

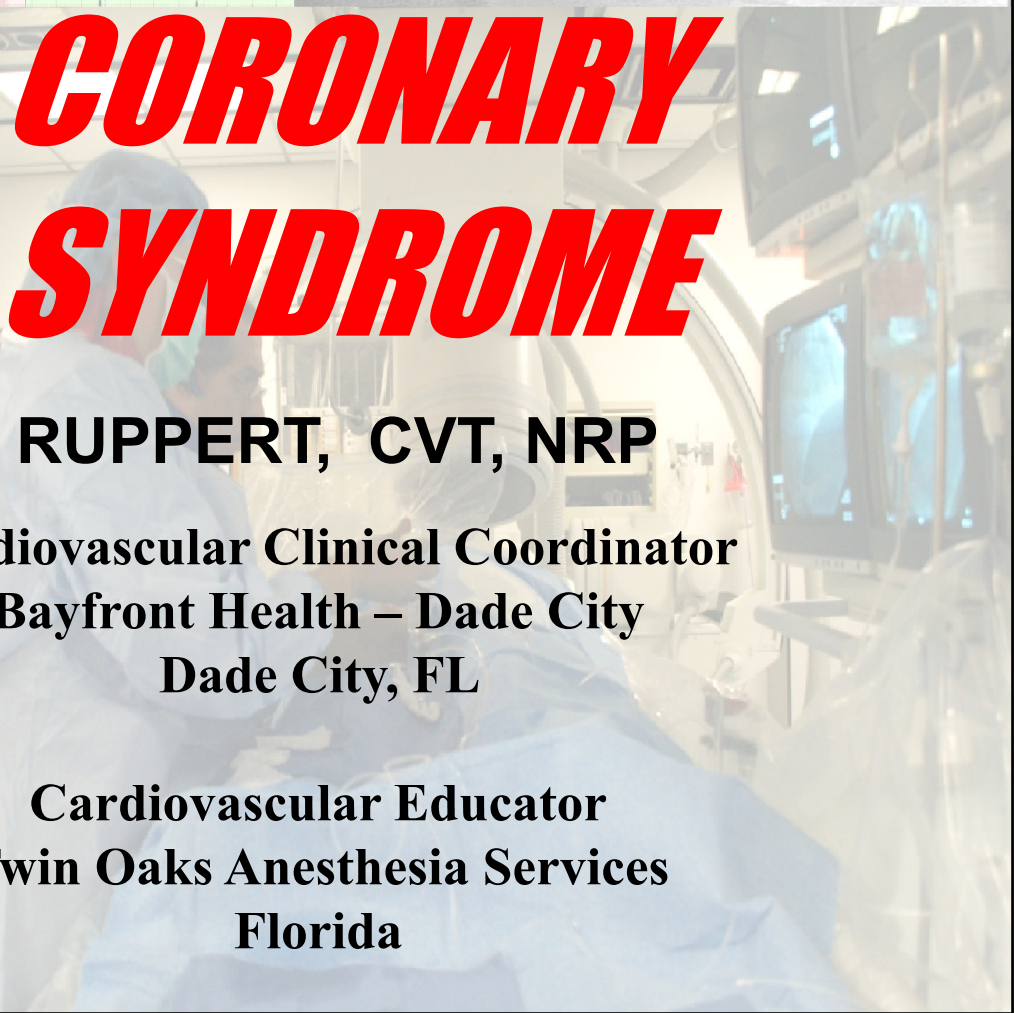
ACUTE CORONARY SYNDROME



WAYNE W RUPPERT, CVT, NRP

**Cardiovascular Clinical Coordinator
Bayfront Health – Dade City
Dade City, FL**

**Cardiovascular Educator
Twin Oaks Anesthesia Services
Florida**



IDENTIFY and MANAGE
ACUTE CORONARY SYNDROMES:

STEMI

UNSTABLE

NON-STEMI

**UNSTABLE
ANGINA**

CP-LOW RISK

"The ACS Scorecard"

- PRESENTING SYMPTOMS**
- RISK FACTOR PROFILE**
- ECG ABNORMALITIES**
- CARDIAC MARKERS**

A POSITIVE finding in TWO or MORE of the above categories indicates it is EXTREMELY LIKELY that ACS is present steps must be **AGGRESSIVELY TAKEN** to definitively **RULE OUT** the **PRESENCE** of ACS!

PATIENT EVALUATION

- INITIAL APPROACH (SHOCK SURVEY)
- ABCs (er, oops... CAB !)
- CHIEF COMPLAINT
- SECONDARY EVALUATION
 - RAPID, FOCUSED ASSESSMENT
 - PAIN / PRESSURE / BREATHING / SYMPTOMS ?

SHOCK ASSESSMENT





SECONDS

**SHOCK =
INADEQUATE TISSUE
PERFUSION**

- **STARTS THE INSTANT YOU SEE PATIENT**
- **ENDS WHEN YOU REACH THE PATIENT'S SIDE**

SHOCK ASSESSMENT

LOC:	ANXIOUS RESTLESS LETHARGIC UNCONSCIOUS	AWAKE ALERT & ORIENTED
SKIN:	PALE / ASHEN CYANOTIC COOL DIAPHORETIC	NORMAL HUE WARM DRY
BREATHING:	TACHYPNEA	NORMAL
PULSE:	WEAK / THREADY TOO FAST or SLOW	STRONG
STATUS:	 SHOCK 	NORMAL

FAIL the SHOCK SURVEY ?



**WORK TO RAPIDLY IDENTIFY
THE CAUSE OF SHOCK.**

CARDIOGENIC ? ----- RAPID EKG !!

HYPOVOLEMIC ?

SEPTIC ?

DIABETIC ?

NEUROGENIC / SPINAL ?

METABOLIC ?

etc.

CHIEF COMPLAINT

CHIEF COMPLAINT

KEY WORDS:

**“CHEST: PAIN / HEAVINESS / PRESSURE/
FUNNY FEELING IN,” etc.**

SHORTNESS BREATH

DIZZINESS / LIGHTHEADEDNESS

ETC. ETC. ETC.

INFARCTION

SYMPTOMS OF MYOCARDIAL INFARCTION:

1. CHEST PAIN:

- Substernal - can radiate to neck, shoulders, jaw, L or R arm
- Pain described as "Dull Pain" or "Pressure" or "Heaviness" - but can be sharp
- Usually NOT effected by DEEP INSPIRATION, POSITION, or MOVEMENT

INFARCTION

SYMPTOMS OF MYOCARDIAL INFARCTION:

1. CHEST PAIN
2. SHORTNESS OF BREATH
May or may not be present.

INFARCTION

SYMPTOMS OF MYOCARDIAL INFARCTION:

1. CHEST PAIN
2. SHORTNESS OF BREATH
3. NAUSEA
May or may not be present

INFARCTION

SYMPTOMS OF MYOCARDIAL INFARCTION:

1. CHEST PAIN
2. SHORTNESS OF BREATH
3. NAUSEA
4. COLD, CLAMMY, PALE SKIN
and other signs of hypoperfusion
may be present

INFARCTION

- - - "*Classic Symptoms*" - - -



QUICK ASSESSMENT "SHORT FORM"

- SUBSTERNAL CHEST PAIN**
(HAVE PATIENT POINT TO WORST PAIN)
- DESCRIBED AS "DULL PAIN,"**
"PRESSURE," or "HEAVINESS"
- DOES NOT CHANGE WITH**
DEEP BREATH

ATYPICAL SYMPTOMS of ACS

???

Acute MI patients who present without chest pain* are SHREWD:

Sroke (previous history of)

Heart failure (previous history of)

Race (non-white)

Elderly (age 75+)

Women

Diabetes mellitus

* The information listed in the table to the immediate left resulted from a study conducted by John G. Canto, MD, MSPH, et. al., of the University of Alabama. The study consisted of 434,877 patients diagnosed with AMI between 1994 and 1998 in 1,674 US hospitals. Study results were published in the Journal of the American Medical Association (JAMA) on June 28, 2000, Vol. 283, No. 24, pages 3223-3229

Common atypical complaints associated with AMI without chest pain include:

Malaise (weakness)

Indigestion

Nausea

Dizziness

Syncope

Fatigue

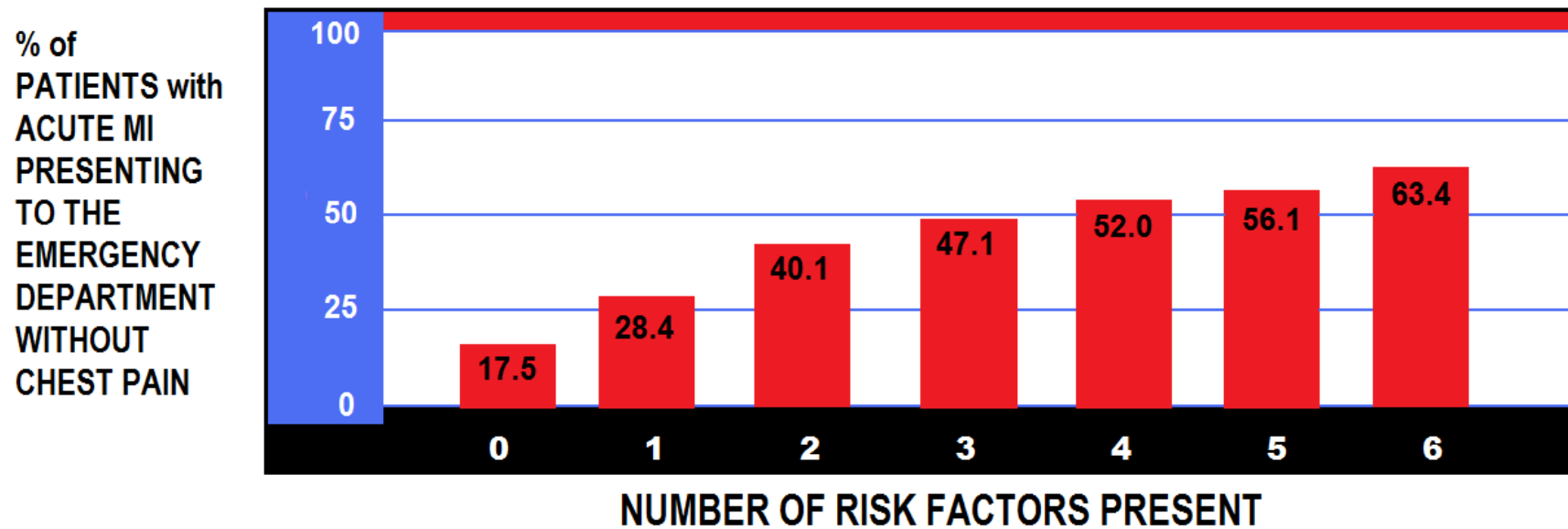
Abdominal pain

Cold sweats

Elevated heart rate

Dyspnea

Effect of Having Multiple Risk Factors for AMI Without Chest Pain



RISK FACTORS INCLUDE: **S**roke (previous), **H**eat failure (previous), **R**ace (non-white), **E**lderly (age 75+), **W**omen, **D**iabetes

DATA SOURCE: J. CANTO, MD, MSPH, et al, JAMA 2000 ; 283 : 3223 - 3229

**WOMEN'S MAJOR SYMPTOMS
PRIOR TO THEIR HEART ATTACK:**

- UNUSUAL FATIGUE 71 %
- SLEEP DISTURBANCE 48 %
- SOB 42 %
- INDIGESTION 39 %
- ANXIETY 36 %

APPROXIMATELY 78 % OF WOMEN REPORTED EXPERIENCING AT LEAST ONE OF THESE SYMPTOMS FOR MORE THAN ONE MONTH EITHER DAILY OR SEVERAL TIMES PER WEEK PRIOR TO THEIR MI.

**WOMEN'S MAJOR SYMPTOMS
DURING THEIR HEART ATTACK:**

- SHORTNESS OF BREATH 58 %
- WEAKNESS 55 %
- UNUSUAL FATIGUE 43 %
- COLD SWEAT 39 %
- DIZZINESS 39 %



43 % HAD NO CHEST PAIN AT ANY TIME DURING THEIR MI!

Circulation, 2003;108;2619-2623

SUSPECTED ACUTE MI PATIENT . . .

- **OXYGEN**
- **ECG MONITORING**
- **VITALS**
- **LUNG / HEART SOUNDS**
- **IV THERAPY SEND LABS**
- **12 + LEAD EKG -- within 10 MINUTES
of PATIENT'S ARRIVAL**

"The ACS Scorecard"

- PRESENTING SYMPTOMS**
- RISK FACTOR PROFILE**
- ECG ABNORMALITIES**
- CARDIAC MARKERS**

A POSITIVE finding in TWO or MORE of the above categories indicates it is EXTREMELY LIKELY that ACS is present steps must be **AGGRESSIVELY TAKEN** to definitively **RULE OUT** the **PRESENCE** of ACS!

"The ACS Scorecard"











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RISK FACTORS

for the development of

CORONARY ARTERY DISEASE:

-  **HEREDITY**
-  **↑ LDL and ↓ HDL CHOLESTEROL PROFILES**
-  **SMOKING**
-  **DIABETES MELLITUS**
-  **OBESITY**
-  **PHYSICAL INACTIVITY**
-  **HYPERTENSION**
-  **AGE - OVER 65**
-  **MALE**
-  **HIGH STRESS**

per the AMERICAN HEART ASSOCIATION

"The ACS Scorecard"

- PRESENTING SYMPTOMS**
- RISK FACTOR PROFILE**
- ECG ABNORMALITIES**
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Assess Initial 12 – Lead ECG Findings

STEMI


- ST elevation or new LBBB:
- ST elevation MI (STEMI)

NON-STEMI

- ST depression or T-wave inversion: strongly suspicious for ischemia
- High-risk unstable angina / non ST elevation MI (UA ? NSTEMI)

CP-LOW RISK

- Nondiagnostic ECG: absence of changes in ST segment or T-waves
- Intermediate / low risk UA

 Classify patients with acute ischemic chest pain into 1 of the 3 groups above within 10 minutes of arrival.

ECG EVALUATION for ACS:

STEP 1: EVALUATE *WIDTH of QRS*

BOOK PAGE: 73

IF THE QRS IS TOO WIDE

(GREATER THAN 120 ms)

. . . . IS the QRS morphology:

LEFT BUNDLE BRANCH BLOCK

- OR -



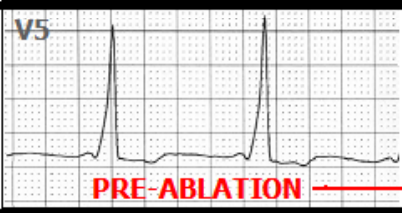

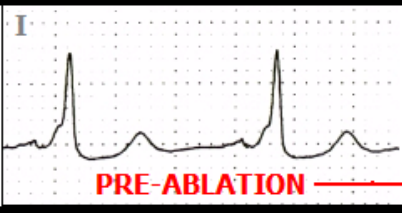


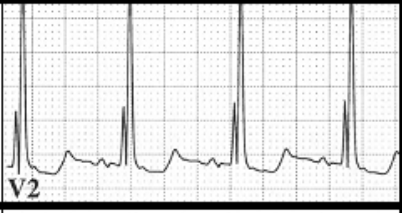

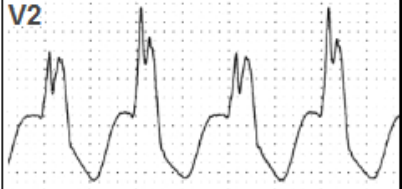

RIGHT BUNDLE BRANCH BLOCK

?????

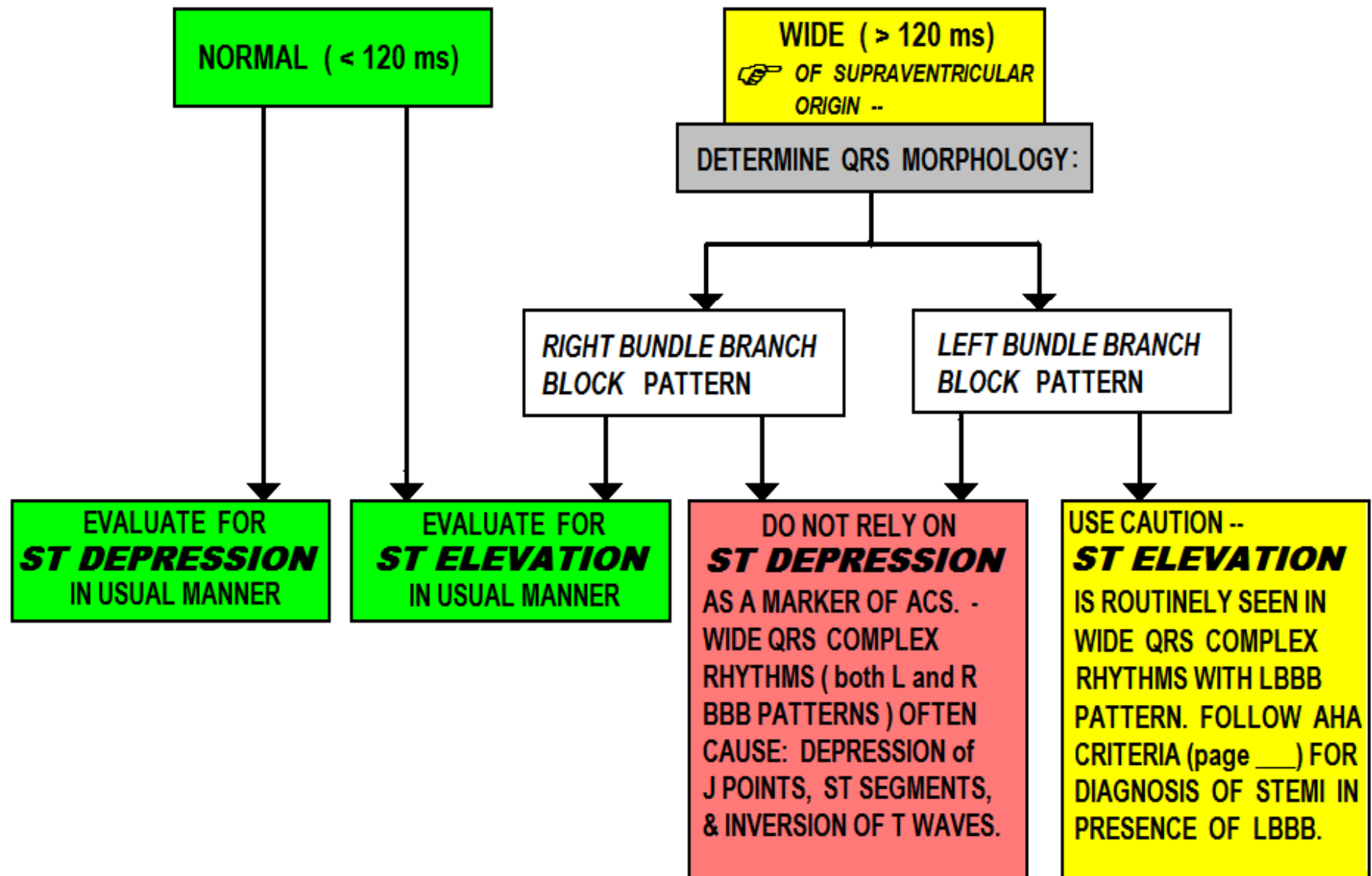
**WIDE QRS
COMPLEXES
ALTER THE
-J POINTS
-ST SEGMENTS
-T WAVES**

Of the ECG . . .

**CONDITIONS WHICH ALTER THE ECG MARKERS
of ACUTE CORONARY SYNDROME**

<p>RIGHT BUNDLE BRANCH BLOCK</p>			<p>LEFT BUNDLE BRANCH BLOCK</p>
<p>W-P-W BYPASS TRACT, LEFT LATERAL WALL 49 y/o MALE</p>	 <p>PRE-ABLATION</p>	 <p>POST-ABLATION</p>	<p>SAME PATIENT AS ON LEFT - IMMEDIATELY AFTER RF ABLATION OF BYPASS TRACT</p>
<p>W-P-W BYPASS TRACT, RIGHT ANTERIOR/ LATERAL WALL 14 y/o MALE</p>	 <p>PRE-ABLATION</p>	 <p>POST-ABLATION</p>	<p>SAME PATIENT AS ON LEFT - IMMEDIATELY AFTER RF ABLATION OF BYPASS TRACT</p>
<p>PACEMAKER - RIGHT VENTRICULAR APEX</p>			<p>PACEMAKER TURNED OFF HERE</p>
<p>RIGHT VENTRICULAR HYPERTROPHY (Strain Pattern)</p>			<p>LEFT VENTRICULAR HYPERTROPHY (Strain Pattern)</p>
<p>VENTRICULAR TACHYCARDIA FOCUS: LEFT FASCICULAR, 17 y/o FEMALE</p>			<p>VENTRICULAR TACHYCARDIA-FOCUS: RIGHT VENTRICULAR APEX</p>

STEP 1 - EVALUATE WIDTH OF QRS:



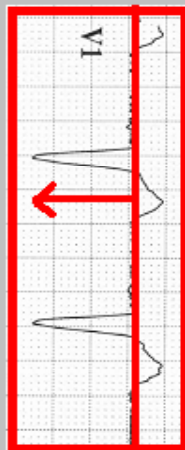
DIAGNOSING BUNDLE BRANCH BLOCKS in LEAD V1

* The "York Hospital" Method:

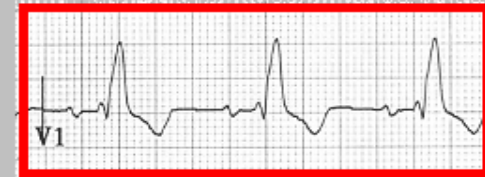
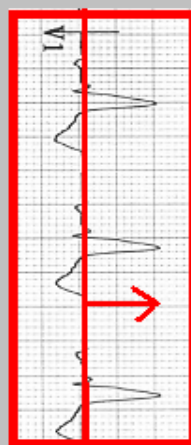
1. **ROTATE** your rhythm strip (of LEAD V1) **CLOCKWISE**

2. **DIAGNOSE** -- The side of the **ISOELECTRIC LINE** that the bulk of the QRS complex rests -- is the side of the heart with the **BUNDLE BRANCH BLOCK!**

LB BB !

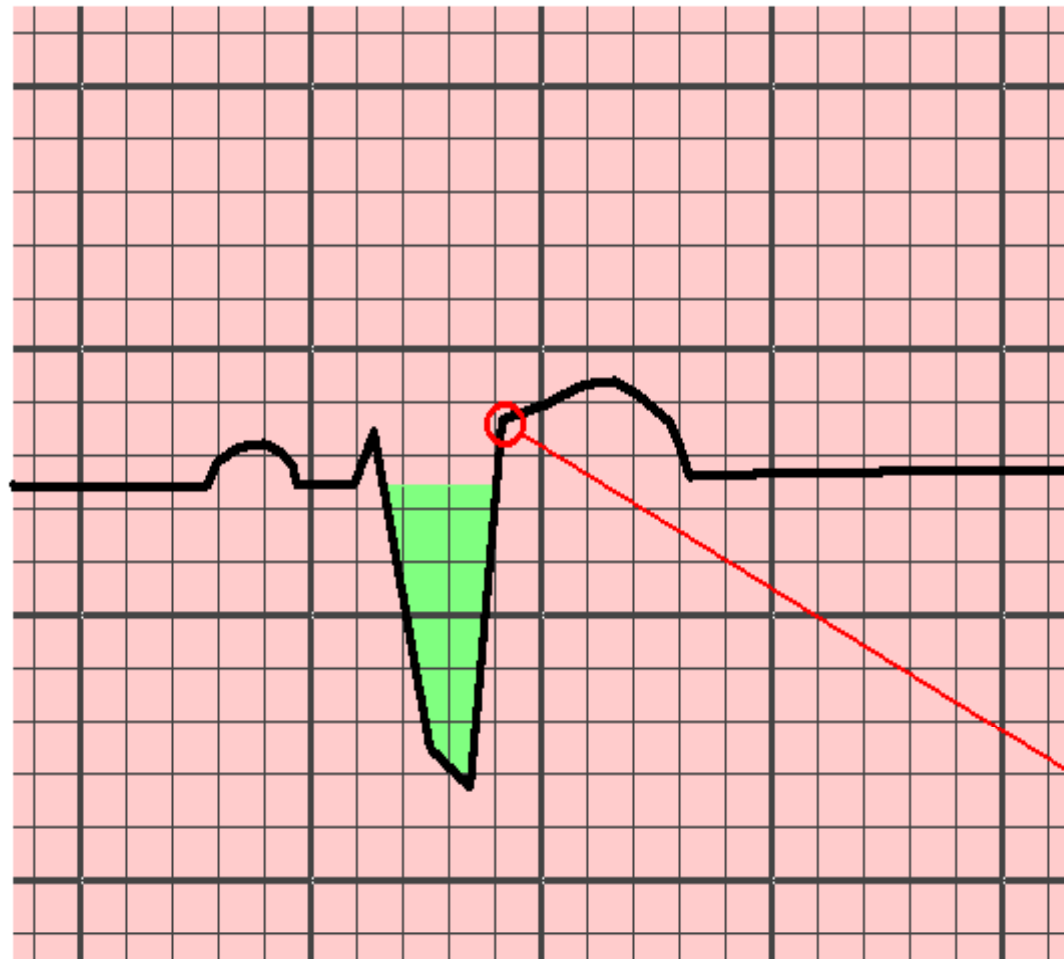


RB BB !



* I do not know whom is responsible for developing this "fine pearl" of cardiology wisdom, but the first time I ever heard of it -- after teaching 12 Lead EKG for several years -- was while teaching EKG at York Hospital in York, Pennsylvania. I promised the room full of nurses -- who were laughing, by this time -- that I would credit them for enlightening me on this rather useful and usually accurate technique !

DIAGNOSING LBBB IN LEAD V1:



- QRS GREATER THAN 120 ms (.12)
- EVIDENCE THAT THIS IS NOT VENTRICULAR BEAT
- TERMINAL PHASE (LAST PART) OF QRS COMPLEX IS NEGATIVE DEFLECTION
- S-T SEGMENTS ARE NORMALLY ALWAYS ELEVATED !

78 yr
Female Black
Room:ICU5
Loc:6 Option:19

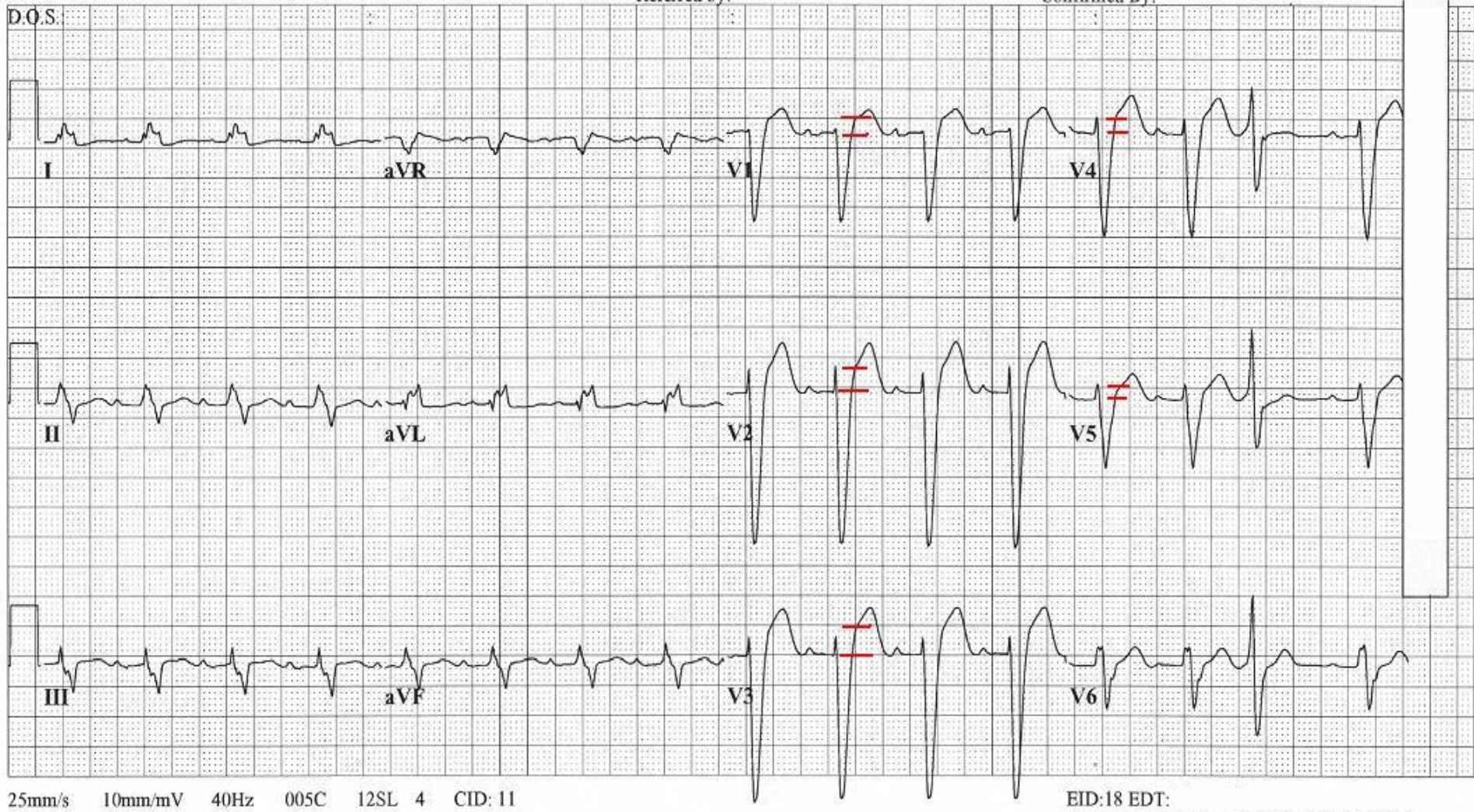
Vent. rate	94	BPM
PR interval	202	ms
QRS duration	160	ms
QT/QTc	388/485	ms
P-R-T axes	91 -23 87	

Normal sinus rhythm with occasional Premature ventricular complexes
Left bundle branch block
Abnormal ECG

- Normal arteries
- Normal LV Function
- No hypertrophy

Technician: EKG CLASS #WR03602718

Referred by:



INFARCTION

A.H.A. ACLS GUIDELINES 2000 / 2006

**FOR PATIENTS WITH KNOWN Hx of
LBBB PRESENTING WITH Sx of
ACUTE MI RELY ON:**

- Cardiac Enzymes**
- Symptoms**
- Risk Factor Profile**
- High Index of Suspicion**

CARDIAC MARKERS

RISE - PEAK - NORMALIZE TIME APPROXIMATIONS

NUMBER OF HOURS FROM ONSET OF MI:

0 1 2 3 4 5 6 8 12 24 36 48 72 96

MYOGLOBIN

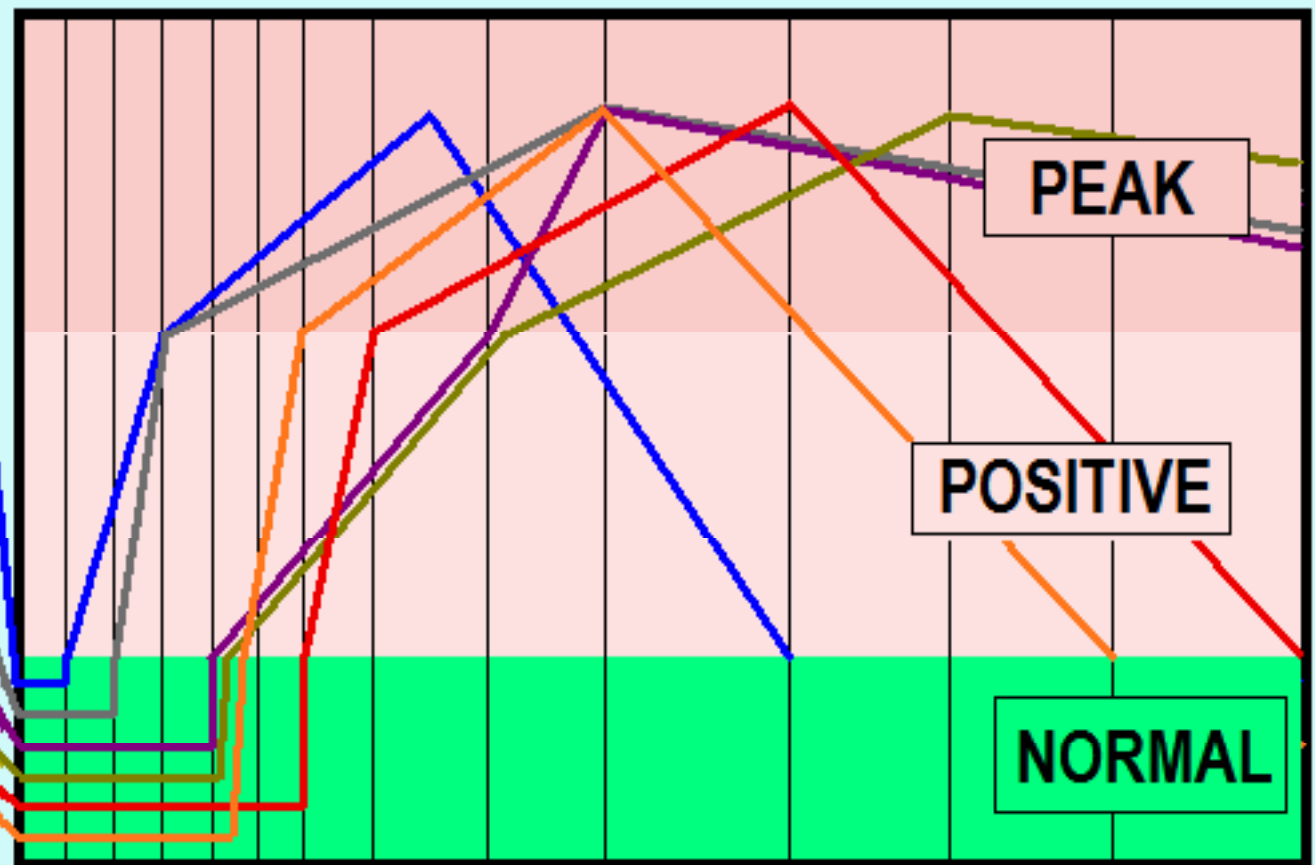
TROPONIN-I
ULTRA

TROPONIN-I

TROPONIN-T

CK

CK-MB



INFARCTION

A.H.A. ACLS GUIDELINES 2000 / 2006

**A patient with ACUTE MI symptoms
and LBBB who has:**

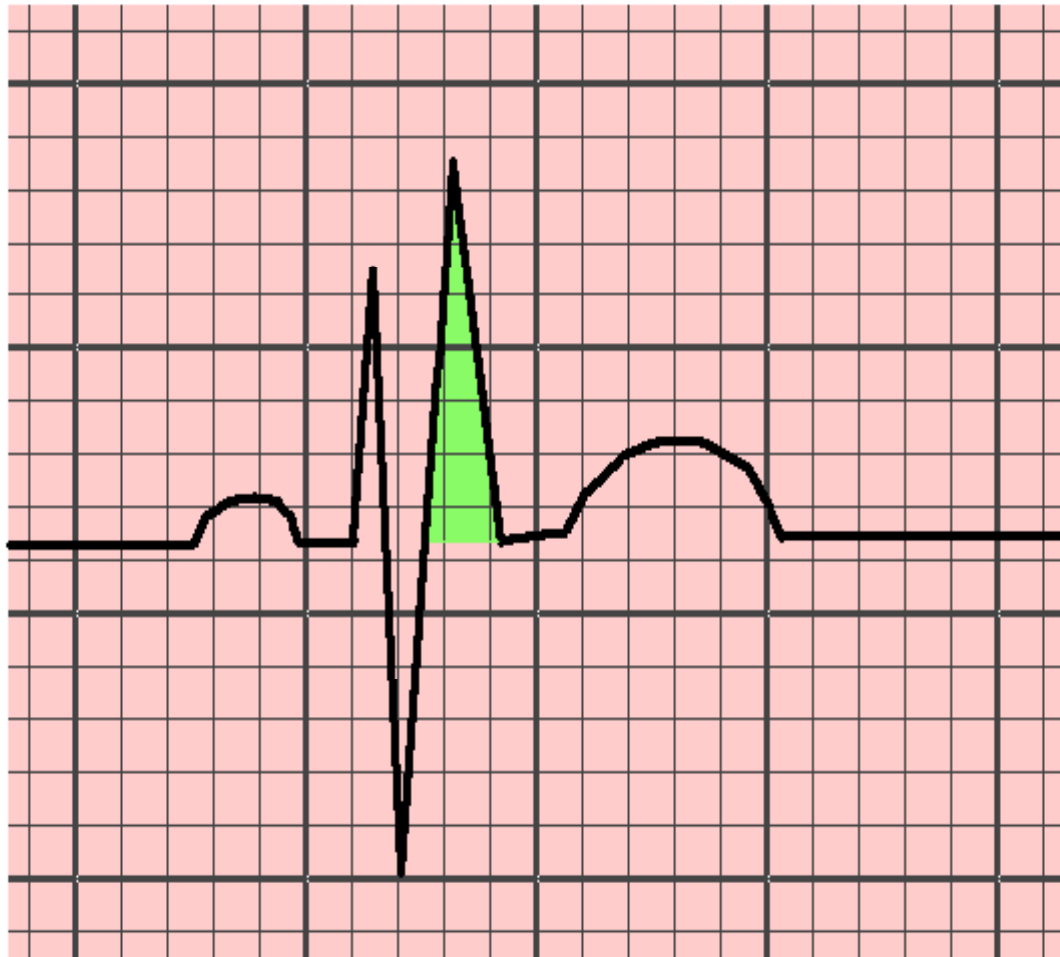
a) Previously NORMAL EKGs

- or -

b) NO EKG HISTORY AVAILABLE

**should be treated as NEW ANTERIOR-
SEPTAL WALL MI UNTIL PROVEN
OTHERWISE**

DIAGNOSING RBBB IN LEAD V1:



- **WIDER THAN 120 ms (.12)**
(or 3 little boxes)
- **TERMINAL PHASE (LAST PART) OF QRS COMPLEX IS POSITIVE DEFLECTION**

INFARCTION

A.H.A. ACLS GUIDELINES 2000 / 2006

PATIENTS with RIGHT BUNDLE
BRANCH BLOCK --



use J-POINTS
and S-T SEGMENTS in the *usual*
manner to screen for ACUTE MI

ACUTE ANTERIOR WALL M.I. WITH RIGHT BUNDLE BRANCH BLOCK
---- NOTE S-T ELEVATION EASILY IDENTIFIED ...

48 yr
Male Caucasian
Room:ATL
Loc:3 Option:23

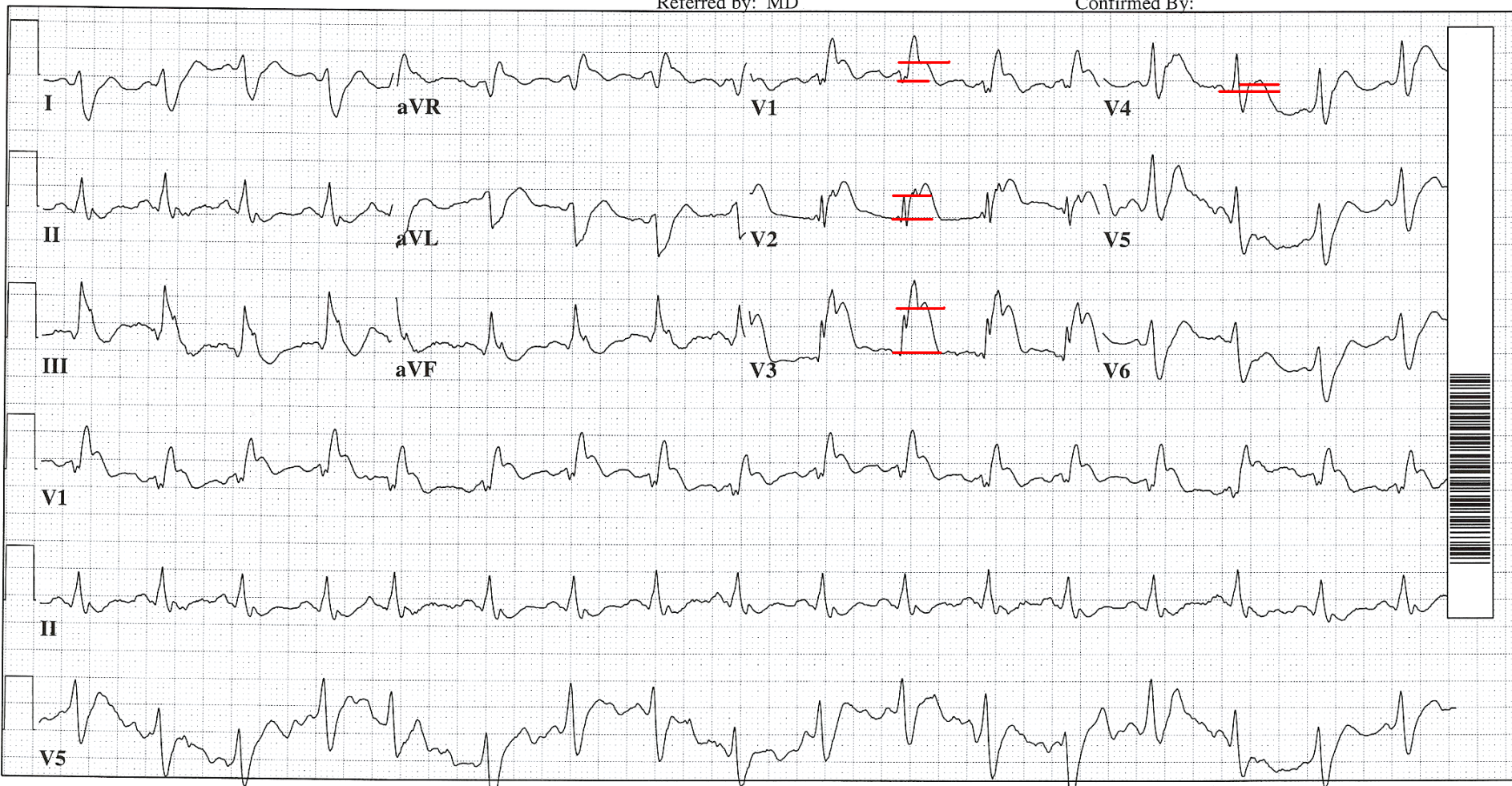
Vent. rate 102 BPM
PR interval 130 ms
QRS duration 168 ms
QT/QTc 400/521 ms
P-R-T axes 60 114 -19

Sinus tachycardia with Premature supraventricular complexes and Fusion complexes
Right bundle branch block
Left posterior fascicular block
*** Bifascicular block ***
ST elevation consider anterior injury or acute infarct
***** ACUTE MI *****
Abnormal ECG ...

Technician: W Ruppert

Referred by: MD

Confirmed By:



25mm/s 10mm/mV 40Hz 005C 12SL 235 CID: 3

EID:5 EDT:

ACUTE INFERIOR WALL M.I. WITH RIGHT BUNDLE BRANCH BLOCK -- WITH POSTERIOR RECIPROCAL S-T DEPRESSION

25 yr
Male Caucasian

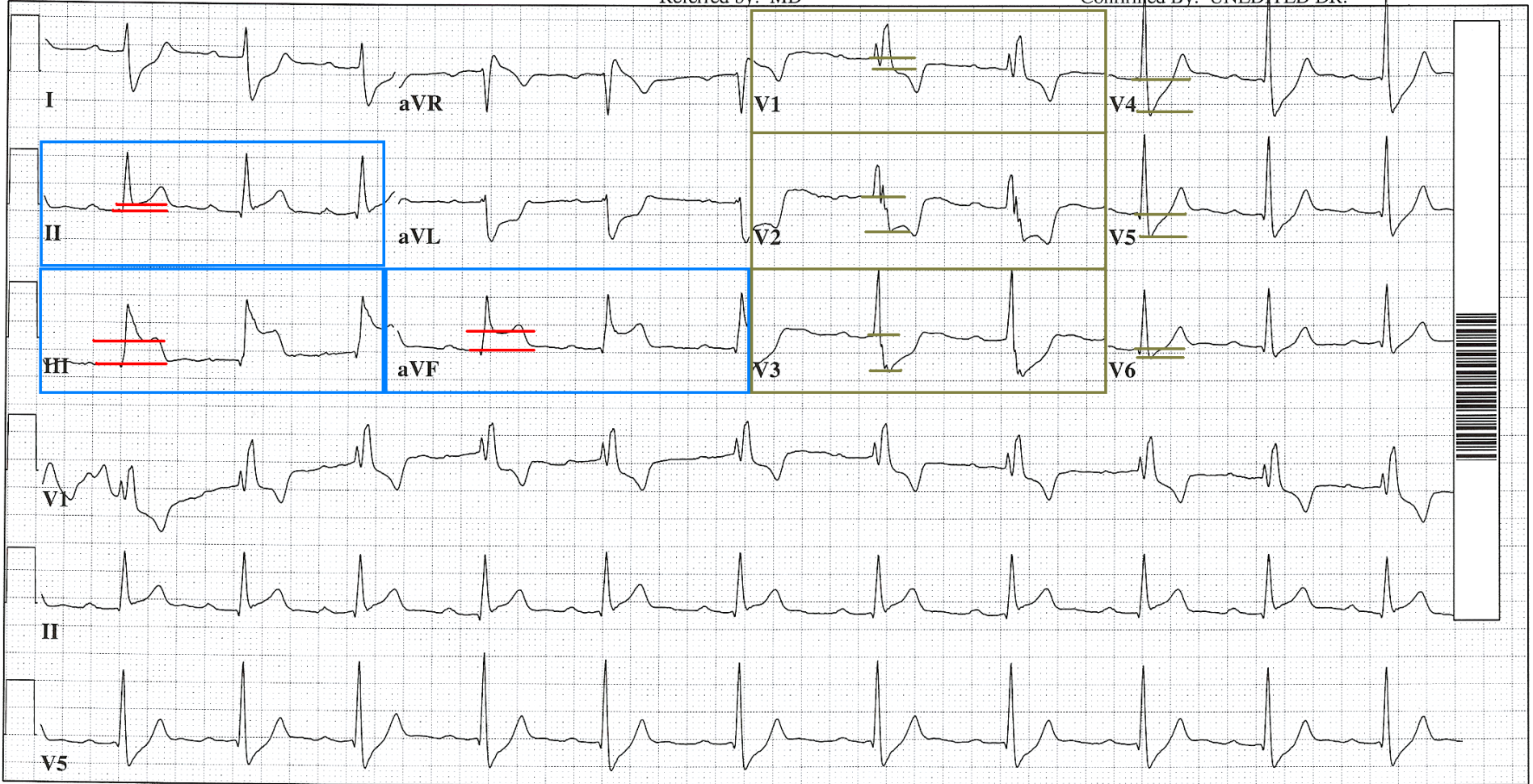
Loc:3 Option:23

Vent. rate 67 BPM
PR interval 258 ms
QRS duration 136 ms
QT/QTc 398/420 ms
P-R-T axes 44 94 82

Sinus rhythm with 1st degree A-V block
Right bundle branch block
ST elevation consider inferior injury or acute infarct
***** ACUTE MI *****
Abnormal ECG

Referred by: MD

Confirmed By: UNEDITED DR.



IF THE QRS COMPLEXES ON THE EKG
ARE OF NORMAL WIDTH (<120 ms) :

STEP 2 - EVALUATE the EKG for ACS

THE EKG MARKERS USED FOR DETERMINING THE PRESENCE OF ACUTE CORONARY SYNDROME
INCLUDE:

- J POINTS
- ST SEGMENTS
- T WAVES

CAREFULLY SCRUTINIZE THESE MARKERS IN EVERY LEAD OF THE 12 LEAD EKG, TO DETERMINE
IF THEY ARE *NORMAL* or *ABNORMAL*.

NORMAL ST - T WAVES

- WHEN QRS WIDTH IS NORMAL (< 120 ms)



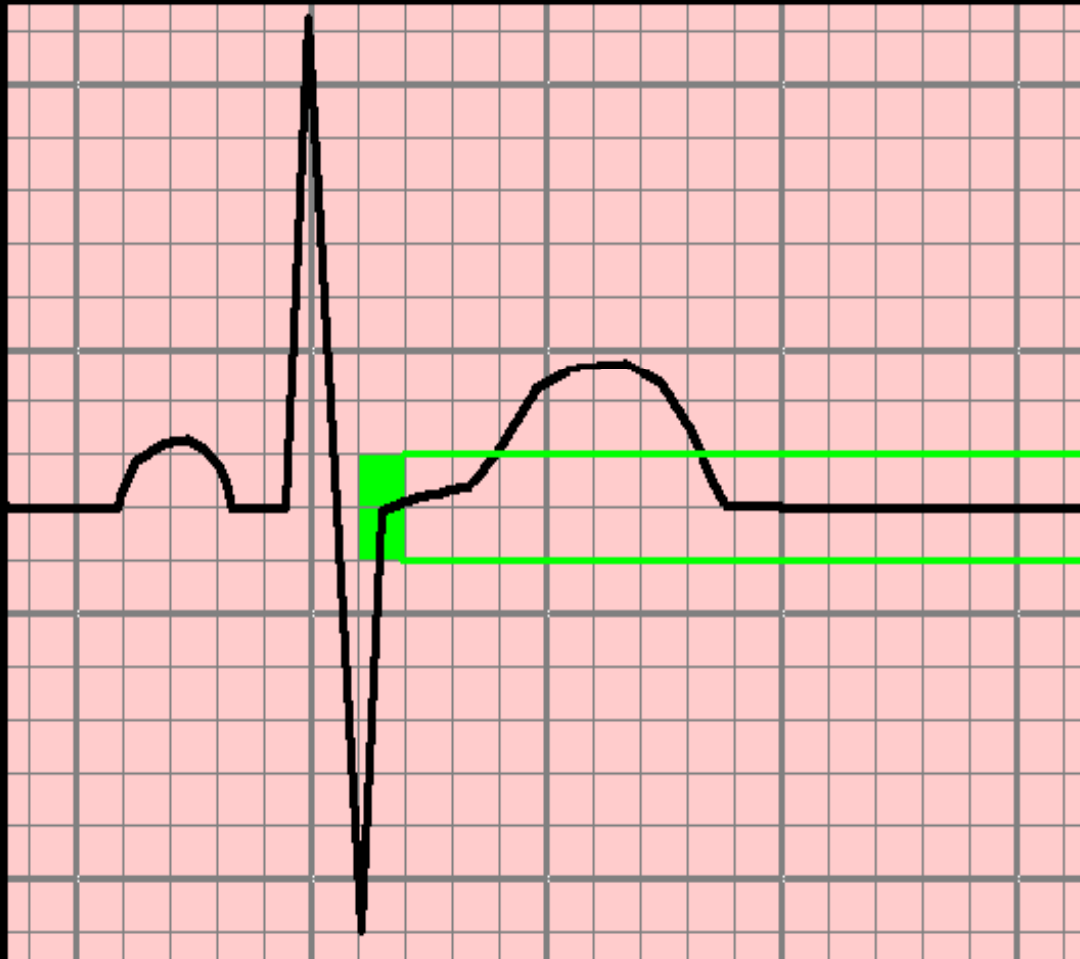
ASSESS:

- J POINT: ISOELECTRIC (or < 1 mm dev.)
- ST SEG: SLIGHT, POSITIVE INCLINATION
- T WAVE: UPRIGHT, POSITIVE



in EVERY LEAD EXCEPT aVR !!

THE J POINT SHOULD BE ..

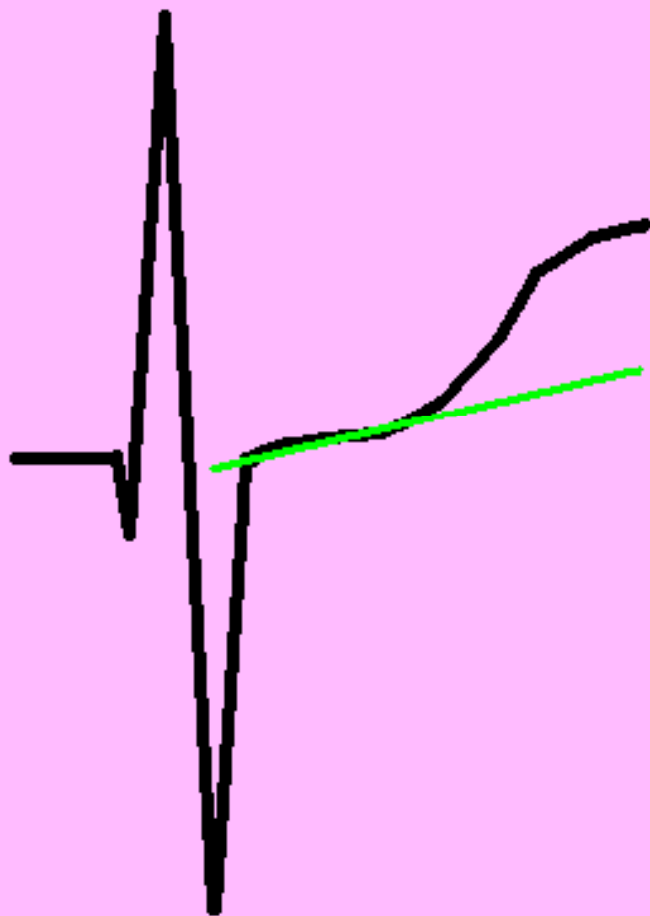


**WITHIN
1 mm
ABOVE**

OR

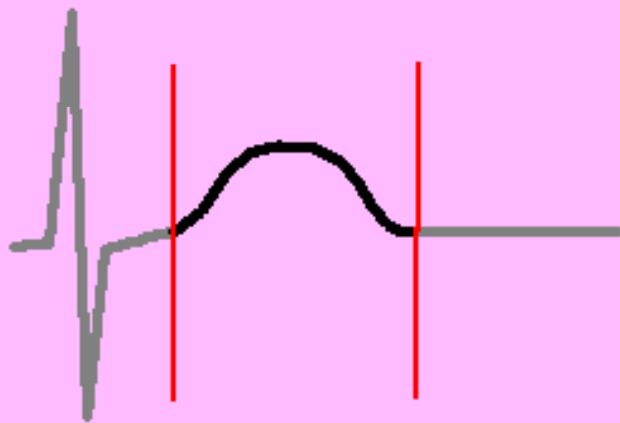
**BELOW
ISO-ELECTRIC
LINE**

THE S-T SEGMENT



**SHOULD HAVE
A "SLIGHT POSITIVE"
INCLINATION**

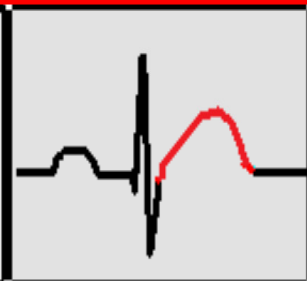
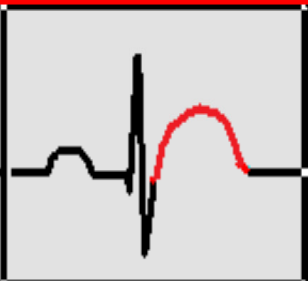
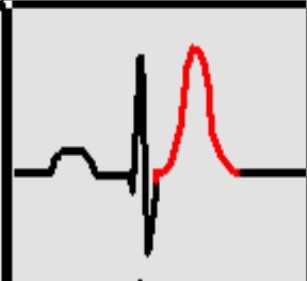
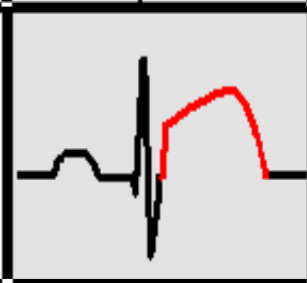
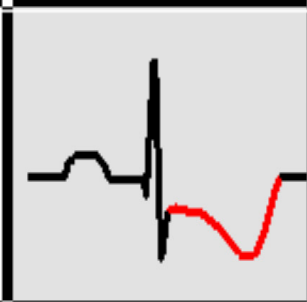
THE T WAVE

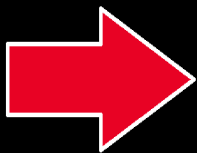


- SHOULD BE A "NICE," ROUNDED, CONVEX SHAPE
- SHOULD BE SYMMETRICAL
- SHOULD BE UPRIGHT IN ALL LEADS, EXCEPT AVR
- MAY BE INVERTED IN LEADS AVL, III, and V1

PATTERNS of ACS & ISCHEMIA

-- J POINT, ST SEGMENT, and T WAVE ABNORMALITIES --

! FLAT or CONVEX J-T APEX SEGMENT			<i>ACUTE MI</i> <i>EARLY PHASE</i>
! HYPER-ACUTE T WAVE			<i>ACUTE MI</i> <i>EARLY PHASE</i>
! S-T SEGMENT ELEVATION at J POINT			<i>ACUTE MI</i>
! DEPRESSED J pt. DOWNSLOPING ST and INVERTED T			- ACUTE (NON-Q WAVE) MI - ACUTE MI - (RECIPROCAL CHANGES) - ISCHEMIA



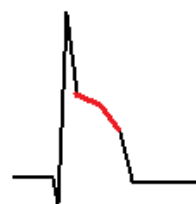
ST SEGMENT ELEVATION:

S-T SEGMENTS ELEVATE WITHIN SECONDS OF CORONARY ARTERY OCCLUSION:



IN THIS CASE, a normal response to balloon occlusion of the RIGHT CORONARY ARTERY during PTCA in the CARDIAC CATH LAB

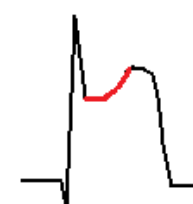
**3 COMMON PATTERNS of
ST SEGMENT ELEVATION
From ACUTE MI:**



**DOWNSLOPING
S-T SEGMENT**

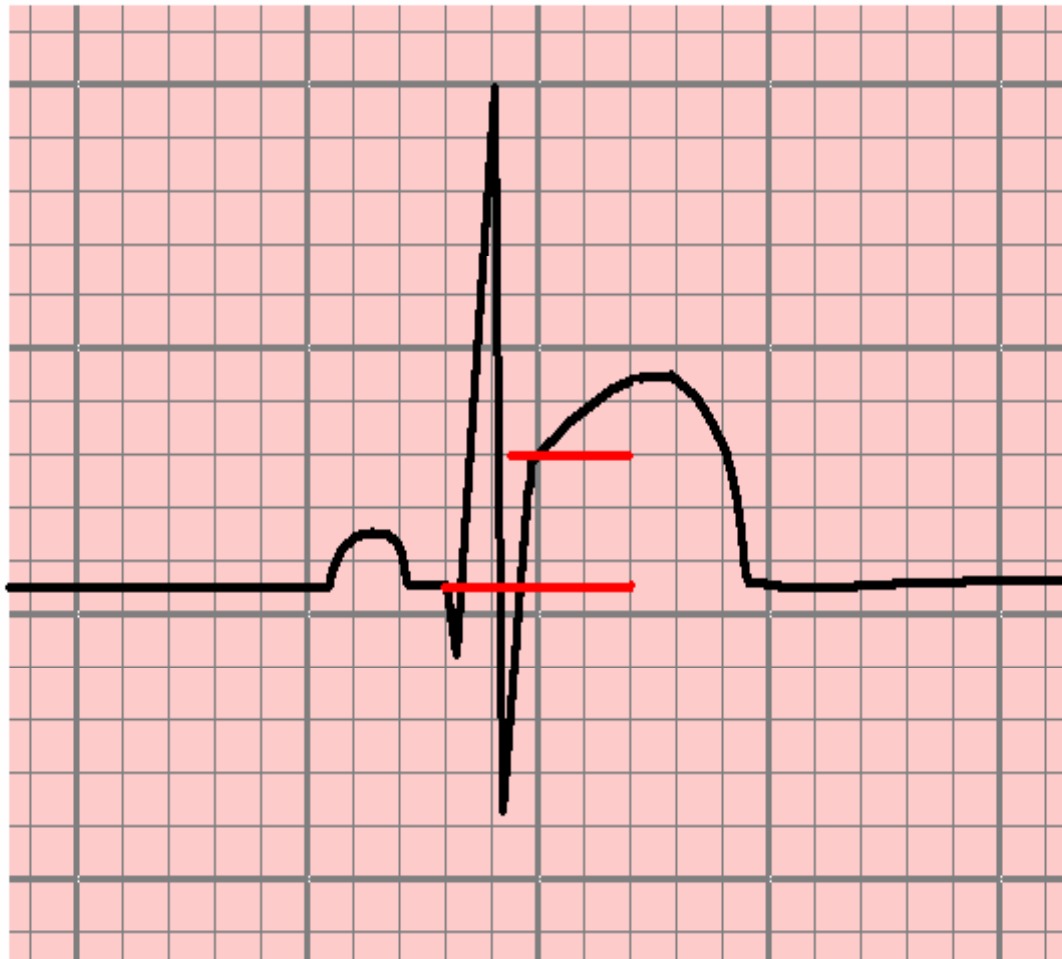


**FLAT
S-T SEGMENT**



**UPSLOPING
S-T SEGMENT**

S-T SEGMENT ELEVATION in ACUTE M.I.



- **GREATER THAN 1 mm**
- **IN TWO OR MORE CONSECUTIVE LEADS**

INFARCTION

SUDDEN DEATH
from ACUTE MI
may occur at ANY
TIME during the MI



Although CARDIAC CELLS can survive
up to 12 HOURS without perfusion,
TIME is of ESSENCE

ACUTE MI

COMPLICATIONS TO ANTICIPATE FOR ALL MI PATIENTS :



LETHAL DYSRHYTHMIAS



CARDIAC ARREST



**FAILURE OF STRUCTURE(S)
SERVED BY THE BLOCKED ARTERY**

YOU ARE

THE
EMERGENCY ROOM
PHYSICIAN



CASE STUDY 1 - STEMI

CHIEF COMPLAINT and SIGNIFICANT HISTORY:

72 y/o male, c/o CHEST "HEAVINESS," started 20 minutes before calling 911. Pain is "8" on 1-10 scale, also c/o mild shortness of breath. Has had same pain "intermittently" x 2 weeks.

RISK FACTOR PROFILE:

- 💣 FAMILY HISTORY - father died of MI at age 77
- 💣 FORMER CIGARETTE SMOKER - smoked for 30 year - quit 27 years ago
- 💣 DIABETES - oral meds and diet controlled
- 💣 HIGH CHOLESTEROL - controlled with STATIN meds
- 💣 AGE: OVER 65

PHYSICAL EXAM: Patient calm, alert, oriented X 4, skin cool, dry, pale.
No JVD, Lungs clear bilaterally. Heart sounds normal S1, S2. No peripheral edema.

VITAL SIGNS: BP: 100/64, P: 75, R: 20, SAO2: 94%

LABS: FIRST TROPONIN: 6.4

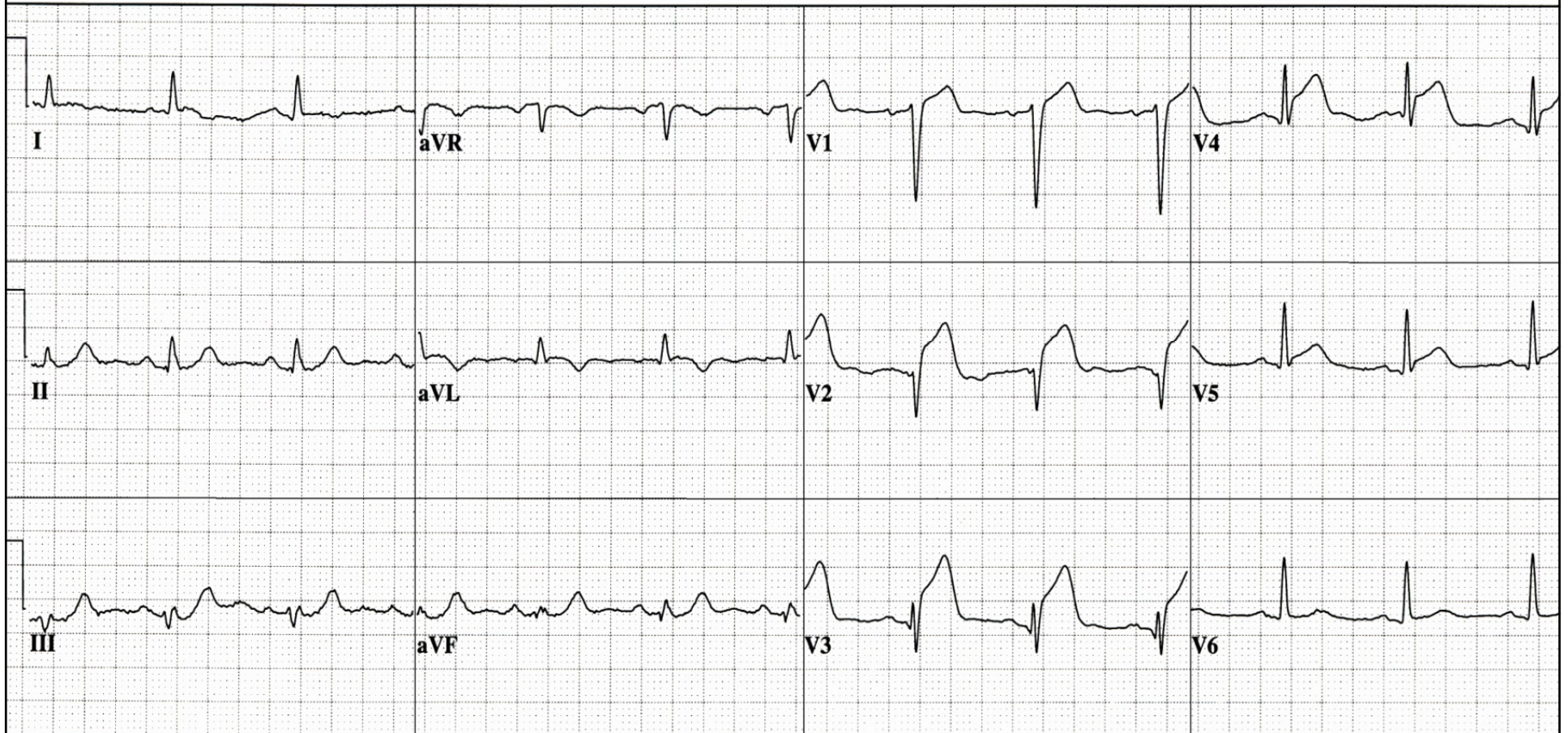
72 yr
Male Caucasian
Loc:3 Option:23

Vent. rate	75	BPM
PR interval	162	ms
QRS duration	98	ms
QT/QTc	382/426	ms
P-R-T axes	72 13	83



EVALUATE EKG for indicators of ACS:

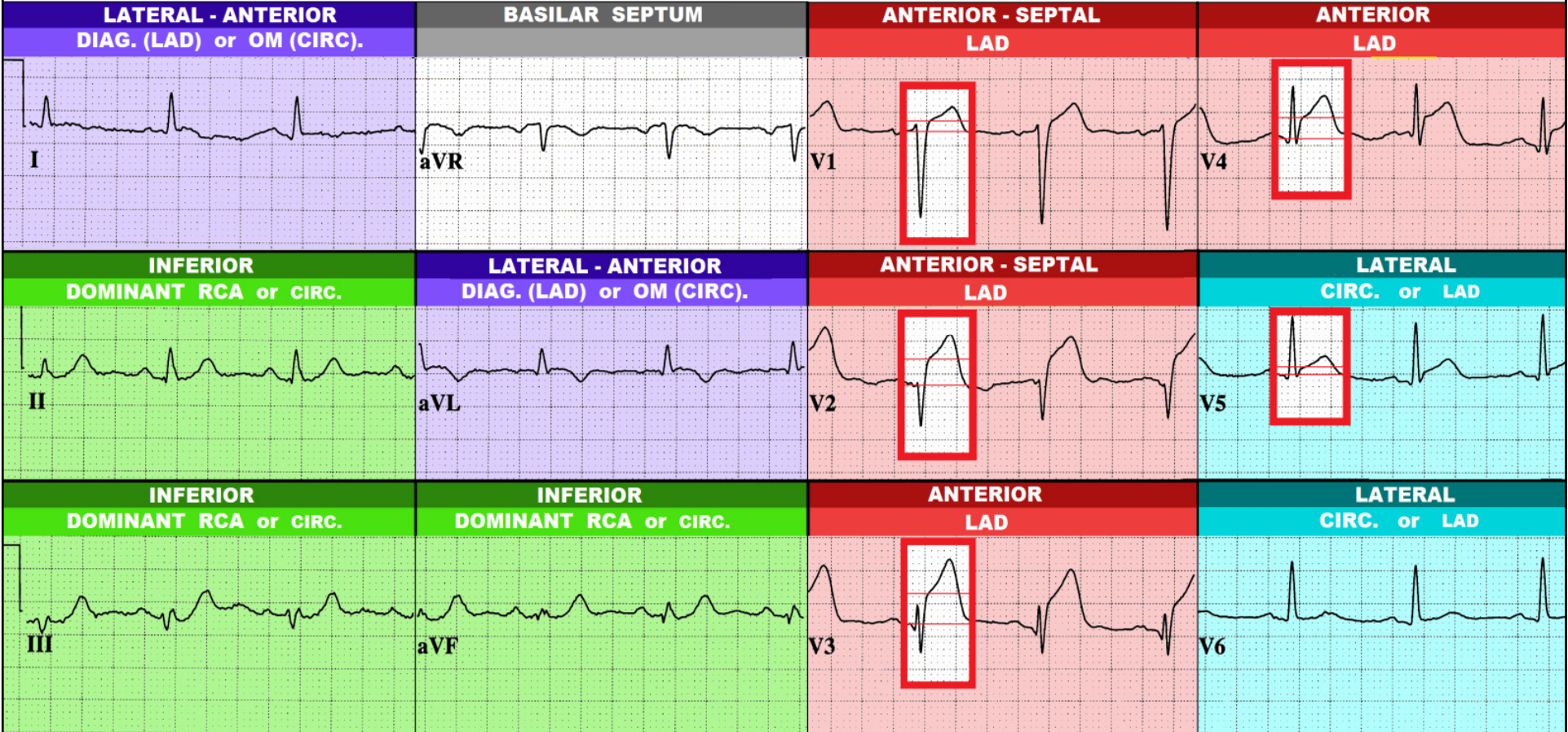
- ST SEGMENT ELEVATION / DEPRESSION
- HYPERACUTE T WAVES
- CONVEX ST SEGMENTS
- OTHER ST SEGMENT / T WAVE ABNORMALITIES



72 yr
Male
Caucasian
Vent. rate 75 BPM
PR interval 162 ms
QRS duration 98 ms
QT/QTc 382/426 ms
P-R-T axes 72 13 83

Normal sinus rhythm
Anteroseptal infarct, possibly acute
***** ACUTE MI *****
Abnormal ECG

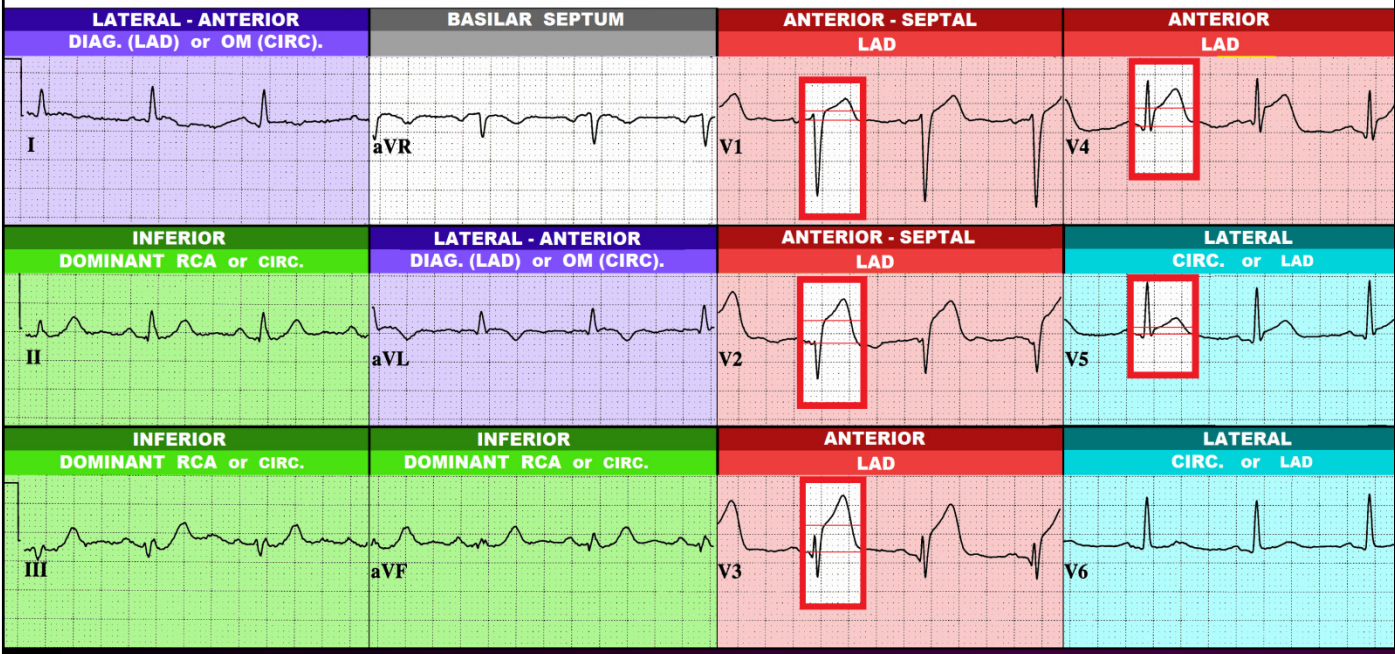
ST SEGMENT ELEVATION



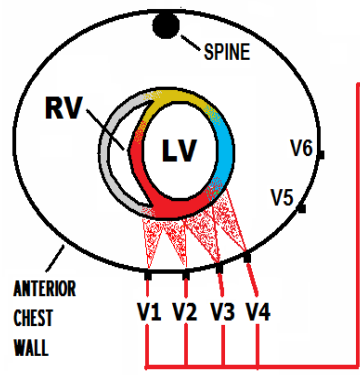
72 yr
 Male Caucasian
 Vent. rate 75 BPM
 PR interval 162 ms
 QRS duration 98 ms
 QT/QTc 382/426 ms
 P-R-T axes 72 13 83

Normal sinus rhythm
 Anteroseptal infarct, possibly acute
 ***** ACUTE MI *****
 Abnormal ECG

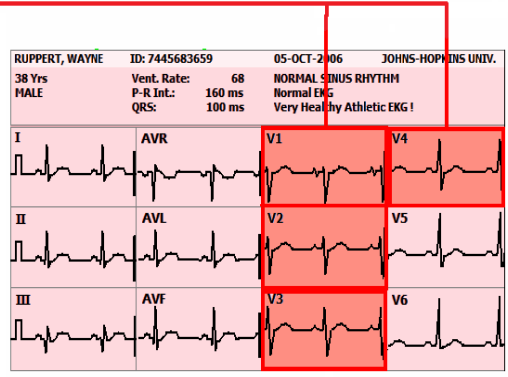
ST SEGMENT ELEVATION



**V1 - V4 VIEW THE ANTERIOR-SEPTAL WALL
 of the LEFT VENTRICLE**



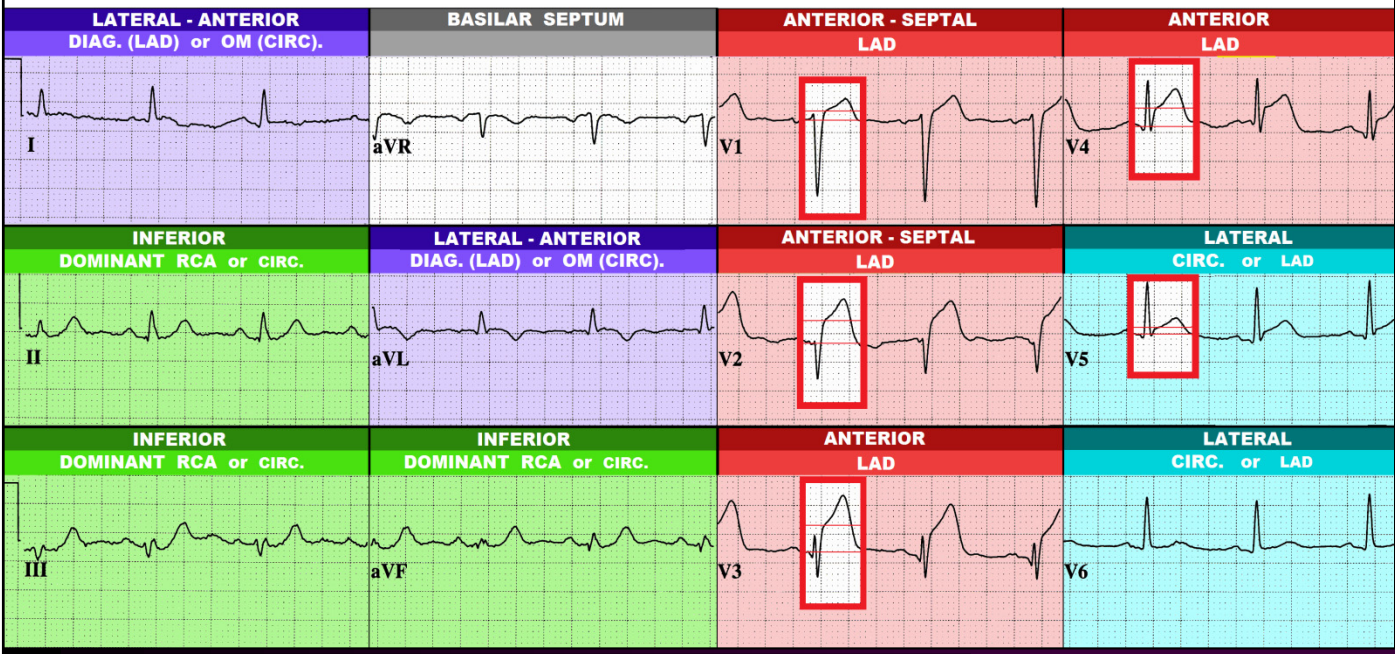
**V1, V2 - ANTERIOR / SEPTAL
 V3, V4 - ANTERIOR**



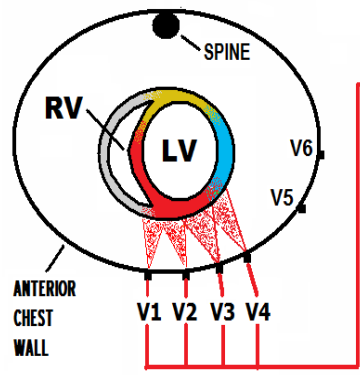
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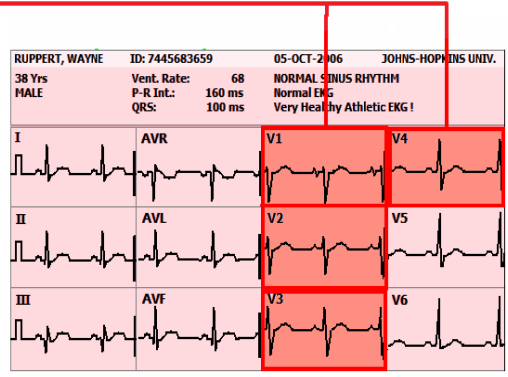
ST SEGMENT ELEVATION



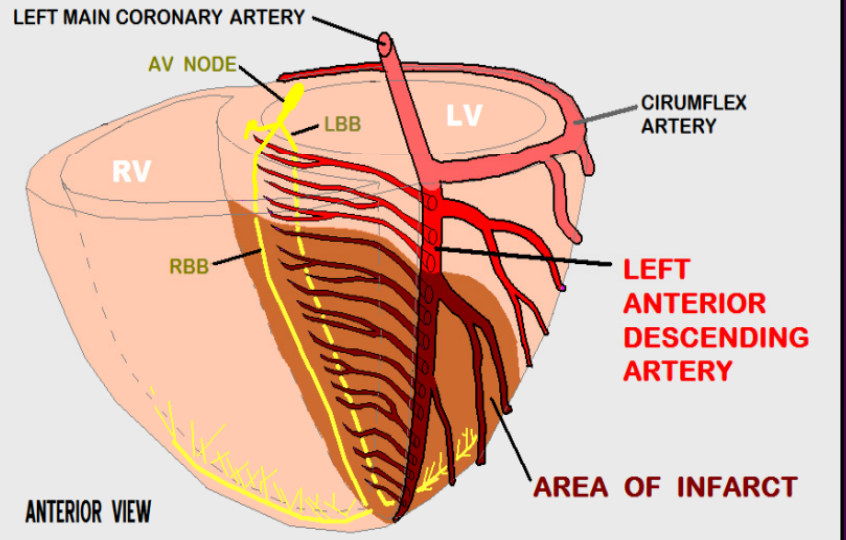
V1 - V4 VIEW THE ANTERIOR-SEPTAL WALL of the LEFT VENTRICLE



V1, V2 - ANTERIOR / SEPTAL
 V3, V4 - ANTERIOR

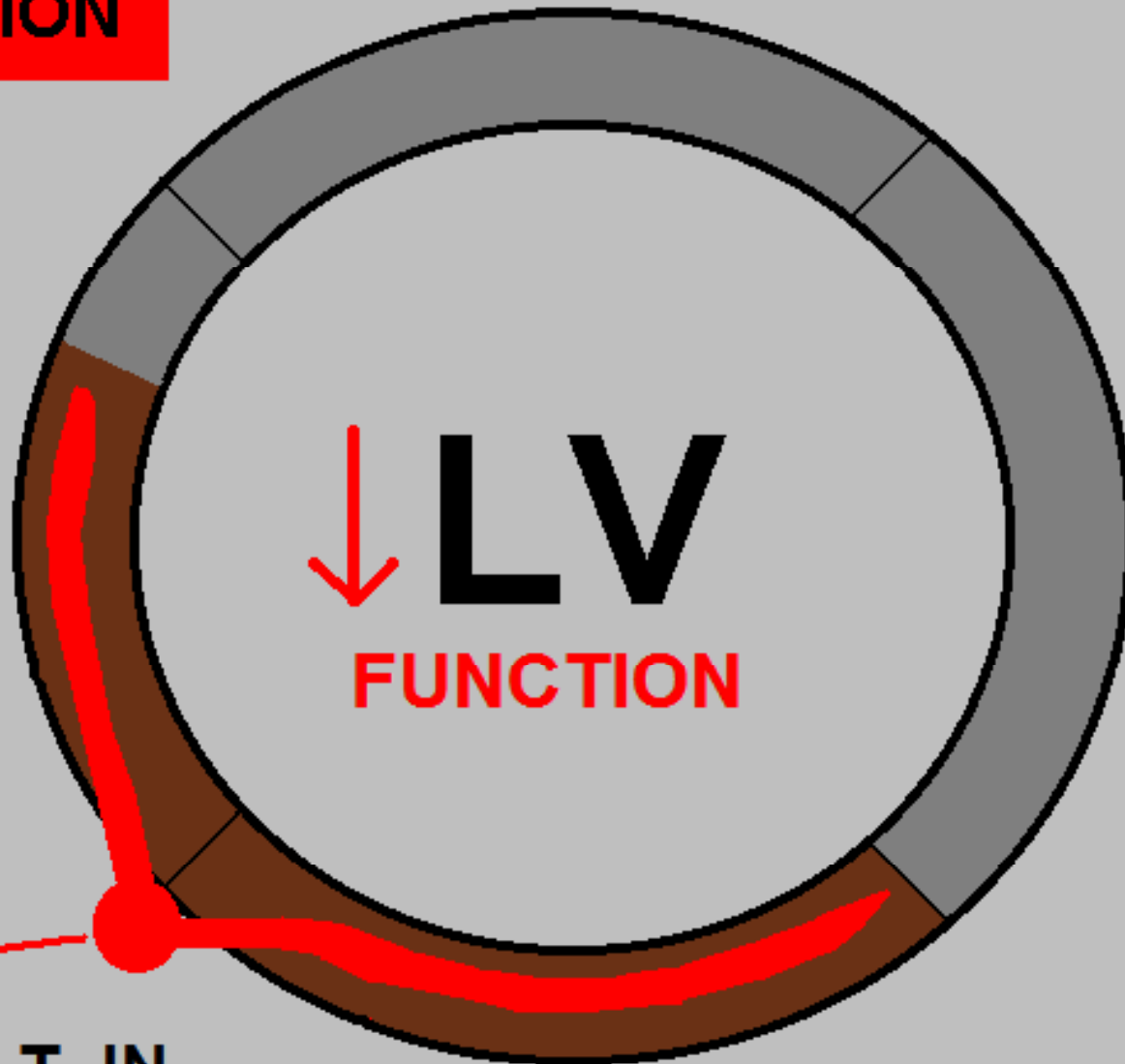


OCCCLUSION of MID - LEFT ANTERIOR DESCENDING ARTERY



**LAD
DISTRIBUTION**

35 - 45 % of LV MUSCLE MASS



**A
BLOCKAGE
OF THE
LAD**

**CAN RESULT IN
LV PUMP FAILURE --**



CARDIOGENIC SHOCK



PULMONARY EDEMA



Do not remove unit from overwrap and ready to use.
Do not use if overwrap has been previously opened or
damaged. This overwrap is a plastic and oxygen barrier.
The inner bag maintains the sterility of the product.

400 mg Dopamine

(1600 mcg/mL)
Dopamine Hydrochloride
and 5% Dextrose Injection USP

250 mL

Each 100 mL contains 160 mg Dopamine Hydrochloride,
USP, 5 g Dextrose Hydrated, USP, 5 mEq/L sodium chloride,
added as a stabilizer. pH adjusted with hydrochloric acid,
pH 3.5 (2.5 to 4.5). Osmolality 269 mOsm/L. Sterile,
sterile, nonpyrogenic, single dose container. Drug substance
should not be made to this solution. Dosage: Intravenously
as directed by a physician. See directions. Caution: Check
for minute leaks by squeezing the inner bag firmly. If
leaks are found, discard solution. If a leak is found,
the inner bag may be impaired. Do not use if the inner bag
is in series connections. Do not administer simultaneously
with blood. Do not use unless solution is clear
and is not darker than slightly yellow. Rx Only. Recommended storage:
Room temperature (25°C). Avoid excessive heat. Protect from
freezing. See insert.

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call 1-800-328-2265

7-7-4-102
99%

20042
NDC 0208-102-02



Do not remove unit from overwrap and ready to use.
Do not use if overwrap has been previously opened or
damaged. This overwrap is a plastic and oxygen barrier.
The inner bag maintains the sterility of the product.

500 mg Total DOBUtamine

Hydrochloride in
5% Dextrose Injection
(2000 mcg/mL)

250 mL

Each 100 mL contains 500 mg Dobutamine Hydrochloride, USP
(2000 mcg/mL), 5 g Dextrose Hydrated, USP, 5 mEq/L sodium
chloride, added as a stabilizer. pH adjusted with hydrochloric acid,
pH 3.5 (2.5 to 4.5). Osmolality 269 mOsm/L. Sterile,
sterile, nonpyrogenic, single dose container. Drug substance
should not be made to this solution. Dosage: Intravenously
as directed by a physician. See directions. Caution: Check
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Exp. Sep 23

LEFT ANTERIOR DESCENDING ARTERY (LAD)

- ANTERIOR WALL OF LEFT VENTRICLE

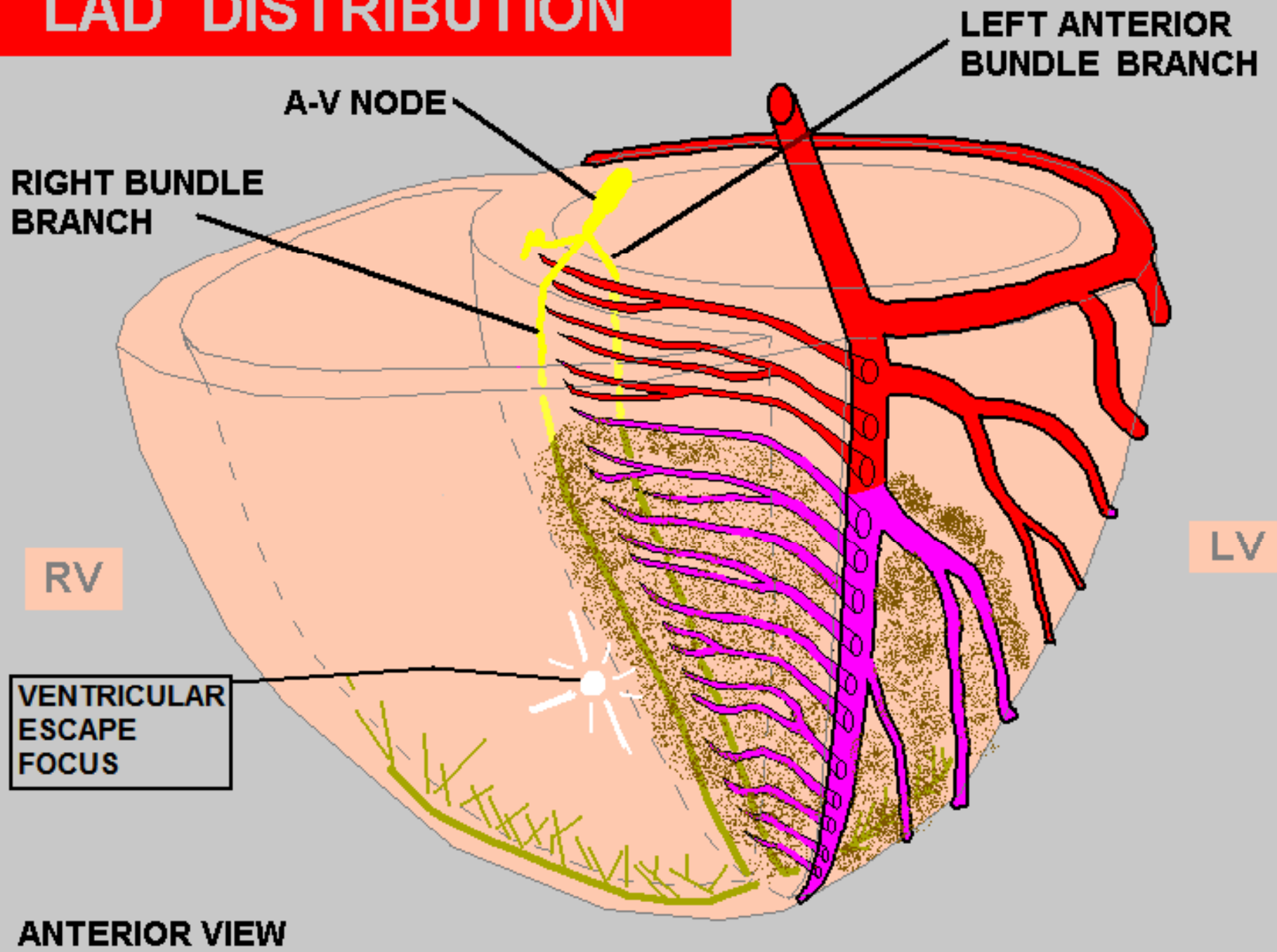
 **35 - 45 % OF LEFT VENTRICLE MUSCLE MASS**

- SEPTUM, ANTERIOR 2/3

 **BUNDLE BRANCHES**

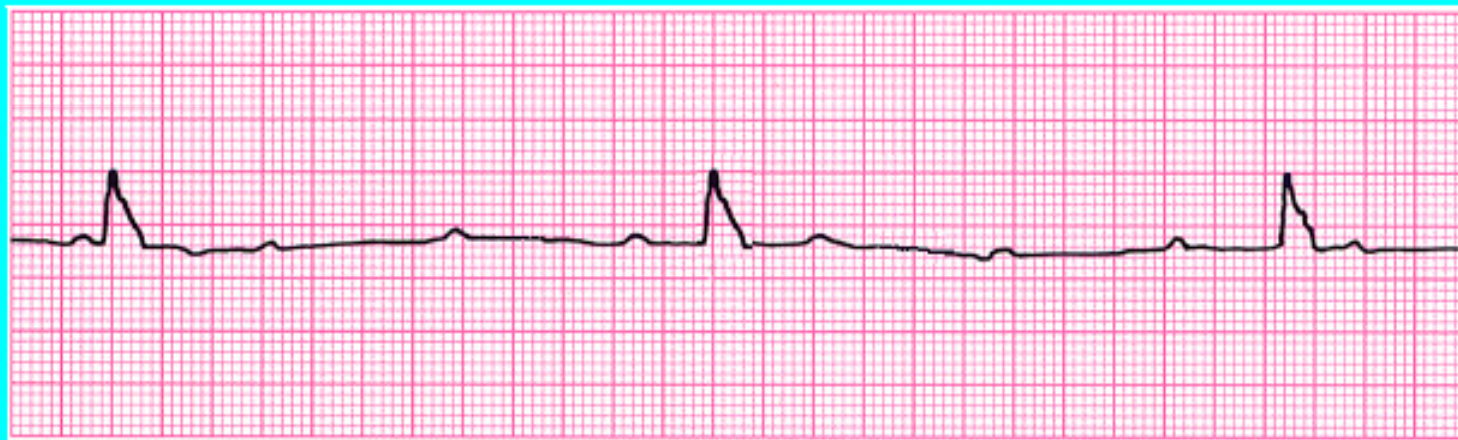
- ANTERIOR-MEDIAL PAPILLARY MUSCLE

LAD DISTRIBUTION



3rd DEGREE HB with IDIOVENTRICULAR ESCAPE RHYTHM

LOOKS LIKE THIS:



**AND IT PROBABLY WILL NOT RESPOND
TO ATROPINE -- BEST TREATMENT IS
TRANSCUTANEOUS PACEMAKER**

COMPLICATIONS of ANTERIOR WALL MI :



CRITICAL INTERVENTIONS



LV
PUMP
FAILURE

- **HYPOTENSION /
CARDIOGENIC SHOCK**
- **PULMONARY EDEMA**

- **INOTROPES**
- **I.A.B.P.**

DAMAGE
TO
BUNDLE
BRANCHES

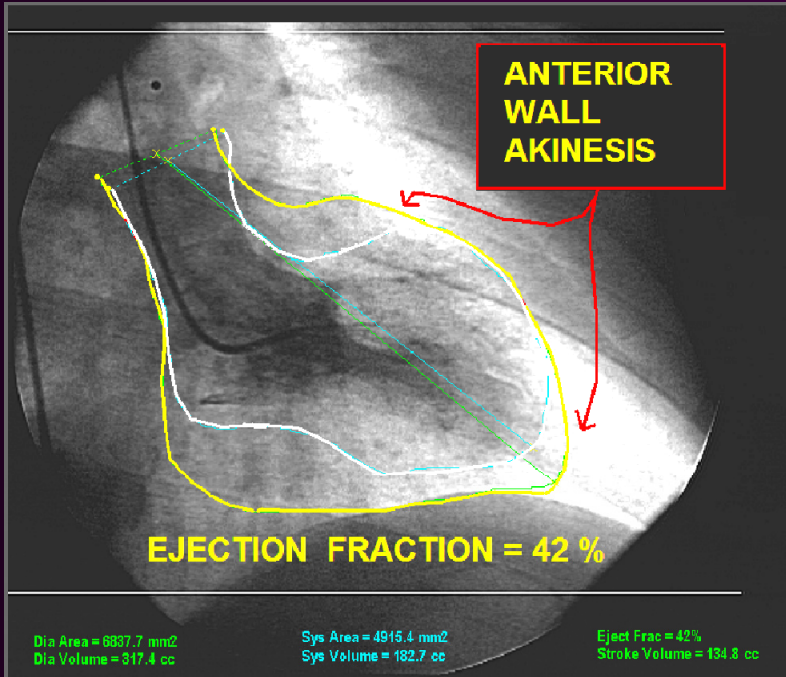
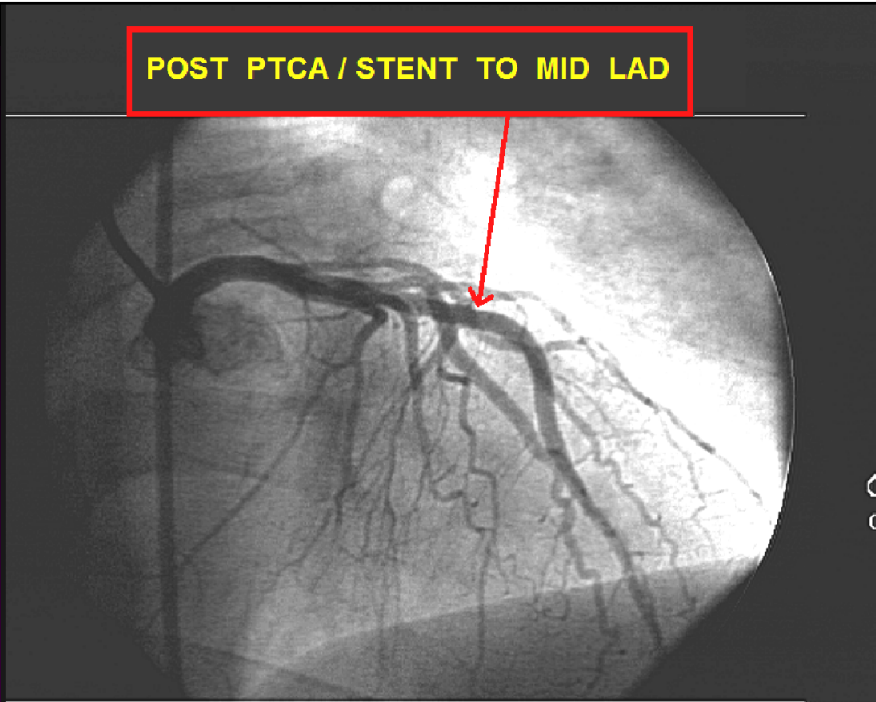
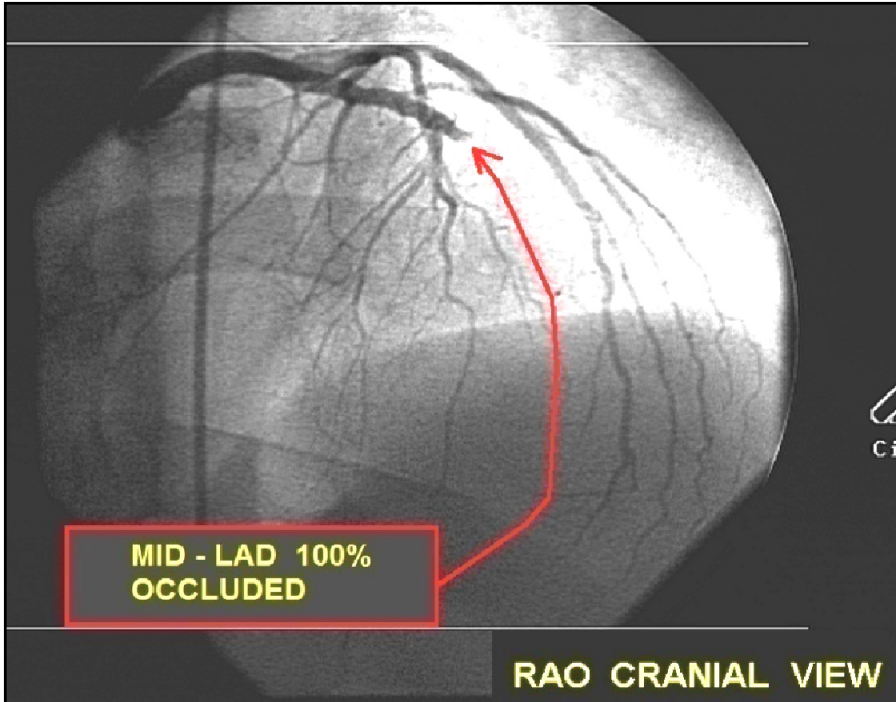
- **BUNDLE BRANCH BLOCKS**
- **3^o HEART BLOCK w/
IDIOVENTRICULAR ESCAPE
RHYTHM**

- **MONITOR
with
DEFIB /
PACING
PADS**

CARDIAC
ARREST

- **VENTRICULAR TACHYCARDIA**
- **VENTRICULAR FIBRILLATION**

- **DEFIB PADS**
- **ANTI-
ARRHYTHMIC
MEDS**



CASE STUDY 7 - STEMI

CHIEF COMPLAINT and SIGNIFICANT HISTORY:

46 yr. old MALE arrives in ER, C/O SUDDEN ONSET OF CHEST PRESSURE 45 MINUTES AGO. PAIN IS CONSTANT, PRESSURE-LIKE, AND NOT EFFECTED BY POSITION, MOVEMENT or DEEP INSPIRATION. ALSO C/O D.I.B.

RISK FACTOR PROFILE:

-  CURRENT CIGARTE SMOKER x 18 YEARS
-  HYPERTENSION
-  HIGH LDL CHOLESTEROL

PHYSICAL EXAM: Patient is alert & oriented x 4, skin warm, dry, color normal. Non-anxious
Lungs clear, normal S1, S2. No JVD, No ankle edema.

VITAL SIGNS: BP: 136/88 P: 88 R: 20 SAO2: 100% on 4 LPM O2

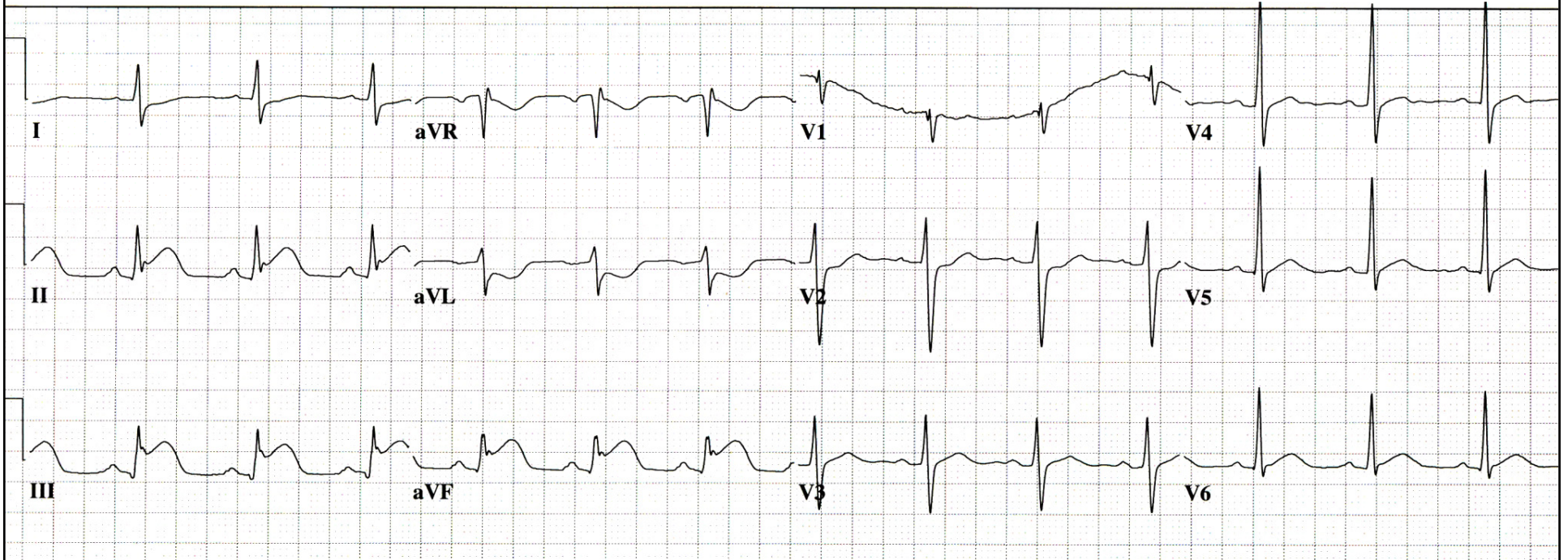
LABS: TROPONIN: < .04

46 yr
Male Caucasian
Loc:3 Option:23

Vent. rate	82	BPM
PR interval	168	ms
QRS duration	96	ms
QT/QTc	384/448	ms
P-R-T axes	76 81	88

EVALUATE EKG for indicators of ACS:

- ST SEGMENT ELEVATION / DEPRESSION
- HYPERACUTE T WAVES
- CONVEX ST SEGMENTS
- OTHER ST SEGMENT / T WAVE ABNORMALITIES



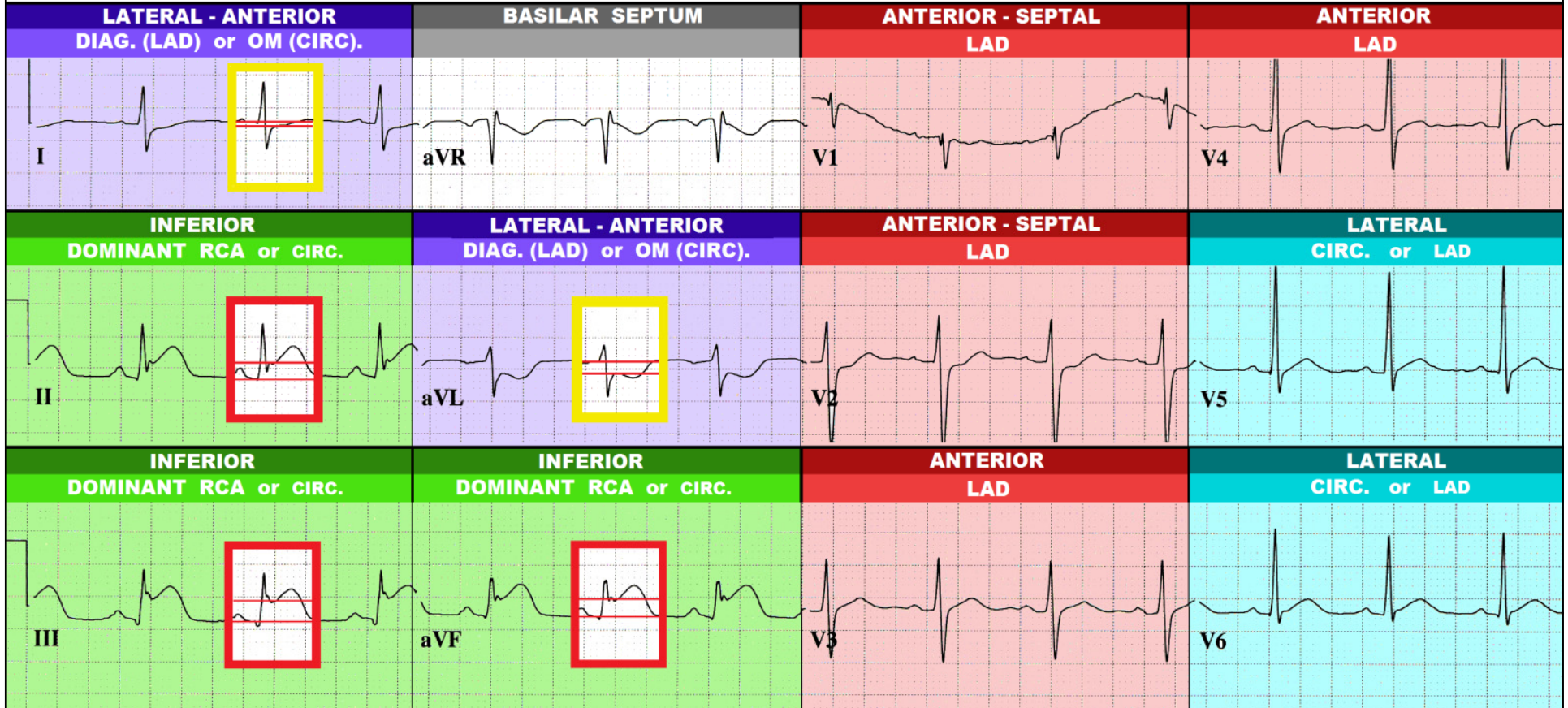
46 yr
Male Caucasian

Vent. rate 82 BPM
PR interval 168 ms
QRS duration 96 ms
QT/QTc 384/448 ms
P-R-T axes 76 81 88

Normal sinus rhythm
ST elevation consider inferior injury or acute infarct
***** ACUTE MI *****
Abnormal ECG

ST SEGMENT ELEVATION

ST SEGMENT DEPRESSION

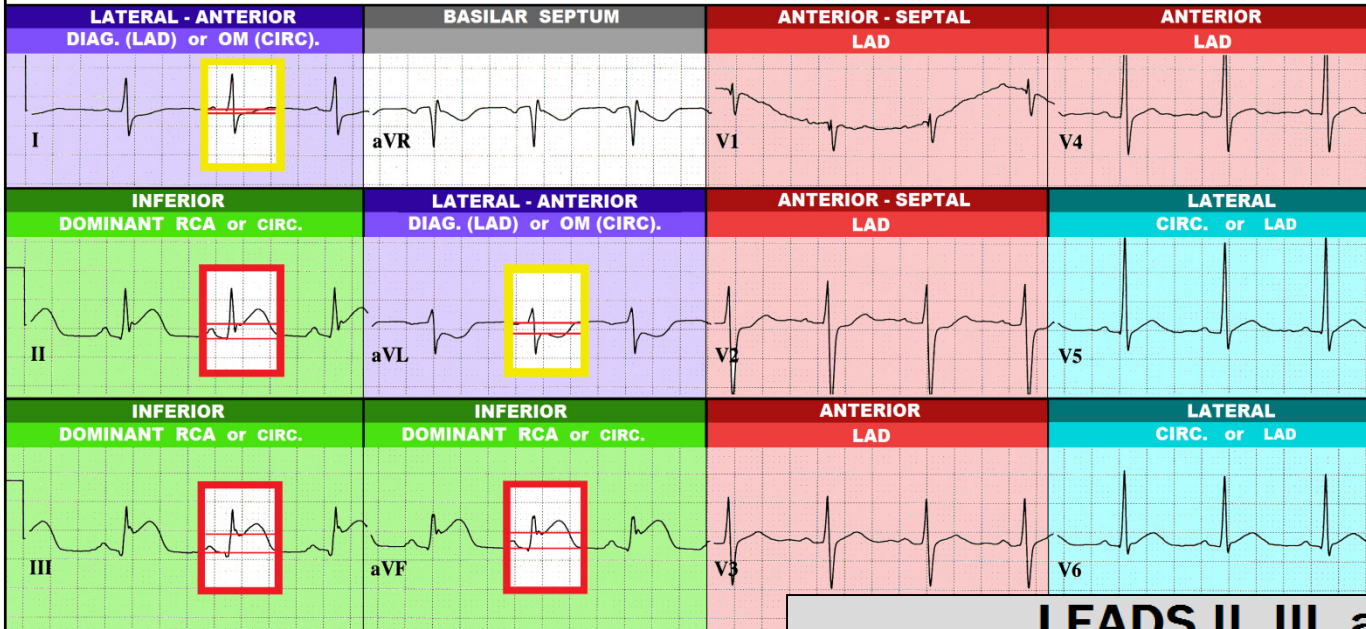


46 yr Male Caucasian
 Vent. rate 82 BPM
 PR interval 168 ms
 QRS duration 96 ms
 QT/QTc 384/448 ms
 P-R-T axes 76 81 88

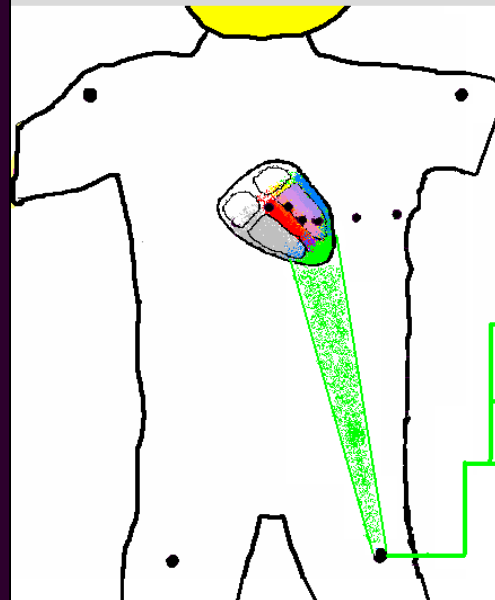
Normal sinus rhythm
 ST elevation consider inferior injury or acute infarct
 ***** ACUTE MI *****
 Abnormal ECG

ST SEGMENT ELEVATION

ST SEGMENT DEPRESSION



**LEADS II, III, and aVF VIEW
 INFERIOR WALL of the LEFT VENTRICLE**

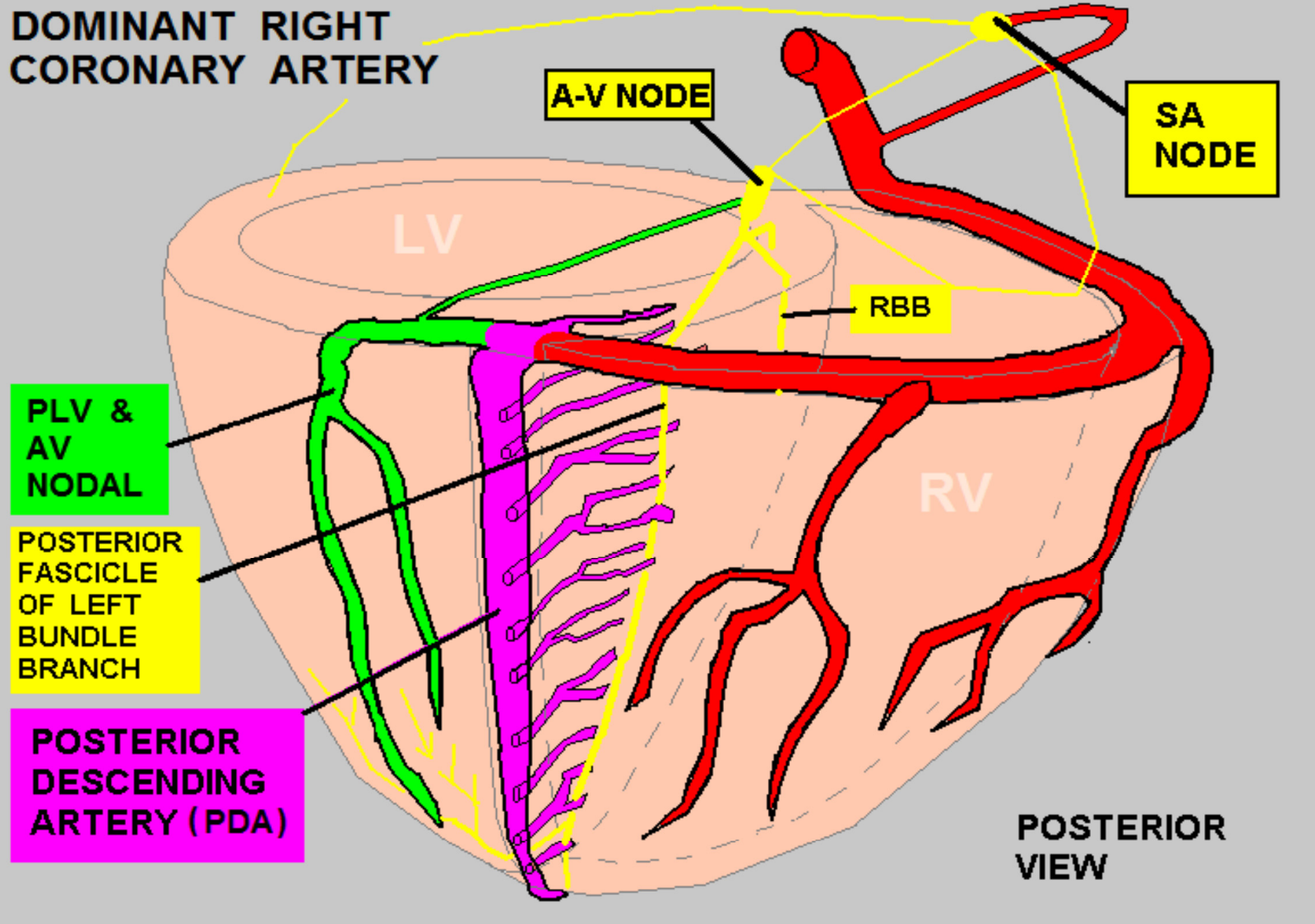


RUPPERT, WAYNE		ID: 7445683659	05-OCT-2006	JOHNS-HOPKINS UNIV.
38 Yrs	MALE	Vent. Rate: 68	NORMAL SINUS RHYTHM	
		P-R Int.: 160 ms	Normal EKG	
		QRS: 100 ms	Very Healthy Athletic EKG!	

I	AVR	V1	V4
II	AVL	V2	V5
III	AVF	V3	V6

**FED by the RCA (75 - 80 % pop)
 or the CIRCUMFLEX (10 - 15 %)**

DOMINANT RIGHT CORONARY ARTERY



75 - 80% of the POPULATION HAVE THIS CORONARY ARTERY ANATOMY



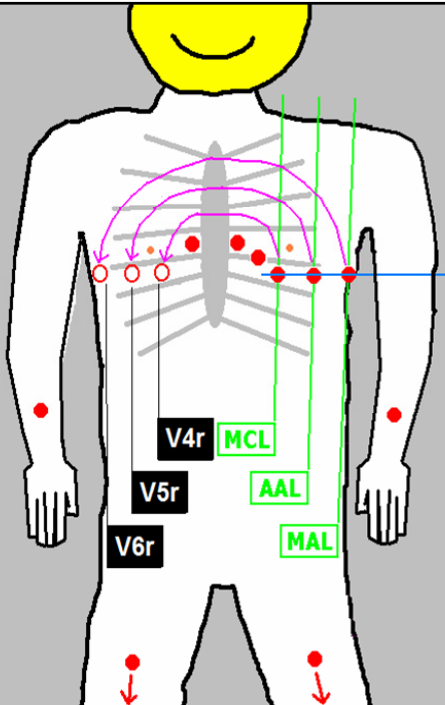
HELPFUL HINT... *MEMORIZE THIS!*



RIGHT CORONARY ARTERY (RCA)

RIGHT DOMINANT
SYSTEMS

- ▶ RIGHT ATRIUM
- ▶ SINUS NODE (55% of the population)
- ▶ RIGHT VENTRICLE - 100 % of muscle mass
- ▶ LEFT VENTRICLE: 15 - 25 % of muscle mass
 - INFERIOR WALL
 - approx. 1/2 of POSTERIOR WALL
- ▶ AV NODE

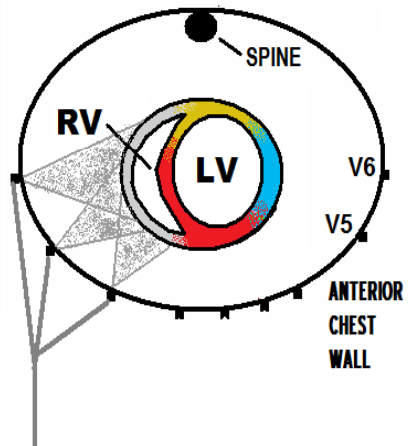


To do a
RIGHT - SIDED EKG . .

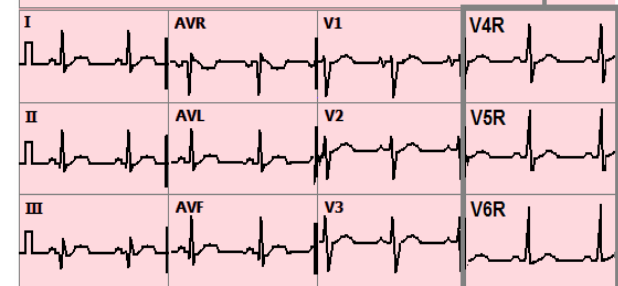
MOVE leads
V4, V5, and V6

to the corresponding
placement on the
RIGHT SIDE of patient's
chest . . .

V4R - V6R VIEW THE RIGHT VENTRICLE



RUPPERT, WAYNE	ID: 7445683659	05-OCT-2006	JOHNS-HOPKINS UNIV.
38 Yrs	Vent. Rate: 68	NORMAL SINUS RHYTHM	
MALE	P-R Int.: 160 ms	Normal EKG	
	QRS: 100 ms	Very Healthy Athletic EKG!	



ID:

46 yo
Male Caucasian
Room: Opt:

Vent. rate 87 bpm
PR interval 176 ms
QRS duration 94 ms
QT/QTc 330/397 ms
P-R-T axes 79 81 102

Normal sinus rhythm
~~Anterolateral infarct, possibly acute~~
Inferior injury pattern
***** Acute MI *****
Abnormal ECG

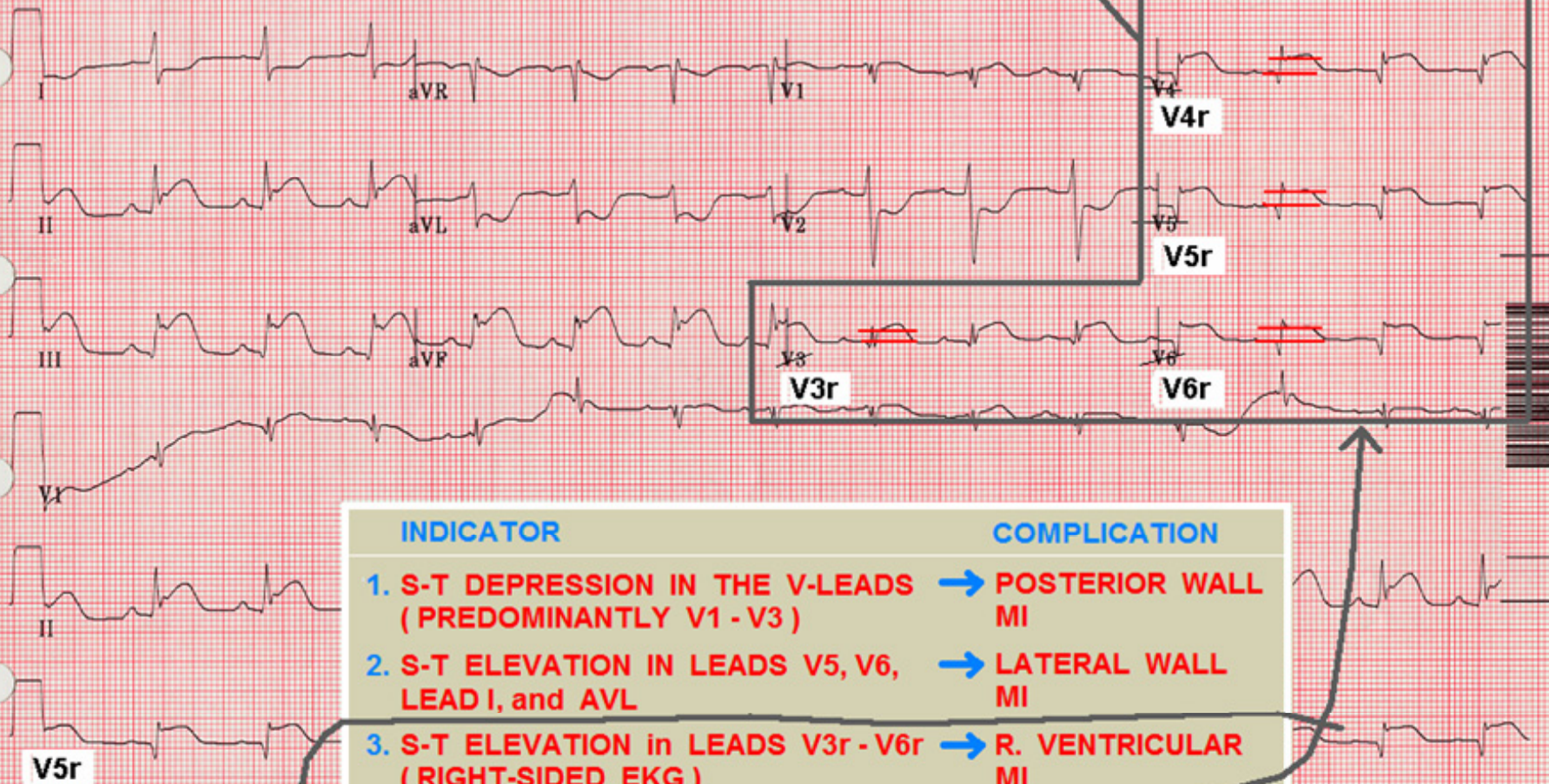
Right Ventricular Infarct

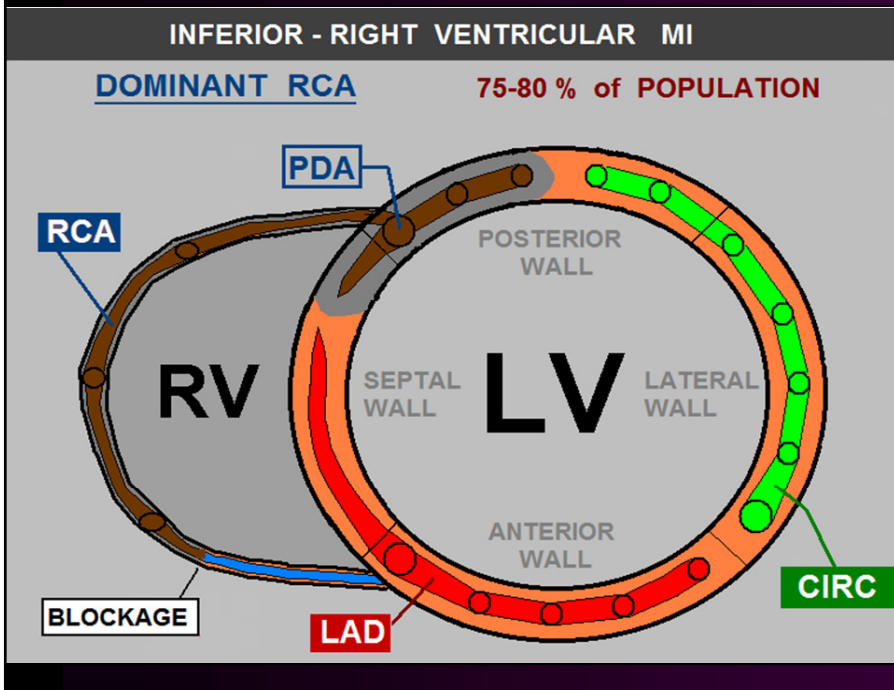
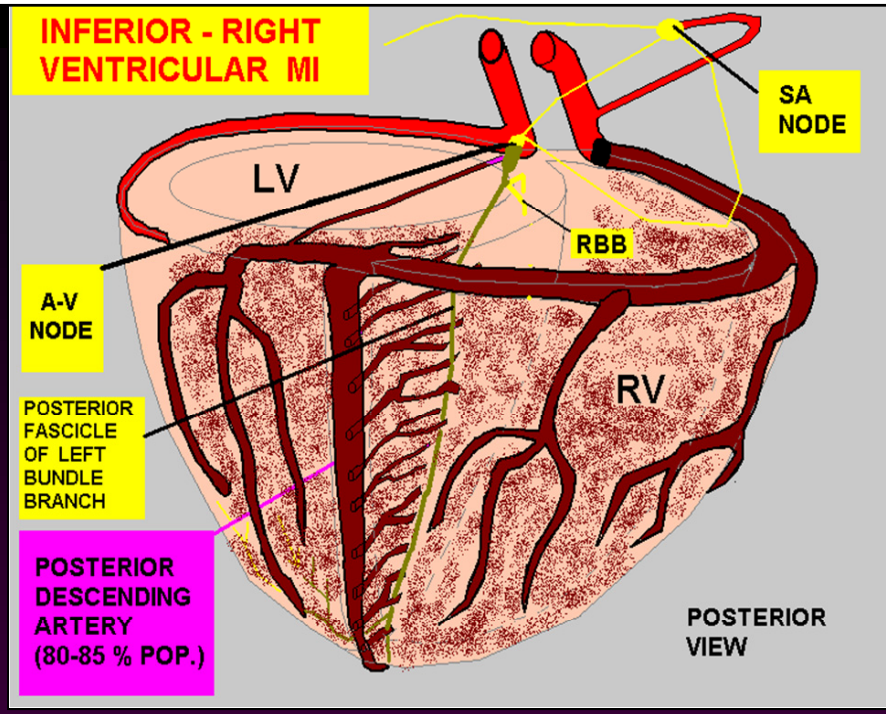
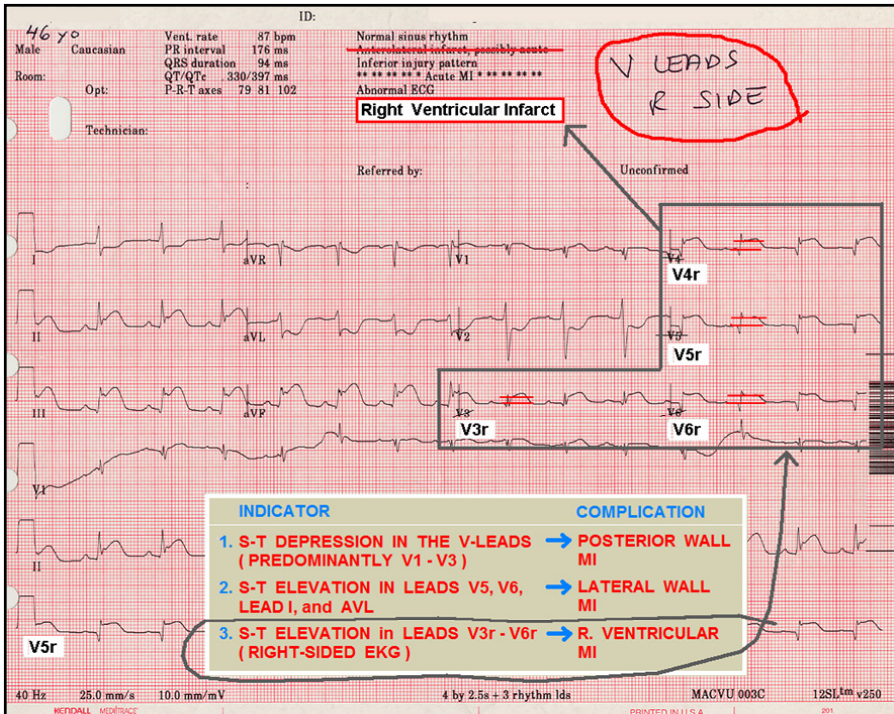
V LEADS
R SIDE

Technician:

Referred by:

Unconfirmed





***RIGHT
VENTRICULAR***

MI =

***NO NITRATE or
BETA BLOCKERS !!***

ACUTE MI PATIENT

INITIATE CARDIAC ALERT !



ALL PATIENTS

***CATH LAB
STAT !!***

????

