

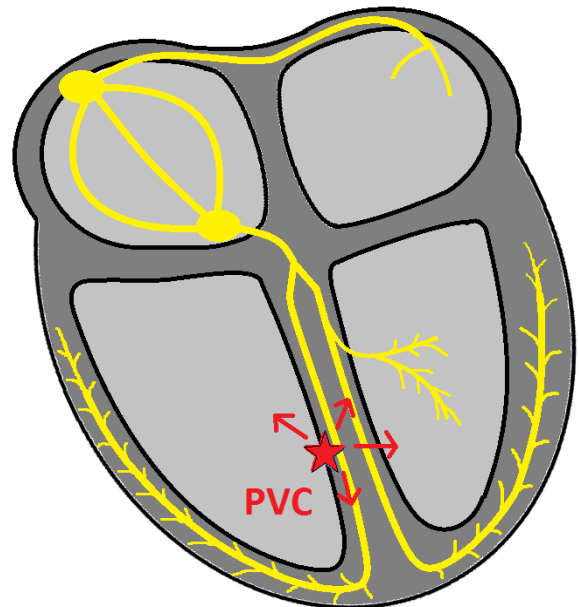
Ventricular Rhythms

Premature Ventricular Contractions (PVCs)

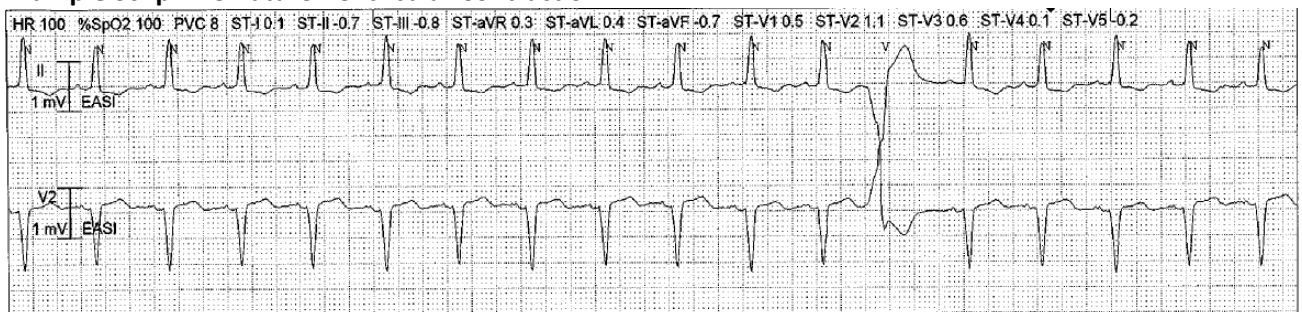
Premature Ventricular Contractions (PVCs) are early depolarizations originating from either the right or left ventricle. Because they occur from within the ventricles PVCs have wide and bizarre QRS complexes and usually have inverted T waves. PVCs are usually followed by a compensatory pause which means the electrical impulse does not travel back up to the atria causing depolarization which resets its atrial timing so the P-P intervals will not be interrupted. They may occur as a single PVC, Couplet (Pair), Triplet/Runs (AIVR/VT), Bigeminal, Trigeminal, Interpolated, or R-on-T. PVCs of different morphologies are referred to as **multiform PVCs** and imply the PVCs came from different foci and therefore are multifocal. PVCs may produce limited cardiac output due to lack of adequate ventricular refill and their delayed contraction time.

Premature Ventricular Contraction

- QRS is wide and bizarre (≥ 0.12 sec)
- No associated P waves
- T wave usually inverted
- Compensatory Pause
- Uniform or Multiform
- May occur as
 - Single PVC
 - Couplet/Pair (2 together)
 - Triplet/Run (See AIVR/VT)
 - Bigeminal (Every 2nd Beat)
 - Trigeminal (Every 3rd beat)
 - Quadrigeminal (Every 4th beat)
 - Interpolated
 - R-on-T

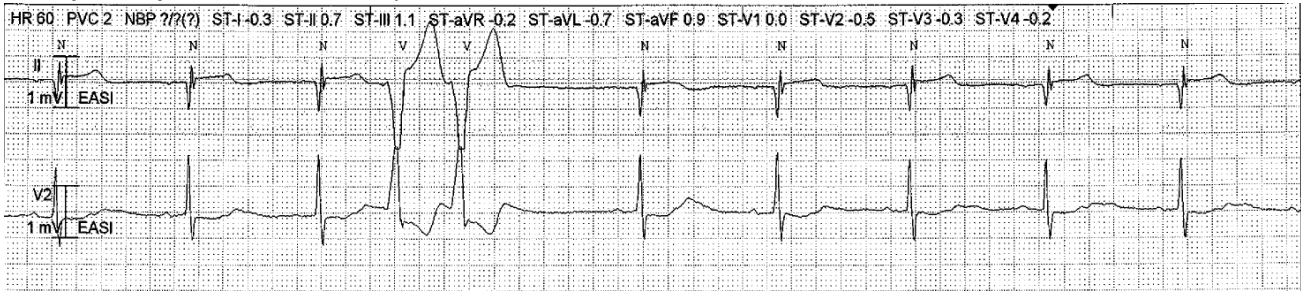


Example Strip: Premature Ventricular Contraction



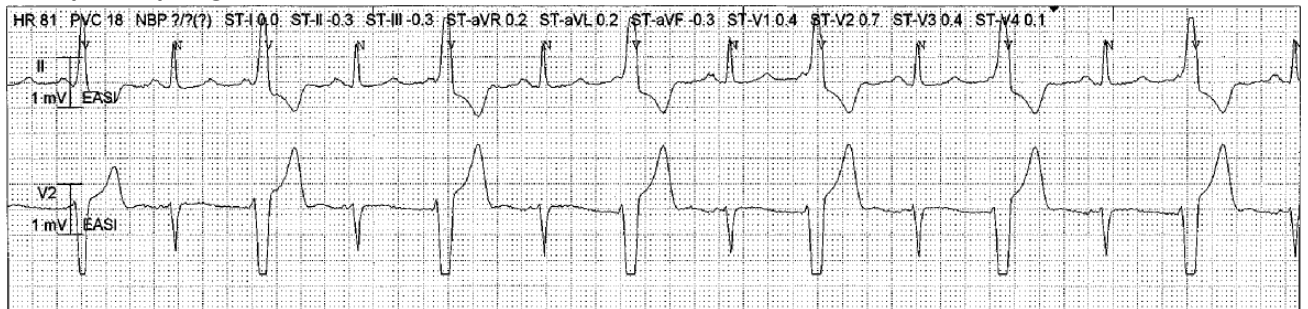
Examples of Ventricular Ectopy

Example Strip: Uniform PVC Couplet/Pair



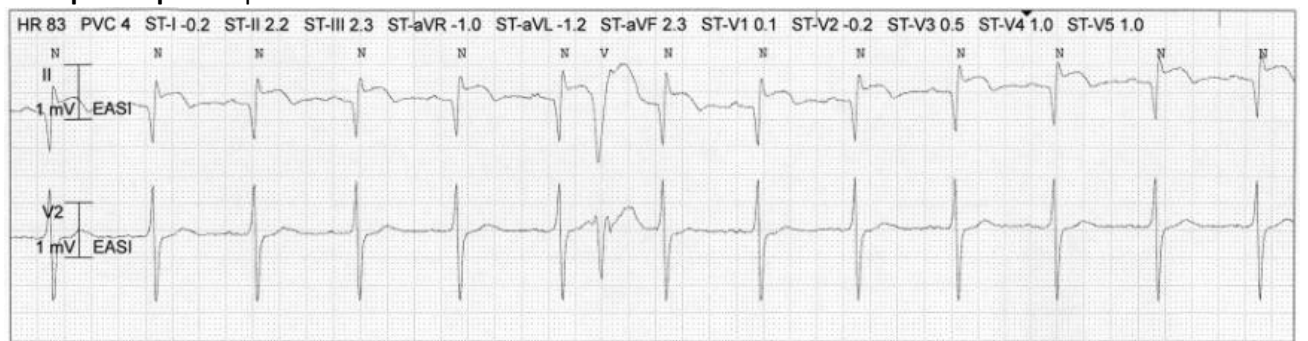
The above strip shows two PVCs “Paired” together. The PVCs are Uniform, meaning they have the same morphology and likely originated from the same location within the ventricles.

Example Strip: Bigeminal PVCs



The above strip shows ventricular Bigeminy. Every second beat is a PVC.

Example Strip: Interpolated R-on-T PVC



The above strip shows an R-on-T PVC meaning the R of the PVC is sitting on the T wave of the previous complex. R-on-T PVCs are very serious and can cause lethal arrhythmias. This PVC is also Interpolated meaning it did not disrupt the R-R intervals.

Idioventricular Rhythm (IVR)

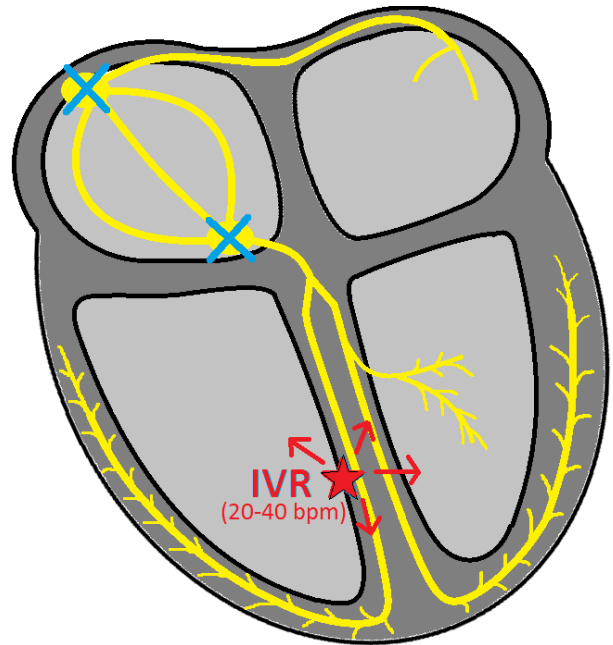
When the SA Node and the AV Node are both unable to pace the heart, due to lack of function or heart block, the ventricles are able to pace the heart at a much slower rate. Idioventricular Rhythm can pace the heart between 20-40 bpm. Unlike Atrial Rhythms, Ventricular Rhythms have very wide and bizarre QRS complexes because the electrical impulse is not able to travel down the right and left bundle branches simultaneously. When Idioventricular Rhythm has a rate greater than 40 bpm it is referred to as Accelerated Idioventricular Rhythm or AIVR.

Idioventricular Rhythm (IVR)

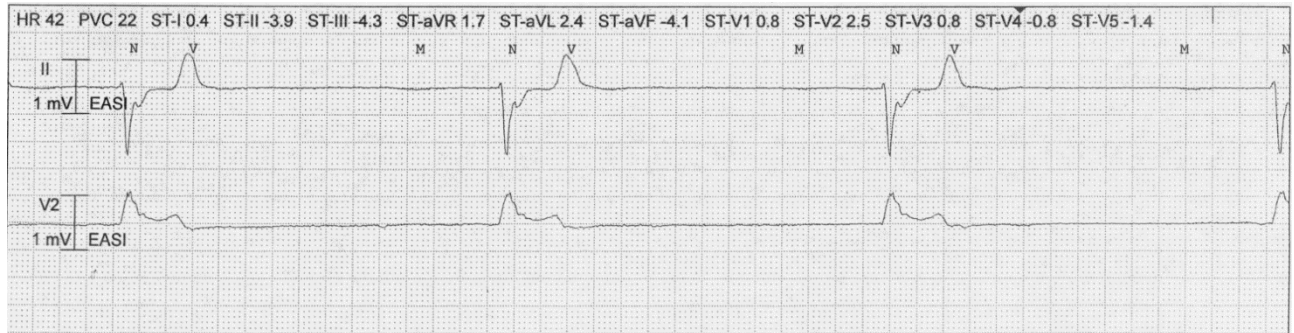
- HR between 20-40 bpm
- Usually Regular R-R interval
- No associated P waves
- Wide QRS $\geq .12$ sec

Accelerated Idioventricular Rhythm (AIVR)

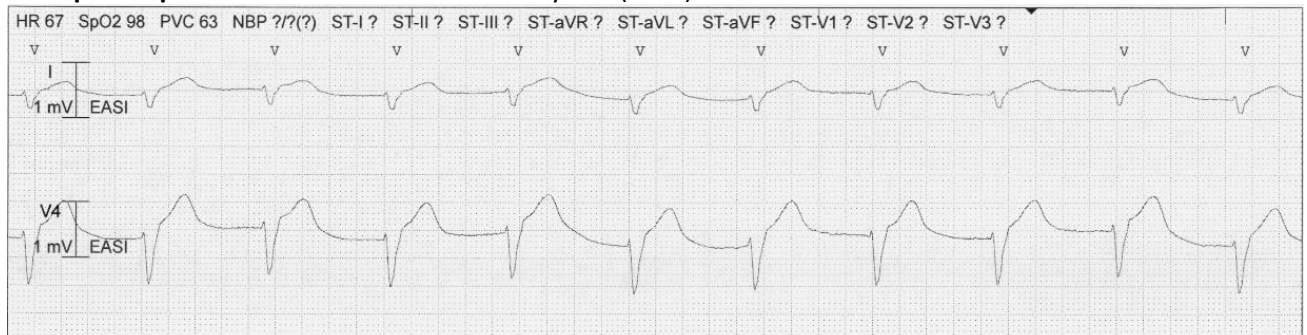
- HR between 41-100 bpm
- Usually Regular R-R interval
- No associated P waves
- Wide QRS $\geq .12$ sec



Example Strip: Idioventricular Rhythm (IVR)



Example Strip: Accelerated Idioventricular Rhythm (AIVR)

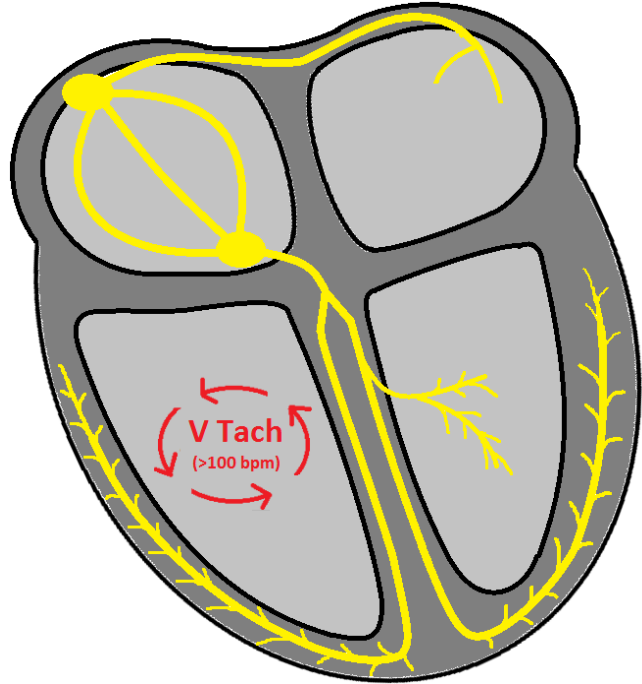


Ventricular Tachycardia (V Tach)

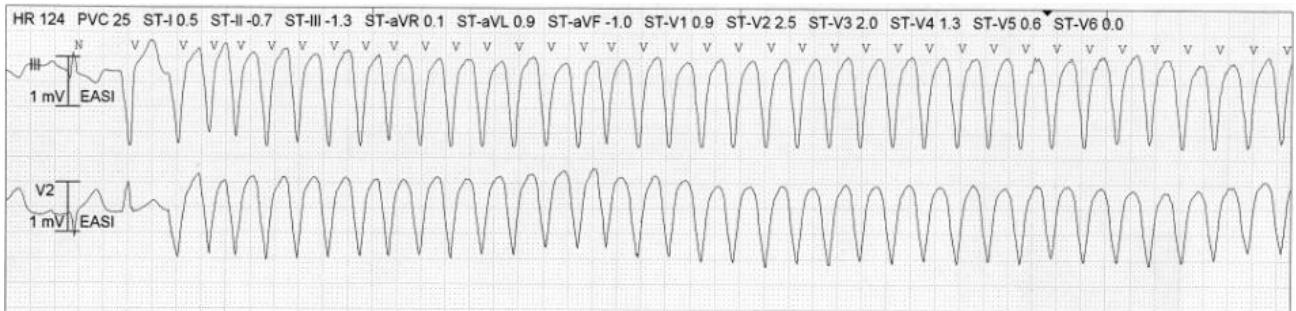
Ventricular Tachycardia (VTach) is a rapid arrhythmia originating from within the ventricles. It is often a result of reentry causing a rapid heart rate of > 100 bpm. Since it originates from within the ventricles, like IVR and AIVR, Ventricular Tachycardia has a wide QRS. Patients experiencing Ventricular Tachycardia may have decreased cardiac output resulting in shortness of breath, dizziness, syncope, etc.

Ventricular Tachycardia (V Tach)

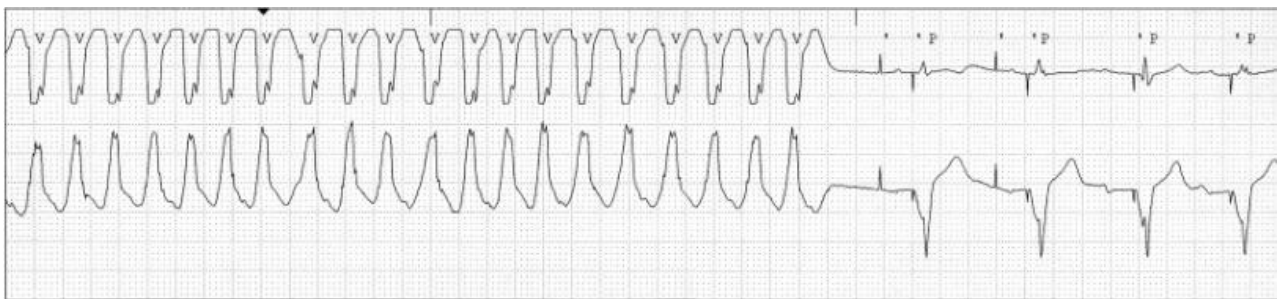
- HR > 100 bpm
- Usually Regular R-R interval
- No associated P waves
- Wide QRS $\geq .12$ sec



Example Strip: Ventricular Tachycardia (V Tach)



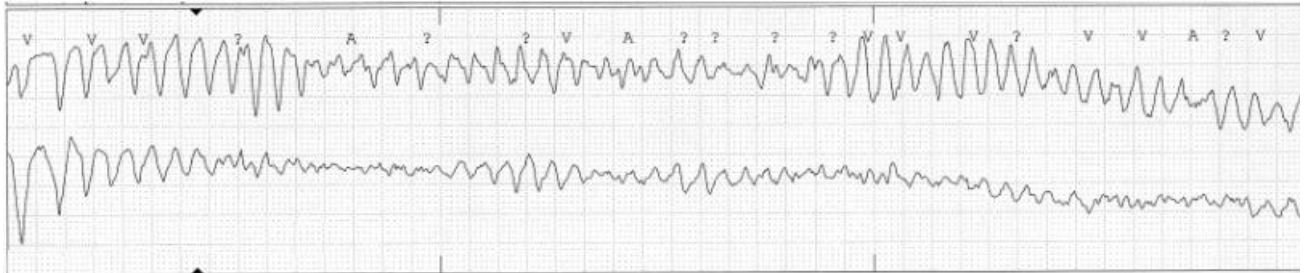
Example Strip: Ventricular Tachycardia (V Tach)



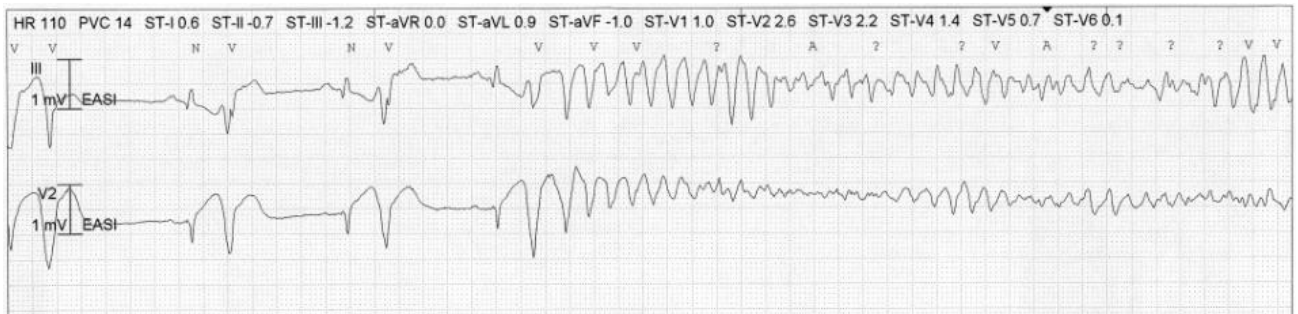
Torsades de Pointes

Torsades de Pointes (Torsades) is a rapid ventricular arrhythmia and may also be referred to as polymorphic ventricular tachycardia. Torsades de Pointes is French for Twisting of the Points named for its twisting pattern on the ECG tracing. It is a lethal arrhythmia requiring immediate defibrillation.

Example Strip: Torsades de Pointes



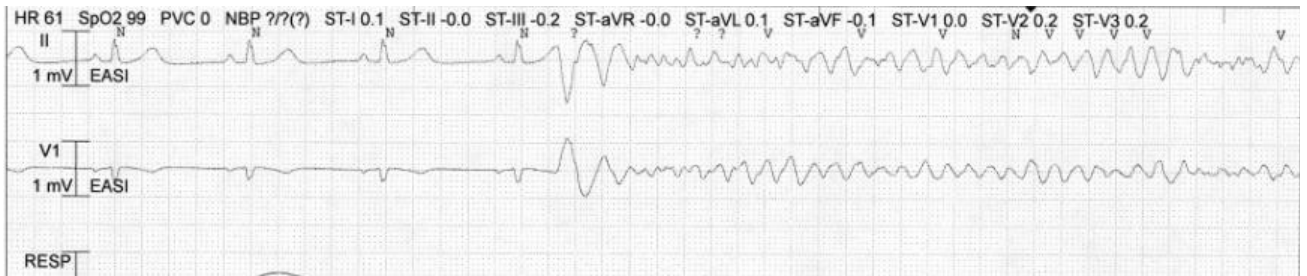
Example Strip: Torsades de Pointes with R on T PVC



Ventricular Fibrillation

Ventricular Fibrillation (V Fib) is random chaotic electrical activity within the ventricles. Ventricular Fibrillation is a lethal arrhythmia because the ventricles are quivering rather than contracting so there is not adequate cardiac output to sustain life. Ventricular Fibrillation requires immediate defibrillation.

Example Strip: Ventricular Fibrillation



References

Surawicz, B., & Knilans, T. K. (2008). *Chous electrocardiography in clinical practice: Adult and pediatric*. Philadelphia, PA: Elsevier Saunders.

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