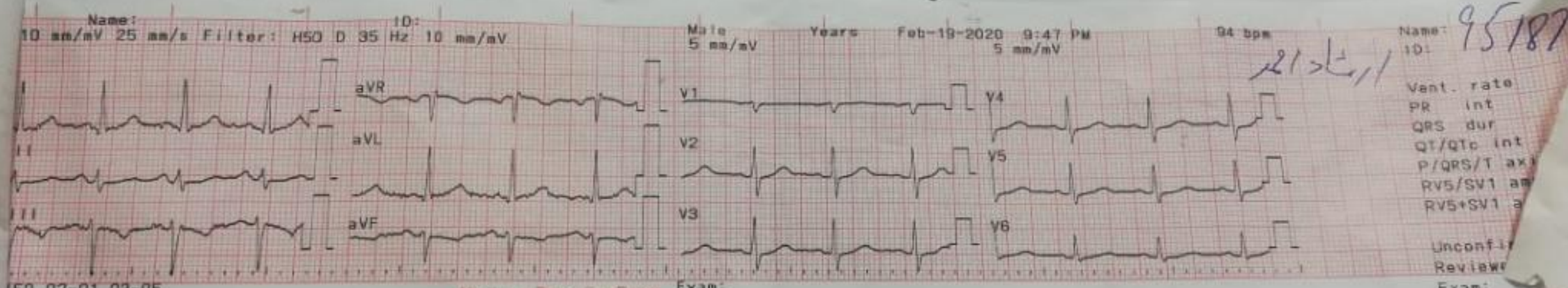
Name:
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10 mm/mV 25 mm/s Filter: H50 D 35 Hz 10 mm/mV
Male
Years
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V5
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Vent. rate
PR int
QRS dur
QT/QTc int
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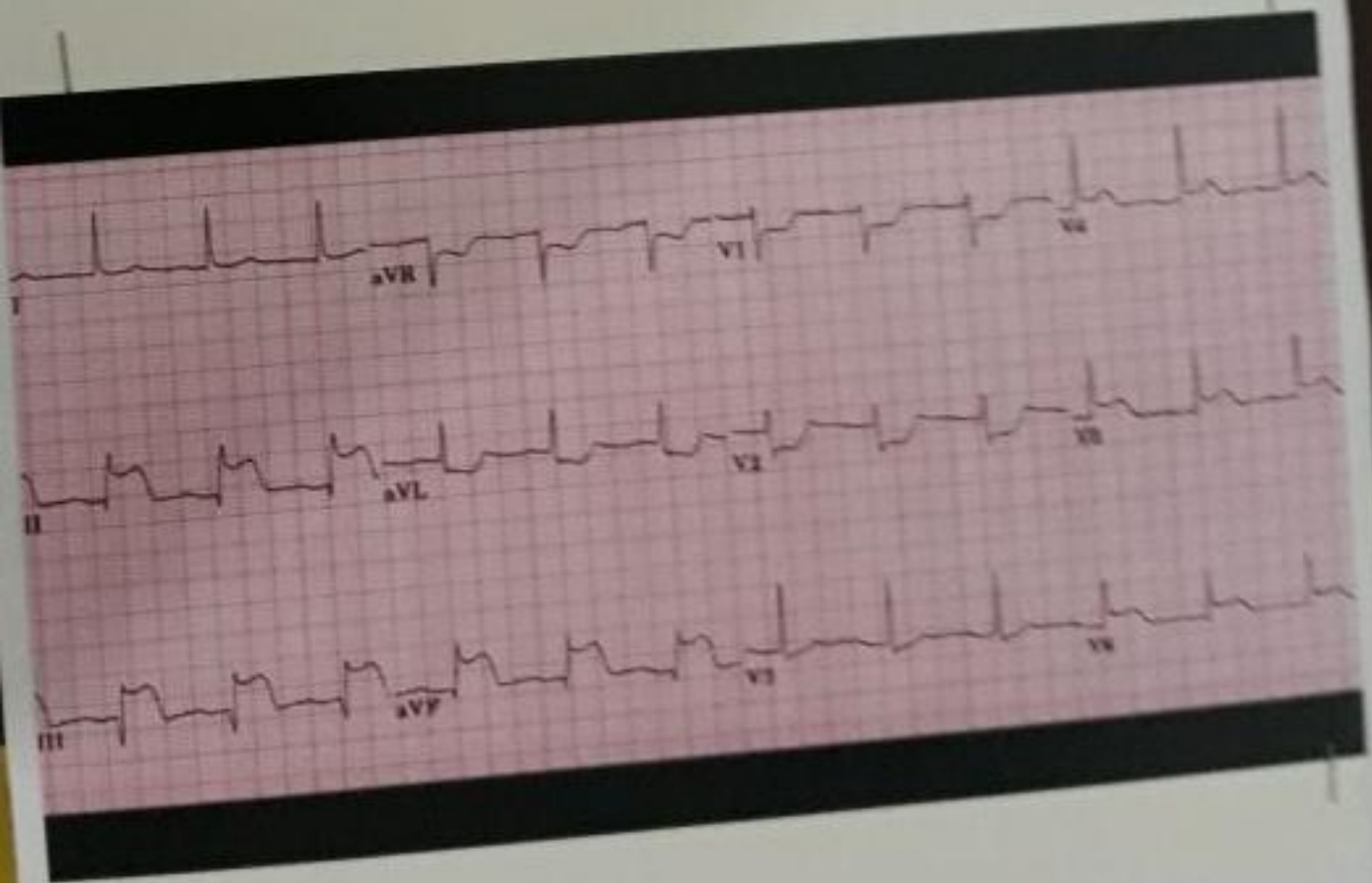
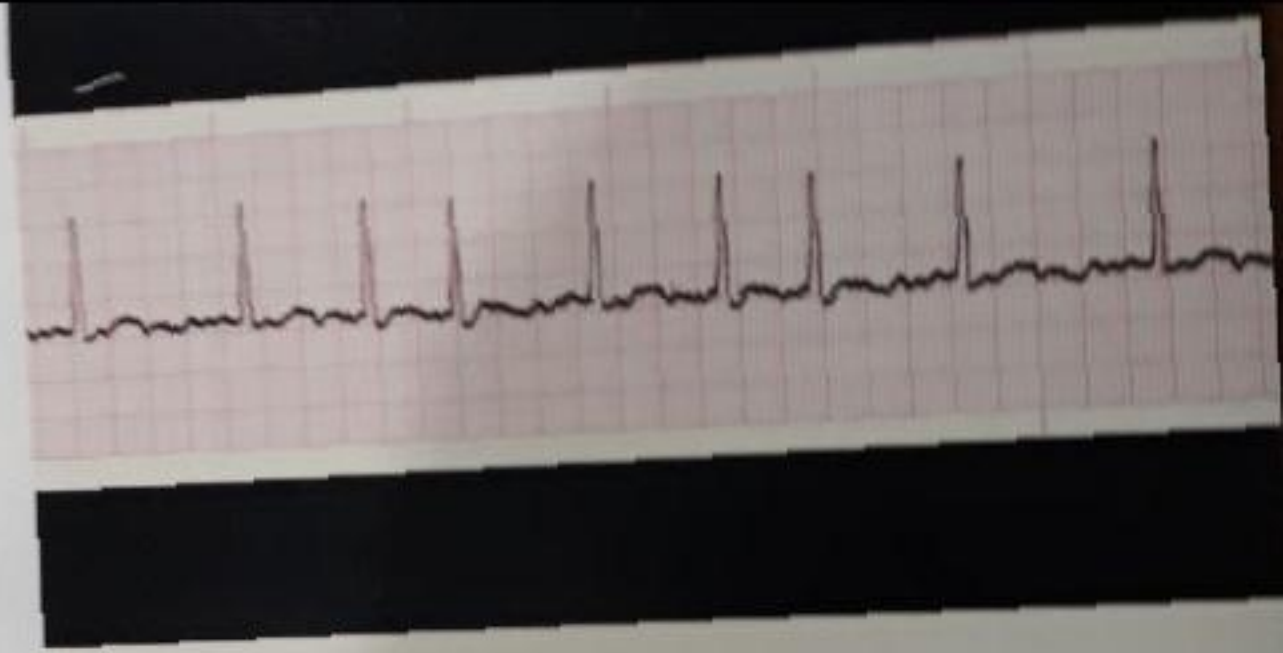
50 02-01 03-05
Medicare Recording Paper
Exam:

6

A 60 years old smoker presented with sudden left sided chest pain for 6 hours.Pain was severe,it was radiating to left arm and associated with profuse sweating.

1. What is the diagnosis?
2. Name the biochemical tests required for the diagnosis.
3. Discuss the significance of these biochemical test.

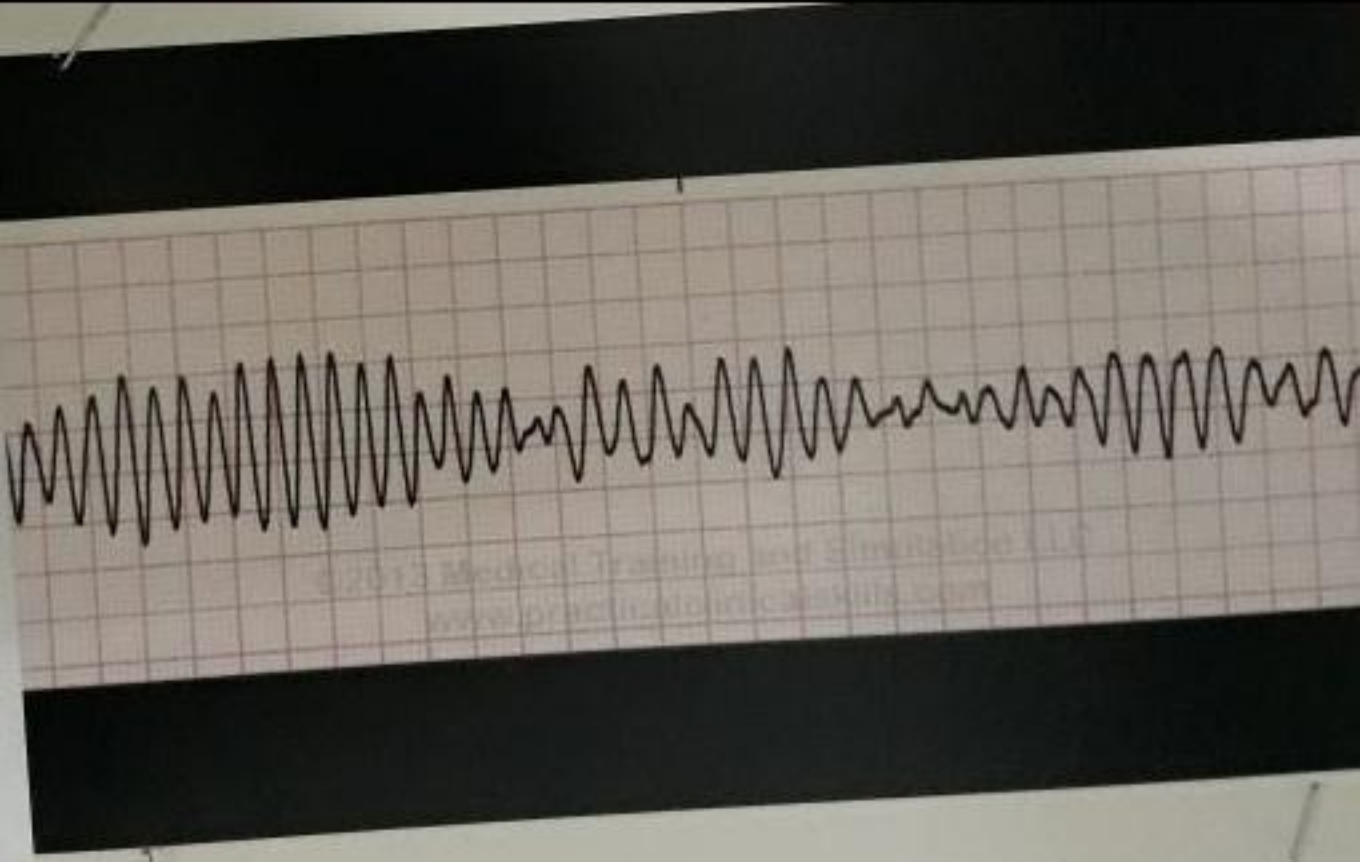




This is ECG of 20 Year old known case of R H D,Who has presented with palpitation.

1. What is Diagnosis.

2. Give management steps



1.What is abnormality.

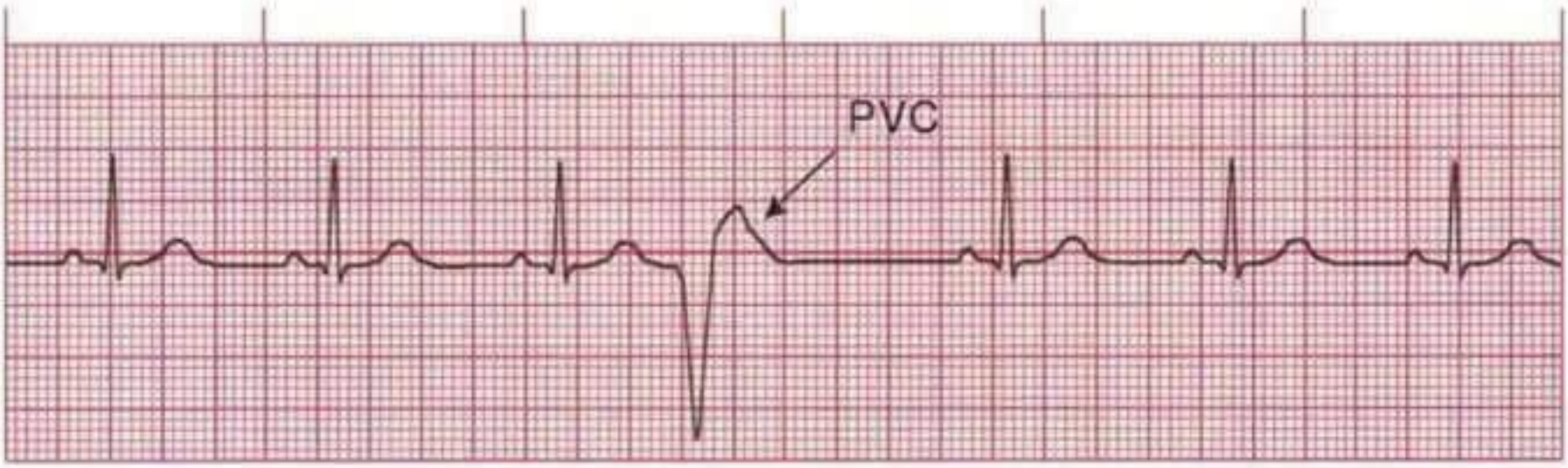
2.Give Management steps.

2:1 and 3:1 CONDUCTION

This refers to the ratio of P waves to the number of QRS complexes seen on the ECG- that is, for every impulse starting at the SAN how many make it past the AVN to depolarise the ventricles? So a 2:1 conduction means that you get alternating conducted and non conducted impulses (P wave + QRS complex, then P wave + no QRS, P wave + QRS and so on). It's the same idea for 3:1 conduction, but for every 3 P waves you only see 1 conducted impulse and QRS complex. In this type of AV conduction defect, the PR interval remains constant. This type of heart block can also lead to **third degree heart block**.

Premature Ventricular Contraction (PVC)

- PVCs result from an irritable ventricular focus.
- PVCs may be uniform (the same form) or multiform (different forms).
- Usually a PVC is followed by a full compensatory pause because the sinus node timing is not interrupted. In contrast, a PVC may be followed by a noncompensatory pause if the PVC enters the sinus node and resets its timing, enabling the following sinus P wave to appear earlier than expected.

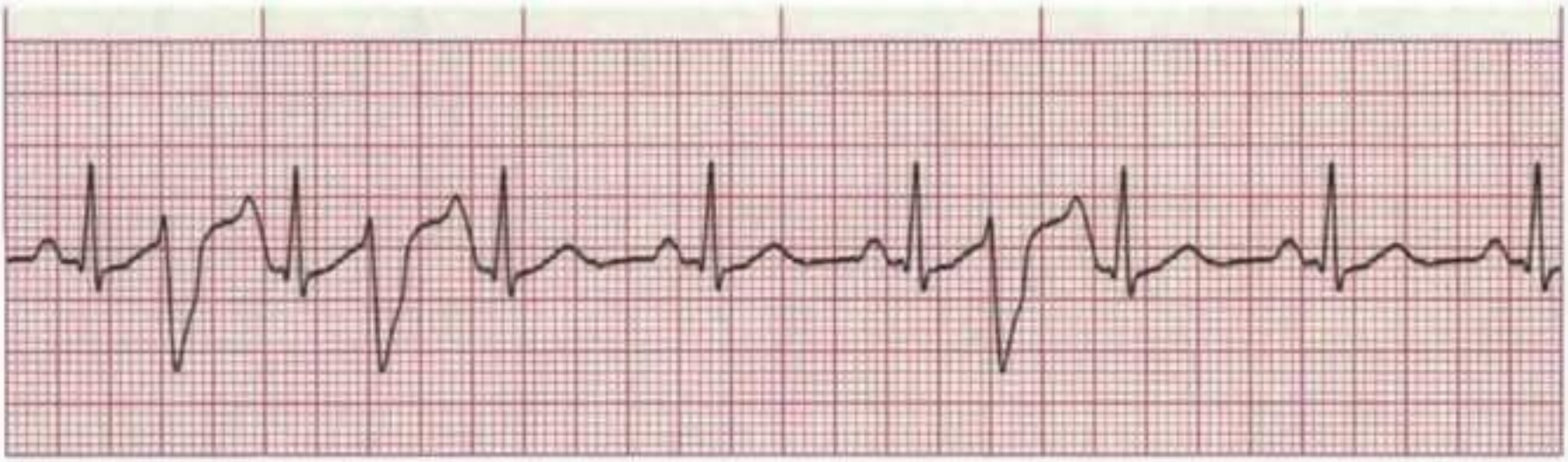


Rate: Depends on rate of underlying rhythm
Rhythm: Irregular whenever a PVC occurs
P Waves: None associated with the PVC
PR Interval: None associated with the PVC
QRS: Wide (>0.10 sec), bizarre appearance

Clinical Tip: Patients may sense PVCs as skipped beats. Because the ventricles are only partially filled, the PVC frequently does not generate a pulse.

Premature Ventricular Contraction: R-on-T Phenomenon

- The PVCs occur so early that they fall on the T wave of the preceding beat.
- These PVCs occur during the refractory period of the ventricles, a vulnerable period because the cardiac cells have not fully repolarized.

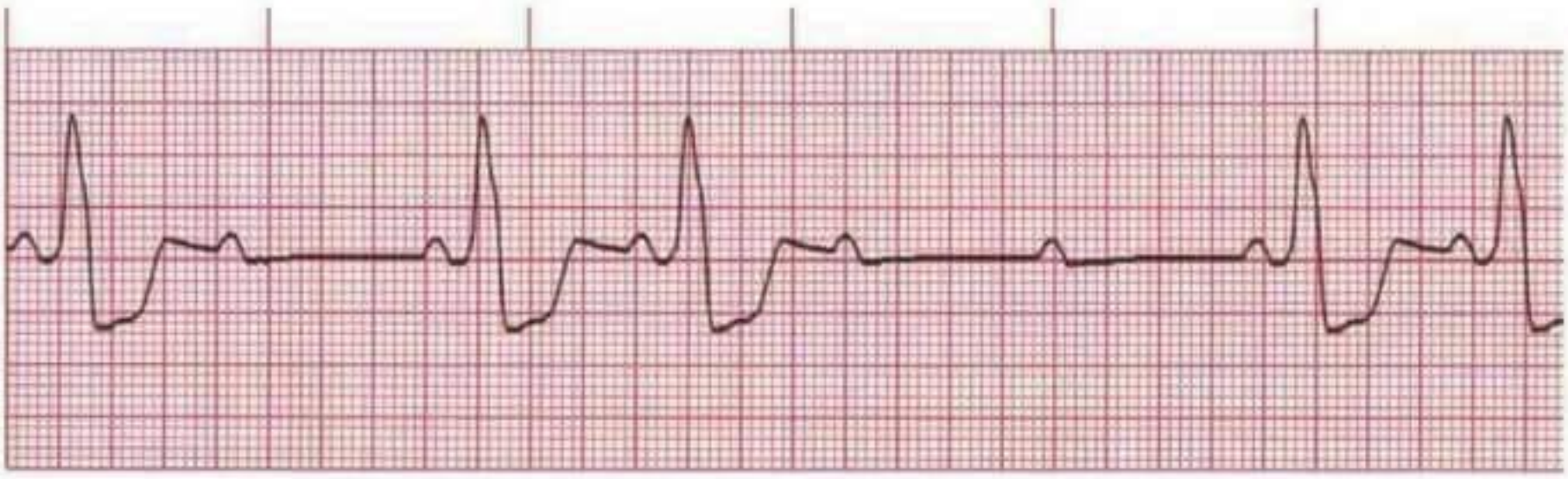


Rate: Depends on rate of underlying rhythm
Rhythm: Irregular whenever a PVC occurs
P Waves: None associated with the PVC
PR Interval: None associated with the PVC
QRS: Wide (>0.10 sec), bizarre appearance

Clinical Tip: In acute ischemia, R-on-T phenomenon may be especially dangerous because the ventricles may be more vulnerable to ventricular tachycardia (VT), ventricular fibrillation (VF), or torsade de pointes.

Second-Degree AV Block—Type II (Mobitz II)

- Conduction ratio (P waves to QRS complexes) is commonly 2:1, 3:1, or 4:1, or variable.
- QRS complexes are usually wide because this block usually involves both bundle branches.



Rate: Atrial: usually 60–100 bpm; ventricular: slower than atrial rate
Rhythm: Atrial: regular; ventricular: regular or irregular
P Waves: Normal (upright and uniform); more P waves than QRS complexes
PR Interval: Normal or prolonged but constant
QRS: May be normal, but usually wide (>0.10 sec) if the bundle branches are involved

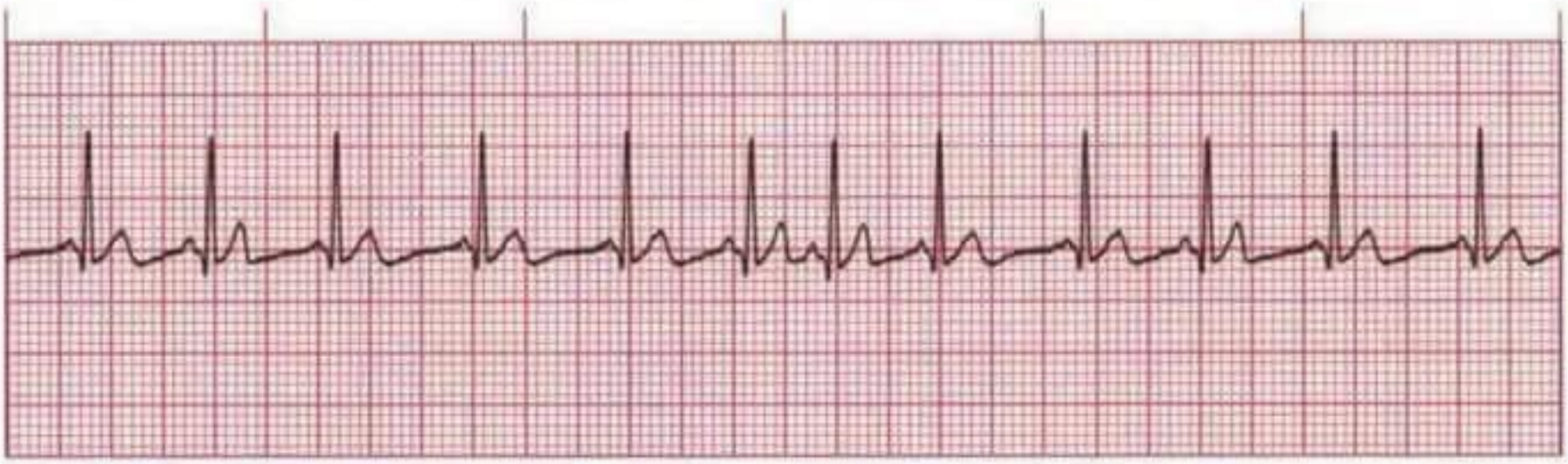
Clinical Tip: Resulting bradycardia can compromise cardiac output and lead to complete AV block. This rhythm often occurs with cardiac ischemia or an MI.

Atrial Arrhythmias

- P waves differ in appearance from sinus P waves.
- QRS complexes are of normal duration if no ventricular conduction disturbances are present.

Multifocal Atrial Tachycardia (MAT)

- This form of wandering atrial pacemaker (WAP) is associated with a ventricular response >100 bpm.
- MAT may be confused with atrial fibrillation (A-fib); however, MAT has a visible P wave.



Rate: Fast (>100 bpm)
Rhythm: Irregular
P Wave: At least three different forms, determined by the focus in the atria
PR Interval: Variable; determined by focus
QRS: Normal (0.06–0.10 sec)

Heart Blocks - Second Degree Heart Block Type II

Description

- The hallmark of this dysrhythmia is a constant P-R interval with missing QRS complexes.
- This dysrhythmia may present in a couple of different ways.
    - A. QRS complexes occurring in a specific pattern in a ratio with the P waves. This is often referred to as 2:1 or 3:1 block depending upon the ratio of P waves to each QRS complex.
    - B. QRS complexes occur in a more unstable, unpredictable manner.
- Either presentation requires immediate reporting due to its potential for conversion to Third Degree (Complete) Heart Block.

A.

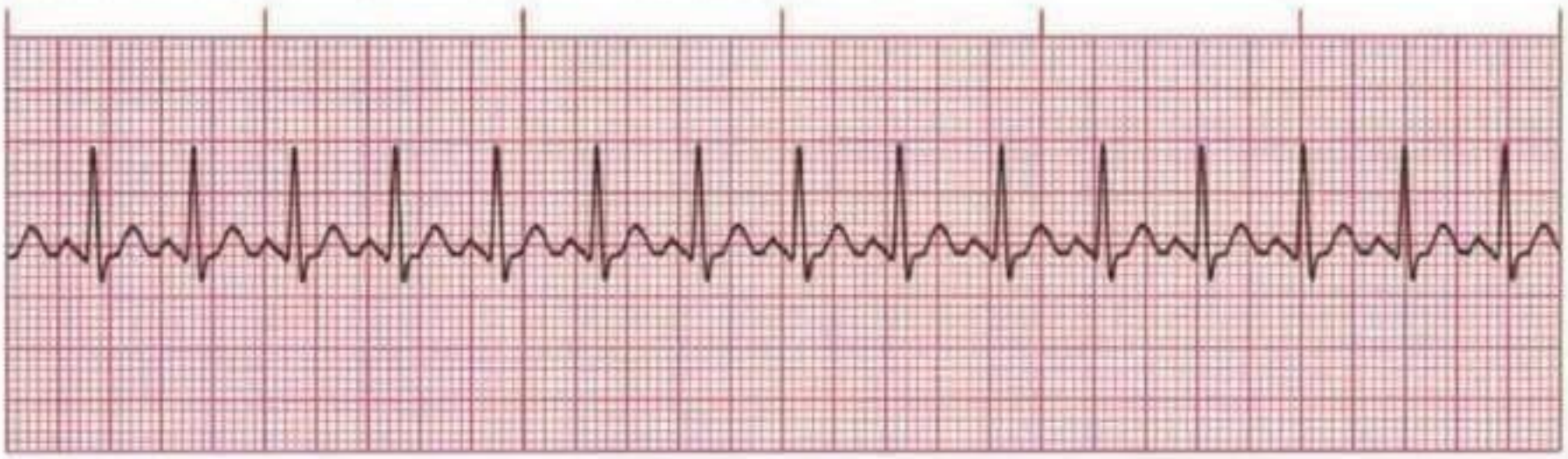
B.

Practice Strip

- Analyze this tracing using the five steps of

Sinus Tachycardia

- The sinus node discharges more frequently than in NSR.

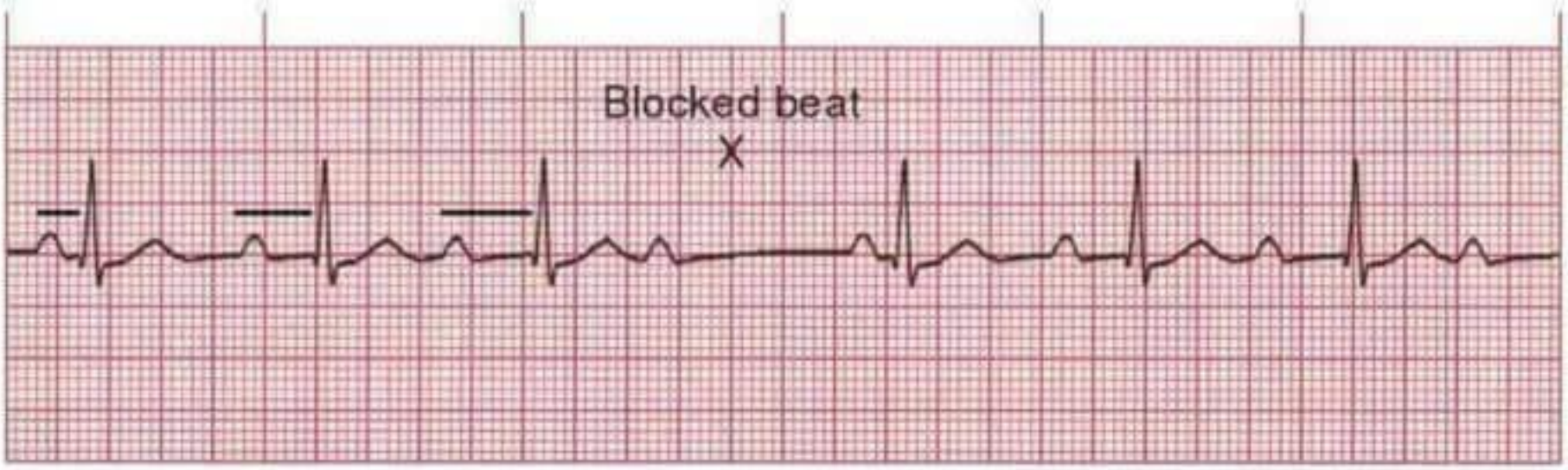


Rate: Fast (>100 bpm)
Rhythm: Regular
P Waves: Normal (upright and uniform)
PR Interval: Normal (0.12–0.20 sec)
QRS: Normal (0.06–0.10 sec)

Clinical Tip: Sinus tachycardia may be caused by conditions such as fear, pain, exercise, anxiety, or fever. More significant pathological causes include hypoxemia, hypovolemia/dehydration, cardiac failure or recent MI, CHF, beta blocker withdrawal, hyperthyroidism, or withdrawal from nicotine, caffeine, or alcohol.

Second-Degree AV Block—Type I (Mobitz I or Wenckebach)

- PR intervals become progressively longer until one P wave is totally blocked and produces no QRS complex. After a pause, during which the AV node recovers, this cycle is repeated.

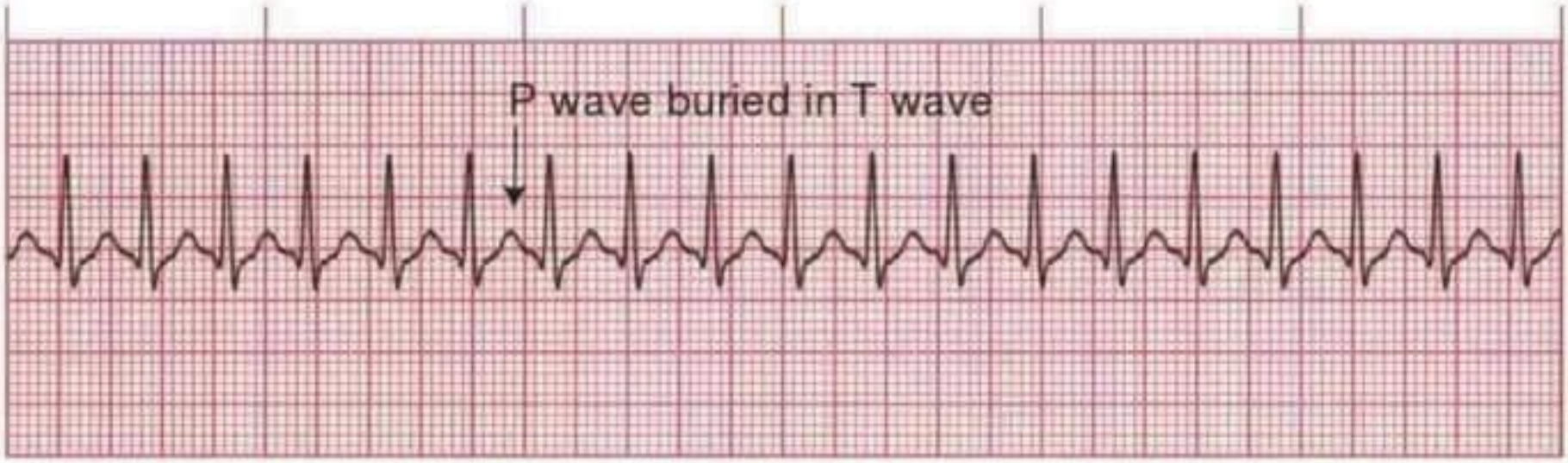


Rate: Depends on rate of underlying rhythm
Rhythm: Atrial: regular; ventricular: irregular
P Waves: Normal (upright and uniform), more P waves than QRS complexes
PR Interval: Progressively longer until one P wave is blocked and a QRS is dropped
QRS: Normal (0.06–0.10 sec)

Clinical Tip: This rhythm may be caused by medication such as beta blockers, digoxin, and calcium channel blockers. Ischemia involving the right coronary artery is another cause.

Supraventricular Tachycardia (SVT)

- This arrhythmia has such a fast rate that the P waves may not be seen.



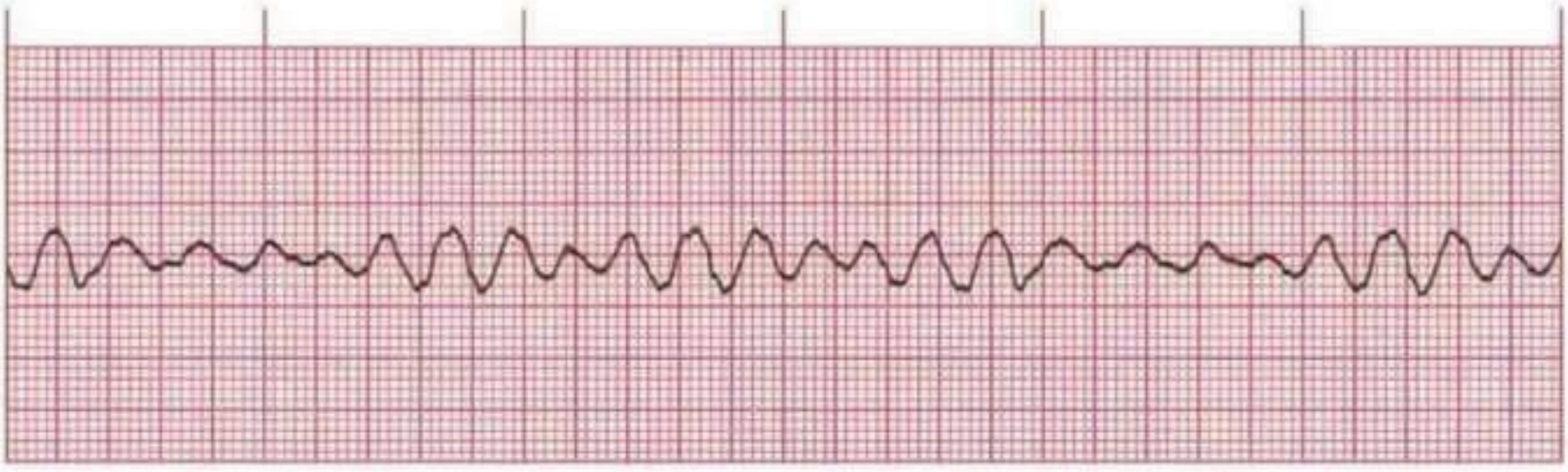
Rate: 150–250 bpm
Rhythm: Regular
P Waves: Frequently buried in preceding T waves and difficult to see
PR Interval: Usually not possible to measure
QRS: Normal (0.06–0.10 sec) but may be wide if abnormally conducted through ventricles

Clinical Tip: SVT may be related to caffeine intake, nicotine, stress, or anxiety in healthy adults.

Clinical Tip: Some patients may experience angina, hypotension, lightheadedness, palpitations, and intense anxiety.

Ventricular Fibrillation (VF)

- Chaotic electrical activity occurs with no ventricular depolarization or contraction.
- The amplitude and frequency of the fibrillatory activity can define the type of fibrillation as coarse, medium, or fine. Small baseline undulations are considered fine; large ones are coarse.

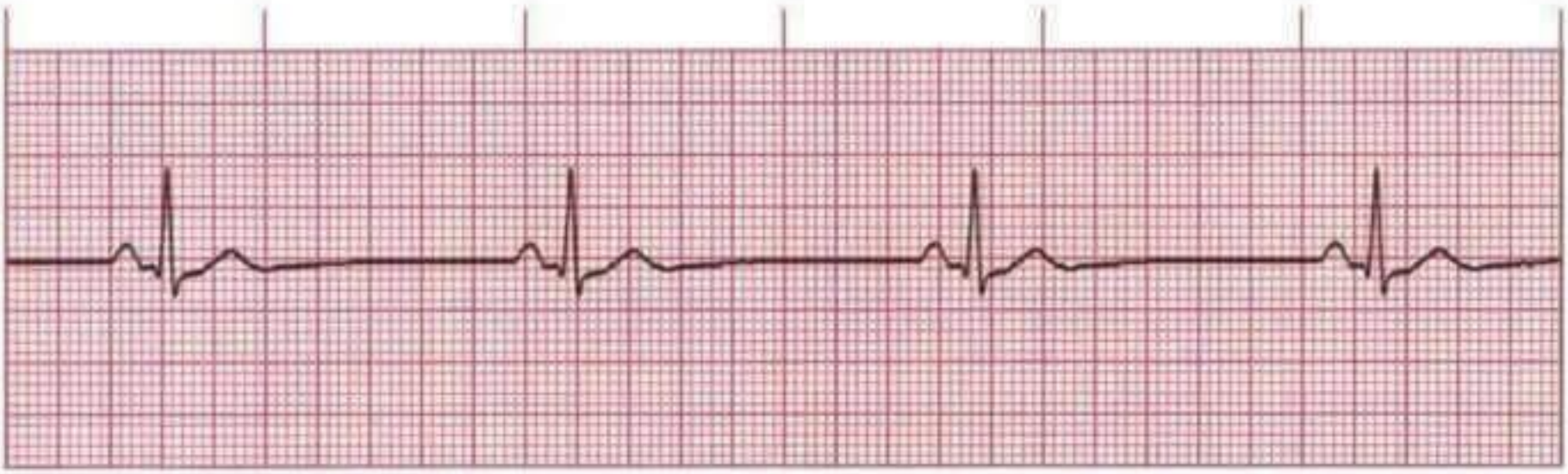


Rate: Indeterminate
Rhythm: Chaotic
P Waves: None
PR Interval: None
QRS: None

Clinical Tip: There is no pulse or cardiac output. Rapid intervention is critical. The longer the delay, the less the chance of conversion.

Pulseless Electrical Activity (PEA)

- The monitor shows an identifiable electrical rhythm, but no pulse is detected.
- The rhythm may be sinus, atrial, junctional, or ventricular.
- PEA is also called electromechanical dissociation (EMD).

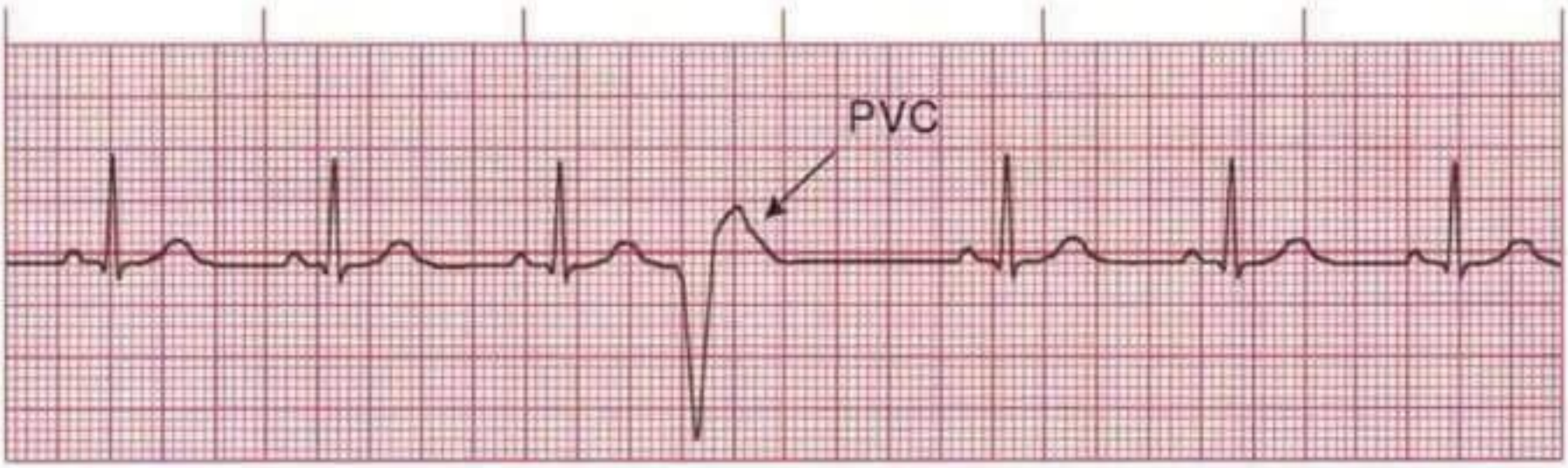


Rate: Reflects underlying rhythm
Rhythm: Reflects underlying rhythm
P Waves: Reflects underlying rhythm
PR Interval: Reflects underlying rhythm
QRS: Reflects underlying rhythm

Clinical Tip: Potential causes of PEA are trauma, tension pneumothorax, thrombosis (pulmonary or coronary), cardiac tamponade, toxins, hypokalemia or hyperkalemia, hypovolemia, hypoxia, hypoglycemia, hypothermia, and hydrogen ion (acidosis).

Premature Ventricular Contraction (PVC)

- PVCs result from an irritable ventricular focus.
- PVCs may be uniform (the same form) or multiform (different forms).
- Usually a PVC is followed by a full compensatory pause because the sinus node timing is not interrupted. In contrast, a PVC may be followed by a noncompensatory pause if the PVC enters the sinus node and resets its timing, enabling the following sinus P wave to appear earlier than expected.

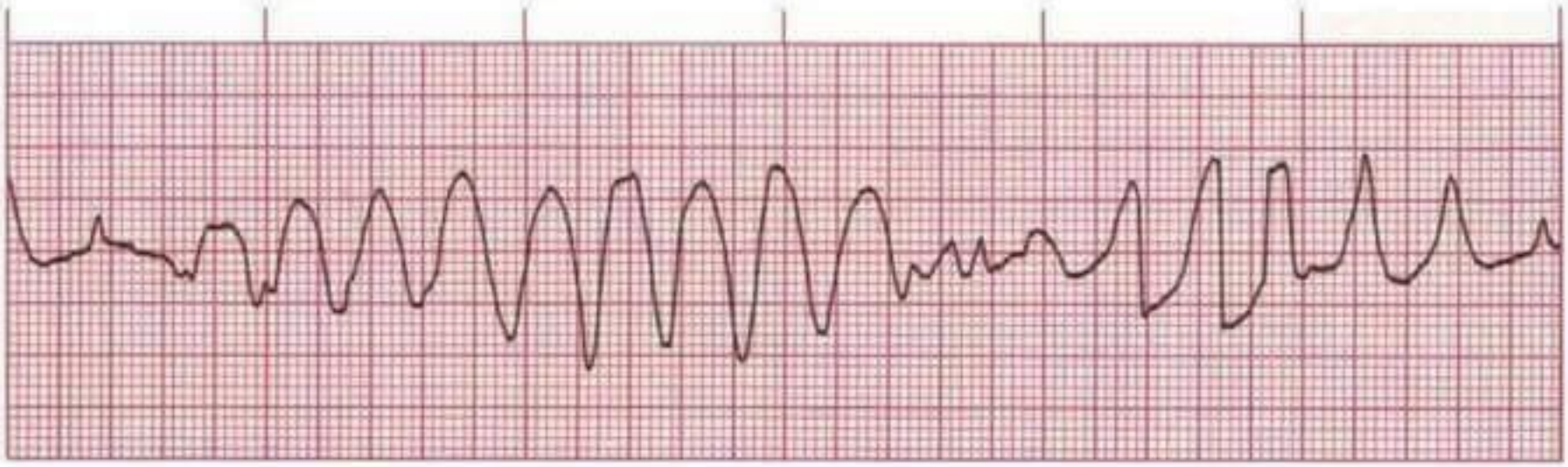


Rate: Depends on rate of underlying rhythm
Rhythm: Irregular whenever a PVC occurs
P Waves: None associated with the PVC
PR Interval: None associated with the PVC
QRS: Wide (>0.10 sec), bizarre appearance

Clinical Tip: Patients may sense PVCs as skipped beats. Because the ventricles are only partially filled, the PVC frequently does not generate a pulse.

Torsade de Pointes

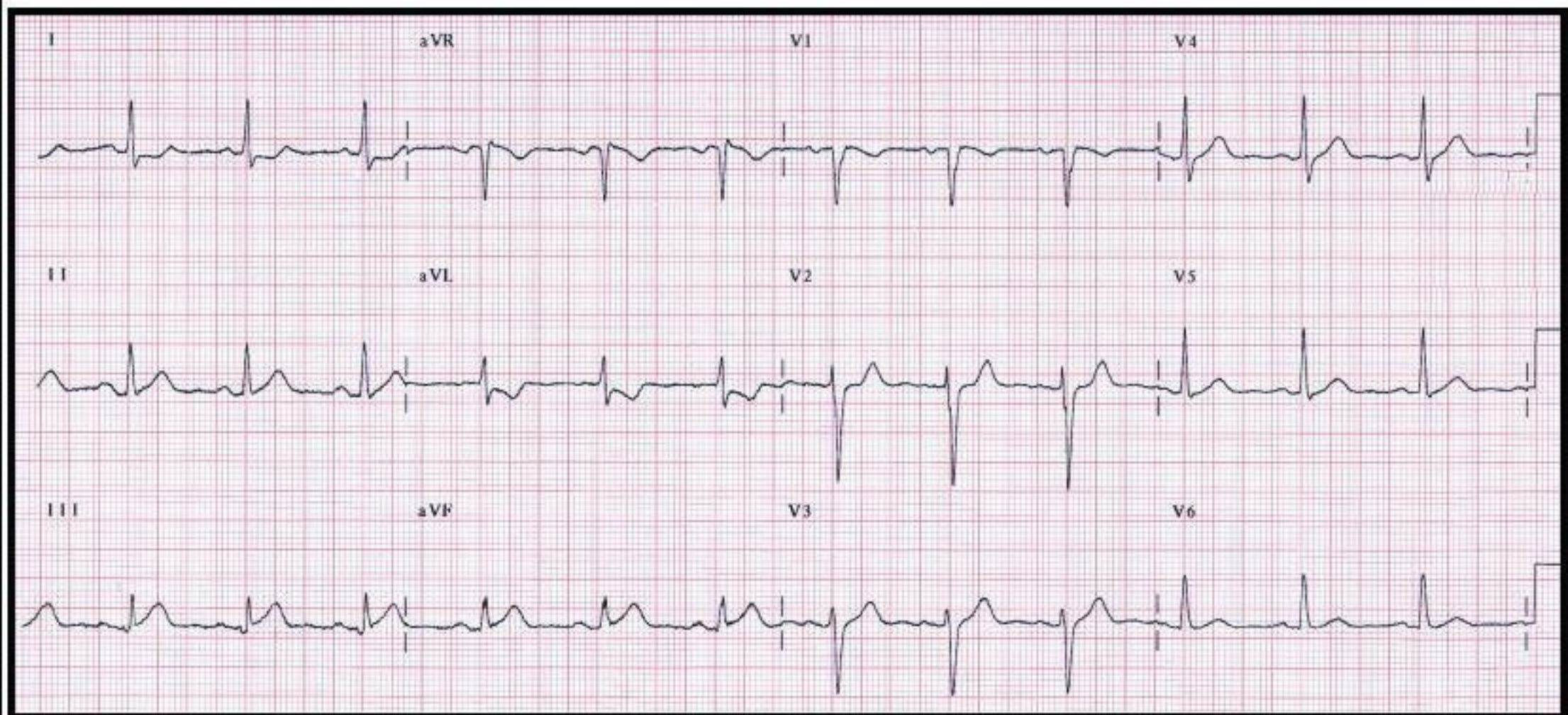
- The QRS reverses polarity, and the strip shows a spindle effect.
- This rhythm is an unusual variant of polymorphic VT with long QT intervals.
- In French *torsade de pointes* means "twisting of points."



Rate: 200–250 bpm
Rhythm: Irregular
P Waves: None
PR Interval: None
QRS: Wide (>0.10 sec), bizarre appearance

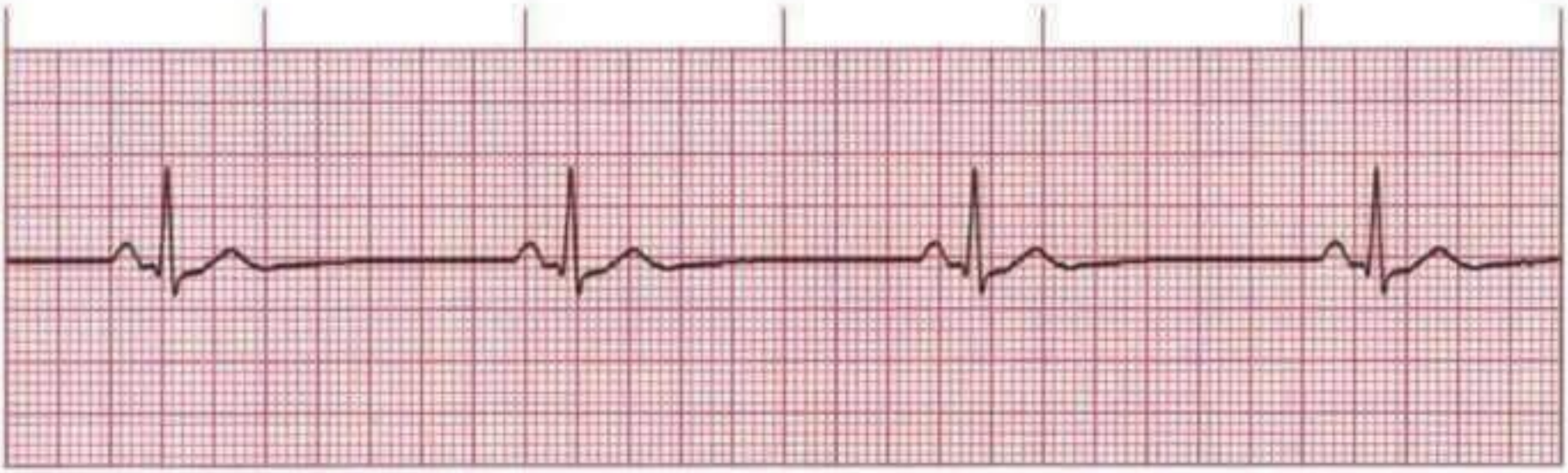
Clinical Tip: Torsade de pointes may deteriorate to VF or asystole.

Clinical Tip: Frequent causes are drugs that prolong the QT interval, electrolyte abnormalities such as hypomagnesemia, and the R-on-T phenomenon.


I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6

Pulseless Electrical Activity (PEA)

- The monitor shows an identifiable electrical rhythm, but no pulse is detected.
- The rhythm may be sinus, atrial, junctional, or ventricular.
- PEA is also called electromechanical dissociation (EMD).

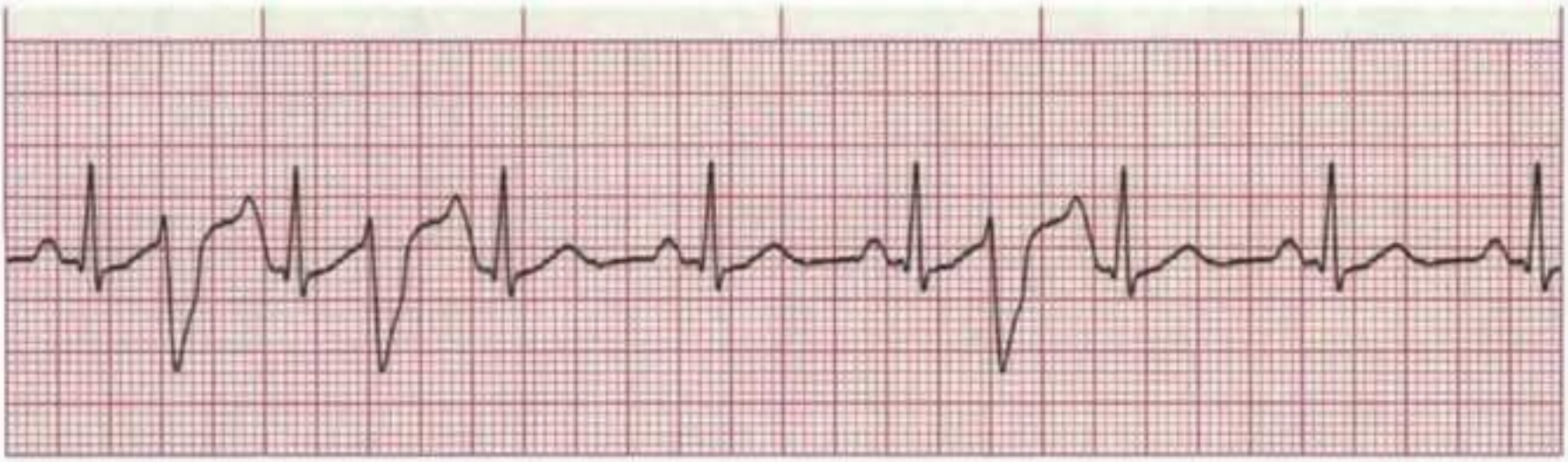


Rate: Reflects underlying rhythm
Rhythm: Reflects underlying rhythm
P Waves: Reflects underlying rhythm
PR Interval: Reflects underlying rhythm
QRS: Reflects underlying rhythm

Clinical Tip: Potential causes of PEA are trauma, tension pneumothorax, thrombosis (pulmonary or coronary), cardiac tamponade, toxins, hypokalemia or hyperkalemia, hypovolemia, hypoxia, hypoglycemia, hypothermia, and hydrogen ion (acidosis).

Premature Ventricular Contraction: R-on-T Phenomenon

- The PVCs occur so early that they fall on the T wave of the preceding beat.
- These PVCs occur during the refractory period of the ventricles, a vulnerable period because the cardiac cells have not fully repolarized.



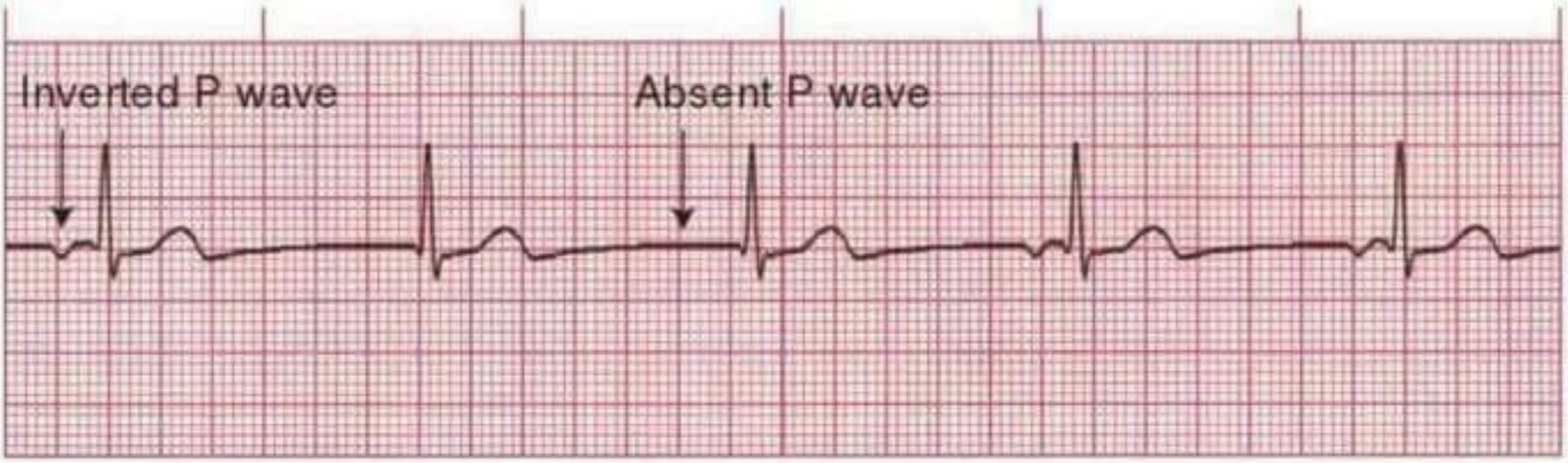
Rate: Depends on rate of underlying rhythm
Rhythm: Irregular whenever a PVC occurs
P Waves: None associated with the PVC
PR Interval: None associated with the PVC
QRS: Wide (>0.10 sec), bizarre appearance

Clinical Tip: In acute ischemia, R-on-T phenomenon may be especially dangerous because the ventricles may be more vulnerable to ventricular tachycardia (VT), ventricular fibrillation (VF), or torsade de pointes.

Junctional Arrhythmias

- The atria and sinus node do not perform their normal pacemaking functions.
- A junctional escape rhythm begins.

Junctional Rhythm

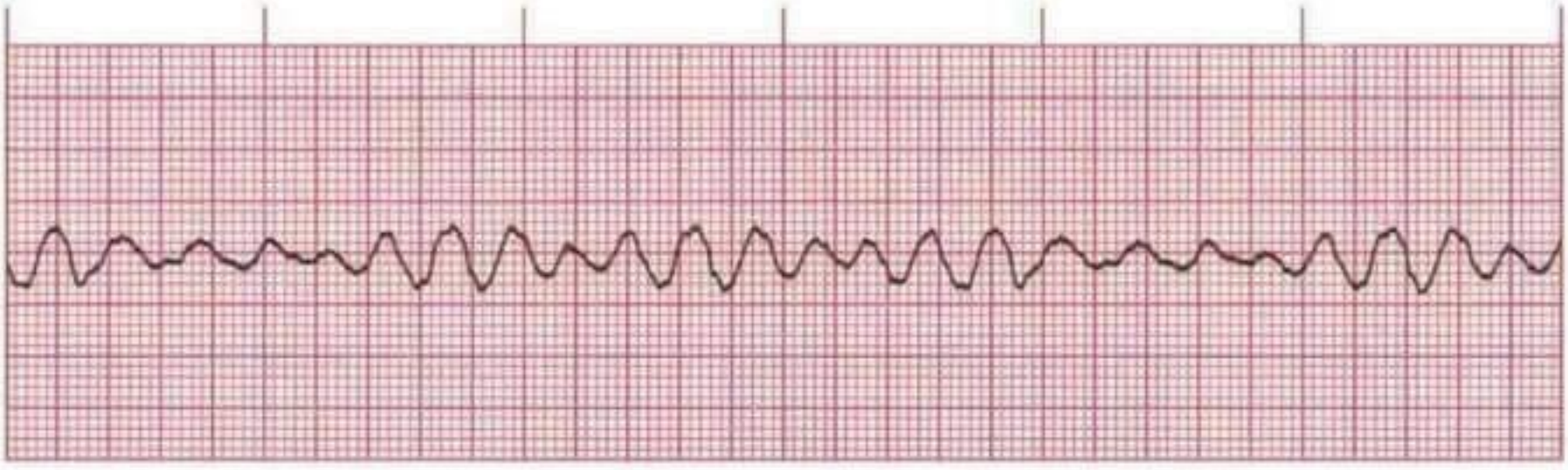


Rate: 40–60 bpm
Rhythm: Regular
P Waves: Absent, inverted, buried, or retrograde
PR Interval: None, short, or retrograde
QRS: Normal (0.06–0.10 sec)

Clinical Tip: Sinus node disease that causes inappropriate sinus node slowing may exacerbate this rhythm. Young, healthy adults, especially those with increased vagal tone during sleep, often have periods of junctional rhythm that is completely benign, not requiring intervention.

Ventricular Fibrillation (VF)

- Chaotic electrical activity occurs with no ventricular depolarization or contraction.
- The amplitude and frequency of the fibrillatory activity can define the type of fibrillation as coarse, medium, or fine. Small baseline undulations are considered fine; large ones are coarse.

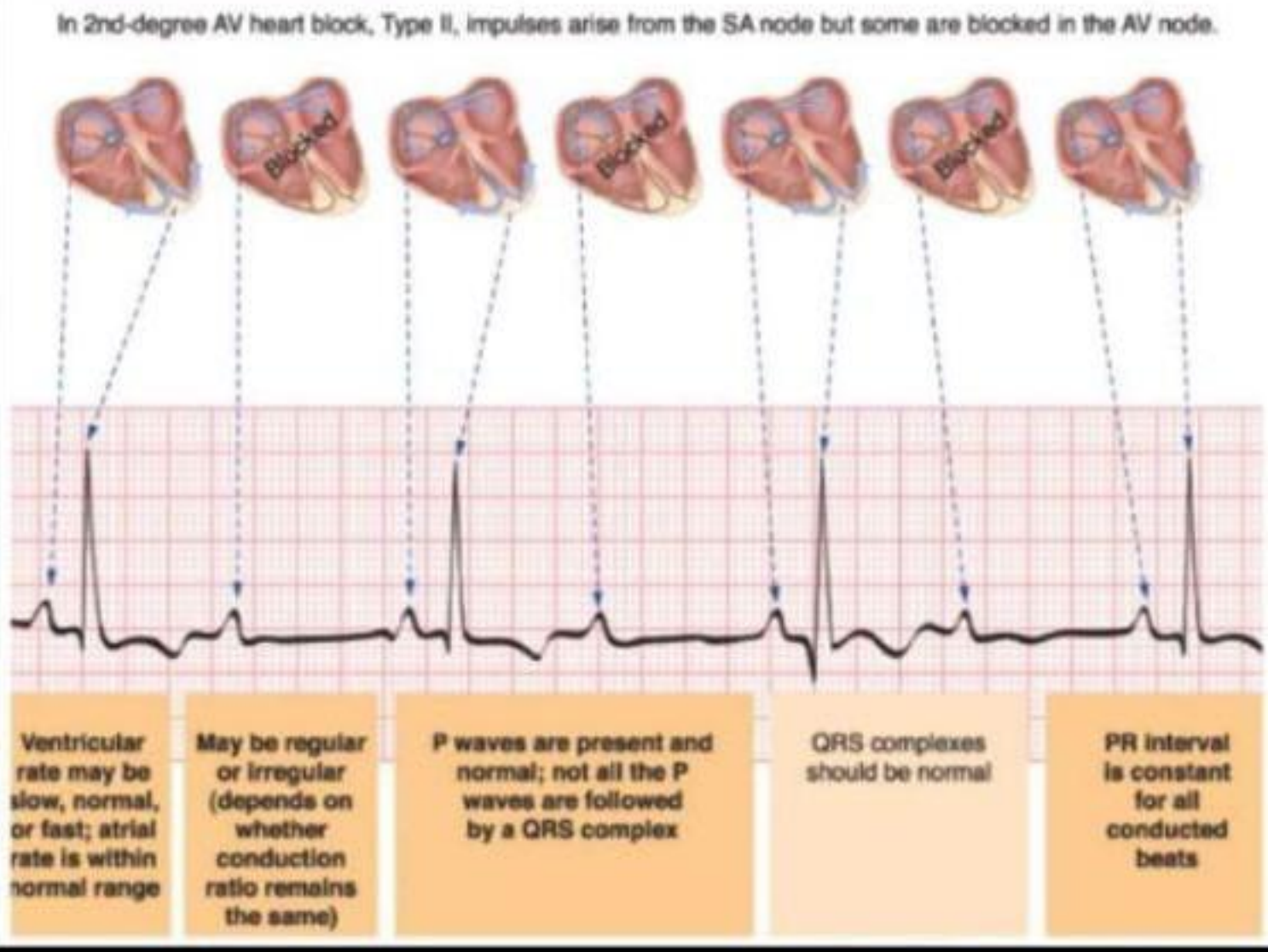


Rate: Indeterminate
Rhythm: Chaotic
P Waves: None
PR Interval: None
QRS: None

Clinical Tip: There is no pulse or cardiac output. Rapid intervention is critical. The longer the delay, the less the chance of conversion.

2nd-Degree AV Heart Block, Mobitz Type II

- Intermittent block at the level of the bundle of His or bundle branches resulting in atrial impulses that are not conducted to the



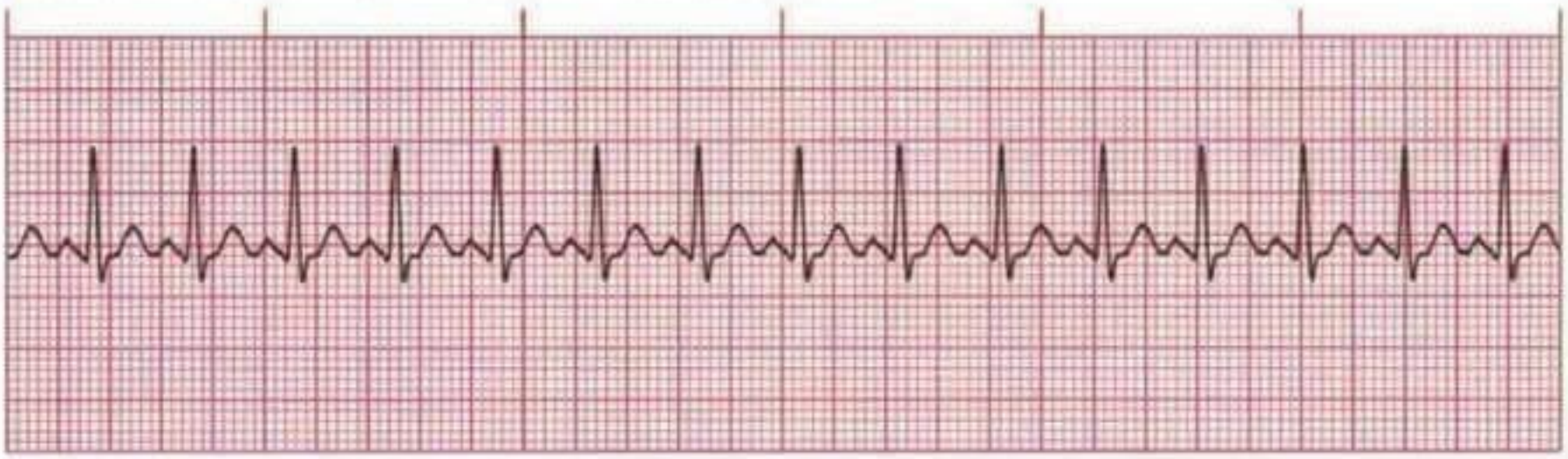
Mobitz I or Wenckebach

Mobitz II

2:1 block

Sinus Tachycardia

- The sinus node discharges more frequently than in NSR.

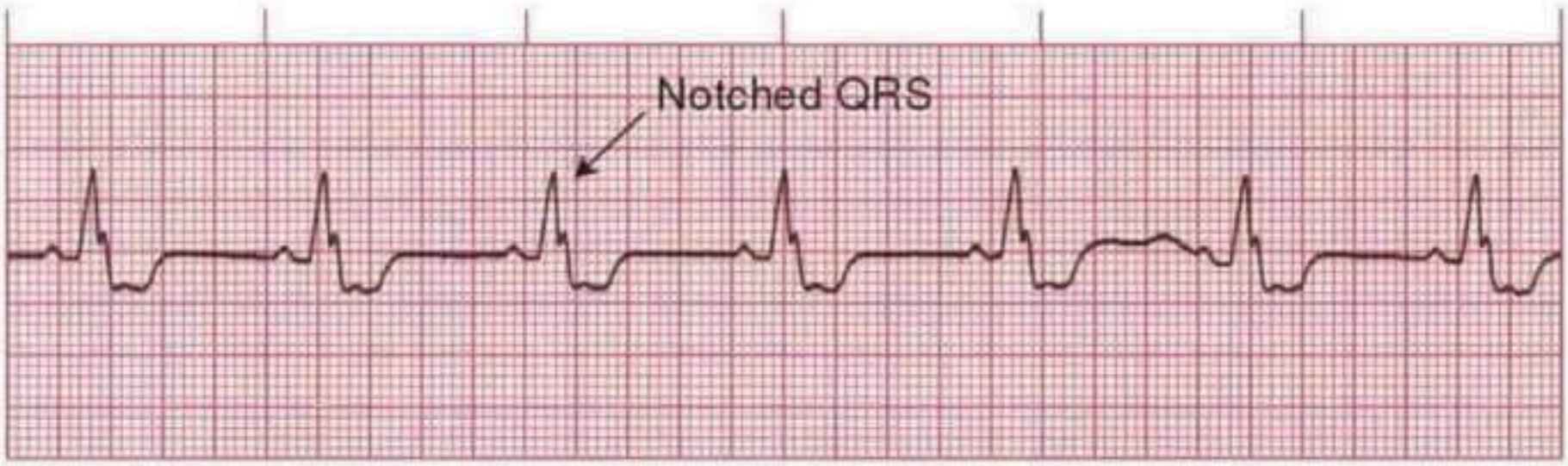


Rate: Fast (>100 bpm)
Rhythm: Regular
P Waves: Normal (upright and uniform)
PR Interval: Normal (0.12–0.20 sec)
QRS: Normal (0.06–0.10 sec)

Clinical Tip: Sinus tachycardia may be caused by conditions such as fear, pain, exercise, anxiety, or fever. More significant pathological causes include hypoxemia, hypovolemia/dehydration, cardiac failure or recent MI, CHF, beta blocker withdrawal, hyperthyroidism, or withdrawal from nicotine, caffeine, or alcohol.

Bundle Branch Block (BBB)

- Either the left or the right ventricle may depolarize late, creating a "wide" or "notched" QRS complex.

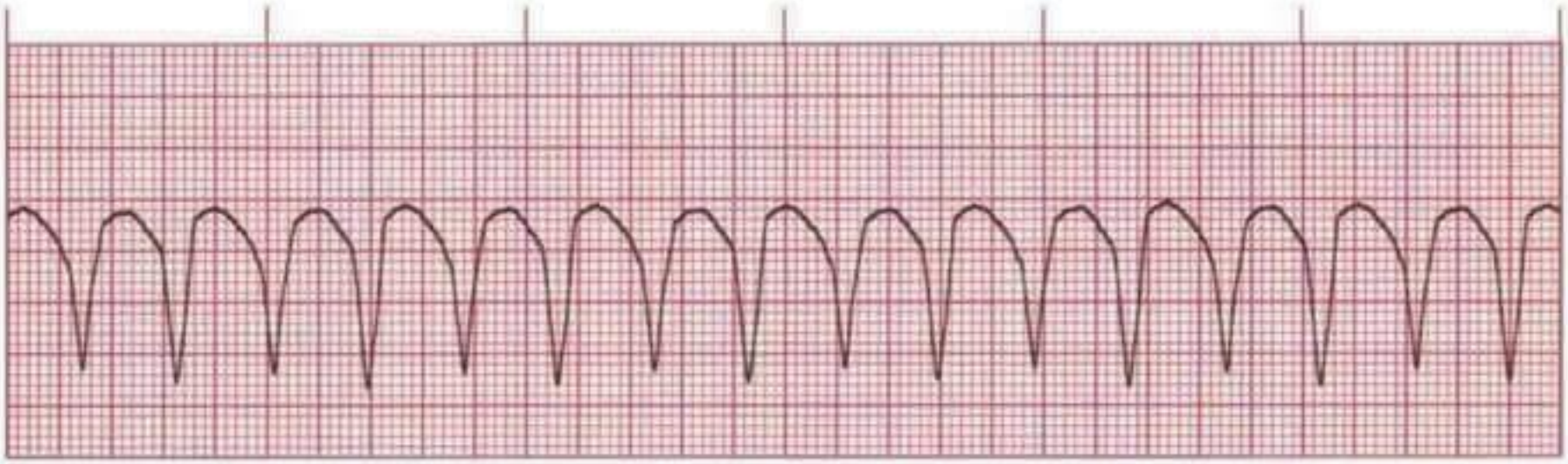


Rate: Depends on rate of underlying rhythm
Rhythm: Regular
P Waves: Normal (upright and uniform)
PR Interval: Normal (0.12–0.20 sec)
QRS: Wide (>0.10 sec) with a notched appearance

Clinical Tip: Bundle branch block commonly occurs in coronary artery disease.

Ventricular Tachycardia (VT): Monomorphic

- In monomorphic VT, QRS complexes have the same shape and amplitude.



Rate: 100–250 bpm
Rhythm: Regular
P Waves: None or not associated with the QRS
PR Interval: None
QRS: Wide (>0.10 sec), bizarre appearance

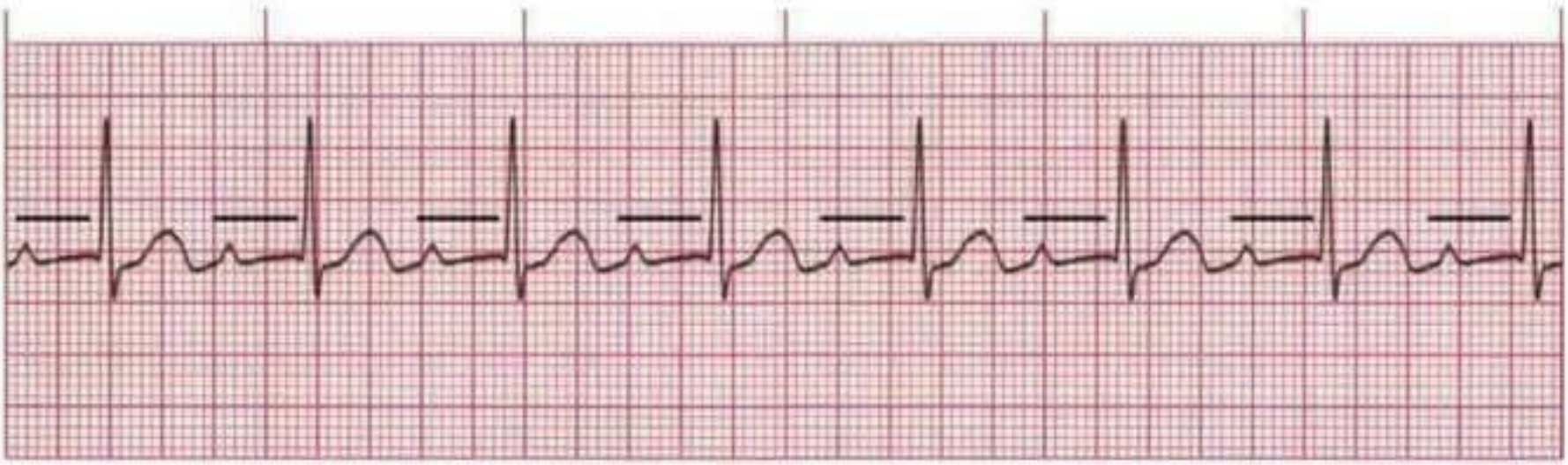
Clinical Tip: It is important to confirm the presence or absence of pulses because monomorphic VT may be perfusing or nonperfusing.

Clinical Tip: Monomorphic VT will probably deteriorate into VF or unstable VT if sustained and not treated.

Atrioventricular (AV) Blocks

- AV blocks are divided into three categories: first, second, and third degree.

First-Degree AV Block



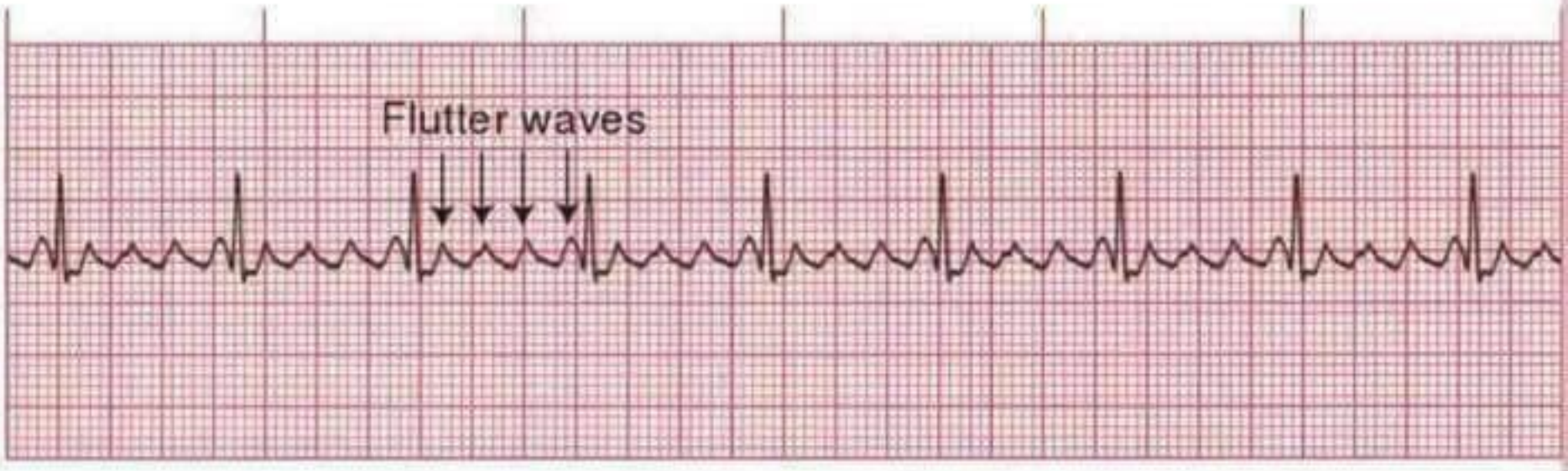
Rate: Depends on rate of underlying rhythm
Rhythm: Regular
P Waves: Normal (upright and uniform)
PR Interval: Prolonged (>0.20 sec)
QRS: Normal (0.06–0.10 sec)

Clinical Tip: Usually a first-degree AV block is benign, but if associated with an acute MI, it may lead to further AV defects.

Clinical Tip: Often AV block is caused by medications that prolong AV conduction; these include digoxin, calcium channel blockers, and beta blockers.

Atrial Flutter (A-flutter)

- AV node conducts impulses to the ventricles at a ratio of 2:1, 3:1, 4:1, or greater (rarely 1:1).
- The degree of AV block may be consistent or variable.



Rate: Atrial: 250–350 bpm; ventricular: variable
Rhythm: Atrial: regular; ventricular: variable
P Waves: Flutter waves have a saw-toothed appearance; some may be buried in the QRS and not visible
PR Interval: Variable
QRS: Usually normal (0.06–0.10 sec), but may appear widened if flutter waves are buried in QRS

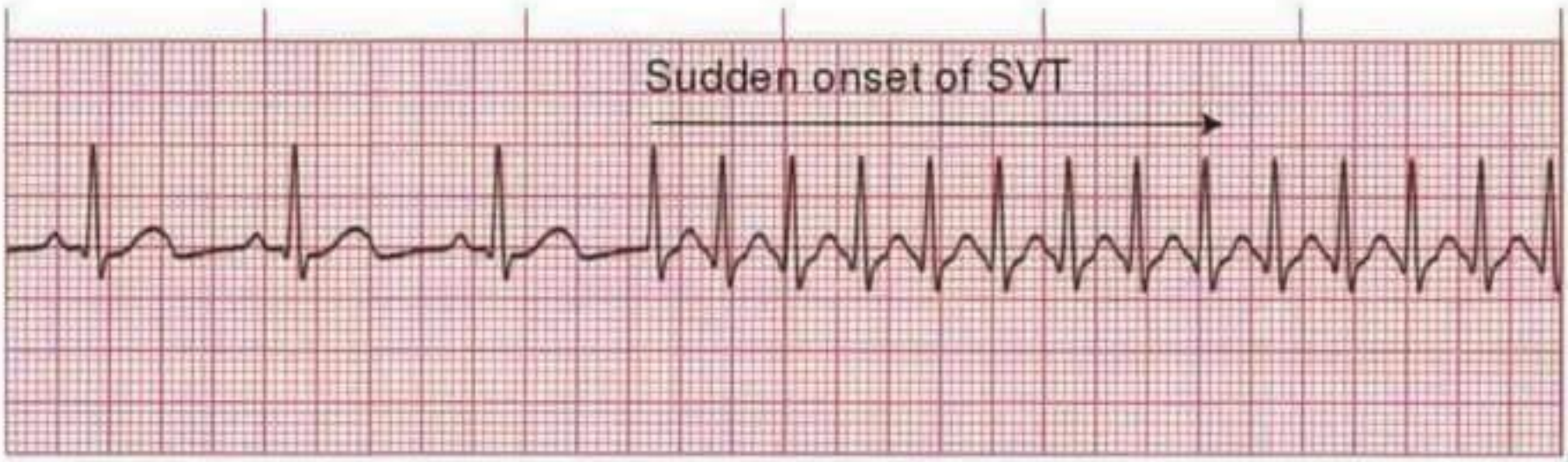
Clinical Tip: A-flutter may be the first indication of cardiac disease.

Clinical Tip: Signs and symptoms depend on ventricular response rate.

Figure 2. Atrial fibrillation on an electrocardiogram

Paroxysmal Supraventricular Tachycardia (PSVT)

- PSVT is a rapid rhythm that starts and stops suddenly.
- For accurate interpretation, the beginning or end of the PSVT must be seen.
- PSVT is sometimes called paroxysmal atrial tachycardia (PAT).



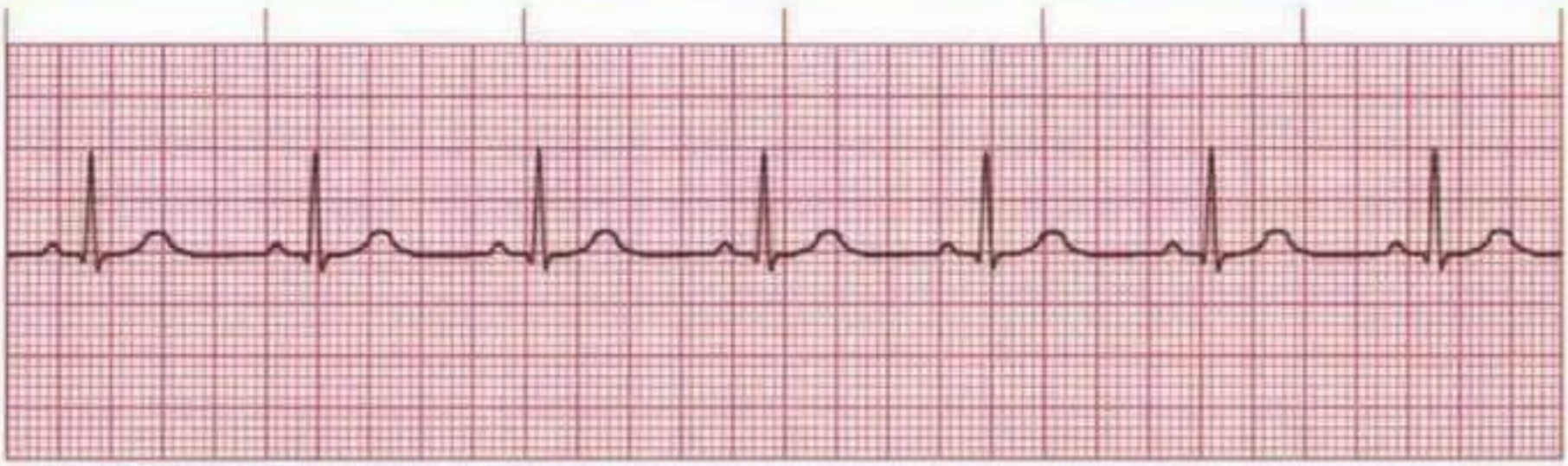
Rate: 150–250 bpm
Rhythm: Irregular
P Waves: Frequently buried in preceding T waves and difficult to see
PR Interval: Usually not possible to measure
QRS: Normal (0.06–0.10 sec) but may be wide if abnormally conducted through ventricles

Clinical Tip: The patient may feel palpitations, dizziness, lightheadedness, or anxiety.

Sinoatrial (SA) Node Arrhythmias

- Upright P waves all look similar. **Note: All ECG strips in Tab 1 were recorded in lead II.**
- PR intervals and QRS complexes are of normal duration.

Normal Sinus Rhythm (NSR)



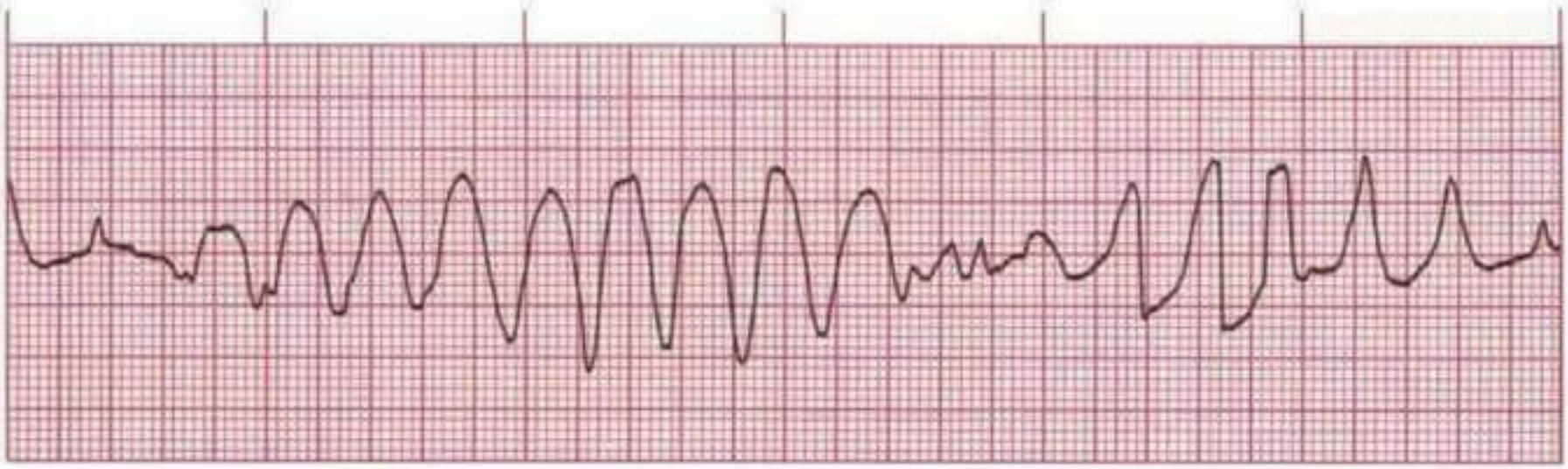
Rate: Normal (60–100 bpm)
Rhythm: Regular
P Waves: Normal (upright and uniform)
PR Interval: Normal (0.12–0.20 sec)
QRS: Normal (0.06–0.10 sec)

Clinical Tip: A normal ECG does not exclude heart disease.

Clinical Tip: This rhythm is generated by the sinus node, and its rate is within normal limits (60–80 bpm).

Torsade de Pointes

- The QRS reverses polarity, and the strip shows a spindle effect.
- This rhythm is an unusual variant of polymorphic VT with long QT intervals.
- In French *torsade de pointes* means "twisting of points."

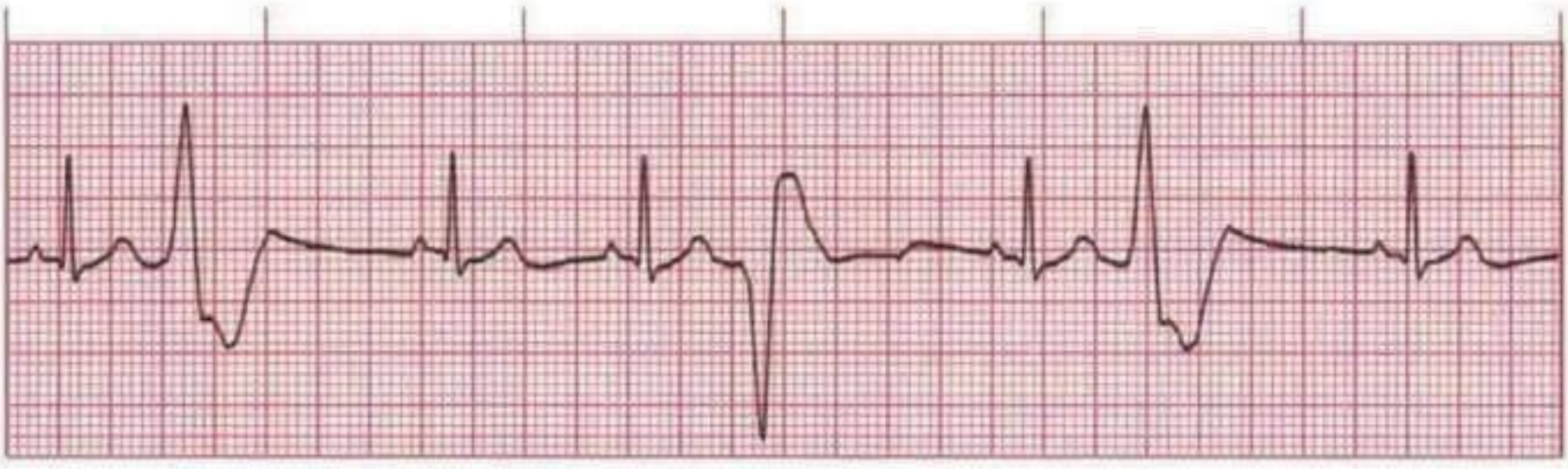


Rate: 200–250 bpm
Rhythm: Irregular
P Waves: None
PR Interval: None
QRS: Wide (>0.10 sec), bizarre appearance

Clinical Tip: Torsade de pointes may deteriorate to VF or asystole.

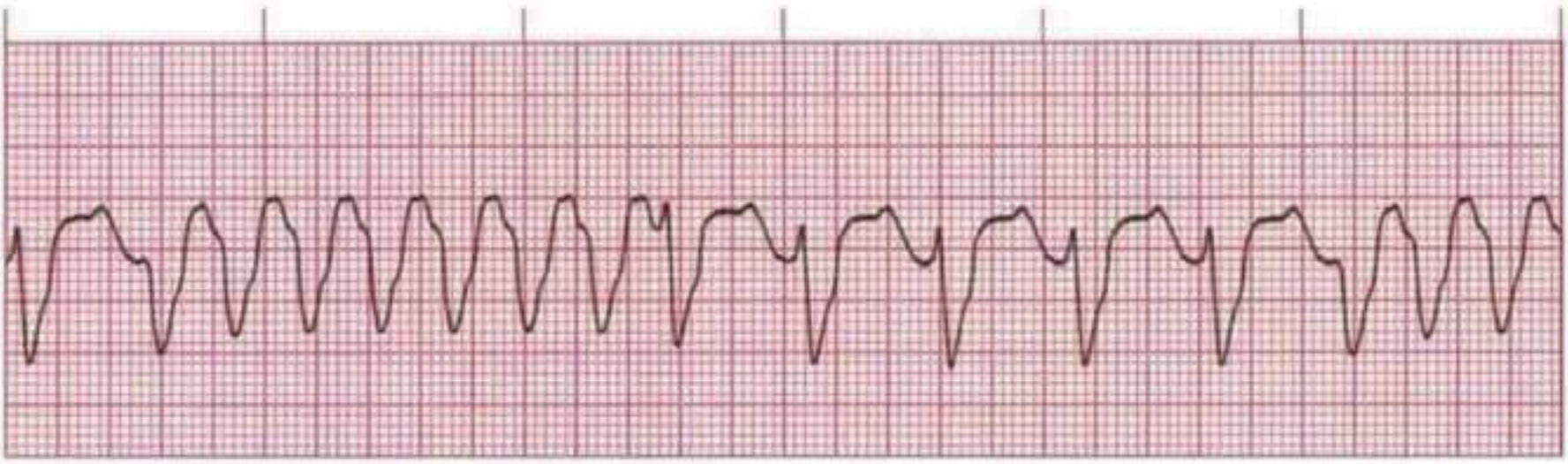
Clinical Tip: Frequent causes are drugs that prolong the QT interval, electrolyte abnormalities such as hypomagnesemia, and the R-on-T phenomenon.

Premature Ventricular Contraction: Multiform (different forms)



Ventricular Tachycardia (VT): Polymorphic

- In polymorphic VT, QRS complexes vary in shape and amplitude.
- The QT interval is normal or long.



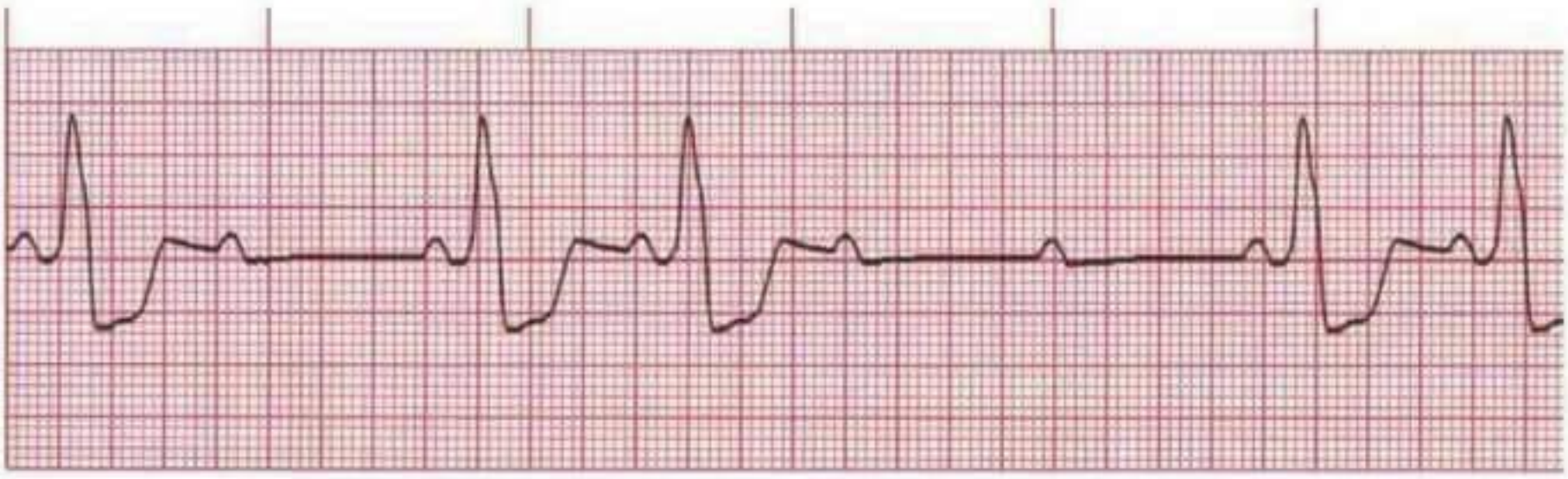
Rate: 100–250 bpm
Rhythm: Regular or irregular
P Waves: None or not associated with the QRS
PR Interval: None
QRS: Wide (>0.10 sec), bizarre appearance

Clinical Tip: It is important to determine whether pulses are present because polymorphic VT may be perfusing or nonperfusing.

Clinical Tip: Consider electrolyte abnormalities as a possible cause.

Second-Degree AV Block—Type II (Mobitz II)

- Conduction ratio (P waves to QRS complexes) is commonly 2:1, 3:1, or 4:1, or variable.
- QRS complexes are usually wide because this block usually involves both bundle branches.

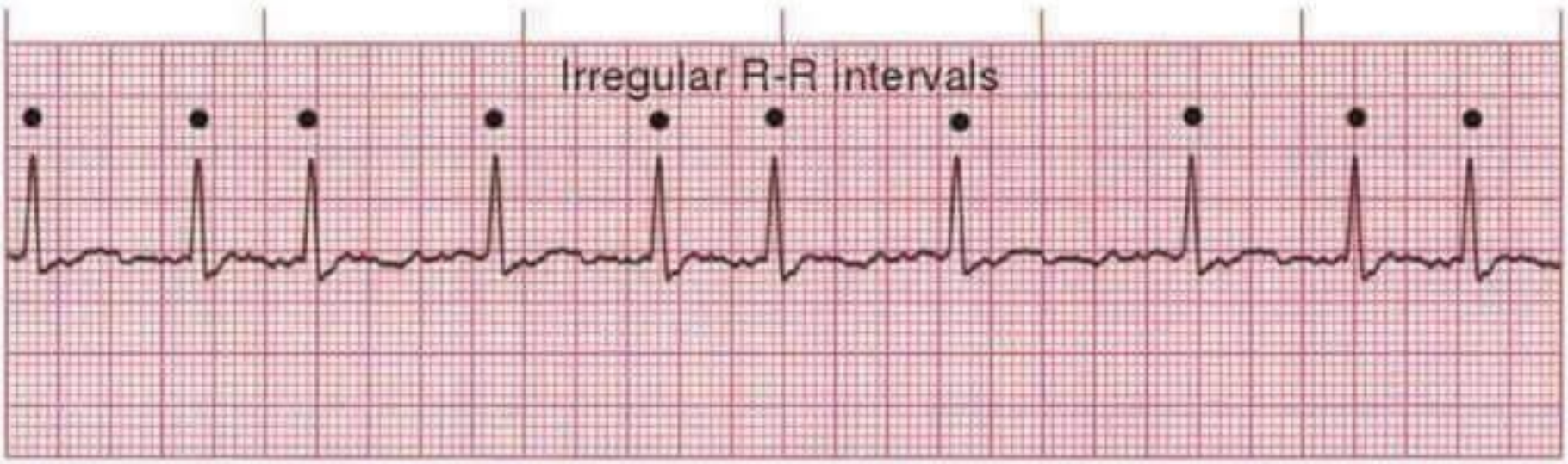


Rate: Atrial: usually 60–100 bpm; ventricular: slower than atrial rate
Rhythm: Atrial: regular; ventricular: regular or irregular
P Waves: Normal (upright and uniform); more P waves than QRS complexes
PR Interval: Normal or prolonged but constant
QRS: May be normal, but usually wide (>0.10 sec) if the bundle branches are involved

Clinical Tip: Resulting bradycardia can compromise cardiac output and lead to complete AV block. This rhythm often occurs with cardiac ischemia or an MI.

Atrial Fibrillation (A-fib)

- Rapid, erratic electrical discharge comes from multiple atrial ectopic foci.
- No organized atrial depolarization is detectable.



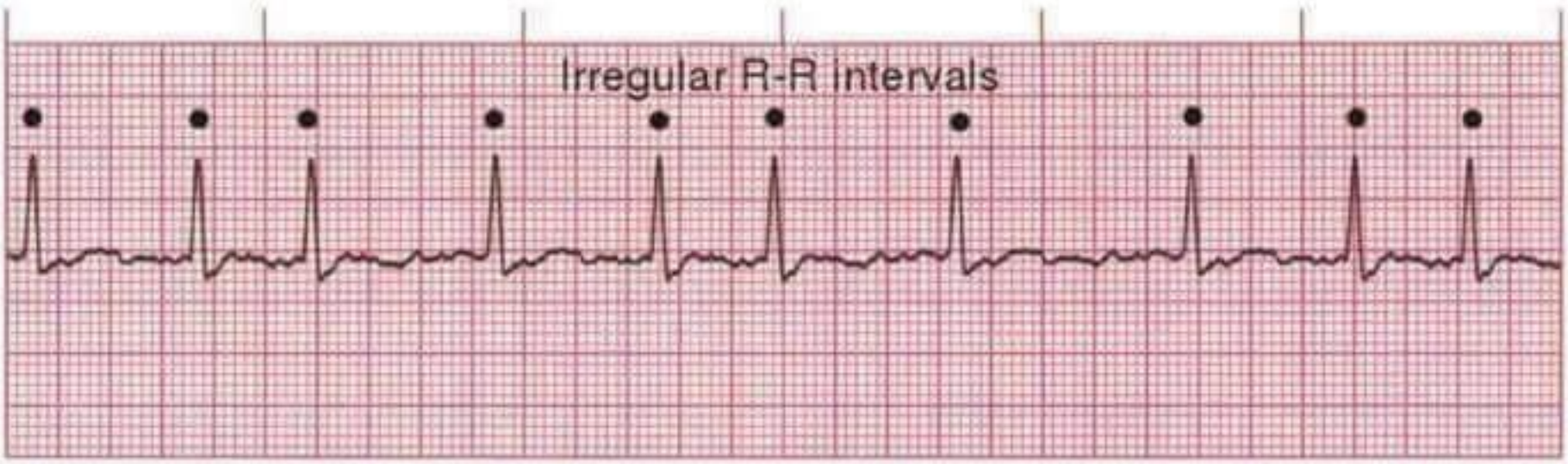
Rate: Atrial: ☒350 bpm; ventricular: variable
Rhythm: Irregular
P Waves: No true P waves; chaotic atrial activity
PR Interval: None
QRS: Normal (0.06–0.10 sec)

Clinical Tip: A-fib is usually a chronic arrhythmia associated with underlying heart disease.

Clinical Tip: Signs and symptoms depend on ventricular response rate.

Atrial Fibrillation (A-fib)

- Rapid, erratic electrical discharge comes from multiple atrial ectopic foci.
- No organized atrial depolarization is detectable.



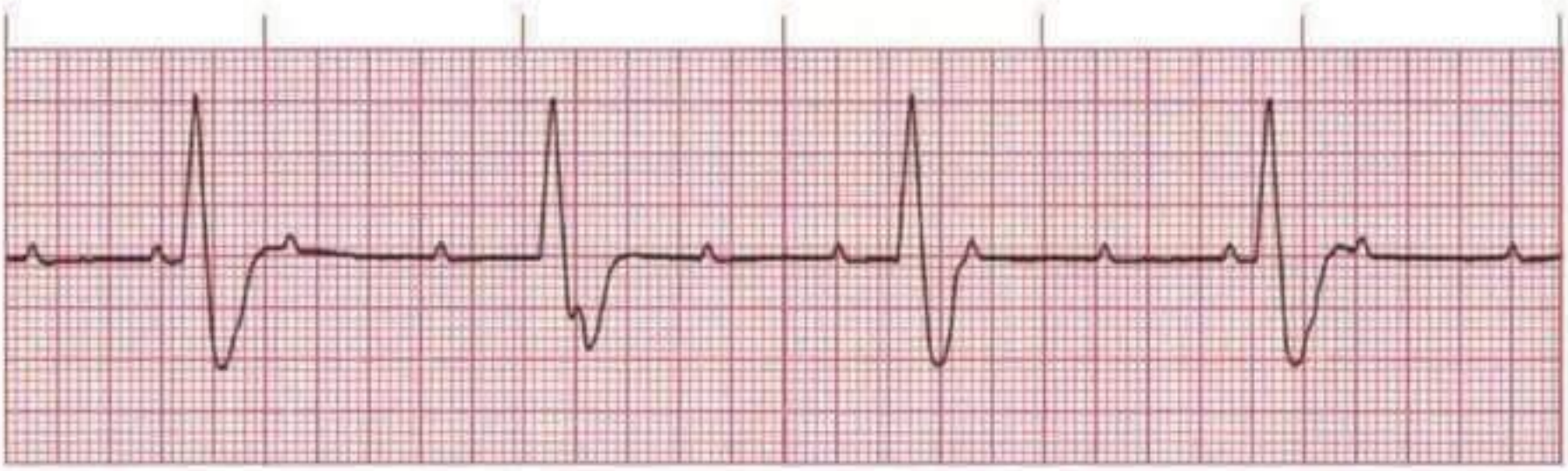
Rate: Atrial: ☒350 bpm; ventricular: variable
Rhythm: Irregular
P Waves: No true P waves; chaotic atrial activity
PR Interval: None
QRS: Normal (0.06–0.10 sec)

Clinical Tip: A-fib is usually a chronic arrhythmia associated with underlying heart disease.

Clinical Tip: Signs and symptoms depend on ventricular response rate.

Third-Degree AV Block

- Conduction between the atria and ventricles is totally absent because of complete electrical block at or below the AV node. This is known as AV dissociation.
- "Complete heart block" is another name for this rhythm.



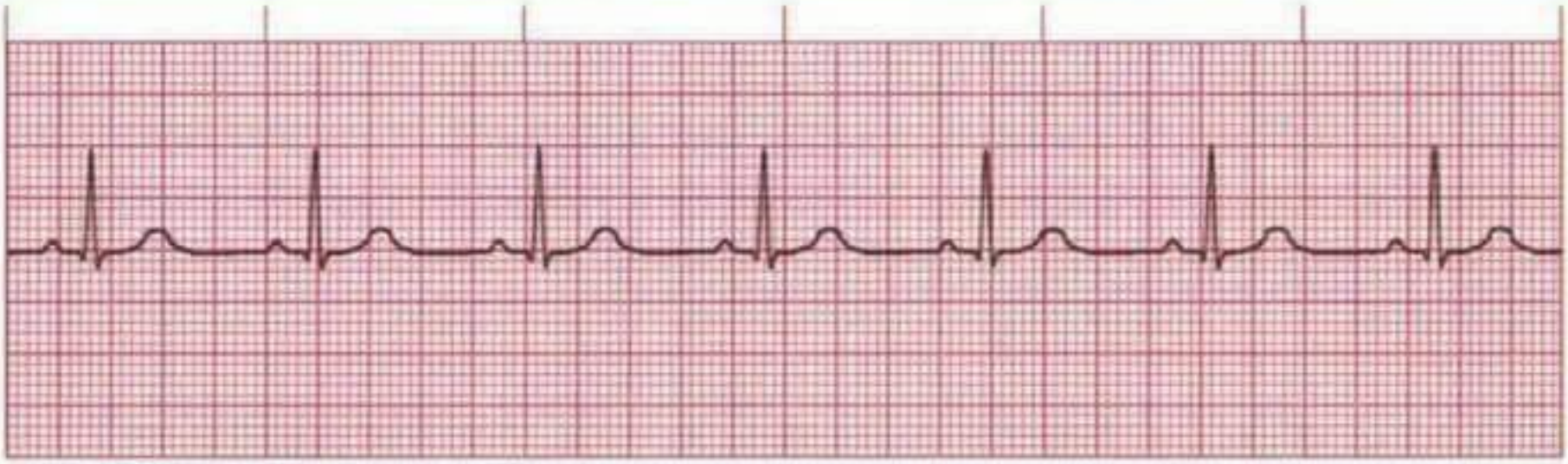
Rate: Atrial: 60–100 bpm; ventricular: 40–60 bpm if escape focus is junctional, <40 bpm if escape focus is ventricular
Rhythm: Usually regular, but atria and ventricles act independently
P Waves: Normal (upright and uniform); may be superimposed on QRS complexes or T waves
PR Interval: Varies greatly
QRS: Normal if ventricles are activated by junctional escape focus; wide if escape focus is ventricular

Clinical Tip: Third-degree AV block may be associated with ischemia involving the left coronary arteries.

Sinoatrial (SA) Node Arrhythmias

- Upright P waves all look similar. **Note: All ECG strips in Tab 1 were recorded in lead II.**
- PR intervals and QRS complexes are of normal duration.

Normal Sinus Rhythm (NSR)



Rate: Normal (60–100 bpm)
Rhythm: Regular
P Waves: Normal (upright and uniform)
PR Interval: Normal (0.12–0.20 sec)
QRS: Normal (0.06–0.10 sec)

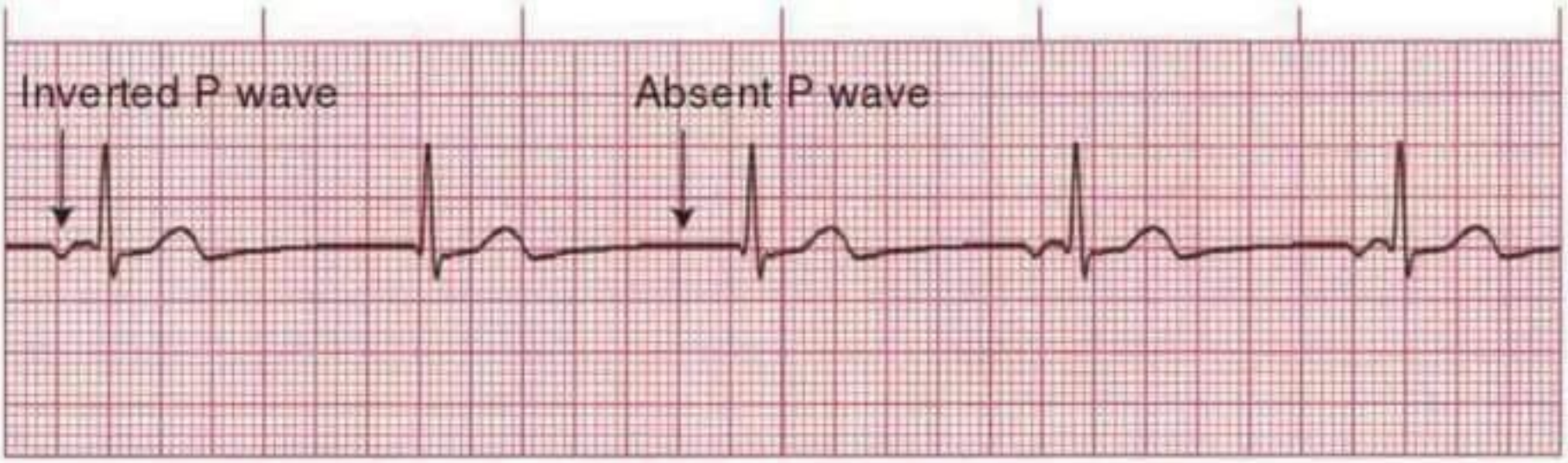
Clinical Tip: A normal ECG does not exclude heart disease.

Clinical Tip: This rhythm is generated by the sinus node, and its rate is within normal limits (60–80 bpm).

Junctional Arrhythmias

- The atria and sinus node do not perform their normal pacemaking functions.
- A junctional escape rhythm begins.

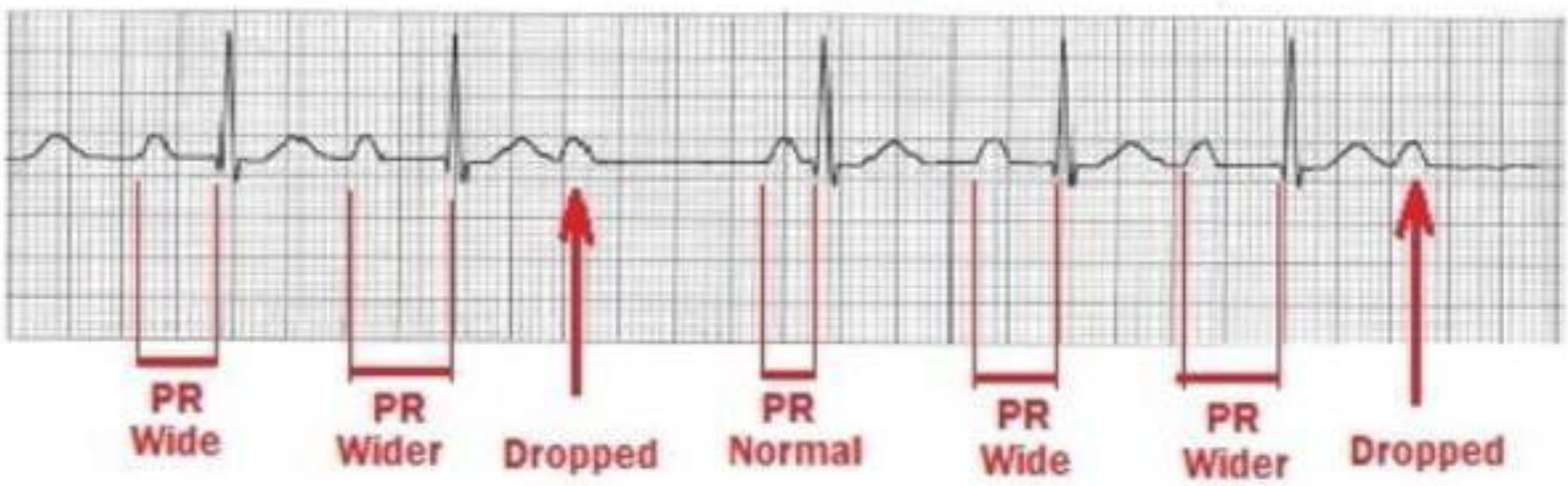
Junctional Rhythm



Rate: 40–60 bpm
Rhythm: Regular
P Waves: Absent, inverted, buried, or retrograde
PR Interval: None, short, or retrograde
QRS: Normal (0.06–0.10 sec)

Clinical Tip: Sinus node disease that causes inappropriate sinus node slowing may exacerbate this rhythm. Young, healthy adults, especially those with increased vagal tone during sleep, often have periods of junctional rhythm that is completely benign, not requiring intervention.

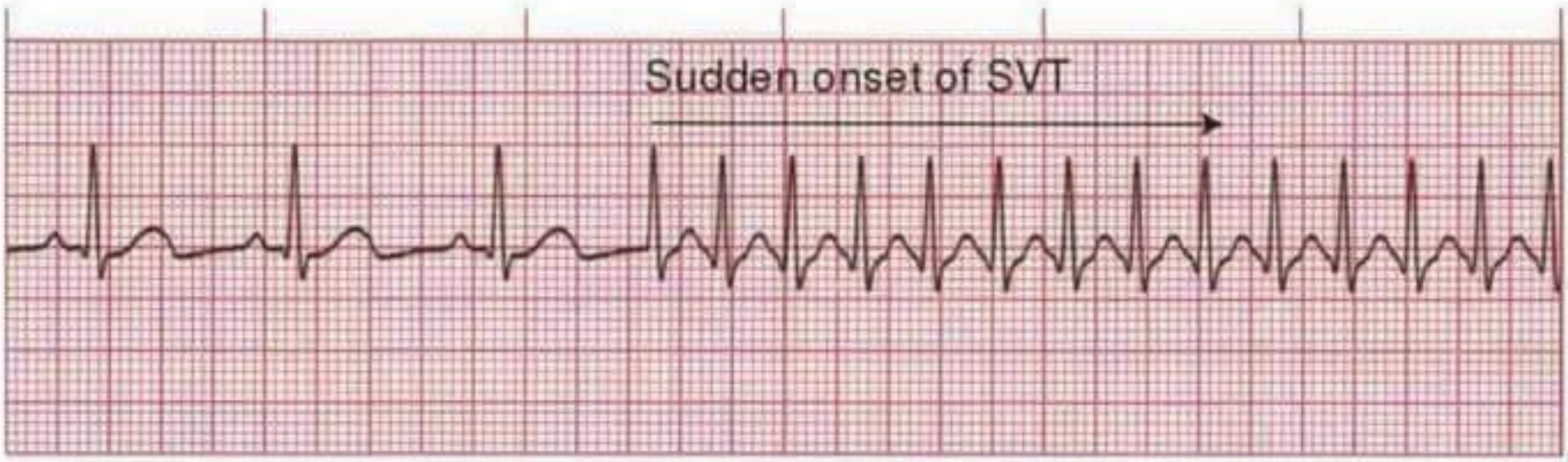
2nd Degree AV Block Type I (Wenkebach)



1. The P-R interval successively widens until QRS fails (drops)
2. The ventricular rhythm is irregular
3. The Atrial rhythm is usually regular

Paroxysmal Supraventricular Tachycardia (PSVT)

- PSVT is a rapid rhythm that starts and stops suddenly.
- For accurate interpretation, the beginning or end of the PSVT must be seen.
- PSVT is sometimes called paroxysmal atrial tachycardia (PAT).



Rate: 150–250 bpm
Rhythm: Irregular
P Waves: Frequently buried in preceding T waves and difficult to see
PR Interval: Usually not possible to measure
QRS: Normal (0.06–0.10 sec) but may be wide if abnormally conducted through ventricles

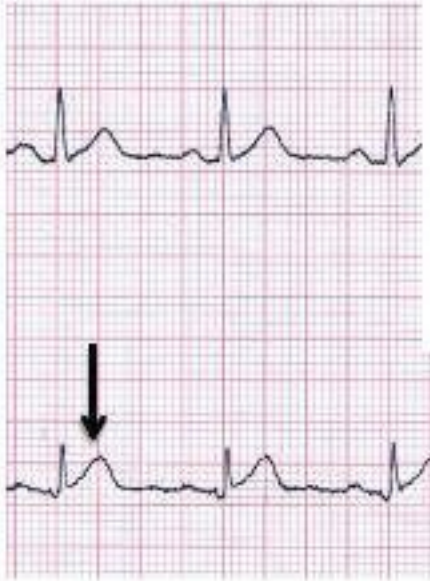
Clinical Tip: The patient may feel palpitations, dizziness, lightheadedness, or anxiety.

B

Lateral Leads

Reciprocal
ST Segment
Depression

C

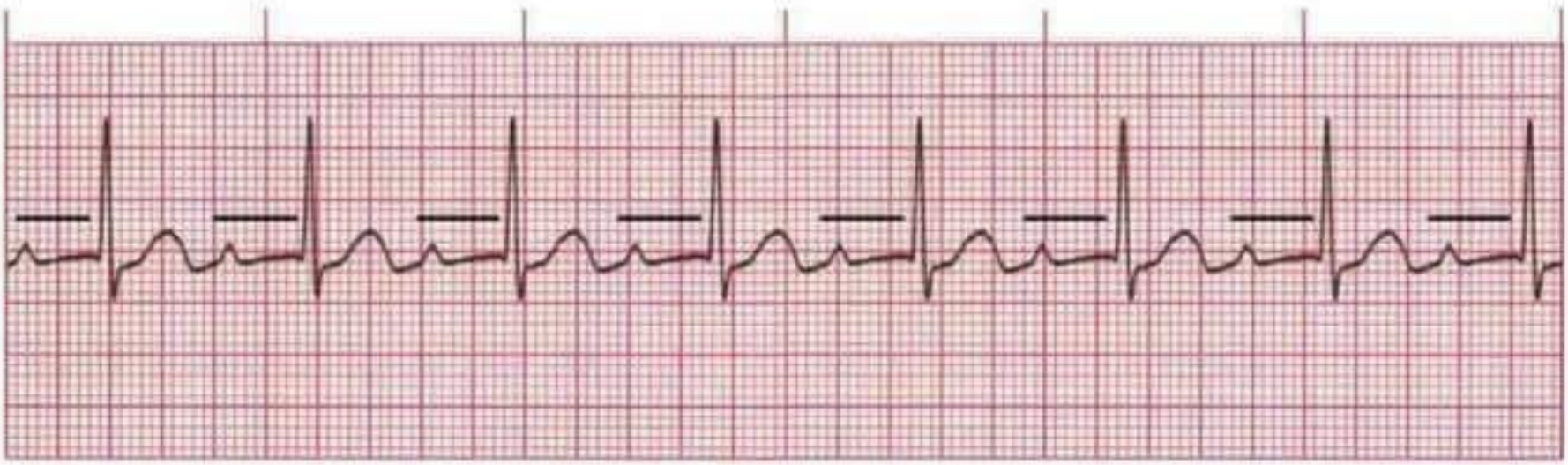


Inferior Leads
Subtle
Inferior STEMI

Atrioventricular (AV) Blocks

- AV blocks are divided into three categories: first, second, and third degree.

First-Degree AV Block

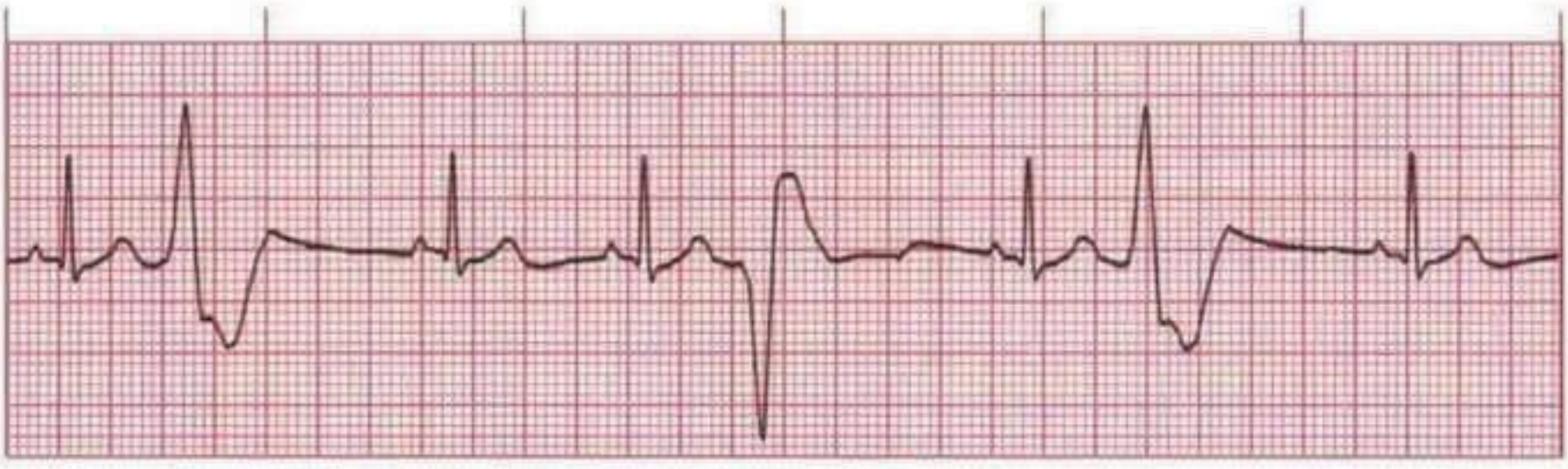


Rate: Depends on rate of underlying rhythm
Rhythm: Regular
P Waves: Normal (upright and uniform)
PR Interval: Prolonged (>0.20 sec)
QRS: Normal (0.06–0.10 sec)

Clinical Tip: Usually a first-degree AV block is benign, but if associated with an acute MI, it may lead to further AV defects.

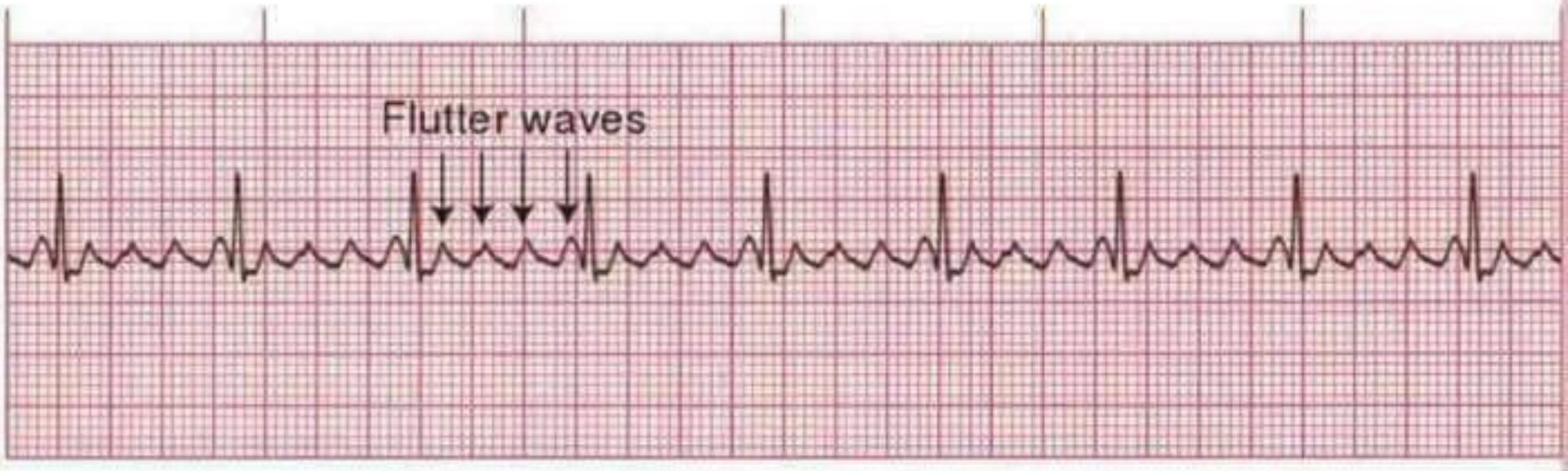
Clinical Tip: Often AV block is caused by medications that prolong AV conduction; these include digoxin, calcium channel blockers, and beta blockers.

Premature Ventricular Contraction: Multiform (different forms)



Atrial Flutter (A-flutter)

- AV node conducts impulses to the ventricles at a ratio of 2:1, 3:1, 4:1, or greater (rarely 1:1).
- The degree of AV block may be consistent or variable.



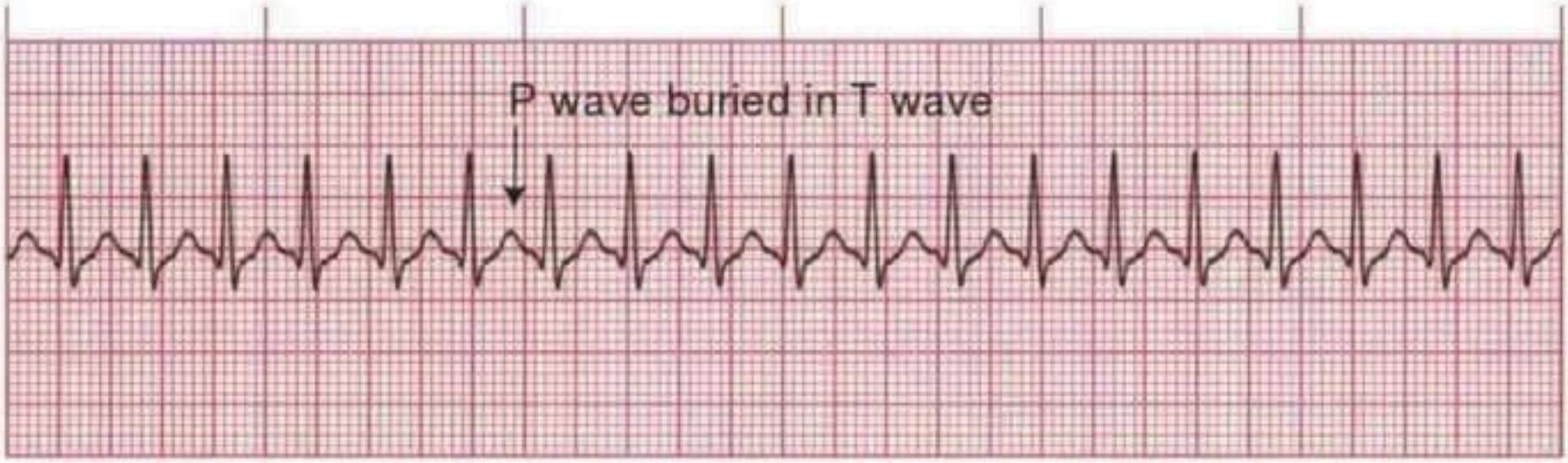
Rate: Atrial: 250–350 bpm; ventricular: variable
Rhythm: Atrial: regular; ventricular: variable
P Waves: Flutter waves have a saw-toothed appearance; some may be buried in the QRS and not visible
PR Interval: Variable
QRS: Usually normal (0.06–0.10 sec), but may appear widened if flutter waves are buried in QRS

Clinical Tip: A-flutter may be the first indication of cardiac disease.

Clinical Tip: Signs and symptoms depend on ventricular response rate.

Supraventricular Tachycardia (SVT)

- This arrhythmia has such a fast rate that the P waves may not be seen.



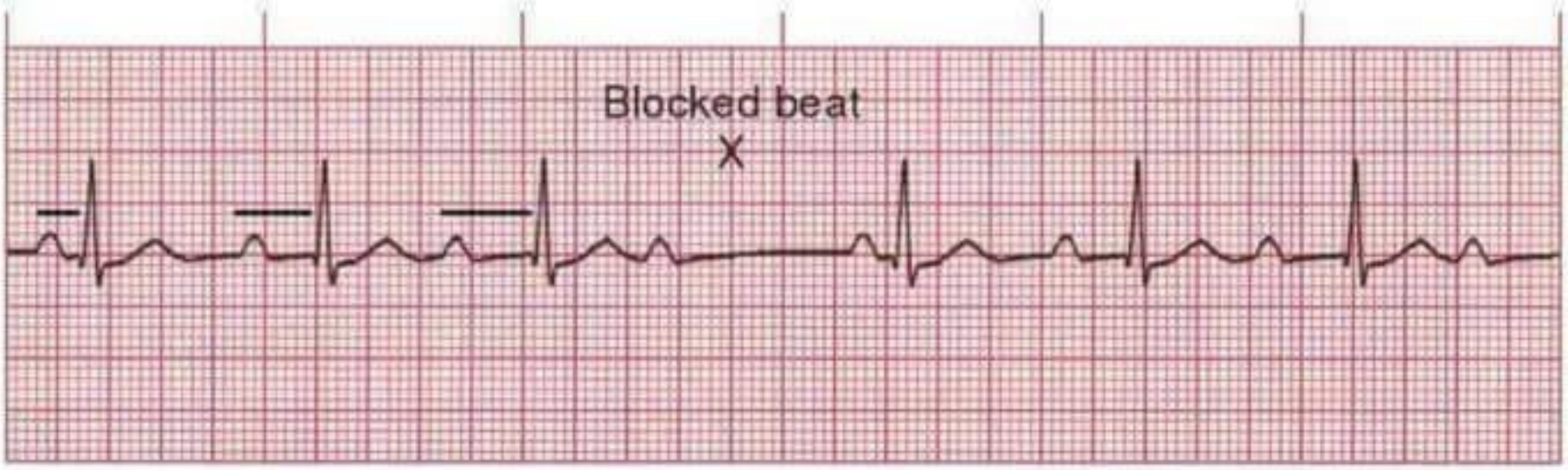
Rate: 150–250 bpm
Rhythm: Regular
P Waves: Frequently buried in preceding T waves and difficult to see
PR Interval: Usually not possible to measure
QRS: Normal (0.06–0.10 sec) but may be wide if abnormally conducted through ventricles

Clinical Tip: SVT may be related to caffeine intake, nicotine, stress, or anxiety in healthy adults.

Clinical Tip: Some patients may experience angina, hypotension, lightheadedness, palpitations, and intense anxiety.

Second-Degree AV Block—Type I (Mobitz I or Wenckebach)

- PR intervals become progressively longer until one P wave is totally blocked and produces no QRS complex. After a pause, during which the AV node recovers, this cycle is repeated.

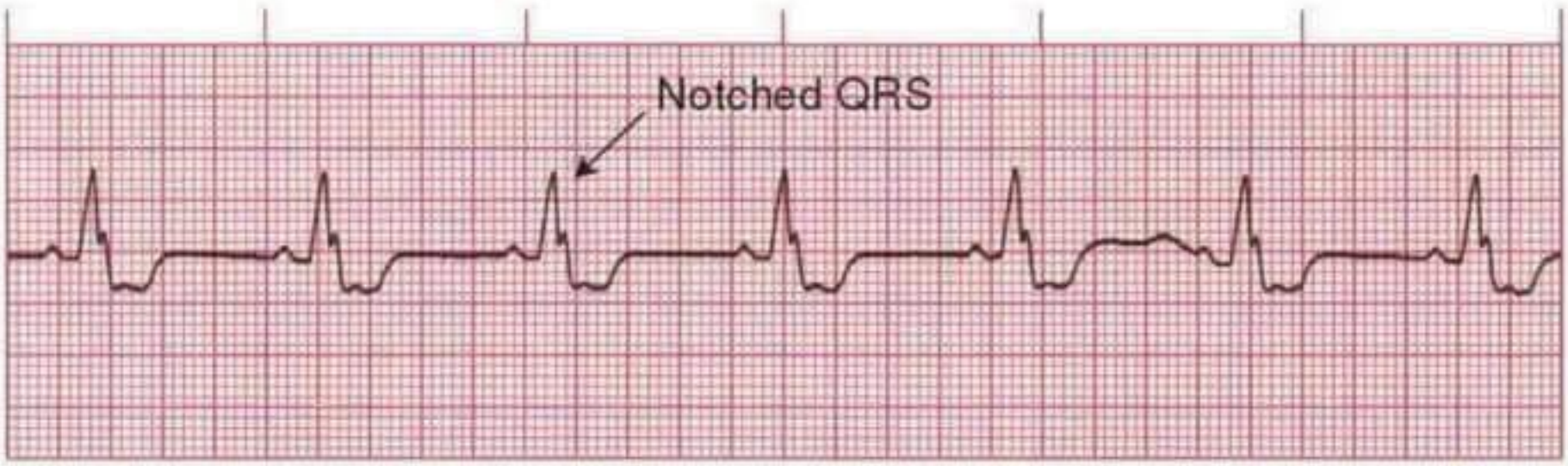


Rate: Depends on rate of underlying rhythm
Rhythm: Atrial: regular; ventricular: irregular
P Waves: Normal (upright and uniform), more P waves than QRS complexes
PR Interval: Progressively longer until one P wave is blocked and a QRS is dropped
QRS: Normal (0.06–0.10 sec)

Clinical Tip: This rhythm may be caused by medication such as beta blockers, digoxin, and calcium channel blockers. Ischemia involving the right coronary artery is another cause.

Bundle Branch Block (BBB)

- Either the left or the right ventricle may depolarize late, creating a "wide" or "notched" QRS complex.

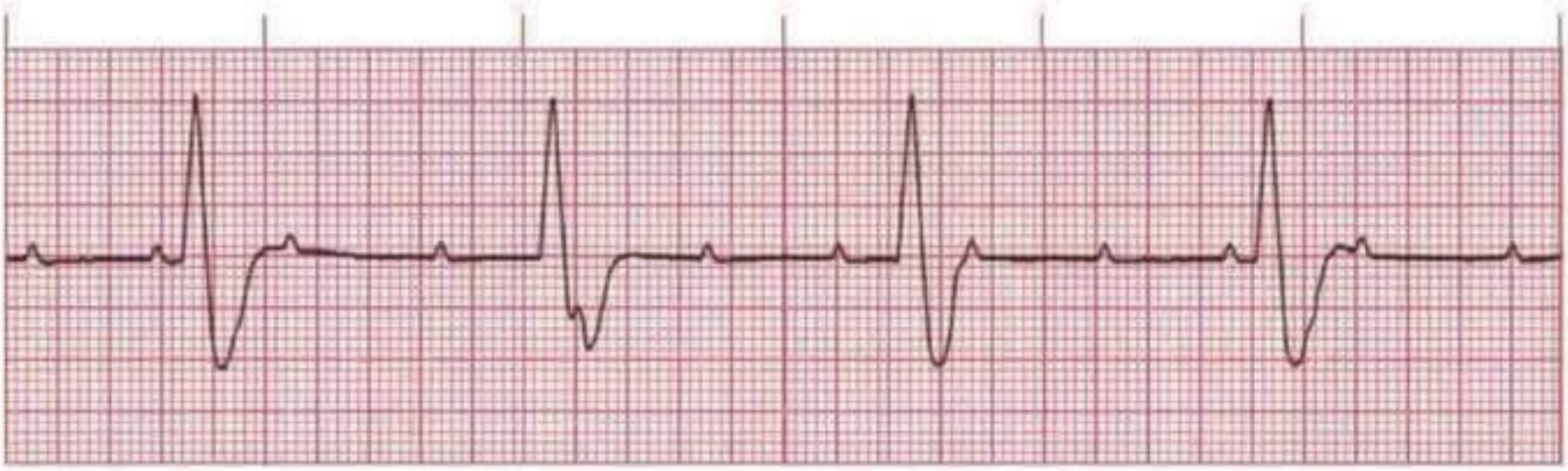


Rate: Depends on rate of underlying rhythm
Rhythm: Regular
P Waves: Normal (upright and uniform)
PR Interval: Normal (0.12–0.20 sec)
QRS: Wide (>0.10 sec) with a notched appearance

Clinical Tip: Bundle branch block commonly occurs in coronary artery disease.

Third-Degree AV Block

- Conduction between the atria and ventricles is totally absent because of complete electrical block at or below the AV node. This is known as AV dissociation.
- "Complete heart block" is another name for this rhythm.

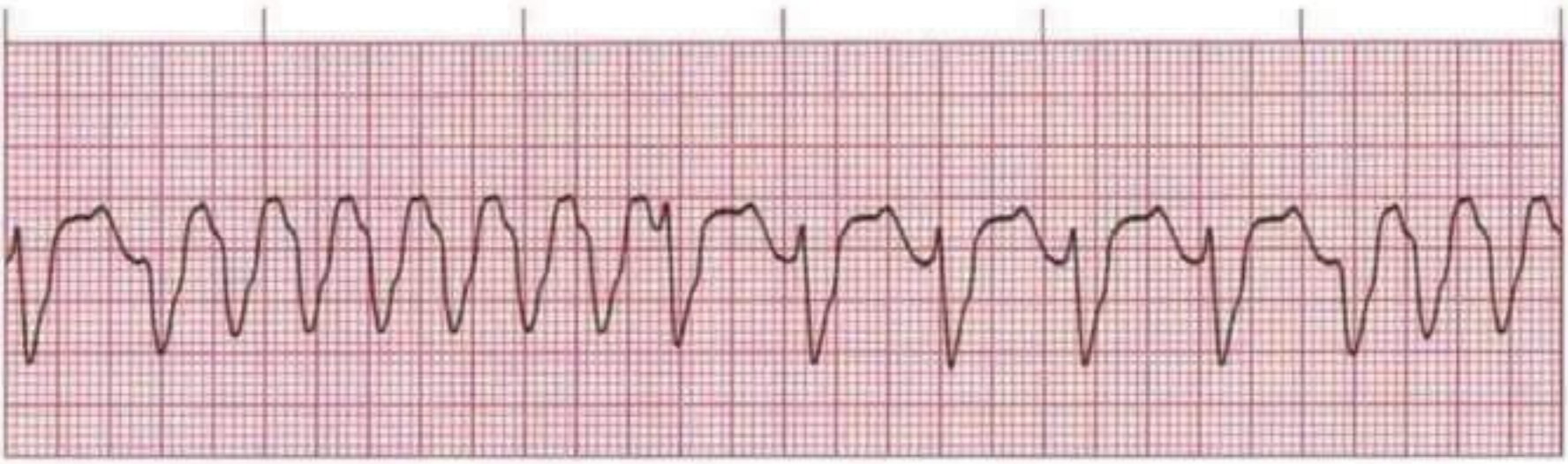


Rate: Atrial: 60–100 bpm; ventricular: 40–60 bpm if escape focus is junctional, <40 bpm if escape focus is ventricular
Rhythm: Usually regular, but atria and ventricles act independently
P Waves: Normal (upright and uniform); may be superimposed on QRS complexes or T waves
PR Interval: Varies greatly
QRS: Normal if ventricles are activated by junctional escape focus; wide if escape focus is ventricular

Clinical Tip: Third-degree AV block may be associated with ischemia involving the left coronary arteries.

Ventricular Tachycardia (VT): Polymorphic

- In polymorphic VT, QRS complexes vary in shape and amplitude.
- The QT interval is normal or long.



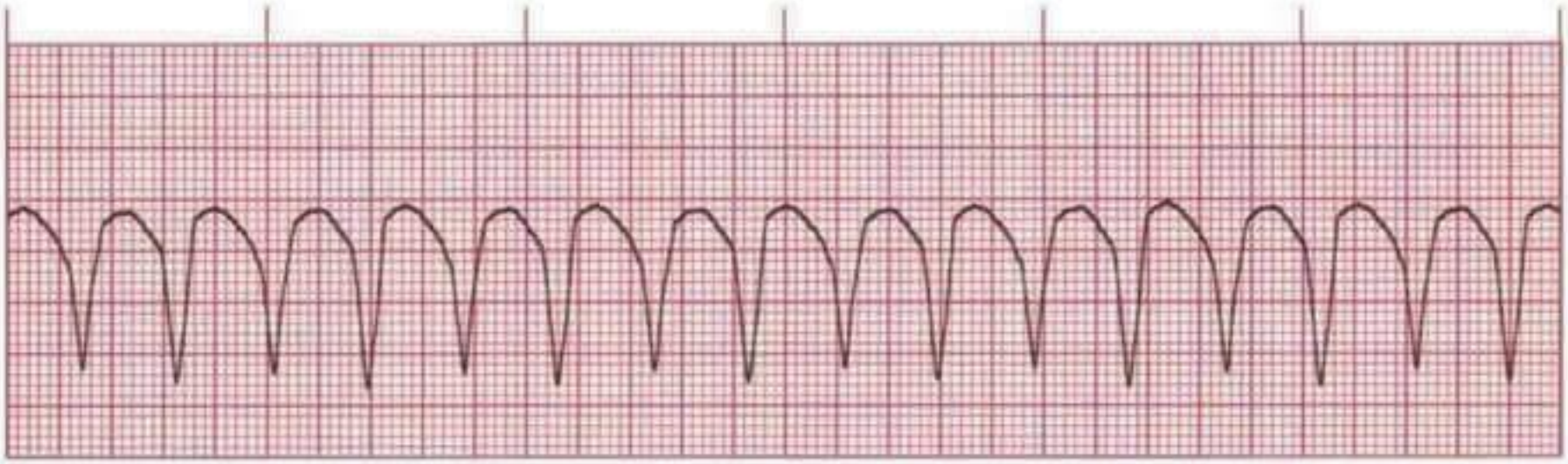
Rate: 100–250 bpm
Rhythm: Regular or irregular
P Waves: None or not associated with the QRS
PR Interval: None
QRS: Wide (>0.10 sec), bizarre appearance

Clinical Tip: It is important to determine whether pulses are present because polymorphic VT may be perfusing or nonperfusing.

Clinical Tip: Consider electrolyte abnormalities as a possible cause.

Ventricular Tachycardia (VT): Monomorphic

- In monomorphic VT, QRS complexes have the same shape and amplitude.



Rate: 100–250 bpm
Rhythm: Regular
P Waves: None or not associated with the QRS
PR Interval: None
QRS: Wide (>0.10 sec), bizarre appearance

Clinical Tip: It is important to confirm the presence or absence of pulses because monomorphic VT may be perfusing or nonperfusing.

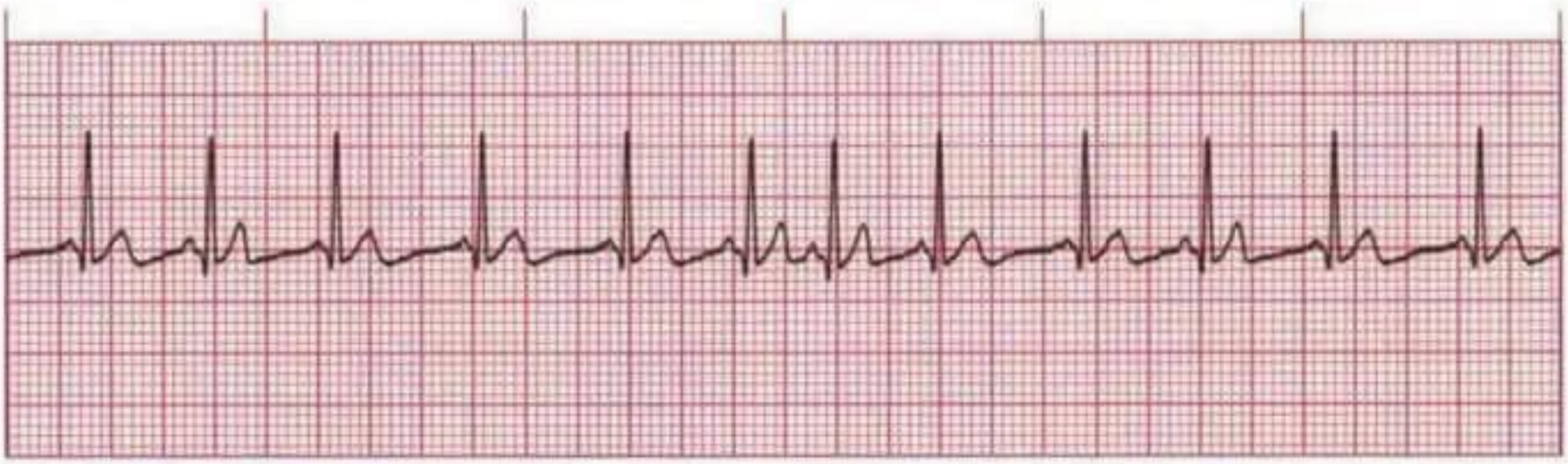
Clinical Tip: Monomorphic VT will probably deteriorate into VF or unstable VT if sustained and not treated.

Atrial Arrhythmias

- P waves differ in appearance from sinus P waves.
- QRS complexes are of normal duration if no ventricular conduction disturbances are present.

Multifocal Atrial Tachycardia (MAT)

- This form of wandering atrial pacemaker (WAP) is associated with a ventricular response >100 bpm.
- MAT may be confused with atrial fibrillation (A-fib); however, MAT has a visible P wave.



Rate: Fast (>100 bpm)
Rhythm: Irregular
P Wave: At least three different forms, determined by the focus in the atria
PR Interval: Variable; determined by focus
QRS: Normal (0.06–0.10 sec)