

Times
55
60
65
70
75
80
85
90
95
100
105
110
120
140
160
180
200
250
300
350
400
Frequency

4 x RR (25 mm/s)
2 x RR (50 mm/s)

50 mm/s
50 mm/s

Amplitude

2. Neurocardiogen. Syncope

Stimulat. of mechanoreceptors (left ventric.) results in bradycardia and peripheral vasodil. leading to hypotension.

Atrial Fibr. with Bradycardia

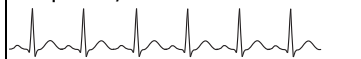
No P waves, an irregular isoelectric line, bradycardia and absolute arrhythmia.



Tachyarrhythmias

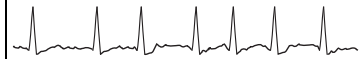
Sinus Tachycardia

Supraventr. tachycardia with a frequency of > 90 beats/min.



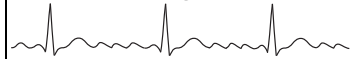
Atrial Fibrillation

No P waves, irreg. isoelec. line, atrial frequency of > 300/min with absol. arrhythmia and a ventric. rate of > 90 beats/min.



Atrial Flutter

Atrial frequency of 240–300 beats/min, sawtooth-like P waves with reg. or irreg. ventr. conduct. through the AV node.



AV Nodal Reentry Tachycardia

Narrow QRS, P waves hidden in QRS, AV reentry can lead to repolar. disturb. and ST depr.



WPW Syndrome

Sinus Rhythm in WPW:

Short. PR intervals, delta waves, QRS > 0.12 s, repolar. disturb.



Orthodr. Tachycard. in WPW:

Regular tachycardia, narrow QRS complex, P waves at the end of QRS in the early ST segment, no Delta waves.

Antidro. Tachycard. in WPW:

Regular tachycardia, significant delta waves, short PR interval, broad QRS complex.

Atrial Fibrillation in WPW:

Variable RR intervals (absolute arrhythmia), delta wave of changing morphology, variable QRS complexes.

Atrial Tachycardia

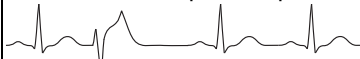
Regular P waves at rate of 100–200 beats/min, some of the P waves are neg. in II, III and aVF.

Sick Sinus Syndrome

Alternating tachycardic (atrial fibrillation, atrial flutter, atrial tachycardias) and bradycardic arrhythmias (sinoatrial block, sinus bradycardia), sometimes an AV block occurs.

Premat. Ventr. Contractions

Extra beats with a broad (> 0.12 s) and bizarre QRS. Sometimes compensat. pause.



Bigeminy: Every sinus beat is followed by a premature ventricular contraction (PVC).



Trigeminy: Every second sinus beat is followed by a PVC.

Couples, Runs

R-on-T-phenomenon: PVCs fall simultan. to T of prev. beat.



Sustained Ventr. Tachycardia

Broad QRS complexes at a rate of > 90 beats/min.



Ventricular Fibrillation

Chaotic ventricular electrical discharge.



Long QT Syndrome

Abnormal prolongation of the corrected QT Interval.



Electrolyte Disturb., Drugs

Hypokalemia

Repol. disord., ST depression, promin. U, may merge into TU waves.



Hyperkalemia

Tall, peaked T waves that later flatten, broad QRS complex. Finally, tachycardic arrhythmias can occur resulting in bradycardia and asystole.



Hypercalcemia

Shortening of the corrected QT Interval (QTc).



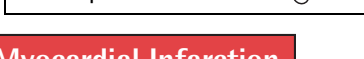
Hypocalcemia

Prolongation of the QT Interval.



ECG Changes Ind. by Digitalis

Shallow ST depressions. AV blocks possible.



Myocardial Ischemia

Angina

Horizontal or descending ST depression.

Myocardial Infarction

Early Stage:

Tall T wave.

Stage I:

ST elevation and R waves are present, no Q waves, T waves are still positive.

Intermediate Stage:

ST elevation and R wave decrease, Q waves arise and inverted T waves appear.

Next Stage:

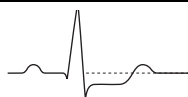
Q waves develop, R wave will disappear.

Stage III (chronic):

Loss of R wave in the ant. leads. Q waves may be found across the ant. myocard. wall, T wave becomes pos. again and ST elevat. disappears.

Non-Q-Wave Myocardial Infarction

Subendocardial infarction of the anterior wall with T wave inversion over anterior precordial leads, no ST elevations, no R loss, no Q waves.



Stages of Myocardial Infarction

Stage	Age	ECG
Early Stage	A few minutes	
Stage I	Up to 6 hours	
Intermediate Stage	> 6 hours	
Next Stage	Days	
Stage III	Residual	

Infarct Localization

	I	II	III	aVL	aVF	rV4	V2	V3	V4	V5	V6
Apical	+			+			+	+	+		
Anterosept.							+	+			
Anterolat.	+			+						+	+
Posterolat.			+		+					+	+
Inferior		+	+		+						
Right ventr.			+		+	+	(+)				