

12-lead ECG Course Outline

1. Electrical System of the Heart
 - a. Anatomy
 - b. Concept of Automaticity
 - c. Components of the P-QRS-T Complex
 - d. Intervals and their Normal Range: PR Interval, QRS Duration, QT Interval
2. Attachment of the Leads
 - a. Limb Leads and Einthoven's Triangle
 - b. Precordial Leads
3. Vector Concepts
 - a. Frontal Plane
 - b. Transverse Plane
4. Predicting the waveshape of the Normal 12-Lead ECG
 - a. Polarity of deflection on the ECG
 - b. Depolarization sequence and direction of the normal heart
 - c. Leads associated with areas of the heart
 - d. Parameters defining the normal 12-Lead ECG
 - e. Development of the predicted waveshape of the normal 12-Lead ECG
 - f. R-wave progression and the transition zone
5. Characteristic of the T-wave
 - a. Asymmetrical wave
 - b. HyperAcute T-wave
 - c. Inversion vs. upright
6. Characteristic of the ST-segment
 - a. ST-segment baseline
 - b. ST-segment elevation: (1). concave down, (2). concave up
 - c. ST-segment depression
7. ECG changes of ischemia
8. ECG changes of injury (acute myocardial infarction)
9. Concept of Reciprocity
10. ECG changes of old infarction
11. Locating the STEMI
 - a. Associated Leads with specified area of heart: (1). Inferior, (2). Septal, (3). Anterior, (4). Lateral, (5). High Lateral
 - b. Location of Reciprocal Leads
 - c. Right ventricular infarction
 - d. Posterior infarction
12. Development of the Patterns of the Following Aberrant Conduction
 - a. RBBB
 - b. LBBB

- c. Left Anterior Fascicular Block (LAFB)
 - d. Bifascicular Block
 - e. Preexcitation Syndrome (WPW)
 - f. Left Posterior Fascicular Block (LPFB)
 - g. Primary and Secondary T-wave changes of RBBB and LBBB
13. Hexaxial System
- a. Definition of Axis of Frontal Plane
 - b. Categories: (1). Normal Axis, (2). Right axis deviation, (3). Left axis deviation, (4). Severe right axis deviation
 - c. Calculation of axis (examples)
 - d. Rapid method to recognize axis more negative than -30 degrees
14. Concept of Hypertrophy
15. Criteria of LVH
16. Waveshape Distortion Due to LVH (STEMI Mimic)
- a. ST-T changes of repolarization (strain)
 - b. Precordial Q-waves and ST-segment elevation (pseudoinfarction patterns)
17. Concept of Sensitivity and Specificity
18. Hypertrophy Criteria Related to Age of the Patient
19. Systematic approach to 12-Lead Analysis
- a. Mnemonic with utilization of the acronym H-E-A-R-T to apply to every ECG
 - b. Example tracings interpreted with use of acronym and “Stanley’s Heart Rule”
20. Putting it all in perspective
- a. The LVH pattern and its associated ST-T changes and Q-waves
 - b. The LBBB pattern and its associated ST-T changes and Q-waves. Emphasis on the hazard (virtual impossibility) of diagnosis of the acute MI
 - c. ECG changes of ventricular aneurysm
21. Revisiting ST-segment Elevation
22. Revisiting ST-segment Depression
23. Revisiting T-wave Inversion
24. Revisiting Q-waves
25. Important Truisms: One-liners frequently misunderstood by the practitioner