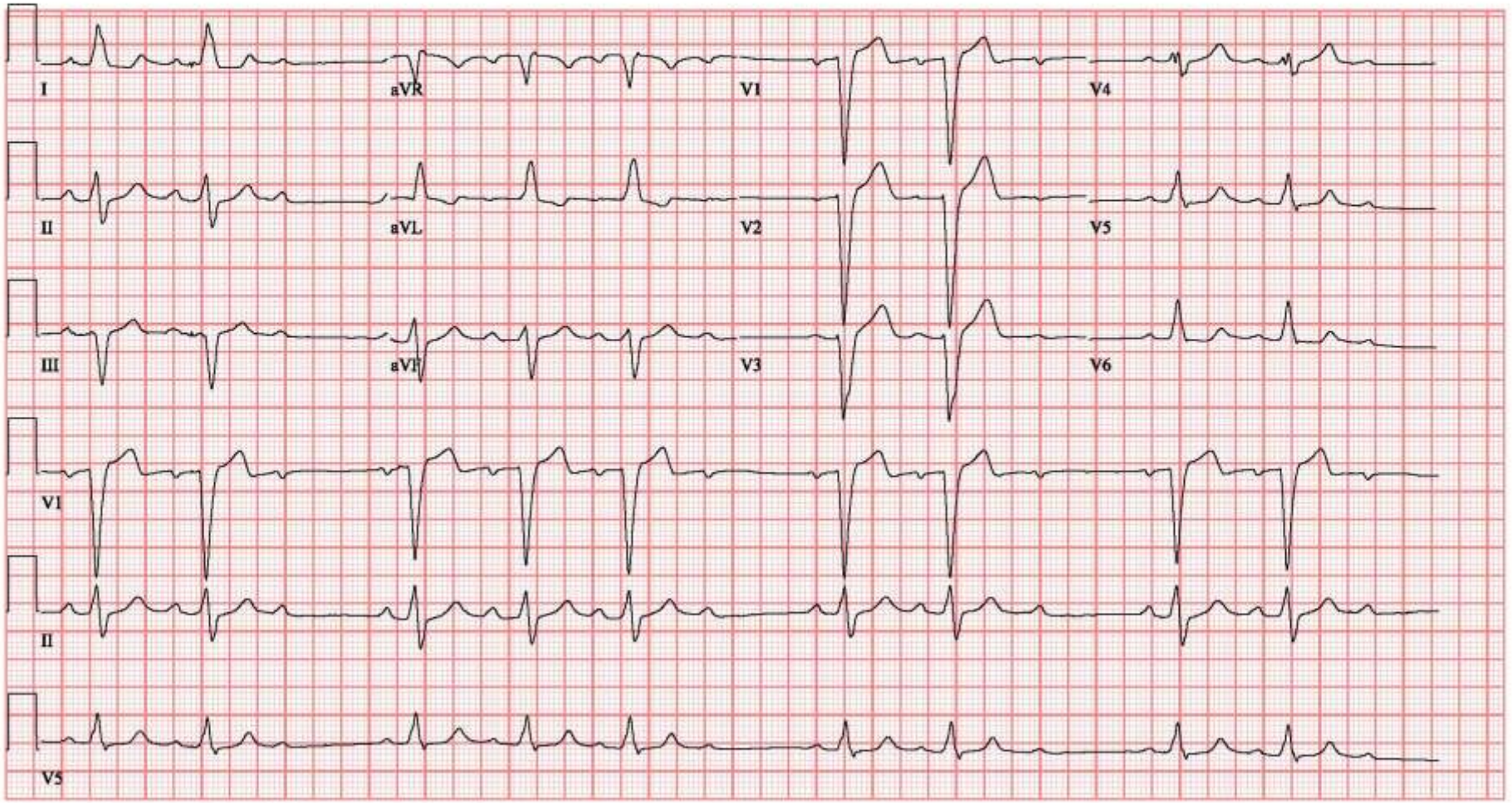
Vent. rate	56	BPM
PR interval	*	ms
QRS duration	150	ms
QT/QTc	454/438	ms
P-R-T axes	67 -33	74

Sinus rhythm with 2nd degree A-V block (Mobitz I)
Left axis deviation
Left bundle branch block
Abnormal ECG
When compared with ECG of 06-JAN-2019 10:25, (unconfirmed)
Sinus rhythm is now with 2nd degree A-V block (Mobitz I)
Sinus rhythm is no longer with 2nd degree A-V block (Mobitz II)
Confirmed by JOHNSON MD, ASHLEY B (4270), editor AKOPOVA, MARINA (2188) on 1/7/2019 7:02:28 AM

Technician: SG
Test ind:IRREGULAR HR

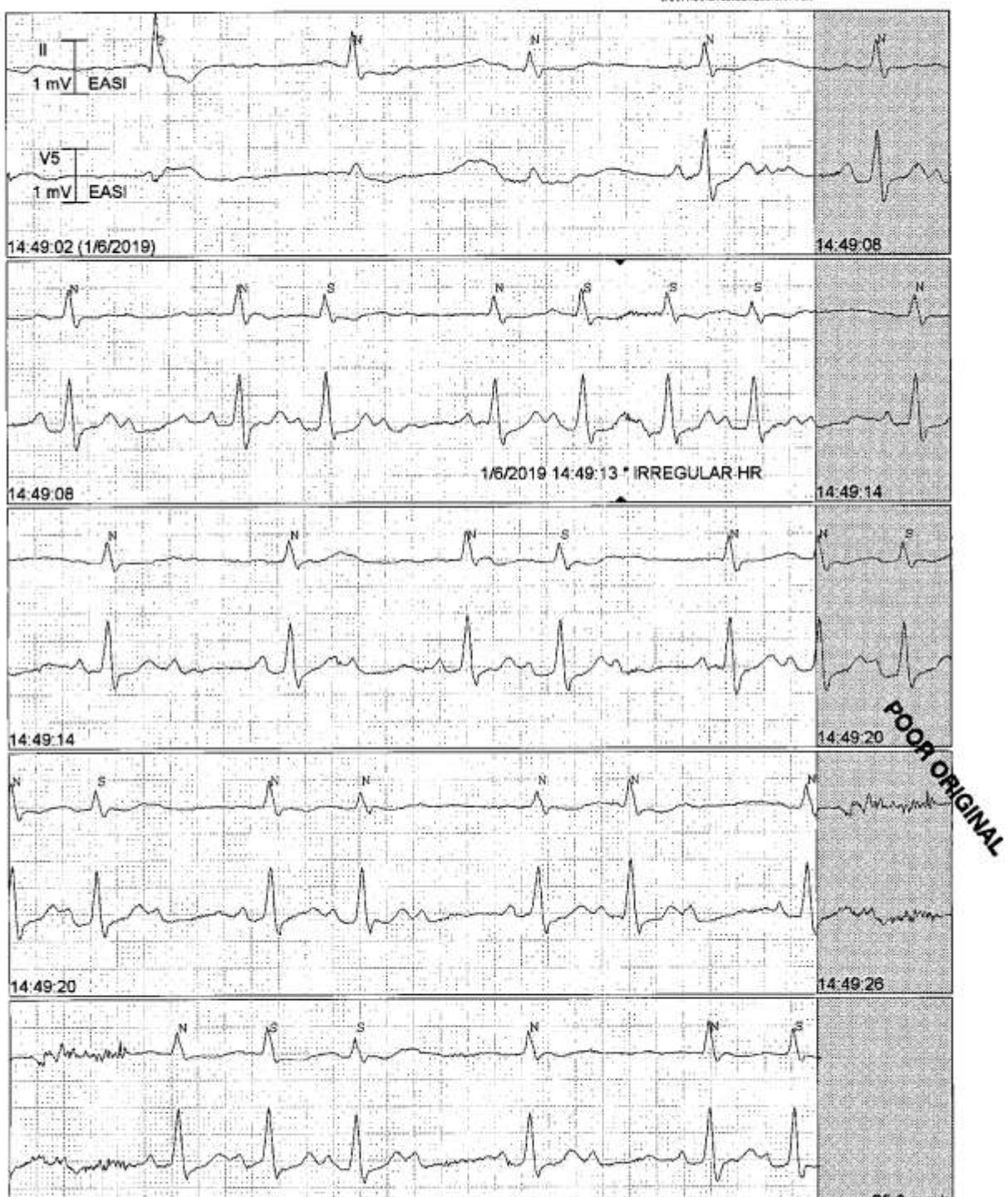
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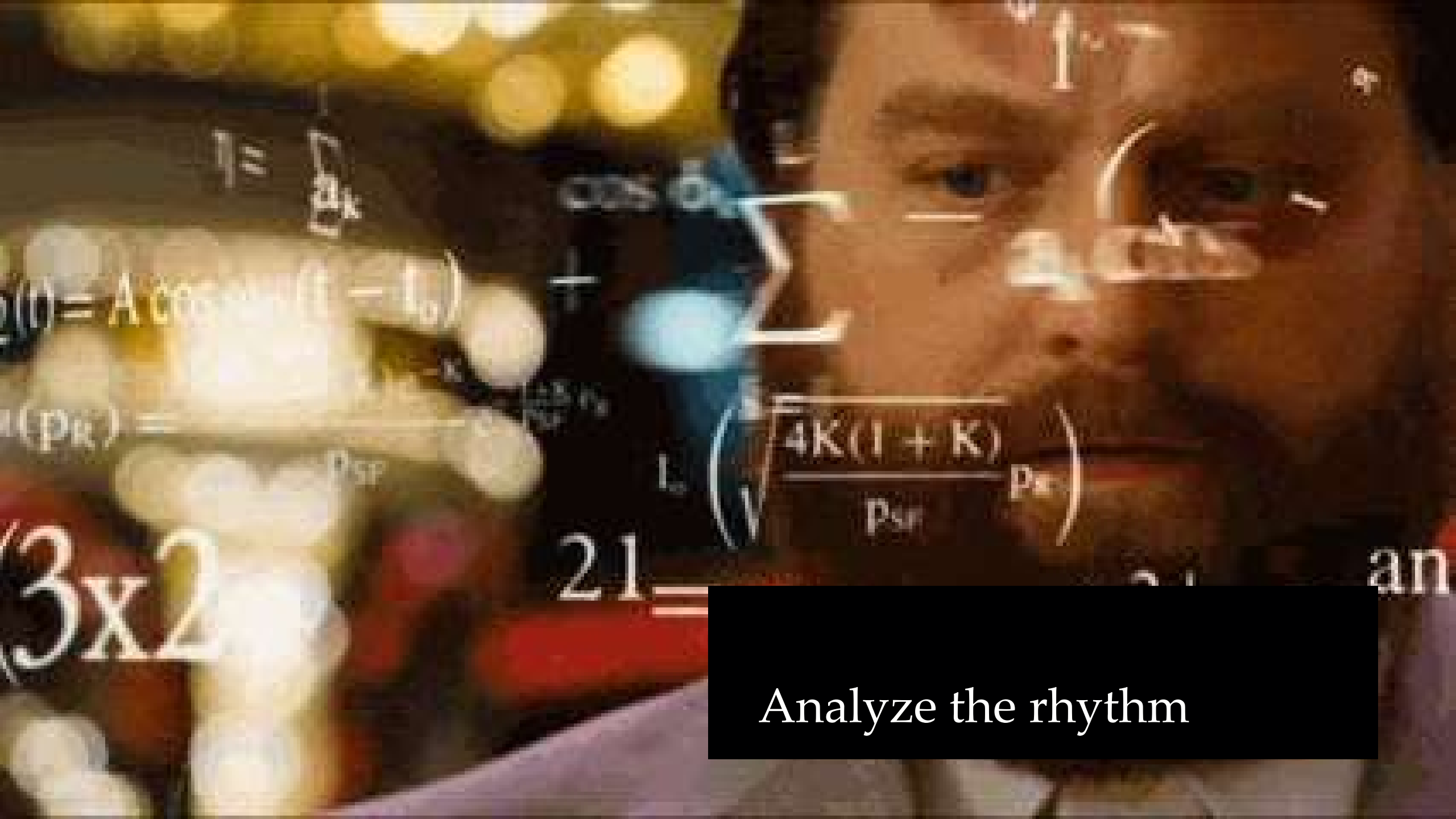
Electronically signed by: ASHLEY B JOHNSON MD



25mm/s 10mm/mV 40Hz 8.0 SP2 12SL 241 HD CID: 126

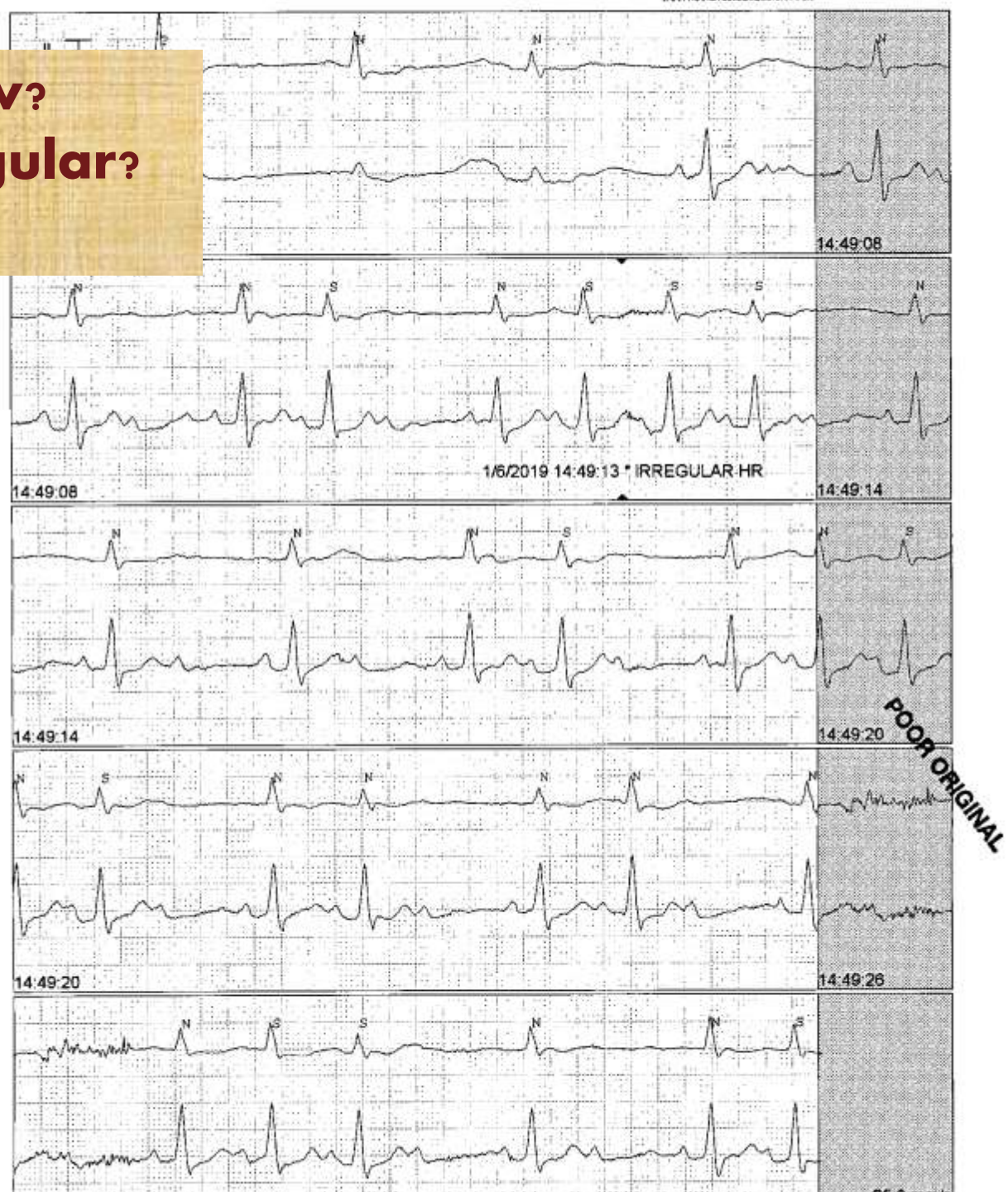
SID: 60000116559 EID:2188 EDT: 07:02 07-JAN-2019 ORDER: 276390663 ACCOUNT: 10158348608


II
1 mV EASI
V5
1 mV EASI
14:49:02 (1/6/2019)
14:49:08
14:49:08
1/6/2019 14:49:13 * IRREGULAR HR
14:49:14
14:49:14
14:49:20
POOR ORIGINAL
14:49:20
14:49:26



Analyze the rhythm

Wide or Narrow?
Regular or irregular?
Fast or Slow?



ID:000237664 06-JAN-2019 10:25:17 Providence Reg Med Cnt Everett

Vent. rate	69	BPM
PR interval	218	ms
QRS duration	146	ms
QT/QTc	426/456	ms
P-R-T axes	68 11	85

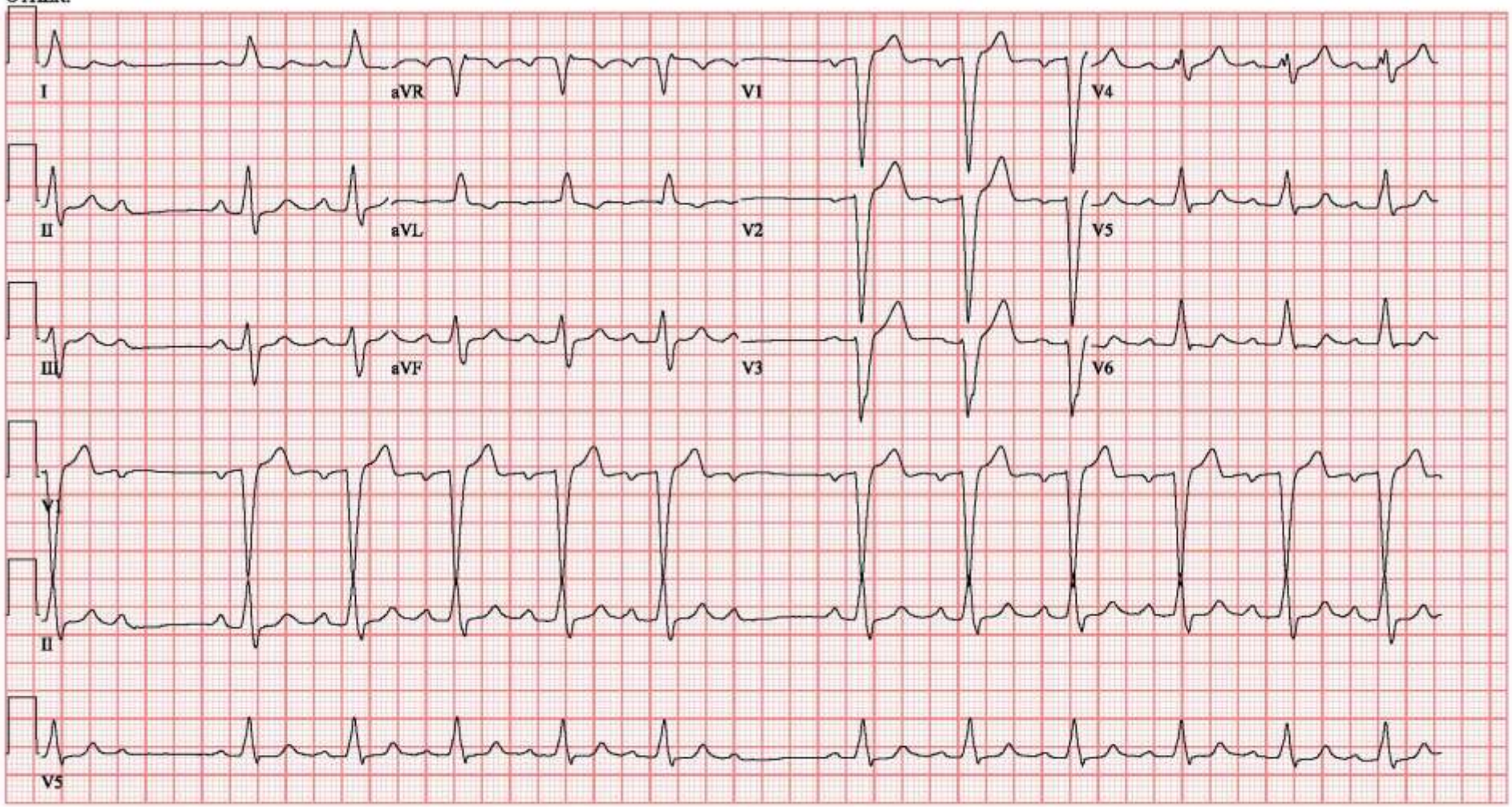
Sinus rhythm with 2nd degree A-V block (Mobitz II)
Left bundle branch block
Abnormal ECG
No previous ECGs available
Confirmed by BROWN MD, ELIZABETH (8045), editor AKOPOVA, MARINA (2188) on 1/7/2019 7:23:18 AM

Technician: GH
Test ind:IRREG HEART BEAT

Referred by: E BROWN

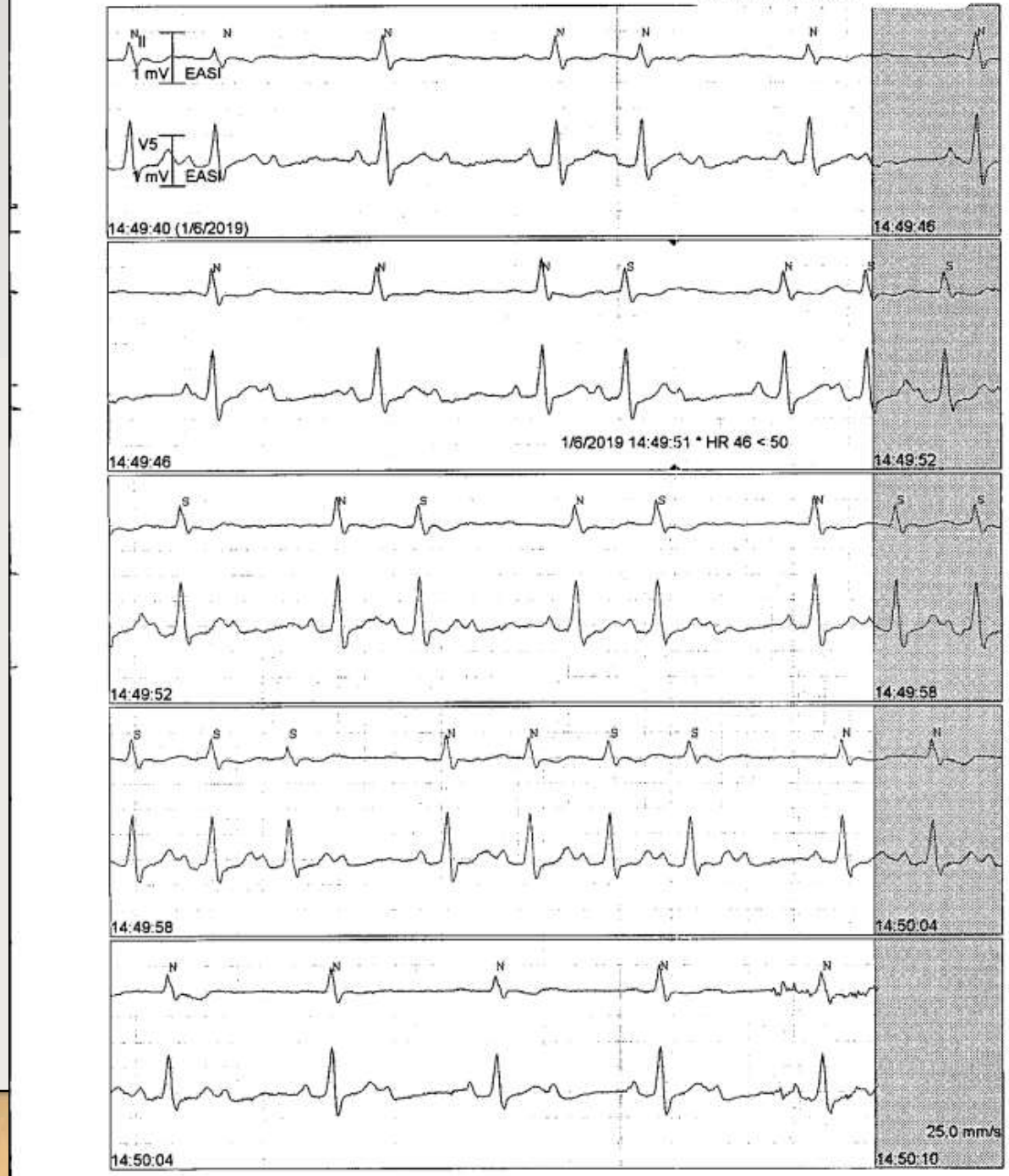
Electronically signed by: ELIZABETH BROWN MD

OTHER:

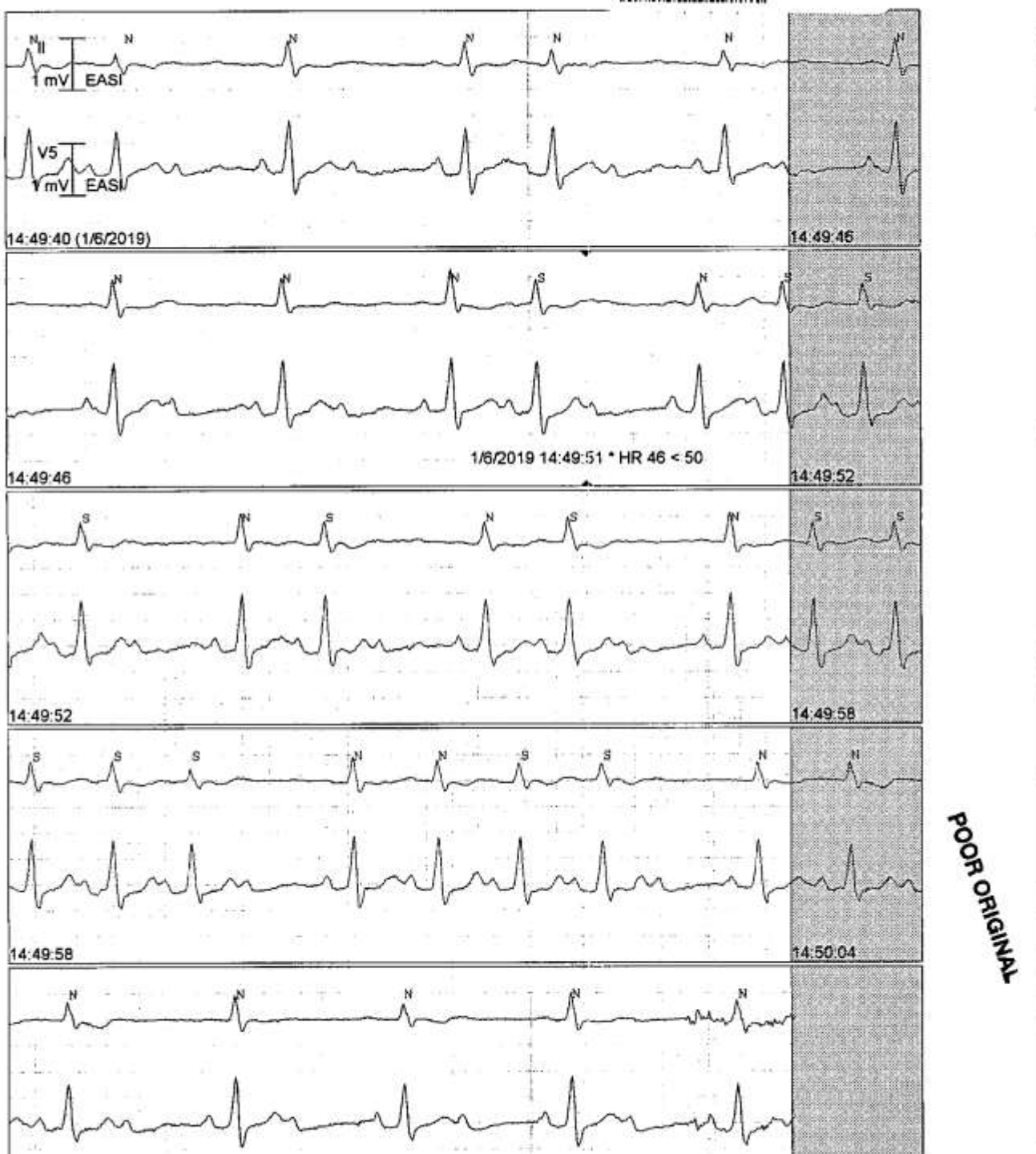


25mm/s 10mm/mV 40Hz 8.0 SP2 12SL 241 CID: 101

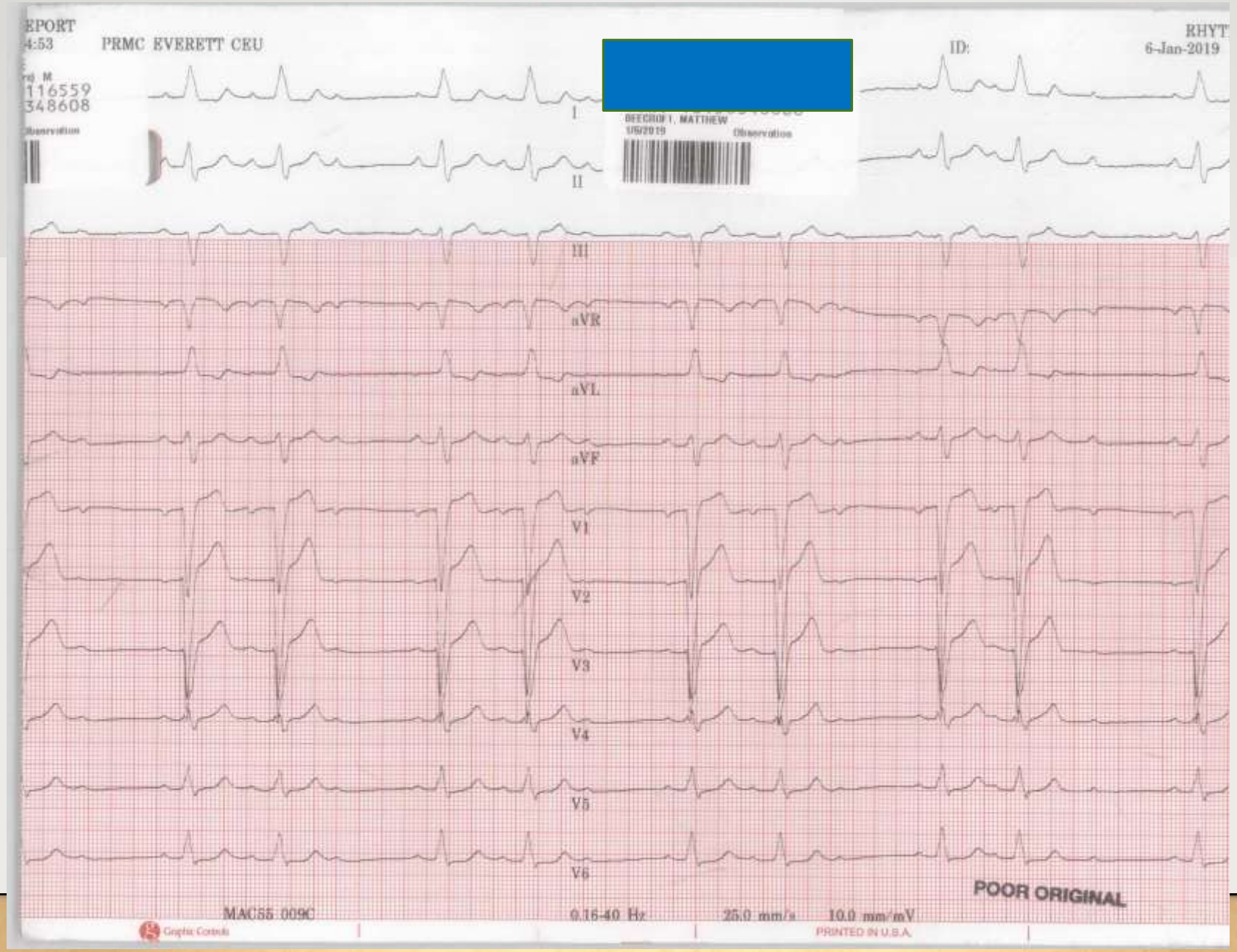
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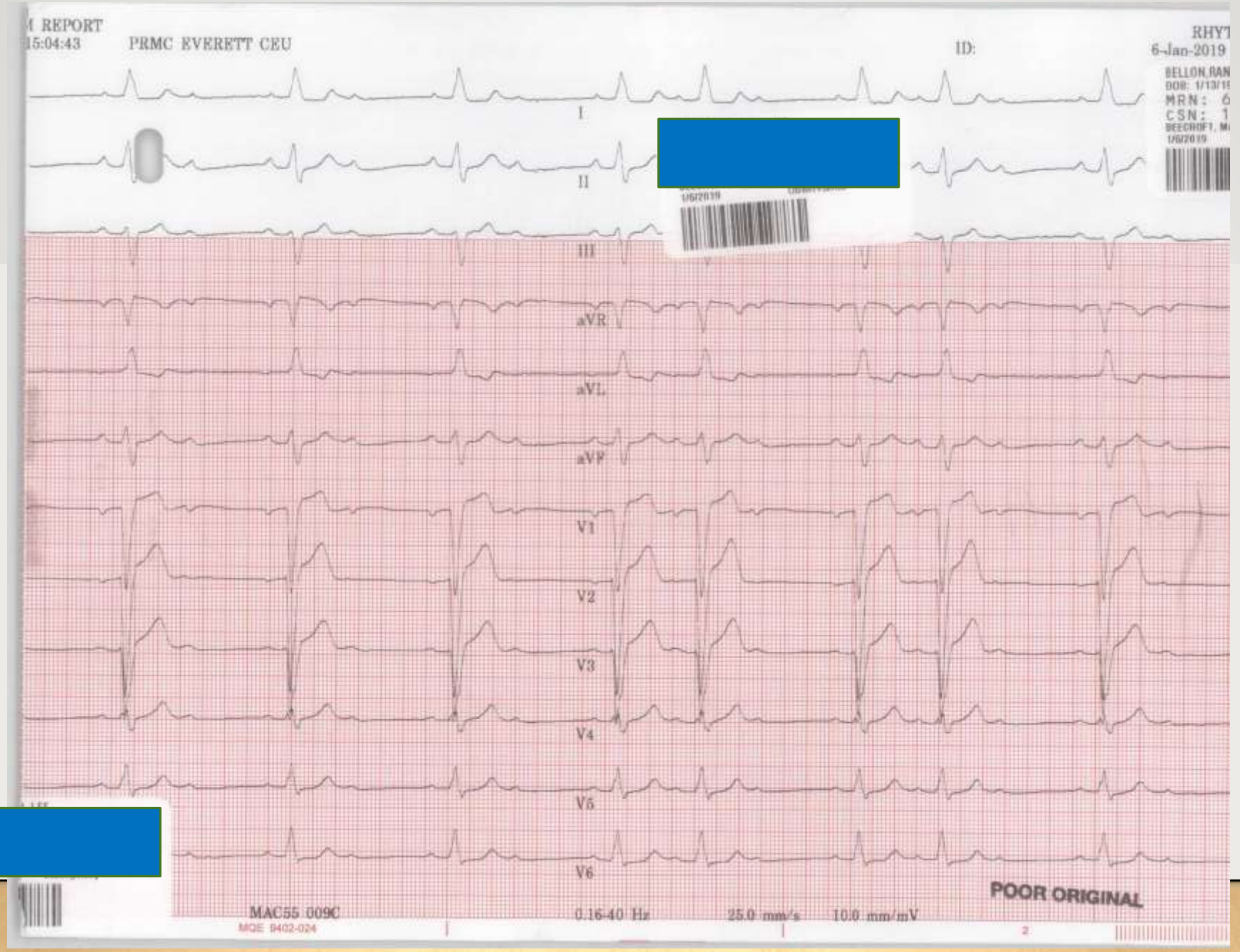


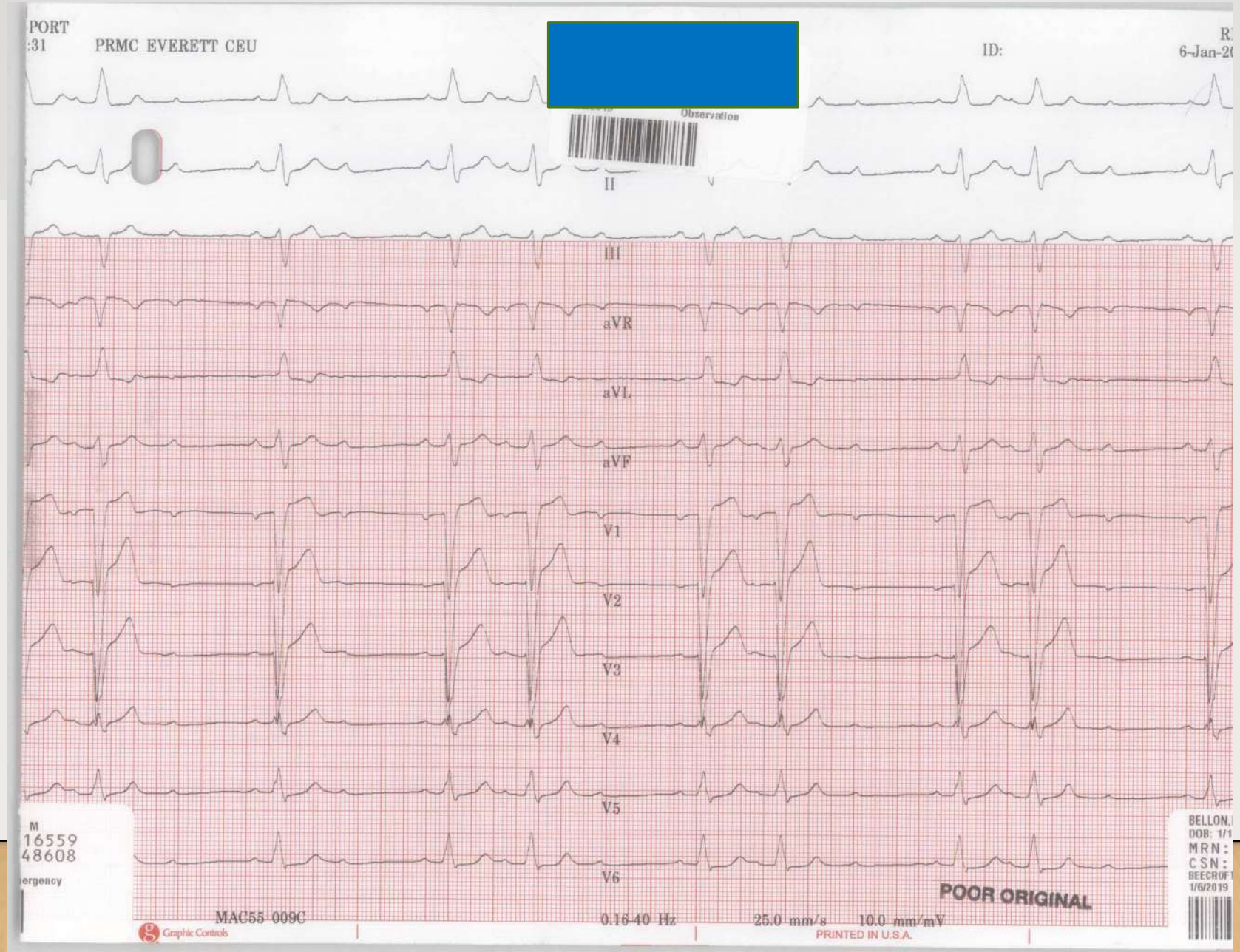
POOR ORIGINAL

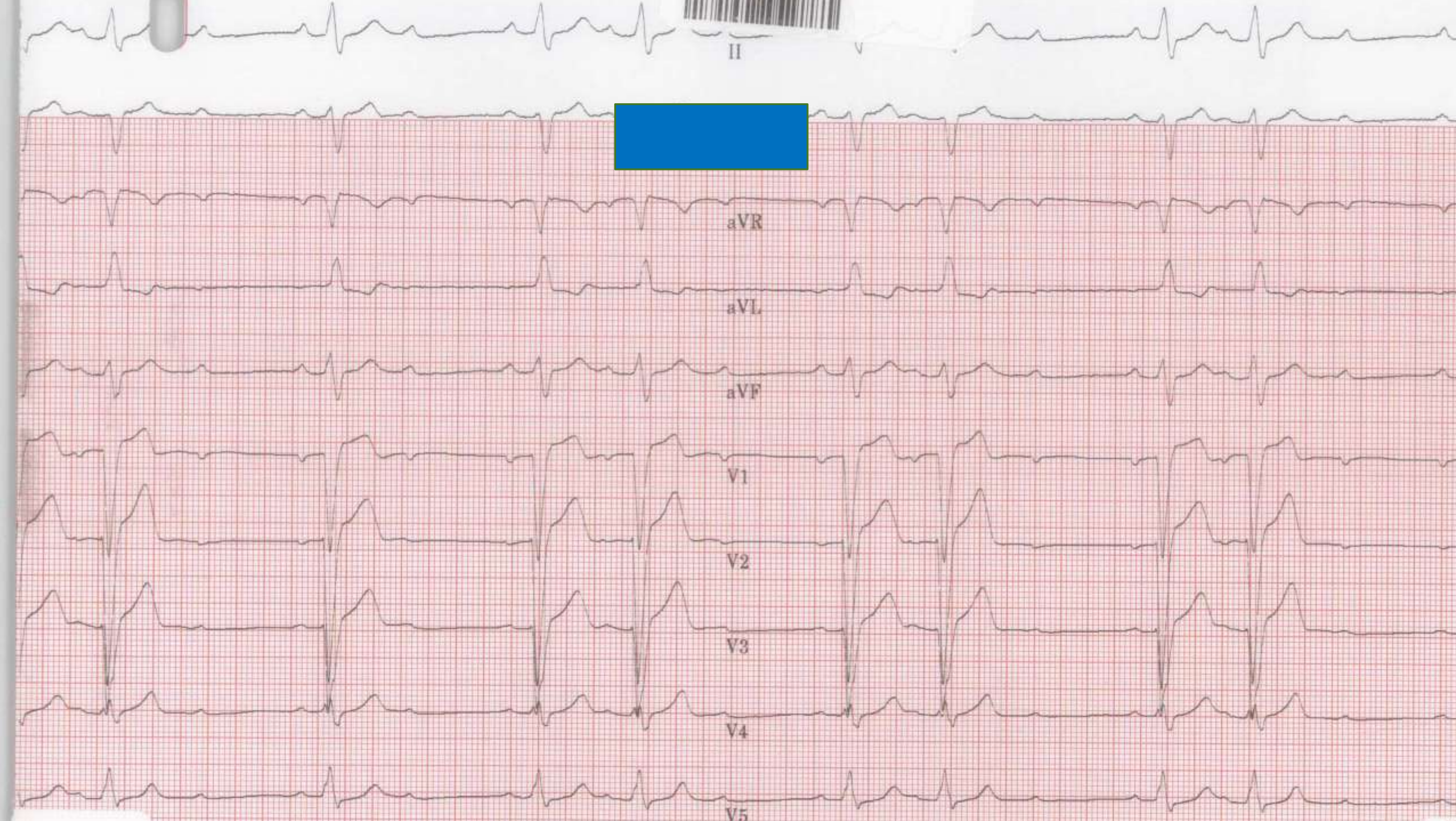


POOR ORIGINAL


EPORT
4:53
PRMC EVERETT CEU
RHYT
ID:
6-Jan-2019
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
POOR ORIGINAL
MAC55 009C
0.16-40 Hz
25.0 mm/s
10.0 mm/mV
PRINTED IN U.S.A.


REPORT
15:04:43
PRMC EVERETT CEU
ID:
6-Jan-2019
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
POOR ORIGINAL
MAC55 009C
0.16-40 Hz
25.0 mm/s
10.0 mm/mV


PORT
:31
PRMC EVERETT CEU
ID:
Observation
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
M
16559
48608
ergency
MAC55 009C
0.16-40 Hz
25.0 mm/s
10.0 mm/mV
POOR ORIGINAL
PRINTED IN U.S.A.
Graphic Controls
BELLON,
DOB: 1/1
MRN:
CSN:
1/6/2019

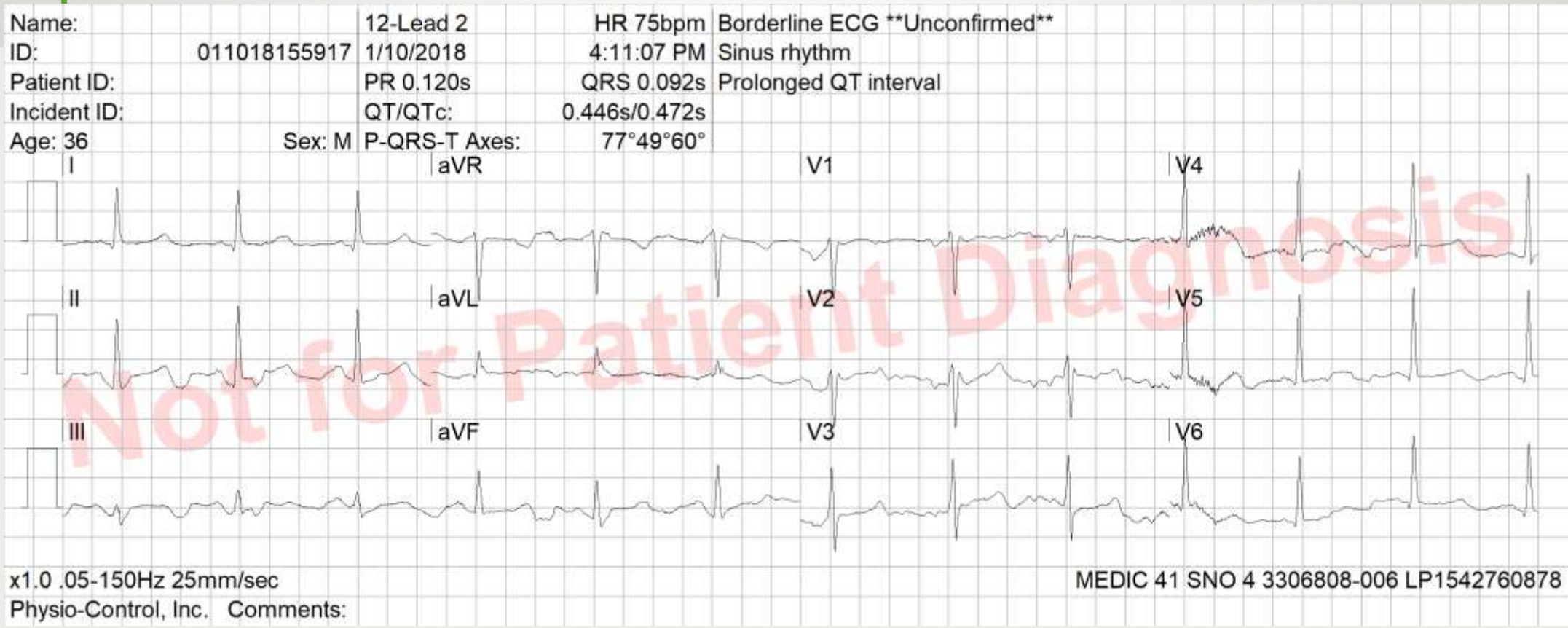

II
aVR
aVL
aVF
V1
V2
V3
V4
V5

Case #2 – Picked the wrong day to stop sniffing glue

- 36 yo male
- Family drops him at fire station
- History of PTSD (soldier) and depression
- Reported taking “pills” and huffing computer cleaner
- No pill bottles
- BP 154/129, HR 23

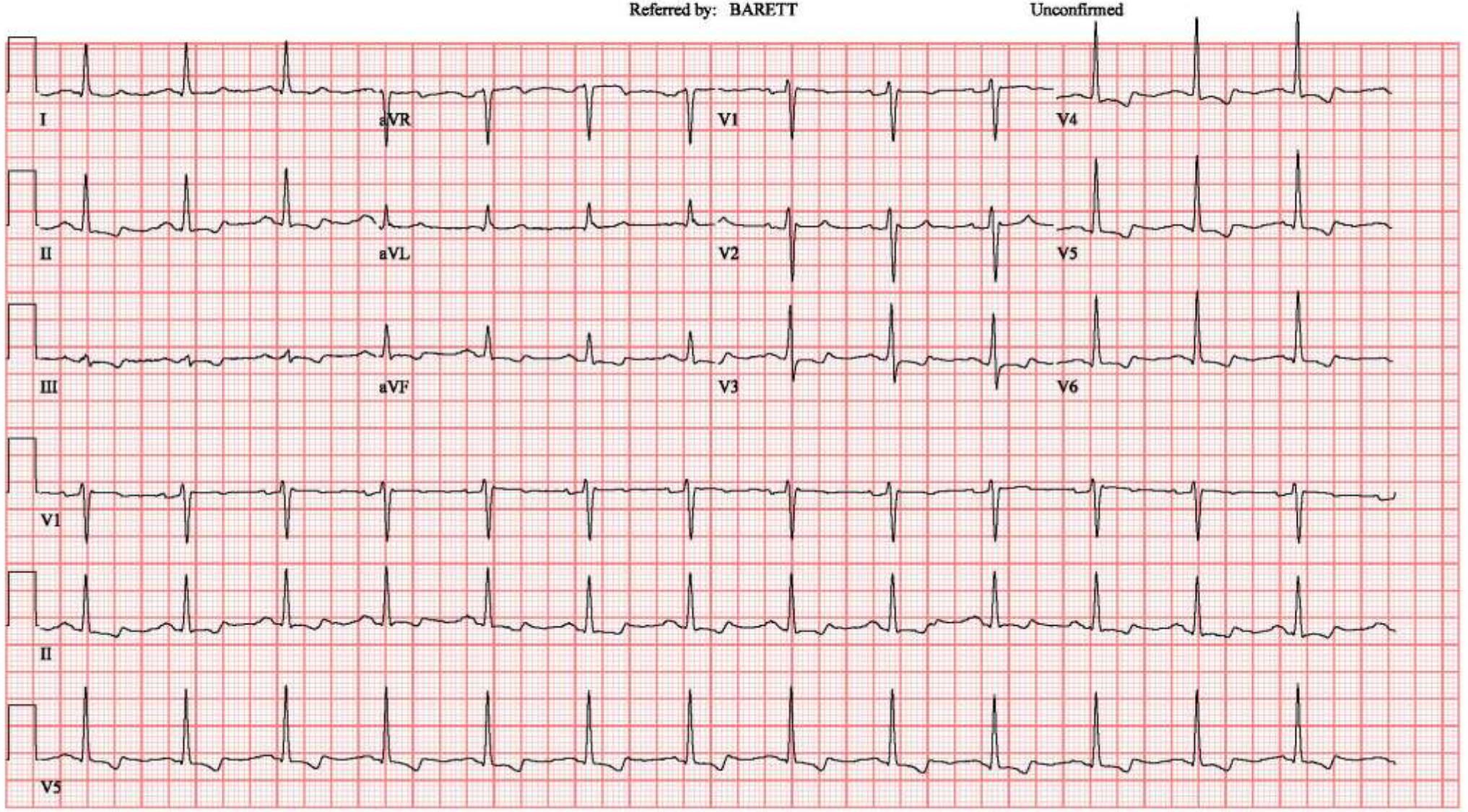
Overdose

- 36 yo male
- Family drops him at fire station
- History of PTSD (soldier) and depression
- Reported taking “pills” and huffing computer cleaner
- No pill bottles
- BP 154/129, HR 23
- After atropine, HR goes up to 75, BP 215/145


Name:
ID: 011018155917
Patient ID:
Incident ID:
Age: 36 Sex: M
12-Lead 2
1/10/2018
PR 0.120s
QT/QTc:
P-QRS-T Axes:
HR 75bpm
4:11:07 PM
QRS 0.092s
0.446s/0.472s
77°49°60°
Borderline ECG **Unconfirmed**
Sinus rhythm
Prolonged QT interval
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
Not for Patient Diagnosis
x1.0 .05-150Hz 25mm/sec
Physio-Control, Inc. Comments:
MEDIC 41 SNO 4 3306808-006 LP1542760878

Referred by: BARETT

Unconfirmed



25mm/s 10mm/mV 40Hz 8.0 SP2 12SL 241 HD CID: 124

SID: 60005623888 EID:20015 EDT: 16:50 10-JAN-2018 ORDER: 387317005 ACCOUNT: 10133025039

OD Bradycardia

- WHAT'S ON THE LIST?



OD Bradycardia

- Calcium channel blockers
- Beta-blockers
- Digoxin
- Opiates
- Alpha-2 antagonists (e.g., clonidine)
- Sodium channel blockers (e.g., TCA, carbamazepine, flexeril, antipsychotics, propranolol, cocaine)

What are these?

- Metoprolol
- Amlodipine
- Verapamil
- Atenolol
- Norvasc
- Diltizem
- Digoxin

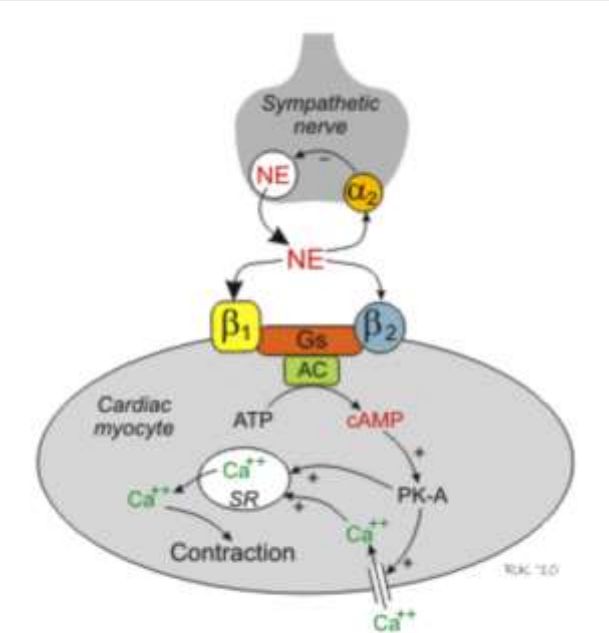
OD Bradycardia – telling them apart

BETA BLOCKER

- More likely to be hypoglycemia
- More likely depressed LOC

CCB

- More likely to be hyperglycemia
- More likely to have normal LOC



Overdose

- 36 yo male
- Family drops him at fire station
- History of PTSD (soldier) and depression
- Reported taking “pills” and huffing computer cleaner
- No pill bottles
- BP 154/129, HR 23
- After atropine, HR goes up to 75, BP 215/145

OD Bradycardia

- Calcium channel blockers
- Beta-blockers
- Digoxin
- Opiates
- Alpha-2 antagonists (e.g., clonidine)
- Sodium channel blockers (e.g., TCA, carbamazepine, flexeril, antipsychotics, propranolol, cocaine)

Clonidine

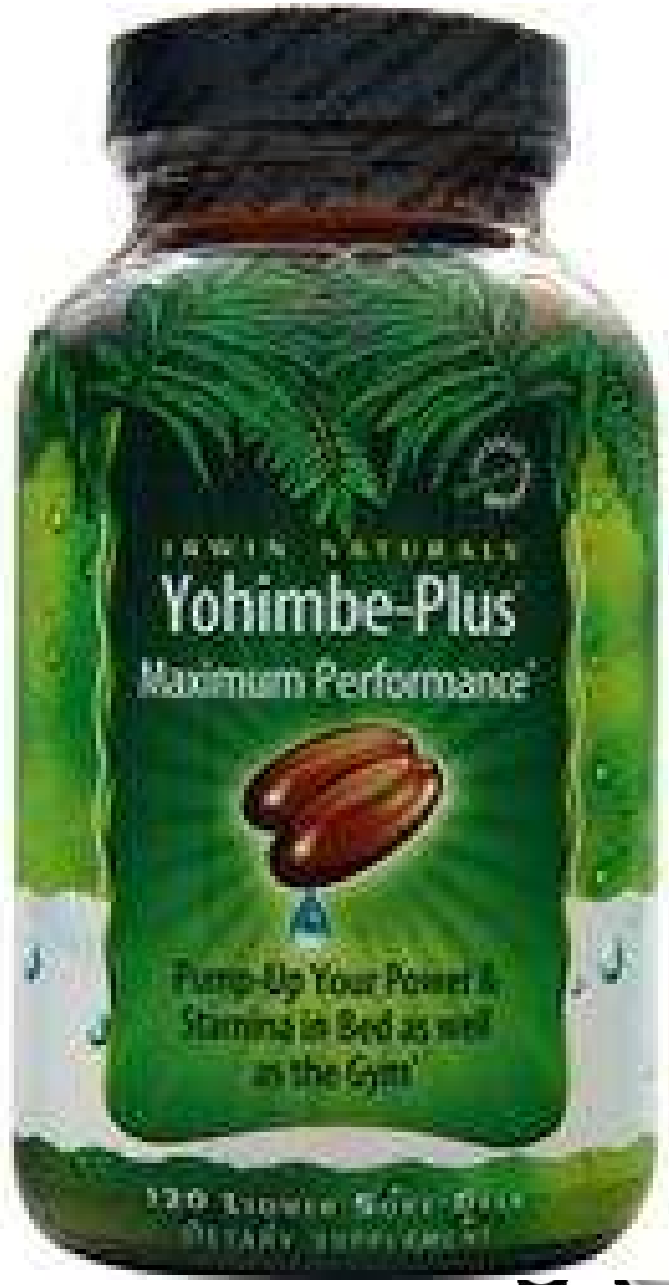
- Alpha 2 receptor agonist
- Clinically indistinguishable from opiate OD
  - bradycardia
  - hypotension
  - respiratory depression
  - miosis
  - a decreased LOC



Clonidine

- Alpha 2 receptor agonist
- Clinically indistinguishable from opiate OD
  - bradycardia
  - hypotension
  - respiratory depression
  - miosis
  - a decreased LOC
  - transient response to narcan




IRWIN NATURALS
Yohimbe-Plus
Maximum Performance

OD Bradycardia

- Calcium channel blockers
- Beta-blockers
- Digoxin
- Opiates
- Alpha-2 antagonists (e.g., clonidine)
- Sodium channel blockers (e.g., TCA, carbamazepine, flexeril, antipsychotics, propranolol, cocaine)

Case 2b – Can’t wake a sleeping baby

- 18 mo old parent cannot arouse
- Poor respiratory effort
- HR 38
- Sleeps with parent

Clonidine

- Initial transient pressor effect
- Hypertension occurs in about one third of patients
- Usually lasts an hour or two, but can last for up to 10–12 hours, especially in renal disease



Clonidine/alpha blocker

- Initial transient pressor effect
- Hypertension occurs in about one third of patients
- Usually lasts an hour or two, but can last for up to 10–12 hours, especially in renal disease



Clonidine/alpha blocker

- Initial transient pressor effect
- Hypertension occurs in about one third of patients
- Usually lasts an hour or two, but can last for up to 10–12 hours, especially in renal disease



Case #3 – Something not right about grandma

- Grandma not acting right
- Complained of some visual changes earlier in the day
- H/o “Heart problems,” HTN, dementia, kidney problems
- Initially BP 101/56, HR 36


Rhythm[II] 10mm/mV

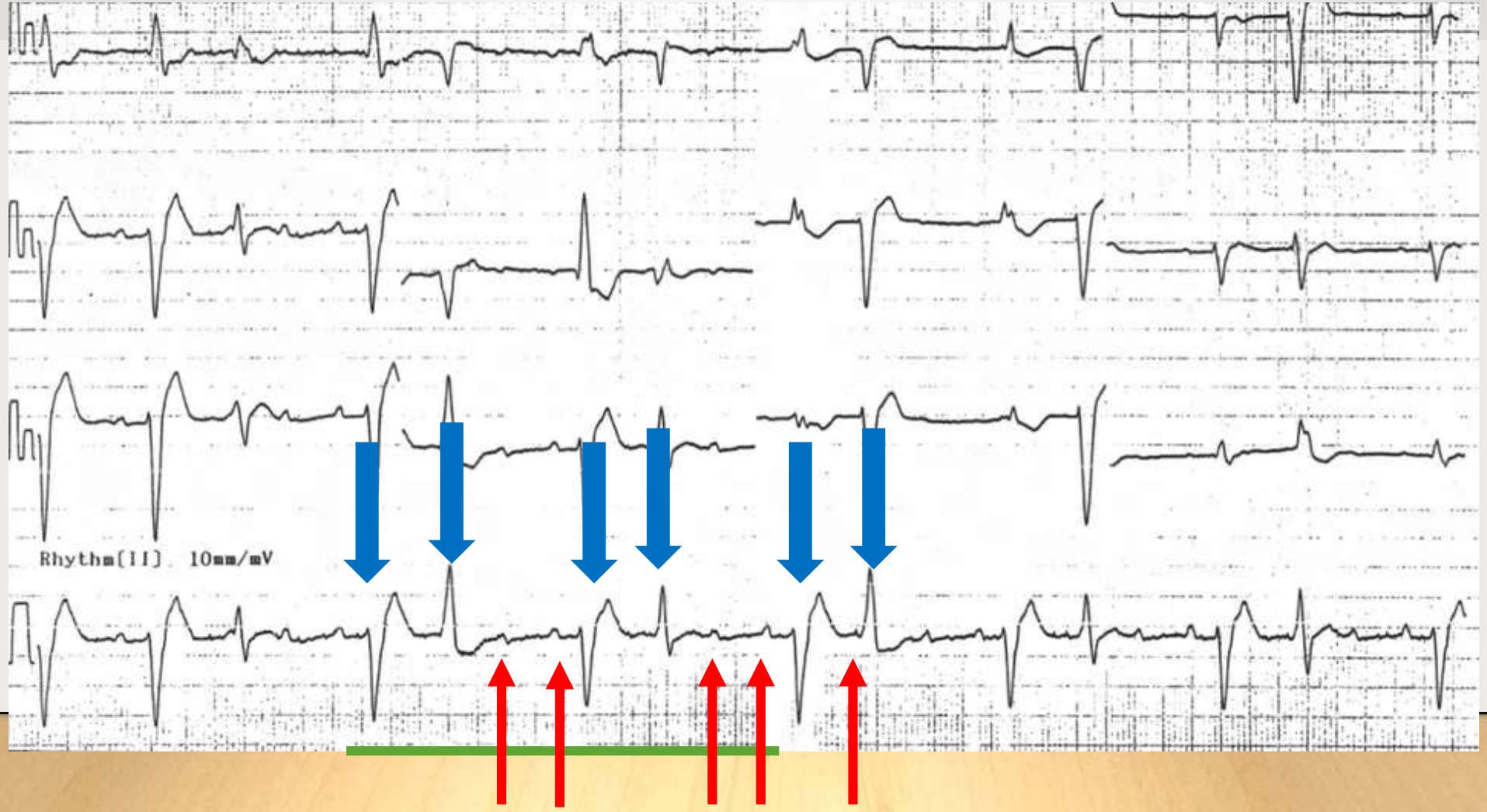
Fast or slow?*
Wide or narrow?
Regular or irregular?



Fast or slow?

Wide or narrow?

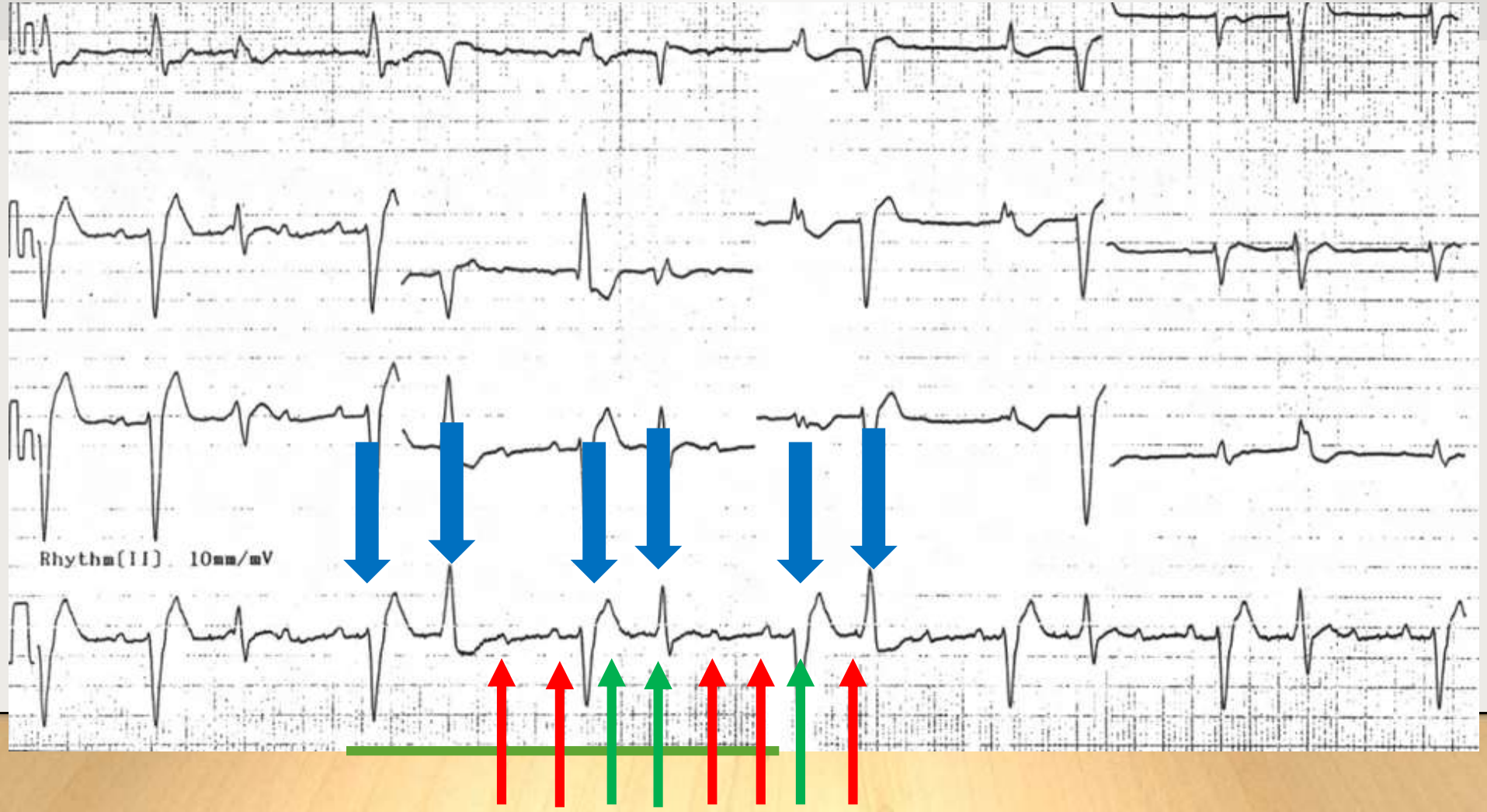
Regular or irregular?



Fast or slow?

Wide or narrow?

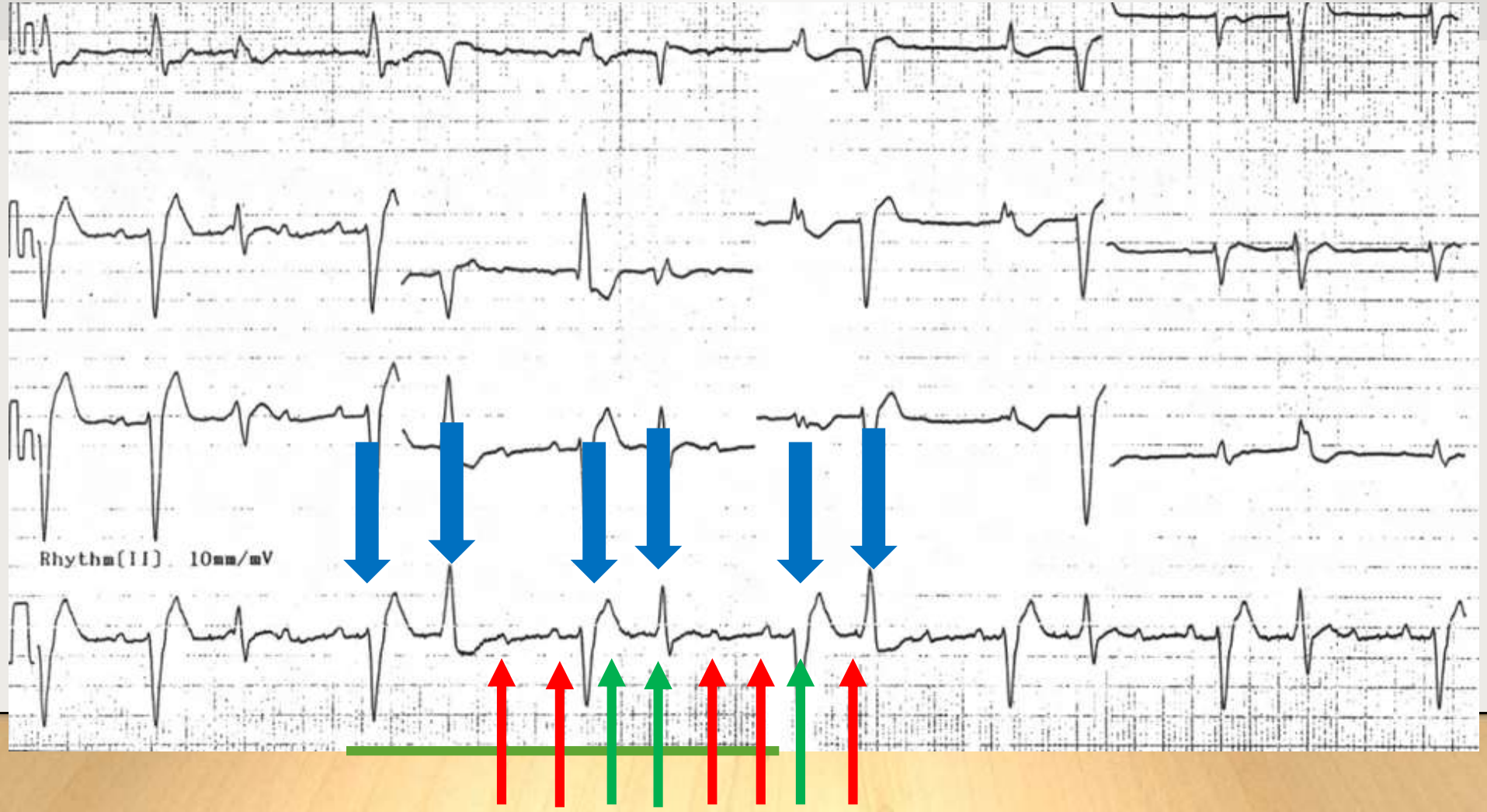
Regular or irregular?



Fast or slow?

Wide or narrow?

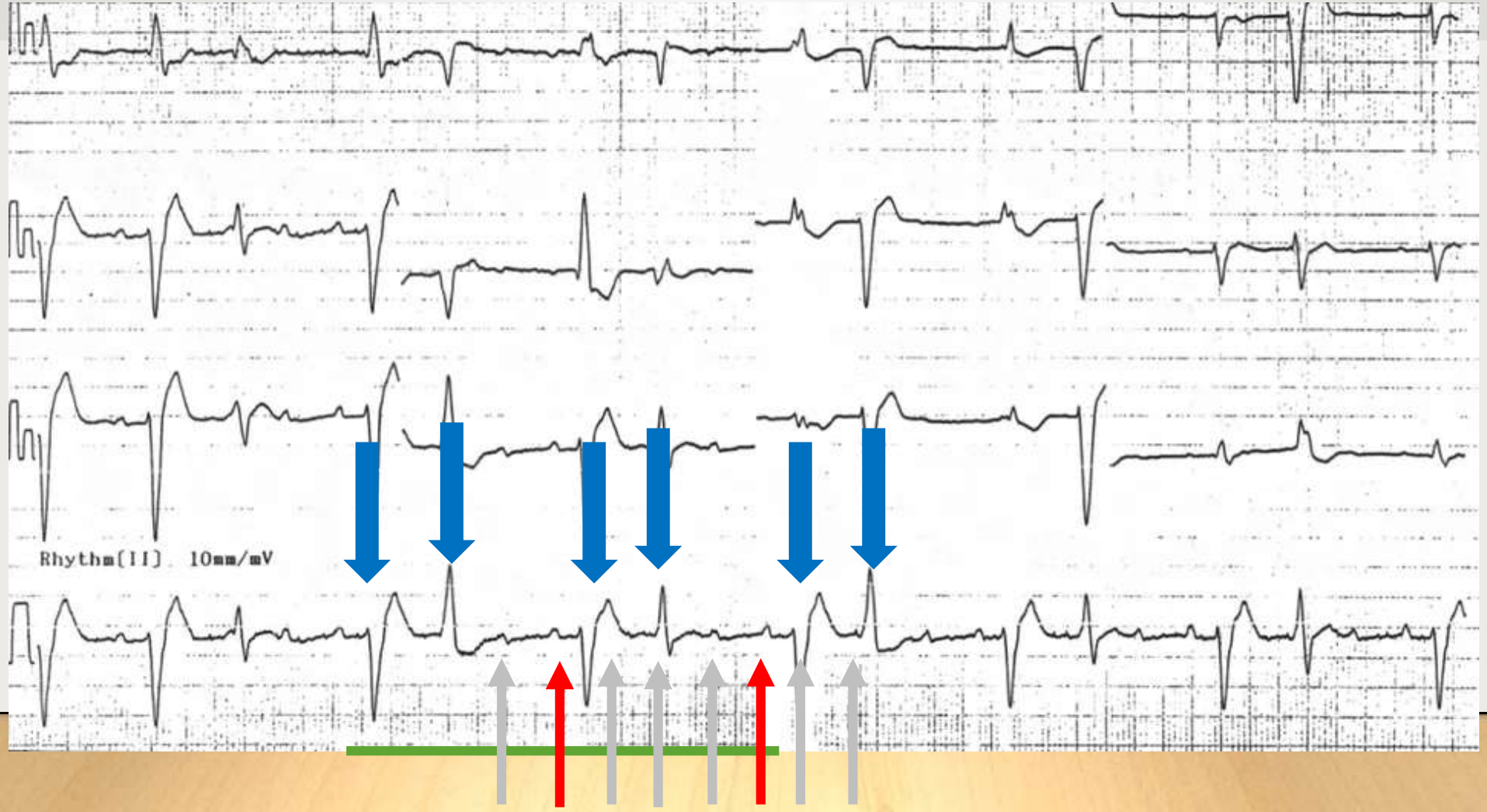
Regular or irregular?



Fast or slow?

Wide or narrow?

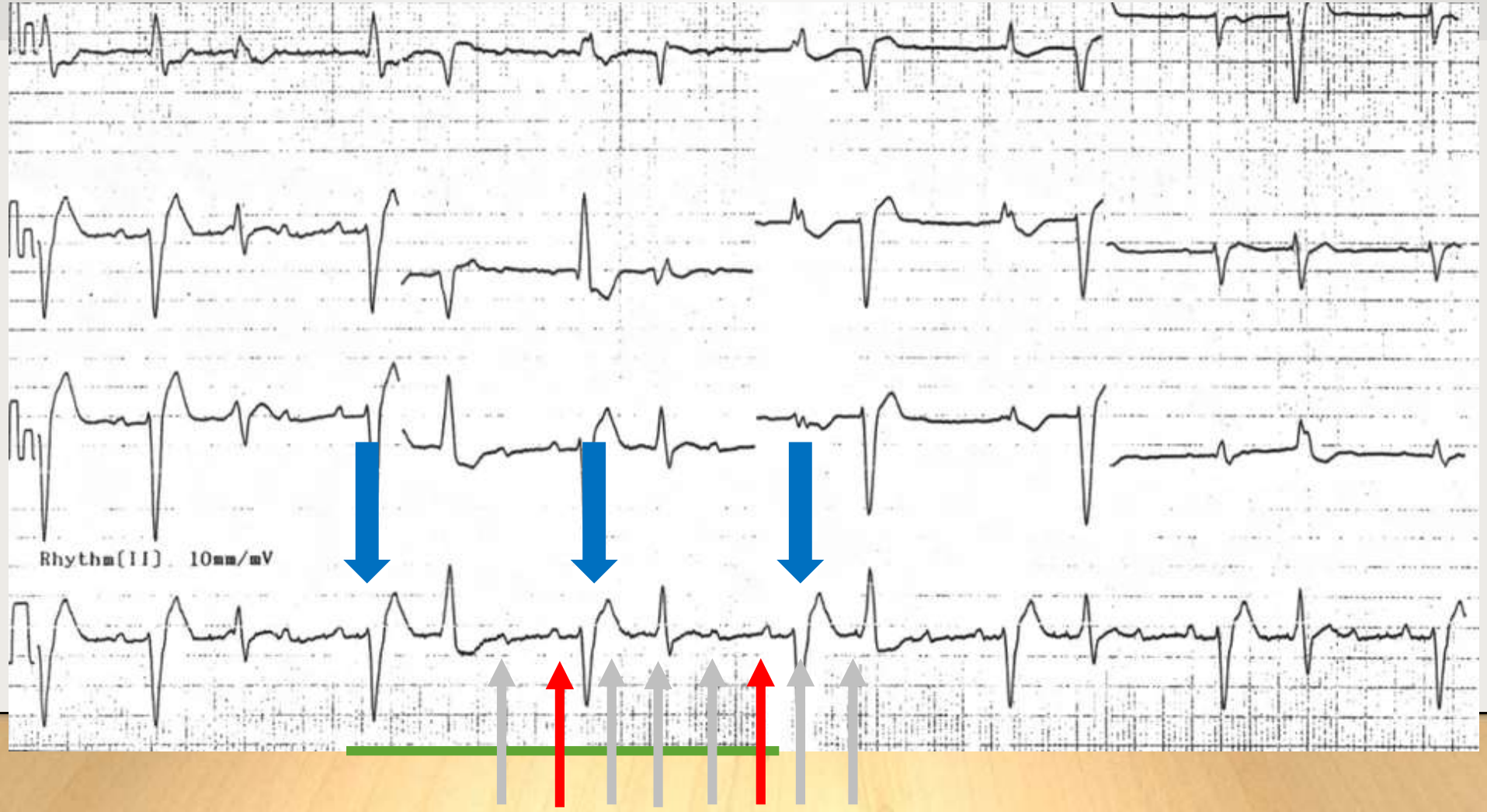
Regular or irregular?



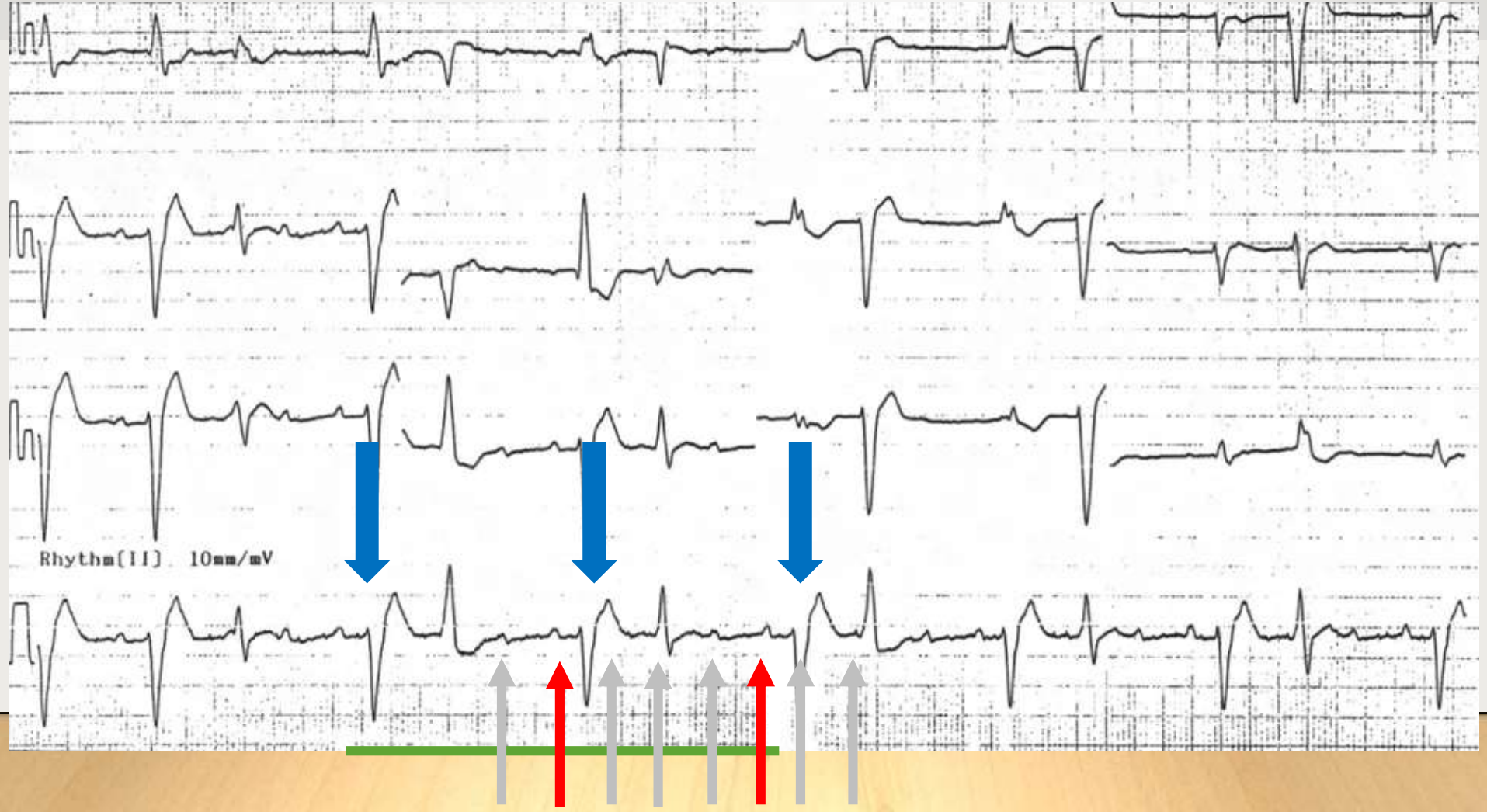
Fast or slow?

Wide or narrow?

Regular or irregular?



Atrial tachycardia
High grade AV block
Ventricular ectopy
BBB

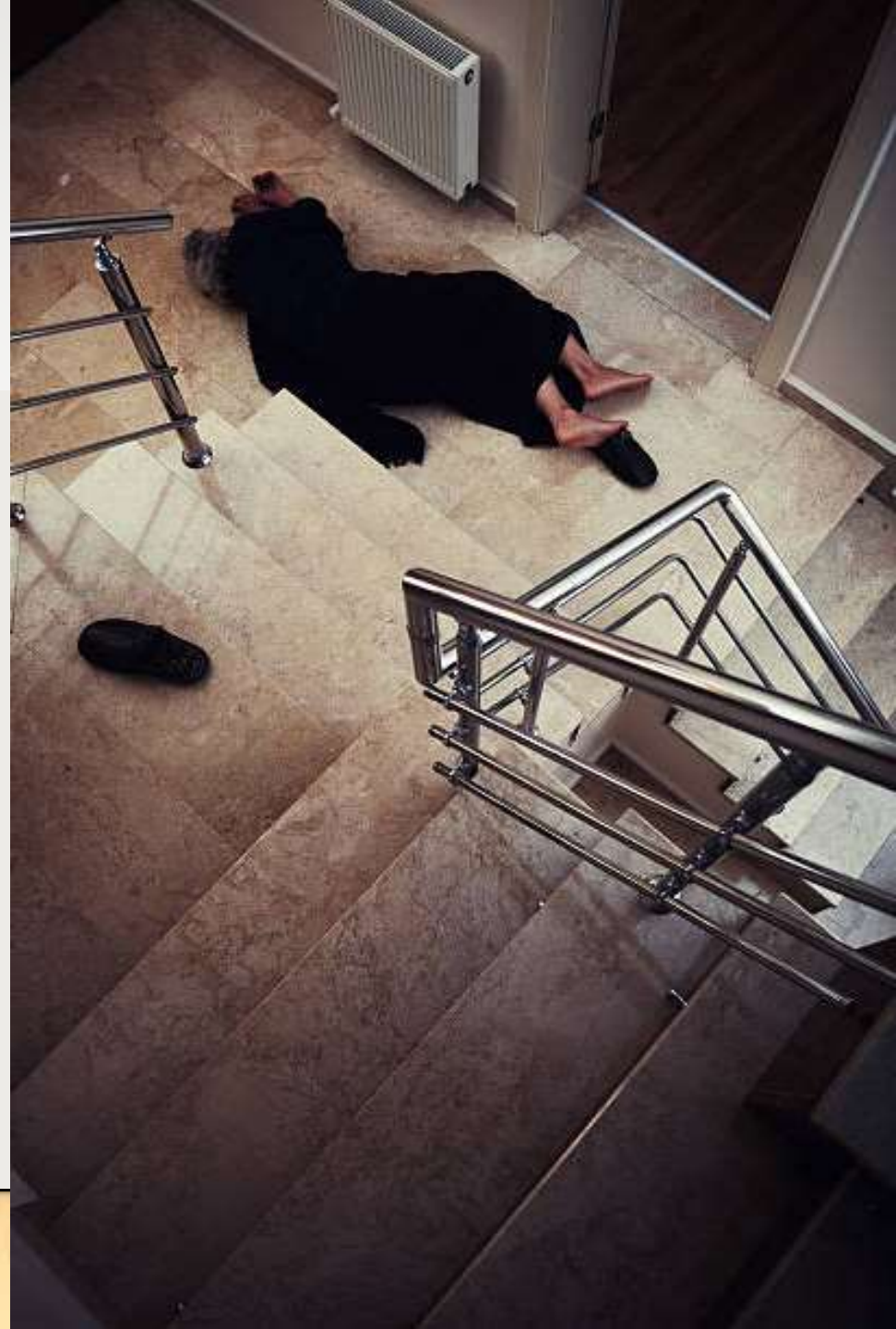


Digoxin toxicity

- **Increased automaticity** of atrial and ventricular tissues
  - Atrial fib/flutter
  - Atrial ectopic rhytms
  - Frequent PVCs
  - Polymorphic V-tach
  - Bigeminy is common
- **Decreased AV conduction** a increased vagal tone at the AV node.
  - AV blocks — including 1st, 2nd and 3rd degree AV block.

Case #4 – Fallen Grandma

- 82 yo female with recent back pain per family
- Acting “out of sorts”
- Fell down stairs





Next steps

- Confused, follows some commands
- BP 100/62, HR 52, RR 18, Sat 96%
- H/o HTN, recent back pain, hyperlipidemia

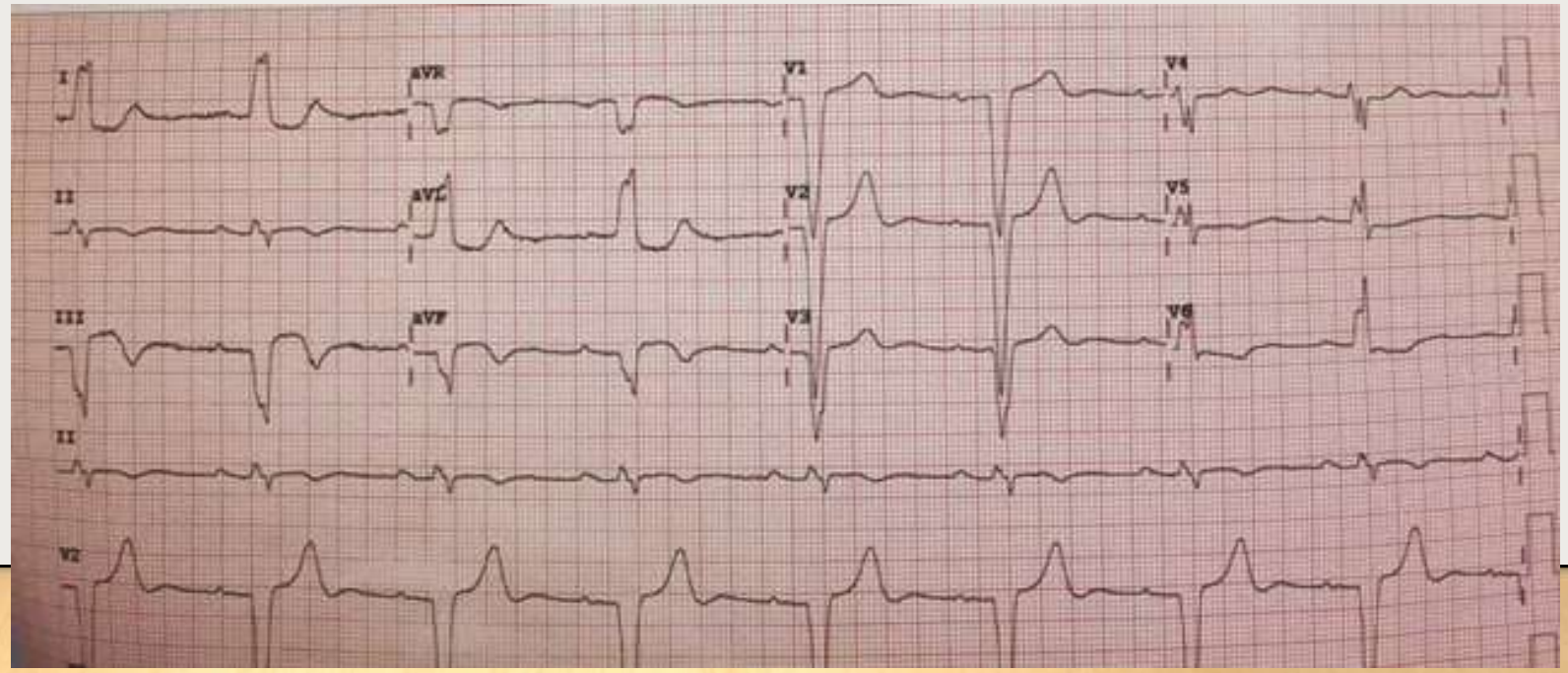


Next steps

- Confused, follows some commands
- BP 100/62, HR 48, RR 18, Sat 96%
- H/o HTN, recent back pain, hyperlipidemia
- Flexeril, Vicodin, lisinopril, atenolol

En route

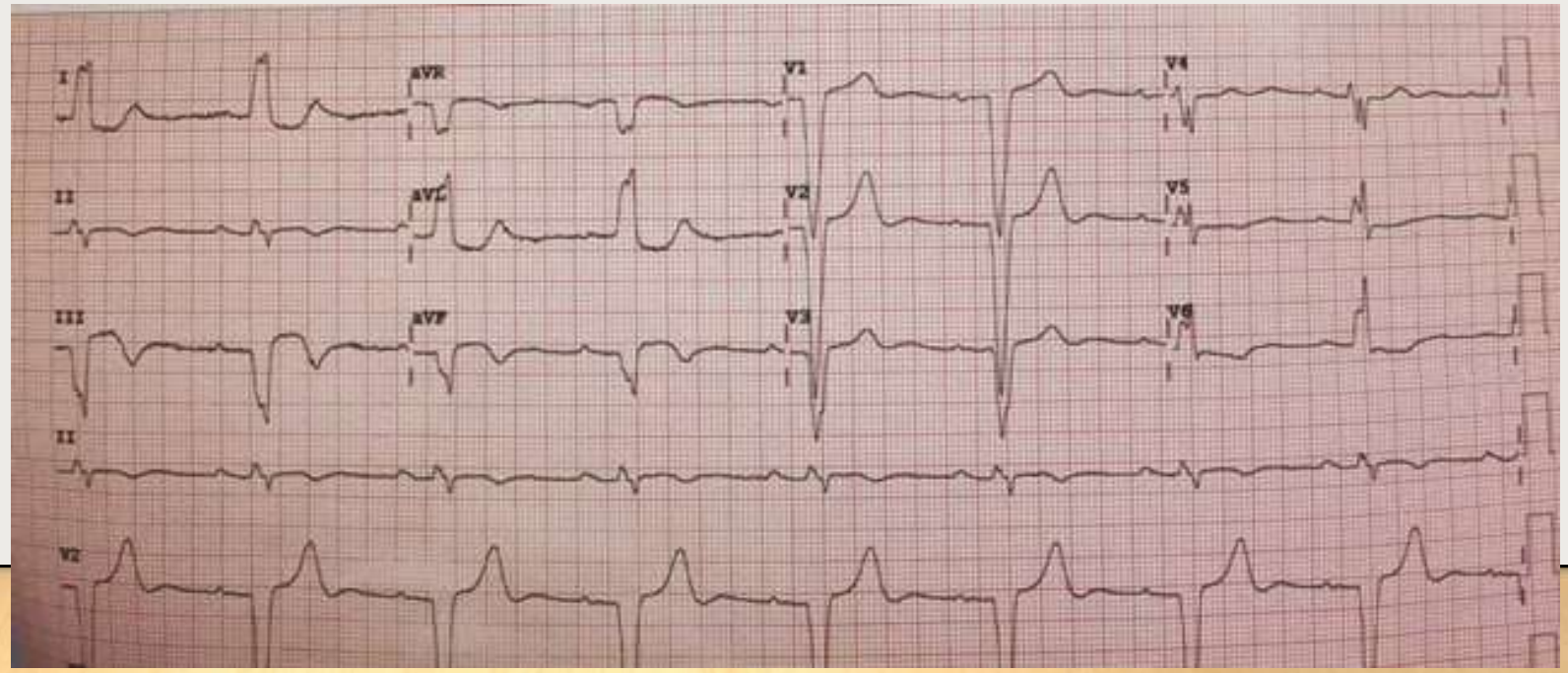
- BP 95/60, HR 50
- Continues to slur words, slightly worse



En route

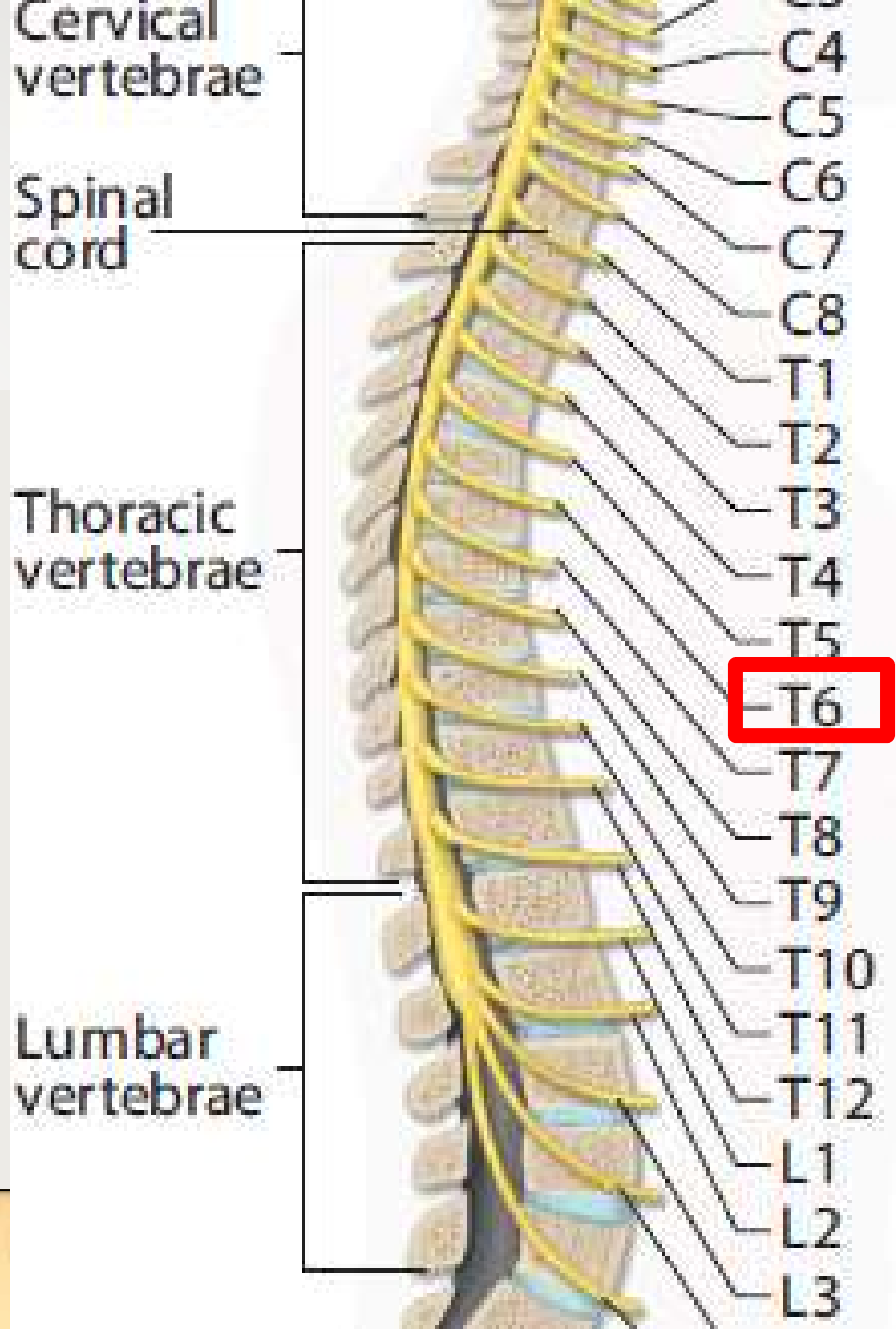
- BP 95/60, HR 50
- Continues to slur words, slightly worse

•QRS >120 ms
•Dominant S wave in V1
•Broad monophasic R wave in lateral leads (I, aVL, V5-V6)



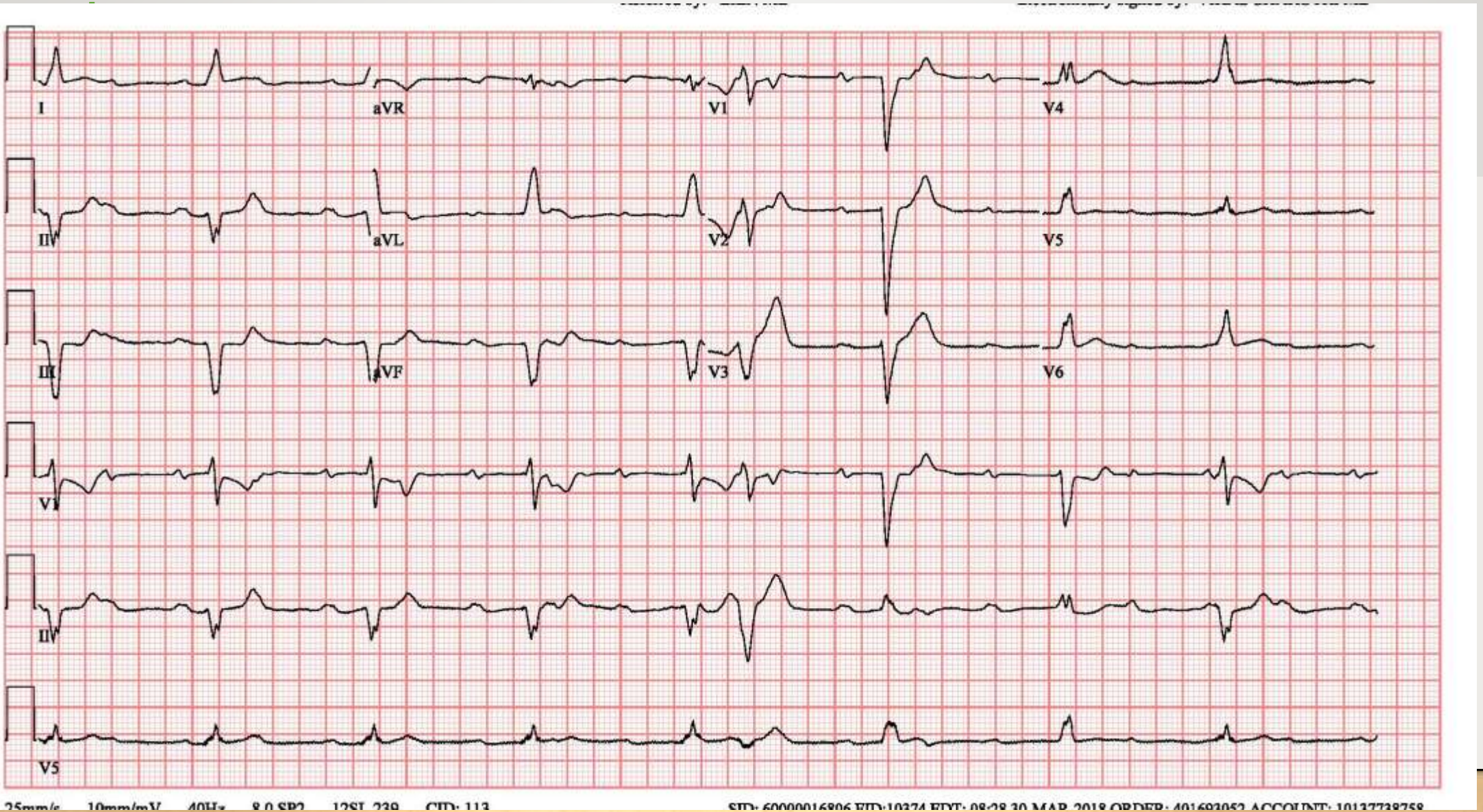
Spinal shock

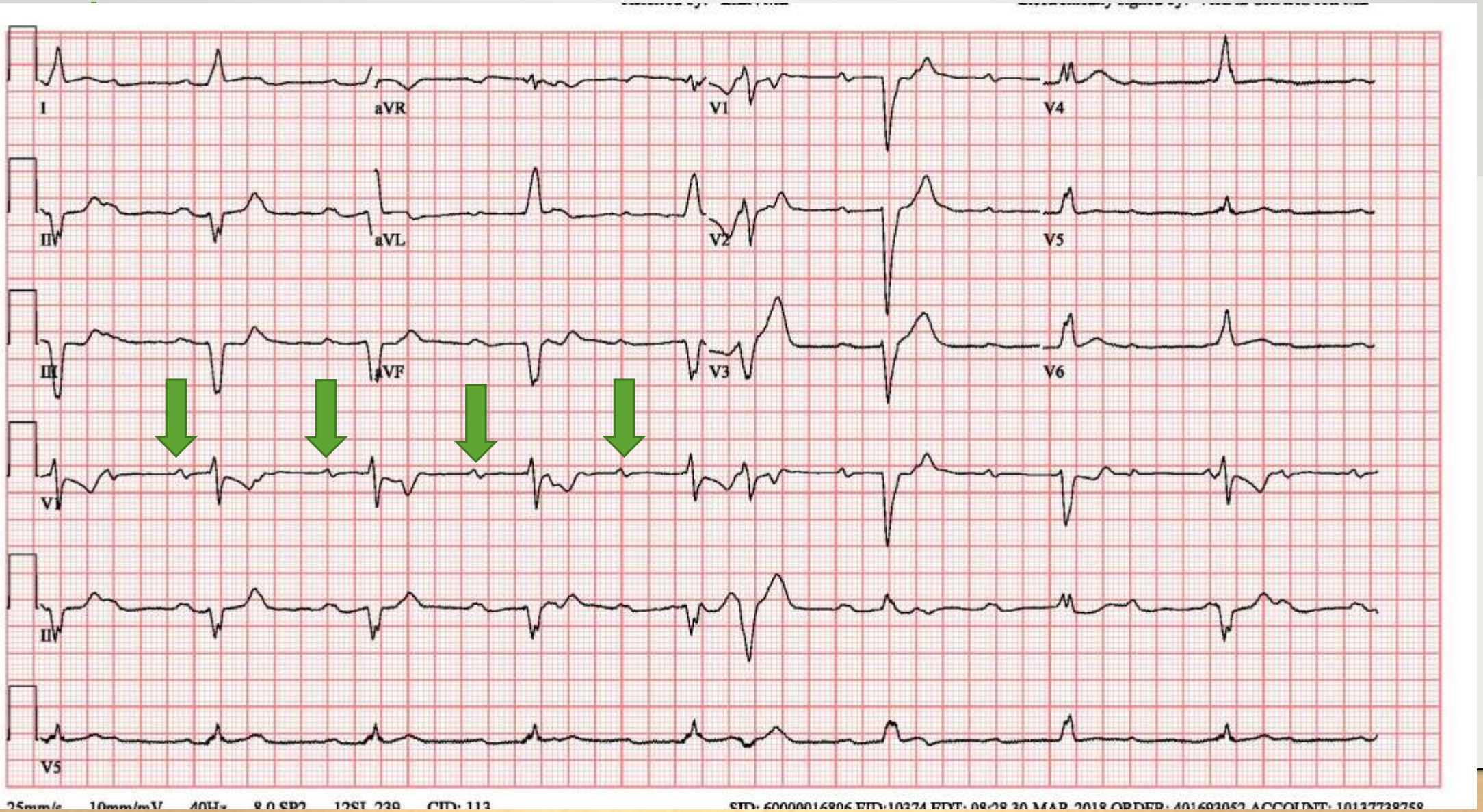
- Sympathetic nervous system – Fight or Flight
- Unopposed parasympathetic if injury above T6
- Unopposed para
  - Vasodilation
  - Unable to generate tachycardia

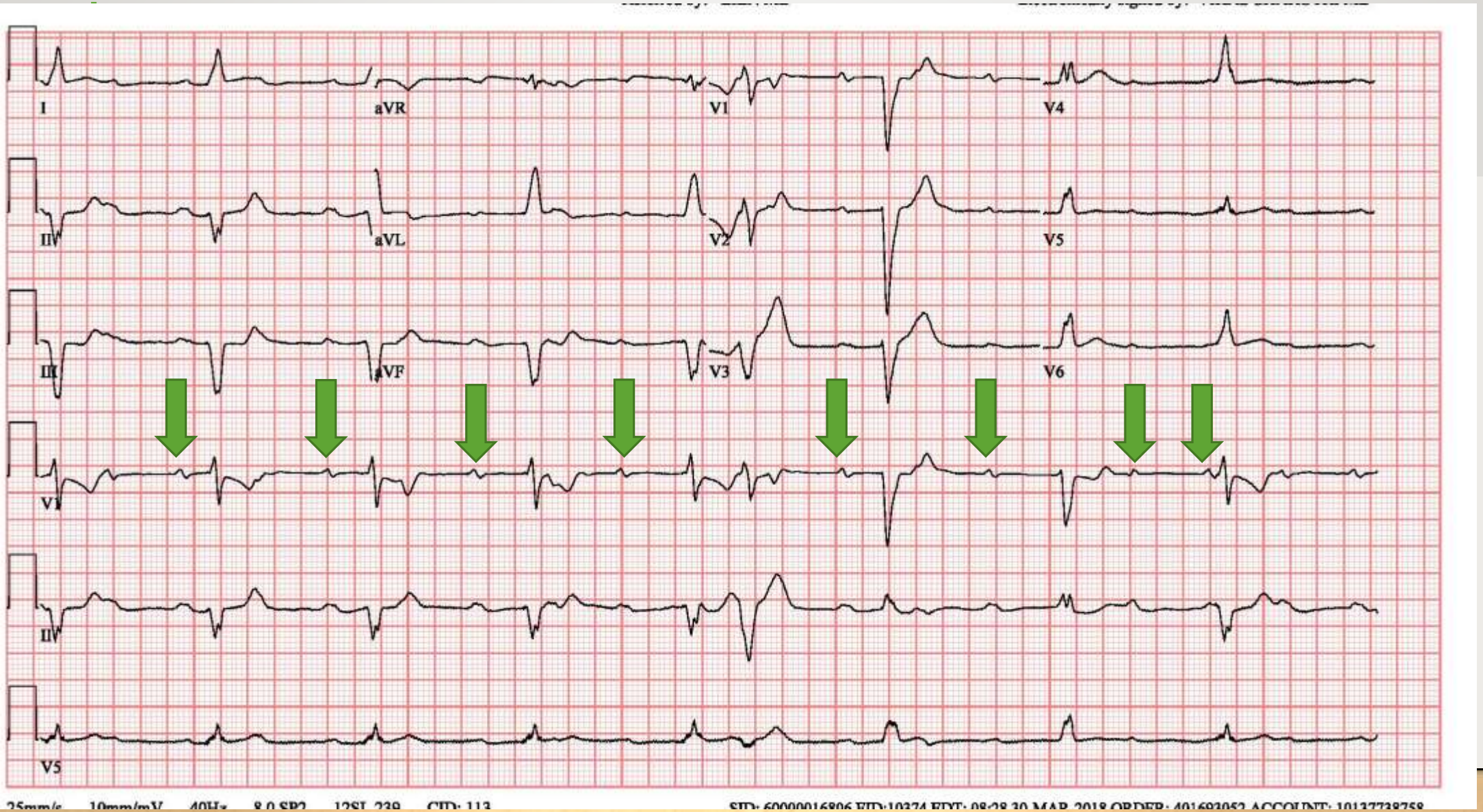


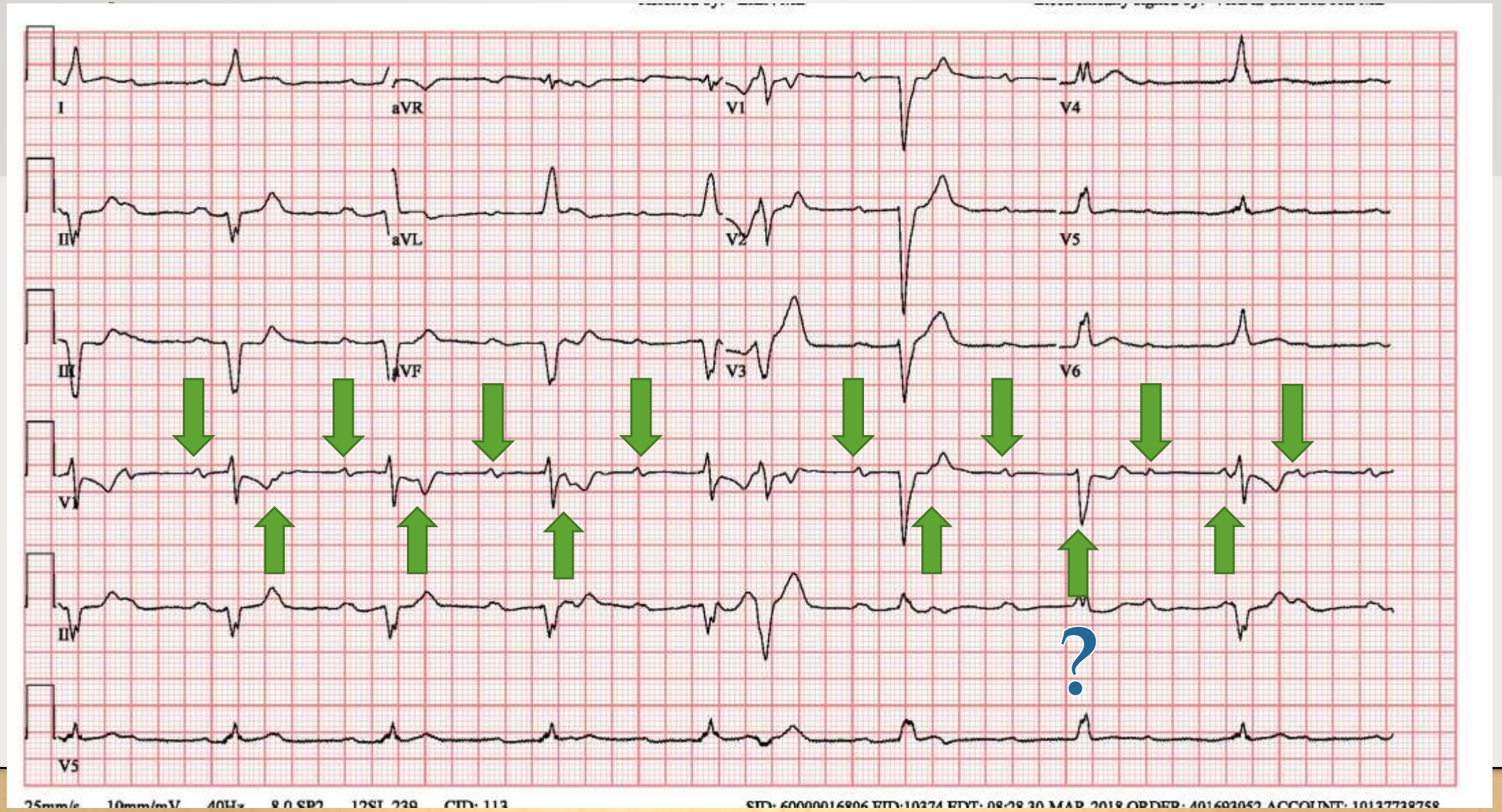
Case #5 – It isn't always obvious

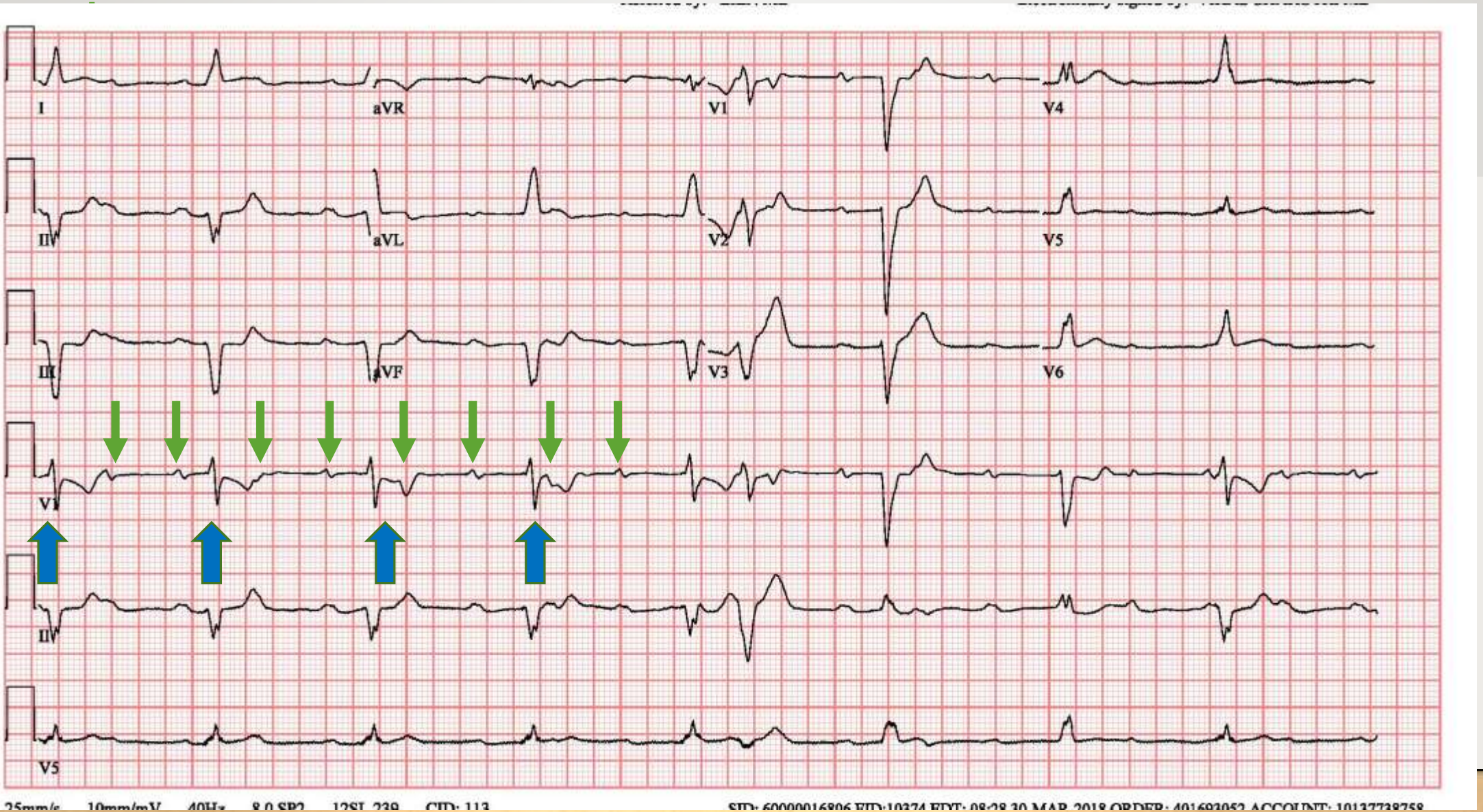
- 77 yo female with afib and CAD
- Increasing SOB for 6-8 weeks
- Currently taking steroids and nebs
  - Not helping
- Worse today when trying to walk to the car to go shopping
- Had to sit down
- 95/45, HR in the 50s

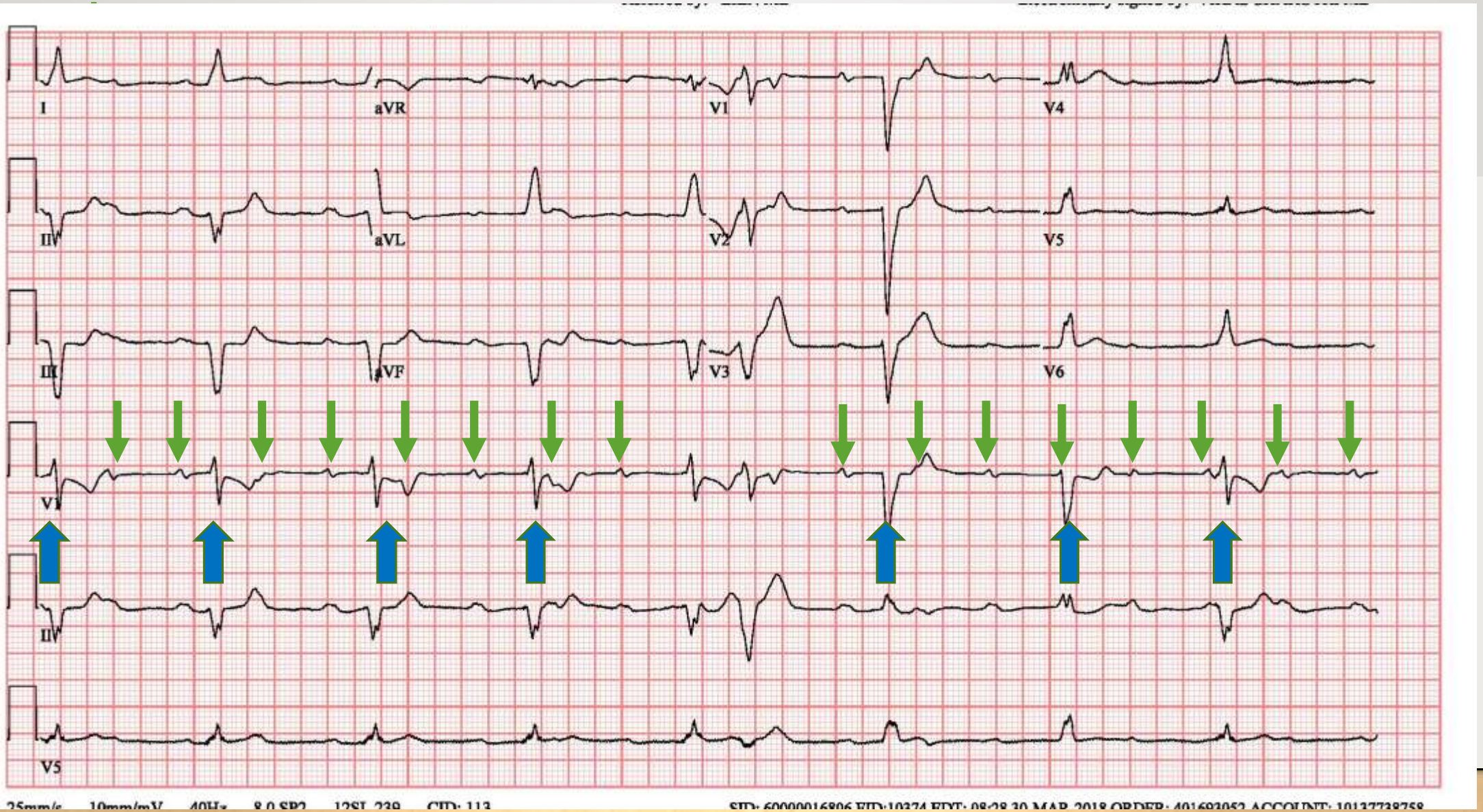

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5

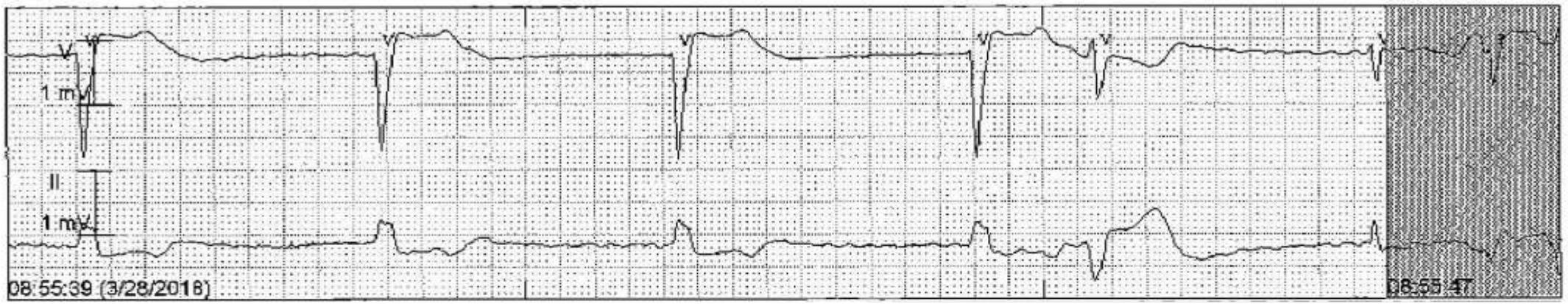

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
?
V5

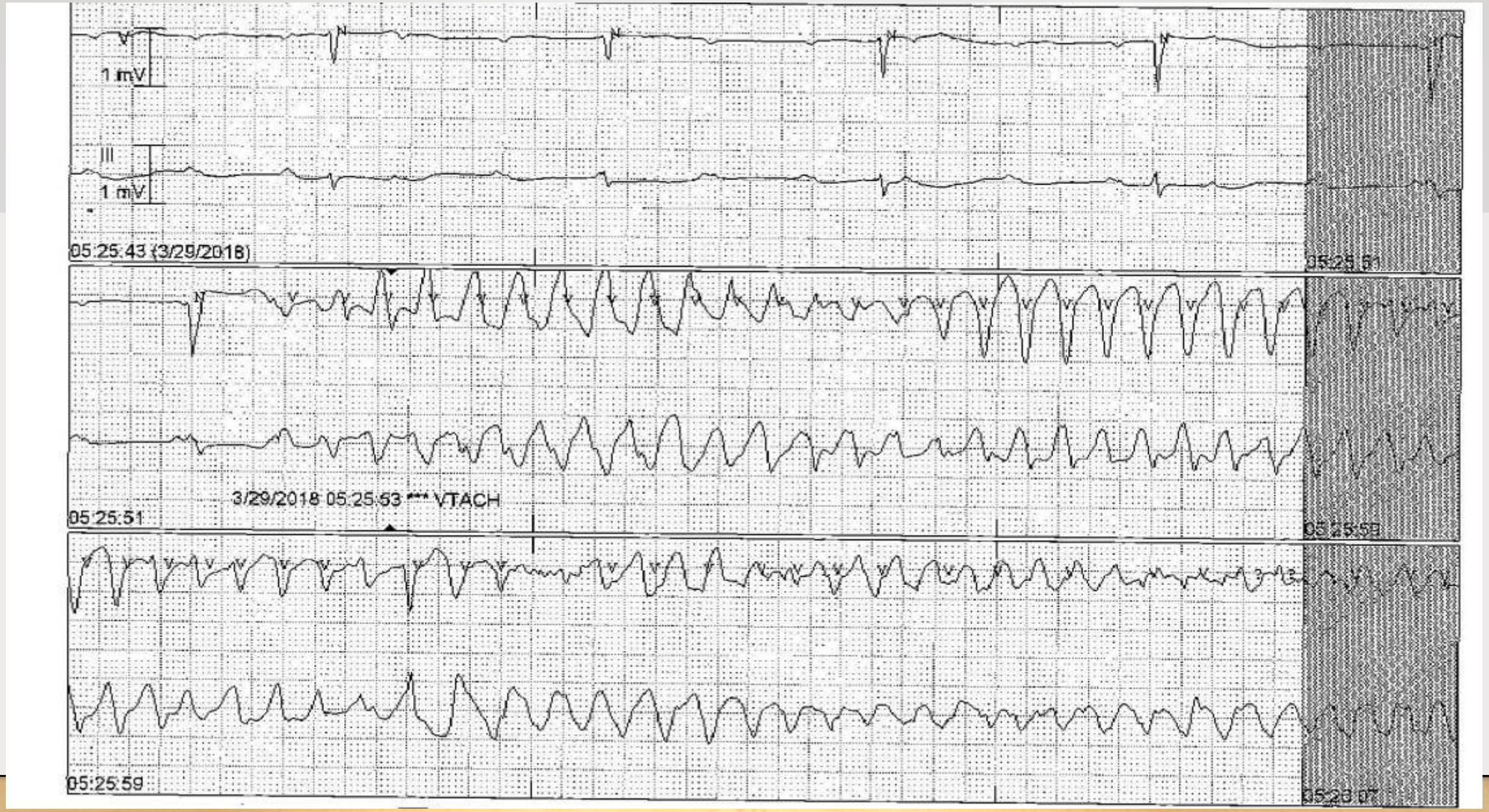

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5

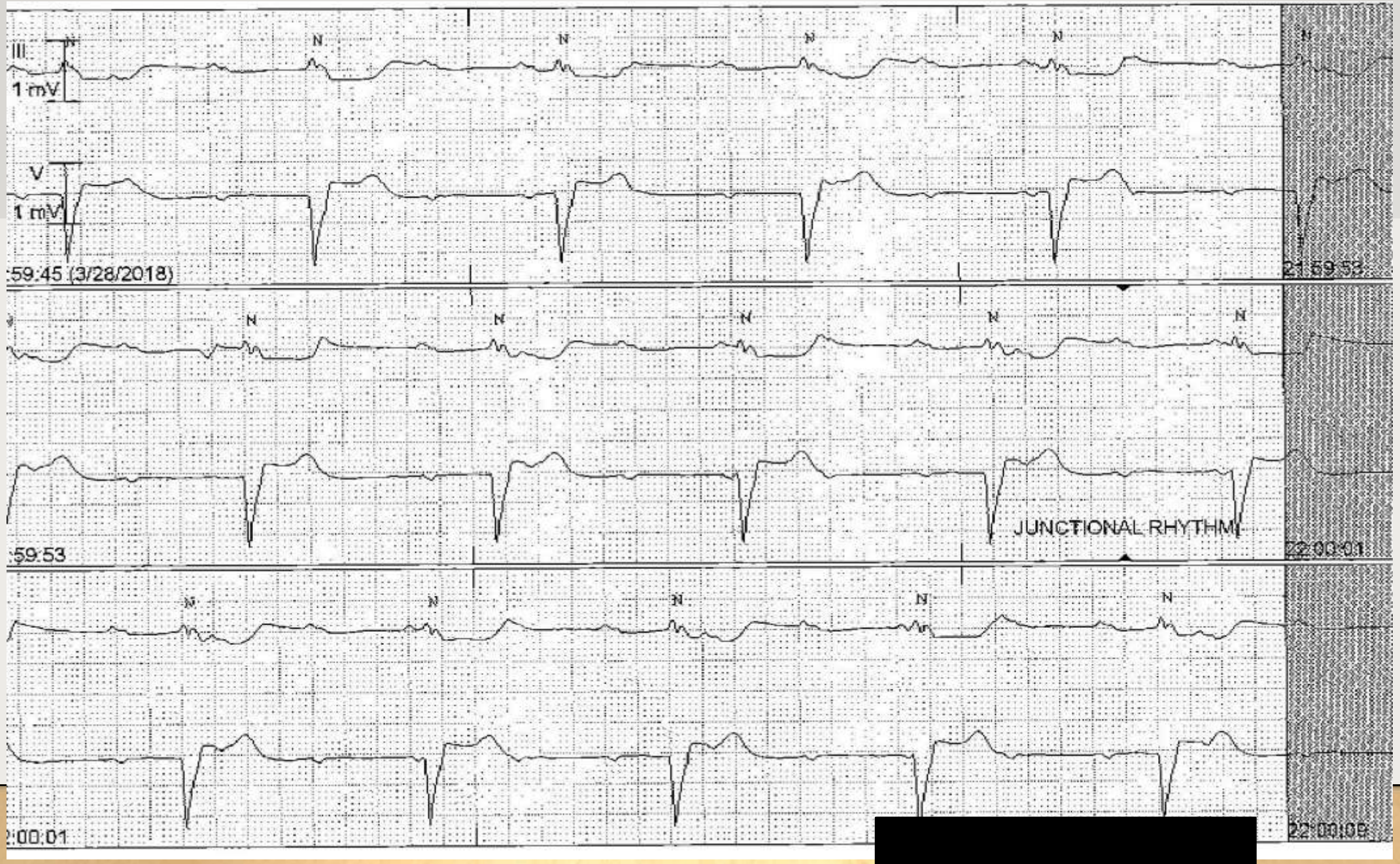

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
V1
II
V5


1 mV
II
1 mV
08:55:39 (3/28/2016)


08:55:55


V
1 mV
II
1 mV
08:55:39 (3/28/2018)
08:55:47
3/28/2018 08:55:50 *** VENT/FIB/TACH
08:55:47
08:55:55
08:55:55


1 mV
III
1 mV
05:25:43 (3/29/2018)
05:25:51
3/29/2018 05:25:53 *** VTACH
05:25:51
05:25:59
05:25:59
05:26:07


III
1 mV
V
1 mV
59:45 (3/28/2018)
21:59:53
N
59:53
JUNCTIONAL RHYTHM
22:00:01
:00:01
22:00:09

Bradycardia and trouble

- Don’t let them DIE
- D – Drugs
- I – ischemia
- E – Electrolytes

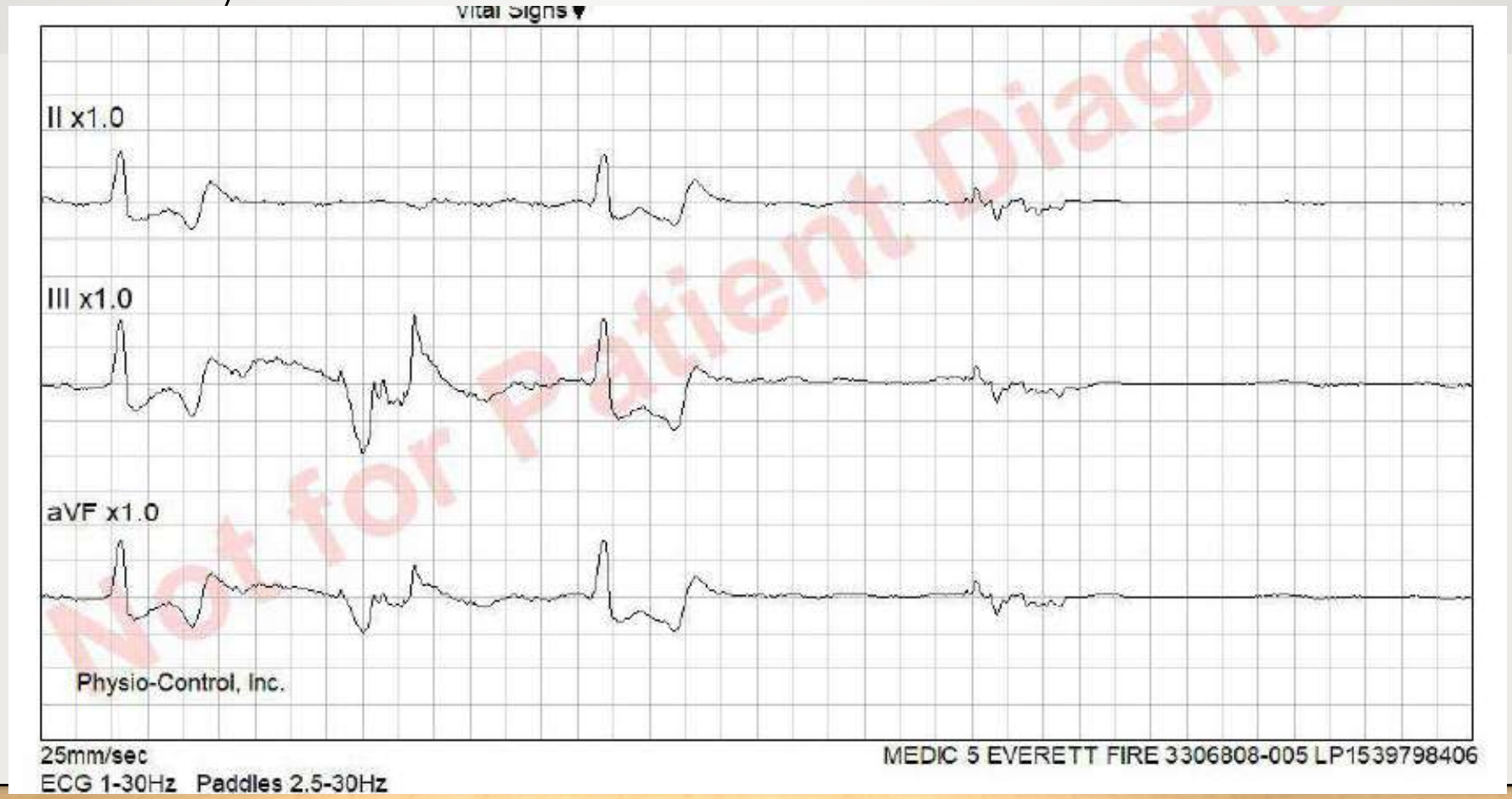
Case #6 – Fake Dementia

- 72 yo male with abnormal behavior
- 3 previous calls for the same
- “fakes dementia”
- Reported seizure, also has faked these

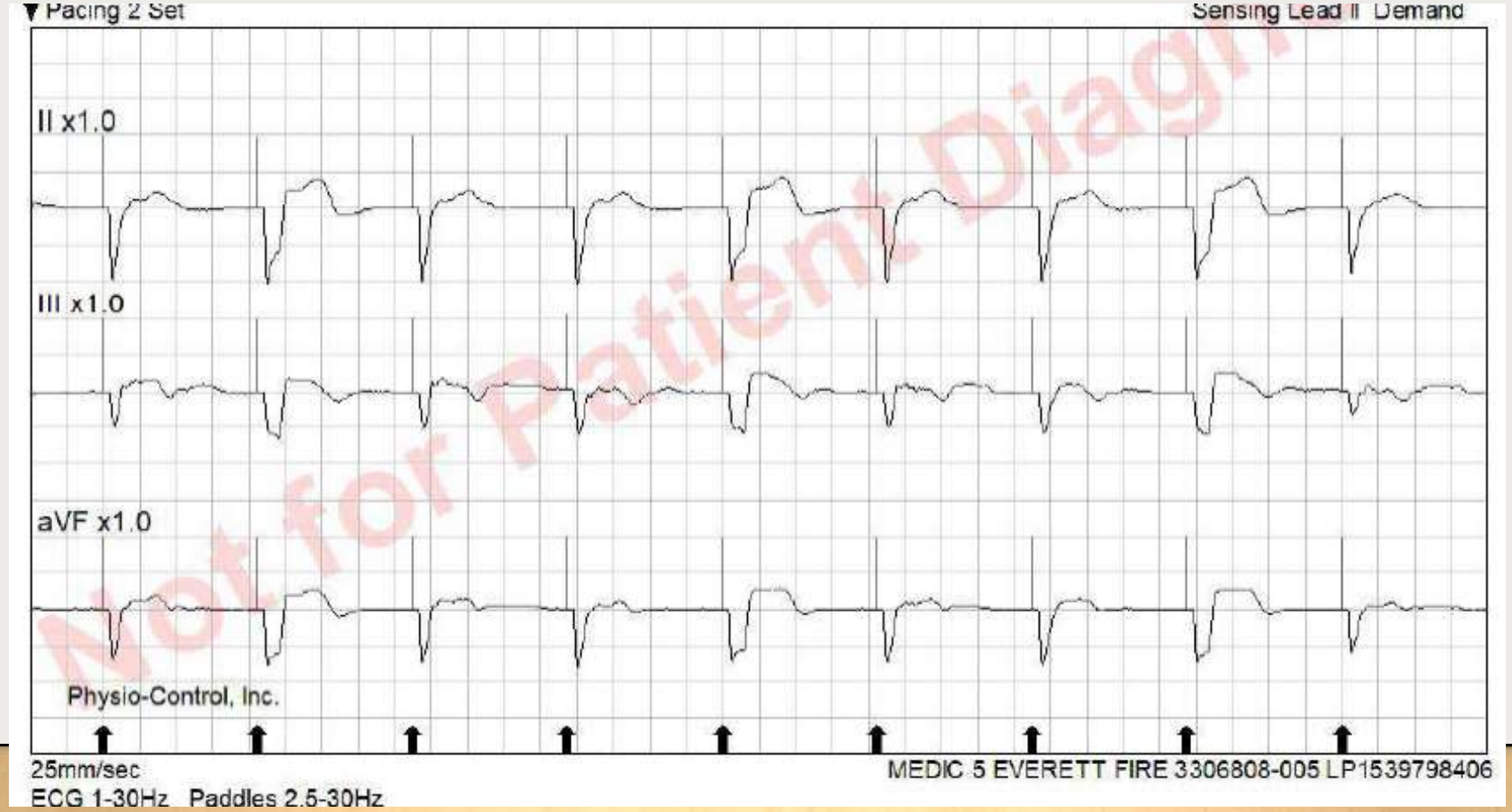
Vitals : “He’s just faking again”

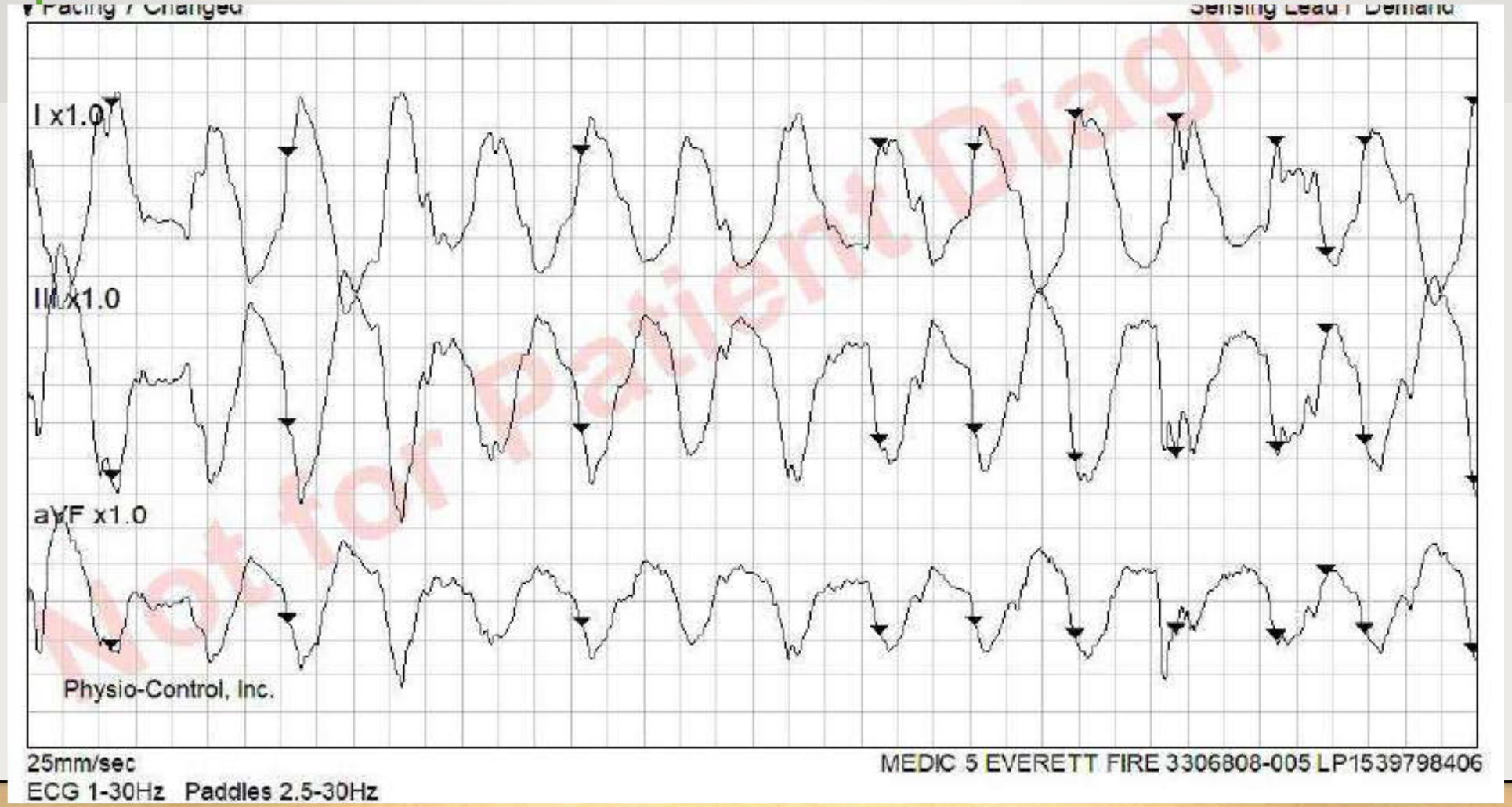
- 90/62, minimally responsive, HR around 40, quickly down to 20.
- Moaning and not really responding

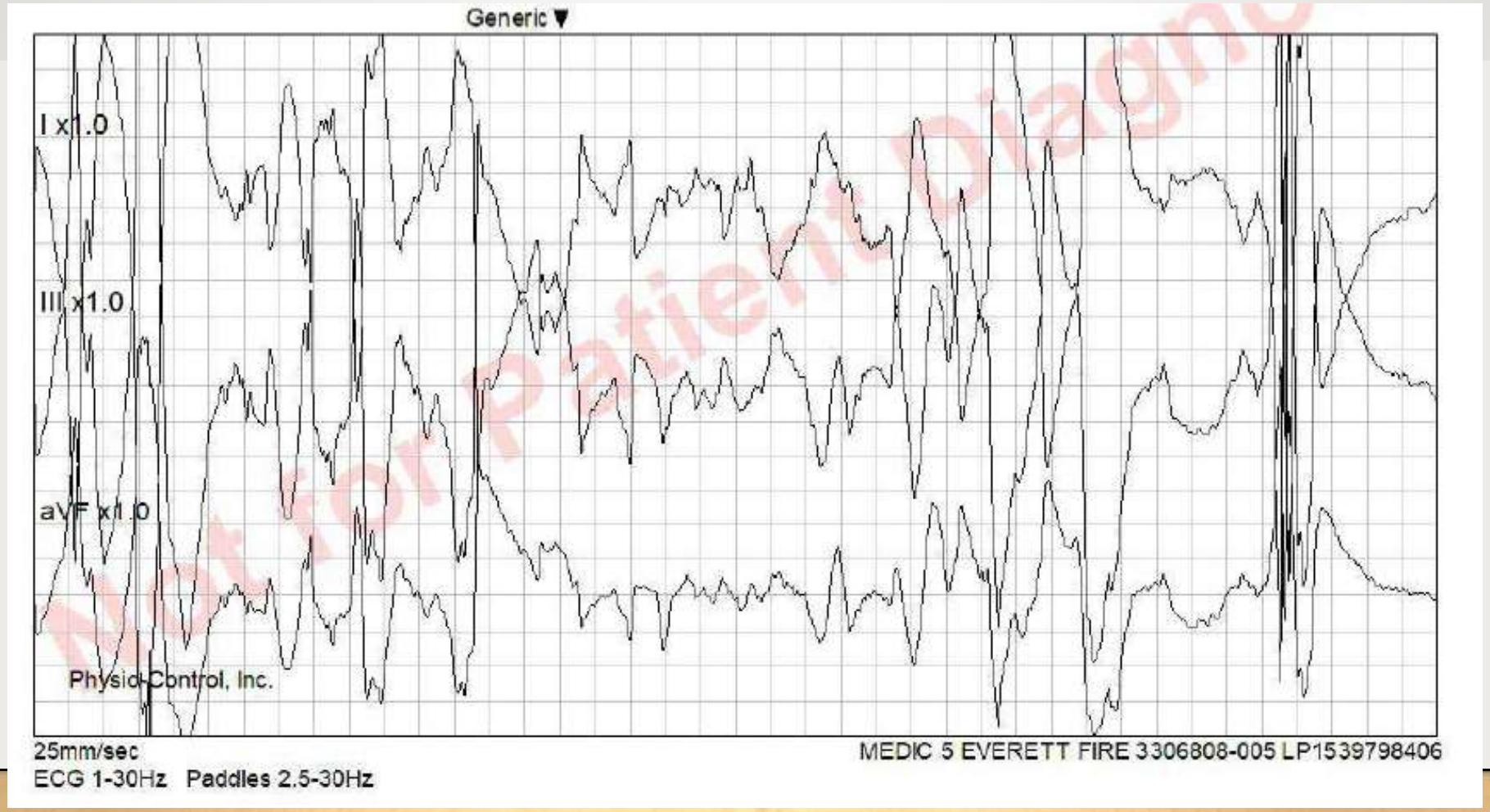
Initial rhythm

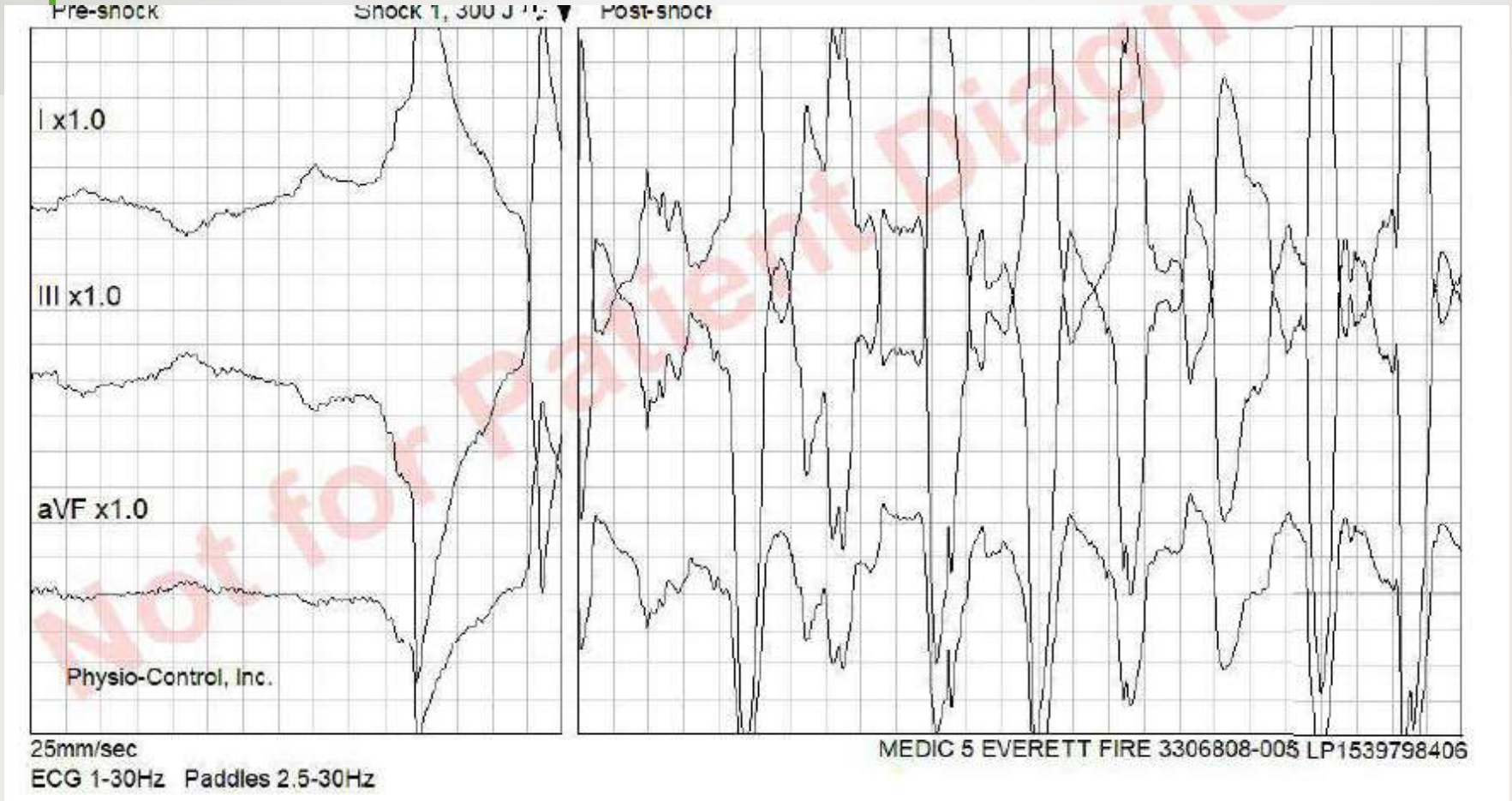


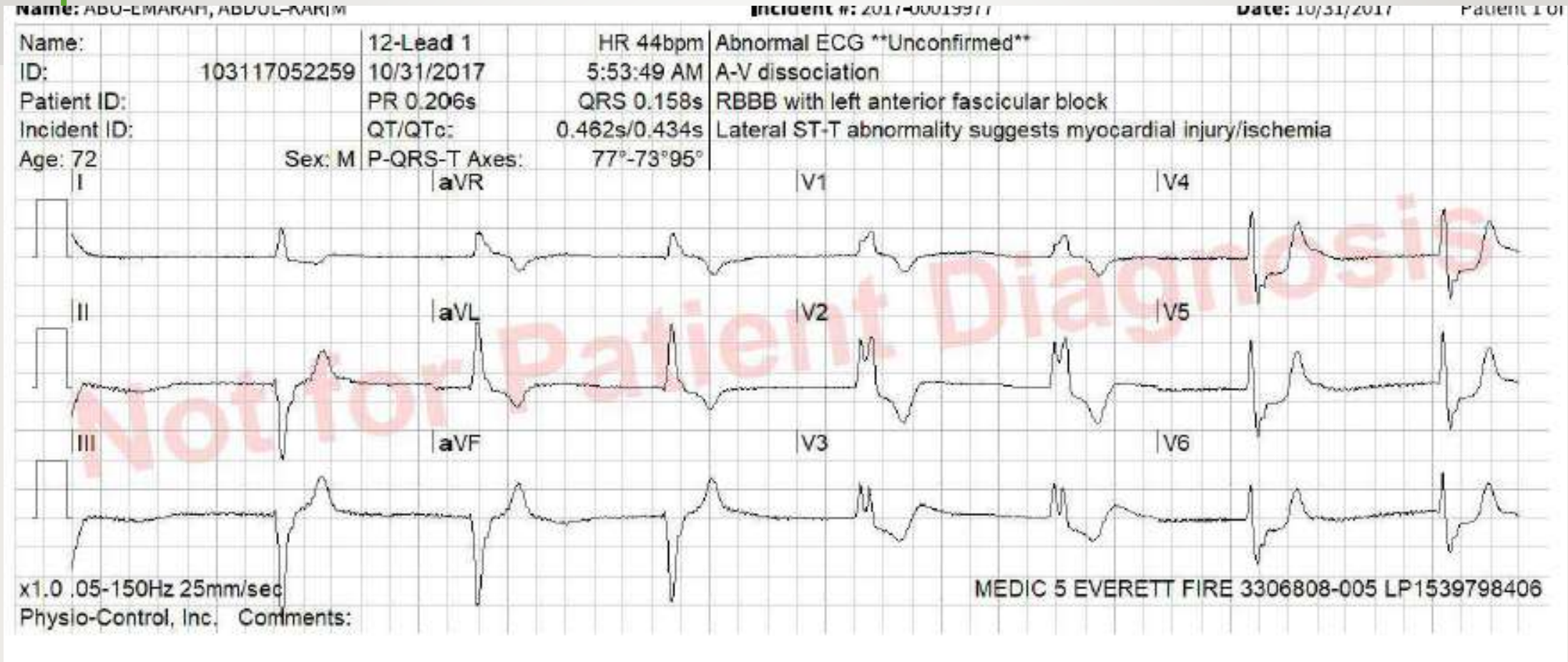
Pacing


Pacing 2 Set
Sensing Lead II Demand
II x1.0
III x1.0
aVF x1.0
Physio-Control, Inc.
25mm/sec
ECG 1-30Hz Paddles 2.5-30Hz
MEDIC 5 EVERETT FIRE 3306808-005 LP1539798406
Not for Patient Diagn


I x1.0
II x1.0
aVF x1.0
Physio-Control, Inc.
25mm/sec
ECG 1-30Hz Paddles 2.5-30Hz
MEDIC 5 EVERETT FIRE 3306808-005 LP1539798406


Generic
I x1.0
III x1.0
aVF x1.0
Physio-Control, Inc.
25mm/sec
ECG 1-30Hz Paddles 2.5-30Hz
MEDIC 5 EVERETT FIRE 3306808-005 LP1539798406


Pre-shock
Post-shock
I x1.0
III x1.0
aVF x1.0
Physio-Control, Inc.
25mm/sec
ECG 1-30Hz Paddles 2.5-30Hz
MEDIC 5 EVERETT FIRE 3306808-005 LP1539798406


Name: ABU-EMARAH, ABDUL-KARIM
Incident #: 2017-0001997
Date: 10/31/2017
Name:
ID: 103117052259
Patient ID:
Incident ID:
Age: 72 Sex: M
12-Lead 1
10/31/2017
PR 0.206s
QT/QTc: 0.462s/0.434s
P-QRS-T Axes: 77°-73°95°
HR 44bpm
5:53:49 AM
QRS 0.158s
Abnormal ECG **Unconfirmed**
A-V dissociation
RBBB with left anterior fascicular block
Lateral ST-T abnormality suggests myocardial injury/ischemia
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
Not for Patient Diagnosis
x1.0 .05-150Hz 25mm/sec
Physio-Control, Inc. Comments:
MEDIC 5 EVERETT FIRE 3306808-005 LP1539798406

Next….

- HR remains in 40s, BP remains around 100 systolic
- Intubated
- Starts gagging on tube

ID:000818917 31-OCT-2017 06:22:20 Providence Reg Med Cnt Everett

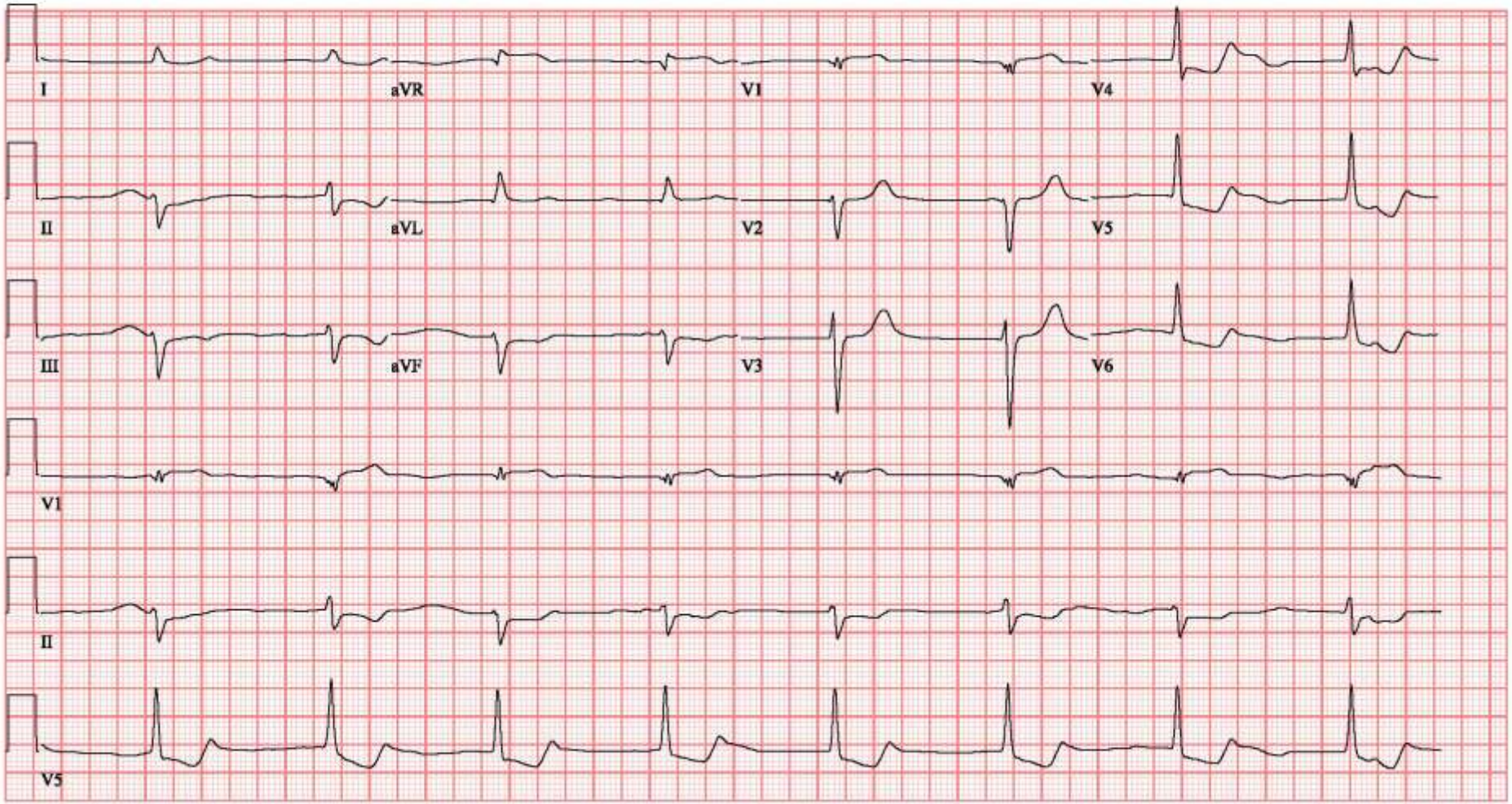
Vent. rate	49	BPM
PR interval	*	ms
QRS duration	130	ms
QT/QTc	506/457	ms
P-R-T axes	* -58	-88

Undetermined rhythm
Left axis deviation
Non-specific intra-ventricular conduction block
T wave abnormality, consider inferolateral ischemia
Abnormal ECG
When compared with ECG of 11-SEP-2017 19:27,
Current undetermined rhythm precludes rhythm comparison, needs review
Questionable change in QRS duration
Confirmed by BEECROFT MD, MATTHEW (4245), editor PILCHARD, MIRANDA (20015) on 11/1/2017 8:20:21 AM

Technician: JS
Test ind:POST CODE

Referred by: BEECROFT

Electronically signed by: MATTHEW BEECROFT MD

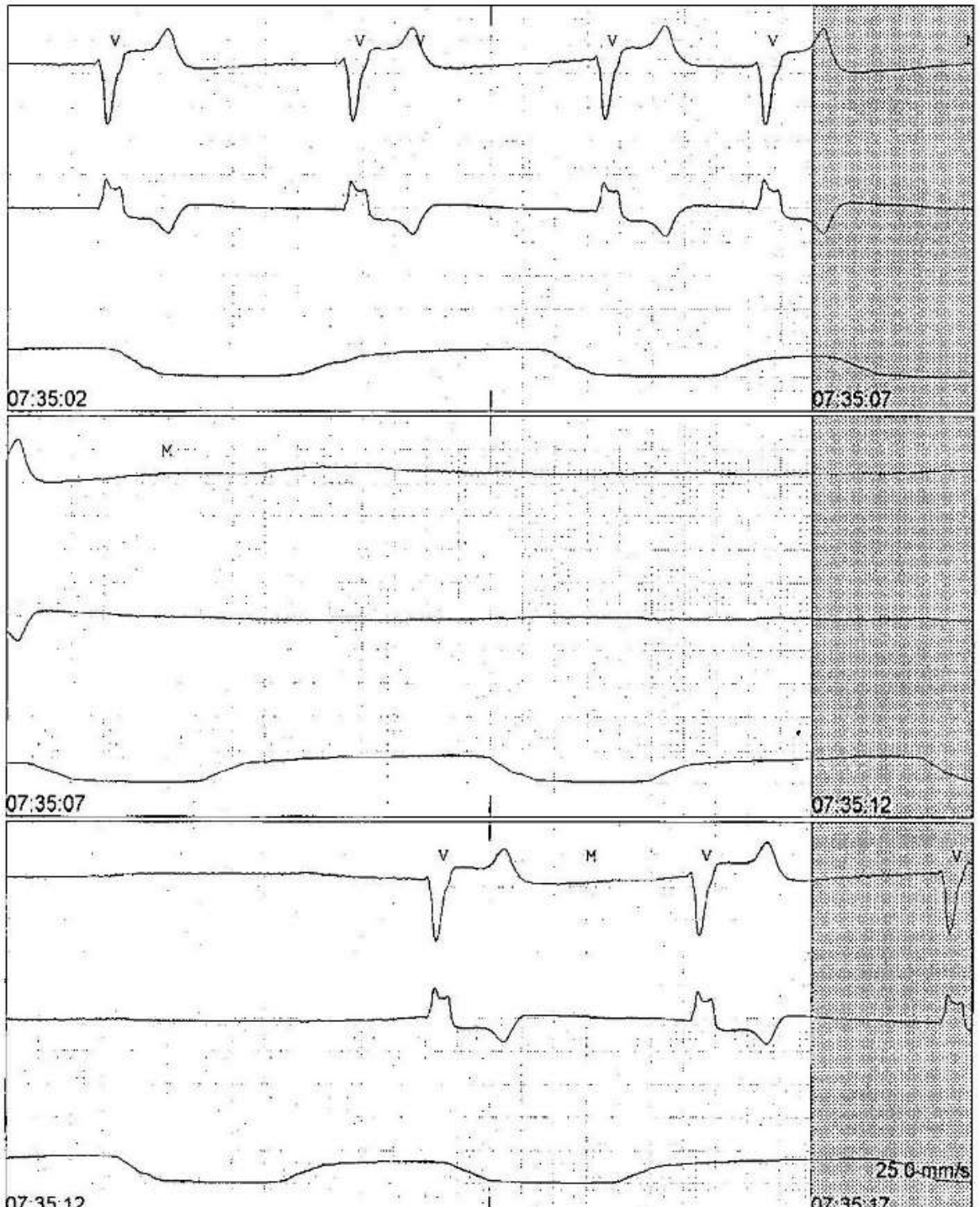


25mm/s 10mm/mV 40Hz 8.0 SP2 12SL 241 HD CID: 120

SID: 60000437066 EID:20015 EDT: 08:20 01-NOV-2017 ORDER: 364293818 ACCOUNT: 10129191591

Now what

- Slows down to 30s and then spaces out without morphology changing
- Pause of about 10 seconds…..does this a couple times
- CPR initiated and he grunts a little and winces
- Held and rhythm is back at 30 then drifts up to 40s
- BP is 88/40


V
V
V
V
V
07:35:02
07:35:07
M
07:35:07
07:35:12
V
M
V
V
25.0 mm/s
07:35:12

Bradycardia and trouble

- Don’t let them DIE
- D – Drugs
- I – Ischemia
- E – Electrolytes

[redacted] ID:000818917 31-OCT-2017 07:42:44 Providence Reg Med Cnt Everett

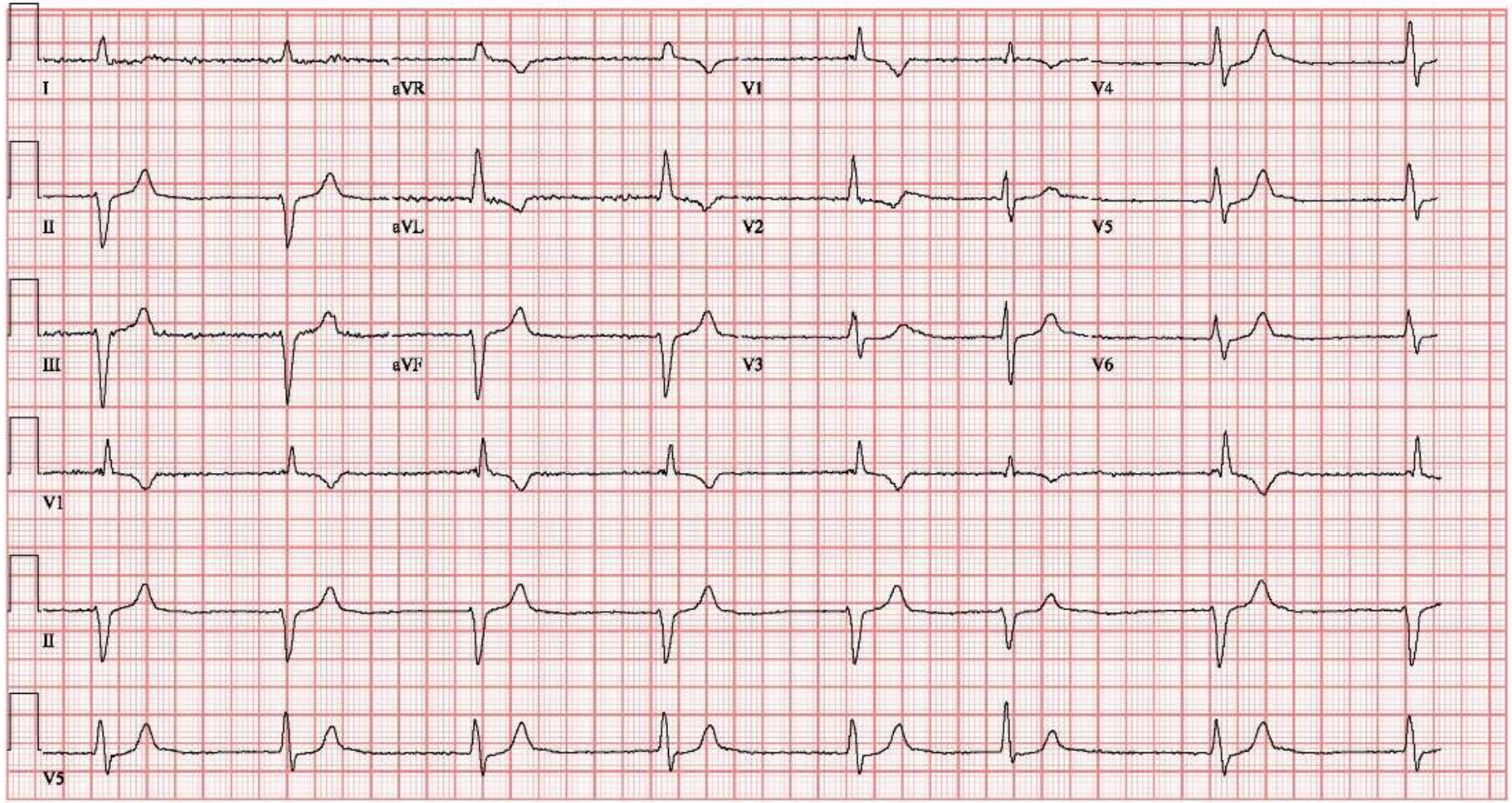
Vent. rate	45	BPM
PR interval	*	ms
QRS duration	128	ms
QT/QTc	472/408	ms
P-R-T axes	* -74	80

Wide QRS rhythm with occasional Premature ventricular complexes
Left axis deviation
Right bundle branch block
Abnormal ECG
When compared with ECG of 31-OCT-2017 06:22, (unconfirmed)
Previous ECG has undetermined rhythm, needs review
Confirmed by BEECROFT MD, MATTHEW (4245), editor PILCHARD, MIRANDA (20015) on 11/1/2017 8:20:16 AM

Technician: KB
Test ind:CARDIAC ARREST

Referred by: BEECROFT

Electronically signed by: MATTHEW BEECROFT MD



25mm/s 10mm/mV 40Hz 8.0 SP2 12SL 241 HD CID: 120

SID: 60000437066 EID:20015 EDT: 08:20 01-NOV-2017 ORDER: 373353829 ACCOUNT: 10129191591

Med list

- Albuterol
- Amlodipine
- Aspirin
- Lipitor
- Neurontin
- Glipizide
- Hydrochlorothiazide
- Prinivil
- Glucophage
- Remeron
- Prilosec
- Quetiapine
- Tamsulosin
- Brilinta
- Tramadol
- Verapamil SR

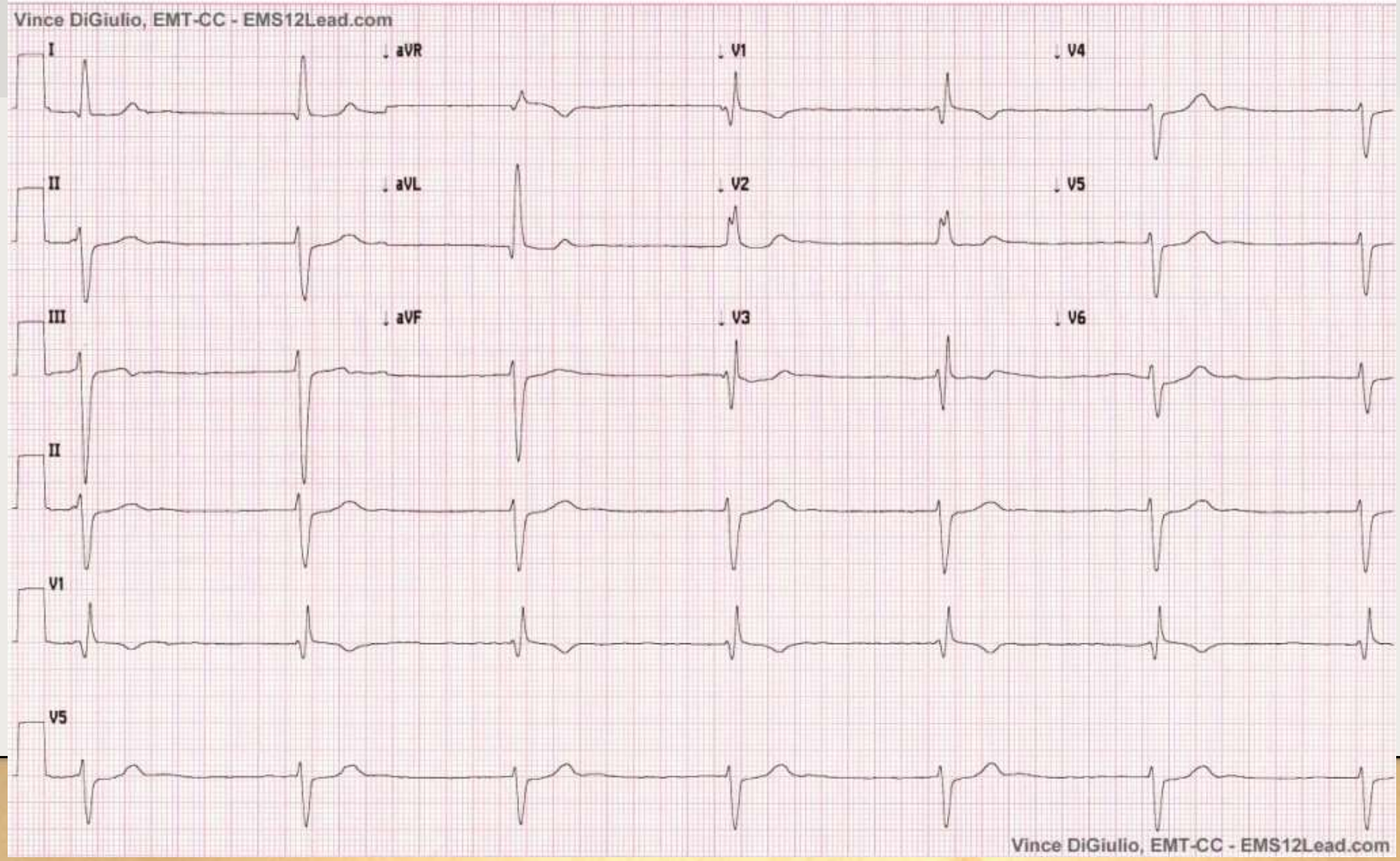
Med list

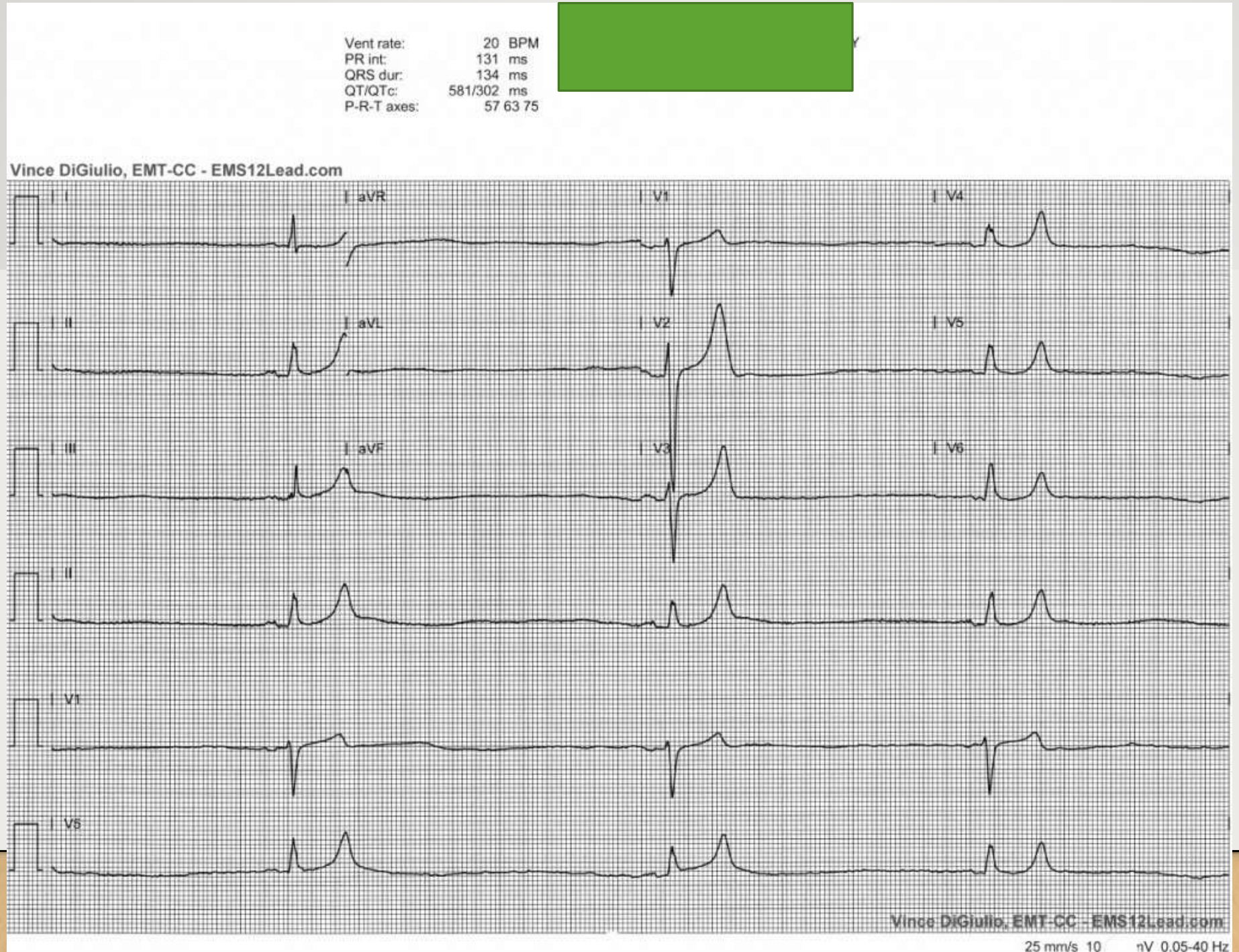
- Albuterol
- Amlodipine
- Aspirin
- Lipitor
- Neurontin
- Glipizide
- Hydrochlorothiazide
- Prinivil
- Glucophage
- Remeron
- Prilosec
- Quetiapine
- Tamsulosin
- Brilinta
- Tramadol
- Verapamil SR

Vent rate:	37 BPM
PR int:	* ms
QRS dur:	146 ms
QT/QTc:	513/429 ms
P-R-T axes:	* -60 22

UNCERTAIN REGULAR RHYTHM
RIGHT BUNDLE BRANCH BLOCK
LEFT ANTERIOR FASCICULAR BLOCK
VOLTAGE CRITERIA FOR LVH
POSSIBLE ANTERIOR MYOCARDIAL INFARCTION, PROBABLY OLD
ABNORMAL ECG
WARNING: DATA QUALITY MAY AFFECT INTERPRETATION

UNCONFIRMED REPORT

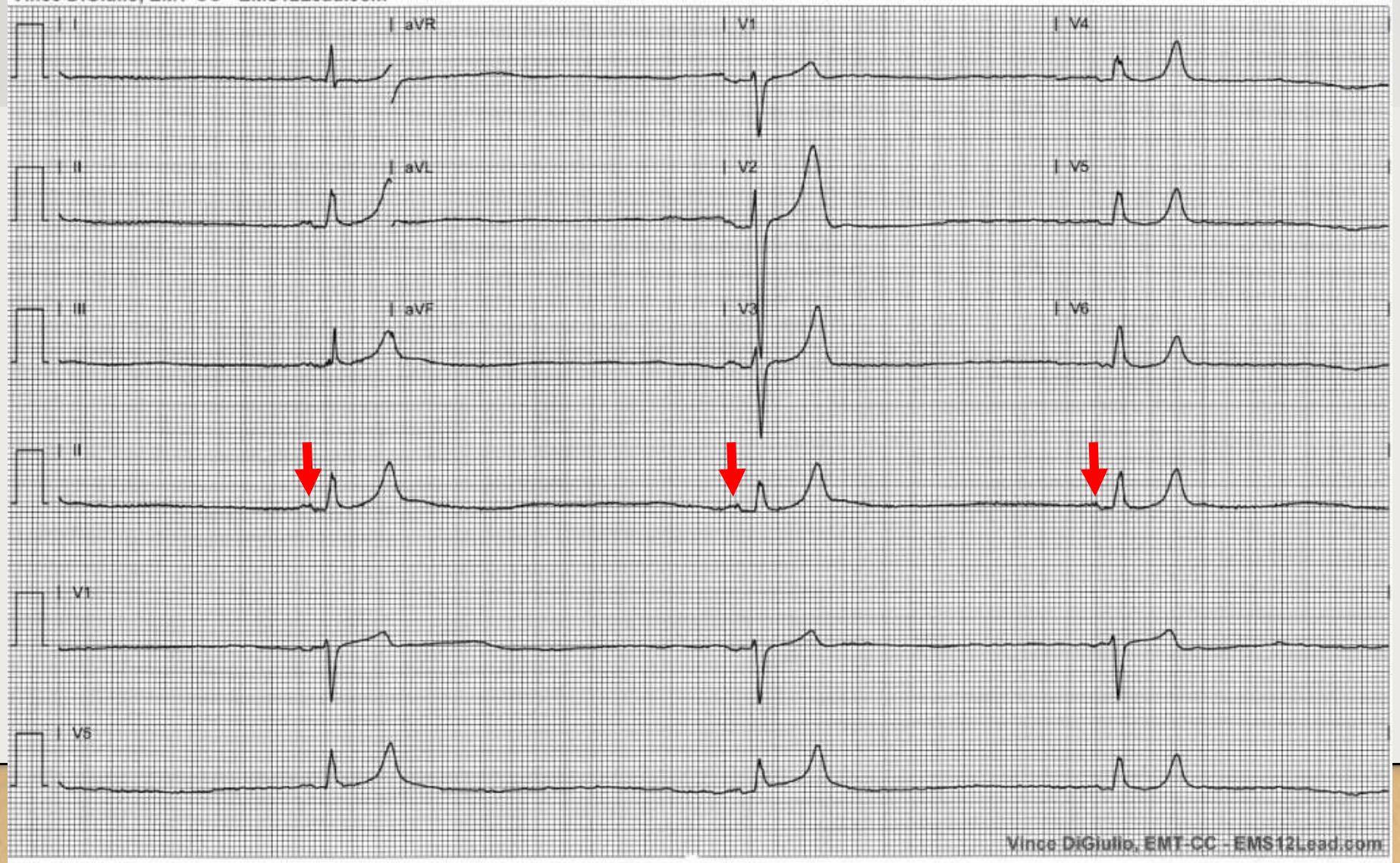



Vent rate: 20 BPM
PR int: 131 ms
QRS dur: 134 ms
QT/QTc: 581/302 ms
P-R-T axes: 57 63 75
Vince DiGiulio, EMT-CC - EMS12Lead.com
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
V1
V5
Vince DiGiulio, EMT-CC - EMS12Lead.com
25 mm/s 10 nV 0.05-40 Hz

..PEDIATRIC ECG INTERPRETATION
SINUS BRADYCARDIA
INTRAVENTRICULAR CONDUCTION DELAY
ABNORMAL ECG
UNCONFIRMED REPORT

Vent rate:	20	BPM
PR int:	131	ms
QRS dur:	134	ms
QT/QTc:	581/302	ms
P-R-T axes:	57 63 75	

Vince DiGiulio, EMT-CC - EMS12Lead.com



25 mm/s 10 mV 0.05-40 Hz

Bradycardia and trouble

- Don’t let them DIE
- D – Drugs
- I – ischemia
- E – Electrolytes

- Standard treatments:
- Atropine
- Dopamine
- Pacing

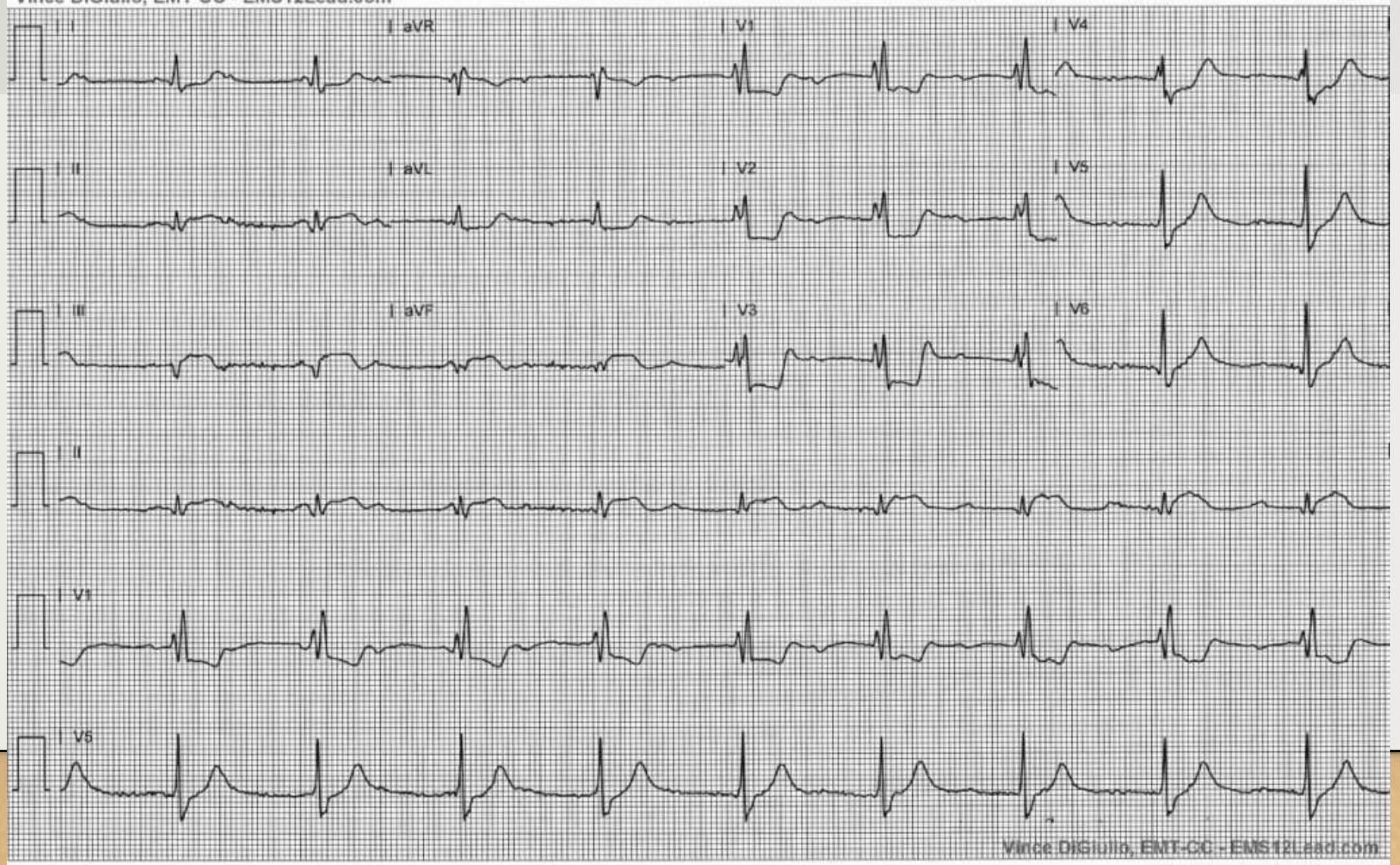
Case #7 – Crushing substernal chest pain

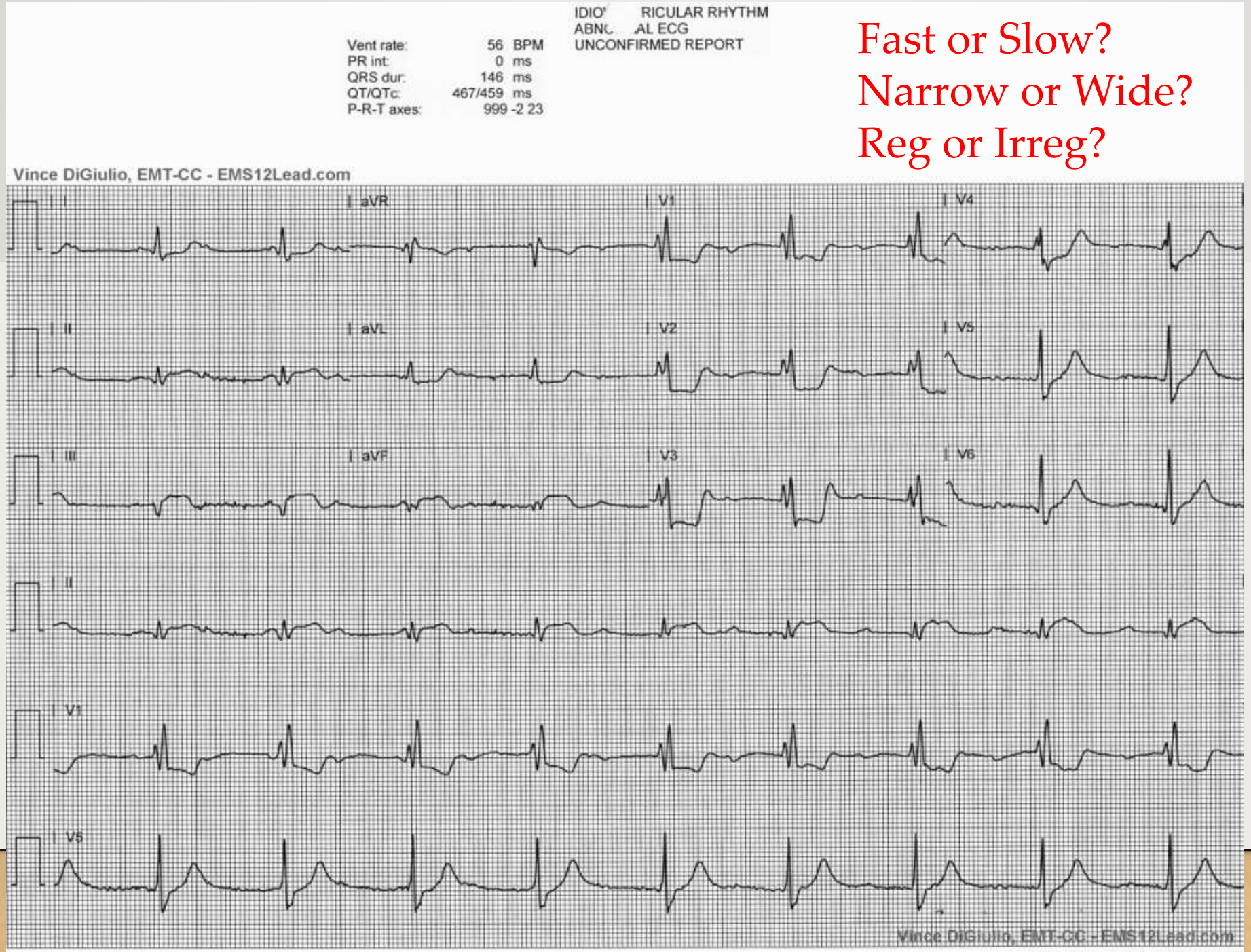
- 65 yo male with history of HTN, diabetes who smokes
- Diaphoretic and clutching his chest
- Takes no meds
- BP 120/60, HR 45

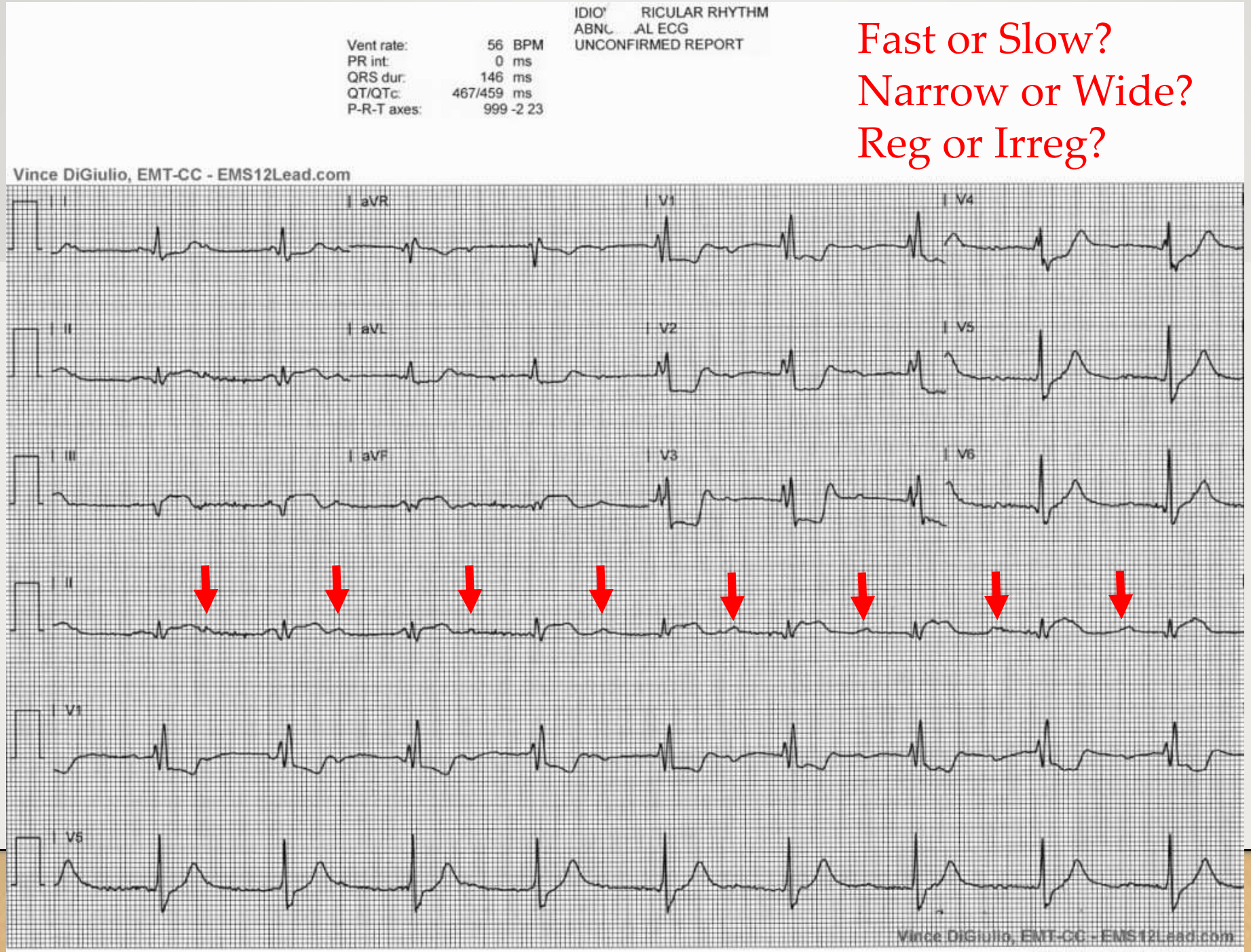
IDIO' RICULAR RHYTHM
ABNC AL ECG
UNCONFIRMED REPORT

Vent rate:	56	BPM
PR int:	0	ms
QRS dur:	146	ms
QT/QTc:	467/459	ms
P-R-T axes:	999	-2 23

Vince DiGiulio, EMT-CC - EMS12Lead.com




IDIO' RICULAR RHYTHM
ABNC AL ECG
UNCONFIRMED REPORT
Vent rate: 56 BPM
PR int: 0 ms
QRS dur: 146 ms
QT/QTc: 467/459 ms
P-R-T axes: 999 -2 23
Fast or Slow?
Narrow or Wide?
Reg or Irreg?
Vince DiGiulio, EMT-CC - EMS12Lead.com
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
II
V1
V5
Vince DiGiulio, EMT-CC - EMS12Lead.com


IDIO' RICULAR RHYTHM
ABNC AL ECG
UNCONFIRMED REPORT
Vent rate: 56 BPM
PR int: 0 ms
QRS dur: 146 ms
QT/QTc: 467/459 ms
P-R-T axes: 999 -2 23
Fast or Slow?
Narrow or Wide?
Reg or Irreg?
Vince DiGiulio, EMT-CC - EMS12Lead.com
I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
V6
II
V1
V5
Vince DiGiulio, EMT-CC - EMS12Lead.com

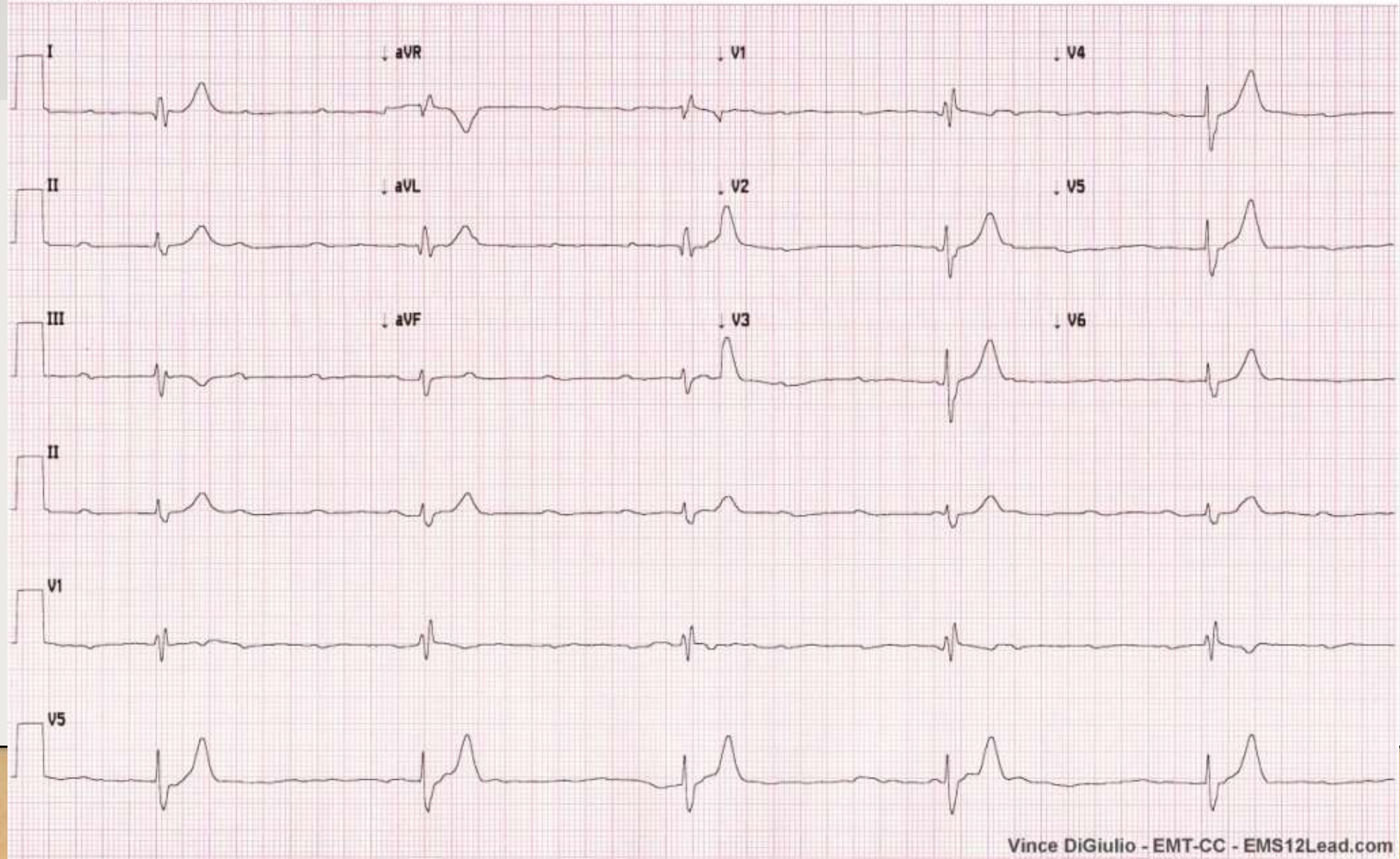
Vent rate:	30 BPM
PR int:	* ms
QRS dur:	118 ms
QT/QTc:	468/333 ms
P-R-T axes:	* -29 6

[redacted]

ABNORMAL ECG

UNCONFIRMED REPORT

Vince DiGiulio - EMT-CC - EMS12Lead.com

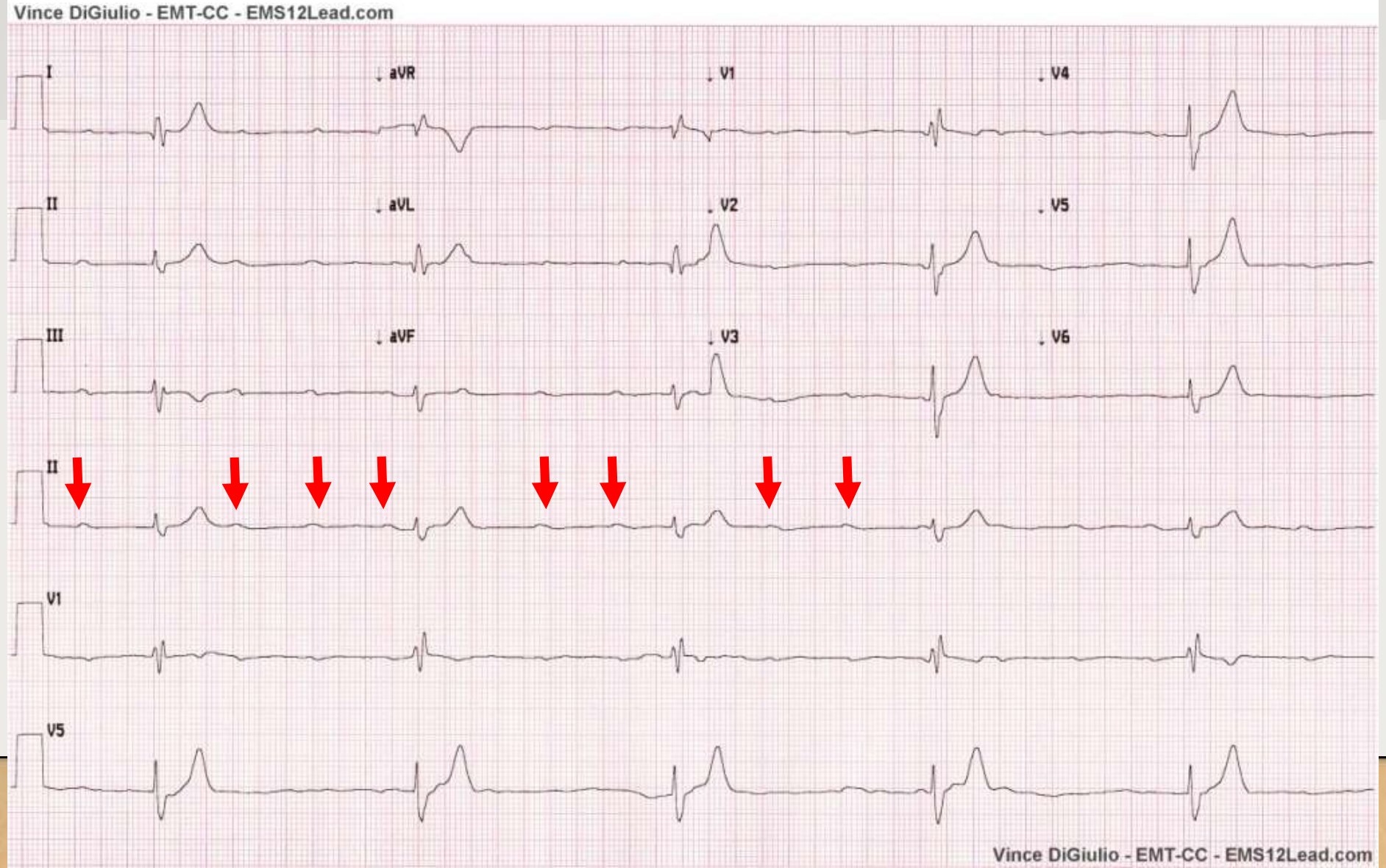


Vince DiGiulio - EMT-CC - EMS12Lead.com

Vent rate:	30 BPM
PR int:	* ms
QRS dur:	118 ms
QT/QTc:	468/333 ms
P-R-T axes:	* -29 6

SINUS RHYTHM WITH HIGH GRADE AV BLOCK
INDETERMINATE AXIS
INCOMPLETE RIGHT BUNDLE BRANCH BLOCK
POSSIBLE LATERAL MYOCARDIAL INFARCTION, OF INDETERMINATE AGE
ABNORMAL ECG

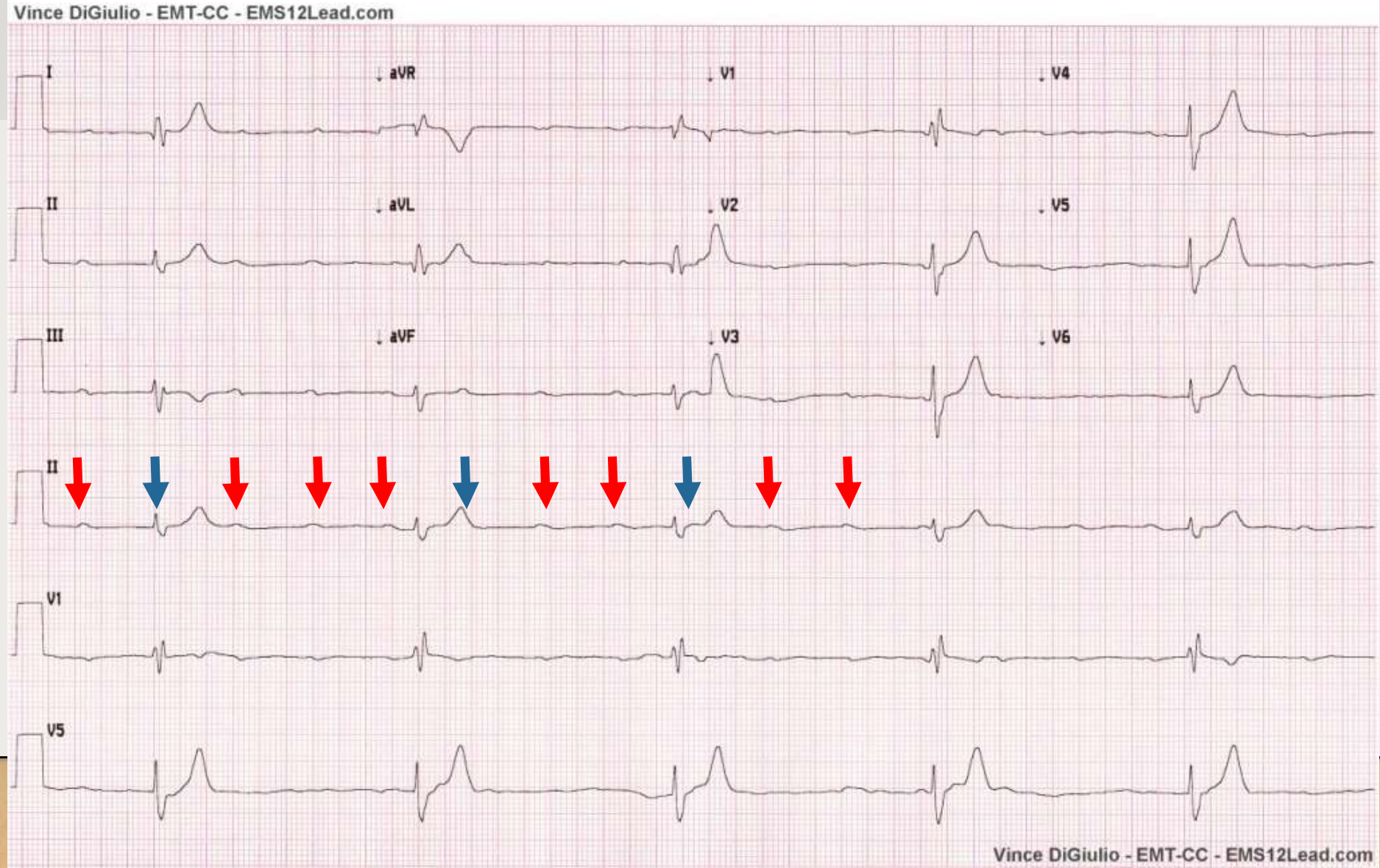
UNCONFIRMED REPORT

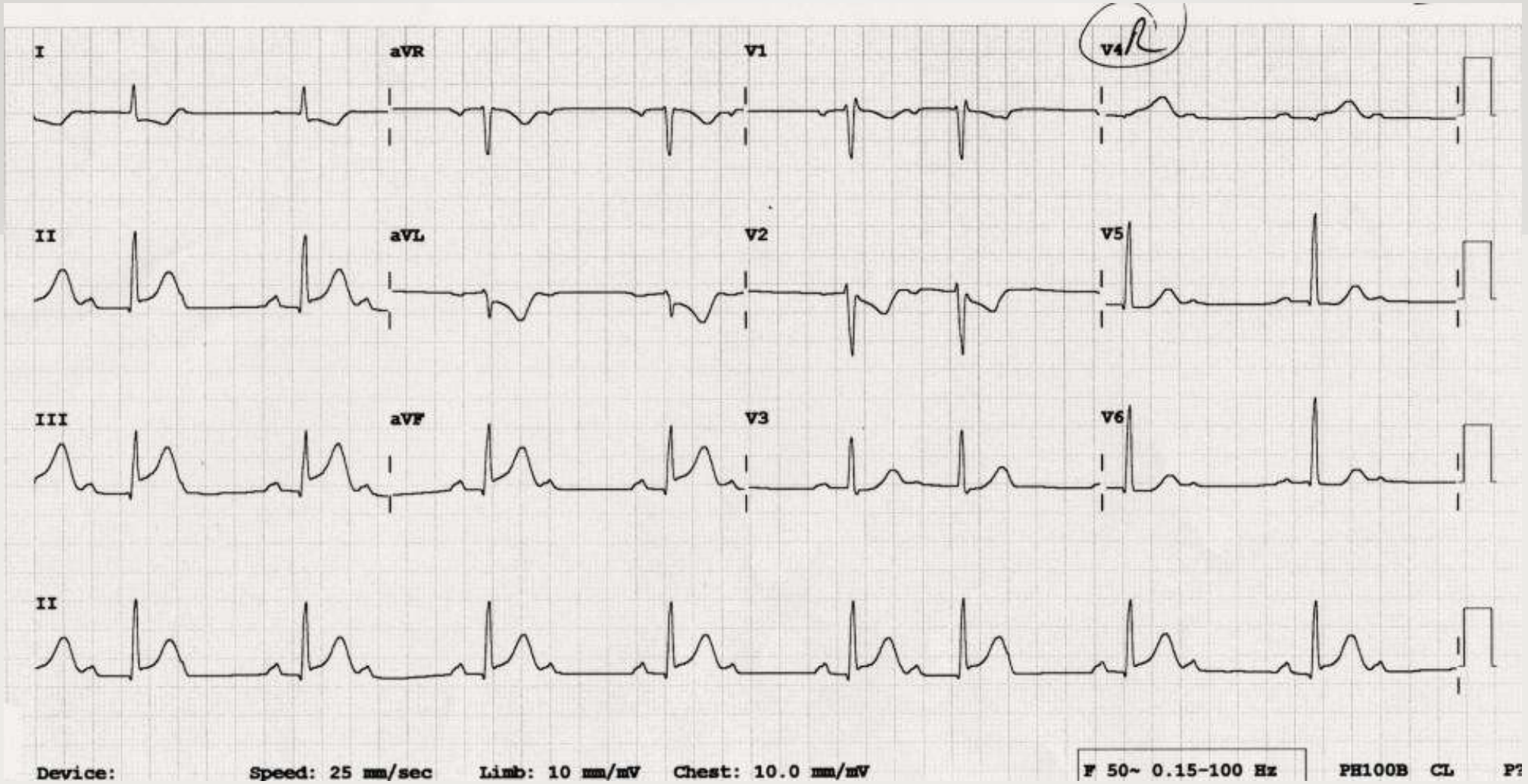


Vent rate:	30 BPM
PR int:	* ms
QRS dur:	118 ms
QT/QTc:	468/333 ms
P-R-T axes:	* -29 6

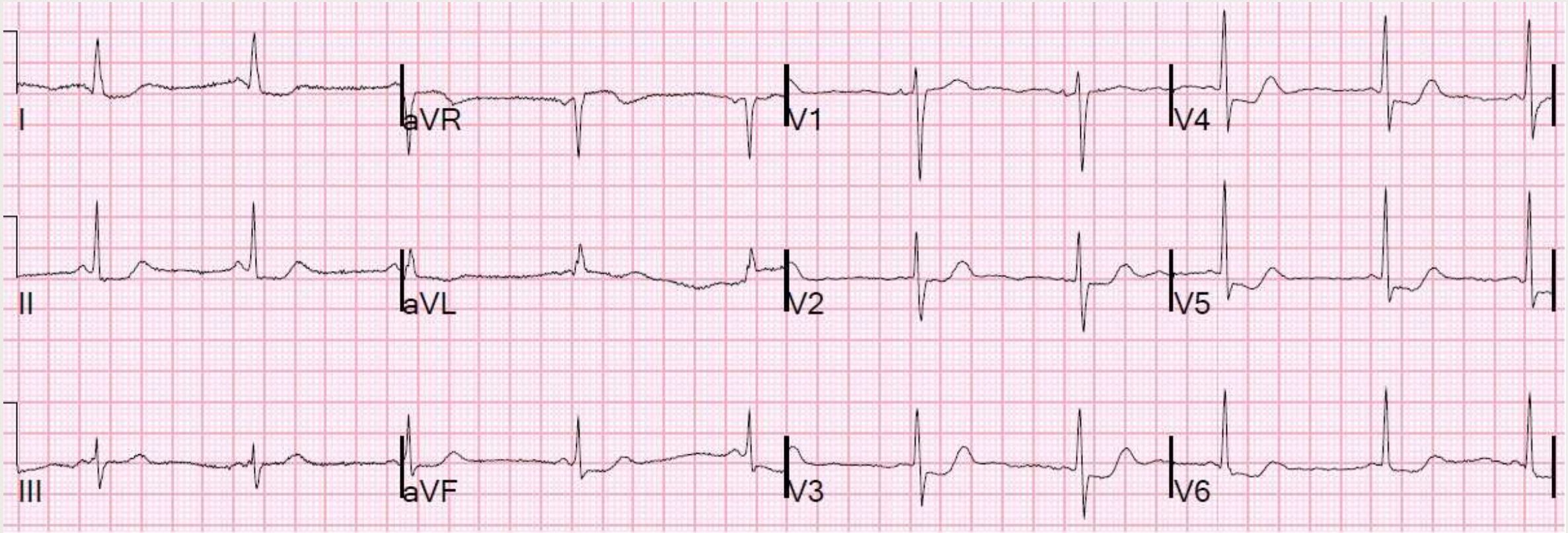
SINUS RHYTHM WITH HIGH GRADE AV BLOCK
INDETERMINATE AXIS
INCOMPLETE RIGHT BUNDLE BRANCH BLOCK
POSSIBLE LATERAL MYOCARDIAL INFARCTION, OF INDETERMINATE AGE
ABNORMAL ECG

UNCONFIRMED REPORT

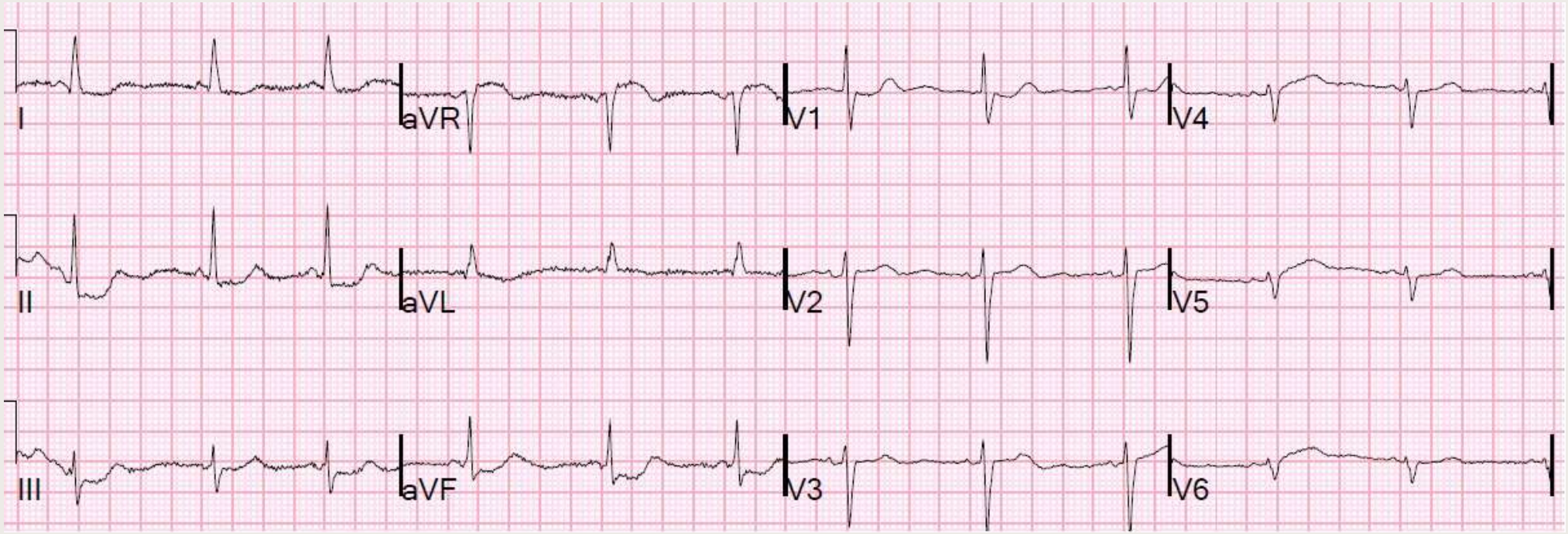



I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II
Device:
Speed: 25 mm/sec
Limb: 10 mm/mV
Chest: 10.0 mm/mV
F 50~ 0.15-100 Hz
PH100B CL

Right sided MI



Here's with Right sided leads



Bradycardia and trouble

- Don’t let them DIE
- D – Drugs
- I – ischemia
- E – Electrolytes

Bradycardia and trouble

- Don’t let them DIE
- D – Drugs
- I – ischemia
- E – Electrolytes

- Beta Blockers
- Calcium channel blockers
- Digoxin
- Clonidine (visine, afrin)
- TCA’s
- Flexeril
- Opiates
- Supplements

Bradycardia and trouble

- Don’t let them DIE
- D – Drugs
- I – ischemia
- E – Electrolytes

- Typically associated with inferior MIs
- Complete HB with anterior MI has a poor prognosis

Non-toxicologic causes

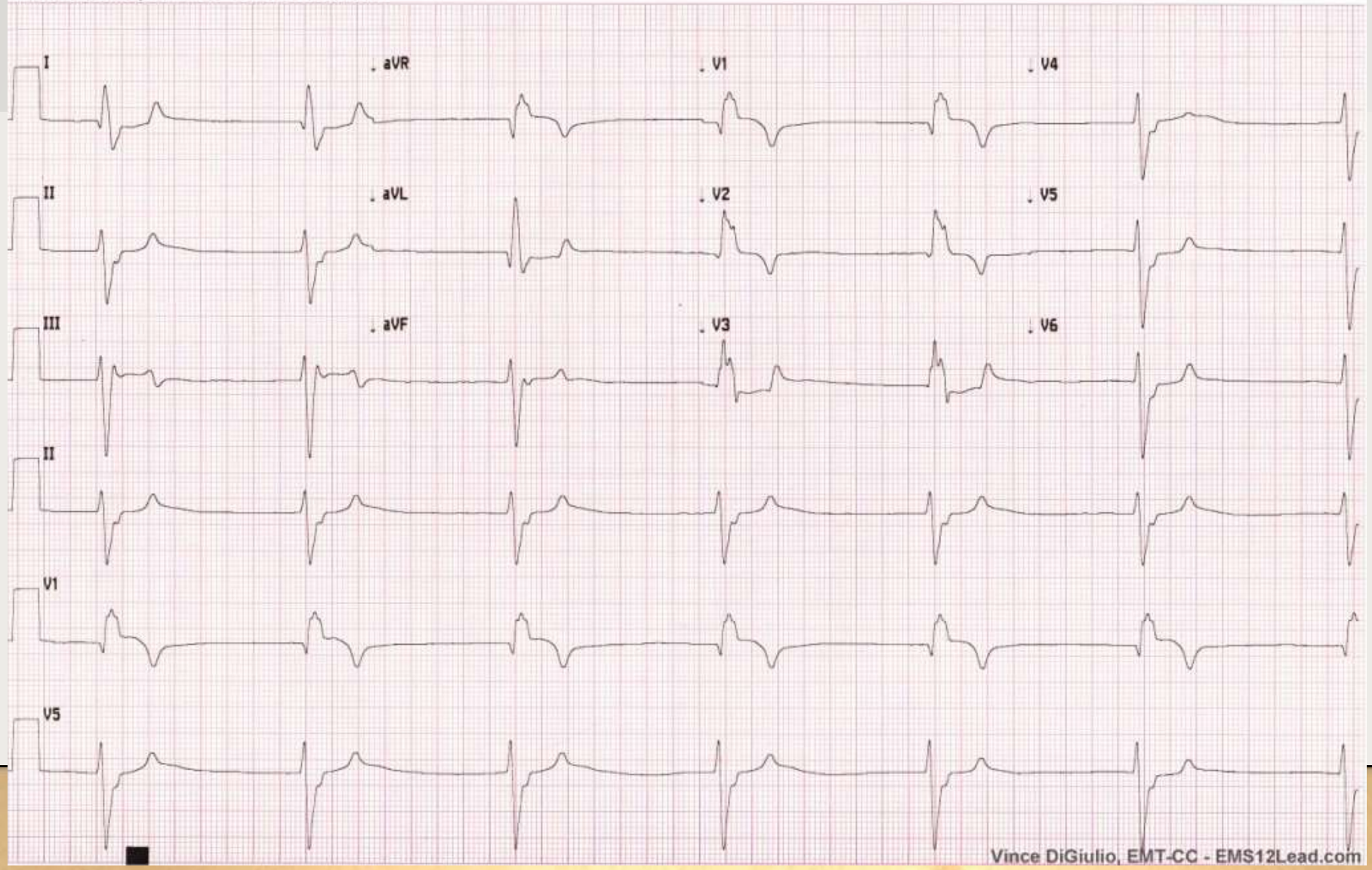
- MI with cardiogenic shock
- Hyperkalemia
- Myxedema coma
- Spinal cord injury
- Hypothermia

Vent rate:	38 BPM
PR int:	* ms
QRS dur:	190 ms
QT/QTc:	529/447 ms
P-R-T axes:	* -74 32

UNCERTAIN REGULAR RHYTHM
RIGHT BUNDLE BRANCH BLOCK
LEFT ANTERIOR FASCICULAR BLOCK
SEPTAL MYOCARDIAL INFARCTION, OF INDETERMINATE AGE
ABNORMAL ECG
WARNING: DATA QUALITY MAY AFFECT INTERPRETATION

UNCONFIRMED REPORT

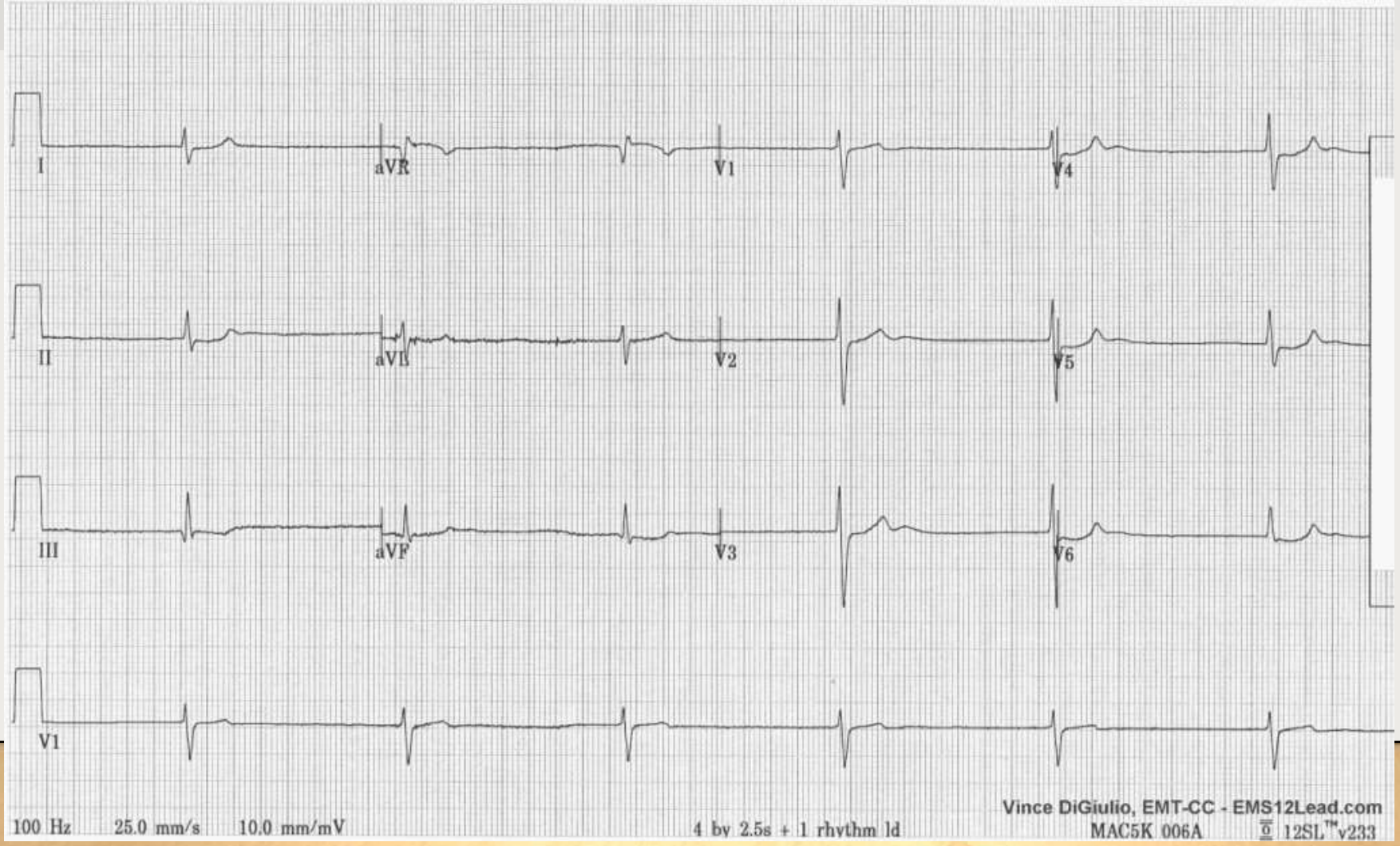
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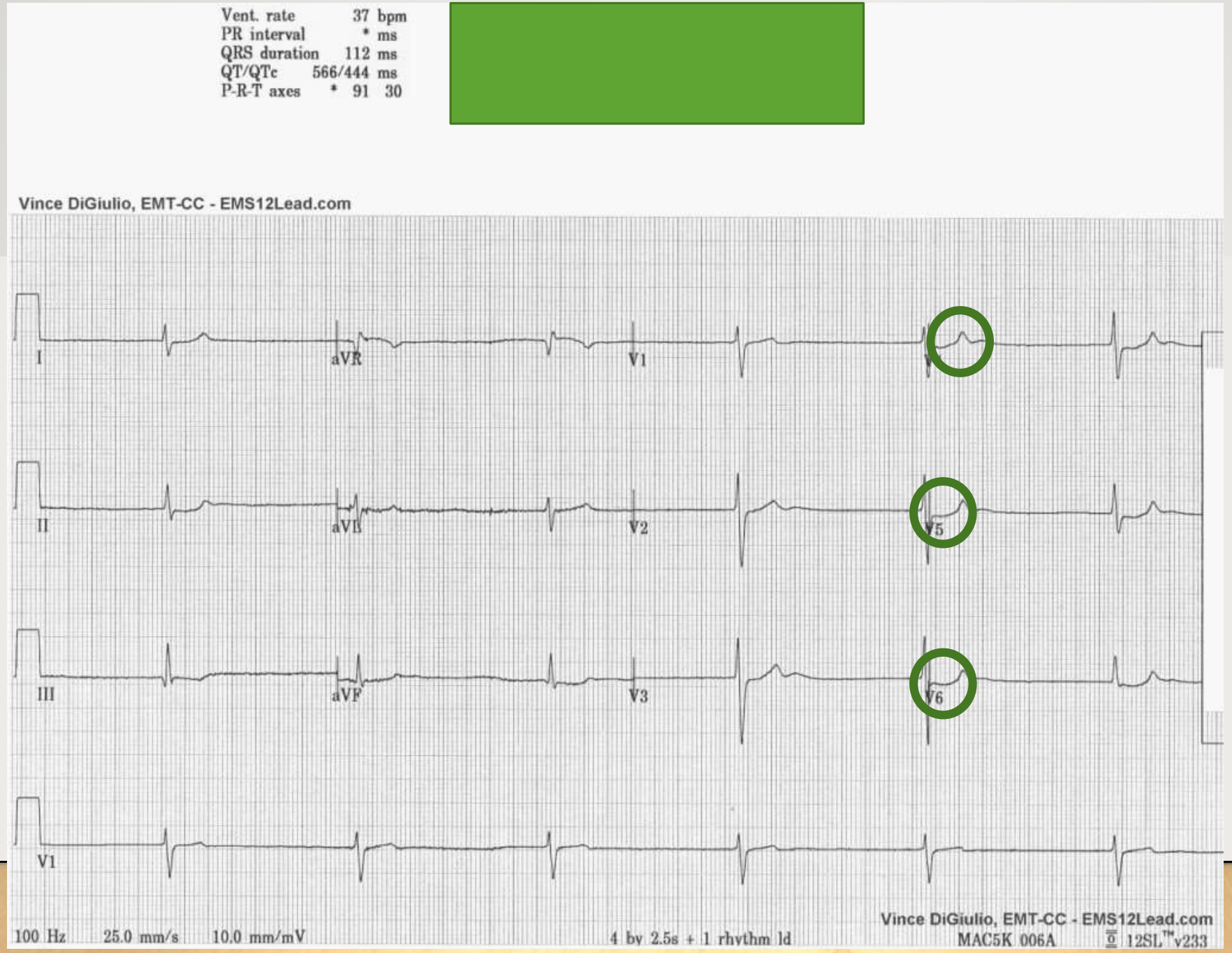


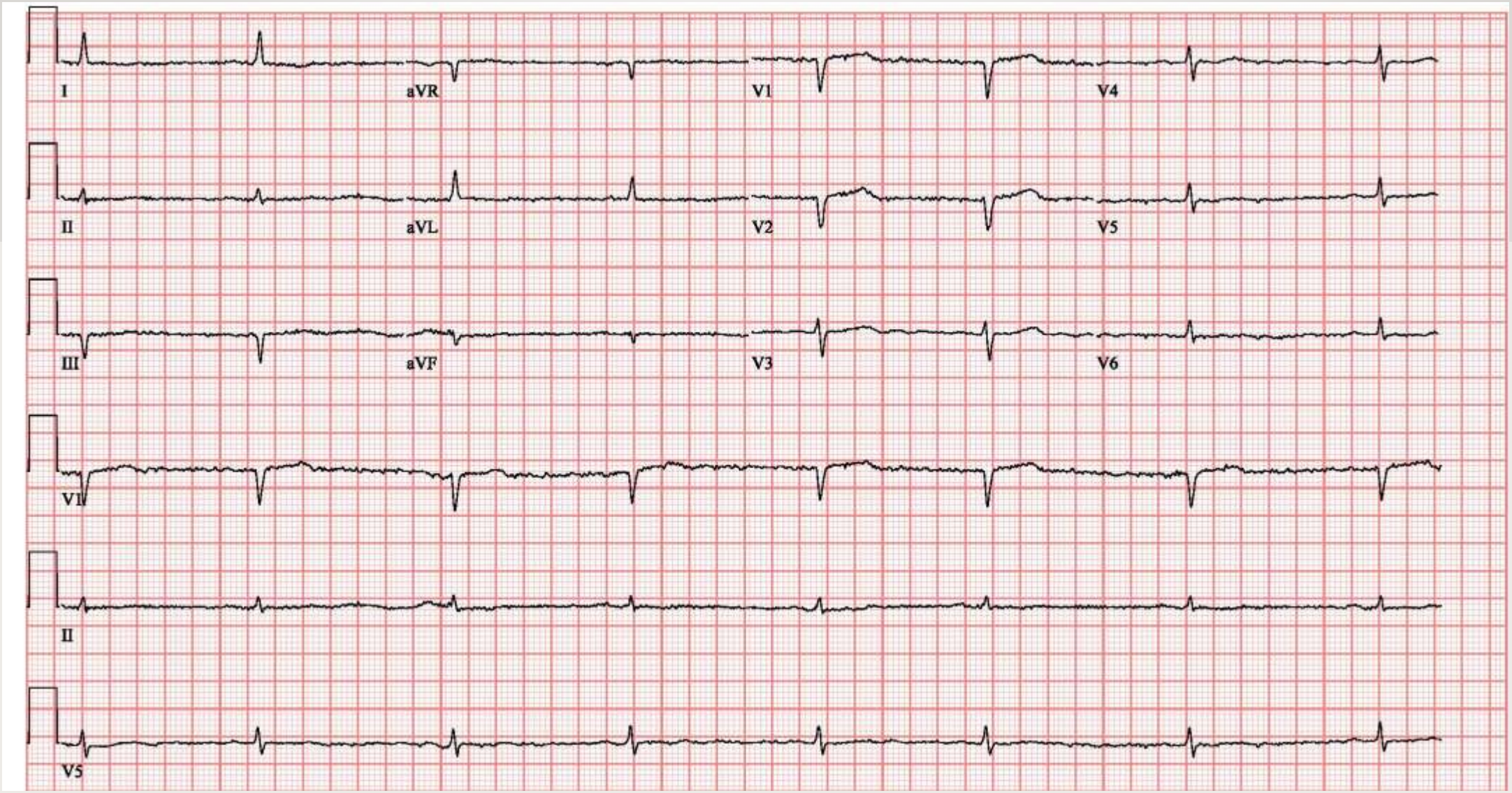
Vince DiGiulio, EMT-CC - EMS12Lead.com

Vent. rate	37 bpm	*** Age and gender specific ECG analysis ***
PR interval	* ms	Junctional bradycardia
QRS duration	112 ms	Rightward axis
QT/QTc	566/444 ms	ST abnormality, possible digitalis effect
P-R-T axes	* 91 30	Abnormal ECG

Vince DiGiulio, EMT-CC - EMS12Lead.com




Vent. rate 37 bpm
PR interval * ms
QRS duration 112 ms
QT/QTc 566/444 ms
P-R-T axes * 91 30
Vince DiGiulio, EMT-CC - EMS12Lead.com
I
aVR
V1
II
aVL
V2
III
aVF
V3
V1
V5
V6
100 Hz 25.0 mm/s 10.0 mm/mV
4 by 2.5s + 1 rhythm ld
Vince DiGiulio, EMT-CC - EMS12Lead.com
MAC5K 006A
12SL™v233


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
VI
II
V5

Summary

- Have an approach.
- Don’t let them DIE
- Atrium relationship to the ventricles
- Know your meds
- Still try atropine and pacing
- Be thorough