

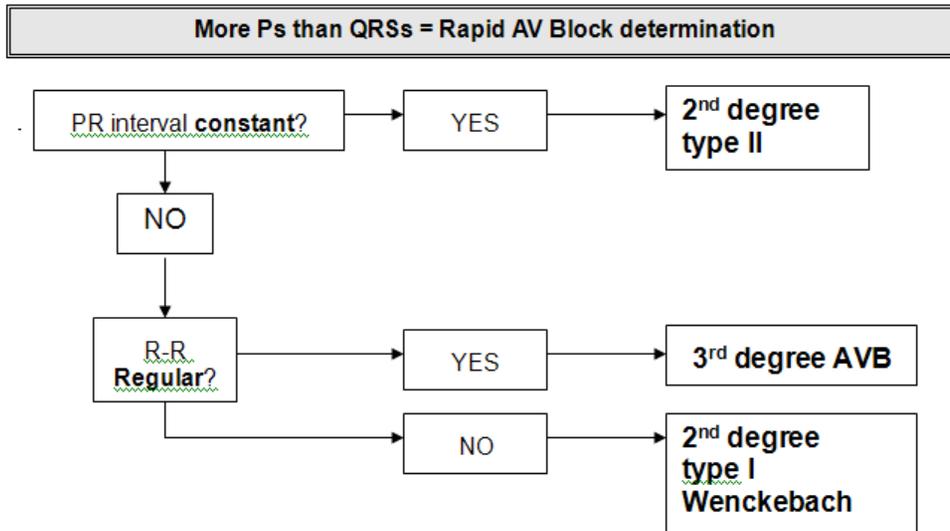
Rhythm RULES – S18

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Rhythm	Regularity	Heart rate	P wave configuration	PRI (Normal, short, long) Fixed/variable	P/QRS ratio	QRS
Sinus rhythm	Regular	60-100	Normal; upright	0.12-0.20; fixed	1:1	0.04-0.10 (< 0.12)
Sinus bradycardia	Regular	< 60 (40-59)	Normal, upright	0.12-0.20; fixed	1:1	< 0.12
Sinus tachycardia	Regular	101-150	Normal, upright	0.12-0.20; fixed	1:1	< 0.12
Sinus arrhythmia	Irregular ; rate gradually increases w/ inspiration; decreases w/ expiration	Usually 60-100	Normal; upright	0.12-0.20; fixed	1:1	< 0.12
Sinus block/arrest	Irregular w/ pauses; may be followed by an escape beat	Normal to slow; depends on frequency of sinus pauses	Normal in underlying rhythm; absent during pause ; escape beats may have no P if from junction or ventricles	0.12-0.20; fixed if underlying rhythm is sinus	1:1	< 0.12
PAC	Irregular on strip with early beat Non-compensatory pause	Usually WNL for sinus; depends on underlying rhythm & # PACs	PAC: early P wave ; may differ in shape from sinus Ps. Shape depends on location of ectopic pacemaker (pointed, flat, biphasic, notched; inverted if close to AV node; may be hidden in preceding T wave) P precedes each QRS	PAC: Usually normal or sl. shortened; differs from underlying rhythm. Not measurable if P buried in QRS or non-conducted PAC	Usually 1:1 unless PAC is non-conducted to ventricles (then early P w/o a QRS)	Usually < 0.12 unless PAC so early that bundle branches are not repolarized sufficiently to conduct impulse normally (aberrant or abnormal conduction causes QRS to be wide)
Atrial Reentrant tachycardia Preexcitation rhythms through accessory pathway (Wolff-Parkinson-White or WPW Syndrome)	Regular if Afib not present Irregular if Afib is present	PSVT and A-fib seen in WPW – can have extremely rapid ventricular rate (250-300) (NO calcium blockers)	Present; normal shape	Short (AV node bypassed)	1:1	Usually prolonged as ventricle gets beat early and depolarizes in cell-to-cell fashion instead of through normal pathways Distorted initial portion (slurred uptake called delta wave)
AV nodal reentrant tachycardia (AVNRT or PSVT)	Regular except at onset and termination	150-250 (170-250)	If present, may be pointed; originates in area around AV node; P waves may be hidden in QRS or distort end of QRS. 3 or more sequential PACs at rate > 100 = paroxysmal atrial tach	Usually not measurable	If P waves seen: 1:1	< 0.12

Rhythm	Regularity	Heart rate	P wave configuration	PRI (Normal, short, long) Fixed/variable	P/QRS ratio	QRS
Atrial flutter	Atrial: regular Ventricular: variable depending on conduction ratio	Atrial: 250-450 (300) Ventricular: Variable depending on conduction ratio (not usually >180)	V-shaped waveforms resemble "sawtooth" pattern called flutter waves.	Not measurable	Flutter wave/QRS ratio varies	< 0.12 unless conduction disturbance through ventricles
Atrial fibrillation	Irregularly irregular unless very fast – then may appear almost regular	Atrial: 350 or more; not measurable Ventricular: varies < 100: Controlled > 100: Uncontrolled	None discernable Fib waves cause chaotic baseline that may be fine or coarse	Not measurable	Not measurable	< 0.12
Wandering atrial pacemaker (multifocal atrial rhythm)	Regular to irregularly irregular as pacemaker shifts from SA node to ectopic atrial location & AV node	Usually 60-100; may be slow If rate > 100: multifocal atrial tachycardia	Change as pacemaker site changes ("wanders") Vary in size, shape, direction. Should see 3 different P's on one strip	Varies based on location of impulse formation & conduction; may be < 0.12	1:1	< 0.12
Junctional rhythm	Regular	40-60	If precedes QRS: may be inverted, absent, or after QRS	If present: < 0.12	If P waves seen: 1:1	< 0.12
Accelerated junctional rhythm	Regular	61-100	Junctional configuration	If present: < 0.12	If P waves seen: 1:1	< 0.12
Junctional Tachycardia	Regular	> 100 – 180 (220)	Junctional configuration (often hidden)	If present: < 0.12	If P waves seen: 1:1	< 0.12
Junctional escape beat	Irregular due to late beat	Slow; allows junction to beat in late	Junctional configuration for late beat	If present: < 0.12	If P waves seen: 1:1	< 0.12
PJC	Irregular due to early junctional beat Non-compensatory pause	60-100 if underlying rhythm sinus	Junctional configuration for early beat	If present: < 0.12	If P waves seen: 1:1	< 0.12
1 st degree AVB	Generally reg if AVB is only abnormality	May occur at any underlying rate	Present, upright P-P regular	Consistently >0.20 Fixed	1:1 All atrial impulses conduct to ventricles	< 0.12
2 nd degree type I (Wenckebach)	P-P regular R-R Irregular with distinct pattern to irregularity (grouped beating)	Atrial usually normal Ventricular may be slow depending on # of dropped QRS complexes	Present; upright	Variable Progressively lengthens prior to dropped QRS	More Ps than QRS	< 0.12
2 nd degree type II	P-P regular R-R may be regular or irregular depending on conduction ratio	Atrial usually normal Ventricular may be slow depending on # of dropped QRS complexes	Present; upright	Fixed for conducted beats May be normal or > 0.20 sec	More Ps than QRS	May be normal or prolonged depending on site of block
3 rd degree AVB (CHB)	P-P regular (may need to look for them) R-R regular	Atrial rate usually WNL for SA node Ventricular (R) rate 40-60 if paced by AV 20-40 if paced by ventricles	Present; upright – may be buried in a QRS	Variable; no correlation between Ps and QRSS	More Ps than QRS	Narrow (<0.12) if Junctional escape pacemaker Wide (≥ 0.12) if ventricular escape pacemaker

Rhythm	Regularity	Heart rate	P wave configuration	PRI (Normal, short, long) Fixed/variable	P/QRS ratio	QRS
Idioventricular rhythm	R-R essentially regular	20-40	None	None	Only QRS complexes	≥ 0.12; T wave opposite polarity to main QRS
Accelerated idioventricular rhythm	R-R essentially regular	41-100	None	None	Only QRS complexes	≥ 0.12; T wave opposite polarity to main QRS
Ventricular tachycardia monomorphic	Regular R-R	101-250 If > 250, QRS complexes appear sawtoothed – ventricular flutter	Usually none May be present dissociated from QRS	Not measurable	More QRSs than P waves due to ventricular beats	Uniform ventricular configuration: wide; T wave opposite polarity to main QRS
VT polymorphic w/ prolonged QT Torsades de pointes (twisting of the points)	Regular to irregular	Very rapid	None	None	Only QRSs due to ventricular beats	QRS direction rotates up and down in same lead causing complexes to look very different
Ventricular escape beat	Irregular due to late ventricular beat	Slow	None associated w/ ventricular beat	None measurable w/ ventricular beat	More QRSs than P waves due to late ventricular beat	Ventricular configuration: wide; T wave opposite polarity to main QRS
Premature Ventricular contraction (PVC)	Irregular due to early ventricular beat Full compensatory pause R on T phenomenon is deadly	Depends on underlying rhythm	None associated w/ PVC	None associated w/ PVC	More QRSs than P waves due to early ventricular beat	Ventricular configuration: wide; T wave opposite polarity to main QRS Uniformed or multiformed
Ventricular fibrillation	Irregularly irregular	No distinguishable waves – cannot count rate	None	None	None	None Irregular, chaotic baseline Coarse or fine
Ventricular asystole	No QRS complexes present	None	Usually none; but may be present if original rhythm was 2 nd or 3 rd degree AVB	None	None	None
Paced rhythm	Regular or irregular depending on patient's native rhythm	Usually set at 70; depends on native rhythm if demand pacer	None with demand and external paced beats Present with A-V sequential pacemaker; preceded by a "pacer spike"	None with demand and external paced beats Set between 0.12-0.20 in sequential pacemaker	Varies with type of pacemaker and patient's native rhythm	Preceded by pacer spike; usually ≥ 0.12
Intraventricular conduction delay (defect) BBB	Depends on underlying rhythm; usually regular	Depends on underlying rhythm	Present, upright	May be normal or delayed; Fixed	1:1	Wide; ≥ 0.12



There are only three supraventricular rhythms that are irregularly irregular:

- Sinus arrhythmia (one P-wave morphology and stable PR interval);
- Multifocal atrial rhythm with a rate <100 beats/min and multifocal atrial tachycardia with a rate >100 beats/min (three or more different P-wave morphologies and PR intervals without any P wave morphology being dominant); and
- Atrial fibrillation in which there are no organized P waves.