Is It Really Third Degree AV Block?

Typically, when I ask a class how one recognizes 3rd degree AV block, they respond with "the P waves and the QRS complexes are unrelated to each other" or "there is no association between the P waves and the QRS complexes."

Both responses are incorrect. Each response described **AV dissociation** - *not 3rd degree AV block*. Some might say "Well, that definition partially describes 3rd degree AV block." In that sense, those definitions partially describe 3rd degree AV block the same way that "has four wheels" describes a Chevrolet.

Granted, every case of 3rd degree AV block is characterized by AV dissociation. But 3rd degree AV block is a very infrequent cause of AV dissociation. There are so many other causes that are much more common than 3rd degree AV block.

The most important definition of 3rd degree AV block is the presence of P waves that cannot conduct under any circumstances. There will be P waves in areas of diastole (the T-P segment) that *should have conducted but didn't!*

Contrast that with simple AV dissociation without block in which P waves can - and do! - conduct whenever they do not fall during a refractory period of the AV node or His-Purkinje system.

Hopefully, every case of 3rd degree AV block will have an escape rhythm - usually junctional, but sometimes ventricular. Generally, the escape rhythm is perfectly regular. Although in some cases it *can* be affected by the autonomic nervous system, it usually isn't (or just minimally so). You can assume that an escape rhythm will be perfectly regular.

Simple AV dissociation may present with either an escape rhythm or an accelerated ectopic rhythm. In either case, because there is no AV block, an impulse from the SA node (or elsewhere in the atrium) is sometimes able to cross through the AV node at just the right moment and depolarize the ventricles. This is called a *capture beat* and it always causes an irregularity of the ventricular rhythm because it *appears before the next expected beat* of the escape or accelerated rhythm.

Therefore, simple AV dissociation without a block will have an irregularity in the ventricular rhythm from time to time. On the other hand, AV dissociation due to 3rd degree AV block will not exhibit such irregularities because no capture beats can get past the AV block.

Most 3rd degree AV blocks occur in the AV node and are usually caused by reversible ischemia and are transient, followed by full recovery. Those escape rhythms are usually junctional and are able to sustain the patient well. AV blocks occurring below the AV node tend to be caused by irreparable damage and are usually permanent. The escape rhythms are ventricular, very slow and very, very unreliable. Patients typically do not do well without a pacemaker.