**EKG RHYTHMS**---- **From Order to Chaos------**

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| **Strip** | **Rate** | **Rhythm** | **P Waves** | **PRI** | **QRS** | **Discussion** |
| **Normal Sinus Rhythm**  EKG NSR | **60-**  **100** | **REG** | **+**  **↑**  **~**  **1:1 QRS** | **0.12-**  **0.20**  **Sec**  **=** | **<0.12**  **Sec,**  **=**  **~** | **To be ”Normal Sinus Rhythm” as opposed to “Sinus Rhythm,” must meet all criteria** |
| **Sinus Bradycardia**  EKG Brady | **< 60** | **REG** | **+**  **↑**  **~**  **1:1 QRS** | **0.12-**  **0.20**  **Sec**  **=** | **<0.12**  **Sec,**  **=**  **~** | -Etiology? –  -Symptoms?  **-Atropine IV**  **(Symptomatic**  **Bradycardia)**  **-Consider Pacemaker** |
| **Sinus Tachycardia**  EKG SiTach | **101-**  **150** | **REG** | **+**  **↑**  **~**  **1:1 QRS** | **0.12-**  **0.20**  **Sec**  **=** | **<0.12**  **Sec,**  **=,**  **~** | **Search for and eliminate source, if possible**  **Consider:**  **Pain**  **Anxiety**  **Hypovolemia**  **Drugs** |
| **Supraventricular Tachycardia (SVT)**  EKG psvt | **>150**  **+** | **REG** | **Typically**  **Cannot**  **See (“Buried” in the QRS)** | **N/A** | **<0.12**  **Sec,**  **=**  **~** | **NARROW COMPLEX TACHYCARDIA:**  **-Vagal Maneuvers;**  **-Adenosine IVP;**  **-Synchronized Cardioversion** |
| **Atrial Fibrillation**  EKG Afib | **Varies** | **IRREG** | **NO** | **N/A** | **<0.12**  **sec** | Chronic versus new onset;  “Controlled versus uncontrolled; frequently (in chronic) goal is to keep rate under 100 bpm  -Digoxin  -Synchronized Cardioversion  -Coumadin |

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| **Strip** | **Rate** | **Rhythm** | **P Waves** | **PRI** | **QRS** | **Discussion** |
| **Atrial Flutter**  EKG AT FL | **Varies** | **REG**  **Or IRREG** | **NO---**  ***“F”***  ***Waves***  **(Saw**  **Tooth)** | **N/A** | **<0.12**  **Sec,**  **=’**  **~** | Patient may alternate between a-flutter and a-fib; may be regular or irregular; typically classified by f-wave distribution; i.e., this strip is 3:1—there are 3 f-waves per QRS complex.  --Cardioversion; Digoxin; others…. |
| **Ventricular Tachycardia**  EKG vt2 | **> 100-**  **200** | **REG** | **N/A** | **N/A** | **>0.12**  **Sec,**  **=,**  **~**  **“Wide & Bizarre”** | **2 Types:**  **--With or Without a Pulse**  **(See PVC’s for more discussion)**  **-CPR (No Pulse)**  **-Synchronized Cardioversion**  **-Lidocaine or amiodarone IV**  **-ACLS!** |
| **Ventricular Fibrillation (Coarse)**  V-fib | **0** | **NONE** | **N/A** | **0.12-**  **0.20**  **sec** | **NONE** | **-CPR**  **-IMMEDIATE DEFIBRILLATION**  **-ACLS**  **-Epinephrine, others** |
| **Ventricular Fibrillation (Fine)**  EKG VF | **0** | **NONE** | **N/A** | **N/A** | **NONE** | **-CPR**  **-IMMEDIATE DEFIBRILLATION**  **-ACLS**  **-Epinephrine, others** |
| **Asystole** | **0** | **NONE** | **NO** | **N/A** | **NONE** | **-Check the Leads & Patient !**  **-CPR & ACLS**  **-NON-Shockable Rhythm**  **-Source??**  **-Epinephrine IV**  **-Atropine IV** |

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| **Strip** | **Rate** | **Rhythm** | **P Waves** | **PRI** | **QRS** | **Discussion** |
| **Pulseless Electrical Activity (PEA)**  **IMPORTANT: THIS RHYTHM MAY LOOK LIKE ANY RHYTHM THAT SHOULD HAVE A PULSE !** The approach in treatment of PEA is to treat the underlying cause.  **“6Hs and 6Ts”:**   * [**H**ypovolemia](http://en.wikipedia.org/wiki/Hypovolemia) * [**H**ypoxia](http://en.wikipedia.org/wiki/Hypoxia_%28medical%29) * [**H**ydrogen](http://en.wikipedia.org/wiki/Hydrogen) ions ([Acidosis](http://en.wikipedia.org/wiki/Acidosis)) * [**H**ypothermia](http://en.wikipedia.org/wiki/Hypothermia) * [**H**yperkalemia](http://en.wikipedia.org/wiki/Hyperkalemia) or [**H**ypokalemia](http://en.wikipedia.org/wiki/Hypokalemia) * [**H**ypoglycemia](http://en.wikipedia.org/wiki/Hypoglycemia) * [**T**ablets](http://en.wikipedia.org/wiki/Tablets) or [**T**oxins](http://en.wikipedia.org/wiki/Toxins) ([Drug overdose](http://en.wikipedia.org/wiki/Drug_overdose)) * [**T**amponade](http://en.wikipedia.org/wiki/Cardiac_tamponade), Cardiac * [**T**ension pneumothorax](http://en.wikipedia.org/wiki/Tension_pneumothorax) * [**T**hrombosis](http://en.wikipedia.org/wiki/Thrombosis) ([Myocardial infarction](http://en.wikipedia.org/wiki/Myocardial_infarction)) * [**T**hrombosis](http://en.wikipedia.org/wiki/Thrombosis) ([Pulmonary embolism](http://en.wikipedia.org/wiki/Pulmonary_embolism)) * [**T**rauma](http://en.wikipedia.org/wiki/Physical_trauma) ([Hypovolemia](http://en.wikipedia.org/wiki/Hypovolemia) from blood loss) | **Varies** | **REG**  **Or IRREG** | **Present,**  **Non-Present,**  **Variable** | **Variable** | **Variable** | **PATIENT IS UNRESPONSIVE, WITH NO PULSE**  **IF RHYTHM ON MONITOR IS ASYSTOLE, VENTRICULAR FIBRILLATION, OR VENTRICULAR TACHYCARDIA, THEN (BY DEFINITION) THEY CANNOT BE PEA, BECAUSE THESE RHYTHMS ARE NOT (USUALLY) ASSOCIATED WITH A PULSE..**  **Treated as Asystole:**  **Search for Source**  **Epinephrine IV**  **Atropine IV (Possible)** |
| **Polymorphic Ventricular Tachycardia (Toursades des Pointes)** | **> 100-**  **200** | **IRREG** | **N/A** | **N/A** | **>0.12**  **sec** | **“Twist Around the Point”**  **“Typical medications for Ventricular Tachycardia (Monomorphic V-Tach) will make it worse.**  **--DEFIBRILLATE --Magnesium IV** |

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| **Strip** | **Rate** | **Rhythm** | **P Waves** | **PRI** | **QRS** | **Discussion** |
| **Junctional Rhythms** | **Varies**  **(AV**  **Junct**  **Rate=**  **40-60)** | **REG** | **Absent,**  **Inverted,**  **Biphasic,**  **or retrograde**  **(after the QRS)** | **0 –**  **<**  **0.12 sec** | **< 0.12**  **Sec,**  **=,**  **~** | AV Node or AV Junctional area has taken over as “pacemaker,” so no P wave, or “different p-wave  -Junctional Rhythm  -Accelerated Junctional Rhythm  -Junctional Tachycardia |
| **First Degree A-V Block** | **Varies** | **REG** | **+**  **↑**  **~**  **1:1 QRS** | **>**  **0.20**  **Sec**  **=** | **< 0.12**  **Sec,**  **=,**  **~** | **-Can be a normal variant**  **-Can be benign, or a precursor of “bad things to come…”**  **-Check previous EKG’s**  **-Continue to monitor patient** |
| **Second Degree A-V Block, Mobitz I (Wenkebach)**  **EKG 2nd degree type I wenke** | **<**  **60**  **(usual)** | **IRREG** | **+**  **↑**  **~**  **NOT 1:1 QRS** | **Vary**  **\***  **See**  **Disc.** | **NONE** | **-PRI gradually lengthens until a QRS complex is ‘dropped.’ --Repetitive pattern**  -athletes; post-valvular surgery, MI, Drug-induced: beta-blockers, CA+ Channel blockers, amiodarone, lidocaine, digoxin |
| **Second Degree A-V Block, Mobitz II**  EKG 2nd degr type II | **<**  **60**  **(usual)** | **NONE** | **N/A** | **N/A** | **NONE** | Mobitz II block most commonly is caused by an acute myocardial infarction (anterior or inferior). Drug-induced etiologies can also occur (as above) |
| **Third Degree A-V Block** | **20-40** | **NONE** | **+**  **↑**  **~**  **NOT 1:1** | **N/A** | **NONE** | **-Emergency**  **Pacemaker**  **(Drug induced: as above)**  **Infection**  **-Hyperkalemia**  **-more** |

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| **Strip** | **Rate** | **Rhythm** | **P Waves** | **PRI** | **QRS** | **Discussion** |
| **-----------“INDIVIDUAL” ECTOPY / ECTOPIC BEATS---------------** |  |  |  |  |  |  |
| **Premature Ventricular Contractions (PVC’s) (Unifocal)** | **Varies** | **Irreg** | **None preceding the PVC** | N/A | **“Wide**  **& Bizarre”** | -PVC’s MAY be benign.  -May be a sign of ventricular irritability due to surgery, injury, |
| **Premature Ventricular Contractions (PVC’s) (Bigeminy)**  **TrigemPVC** | **Varies** | **Irreg** | **None preceding the PVC** | **N/A** | **“Wide**  **& Bizarre”** | Such as in an MI; may occur due to electrolyte imbalances; toxins, etc.  -Generally speaking, the more PVC’s per minute, the worse it is. |
| **Premature Ventricular Contractions (PVC’s) (Multifocal) (Frequent)** | **Varies** | **Irreg** | **None preceding the PVC** | **N/A** | **“Wide**  **& Bizarre”** | -Greater than 6 PVC’s per minute is frequently used as criteria to treat with antiarrhythmics.  -Increasing frequency of PVC’s, particularly if appearing in couplets, triplets, salvos, or “runs of V-Tach” |
| **Premature Ventricular Contractions (PVC’s) ( Couplets)** | **Varies** | **Irreg** | None preceding the PVC | **N/A** | **“Wide**  **& Bizarre”** | Lidocaine IVP  Lidocaine Infusion  Amiodarione IVP  Others… |

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| **Strip** | **Rate** | **Rhythm** | **P Waves** | **PRI** | **QRS** | **Discussion** |
| **Premature Ventricular Contractions (PVC’s) (Triplets, Salvos)** | **Varies** | **IRREG** | None preceding the PVC | **N/A** | **< 0.12**  **sec** | Sign of “Increased Ventricular Irritability= greater chance of V-Tach & Cardiac Arrest  Lidocaine IVP  Lidocaine Infusion  Amiodarione IVP  Others… |
| **Multi Focal PVC’s** | **Varies** | **IRREG** | None preceding the PVC | **N/A** | **< 0.12**  **sec** | **As above** |
| **Premature Junctional Contraction / Premature Atrial Contraction**  **(PJC) (PAC)**  **PJC** | **Varies** | **IRREG** | None preceding the PAC or PJC | **N/A** | **NONE** | **Typically benign**  **If this is a change, be vigilant for other changes!** |
| **Paced Rhythms**  **AAIPacer** | Varies | **REG**  **Or**  **IRREG** | **May or may not be present** | **N/A** | **NONE** | Look for the “Pacer Spike” or “Spikes” before the QRS Complex.  -100% Paced  -Demand Paced  -% Paced / % Captured  \*AICD |
| **Artifact** | N/A | **IRREG** | **N/A** |  |  | **--If continues, Search for source & eliminate;**  **--Wait for it to go away!**  **--60 cycle = machinery**  **“Noise”** |