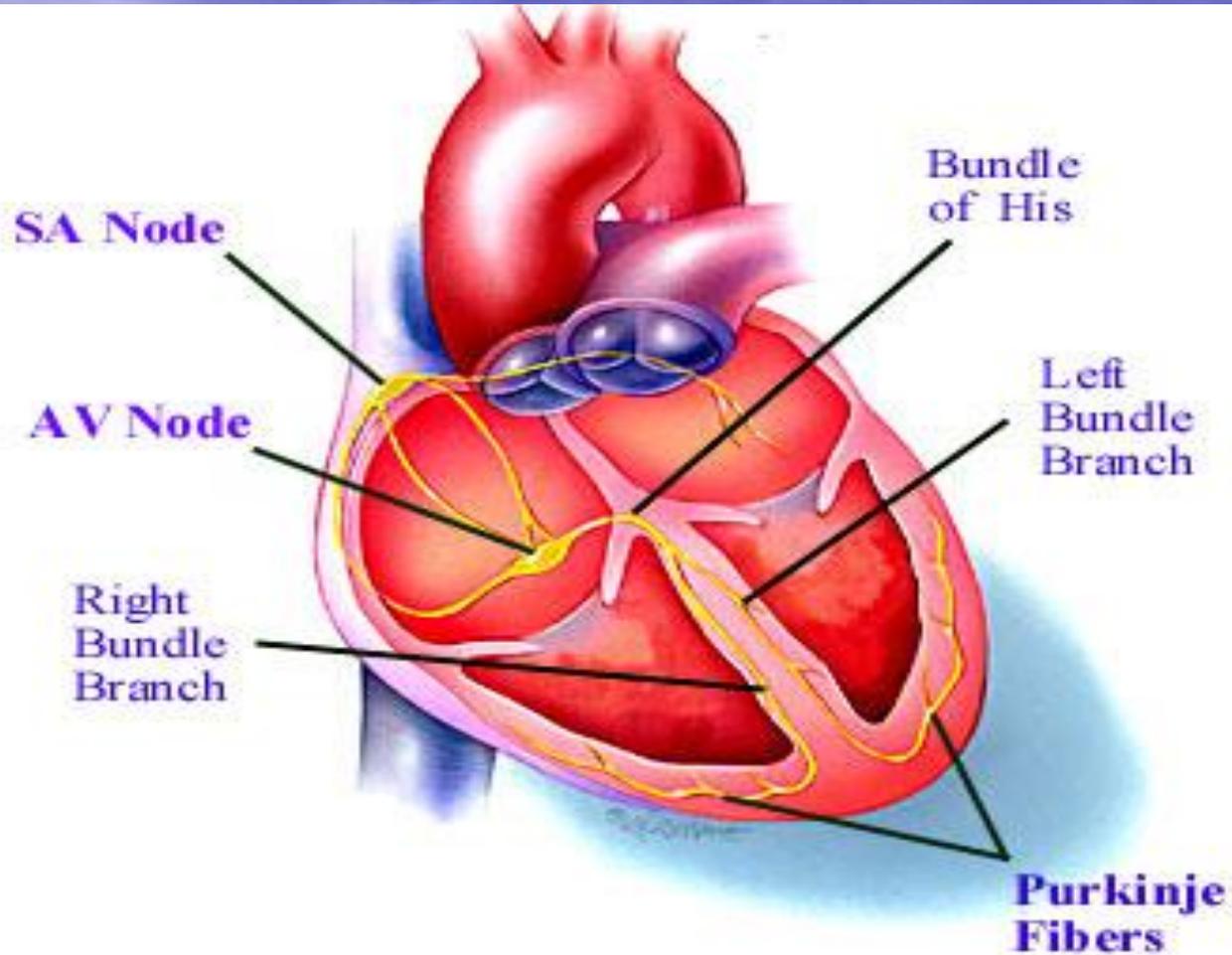


# SKILL EKG

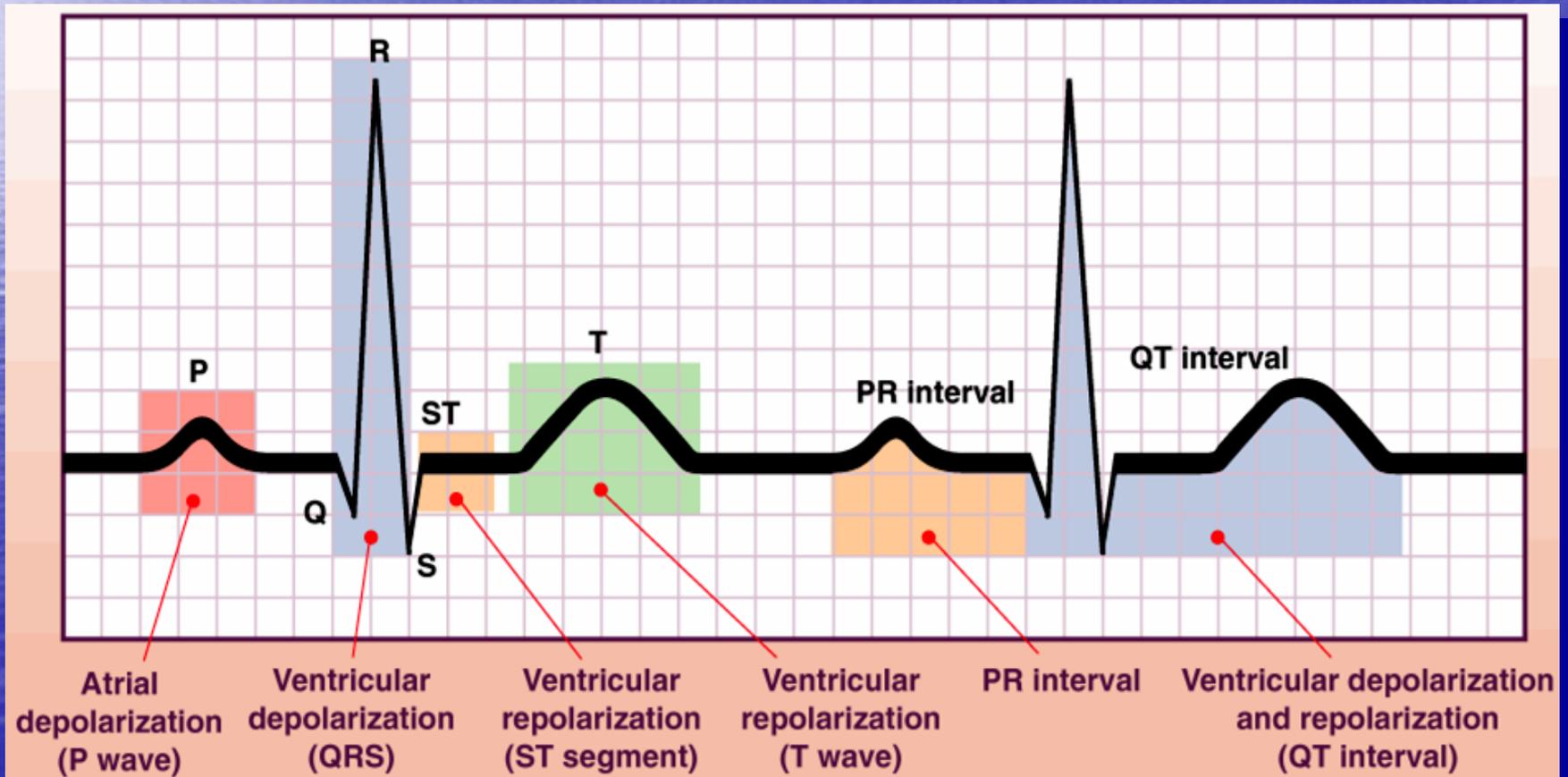
**Pelatihan BTCLS MST 119**

# SISTEM KONDUKSI



# KURVA EKG

Kurva EKG menggambarkan proses listrik yang terjadi pd atrium dan ventrikel EKG normal terdiri dari gel P,Q,R,S dan T serta kadang terlihat gel U. Selain itu ada juga beberapa interval dan segmen EKG.



# KERTAS EKG

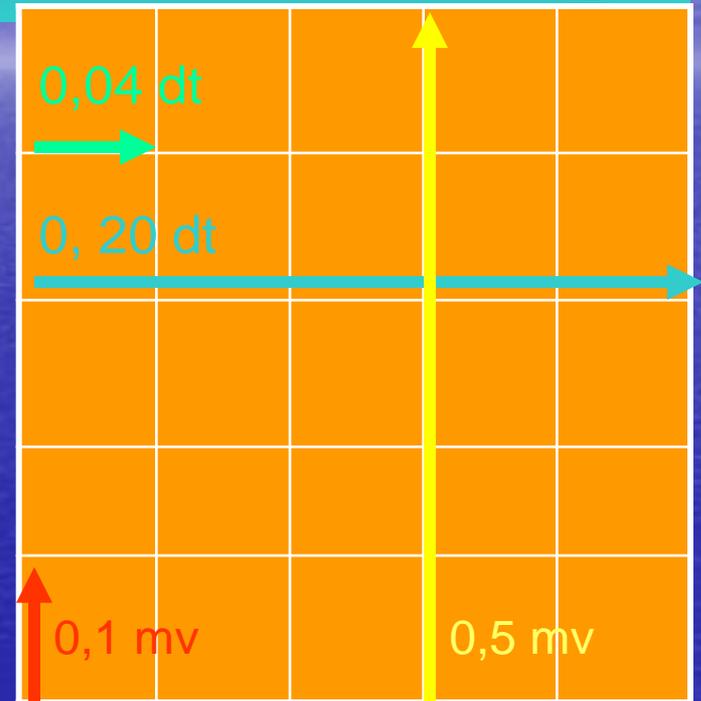
Kertas EKG merupakan kertas grafik yang merupakan garis horizontal dan vertikal dengan jarak 1mm ( kotak kecil ). Garis yang lebih tebal terdapat pada setiap 5mm disebut ( kotak besar ).

## ■ Garis horizontal

Menunjukkan waktu, dimana  
 $1\text{mm} = 0,04\text{ dtk}$ , sedangkan  
 $5\text{mm} = 0,20\text{ dtk}$ .

## ■ Garis vertical

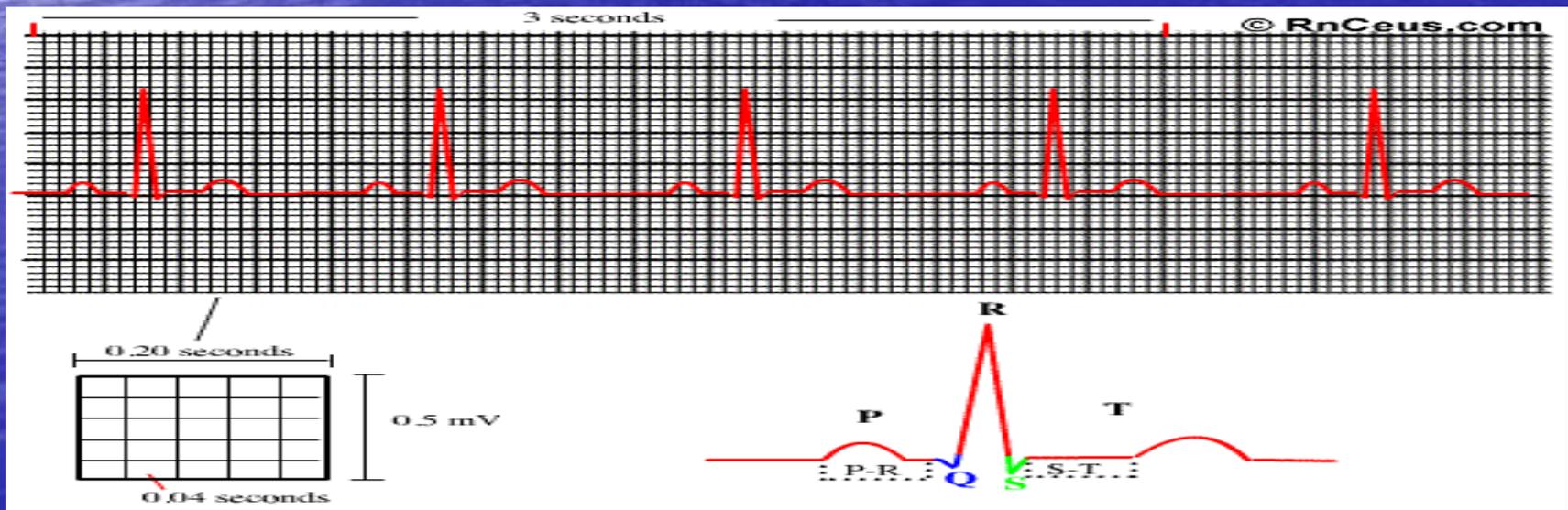
Menggambarkan voltage, dimana  
 $1\text{mm} = 0,1\text{ mv}$ , sedangkan  
setiap  $5\text{ mm} = 0,5\text{ mv}$ .



# EKG NORMAL

**Kriteria irama sinus (SR) atau EKG normal adalah sbb :**

- Irama teratur.
- Frekwensi jantung (HR) antara 60-100 x/menit.
- Gel P normal, setiap gel P diikuti gel QRS dan T.
- Interval PR normal ( 0,12 – 0,20 detik ).
- Gel QRS normal ( 0,06 – 0,12 detik ).
- Semua gel sama.
- Irama EKG yg tidak mempunyai kriteria tersebut disebut disritmia atau aritmia.



# INTERPRESTASI EKG STRIP

Tentukan irama dengan melihat /membandingkan jarak QRS satu dengan lainnya.

Frekuensi Jantung (Heart Rate).

Tentukan Gelombang P Normal atau Tidak.

Lihat gelombang P selalu diikuti QRS ( P : QRS )

Tentukan Interval PR Normal atau Tidak.

Tentukan Gelombang QRS Normal atau Tidak

# CARA MENGHITUNG HR

## *Menentukan frekuensi jantung*

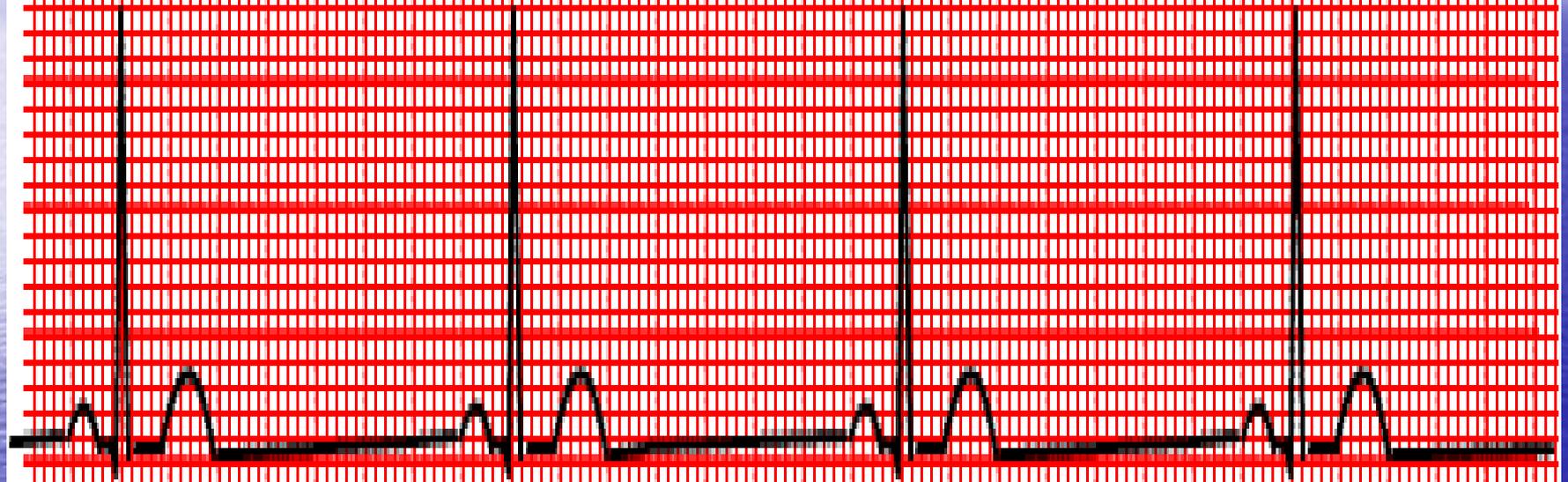
- A.  $\frac{300}{\text{Jml kotak besar antara R - R}}$
- B.  $\frac{1500}{\text{Jml kotak kecil antara R - R}}$
- C. Ambil EKG strip sepanjang 6 detik, hitung jumlah QRS dan kalikan 10.

# Sinus Takikardi ( ST )

- Irama :Teratur
- Frekwensi HR :100 – 150 x/menit
- Gel. P :Normal, setiap gel. P selalu diikuti gel qrs dan t
- Interval PR :Normal ( 0,12 – 0,20 detik )
- Gel. QRS :Normal ( 0,06 – 0,12 detik )
- Catatan :semua gel. Sama

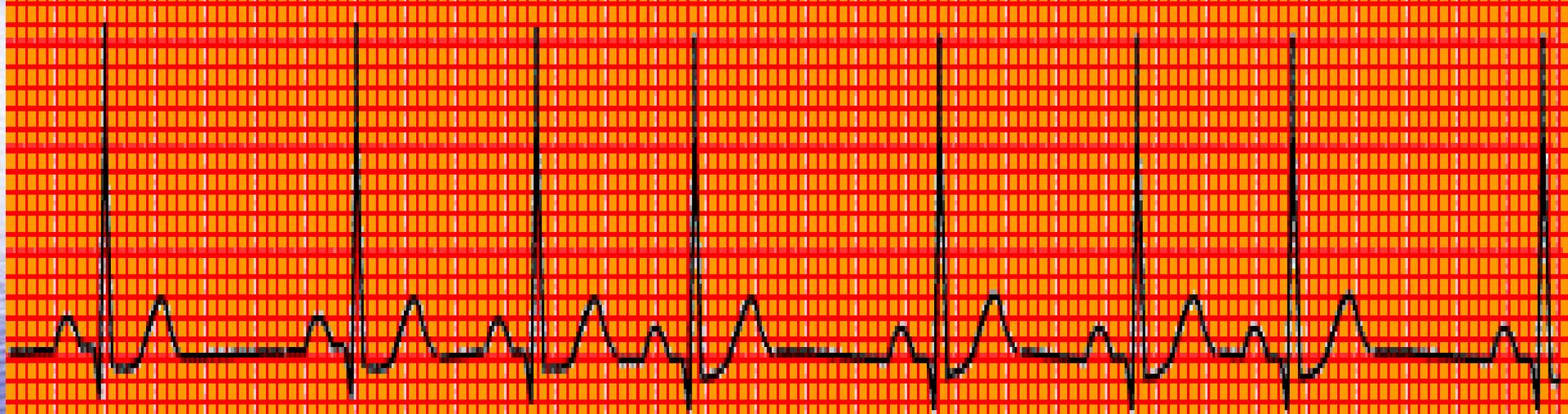
SINUS TACHYCARDIA





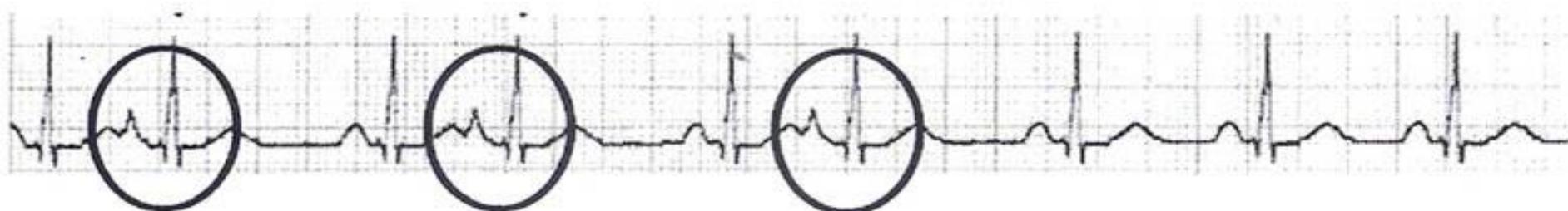
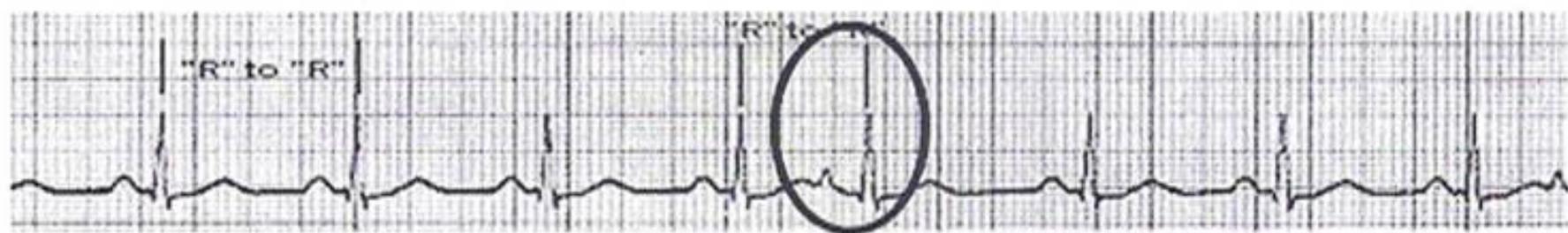
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# SINUS ARRYTHMIA



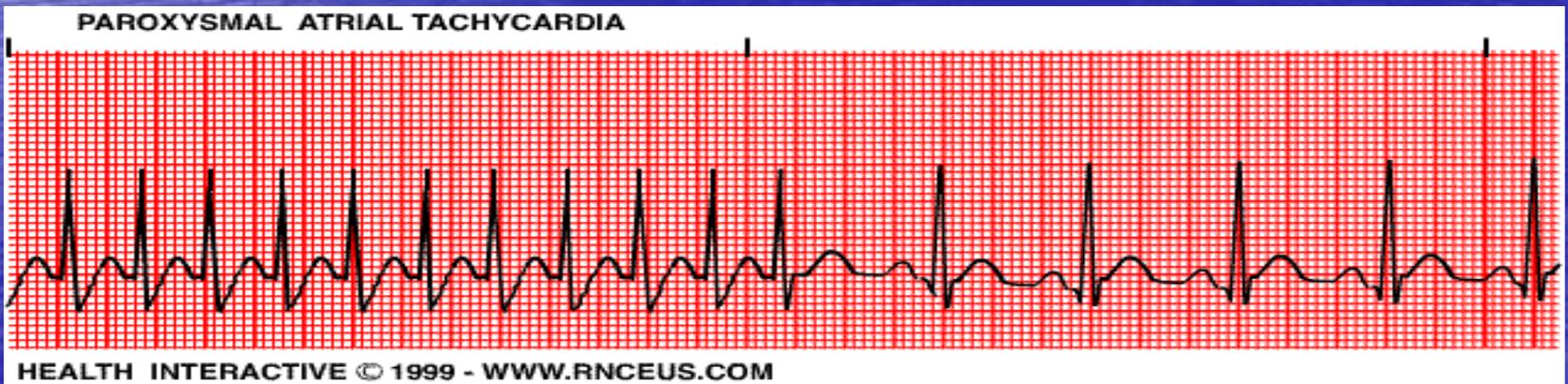
## *Atrial Ekstrasistol ( AES )*

- Irama : Tidak teratur karena ada irama Ekstrasistol
- Frekuensi ( HR ) : Tergantung irama dasarnya
- Gelombang P : Timbulnya lebih awal dan bentuknya berbeda dengan bentuk gelombang irama dasarnya
- Interval PR : Bervariasi antara 0,12 – 0,20 detik, atau < dari 0,12 detik jika sumber ekstrasistolnya di atrium bawah
- Lebar Gelombang QRS : Tidak lebih dari 0,12 detik ( sempit )

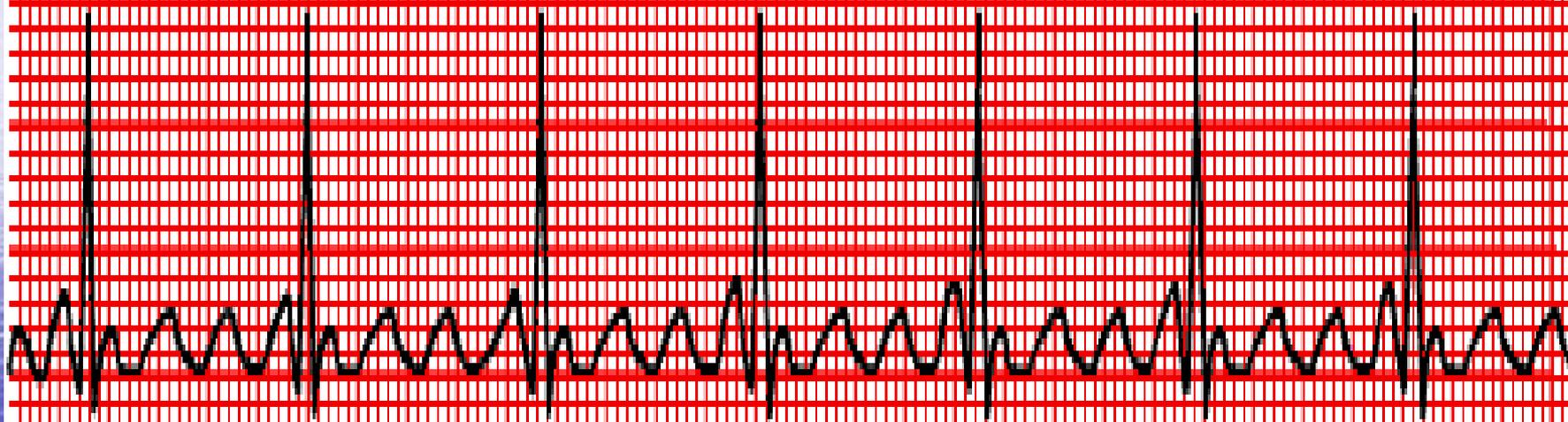


# Atrial Takikardi ( PAT )

- Irama : Teratur
- Frekwensi HR : 150 – 250 x/menit
- Gel. P : Sukar dilihat kadang terlihat tapi kecil
- Interval PR : Tidak dapat dihitung / memendek
- Gel. QRS : Normal ( 0,06 – 0,12 detik )



# ATRIAL FLUTTER



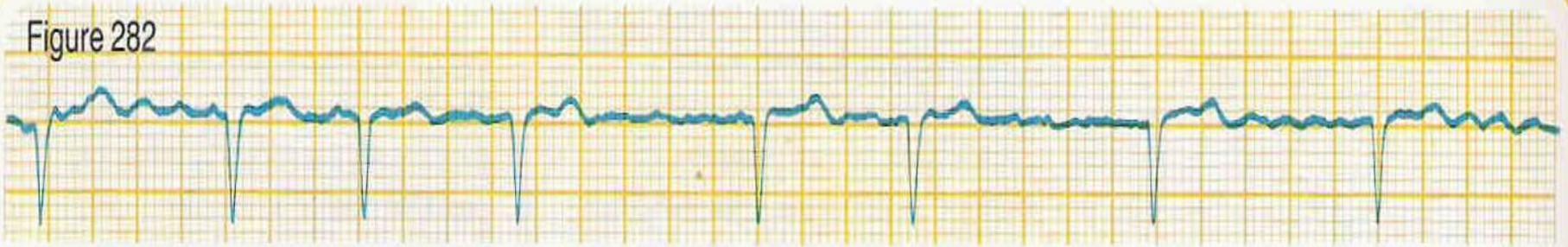
# Atrial Fibrilasi ( AF )

- Irama : Tidak teratur.
- Frekwensi HR : Bervariasi ( bisa normal, lambat / cepat )
- Gel. P : Tidak dapat diidentifikasi, sering terlihat keriting pada garis base line.
- Interval PR : Tidak dapat dihitung
- Gel. QRS : Normal ( 0.06 – 0.12 )



# Atrial Fibrilasi ( AF)

Figure 282

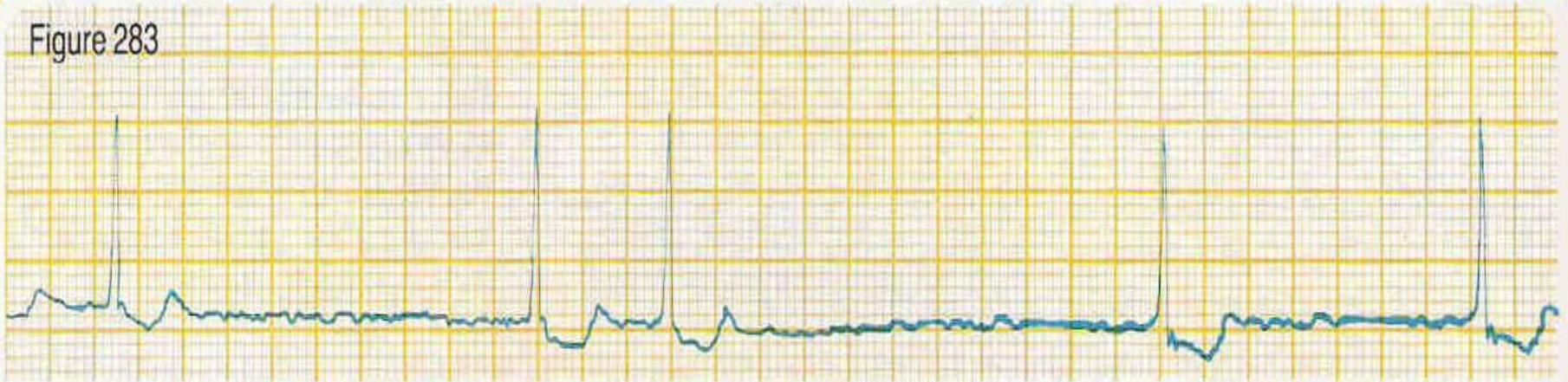


**Lead V<sub>1</sub>. Atrial fibrillation.** No P waves are seen and the baseline is irregular. The QRS complexes are normal in width (0.07 sec).

The ventricular rate varies (i.e. the R-R interval varies) but the mean rate is slow (about 42 beats/min).

# Atrial Fibrilasi ( AF)

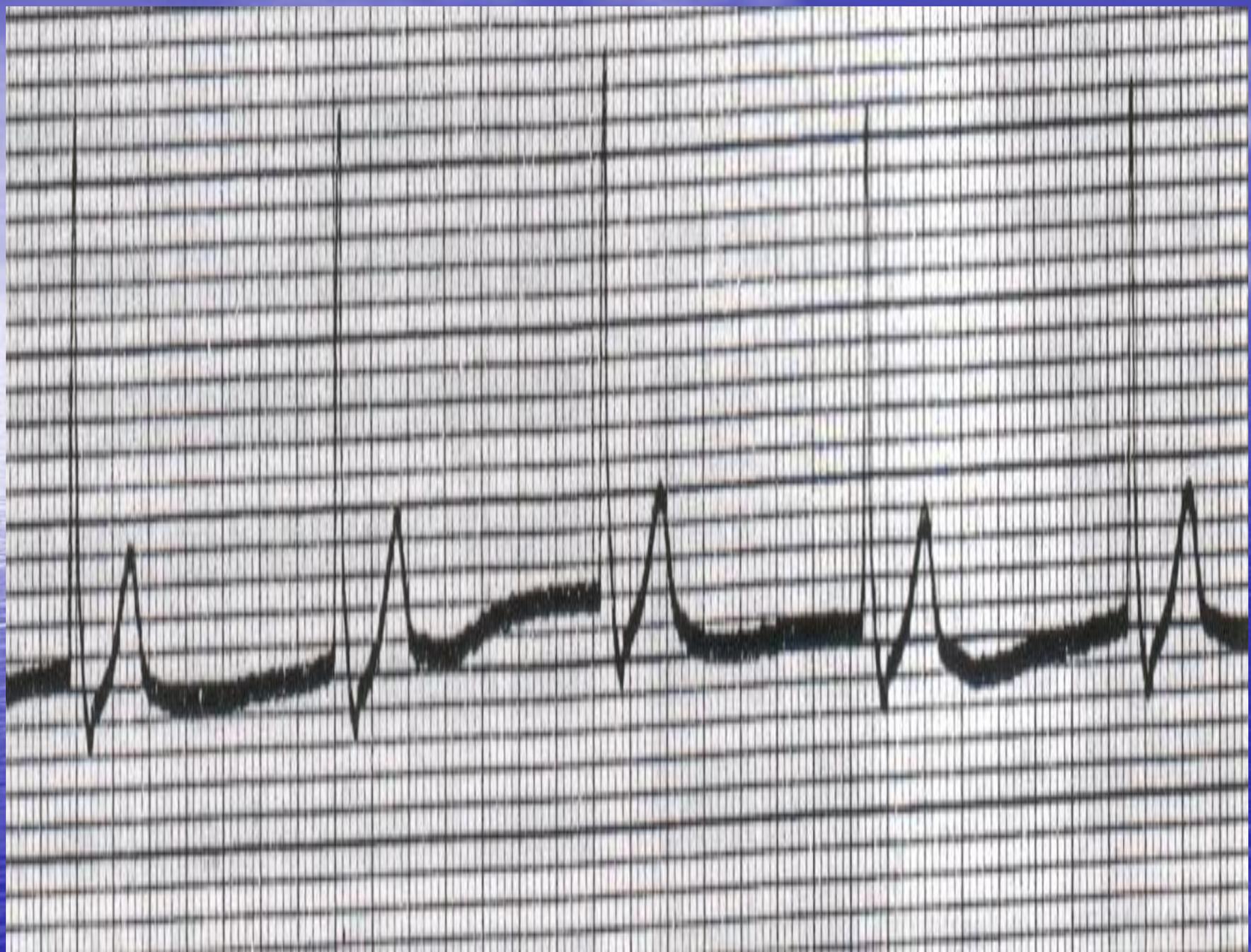
Figure 283

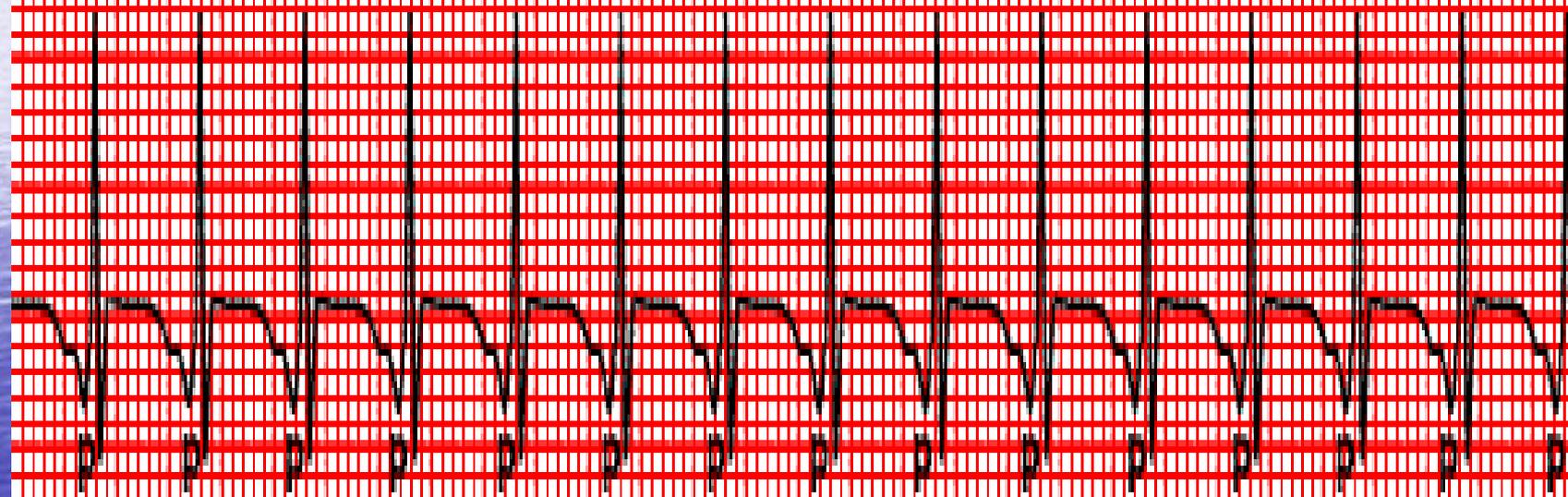


**Lead II. Atrial fibrillation.** No P waves are seen. The baseline is irregular. The QRS complexes are normal in morphology. The R-R

interval is variable but the mean ventricular rate is very slow. The appearances clearly indicate abnormality of atrio-ventricular nodal

function. It is possible that this is depressed by disease, by drugs or by a combination of the two.

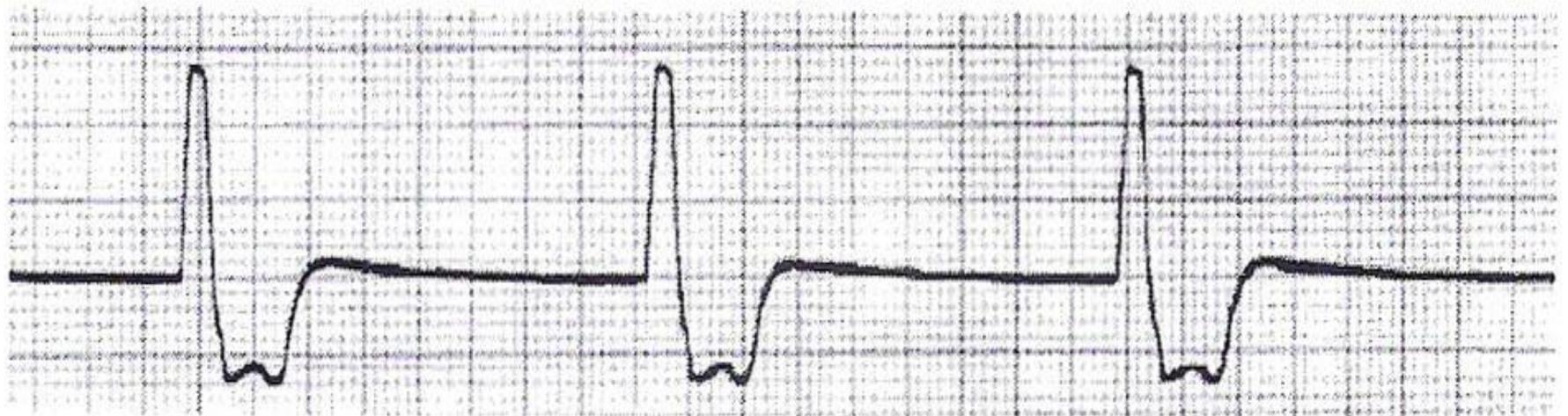




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## *Idioventricular Rhythm (IVR)*

- Irama : Tertur
- Frekuensi ( HR ) : 20 - 40 kali/menit
- Gelombang P : Tidak ada
- Interval PR : Tidak ada
- Lebar Gelombang QRS : Lebih dari 0,12 detik ( lebar )



# Ventrikel Ekstra Sistole (VES )

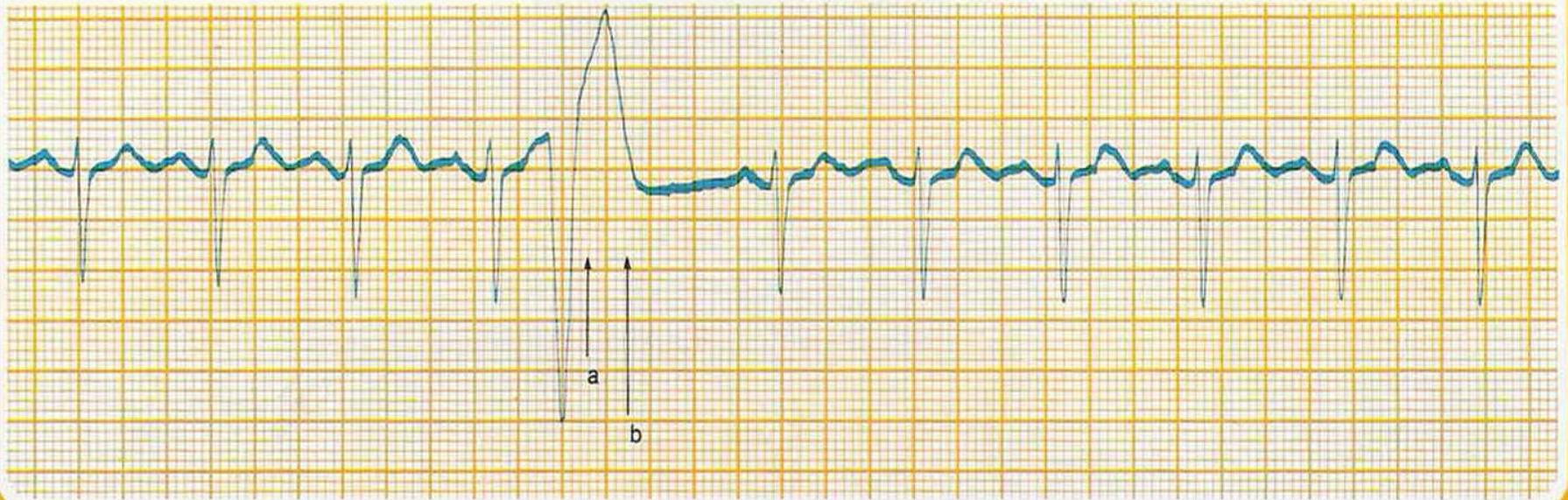
- Irama : Tidak teratur saat muncul ekstra sistol , karena ada irama yg muncul lebih awal
- Frekwensi HR : Tergantung irama dasarnya
- Gel. P : Tidak ada saat timbul ekstra sistole
- Interval PR : Tidak ada,tidak ada saat timbul ekstra sistole
- Gel. QRS : Melebar > dari 0,12 detik

# Ventrikel Ekstra Sistole (VES )

Figure 211  
A premature beat

**Chest monitoring lead.** Beats 1 to 4 and 6 to 11 are sinus beats. The sinus rate is regular. On the basis of the "experience" of beats 1 to 4, beat 5

occur until later (note expected P wave arrow (a) and expected QRS arrow (b)) therefore the beat is premature.



# Ventrikel Ekstra Sistole (VES )

Figure 299



**Lead II. Sinus rhythm with intermittent conduction down an anomalous pathway.** Beats 1, 3, 5 and 7 and all subsequent beats

conduct via the normal atrio-ventricular pathway. Beats 2, 4 and 6 conduct via the anomalous pathway.

# Ventrikel Ekstra Sistole (VES )

Figure 254



**Sinus rhythm with three unifocal ventricular premature beats.** The rhythm strip is taken from a chest monitoring lead. Since one cannot be **absolutely** certain of the location of the lead in relation to the heart, one

cannot be **totally** confident of the site of origin of the ectopics but their morphology looks like that of left bundle branch block so the probability is that they are of right ventricular origin.

# Ventrikel Ekstra Sistole (VES )

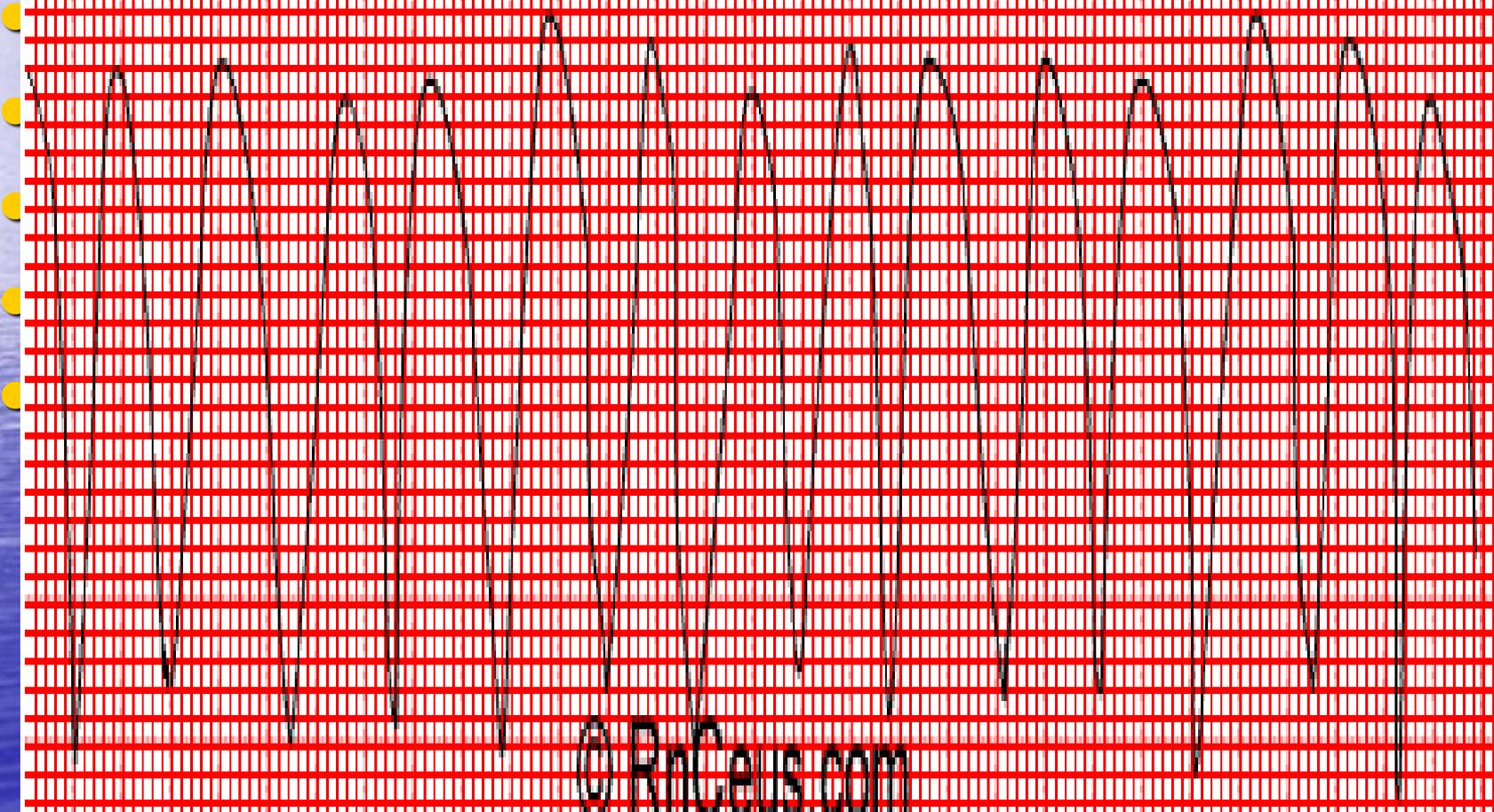
Figure 254



**Sinus rhythm with three unifocal ventricular premature beats.** The rhythm strip is taken from a chest monitoring lead. Since one cannot be **absolutely** certain of the location of the lead in relation to the heart, one

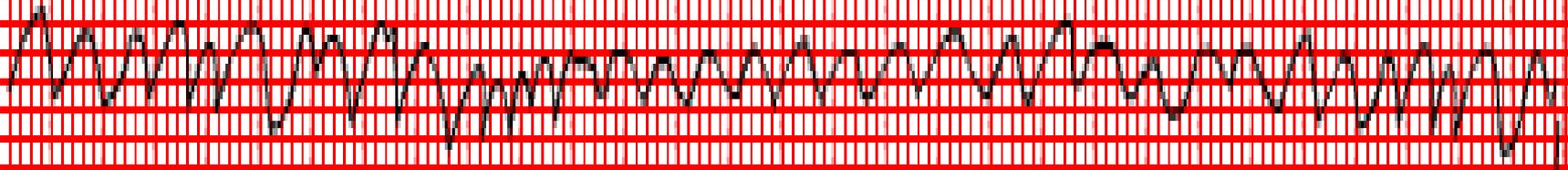
cannot be **totally** confident of the site of origin of the ectopics but their morphology looks like that of left bundle branch block so the probability is that they are of right ventricular origin.

# VENTRICULAR TACHYCARDIA



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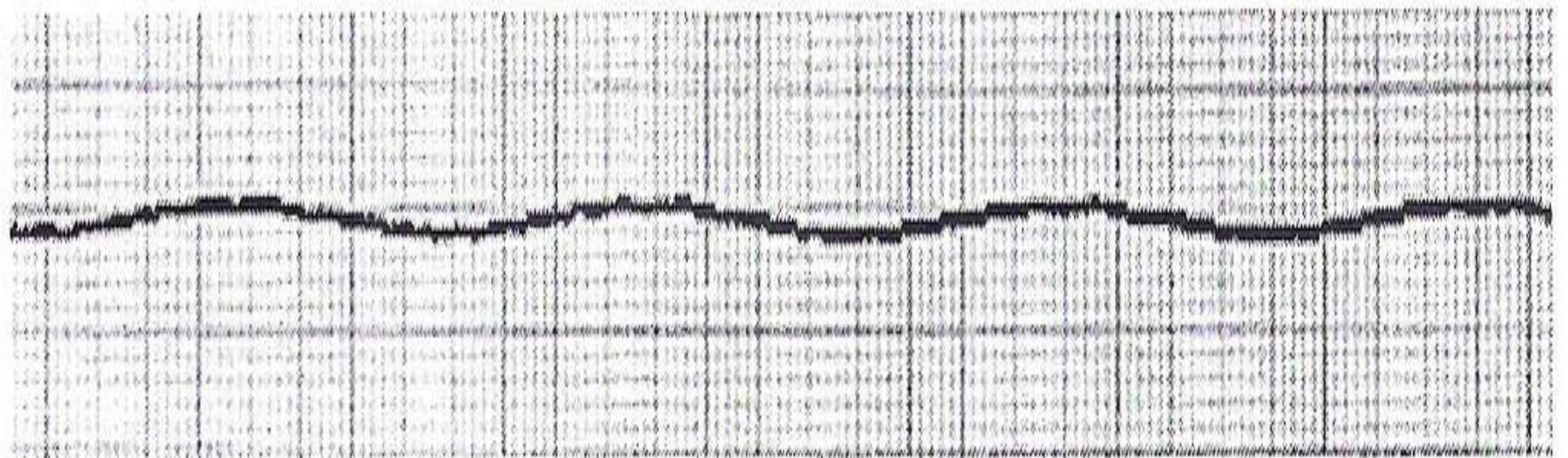
# VENTRICULAR FIBRILLATION



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## *Asistol*

Tidak ada gambaran listrik jantung, gambaran yang terlihat hanya berbentuk garis lurus



TERIMA KASIH