

ECG normal

✓ Intro

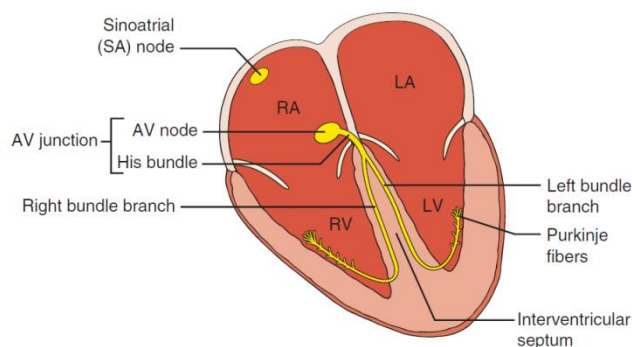
- **Enregistrement de l'activité électrique** du cœur détectée par des électrodes attachées à la peau.
- La différence de potentiel entre ces électrodes est représentée par des **dérivations**
- Examen disponible, non invasif et peu cher.
- Utile dans diverses pathologies: troubles du rythme et de conduction, cardiopathie ischémique, troubles métaboliques,...

✓ Plan

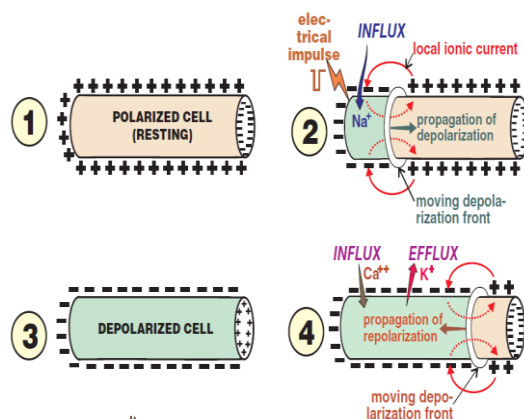
1. Activité électrique du cœur: **électrophysiologie**
2. Enregistrement de l'activité: **dérivations**
3. Résultats: **interprétation**

❖ Electrophysiologie

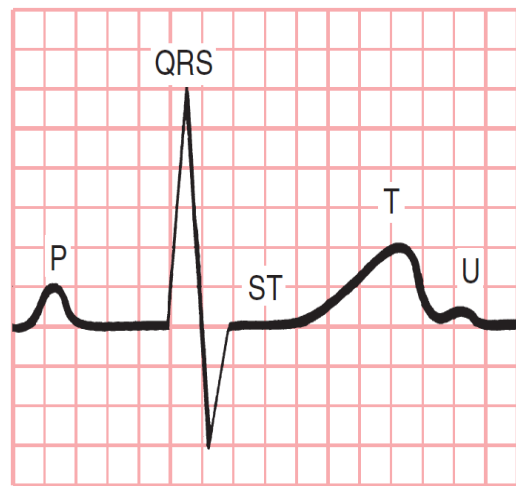
- Système de conduction cardiaque



- Dépolarisation et repolarisation

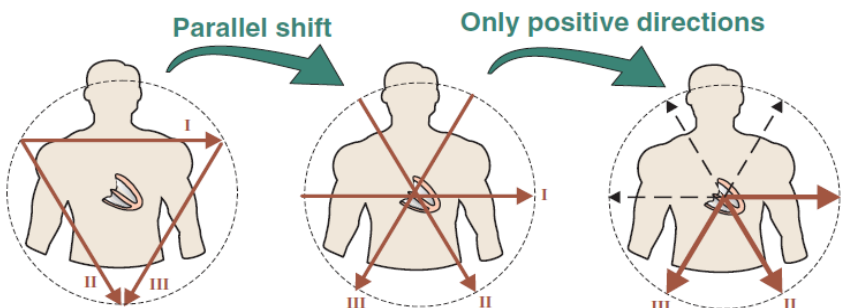
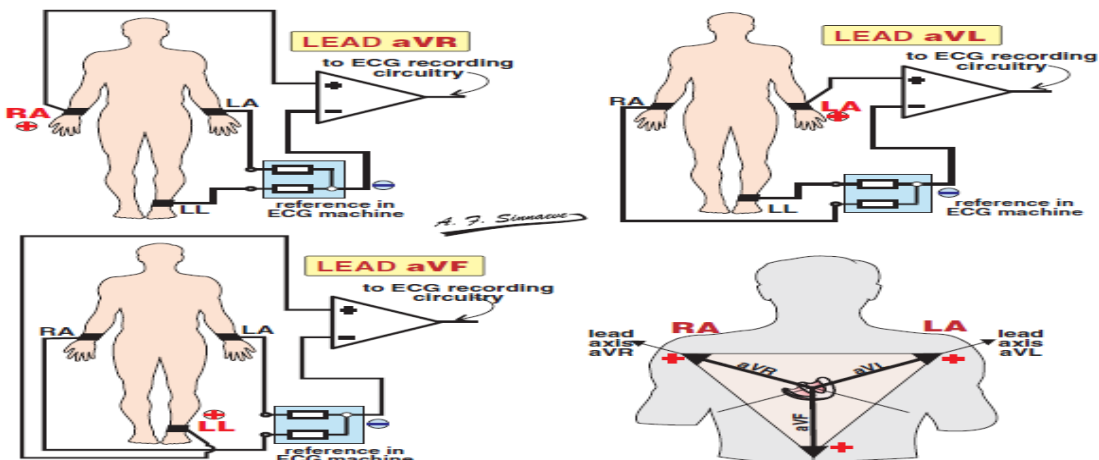
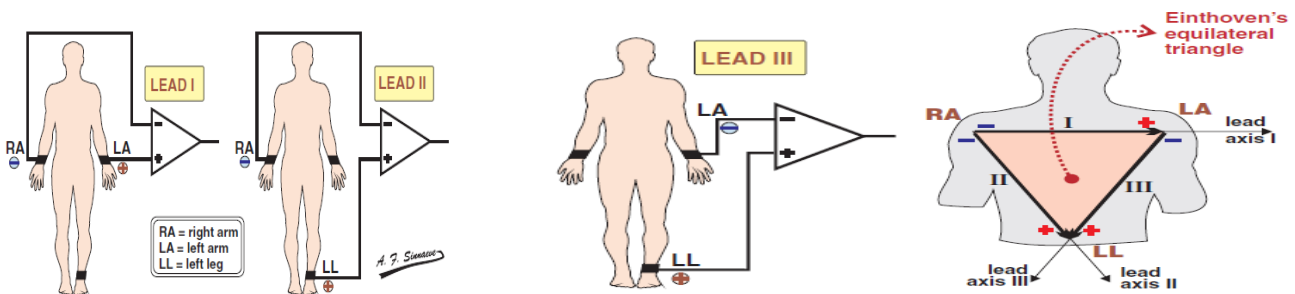
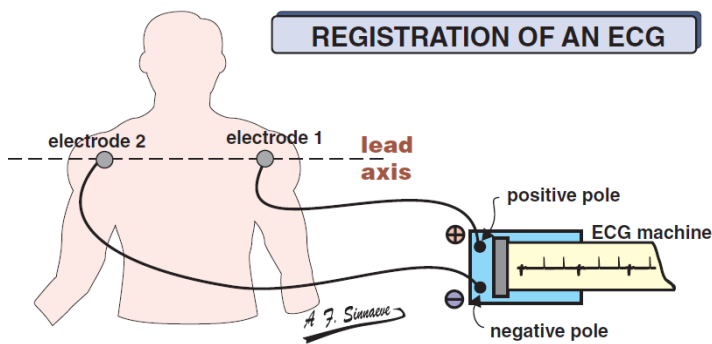


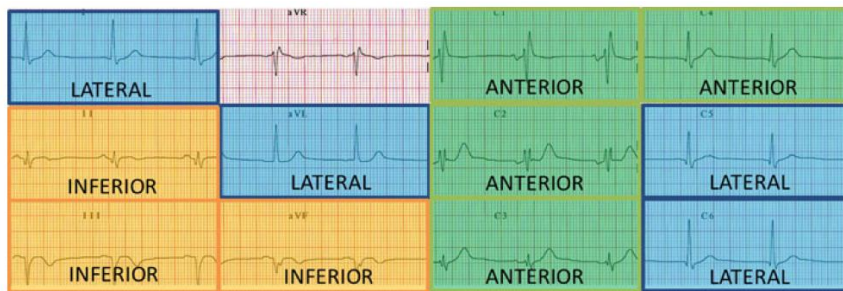
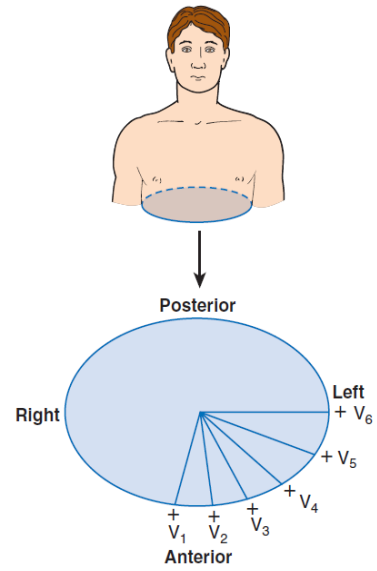
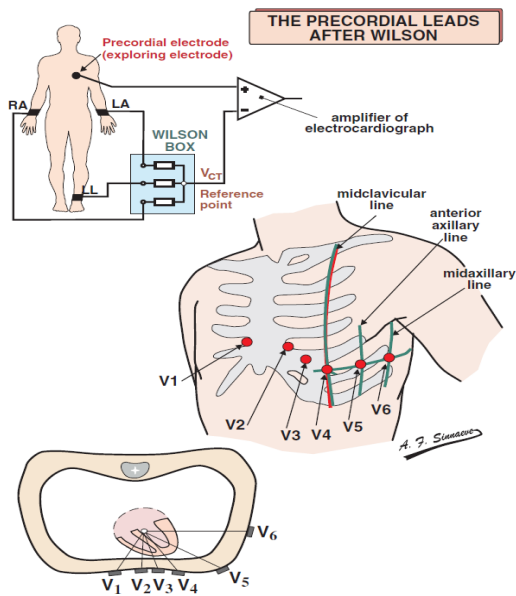
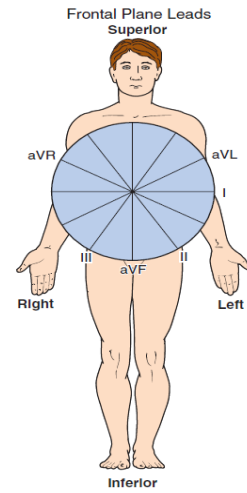
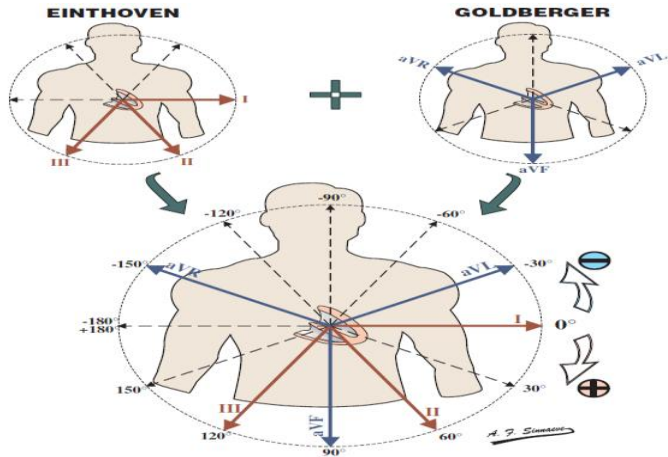
- P: dépolarisation atriale
- QRS: dépolarisation ventriculaire
- ST-T-U: repolarisation ventriculaire



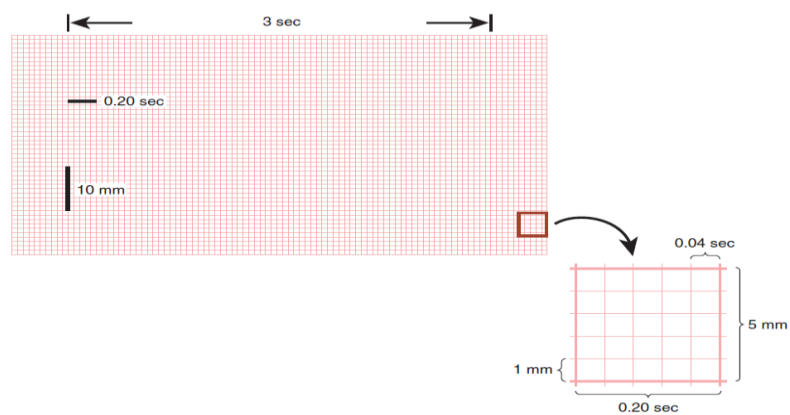
Dérivations

REGISTRATION OF AN ECG





Papier ECG



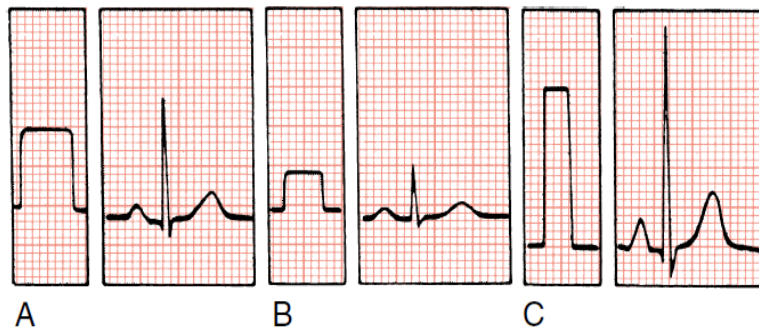
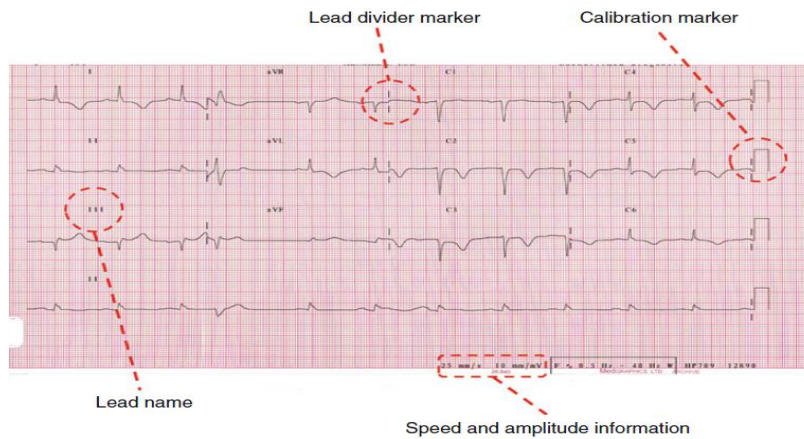
Interpretation

+ Plan de l'interprétation

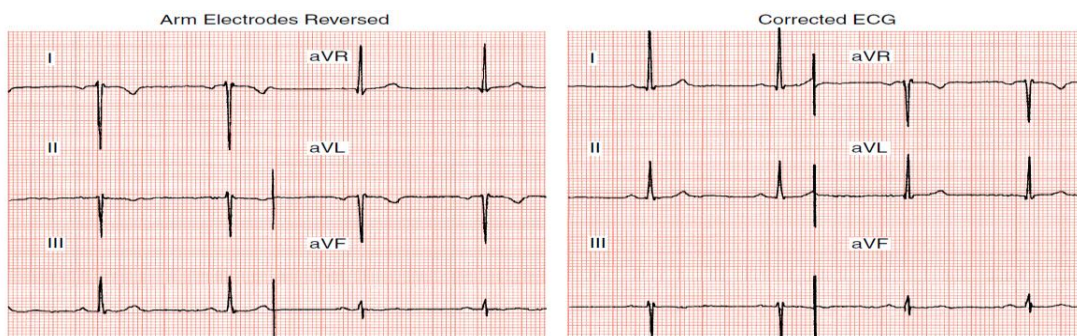
- 1- Qualité
- 2- Fréquence
- 3- Rythme
- 4- Onde P
- 5- Intervalle PR
- 6- Complexe QRS
- 7- ST-T
- 8- Intervalle QT

1- Qualité

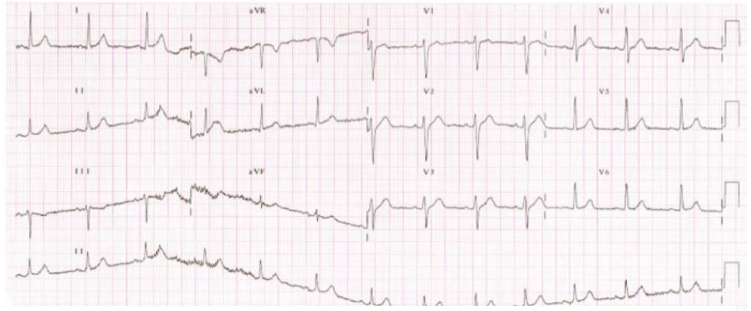
a) Etalonnage



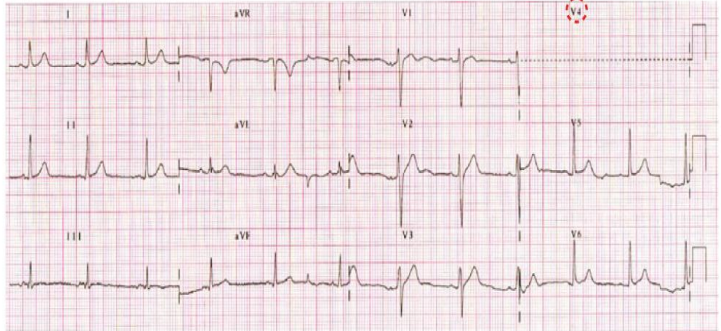
b) Inversion des électrodes



c) Artefacts



Missing lead data



2 - Fréquence 60-100/min

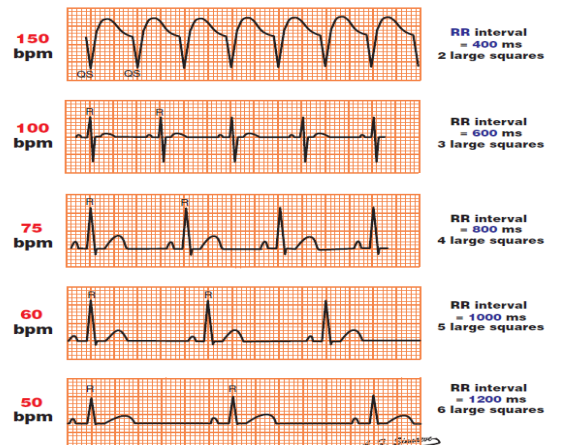
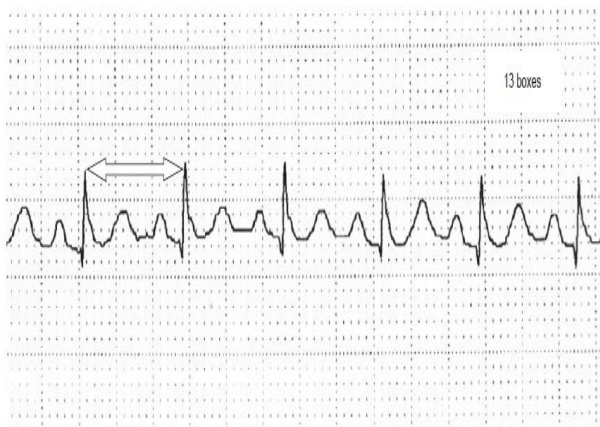
$$\text{Heart rate (bpm)} = \frac{300}{\text{Number of large squares}}$$

$$\text{Heart rate (bpm)} = \frac{1500}{\text{Number of small squares}}$$

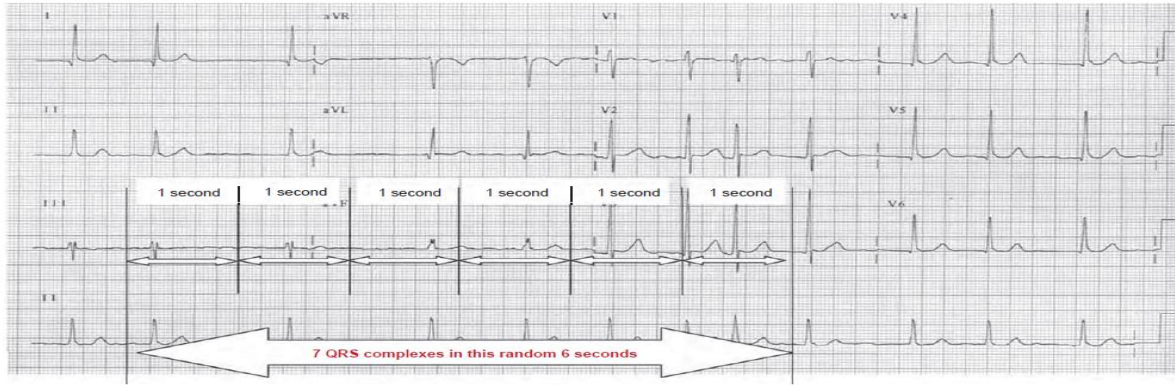
1500/26 = 58
Heart rate = 58 beats per minute
Sinus bradycardia



1500/13 = 115
Heart rate = 115 beats/minute
Sinus tachycardia

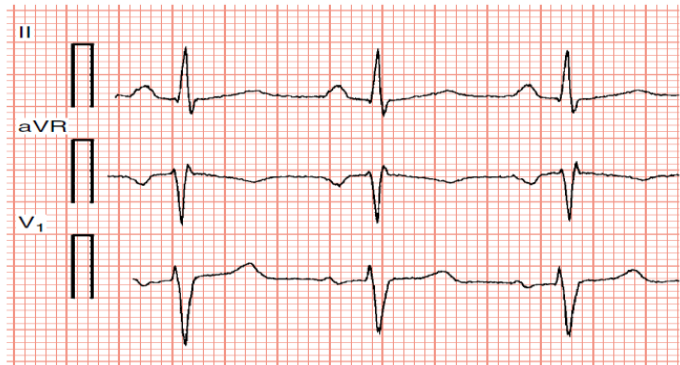
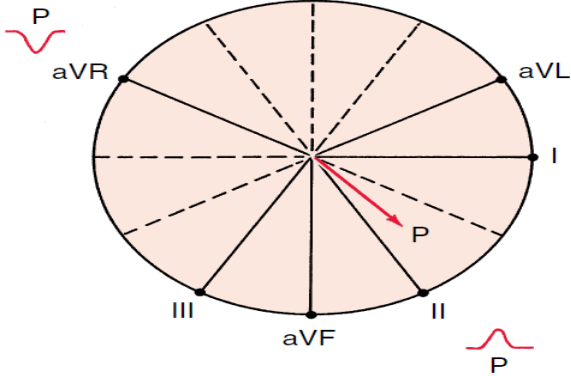
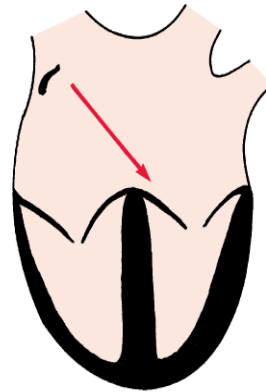
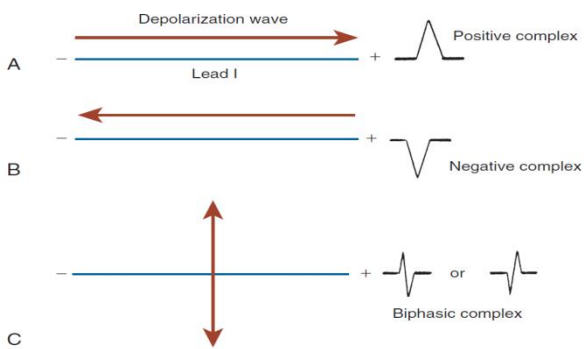


Rythme irrégulier



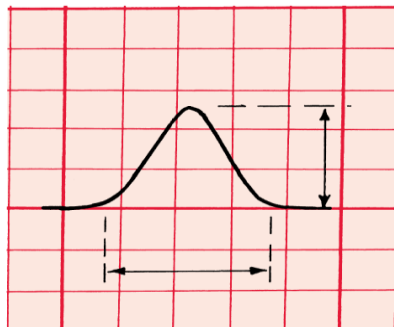
3- Rythme sinusal? régulier?

Onde P sinusale

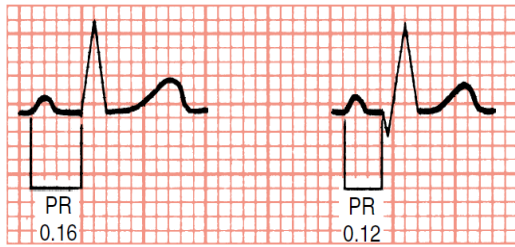


Rythme sinusal

4- Onde P DII: durée < 0.12 sec, amplitude < 2.5 mm



5- Intervalle PR: conduction AV 0.12-0.20 sec



6- Complexe QRS

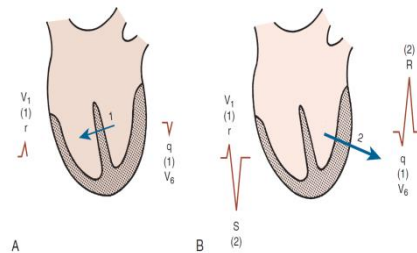
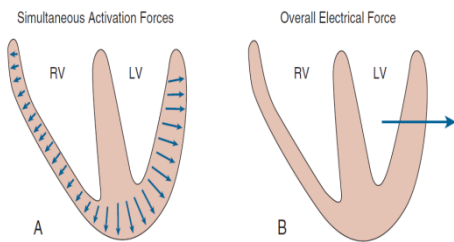
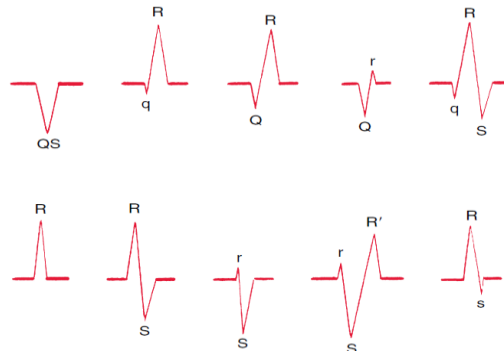
Nomenclature

1^{ère} déflexion positive: R

Déflexion négative avant l'onde R: Q

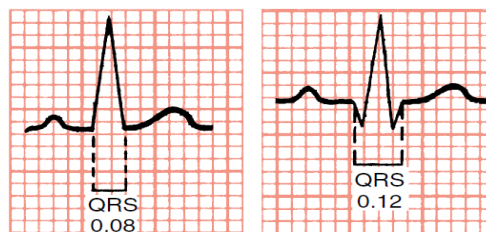
Déflexion négative après l'onde R: S

2^{ème} déflexion positive R'



- Durée < 0.12 sec

QRS Interval

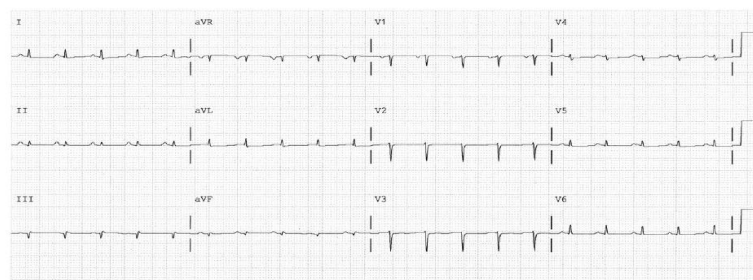


- Amplitude

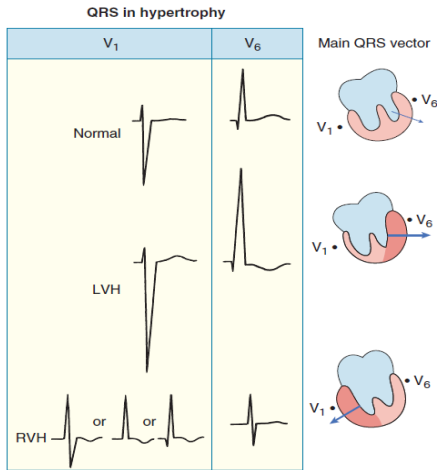
✓ **Bas voltage**

I-aVF < 5 mm

V1-V6 < 10 mm



✓ Hypertrophies



✓ Sokolow-Lyon: $SV_1 + RV_5$ ou $V_6 > 35$ mm

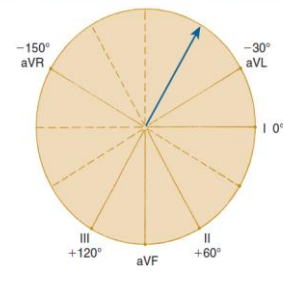
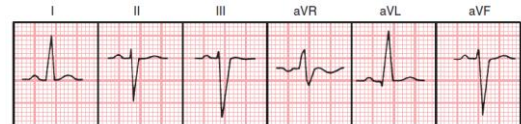
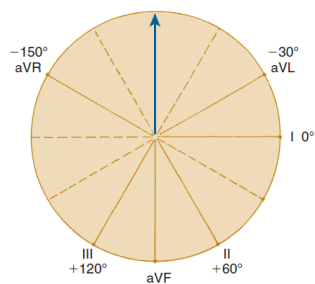
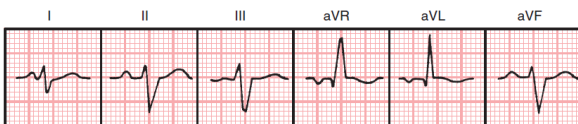
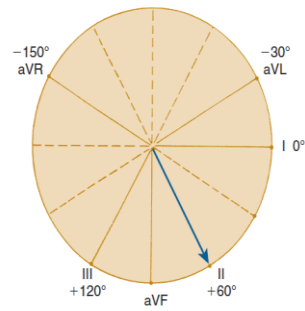
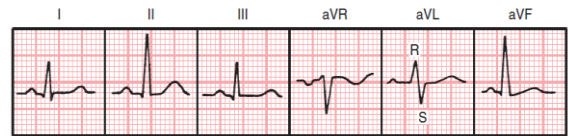
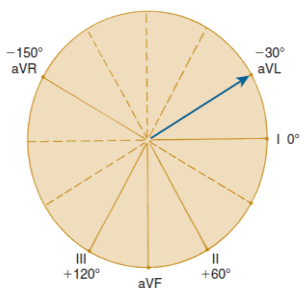
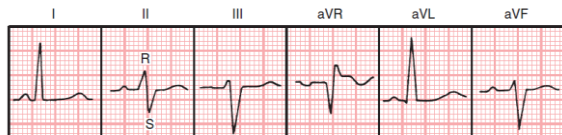
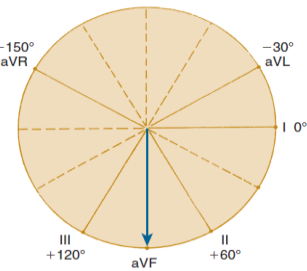
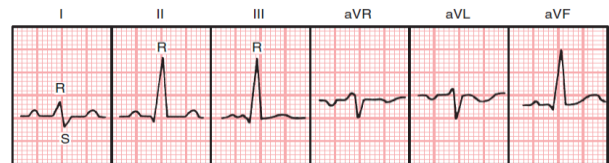
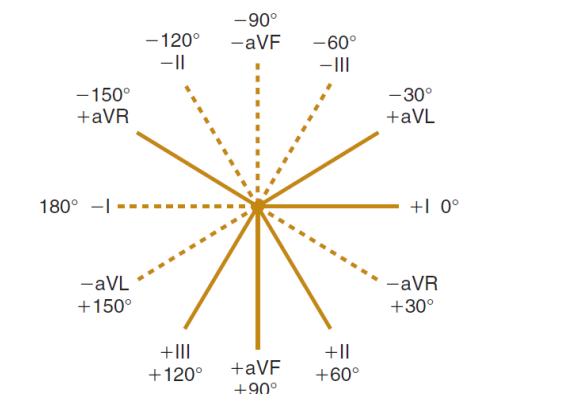
✓ Cornell: $RaVL + SV_3 > 28$ (homme)

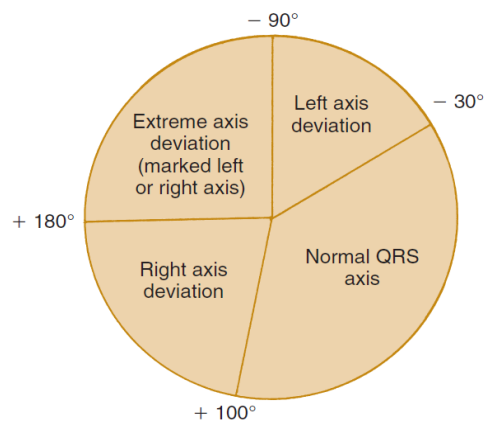
> 20 (femme)

- $R > S$ V1
- $S > R$ V5-6

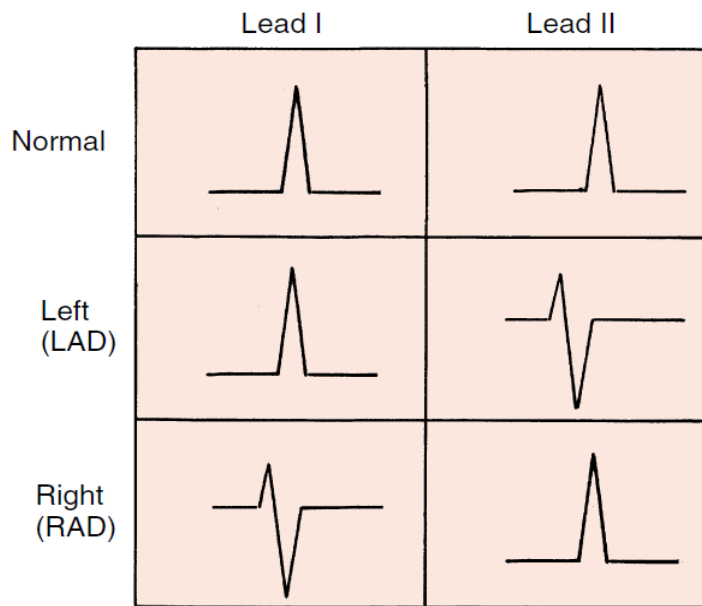
• Morphologie

➤ Plan frontal: Axe

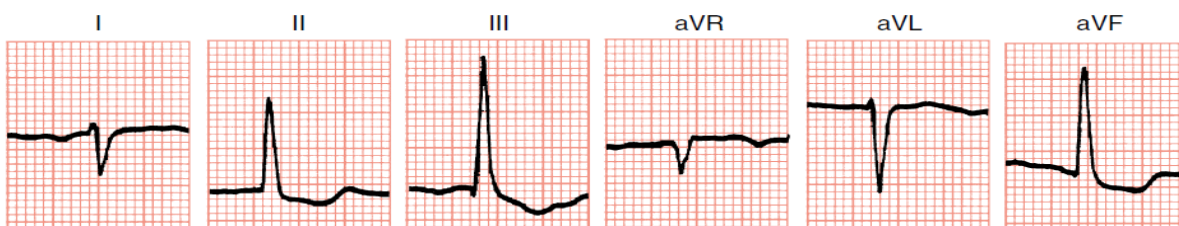




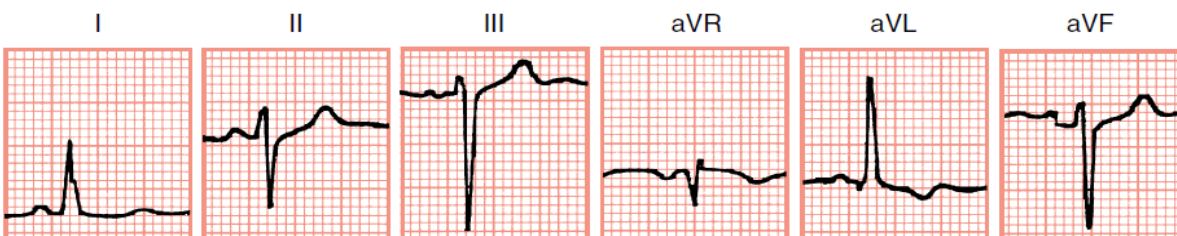
- Deviation axiale gauche et droite



- Axe droit

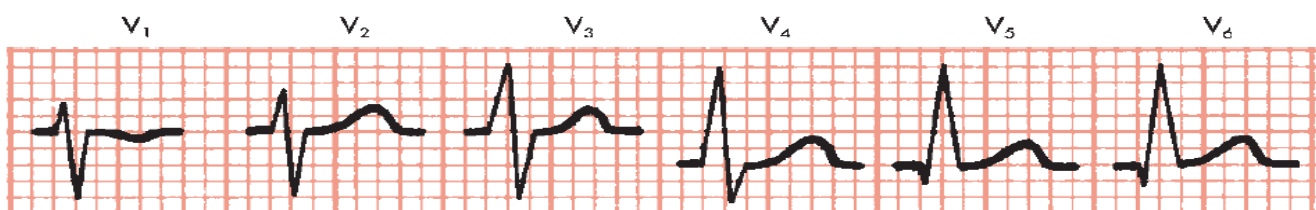


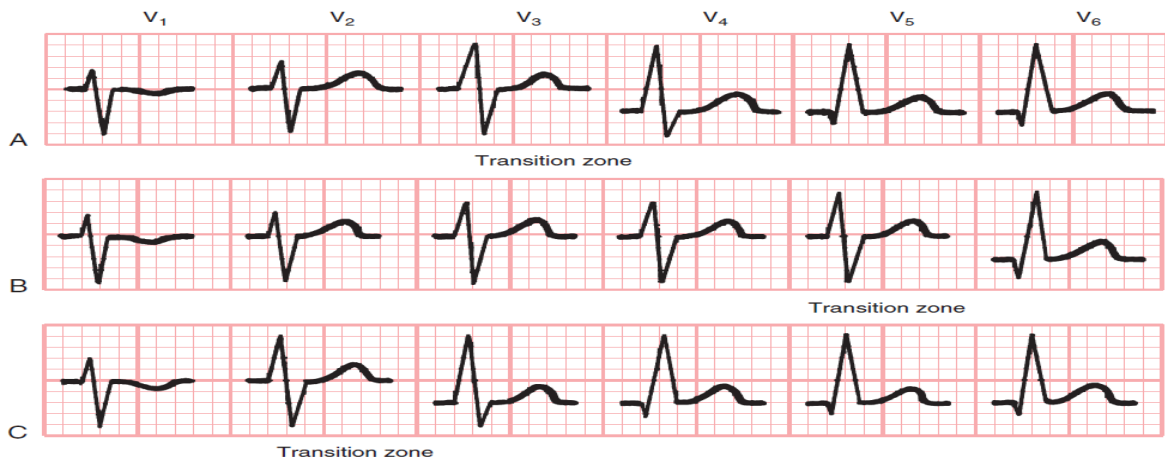
- Axe gauche



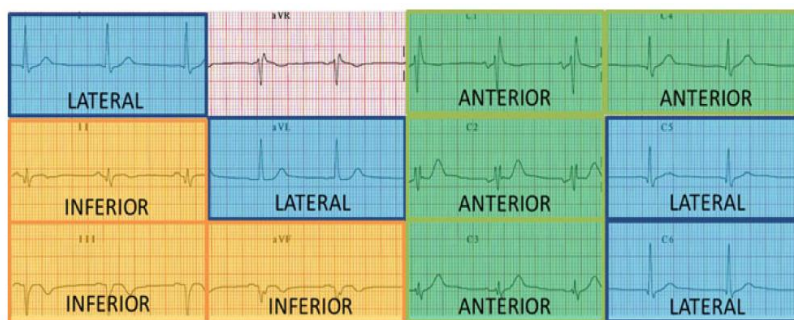
➤ Plan horizontal: Progression de R

Normal R Wave Progression

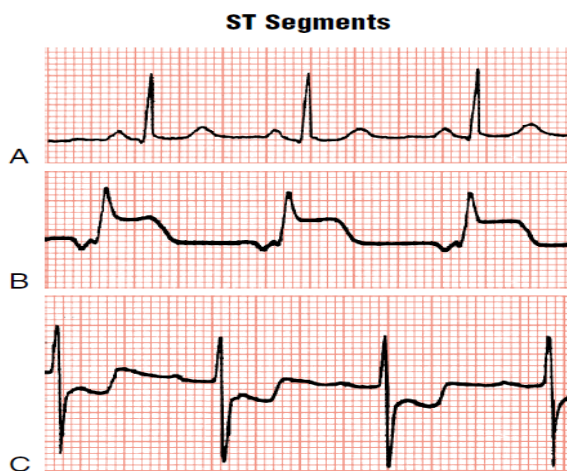




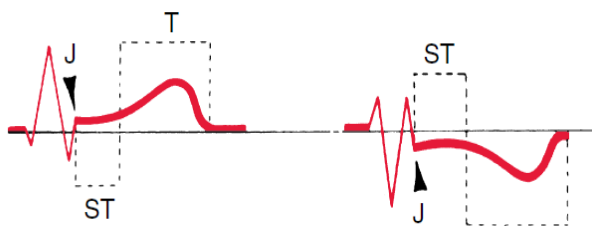
- **Q pathologiques:** ≥ 0.04 sec / 1mm ou QS sur 2 derivations contigües (même territoire)



7-ST-T

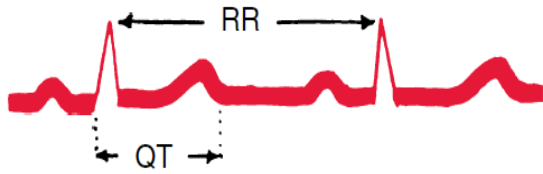


Onde T: Asymétrique et positive



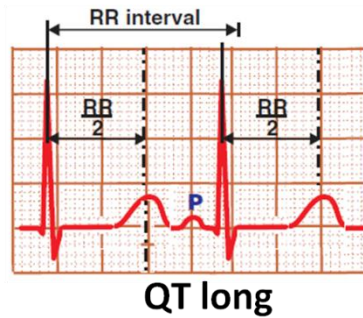
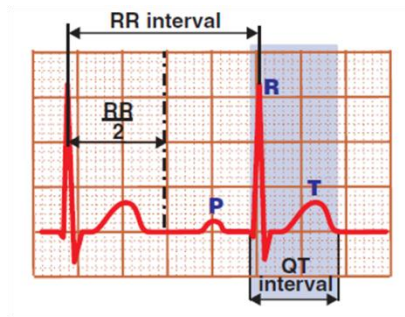
- Peut être négative si le QRS est négatif. Ex: aVr, DIII, V1

8-Intervalle QT

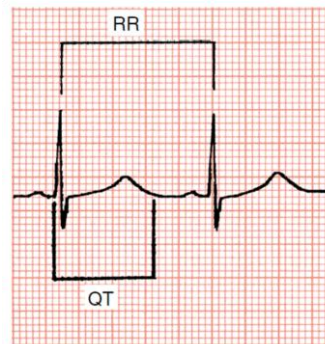


$$QTc = QT / \sqrt{RR}$$

$QTc < 0.45 \text{ sec}$



$0.60 \text{ sec} / \sqrt{0.92} = 0.63 \text{ sec}$



Conclusion

- Etalonnage: 25mm/sec, 10 mm/mv
- FC: 60-100/min
- P: positive DII, durée < 0.12 sec, amplitude < 2.5 mm
- PR: 0.12-0.20 sec
- QRS:
 - Durée < 0.12 sec
 - ISL < 35 mm
 - Axe N: QRS + DI, + DII
 - Progression R V1-V6
 - Absence de Q pathologique
- ST isoélectrique

