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STAT 12 Lead ECG Workshop

The T Wave SHOULD NOT be:

- Inverted in _____ **CONTIGUOUS LEADS**
- _____ (**“Pointy” tipped**)
- _____ (**half above and half below isoelectric line**)

ECG Indicators of NORMAL myocardial perfusion include:

- J Point isoelectric, or within _____ of the ISOELECTRIC LINE
- ST Segment has a slight _____ inclination where ST Segment and T Wave merge, the shape is _____ (bowed downward).
- The T Wave is _____ (in all leads except for AVR), is not taller than _____, and is _____ (NOT "pointy").

P-R Interval

- The P-R Interval should be between _____ - _____ **ms**, (which is 3 – 5 little squares).



QRS Duration (width):

- The Normal QRS should be NO WIDER than ms (3 little squares).



QRS Duration (width):

- If the QRS is WIDER than 120ms, it indicates the VENTRICLES are _____.
- If the Ventricles are DEPOLARIZING ABNORMALLY, it causes them to _____.

_____.

_____.

QRS Duration (width):

- When the VENTRICLES REPOLARIZE ABNORMALLY due to the QRS being TOO WIDE, it often causes _____:

- _____
 - _____
 - _____

- These changes are known as Secondary Repolarization Abnormalities.

Leads V1 & V2 on 12 Lead ECG:

- Proper lead placement of precordial Leads V1 and V2 are _____ on opposite sides of the sternum.
- Incorrect placement of Leads V1 and V2 will result in *the presence of Q Waves* (indicator of necrosis) **leading to misdiagnosis of**

_____.

Leads V1-V4:

- V1 – V4 view the _____ of the Left Ventricle.
- V1 and V2 also view the _____
- V1 – V3 view the _____ via Reciprocal Changes.

Leads V5 & V6:

- V5 & V6 view the _____ of the Left Ventricle.

Leads I and AVL:

- Leads I and AVL view the **PROXIMAL aspect** of the _____ and _____ **WALLS**
- I and AVL can be associated with EITHER the _____, the _____, or BOTH the _____ **and** _____.

Leads II, III, and AVF:

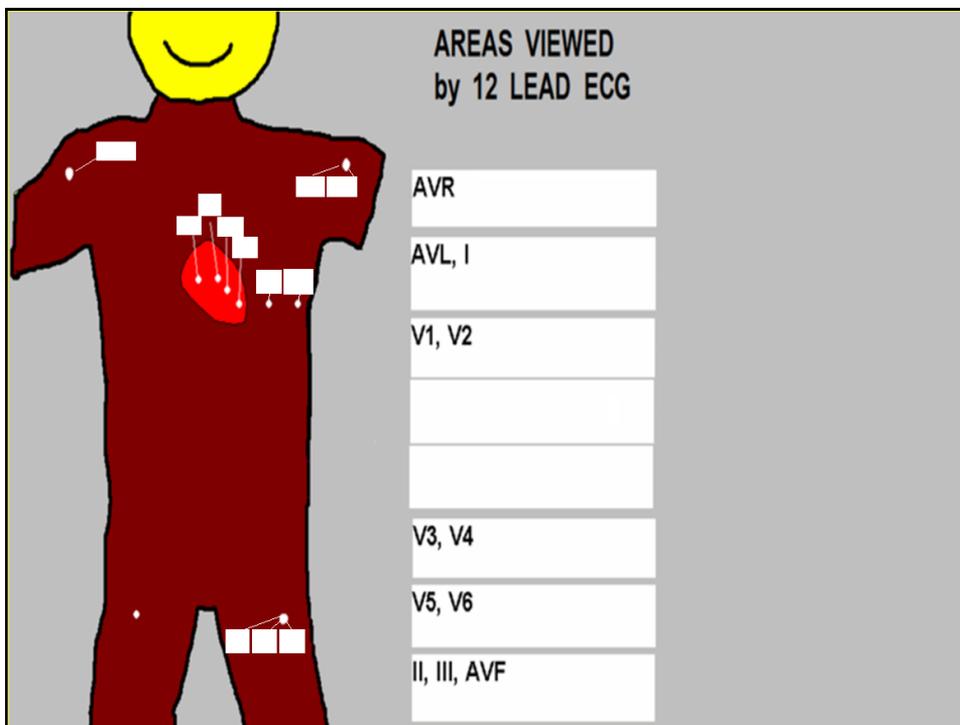
- Leads, II, III, and AVF view the _____ of the Left Ventricle.

Lead AVR:

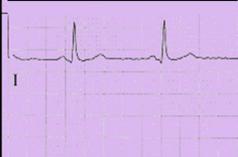
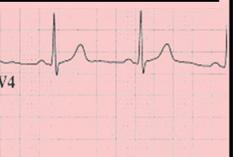
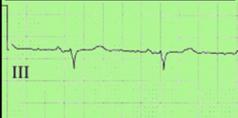
- Lead AVR views the _____.
- The _____ is the area where the _____ is typically located.

Lead AVR:

- **ST Elevation in Lead AVR during Acute STEMI is associated with _____ obstruction, which has a ___% mortality Rate.**
- **ST Elevation of Lead AVR when STEMI is NOT present is often associated with _____ disease, and/or CRITICAL OCCLUSION of the _____: both require Coronary Artery Bypass Graft (CABG) Surgery!!**



What REGION of the HEART does EACH LEAD VIEW ? ?

Lead I views:	Lead AVR views:	Lead V1 views:	Lead V4 views:
			
Lead II views:	Lead AVL views:	Lead V2 views:	Lead V5 views:
			
Lead III view:	Lead AVF views:	Lead V3 views:	Lead V6 views:
			

**The INDICATION for obtaining a
RIGHT VENTRICULAR ECG is**

_____.

**The INDICATION for obtaining a
POSTERIOR LEAD ECG is:**

_____.

Left Anterior Descending Artery

**The LAD supplies blood to the ANTERIOR and
SEPTAL walls, and includes the following
CRITICAL STRUCTURES:**

- **Approximately ____ of the Left Ventricle**
- _____
- _____

Circumflex (Cx) Artery

In patients with a Right Dominant coronary artery system, the Circumflex supplies blood to:

- Approximately 20-30% of the Left Ventricle, which includes:
 - _____ of Left Ventricle
 - _____
- On rare occasion, the _____

Right Coronary Artery (RCA)

In patients with a RIGHT DOMINANT system, the RCA supplies blood to the following cardiac structures:

- _____
- _____
- _____
- Approximately _____% of the Left Ventricle
 - INFERIOR Wall
 - ½ POSTERIOR WALL

If the patient has TWO or more of the following, ACS should be RULED OUT:

- _____
- _____ for Heart Disease (3 or more, or KNOWN history of heart disease)
- _____ (ST- T wave changes)
- _____ (Troponin) elevated.

“Classic” cardiac chest pain:

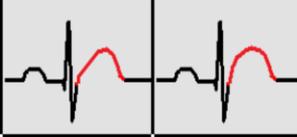
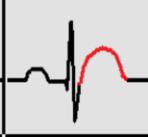
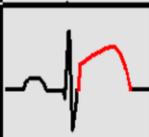
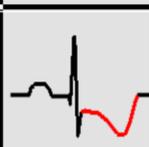
- Location: _____
- ___ or _____ in nature
- Does not change with _____

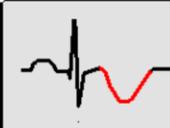
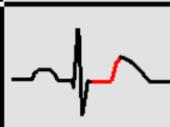
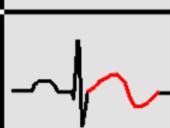
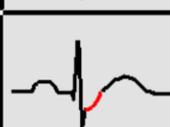
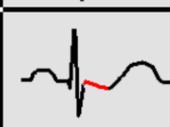
All patients with ACS symptoms . . .

***STAT 12 Lead ECG; obtain and have
read *within* _____ *!!!****

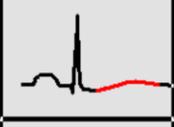
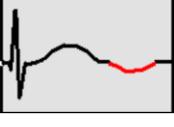
ACC/AHA Guideline!

**ECG Indicators of
ABNORMAL PERFUSION
(possible ischemia / infarction)
in Patients with
Normal Width QRS Complexes
(QRS duration < 120 ms)**

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

INVERTED T WAVE		- MYOCARDITIS - ELECTROLYTE IMBAL. - ISCHEMIA
SHARP S-T T ANGLE		- ACUTE MI (NOT COMMON) - ISCHEMIA
BI-PHASIC T WAVE (WELLEN'S)		- SUB-TOTAL LAD LESION - VASOSPASM - HYPERTROPHY
DEPRESSED J POINT with UPSLOPING ST		- ISCHEMIA
DOWNSLOPING S-T SEGMENT		- ISCHEMIA

Some less common, less reliable possible indicators of ACS:

?	FLAT S-T SEGMENT > 120 ms		- ISCHEMIA
?	LOW VOLTAGE T WAVE WITH NORMAL QRS		- ISCHEMIA
?	U WAVE POLARITY OPPOSITE THAT OF T WAVE		- ISCHEMIA

Unstable Angina Findings:

The 12 Lead ECG may exhibit:

- _____ in leads that view the ischemic region
 - ST Depression
 - T Wave Inversion
 - Other “non-specific” ST-T changes
- The ECG may be _____.
- Troponin is _____.

NSTEMI Findings:

The 12 Lead ECG may exhibit:

- _____ in leads that view the ischemic region
 - ST Depression
 - T Wave Inversion
 - Other “non-specific” ST-T changes
- The ECG may be _____.
- Troponin is _____.

STEMI Criteria for 18 Lead ECGs:

Right-Sided Chest Leads

(V3R – V6R): ____ mm

Posterior Chest Leads

(V7 – V9): ____ mm

* P. Rautaharju et al, “Standardization and Interpretation of the ECG,” JACC 2009;(53)No.11:982-991