

DeWinter's T-Waves

Definition

Early warning of an evolving STEMI.

History/Physical Exam

History and findings suggestive of acute coronary syndrome.

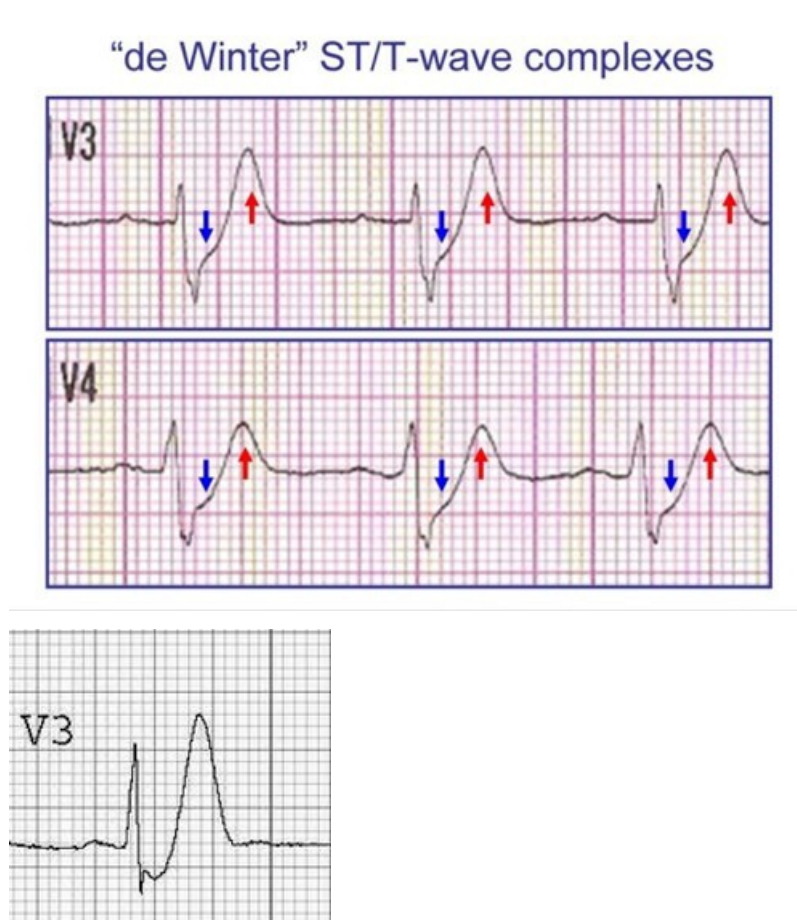
Key 12-Lead Features

- J-Point depression with up-sloping ST segments.
- Tall, prominent, symmetric T waves in the precordial leads.
- Upsloping ST segment depression > 1mm at the J-point in the precordial leads.
- Absence of ST elevation in the precordial leads.
- ST segment elevation (0.5mm-1mm) in aVR.
- "Normal" STEMI morphology may precede or follow the DeWinter pattern.

Key Treatment Points

- Patient advocacy for a cardiology consult
- Monitor for potential emerging STEMI

12 Lead ECG Samples



[Further Reading](#)

References

1. DeWinter et al. A new ECG sign of proximal LAD occlusion. 2008. [\[Link\]](#)

Sgarbossa Criteria

Definition

Used to identify AMI in the presence of LBBB or a paced rhythm.

History/Physical Exam

History and findings suggestive of acute coronary syndrome.

Key 12-Lead Features

ST elevation ≥ 1 mm in a lead with upward (concordant) QRS complex	5 pts
ST depression ≥ 1 mm in lead V1, V2, or V3	3 pts
ST elevation ≥ 5 mm in a lead with downward (discordant) QRS	2 pts

≥ 3 points = 90% specificity of STEMI (sensitivity of 36%)

Smith's Modified Sgarbossa

Replacement of Rule III: discordant ST-elevation measurement of > 5 mm with

Smith's Rule: ST/S ratio greater than 0.25 = STEMI

- Measure the ST Segment Elevation in mm [X]
- Measure the height/depth of the S/R wave in mm [Y]
- $X \div Y = Z$
- $Z > 0.25 = \text{STEMI}$

Sensitivity: 91%

Specificity: 90%

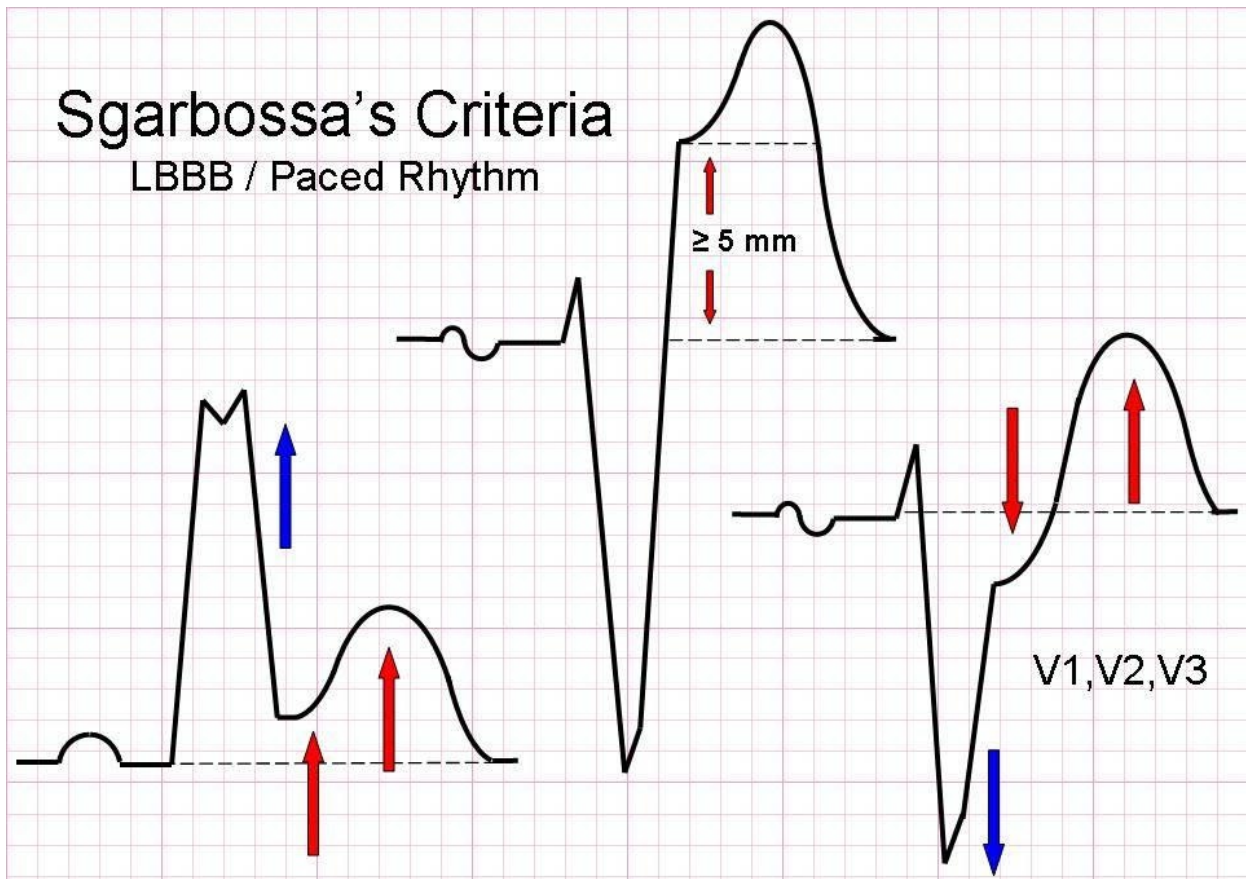
Key Treatment Points

- Transmit as per current guidelines if believed ischemic
- Convey to PCI capable hospital
- Monitor for 12-lead changes and patient decompensation
- Treat as Acute Coronary Syndrome
- Patient advocacy at the hospital

12 Lead ECG Samples

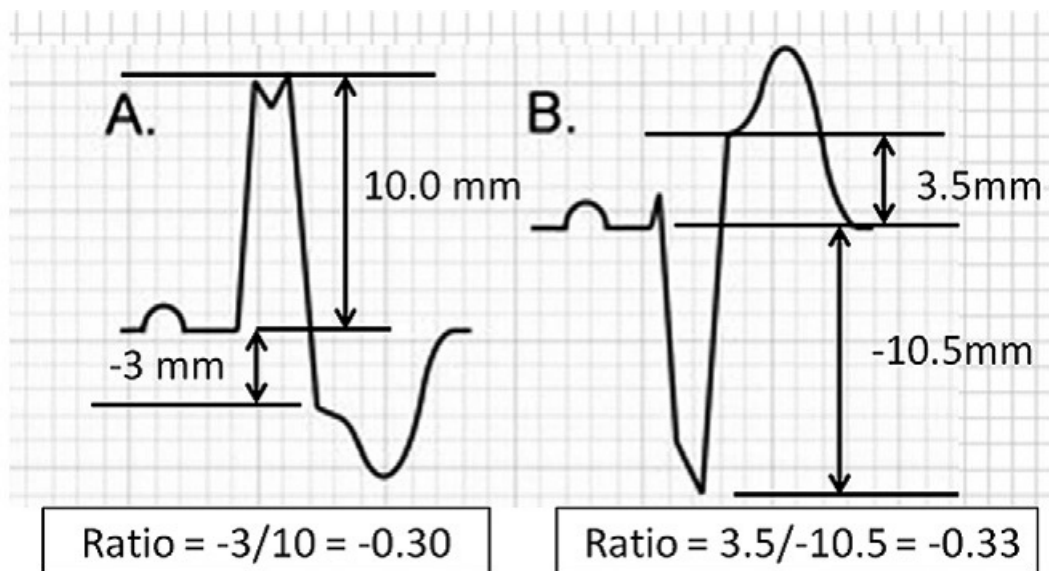
Sgarbossa's Criteria

LBBB / Paced Rhythm



Smith's Modified Sgarbossa

Despite lacking > 5 mm elevation, both complexes below shown are positive for STEMI, due to ratios exceeding 0.25



[Further Reading](#)

References

1. Rodriguez, RM. Electrocardiographic Criteria for Detecting Acute Myocardial Infarction in Patients With Left Bundle Branch Block: A Meta-analysis. 2006. [\[Link\]](#)

Wellens Syndrome

Definition

Pre-infarction stage of coronary artery disease suggesting 80-90% LAD occlusion that often progresses to a devastating anterior wall MI.

History/Physical Exam

Following an ischemic event suggestive of unstable angina. ECG findings are generally only visible once patient is pain free.

Key 12-Lead Features

TYPE A: Biphasic T waves, most commonly in leads V2 and V3. Presents with upstroke/down-stroke.

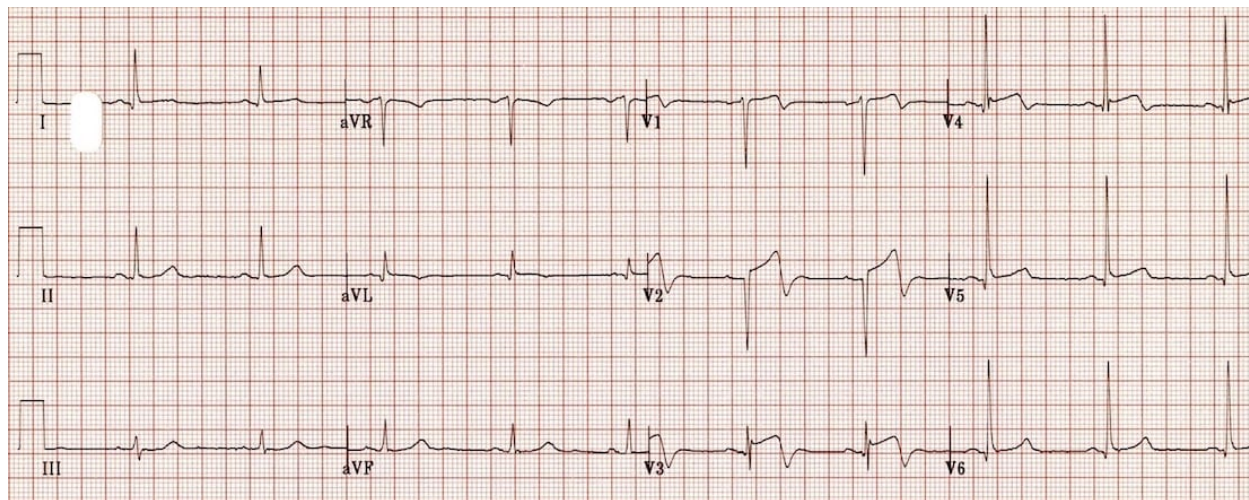
TYPE B: 76% of the time, deep inversion of the T-wave segment in the precordial leads, V1-V4.

Key Treatment Points

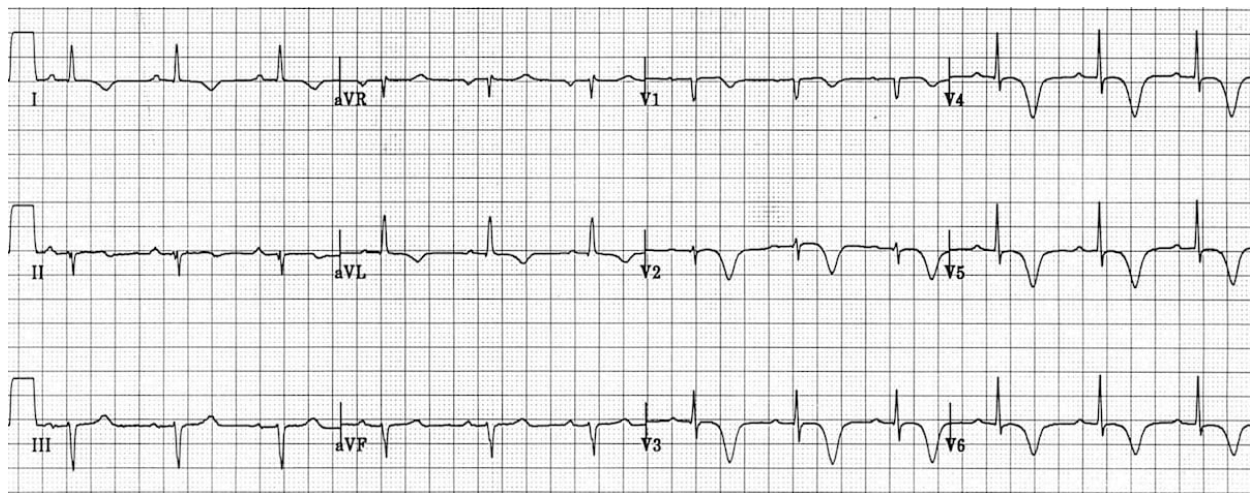
- Patient advocacy for a cardiology consult
- Monitor for potential emerging STEMI

12 Lead ECG Samples

TYPE A



TYPE B



[Further Reading](#)

References

1. Rhinehardt J, et al. Electrocardiographic manifestations of Wellens' syndrome. 2002. [\[Link\]](#)

aVR STEMI

Definition

Electrical activity from the right upper portion of the heart is recorded by aVR. Infarction in this area produces ST elevation in aVR and reciprocal changes in leads I, II, aVL, and V4-6.

Indicative of Left Main coronary artery occlusion, though can also reflect proximal LAD occlusion or severe triple-vessel disease.

History/Physical Exam

History and findings suggestive of acute coronary syndrome.

Key 12-Lead Features

- Widespread horizontal ST depression (often I, II, aVL, and V4-6)
- ST elevation in aVR $\geq 1\text{mm}$
- ST elevation in aVR $\geq \text{V1}$
- aVR elevation in the presence of a tachycardia is often rate related and not suggestive of LMCA occlusion

Key Treatment Points

- Transmit as per current guidelines if believed ischemic
- Convey to PCI capable hospital
- Monitor for 12-lead changes and patient decompensation
- Treat as Acute Coronary Syndrome
- Patient advocacy at the hospital

Predictive Value of aVR Elevation

In the context of widespread ST depression + symptoms of myocardial ischemia:

- STE in aVR $\geq 1\text{mm}$ indicates proximal LAD / LMCA occlusion or severe 3VD
- STE in aVR $\geq 1\text{mm}$ predicts the need for CABG
- STE in aVR $\geq \text{V1}$ differentiates LMCA from proximal LAD occlusion
- Absence of ST elevation in aVR almost entirely excludes a significant LMCA lesion

In the context of anterior STEMI:

- STE in aVR $\geq 1\text{mm}$ is highly specific for LAD occlusion proximal to the first septal branch

Magnitude of ST elevation in aVR is correlated with mortality in patients with acute coronary syndromes:

- STE in aVR $\geq 0.5\text{mm}$ was associated with a 4-fold increase in mortality
- STE in aVR $\geq 1\text{mm}$ was associated with a 6- to 7-fold increase in mortality
- STE in aVR $\geq 1.5\text{mm}$ has been associated with mortalities ranging from 20-75%

12 Lead ECG Sample



[Further Reading](#)

References

1. Aygul N, et al. Value of lead aVR in predicting acute occlusion of proximal left anterior descending coronary artery and in-hospital outcome in ST-elevation myocardial infarction: An electrocardiographic predictor of poor prognosis. 2008. [\[Link\]](#)
2. Barrabes JA, et al. Prognostic value of lead aVR in patients with a first non-ST-segment elevation acute myocardial infarction. 2003. [\[Link\]](#)
3. Nabati M, et al.. ST-segment elevation in lead aVR in the setting of acute coronary syndrome. 2016. [\[Link\]](#)

Posterior STEMI

Definition

History and findings suggestive of acute coronary syndrome.

History/Physical Exam

History and findings suggestive of acute coronary syndrome.

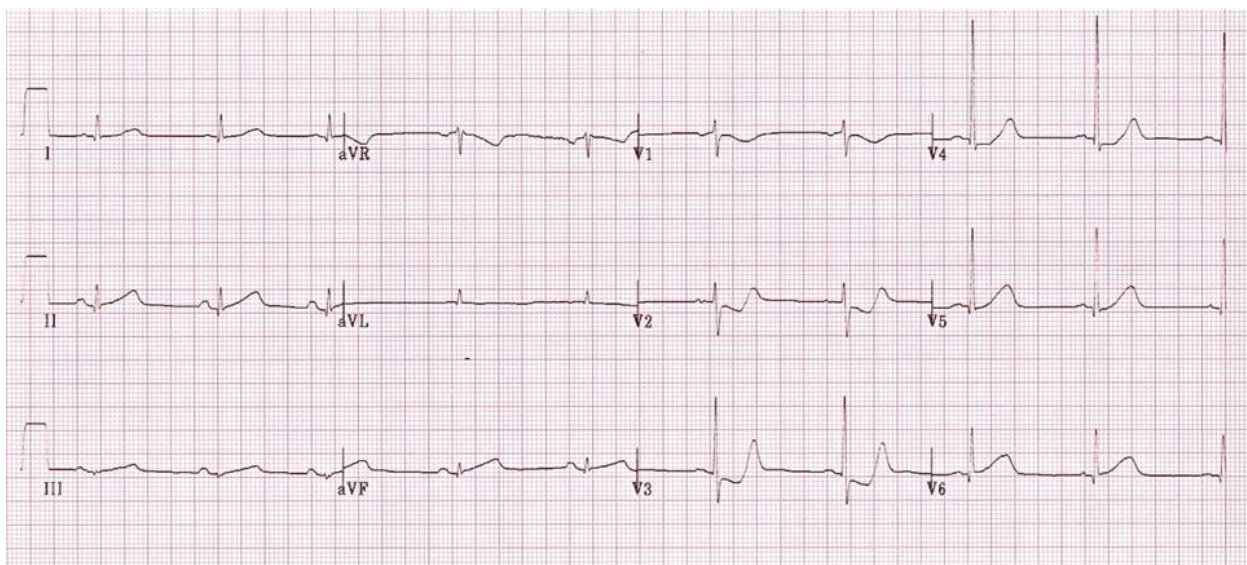
Key 12-Lead Features

- Suspect Posterior MI with marked Precordial ST Depression V1-4 > 1mm (sensitive)
- ST Elevation in V7/8/9 > 0.5mm adds specificity

Key Treatment Points

- Transmit as per current guidelines if believed ischemic
- Convey to PCI capable hospital
- Monitor for 12-lead changes and patient decompensation
- Treat as Acute Coronary Syndrome
- Patient advocacy at the hospital

12 Lead ECG Sample



[Further Reading](#)

References

1. Van Gorselen, EOF, et al. Posterior myocardial infarction: The dark side of the moon. 2007. [\[Link\]](#)

