**Narrow QRS Tachyarrhythmias 🡪 Identification and Management**

Perhaps one of the most vexing aspects of ECG interpretation lies in arrhythmias. Because they are so common, most primary care physicians are going to be faced, sooner or later, with the dilemma of sorting out these rhythm problems. When one tries to read common texts concerning the identification and management of these narrow QRS arrhythmias, the details prove pretty difficult to sort out. So, at some risk of over simplifying them, I’ll take a shot at reducing them to a manageable tangle.

I have to make a presumption at this point that you know what a “normal QRS” or “narrow QRS” means. Well, let’s first just state what it is not. It is not a broad QRS (QRS more than 120 msec) arrhythmia… meaning the narrow QRS arrhythmia has a QRS of less than 90 msec. Examples of the more lethal (and fortunately less common) Broad QRS arrhythmias include ventricular tachycardia and accelerated idioventricular rhythm.

First let’s just limit the count of these beasts to a manageable number. There are four *regular* narrow QRS tachyarrhythmias and two *irregular* narrow QRS tachyarrhythmias.

Regular:

* Sinus tachycardia
* Paroxysmal Atrial Tachycardia (PAT)
* Atrial Flutter
* AV nodal reentrant tachycardia (AVNRT)

Irregular:

* Atrial fibrillation
* Multifocal atrial tachycardia (MAT)

Atrial fib and MAT are dealt with in another paper, so for the purpose of this undertaking, we’ll limit our discussion to only the four regular narrow QRS tachyarrhythmias.

One of the difficulties in sorting out these arrhythmias lies in the nonstandardized nomenclature. For example, you may have noticed that I didn’t mention SVT (supraventricular tachycardia). This is a throw back term used by old crumugens like myself used generally in some circles to refer to any narrow QRS tachyarrhythmia that is faster than 100/min. Others in a different circle might use it more specifically to be almost synonymous with the AVNRT. In addition, AVNRT’s are actually comprised of a group of narrow QRS tachycardias that originate via various anatomical/functional pathways, but can generally only be sorted out by electrophysiologic study. So, for the practical purpose of the standard ECG in the hands of the primary care doc, we’ll lump them all together and just refer to them as AVNRT.

When faced with one of these little jewels, it’s helpful to have a quick and simple way of sorting through them from both an identification and a management perspective. It turns out that one often leads to the other, as you will see. The first thing I generally do is to simply look at the rate. If the rate is 150/min or above you can pretty much eliminate sinus tachycardia. If the P wave in limb lead two is upright (assuming, of course if you can see a P wave), you can pretty much eliminate PAT. So, if the rate is above 150/min, you are likely faced with either AVRNT or atrial flutter with 2:1 AV conduction. If the rate, however, is *faster* than 170/min, then the overwhelming odds lie with AVNRT. This is the case because the atrial flutter rate range (for the atrium) tends to like between 240/min and 340/min. So, as you can see, just paying attention to the rate will get you in the right camp most of the time. Now, just to be honest, AVNRT’s can have rates from 120 to 220. Atrial flutter can have ventricular rates from 120 to 170. Sinus tachycardia can approach 200/min (albeit rarely above 150/min at rest). PAT can range from 130 to 160/min. You see there is a significant overlap of their ranges, so my simplified approach does come at a price.

Management of the narrow QRS tachyarrhythmias does vary a bit depending upon the related symptoms, presence of other cardiac problems like coronary artery disease, and whether the patient is hemodynamically stable. But for most cases, the following little scenario will work out in real life.

As noted above, if the rate is faster than 150/min, I’ll assume we are likely dealing with either AVRNT or atrial flutter. A single dose of rapid push IV adenosine (6 mg) will yield the answer in about eighty percent of cases. Remember what adenosine does physiologically. It causes complete AV block typically for about four seconds. That sounds like a brief period of time. But when you have an anxious patient staring into your eyes, the look on your face will give away any attempt to cover it up when that baseline suddenly goes flat and stays flat as the oscilloscope marker disappears off the screen until the next sweep! On occasion, I’ve seen the osicilloscope make two sweeps before rhythm returns, but that is unusual. The key to correctly identifying the underlying narrow QRS tachycarrhythmia is to pay close attention to what remains on the screen during that few seconds when AV block eliminates the ventricular depolarization complexes.

Here’s what you should look for:

Sinus tach 🡪 You see only P waves at the original ventricular rate you started with.

PAT 🡪 You see only P waves at the original ventricular rate you started with (same as sinus tach)

AVNRT 🡪 The baseline is flat… no P waves and no QRS complexes.

Atrial flutter 🡪 The baseline shows the “flutter waves” or P waves at a rate exactly twice the original ventricular rate.

The next thing to watch for is what comes back after the adenosine wears off (again, only a few seconds).

Sinus tach 🡪 The sinus tach returns unaltered from the original rhythm and rate.

PAT 🡪 The PAT also returns unaltered from its original rhythm and rate.

AVNRT 🡪 Sinus rhythm replaces the tachycardia typically with a rate of about 90 to 110

Atrial flutter 🡪 The atrial flutter returns with the same 2:1 AV conduction it had to start with.

Now, if the culprit rhythm was sinus. No further treatment per se is warranted, though as you’ve heard me say repeatedly, bad things often cause sinus tachycardia. So, don’t neglect looking for them. If the original rhythm was PAT, again, no further treatment per se is warranted, other than to look for the underlying cause and see if it can be alleviated. Typically this will be COPD or asthma being treated with beta-agonists for the related bronchospasm. If the original rhythm was AVNRT, then you are nearly home free. The rhythm has been “broken” by the IV adenosine. If it was atrial flutter then what appeared on the baseline during the adenosine told you that as stated above and your next task is to treat it specifically. With what? Well, if the blood pressure is low, then IV amiodarone or DC cardioversion are your options. If the blood pressure is normal or high, then typically we would use a calcium channel blocker such as Verapamil or Diltiezem. And on the rare occasion that the atrial flutter is due to thyrotoxicosis, then an IV betablocker is the appropriate choice.

Atrial fibrillation is basically initially treated with the same options as atrial flutter. And MAT is managed in much the same way as PAT noted above.



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