

## CLINICAL ECG INTERPRETATION

### FINDINGS IN ECG STRIP:

1. RHYTHM: REGULAR VS. IRREGULAR
2. RATE : TACHY(RAPID) VS. BRADY(SLOW) VS. NORMAL
3. P WAVE PRESENT (SINUS RHYTHM) VS. ABSENT (PATHOLOGICAL)
4. QRS WIDTH: WIDE (EQUAL OR MORE THAN 3 SMALL SQUARES - 3SS \ 120 M .SEC.) VS. NARROW \ NORMAL (LESS THAN 3SS.)
5. RELATION BETWEEN NUMBER OF P AND QRS
  - A. Ps MORE THAN QRSs---
  - B. QRSs MORE THAN Ps , OR ONLY QRS
  - C. Ps EQUAL TO QRSs
6. PR INTERVAL : NORMAL 3-5 SS
7. AV ASSOCIATION:
  - A .PRESENT : PR IS CONSTANT
  - B. ABSENT: PR IS NOT CONSTANT \ VARIABLE—AV DISSOCIATION

### CLINICAL INTERPRETATION :

1. REGULAR + RAPID + P PRESENT + QRS NARROW----SINUS TACHYCARDIA
2. REGULAR + SLOW + P PRESENT + QRS NARROW---- SINUS BRADYCARDIA
3. REGULAR + RAPID + P ABSENT + QRS NARROW ---- PAROXYSMAL SVT
4. IRREGULAR + RAPID + P ABSENT + QRS NARROW ---RAPID AF
5. IRREGULAR+ SLOW + P ABSENT+QRS NARROW---SLOW AF
6. REGULAR+RAPID+ P ABSENT + QRS WIDE ---RAPID VT
7. REGULAR + LESS RAPID (<120-REACHING 90-80)+QRS WIDE + P ABSENT+QRS WIDE ---SLOW VT \ IDIOVENTRICULAR RHYTHM

- 8. REGULAR+ RAPID+P ABSENT+QRS NARROW+ Ps > QRSs--  
---ATRIAL TACHYCARDIA\ATRIA FLUTTER**
- 9. REGULAR + SLOW + P PRESENT + QRS NARROW+Ps >  
QRSs +ABSENT ASSOCIATION BETWEE Ps and QRSs(A-V  
DISSOCIATION)----COMPLETE HEART BLOCK\COMPLETE  
A-V BLOCK**
- 10. REGULAR +SLOW +P PRESENT +QRS NARROW+ Ps  
>QRSs+ QRS DROPPED IN A RATIO 2,3, or 4 \1+PR IS  
CONSTANT ----AV BLOCK\ HEART BLOCK -2<sup>ND</sup> DEGREE-  
MOBITZ 2**
- 11.REGULAR +NORMAL RATE+P PRESENT +QRS NARROW  
+Ps=QRSs + PR PROLONGS PROGRESSIVELY TILL  
REACHING A DROPPED QRS –THEN REPEATING THIS  
CYCLE-----AV BLOCK-2<sup>ND</sup> DEGREE-MOBITZ ONE  
–WINCHEBACH PHENOMENON**
- 12. REGULAR +NORMAL RATE +P PRESENT +QRS NARROW  
+Ps=QRSs +NO DROPPED QRS + PR POLONGED + PR IS  
CONSTANT ----AV BLOCK \HEART BLOCK-1<sup>ST</sup> DEGREE**

**CLINICAL ETIOLOGIES OF ABNORMAL ECGs IN CCU:  
1: PAROXISMAL SVT : IDIOPATHIC\ TRIGGERED BY  
GASEOUS GASTRIC DISTENSION IN IBS—Rx DC ,(IF  
SHOCKED) ,OR CORDARONE,OR B. BLOCKERS, (IF  
FREQUENT WITH PRESYNCOPE),OR INDERAL,AS PILL  
IN A POCKET,(IF INFREQUENT,NO PRESYNCOPE ,AND  
BRIEF EPISODES .ALL THESE AFTER ATRIAL OF  
SPECIAL MANEAUVERS ,ESP. INDUCING VOMITING**

**2. RAPID AF : HT,IF UNCONTROLLED \LVH ,DUE  
SEVERE AS ,OR HCMP\ HF ,IF EXCESSIVE VOLUME  
OVERLOAD \STMI,IF INF\STMI ,IF ANTEROSEPTAL OR  
EXTENSIVE , AS A POOR PROGNOSIC  
FACTER.,AP(VERY RAPID ,CAN DEGENERATE INTO  
VF)**

NOT IN CCU : MS \THYROTOXICOSIS \EXCESSIVE  
CARDIAC STIMULAN USE (COFFEE-TEA- COCAINE-  
EPHEDRINE-ANABOLICS\ EXCESSIVE TRAINING)  
Rx :DC. IF SHOCKED ,OR AGREVATED HF, OR ANGINA,  
OR MI.(ALL CALLED HEMODYNAMIC  
INSTABILITY).OTHERWISE :MEDICATIONS-AV.  
BLOCKERS-WARFARINE(ASPIRINE IF >75 YEARS)

3. SLOW AF: RAPD AF , AFTER EXCESSIVE USE OF AV.  
BLOCKERS(B.BLOCKERS,CA. BLOCKERS,DIGOXIN,  
CORDARONE)—RX OBSERVATION.

4. RAPID VT: STMI, 2TYPES , ACCORDING TO THE  
TIMING OF OCCURANCE: PRIMARY, OR 2NDARY \  
PRINCEMETALS ANGINA\ UN, HIGH RISK \  
DRAWING , DUE TO ACUTE HYPOXIA \  
ELECTROCAUTION \ANY TERMINAL ILLNESS \  
\*TORSADE de POINTS= RAPID VT+OSSILATING QRS  
AXIS,DUE TO ISCHEMIA\ CERTAIN DRUGS CAUSING  
PROLONGED QT. INTERVAL (NORMAL QT. <1\2 OF RR  
.INTERVAL)(Rx.DC \Mg. INFUSION\TREAT THE CAUSE)  
\*TO DIFFERENTIATE RAPID VT FROM SVT .WITH  
BBB(COLLECTIVELY CAULED WIDE QRS  
.TACHY:NEED SPECIAL ALGORYTHEM\+VE  
ATHEROSCLEROSIS RISK FACTORS\ELDERLY\BUT  
SHOCK IS NOT ADIFFERENTIATING)(Rx  
DC\SYNCHRONISATION WITH OR WITHOUT  
.AMIODARONE INFUSION)

5. SLOW VT:BENIGN, EVIDENCE OF RECANALIZED  
THROMBOTIC ARTERY,NO TREATMENT

6. AV BLOCK: CHB .: IDIOPATHIC-AGING-  
CONGENITAL-HYPERCALEMIA IN ARF.,STMI  
(ANTEROSEPTAL-POOR PROGNOSIS\INF  
MI.,MANAGEBLE ,BY TEMPORARY PM.(AS MOBITZ2)

## **1ST DEGREE-WNCKEBACH: OBSERVATION**

### **7. ATRIAL FLUTTER\**

**ATRIAL TACHYCARDIA: CONGENITAL HD-BEFORE OR AFTER SURGICAL CORRECTION-**

**MAT-MULTIFOCAL ATRIAL TACHYCARDIA : IN A COPD PAT. –TACHY, P<sub>s</sub> >QRS<sub>s</sub>- MULTIPLE DIFFERENT SHAPED P<sub>s</sub> –TO MANAGE THE CAUSE**

### **8. S TACHY.: PAIN –RELATED, IN MI .PAT.**

**\HYPOTENSION IN MI. PAT.(EXTENSIVE MI-DRUG INDUCED)\ ACUTE PULMONARY EMBOLISM \ THYROTOXICOSIS \ PANIC ATTACK \ FEVER.**

**9. S. BRADY- REFLEX IN IM INF MI-VASOVAGAL, IN AMBULAT PAT.\SEVERE HT.\HIGH ICP\ OBSTRUCTIVE J.\ ATHLETIC-EXCESSIVE TRAINING-**

### **10. ECTOPICS**

**A. VENTRICULAR: QRS WIDE-P ABSENT- QRS BIZARR SHAPE-PREMATRE-T WAVE AXIS: OPPOSITE TO THAT OF QRS**

**CAUSED BY EXCESSIVE STIMULANTS-GASEOUS GASTRIC DISTENSION-MVP, IF SEVERE WITH MR – CHRONIC ANXIETY-SLEEP DEPRIVATION –ISCHEMIA, IF ASSOCIATED WITH ST CHANGES.**

**NO NEED FOR MEDICATIONS , UNLESS IF PRODUCING ANXIETY ,OR OBSESSION.**

**B. ATRIAL: PREMAURE \P PRESENT: PREMATRE , DIFFERENT SHAPED OF SINUS P . \ QRS.: SIMILAR SHAPE OF SINUS WAV\ -T AXIS IS SIMILR TO QRS AXIS—**

**CAUSED BY EXCESSIVE STIMULANS –OR LIKE VENTRICULAR ECTOPICS**

**QRS CHANGES:**

- A. WIDTH :WIDE: VT---BBB—V.CTOPIC---AP—
- B.AMPLITUDE: IF SUMMATION OF S OF V1+R OF V6>7 LS OR MORE (IF NORMAL STANDERISATION :2LS) =HIGH VOLTAGE CHRITERIA
- C. Q WAVE : PATHOLOGICAL IF DEEP (>2SS)\ WIDE (2SS)\ SEGMENTAL ,NOT DEFFUSE.
- D. AXIS : NOT ESSENCIAL.

**INTRPRETATION OF ABN. QRS:**

- A.WIDE: 1.VT 2. BBB : 2TYPES : V1:WIDE+DEEP S+ ST ELEVATION\ V6:WIDE+PROMINENT R +ST DEPRESION----LBBB ,RELATED TO HT, HF,PM,IDIOPATH.
  - IF V1:WIDE+PROMINENT R+NO ST DEPRESION IN V6---RBBB-BENIGN IF CHRONIC(WITH OR WITH OUT ST DEPRES.IN V1.2 =RV. STRAIN -IN TOF. \LARGE ASD ,WITH Rsr IN V1)
  - IF AP.:WIDE+DELTA WAVE+R PROMINENT IF ON LV SIDE\PROMINT S IF ON RV SIDE\DETAILED AP LOCALISATION NEEDS EPS WITH SPECIAL ALGORITHM ---ALL FOR EPS -ABLATION\ CORARONE IS AN ALTERNAIVE IF NO SYNCOPE-PRESYNCOPE- NO AF,VF,NOT FREQUENT

- B. AMPLITUDE -HIGH VOLT. CRIT.---. LVH (1.HT. IF UNCONTROLLED-WITH STRAIN PATTERN,AS ST DEP, IN V6, ASYMMETRICAL ,WITH NO CHEST DEPRESSION, ONLY IN SEVERE LVH.)
- 2. AS , IF SEVERE ----3. HCMP.----4. AR \MR . IF SEVERE , CHRONIC.

- C . Q IF PATH, -SEGMENTAL OLD OR EVOLVING STMI,IN II.III.AVF—INF MI-----V1.2.3.4 --- ANTEROSEP.MI-----V5.6 AVL.I-----LAT

**ANTEROSEPTAL +LAT. MI-----EXTENSIVE MI,POOR  
PROGNOSIS,HF\VT\ CARDIOG. SHOCK.  
INF LEAD ST DEP\OR LAT. ST DEP +ANTEROSEPT  
MI=RECIPROCAL CHANGES =POORER PROG,  
ANTEROSEPT. ST DEP\+INF STMI=  
RECIPROCAL\POORER PROG.  
INF PATH. Q. IN NO CHEST PAIN + LVH=HCM**

### **ST ELEVATION S**

**1. STMI: SEMIANTERIOR, AS Q WAVE,+ CHEST P.+  
SEARCH FOR ----A. MAX. ST ELEV LEAD -TO REPEAT  
ECG. 90 MINUTES AFTER THROMBOLYT. TO ASSESS  
ITS SUCCESS---RULE OF >50%**

**SITE -TO LOCALISE STMI**

**AGE OF STMI : A. ST ELEV. +NO Q+NO T.**

**INVERS.=ACUTE STMI -WITHIN HOURS---  
THROMBOLYTICS IF NO CI, OR PCI.**

**B. Q +NO ST . ELEVAT.+T FLAT----OLD STMI  
-THROMBOLYT. OR PCI :NOT INDICATED.**

**C. ALL ARE PRESENT: EVOLVING STMI  
THROMBOLYT. NOT INDICATED\PCI IS NOT  
INDICATED, ONLY IN CONTINUOUS CHEST PAIN -NOT  
RELATED TO ACUTE POST-MI PERICARDITIS**

**2. ACUTE PERICARDITIS :ST ELEV +NOT  
SEG.+DIFFUSE+NO Q+ NO SIMULTANEOUS T INVER  
WITH ST .DEP. CHEST P. :CENTRAL,OR  
PERIPHERAL\POSITIONAL \RADIATING TO LT.  
SHOULDER---RX. INDOLOX-PREDNISOLONE (IF  
RECURRENT)**

**3.LV. ANEURYSM -COMPLICATION ANTEROSEPT. STMI  
:NO CHEST P.\HF\HEAVING APEX\ABN. CARDIAC  
SHADOW---TO USE ANTI-REMOLDING AGENTS\**

ASPERINE TO PREVENT MURAL THROMBOSIS, THEN EMBOLIC CVA).

4. BBB: RECENT ,IF COMPLICATING STMI,OR SBE ,POORER PROGNOSIS---OR CHRONIC -IF COMPLICATING HF,VALV.HD, IDIOPATHIC -OPEN HEART SURGERY—

ST DEPRES.: 3 PATTERNS : PLANNER \DOWNSLOPPING ,OF POORER PROGNOSIS\ UPSLOPPING ,MISLEADING,NO ISCHEMIA ,REASSURANCE--.

S DEPRES. 3 SITES ---1. RECIPROCAL\WITH ST. ELEVAT ---- 2. SEGMENTAL :AS SEGMENTAL ST .ELEVAT.,INDICATES ACUTE NSTMI\UA .OF HIGH RISK\ASSOCIATED WITH T .INVER(SAME SITE OF ST. DEPRES.\ARROW HEAD\SYMMETRICAL---FOR PCI—THROMBOLYT IS CI )  
CHRONIC NSTMI :ONLY T .INVERS. \NO ST. DEPRES.

T .CHANGES A. T DEPRES.1. -SEGMENTAL: CHRONIC. NSTMI 2.DEFFUSE-NONSEGMENT:NON-SPECIFIC.- NOT ISCHEM. RELATED  
B: T .ELEVAT.: HYPERKALEMIA

QT. INTERVAL :PROLONGED:  
HYPOCALCEM\FAMILIAL.  
.—SHORT QT :HYPERCALCEMIA---Rx THE CAUSE.





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