

# SVT: Orthodromic or Antidromic? And why does that matter?

This is a way of classifying AV reentrant tachycardia, the one with an accessory pathway.

**Orthodromic conduction = through the AV node**  
**Antidromic conduction = through the accessory pathway**

## RULES OF THUMB:

Antidromic is usually narrow-complex.  
Orthodromic is always broad-complex.

but why?...

### Orthodromic conduction: the "Right Way"

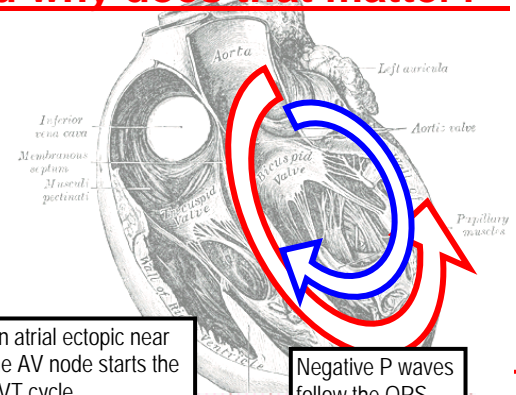
The action potential travels through the AV node; the QRS complex would not show any pre-excitation. After the ventricles conduct the action potential, it comes back around and enters the atria via the accessory pathway. THEREFORE:

- the p-wave is always "retrograde" in this situation; the atria depolarize RIGHT AFTER the ventricles. Thus the P waves will be embedded in the ST segment
- The QRS complex is usually normal-looking, or with BBB- this is because the conduction from the AV node to the ventricles is completely normal.
- Even in WPW, the QRS will be NORMAL because the accessory pathway is not pre-exciting the ventricle- instead it is excited BY the ventricle.

### Antidromic conduction: the "Opposite Way"

The action potential travels through the accessory pathway; in order for this to happen, this pathway must be well away from the AV node (at least 4cm away, so the action potential gets to the pathway first). The action potential first depolarizes the ventricles and then conduct it back up the AV node.

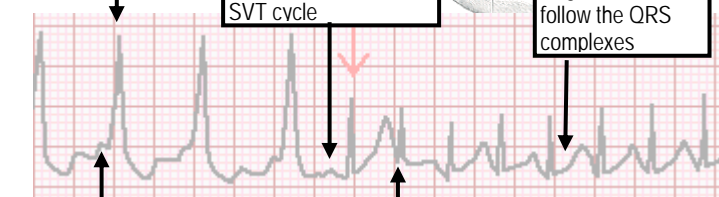
- The P waves are negative, if visible at all.
- The QRS is WIDENED because most of the ventricular conduction occurs via the sluggish ventricular fibers, not the His-Purkinje system.
- in WPW, the QRS will HAVE DELTA WAVES because practically ALL of the ventricle will be excited by the accessory pathway.



Widened bizarre QRS complexes, caused by simultaneous depolarization of the ventricles from both the AV node and the accessory pathway

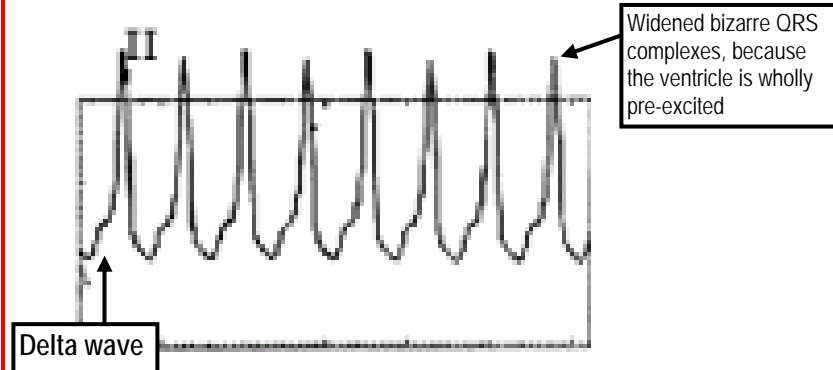
An atrial ectopic near the AV node starts the SVT cycle

Negative P waves follow the QRS complexes



Delta wave

QRS complexes are now narrow and normal-looking, because the accessory pathway plays no role in their initiation.



Delta wave

Widened bizarre QRS complexes, because the ventricle is wholly pre-excited

## WHAT'S THE POINT OF ALL THIS?

### ORTHODROMIC:

The site of antegrade conduction is the AV node; hence it is the crucial weak point. One can attack the tachycardia there by lengthening the AV refractory period.

- vagal manoeuvres

Adenosine and verapamil ONLY is its certain that its not AF

### ANTIDROMIC:

The site of antegrade conduction is the accessory pathway; its conduction speed relies on fast sodium channels. Therefore Class 1 drugs are preferred, such as **Flecainide**. You can also attack the AV node with adenosine, to slow retrograde conduction. In fact, that works surprisingly often.

**Why not Adenosine?** Adenosine on its own can cause AF, as well as blocking the AV node. If the poor fool has AF and you block the gate-keeping AV node, the fast accessory pathway will be in charge of conducting the AF impulses. Of which there are 300 or so per minute. And it will be 1:1 conduction. Beta blockers don't shorten the pathways' refractory period as much as the AV nodes' refractory period. Likewise verapamil. So you may induce VF in a patient with an accessory pathway, by using adenosine, verapamil or beta-blockers. Of course if that happens, you can always shock them.