

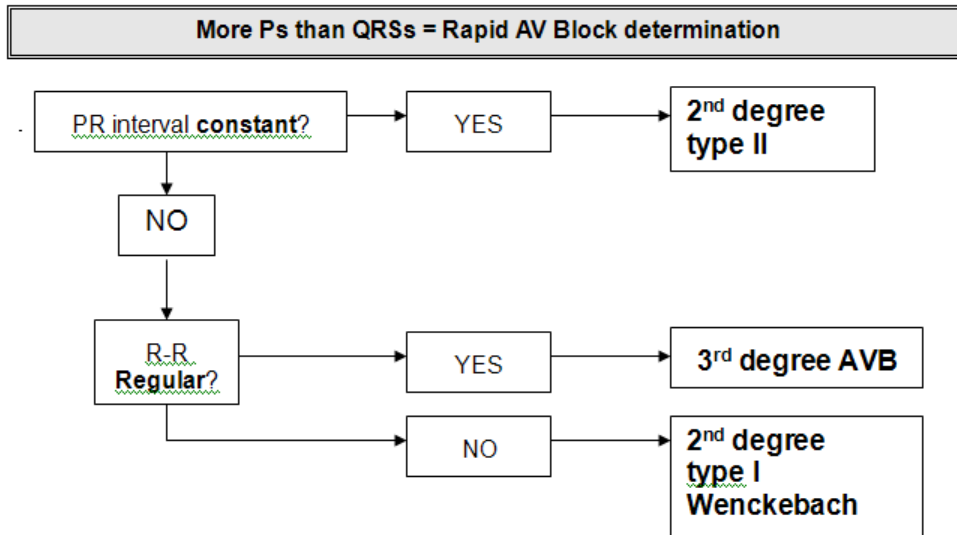
Rhythm RULES – S18

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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.