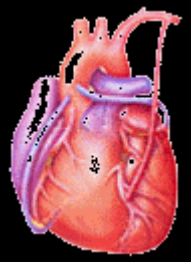

FISIOLOGÍA CARDIOVASCULAR

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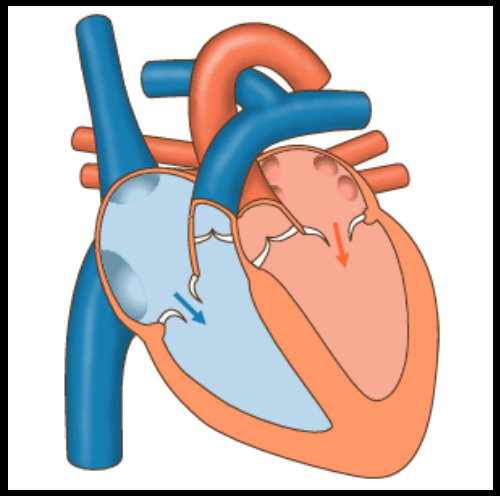
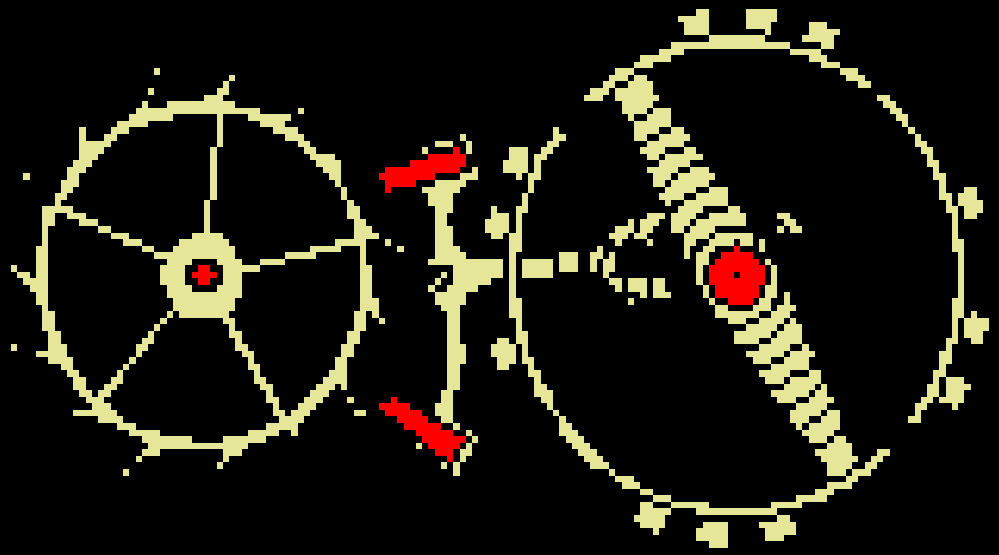
Departamento de Cardiología
HOSPITAL UNIVERSITARIO
UNIVERSIDAD
ABIERTA
INTERAMERICANA



CICLO CARDIACO



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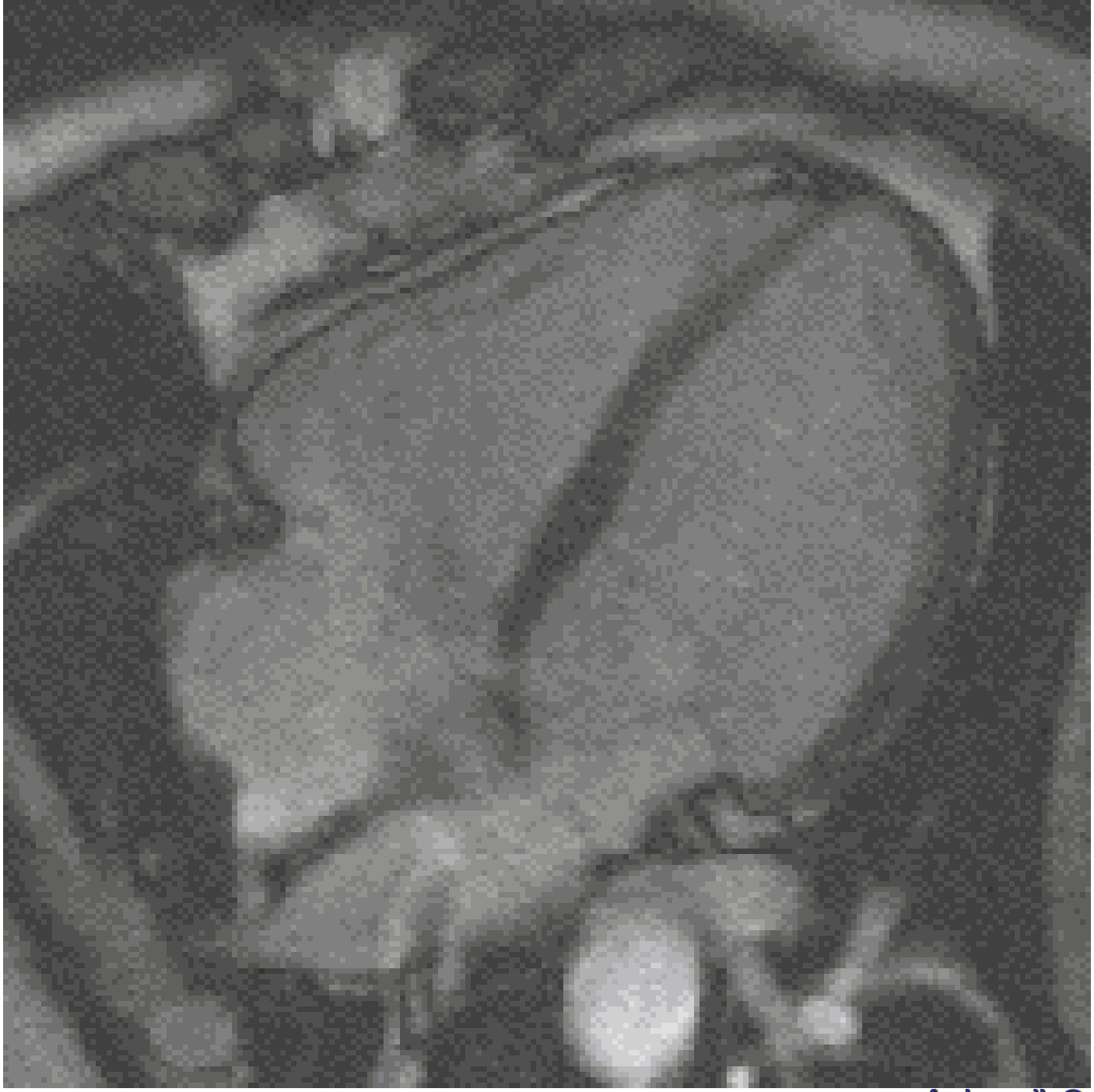

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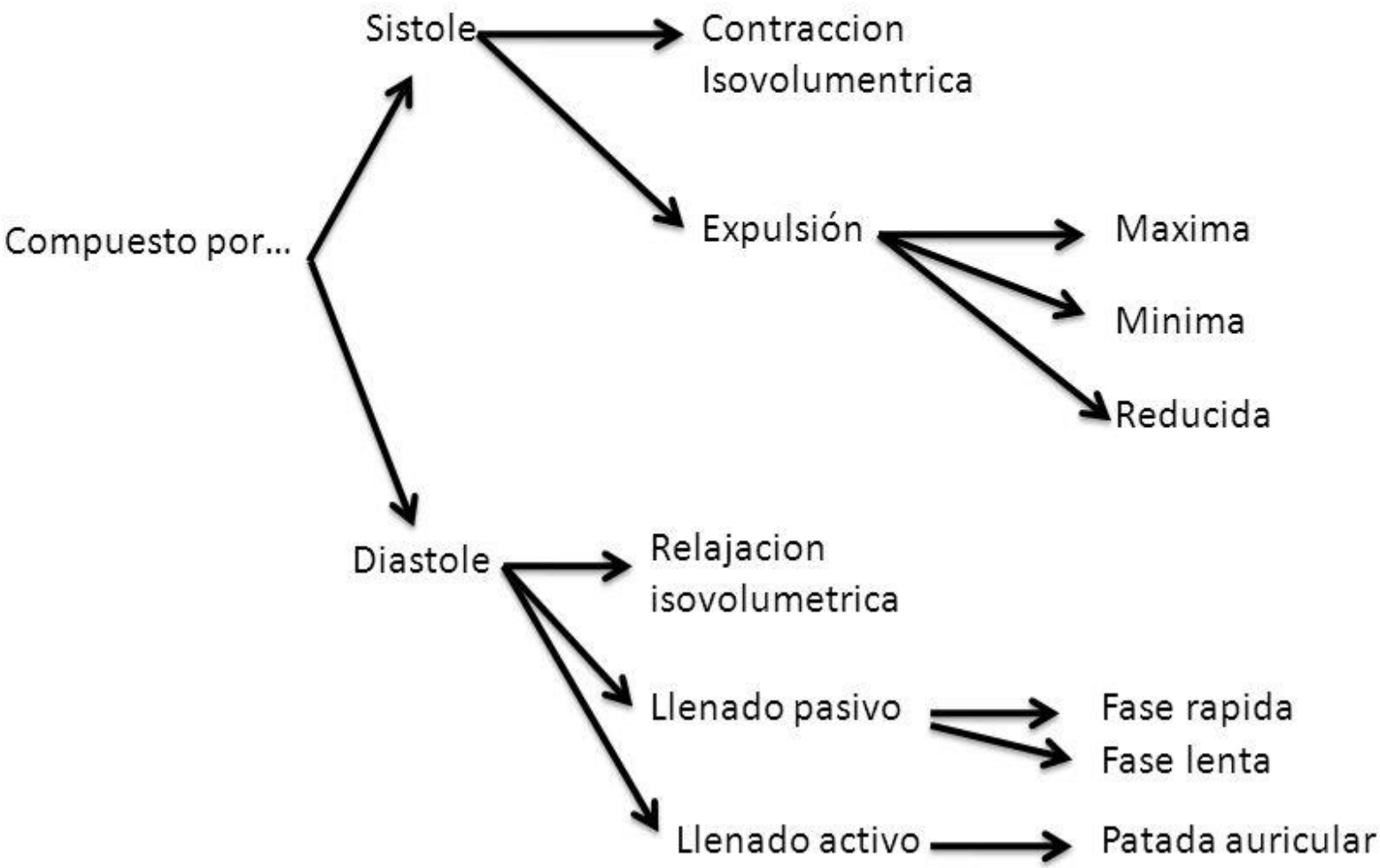
Ciclo Cardiaco:



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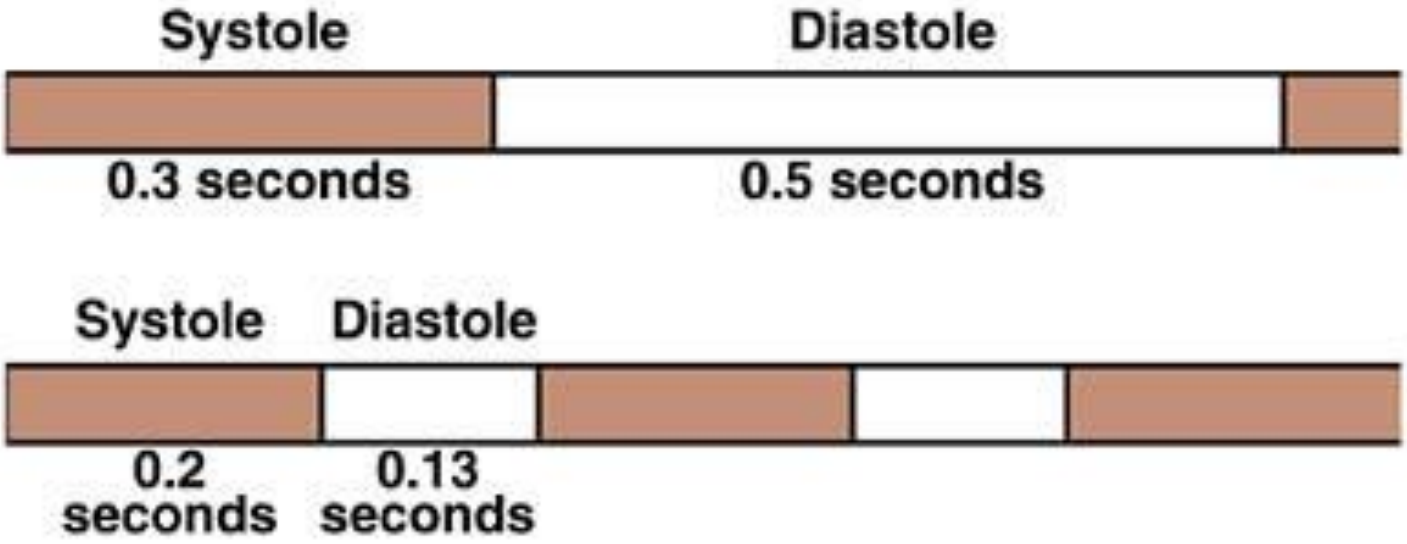
Heart rate and cardiac cycle



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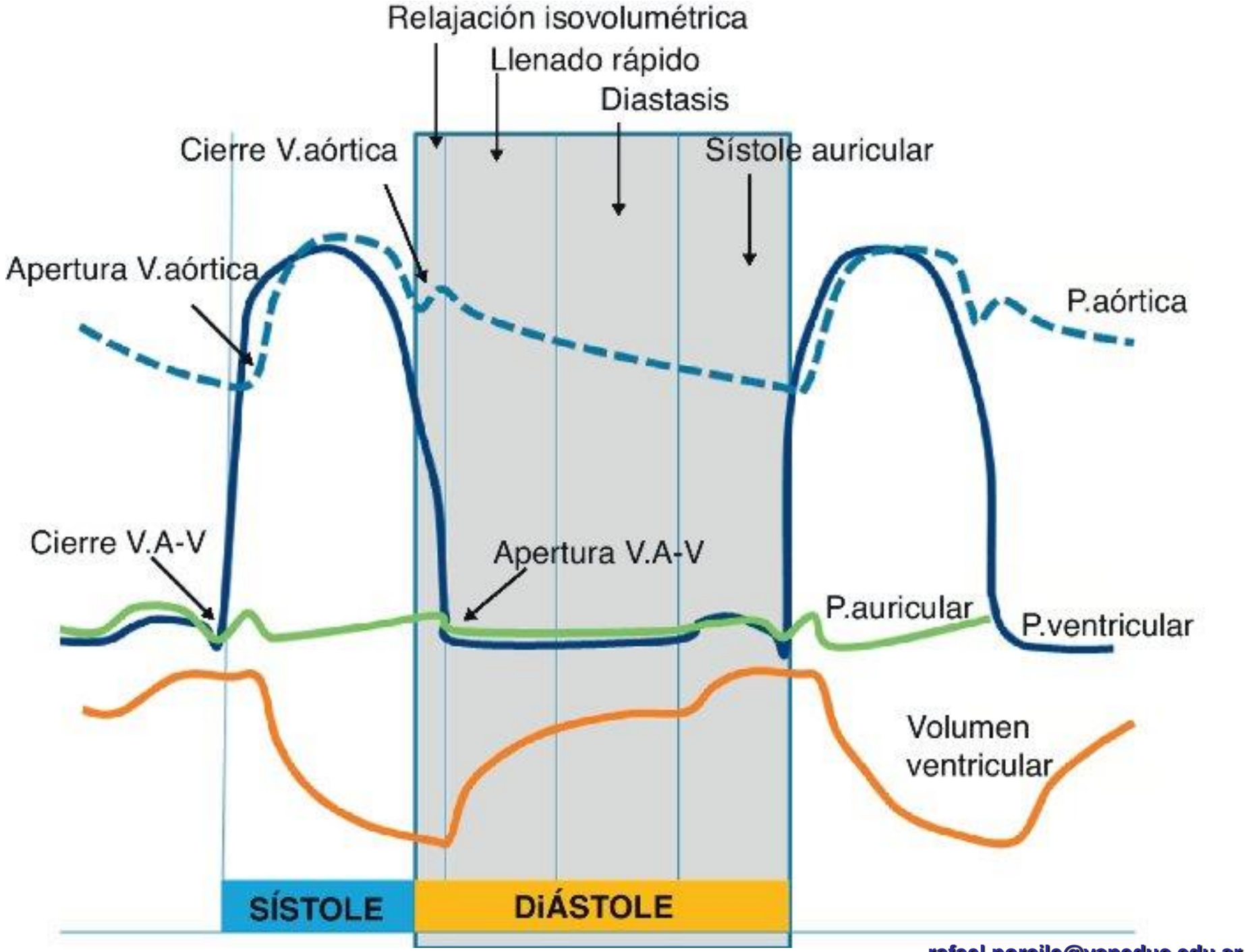

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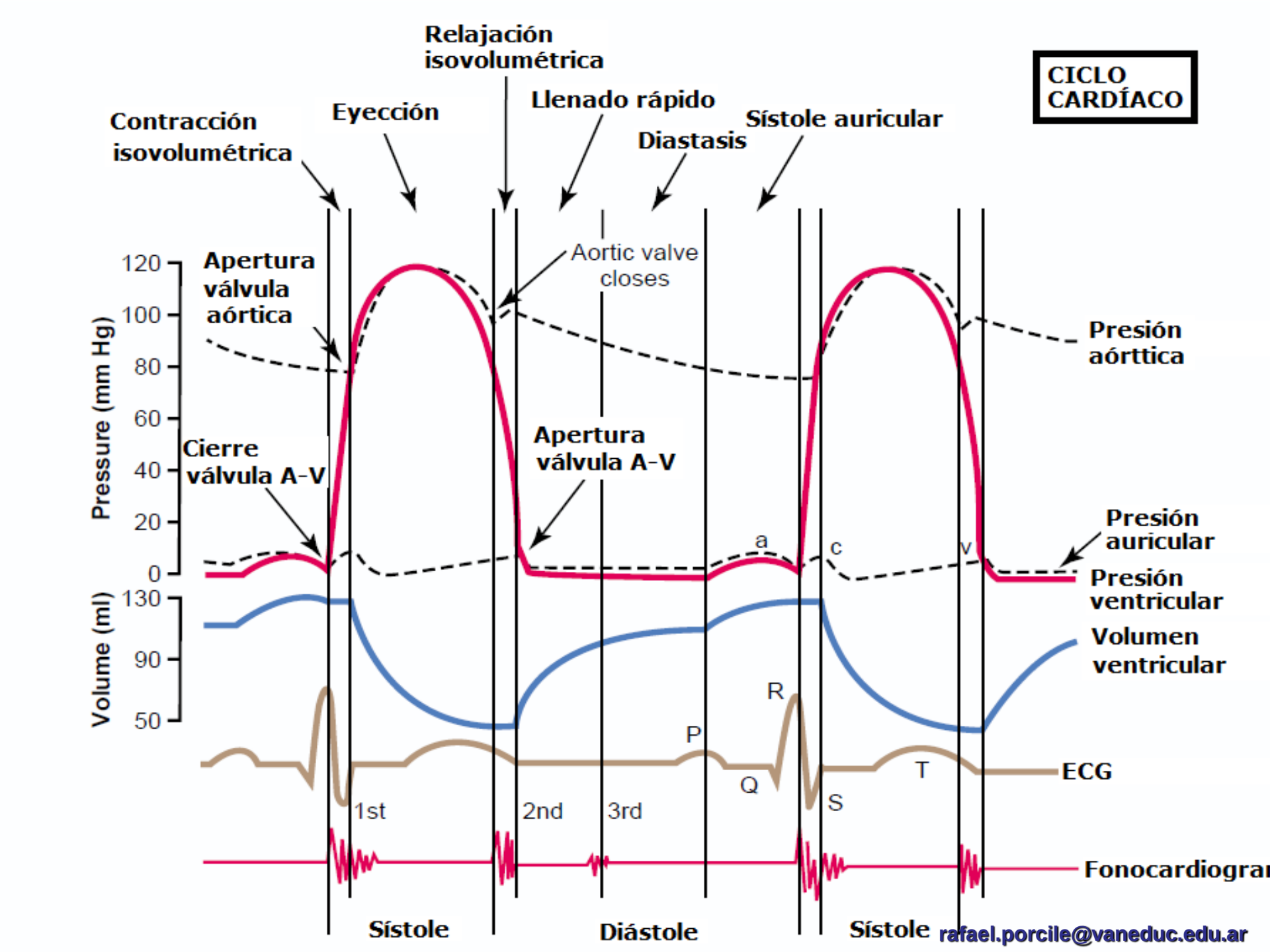
CICLO CARDÍACO
Relajación isovolumétrica
Contracción isovolumétrica
Eyección
Llenado rápido
Diastasis
Sístole auricular
Aortic valve closes
Apertura válvula aórtica
Cierre válvula A-V
Apertura válvula A-V
Presión aórttica
Presión auricular
Presión ventricular
Volumen ventricular
ECG
Fonocardiogra
Pressure (mm Hg)
120
100
80
60
40
20
0
Volume (ml)
130
90
50
a
c
v
R
P
Q
S
T
1st
2nd
3rd
Sístole
Diástole
Sístole
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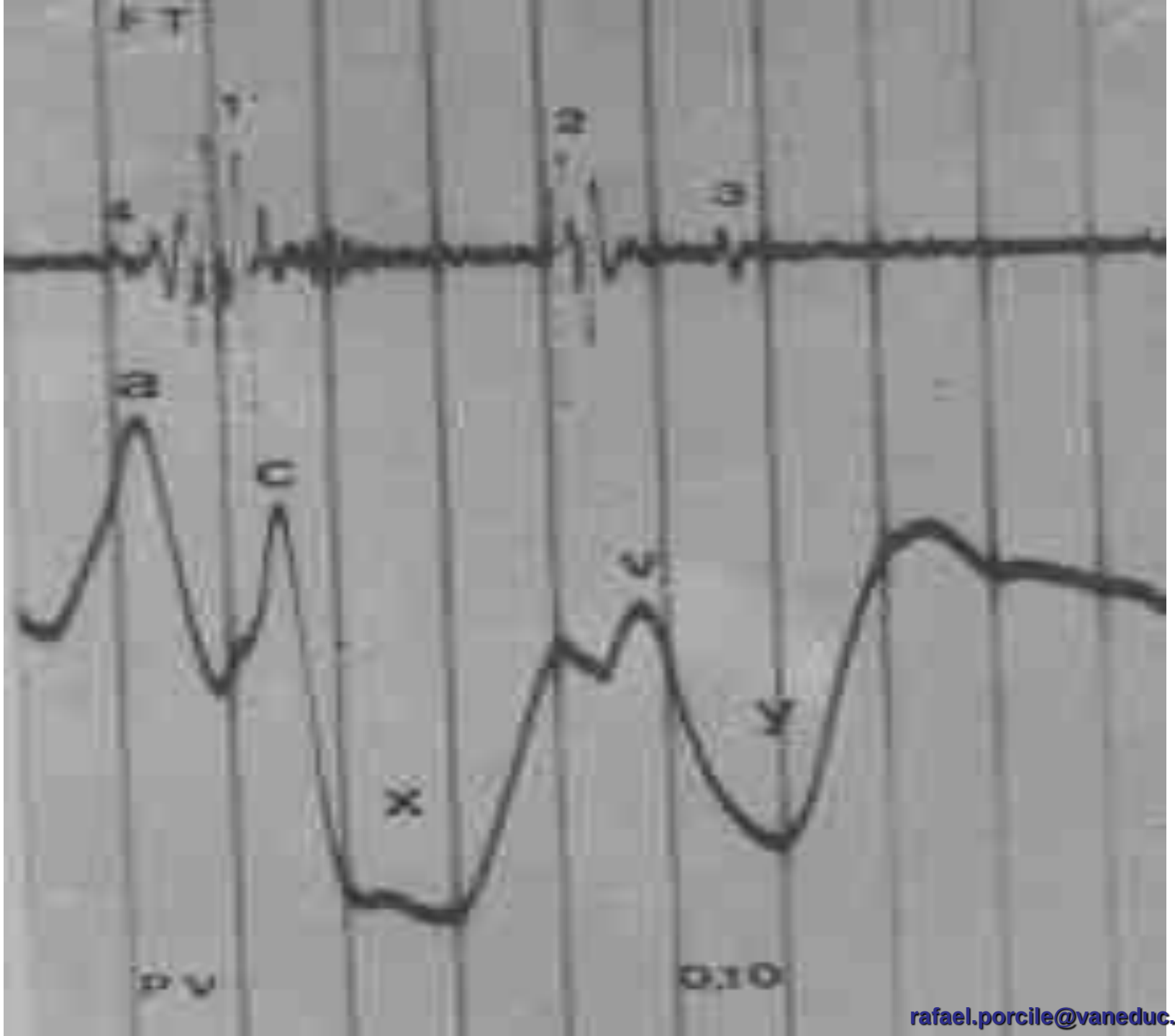


ONDA A (AURICULAR)

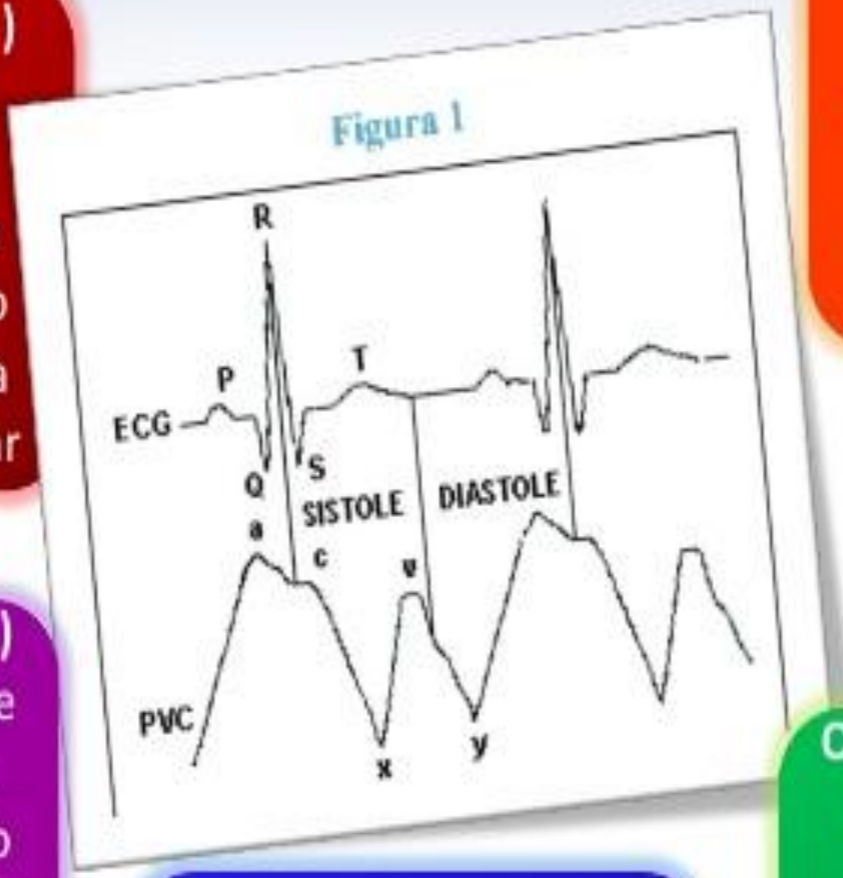
•Contracción de la Aurícula (Sístole Auricular) es la Onda Alta del Pulso Venoso

•Ella desaparece en la FA (fibrilación Auricular

ONDA Y (DESCENDENTE)

•Sigue a la onda V

•Se produce cuando se Abre la válvula Tricúspide permite el paso de la sangre desde la Aurícula al Ventrículo derecho



ONDA C (CAROTIDEA)

Pequeño ascenso que interrumpe la rama descendente del seno X se producen al inicio de la eyección ventricular

ONDA X (DESCENDENTE)

•Se produce por la relajación auricular

•Desaparece en la FA

ONDA V (VENTRICULAR)

•Es ocasionado por el llenado auricular, al finalizar la Sístole ventricular

•Es una onda de llenado pasivo

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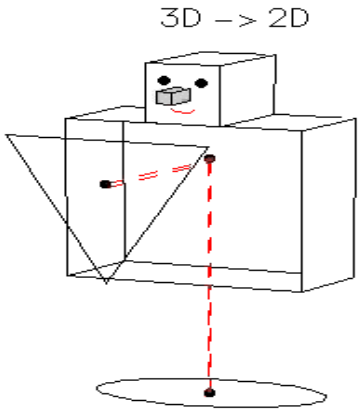

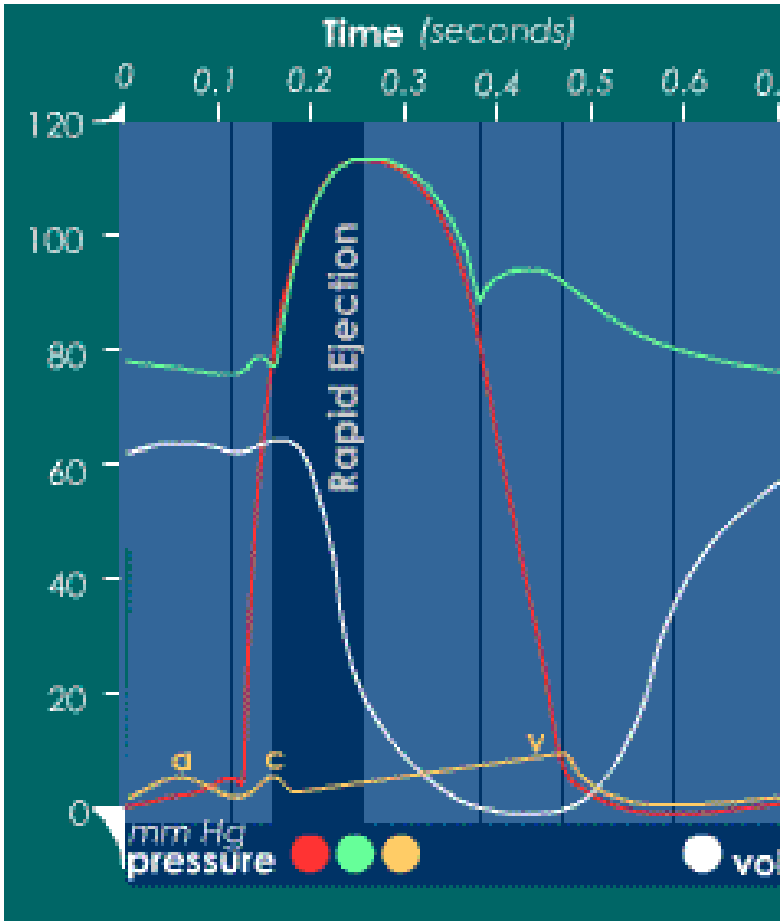

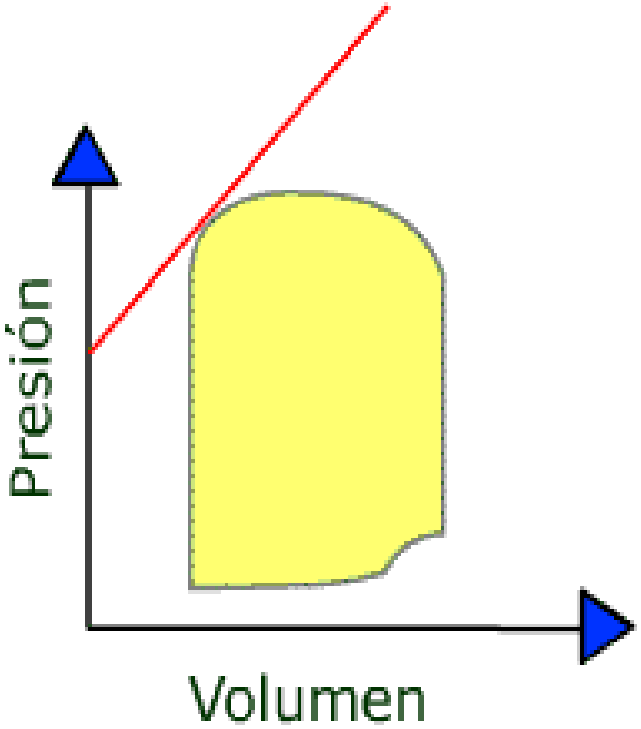

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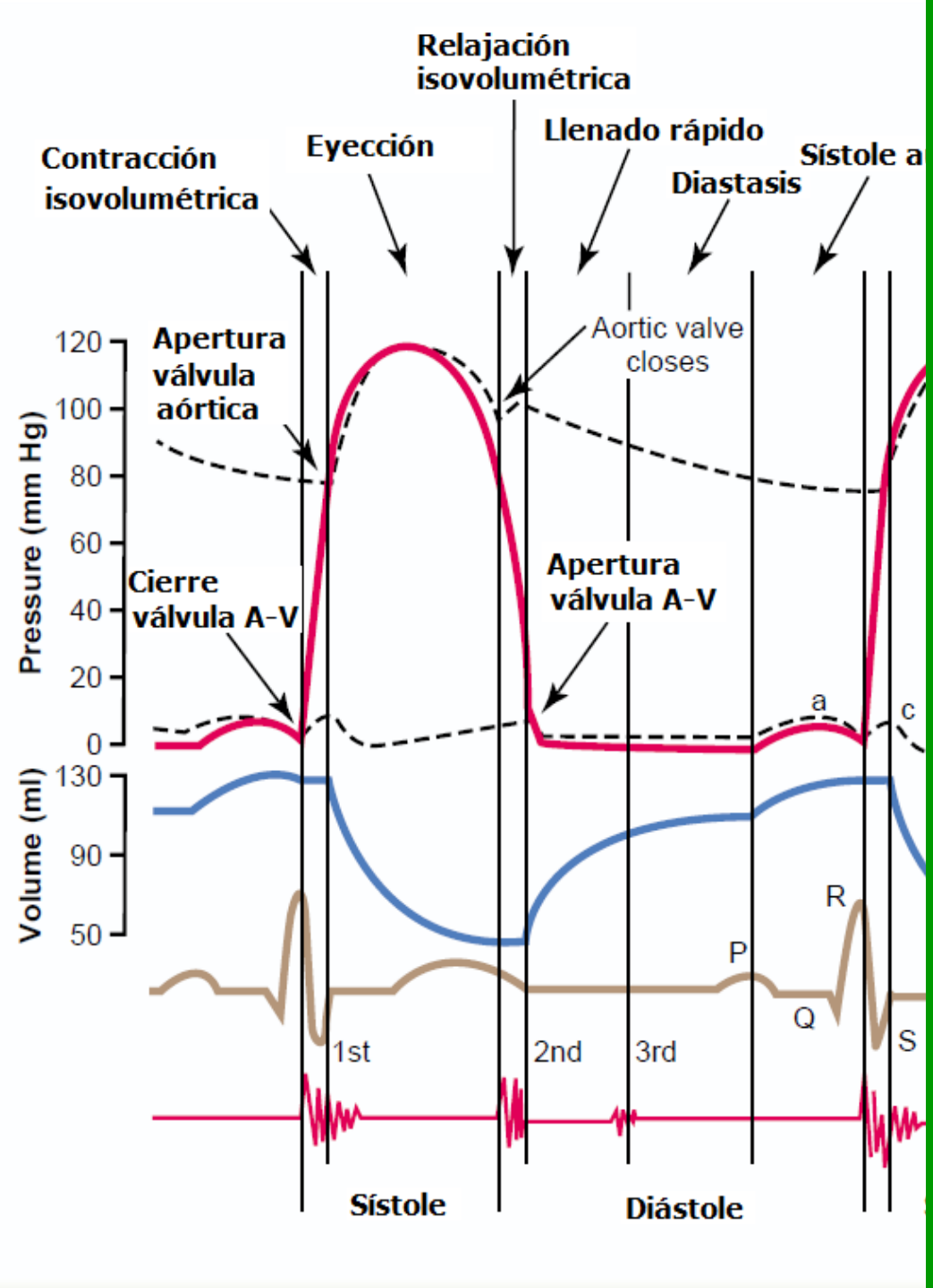

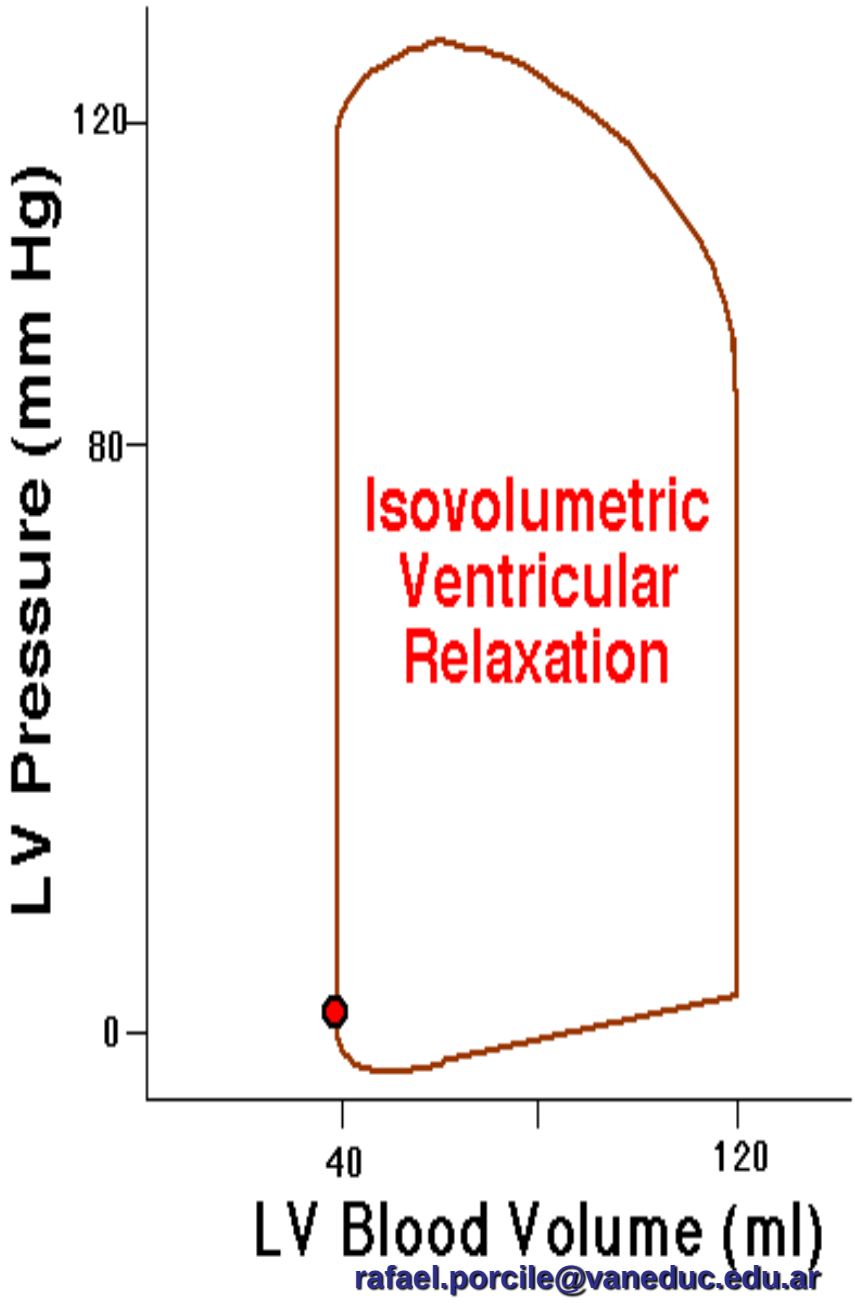

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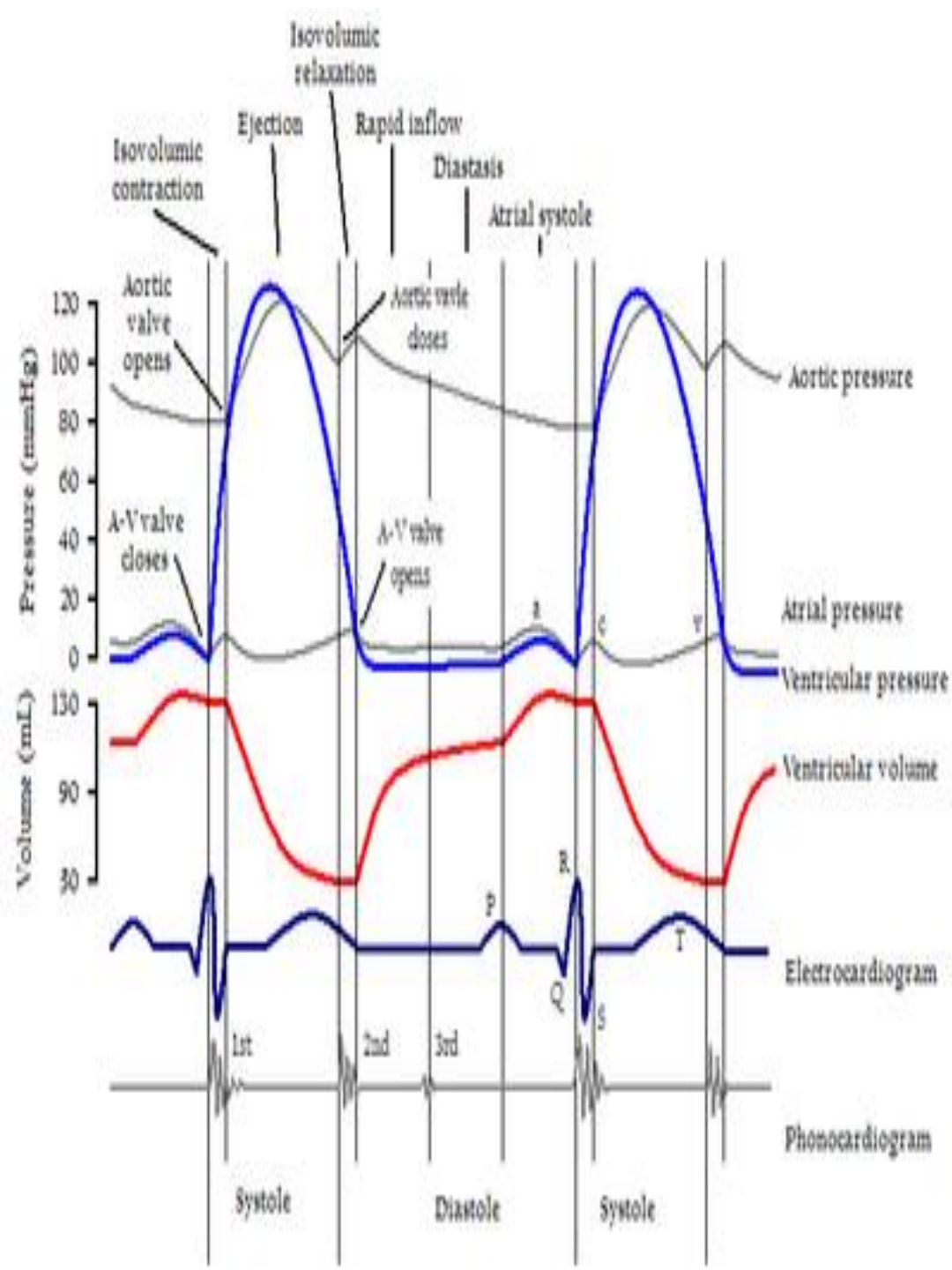

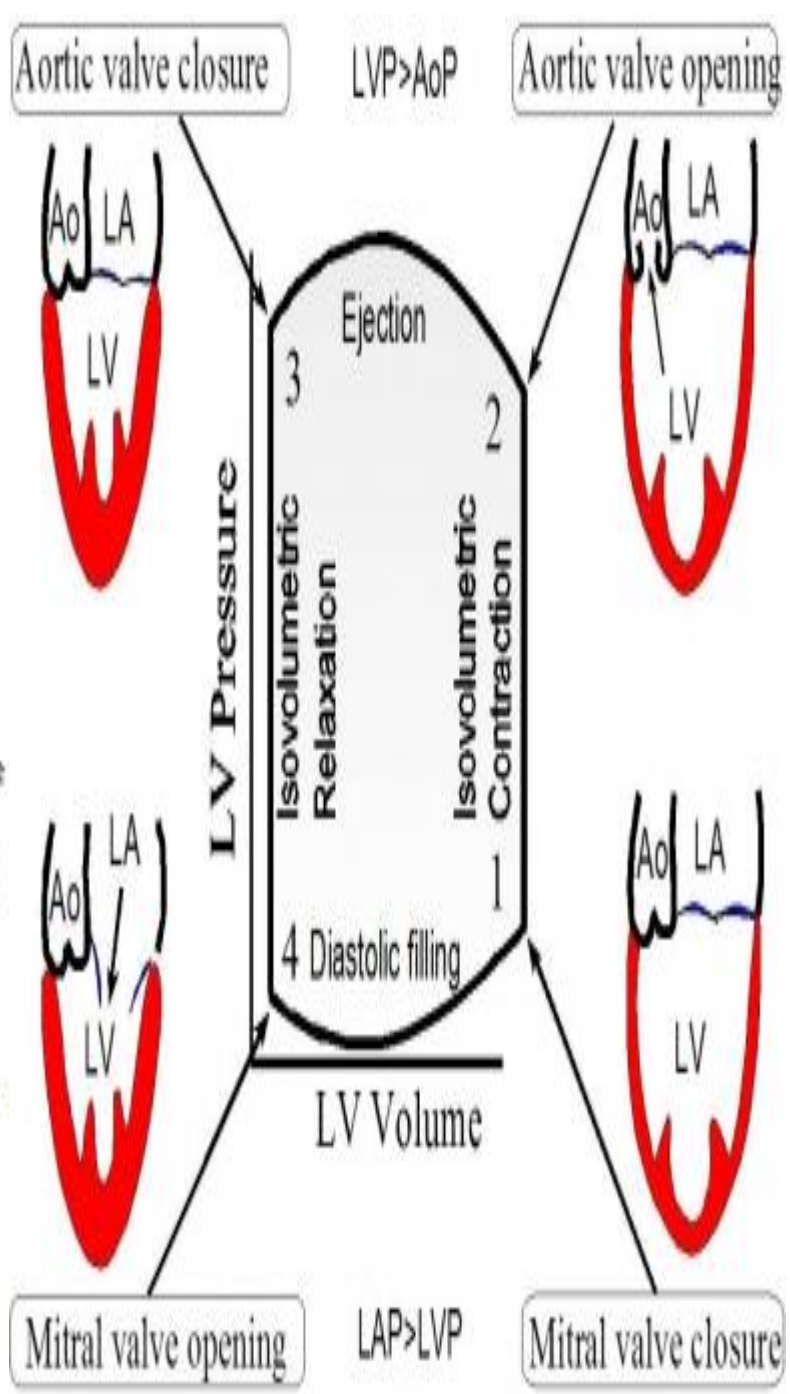

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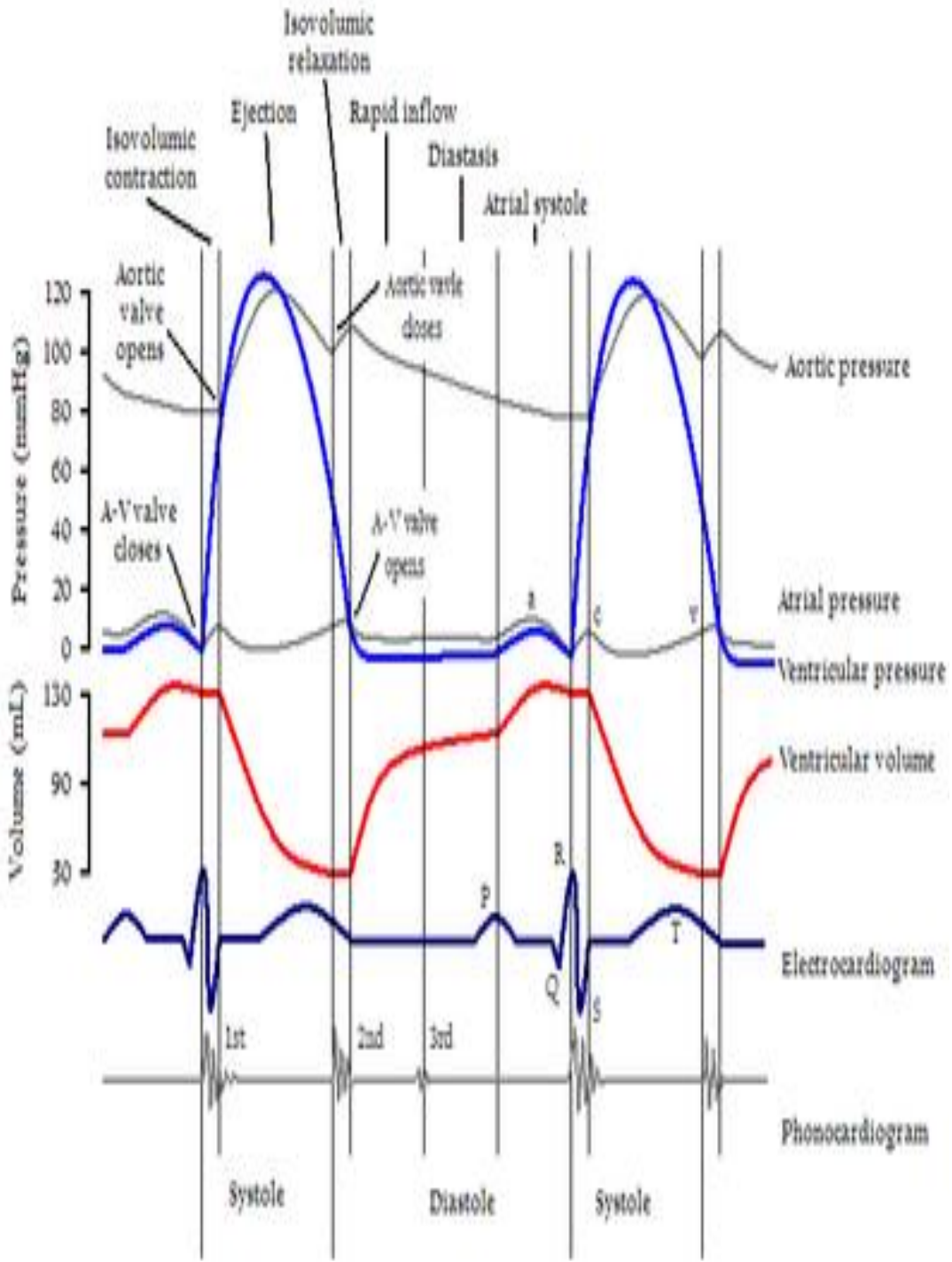

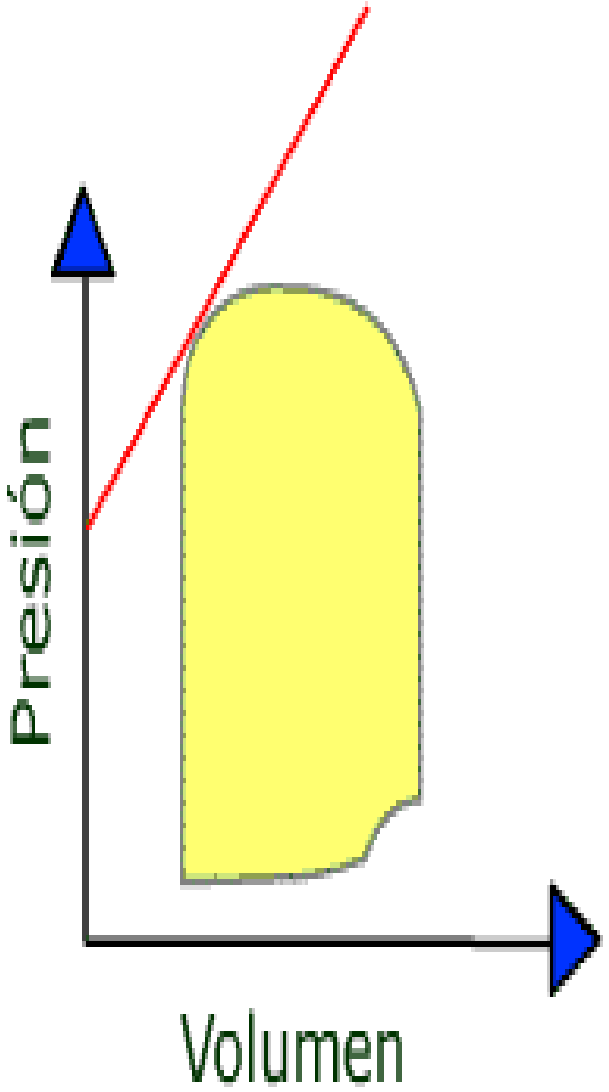

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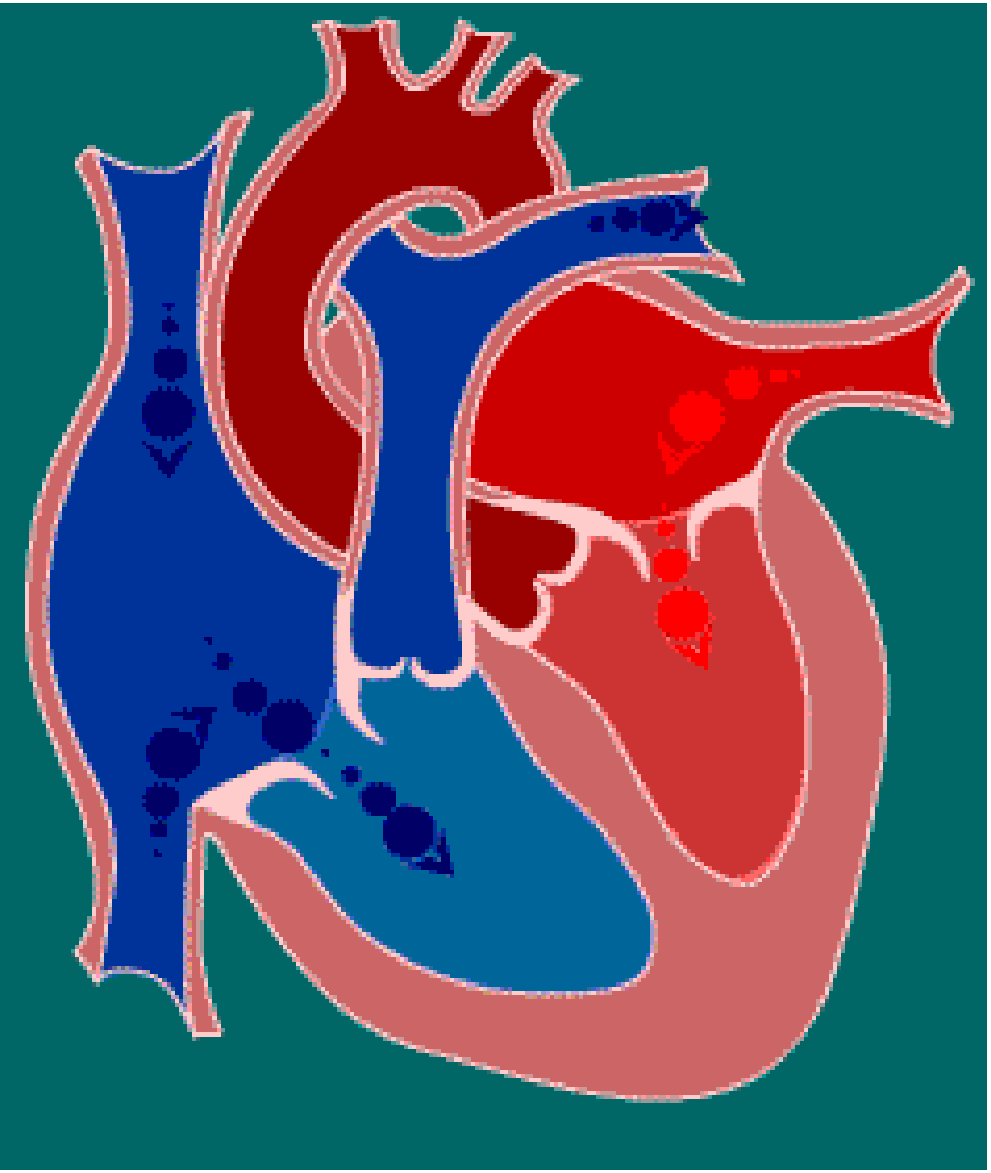
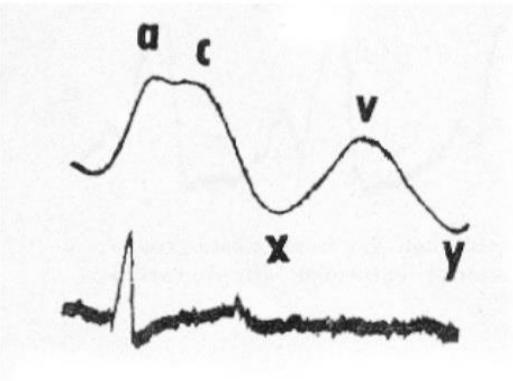
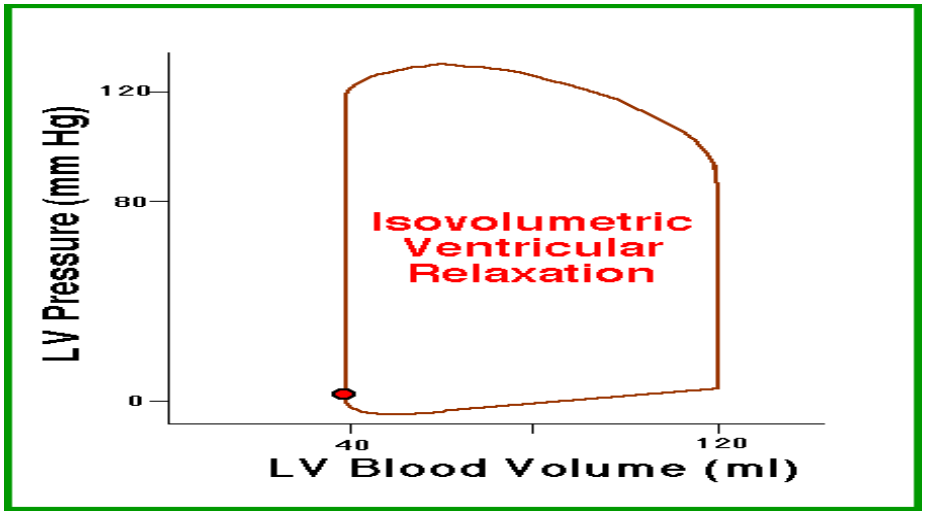
LLENADO VENTRICULAR RAPIDO



Flebograma
Normal





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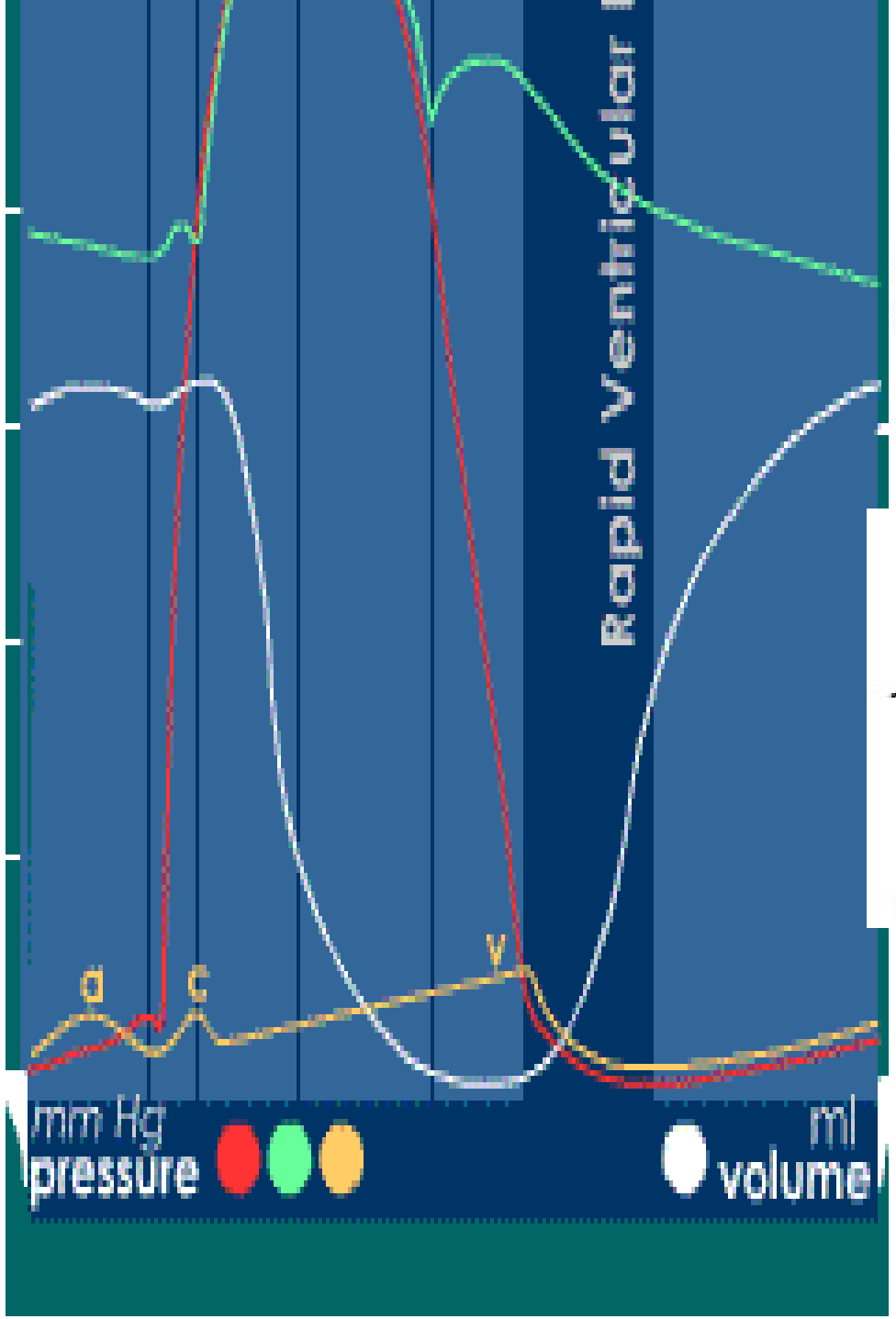
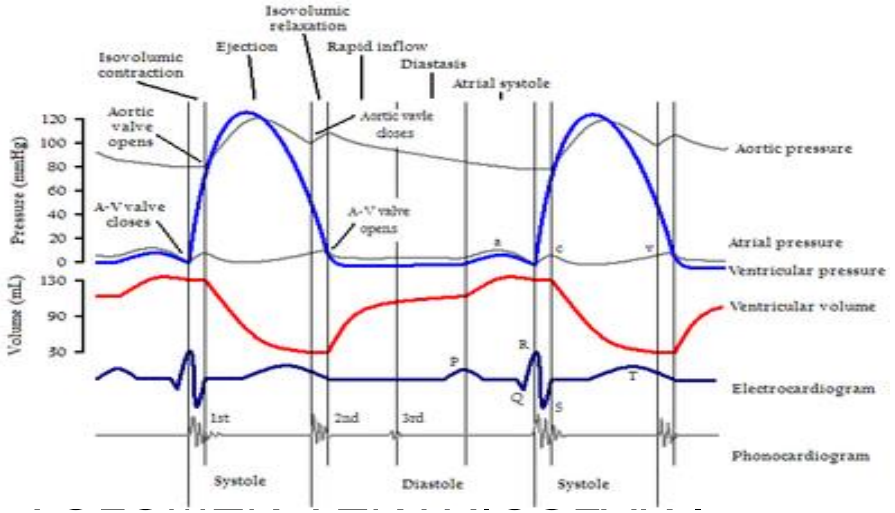
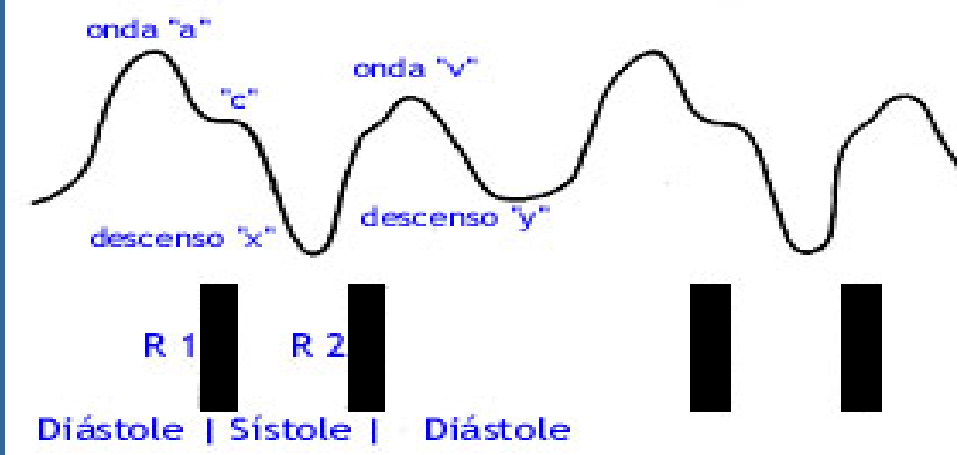
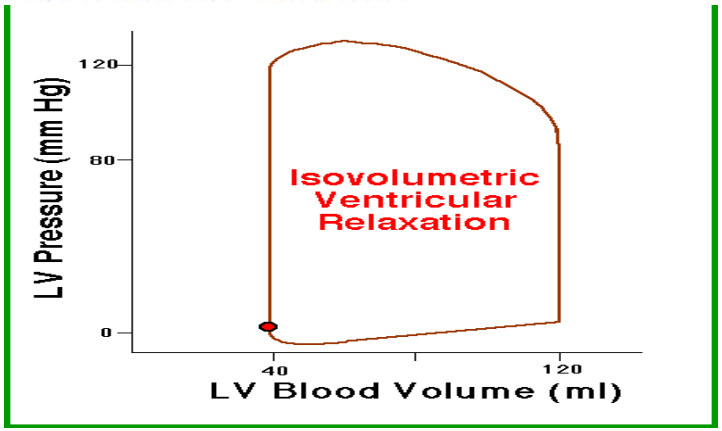
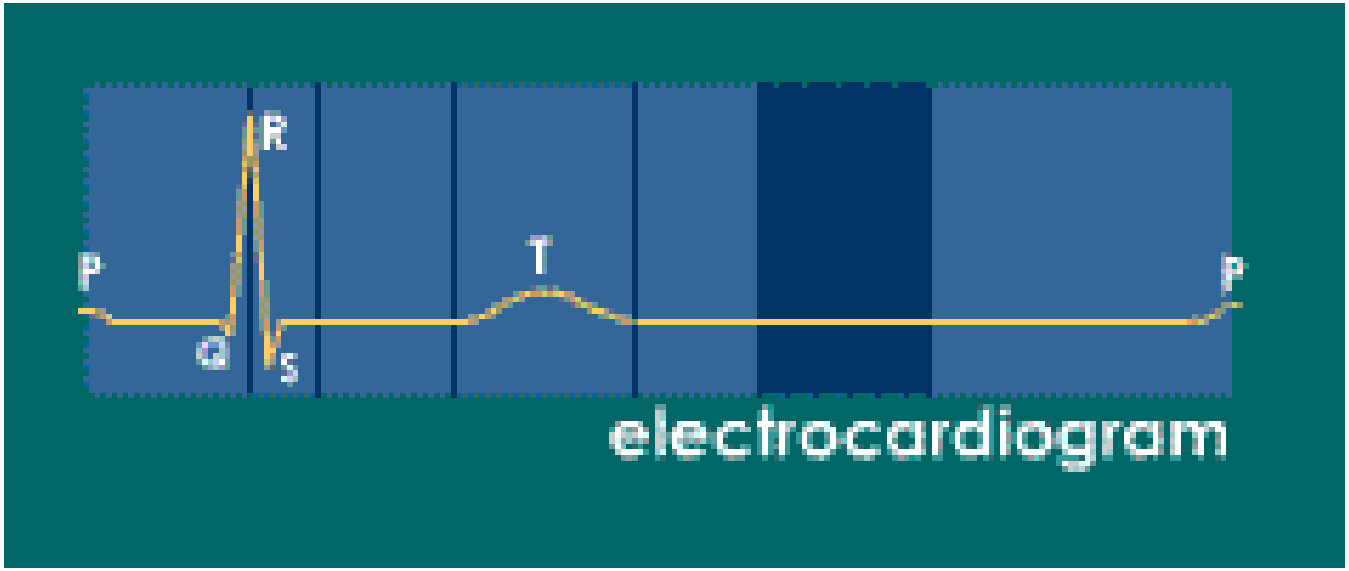

Rapid Ventricular
a
c
v
mm Hg
pressure
ml
volume


Isovolumic relaxation
Ejection
Rapid inflow
Diastasis
Atrial systole
Isovolumic contraction
Aortic valve opens
Aortic valve closes
A-V valve closes
A-V valve opens
Pressure (mmHg)
Volume (mL)
Aortic pressure
Atrial pressure
Ventricular pressure
Ventricular volume
Electrocardiogram
Phonocardiogram
1st
2nd
3rd
Systole
Diastole
Systole

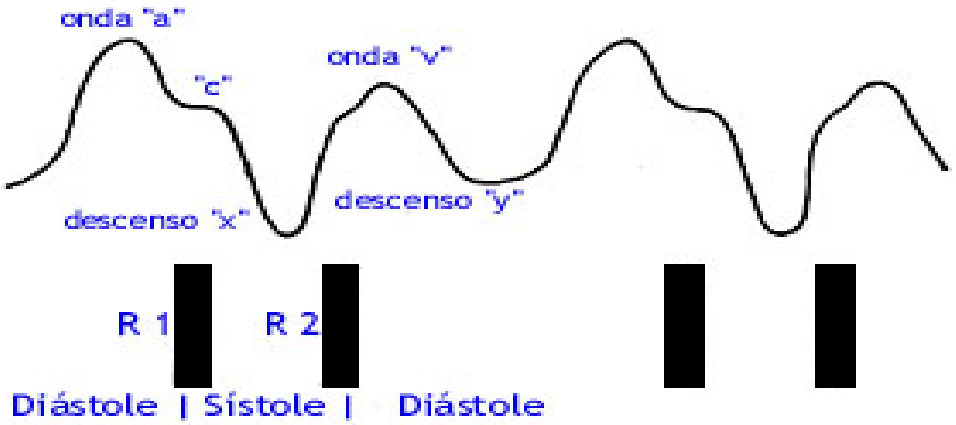

onda "a"
"c"
onda "v"
descenso "x"
descenso "y"
R 1
R 2
Diástole | Sístole | Diástole


LV Pressure (mm Hg)
120
80
0
Isovolumetric
Ventricular
Relaxation
40
120
LV Blood Volume (ml)

LLENADO VENTRICULAR RAPIDO ECG



- SIN DEFLECCIÓNES



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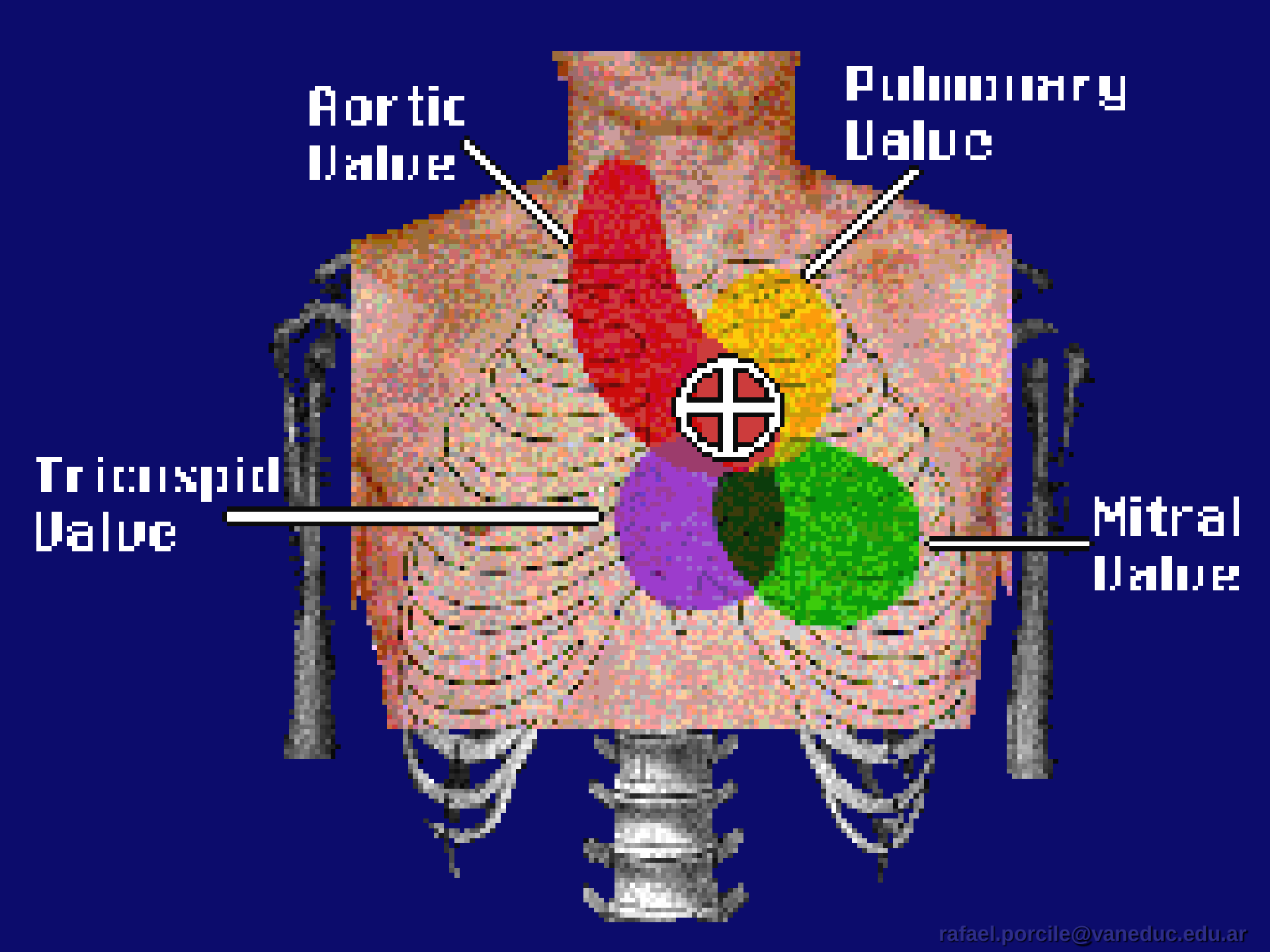
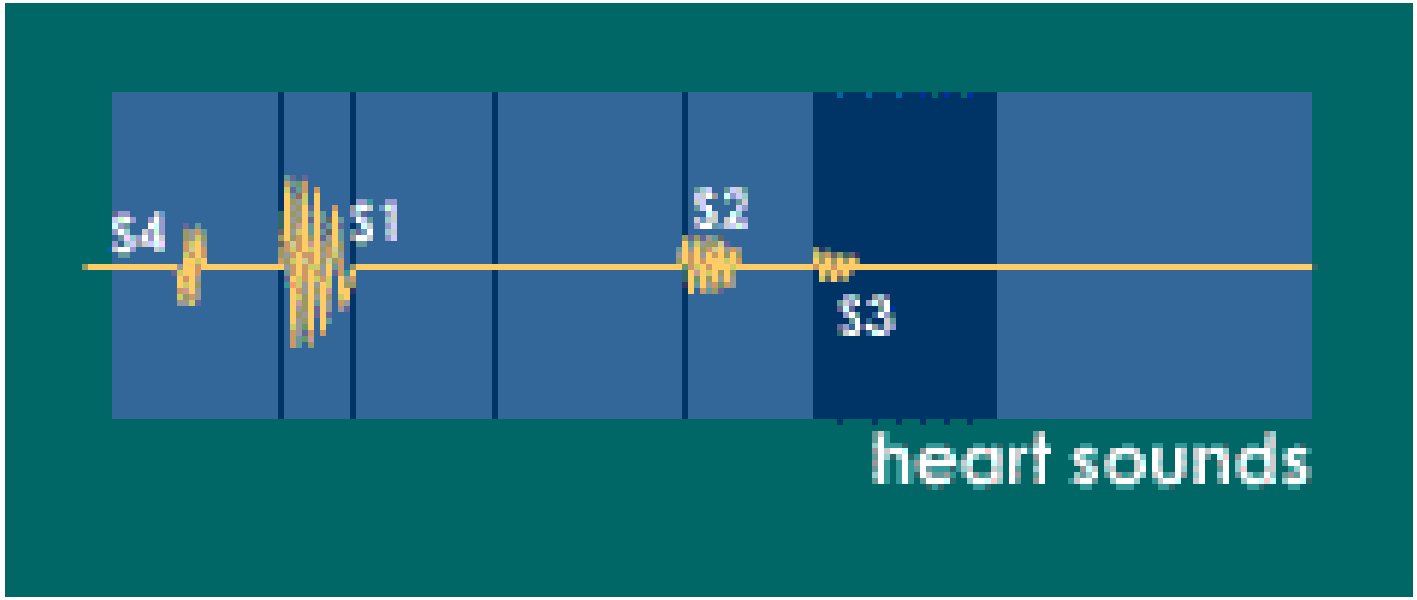
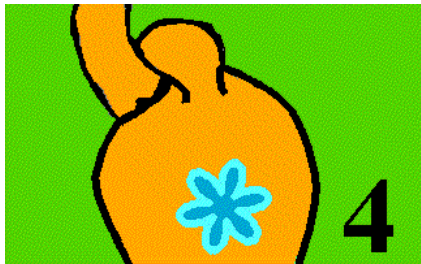


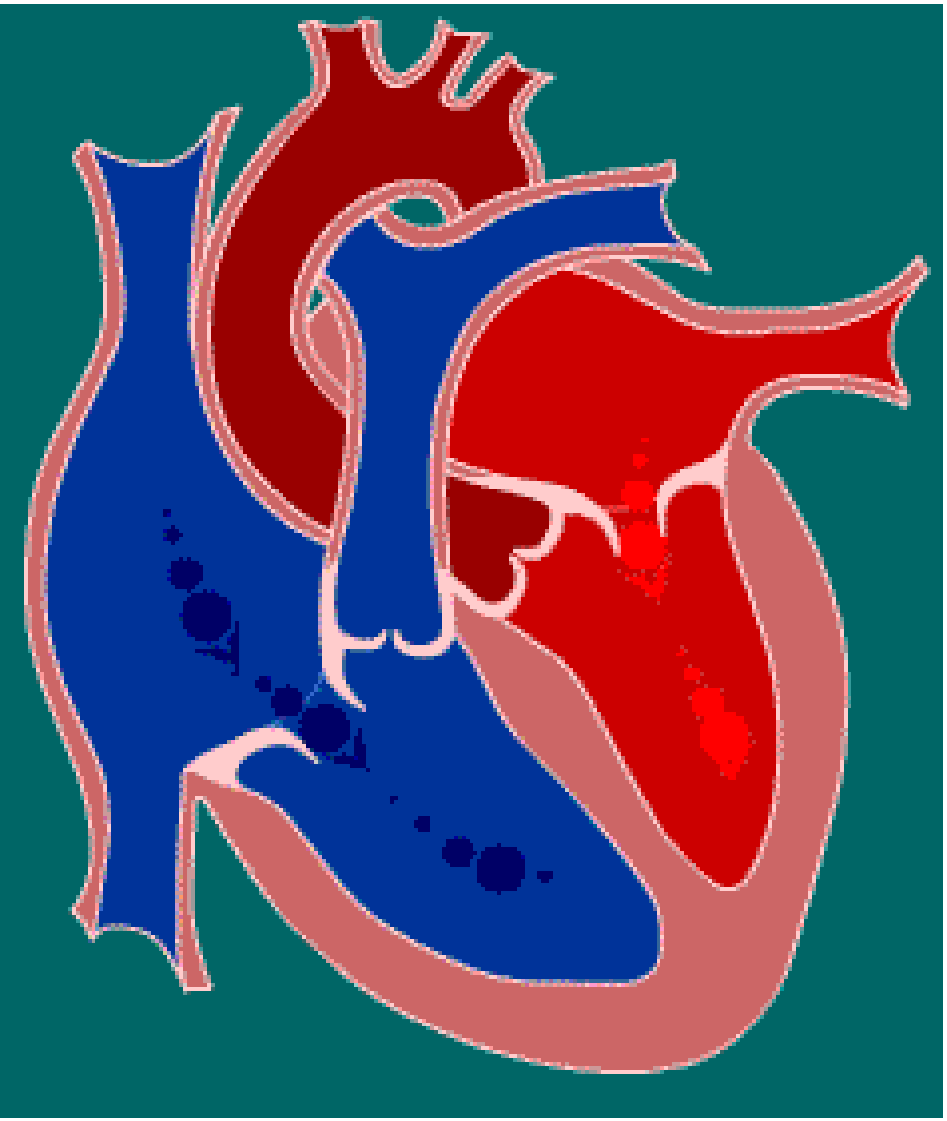
LLENADO VENTRICUAL RAPIDO RUIDOS CARDIACOS

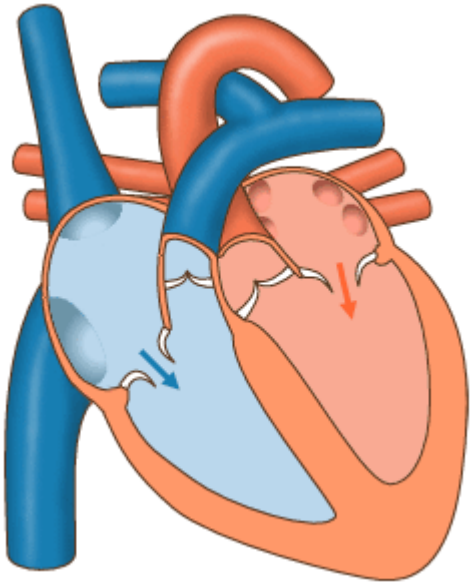


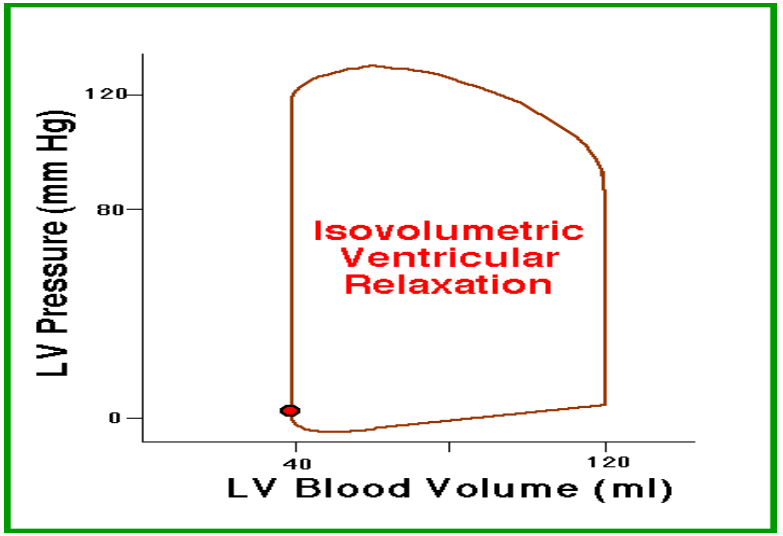
- R3 (anormal) provocado por el llenado ventricular rapido Pasivo .Ocurre en toda ocasión de emumento de la tensión parietal como insuficiencia cardíaca o mitral .



LLENADO VENTRICULAR LENTO







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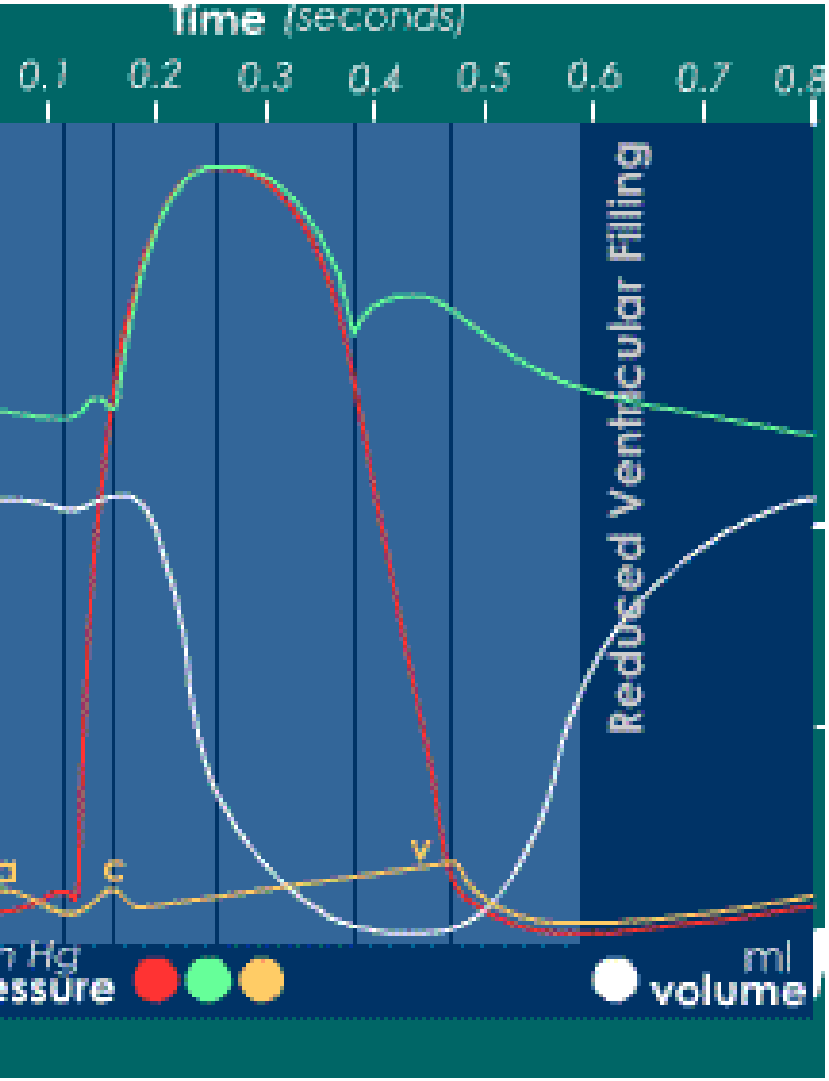
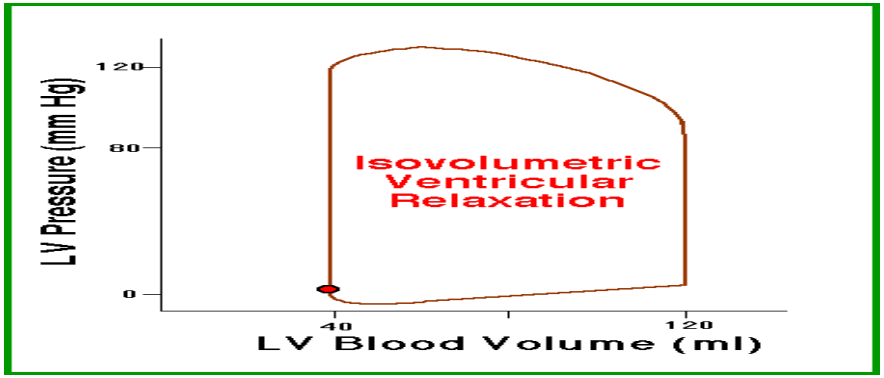
LLENADO VENTRICULAR LENTO



- EL VOLUMEN VENTRICULAR (BLANCO)SIGUE LENANDOSE LENTAMENTE HASTA CASO ESTAR LLENO



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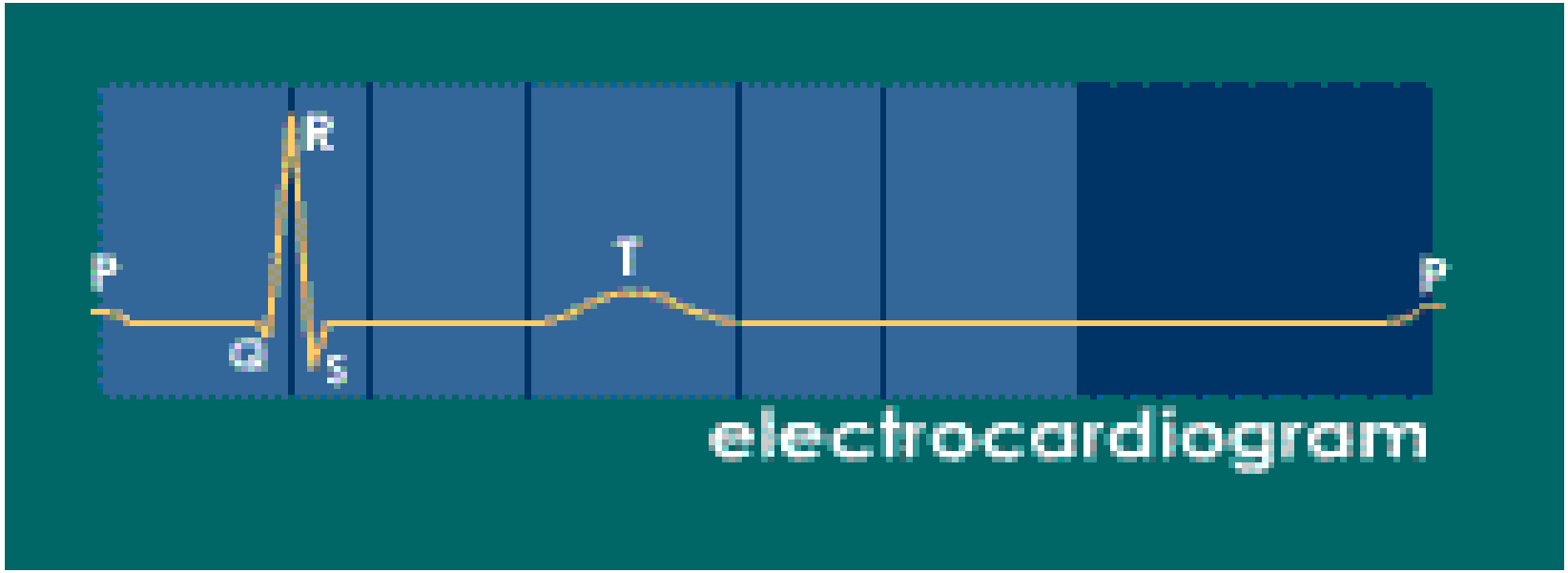
LLENADO VENTRICULAR LENTO ECG



- SIN DEFLECCIONES

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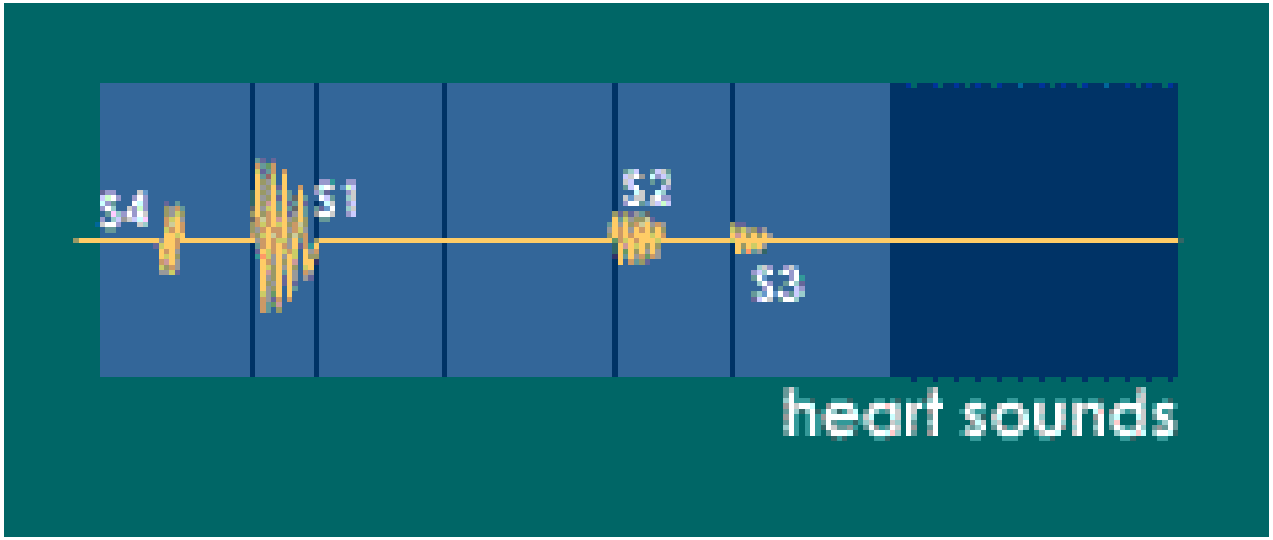
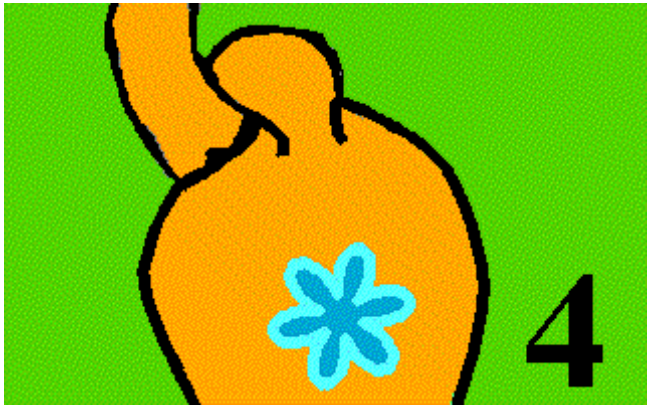
LLENADO VENTRICULAR LENTO



SILENCIO



CUAL ES PUNTO DE MAXIMA PRECARGA?

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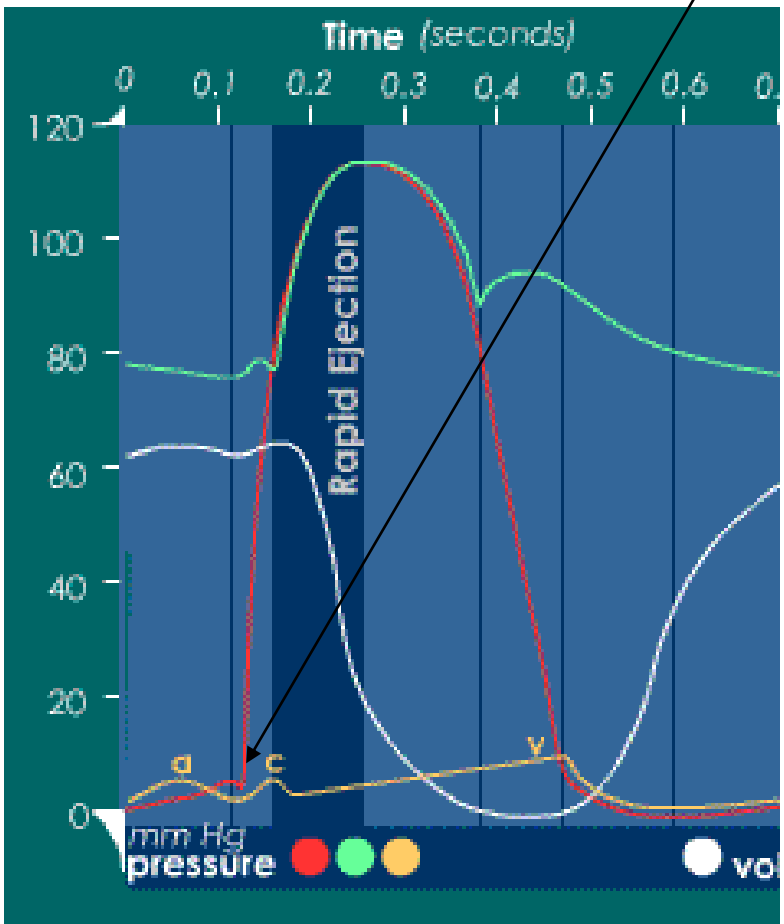
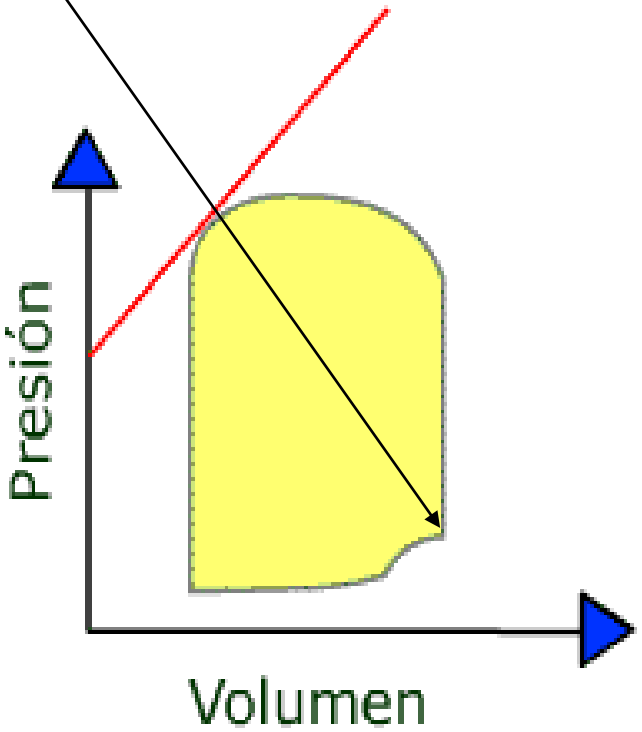
PUNTO DE MAXIMA PRECARGA





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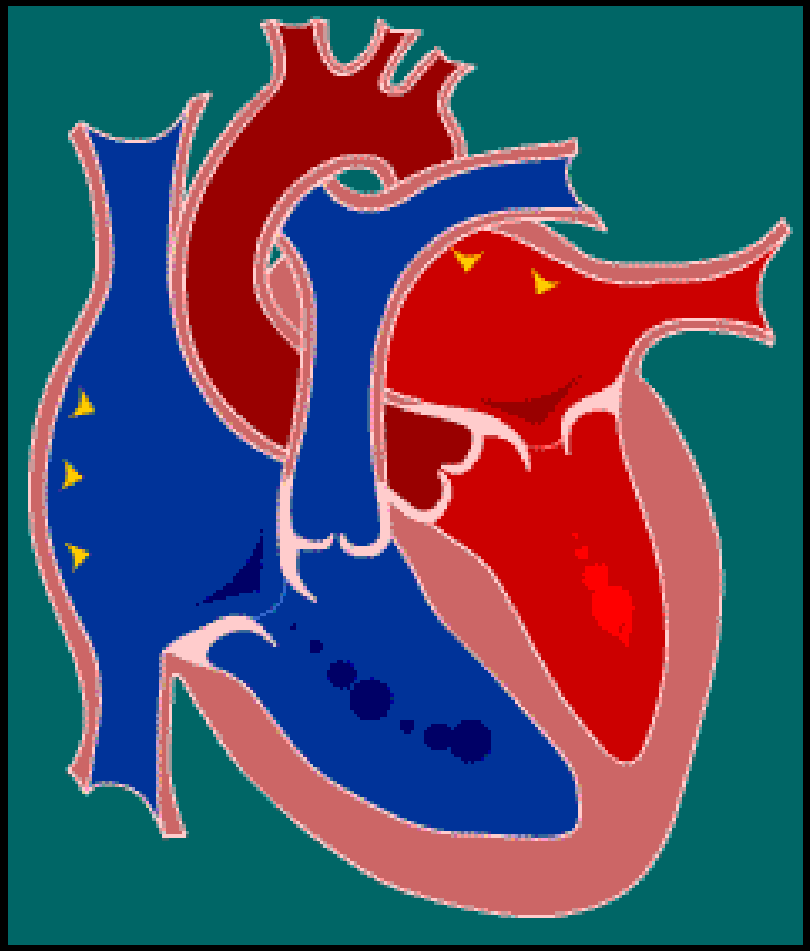
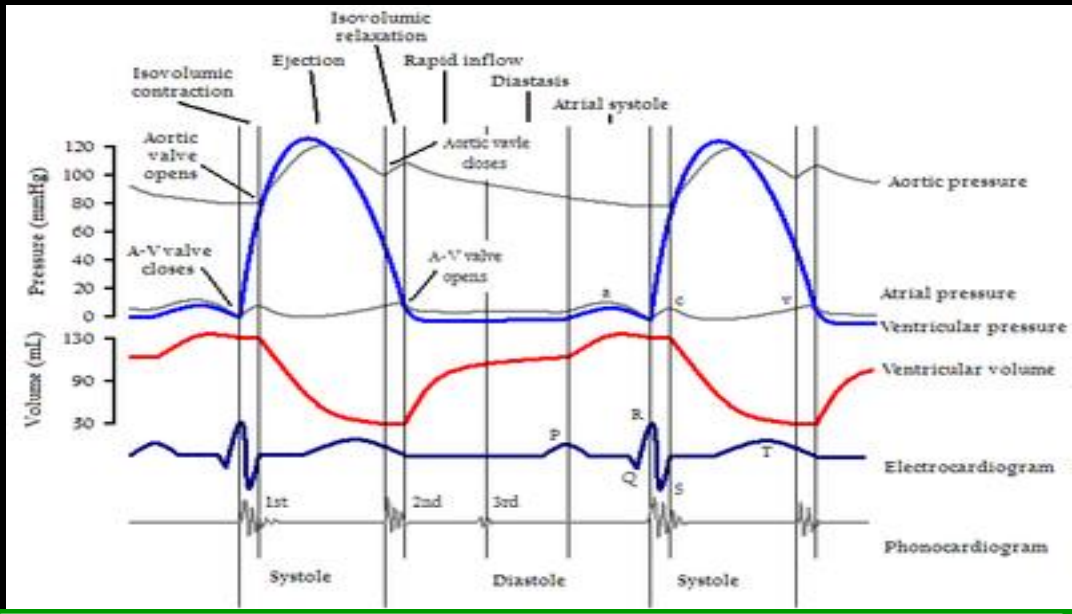
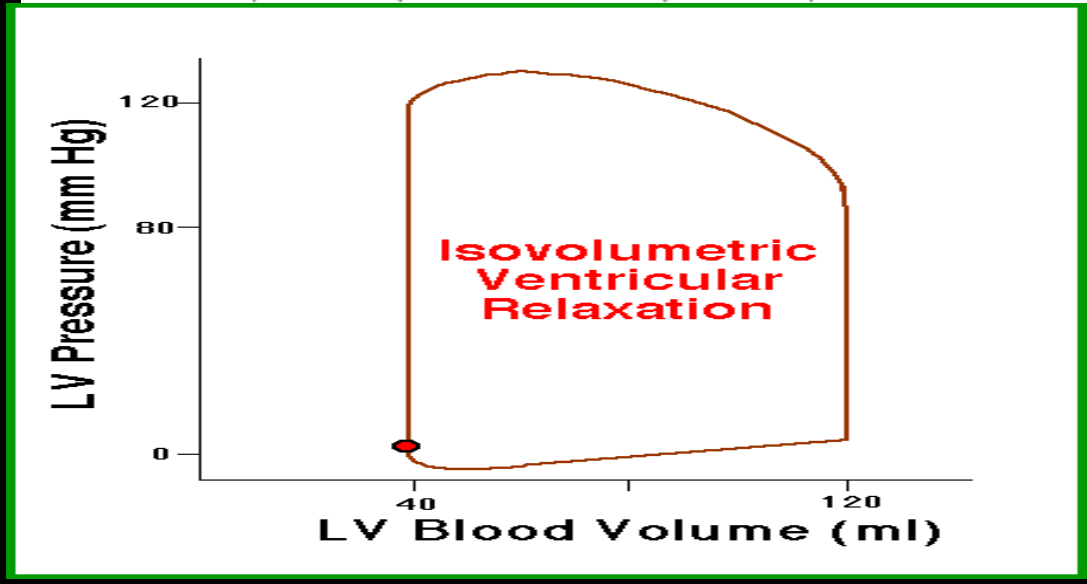
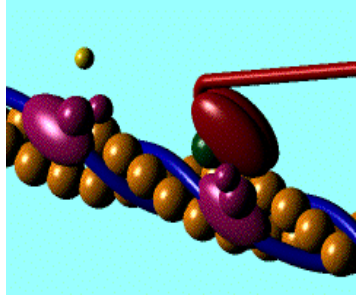
SISTOLE AURICULAR

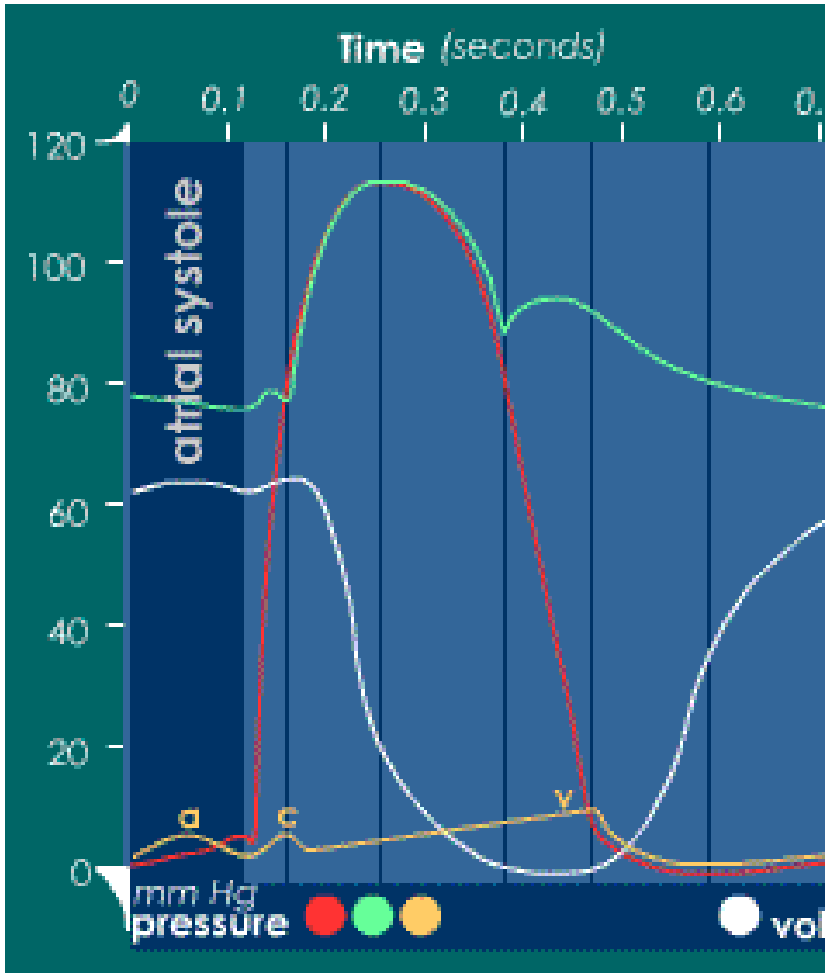




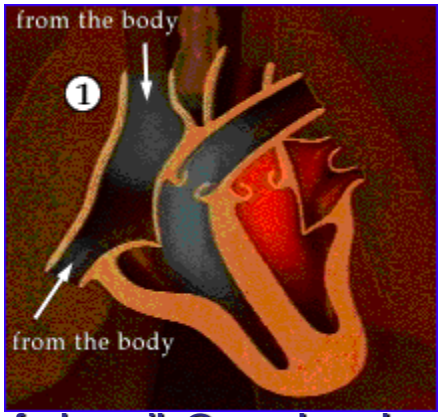


PRESISTOLE O SISTOLE AURICULAR





- AUMENTO DE LAS PRESIÓN AURICULAR POR SU CONTRACCIÓN (AMARILLO)
- LA SANGRE VUELVE DA LA AURICULA A LAS VENAS GENERANDO LA ONDA A PRIMERA ONDA VISIBLE DEL FLEVOGRAMA .
- PEQUEÑO INCREMENTO DE PRESIONES VENTRICULARES (VERDE)



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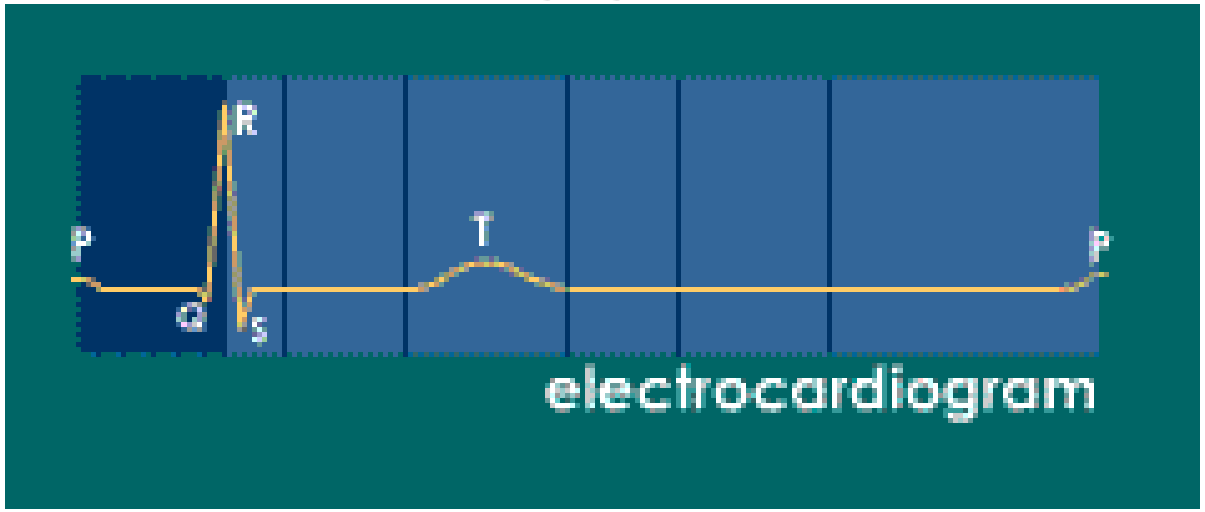
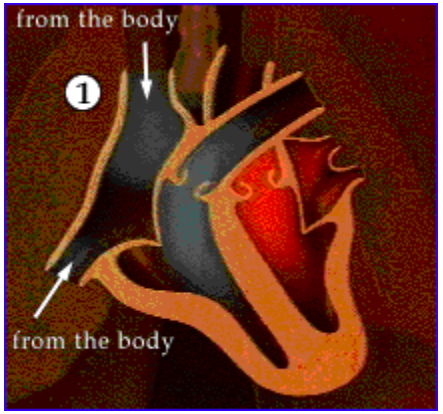
SISTOLE AURICULAR
ECG



- EL ESTIMULO SURGIDO DEL NODO SINUSAL DESPOLARIZA LA AURICULA
- ONDA P
- SGMENTO PR



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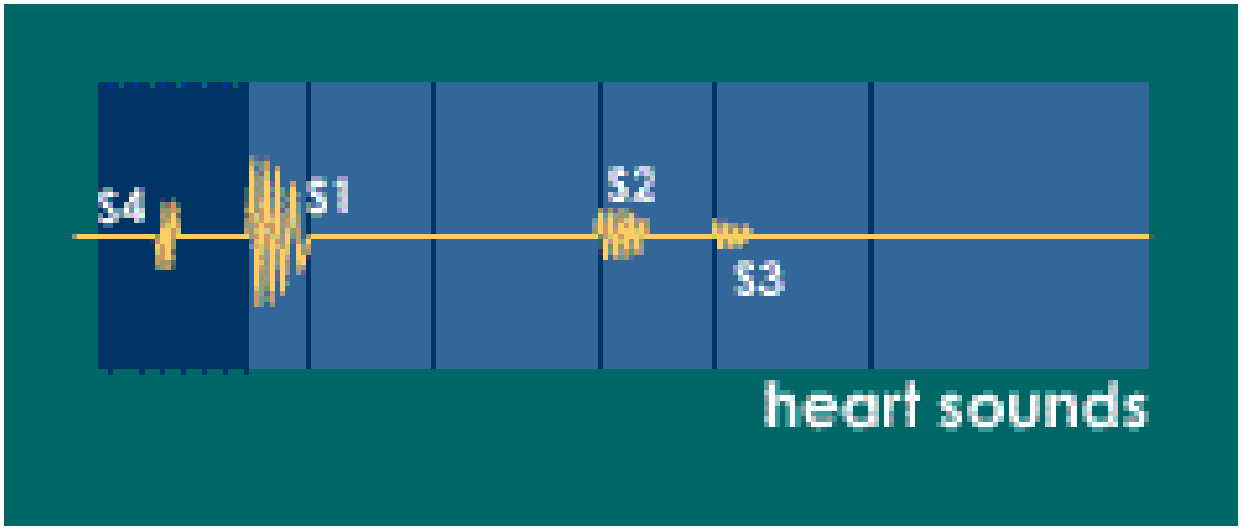
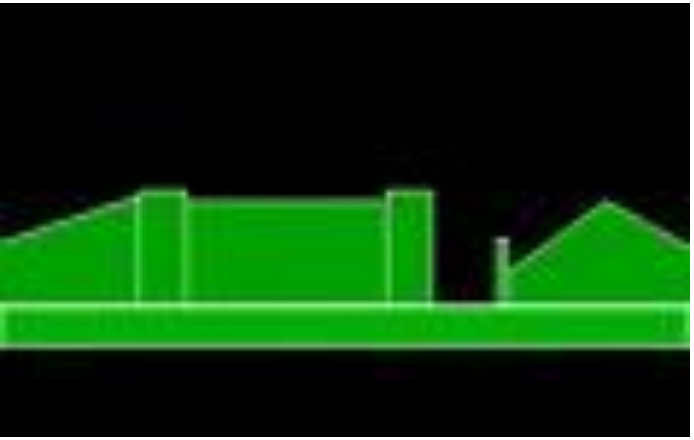
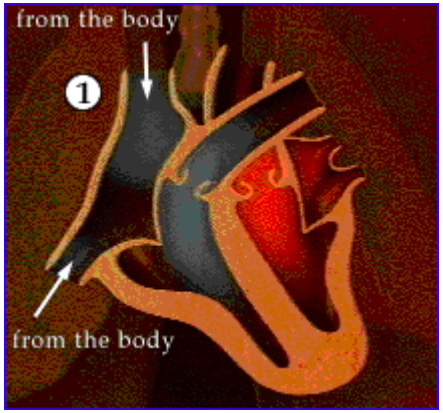
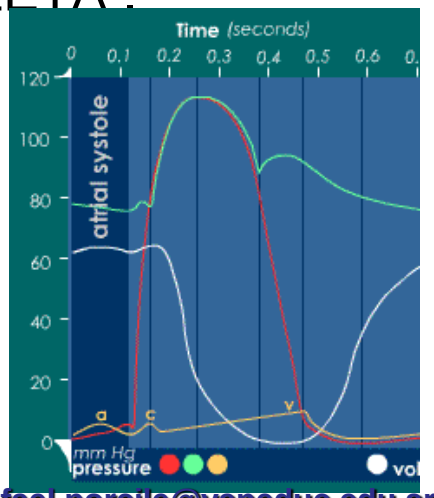
SISTOLE AURICULAR



- R4.
- HIPERTROFIA VENTRICULAR , CORAZON DE ATLETA .







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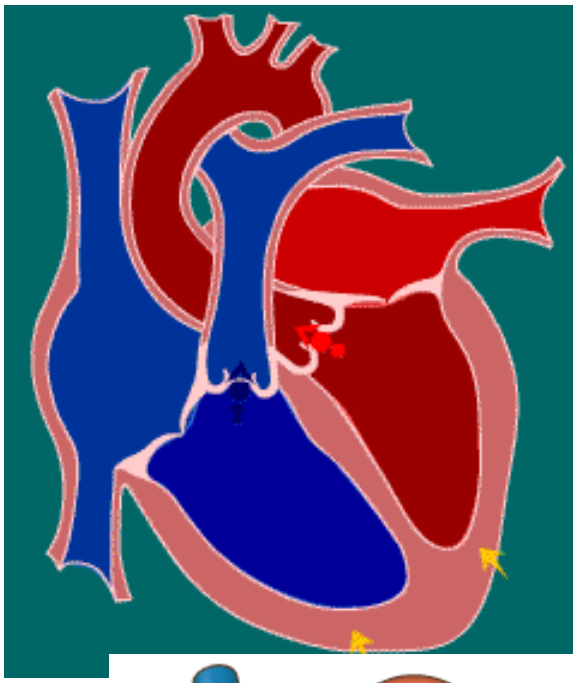
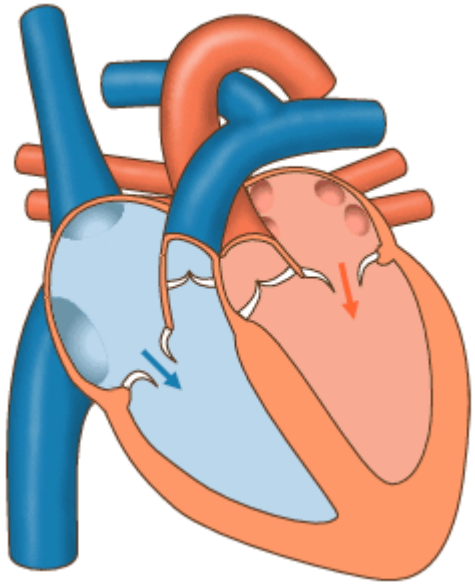
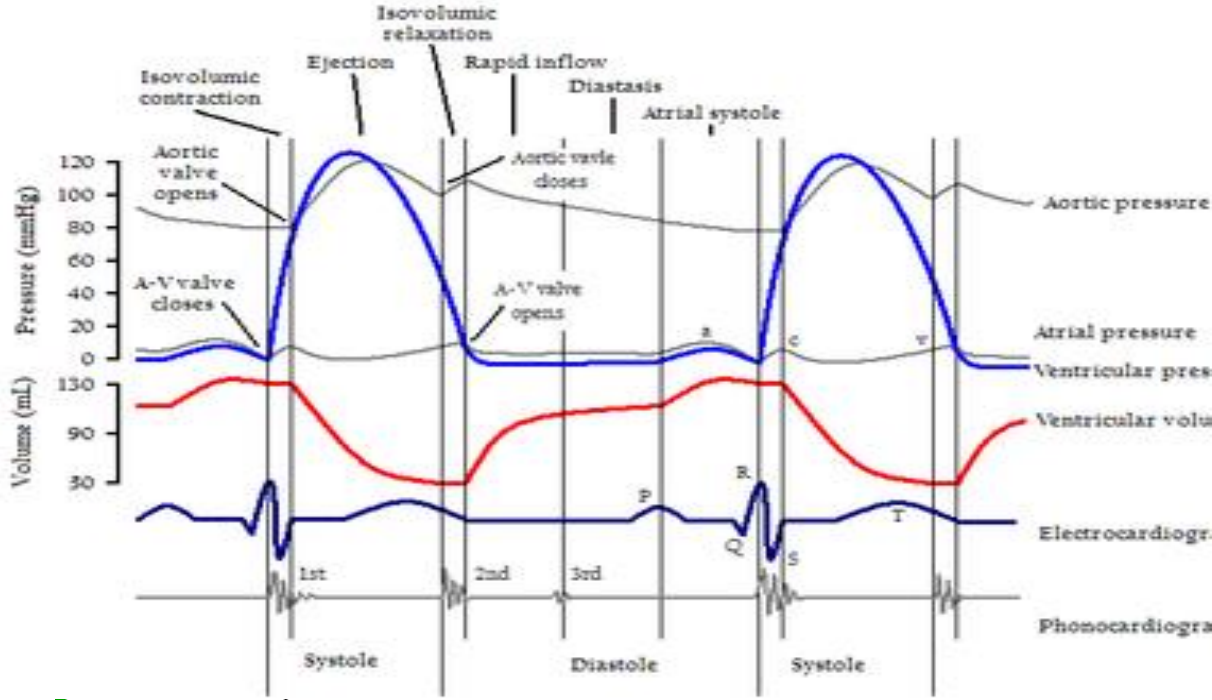
CONTRACCIÓN ISOVOLUMETRICA SISTOLICA







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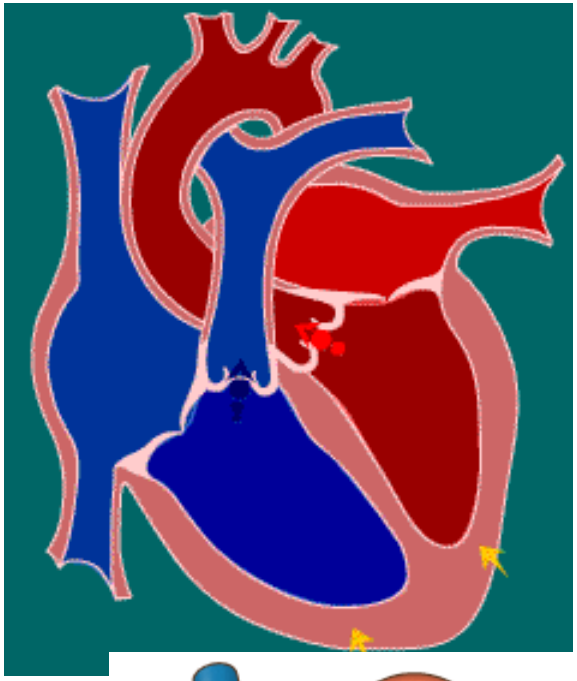
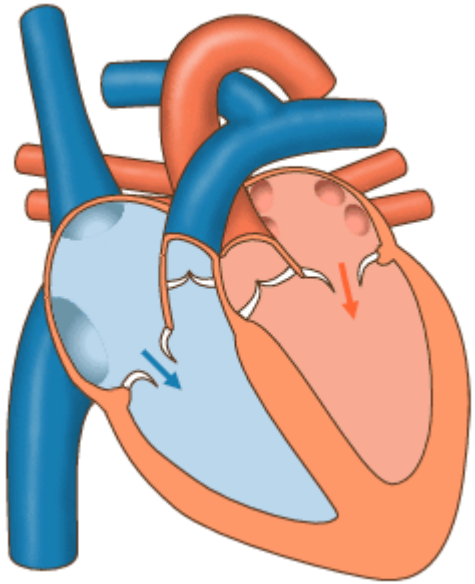
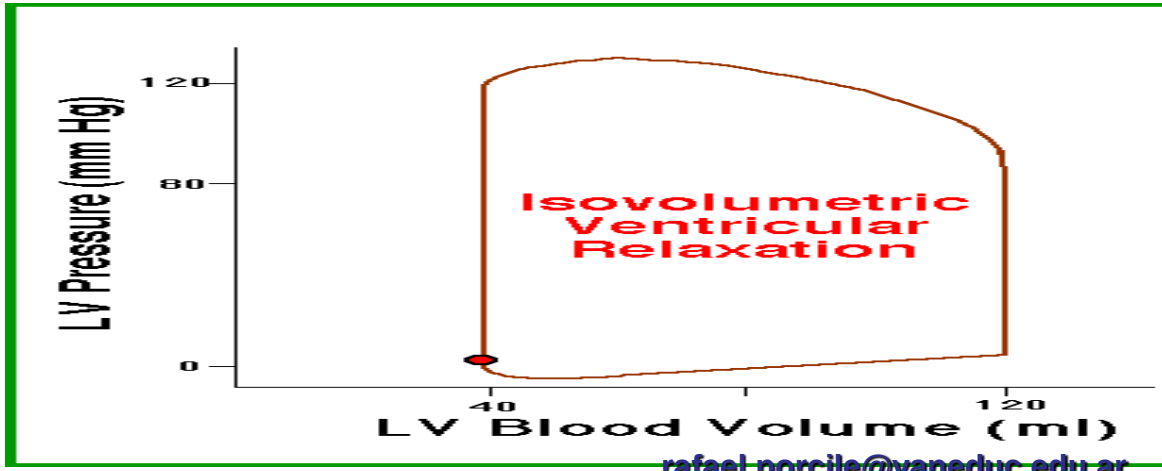


- CIERRE DE LAS AV .
- ELECTRICAMENTE LA SISTOLE VENTRCICULAR ES DEFINIDA COMO EL INTERVALO ENTRE EL COMPLEJO QRS Y LA ONDA T ES DECIR EL INTERVALO QT
- MECANICAMENTE LA SISTOLE VENTRICULAR ES DEFINIDA COMO EL INTERVALO ENTRE EL CIERRE AV Y LA APERTURA DE LAS SEMILUINARES





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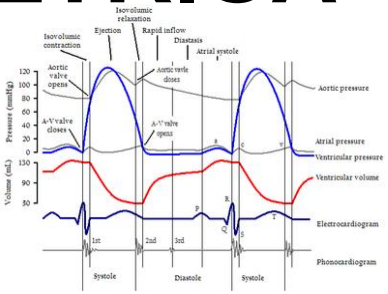
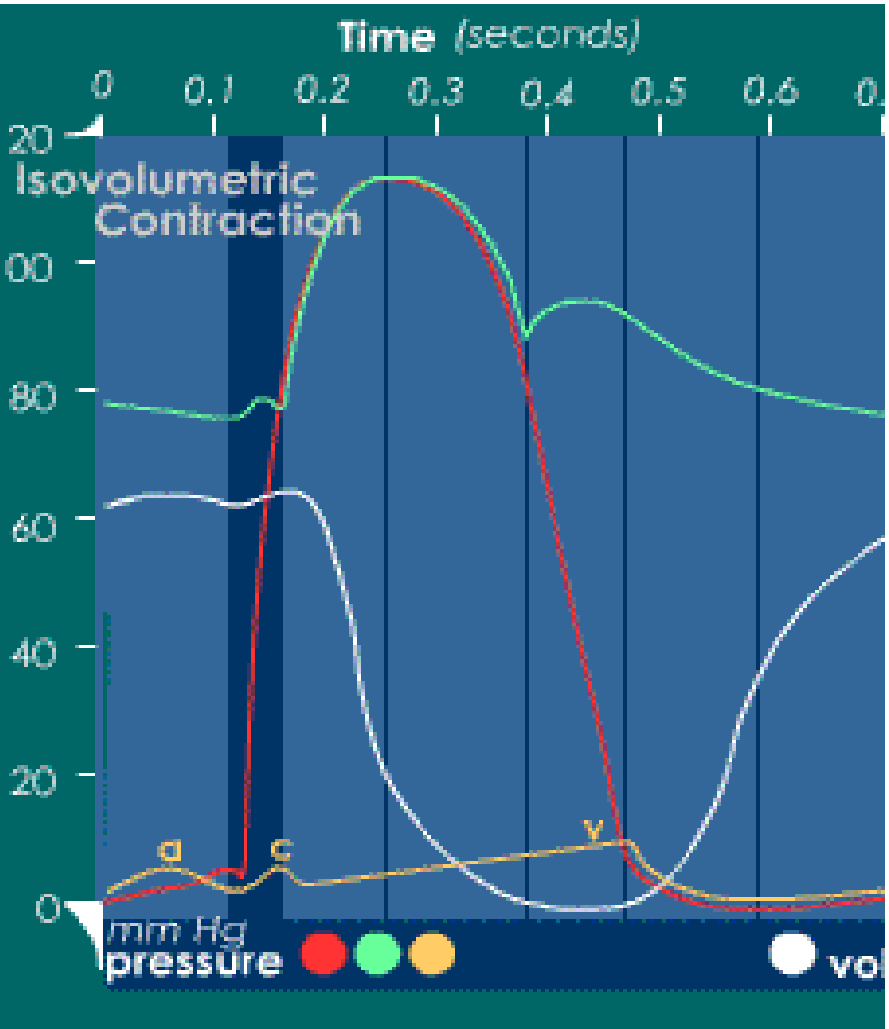
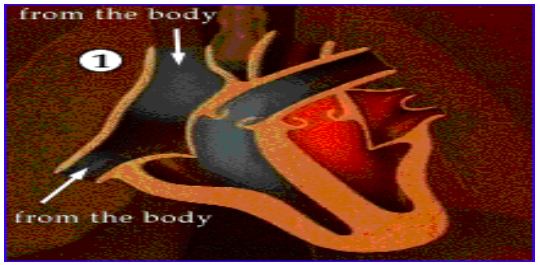
CONTRACCIÓN ISOVOLUMETRICA SISTÓLICA

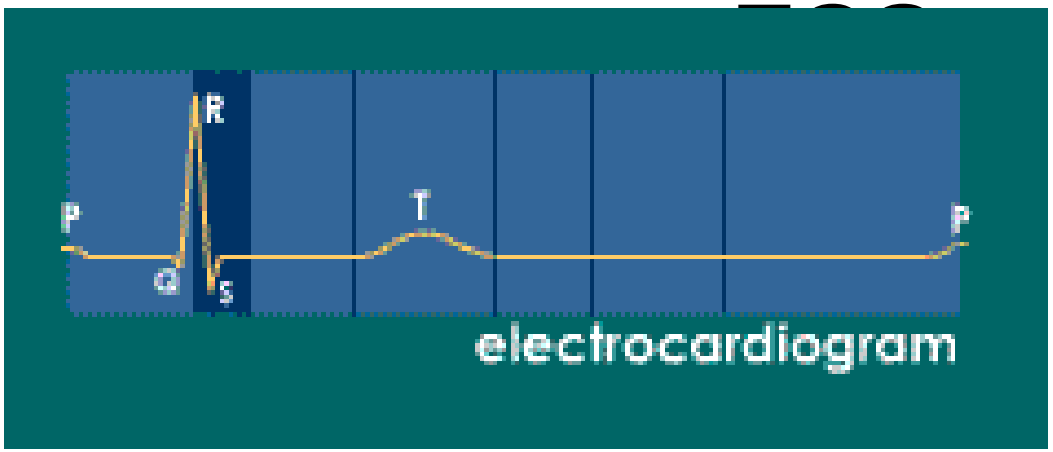


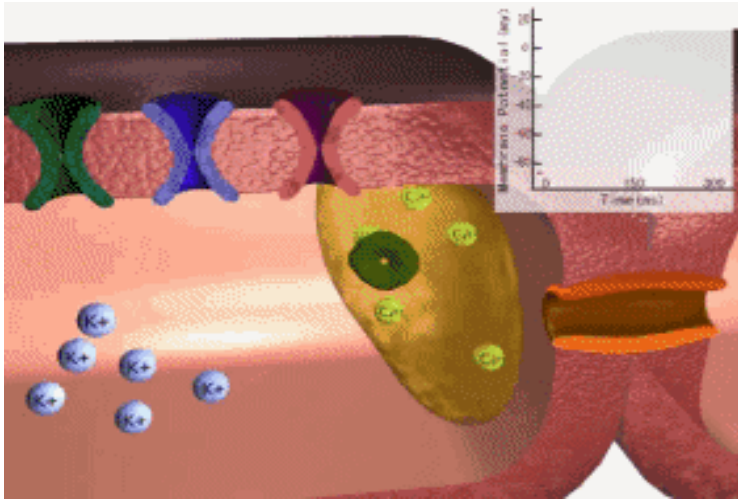


- LAS VALVULAS V/A CIERRAN CUANDO LA PRESIÓN (ROJO) SUPERA LA PRESION EN LA AURICULA (AMARILLO).
- EL VENTRICULO SE CONTRAE SIN CAMBIOS DE VOLUMEN ACERCANDO LA PRESIÓN A LA ARTERIAL (VERDE).



CONTRACCIÓN ISOVOLUMETRICA SISTOLICA





- El impulso electrico llega desde el nodo AV alcnza el HIS las ramas y las fibras de purkinje despolarizando la masa ventricular .
- El complejo QRS representa la despolarización ventricular

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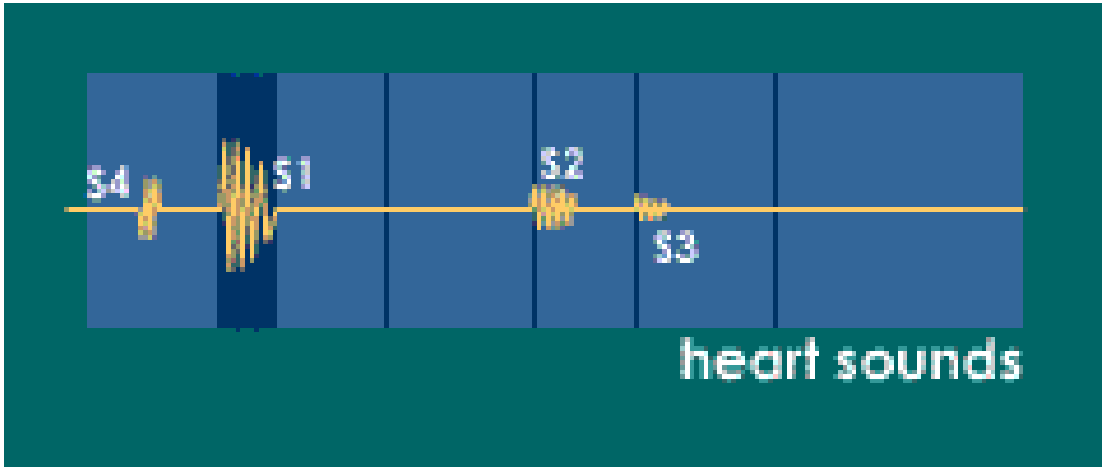
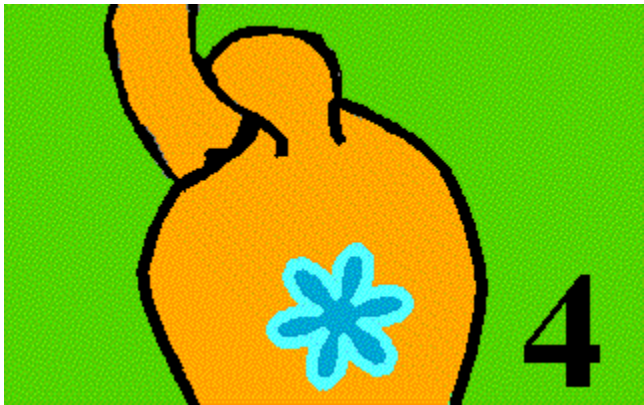
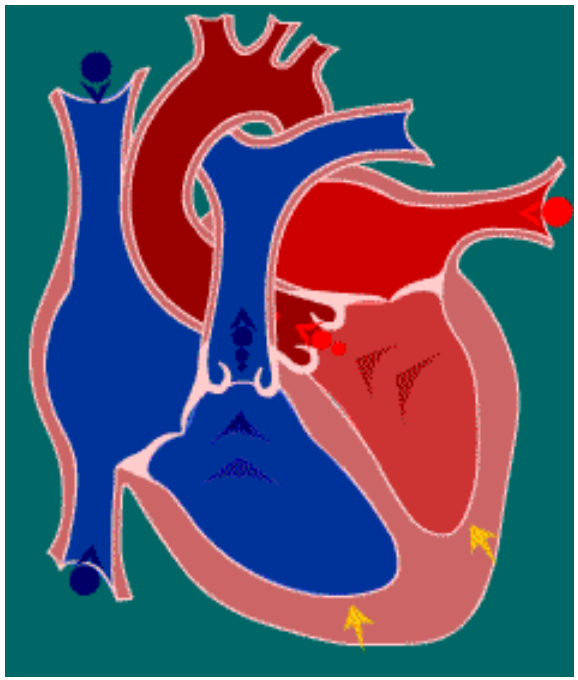
CONTRACCIÓN ISOVOLUMETRICA SISTOLICA



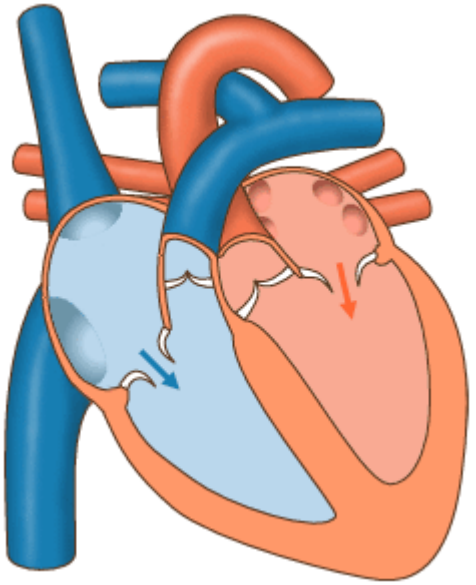
- PRIMER RUIDO CARDÍACO



EYECCIÓN RAPIDA



- APERTURA DE LAS SEMULUNARES AORTUCAS Y PULMONARES



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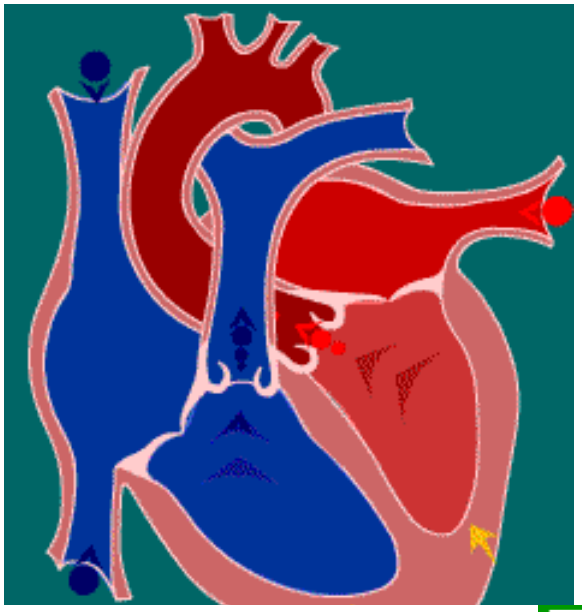
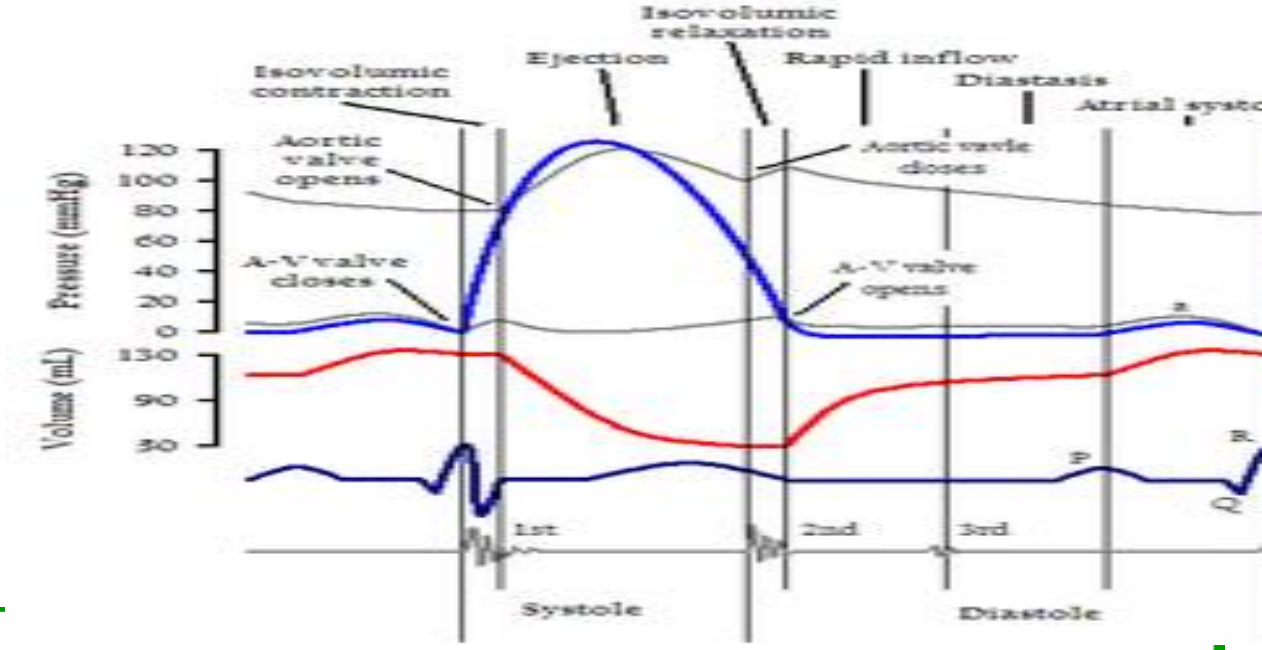
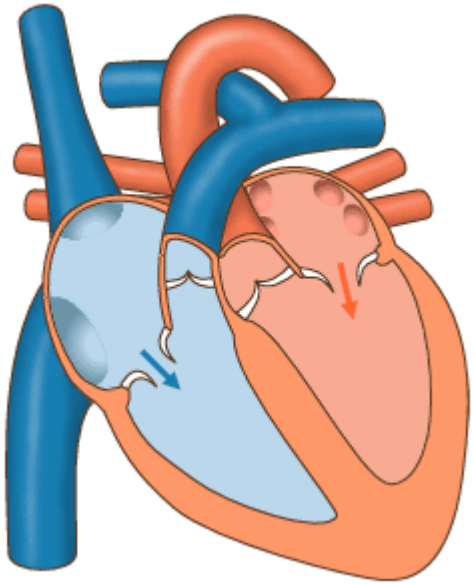
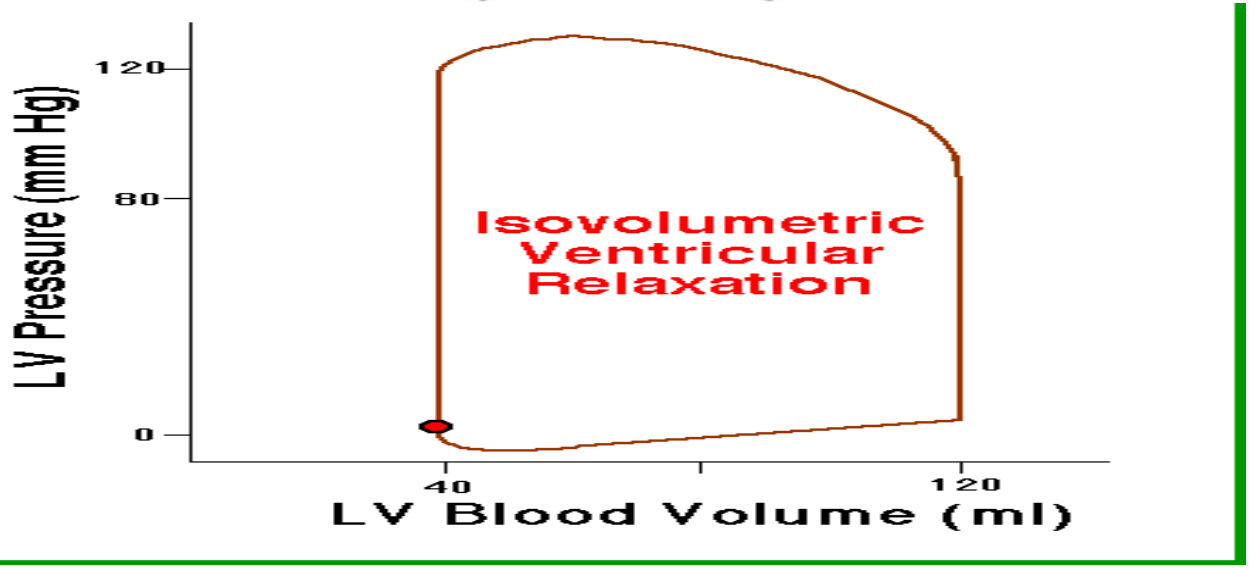
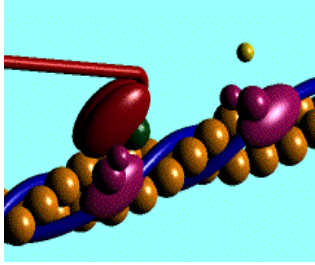


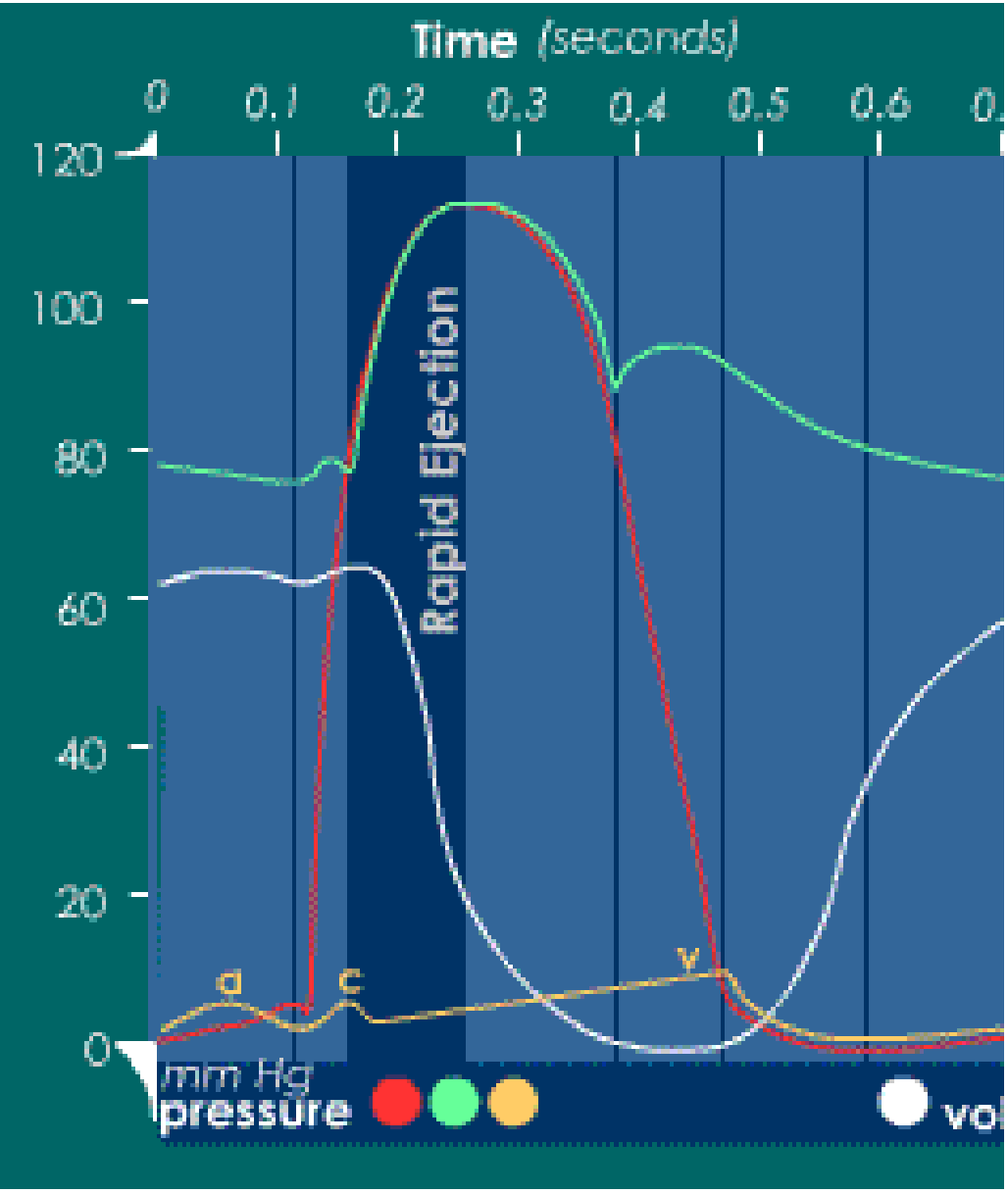


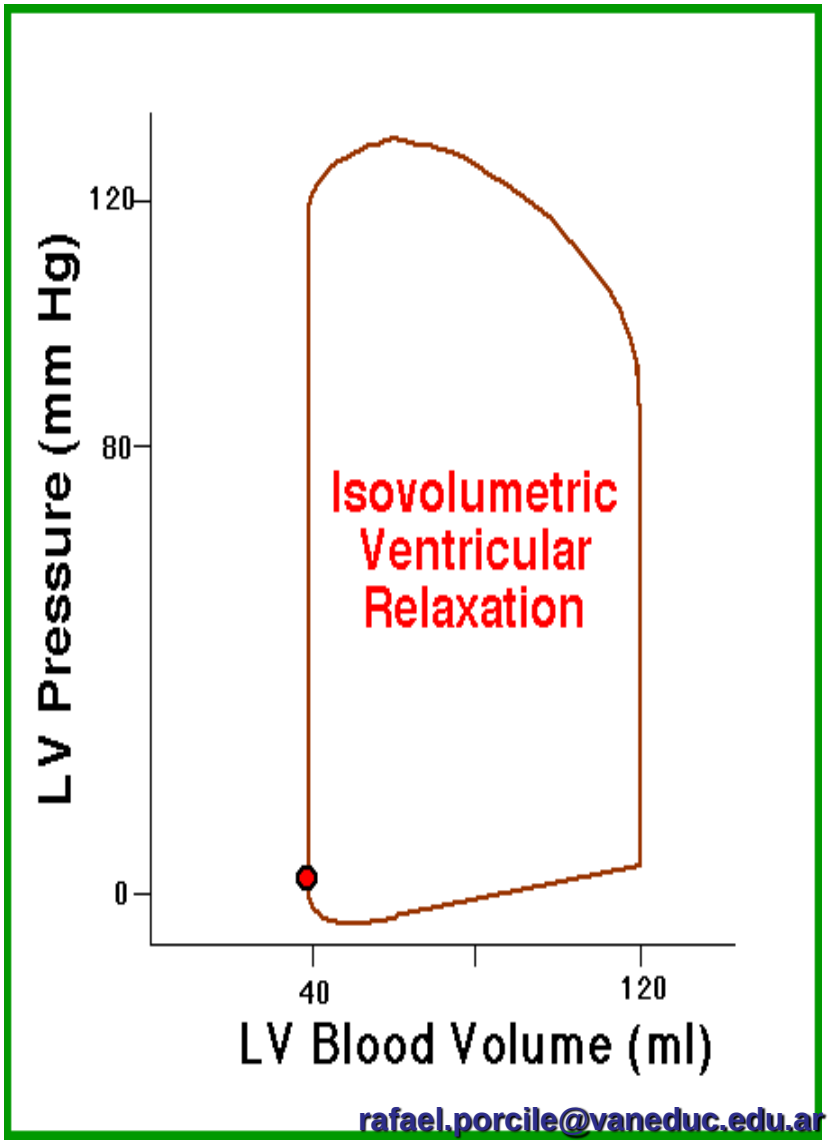




Eyección rapida







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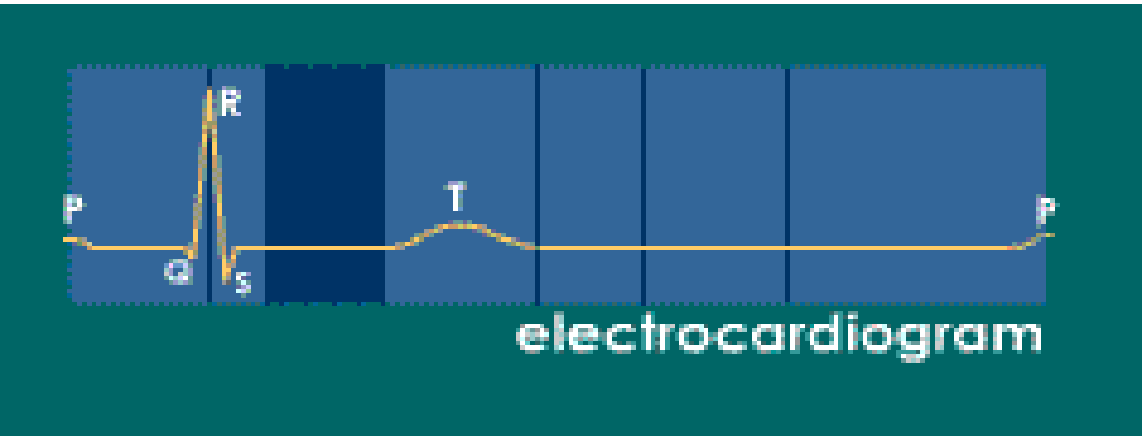
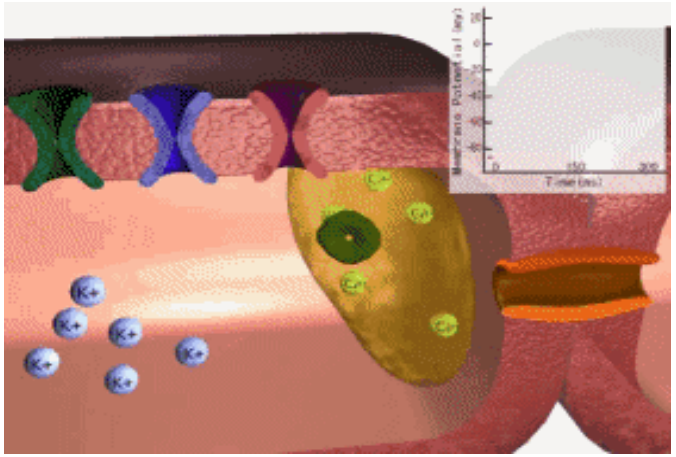
PERIODO EYECTIVO
ECG





Sin deflecciones

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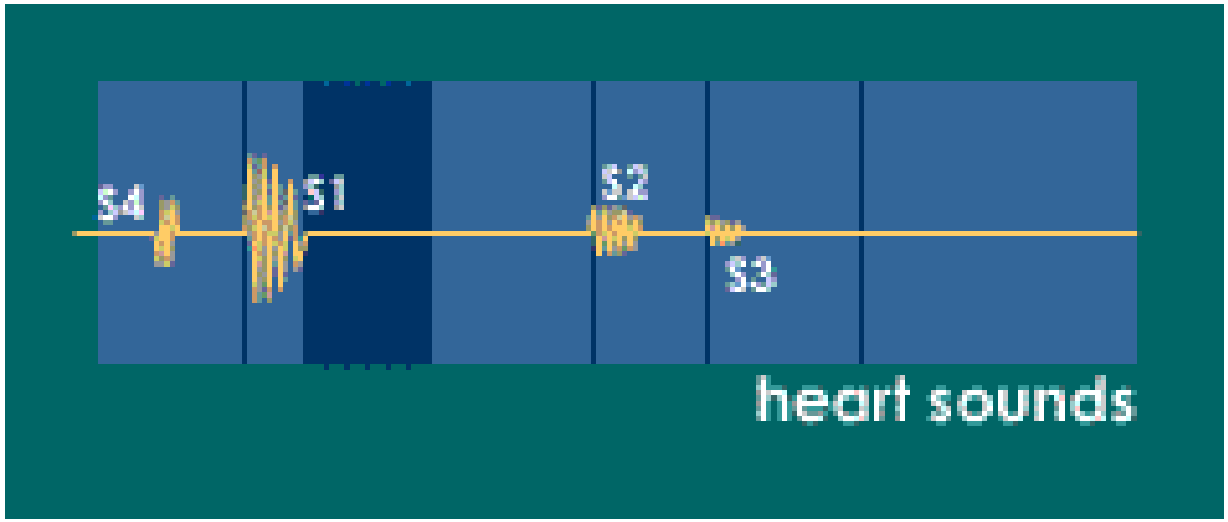
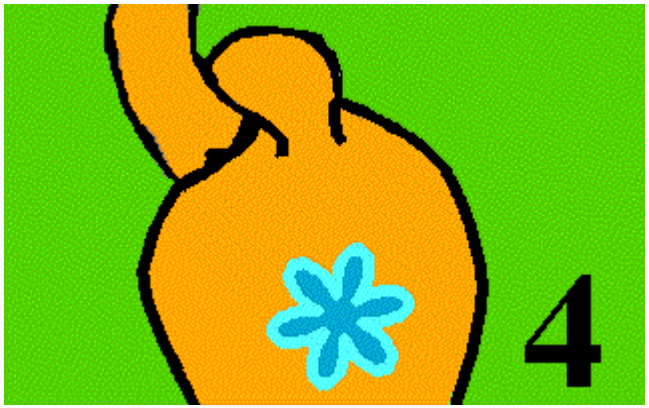
PERIODO EYECTIVO



SILENCIO



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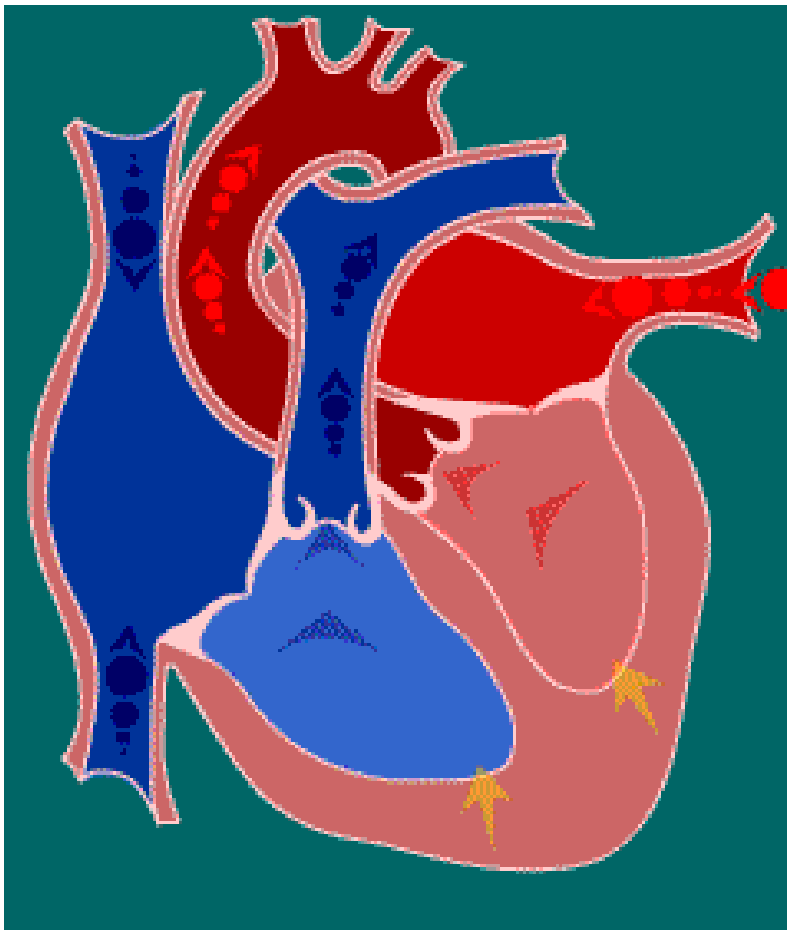
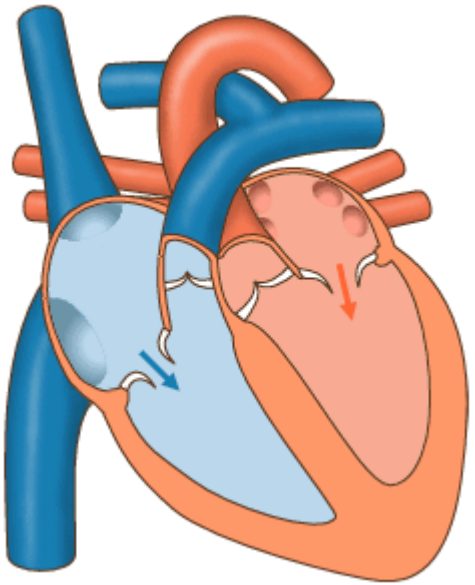
EYECCIÓN LENTA



- AL FIMAL DE LA SISTOLE CIERRE DE LA AV.



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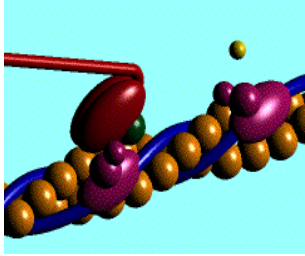
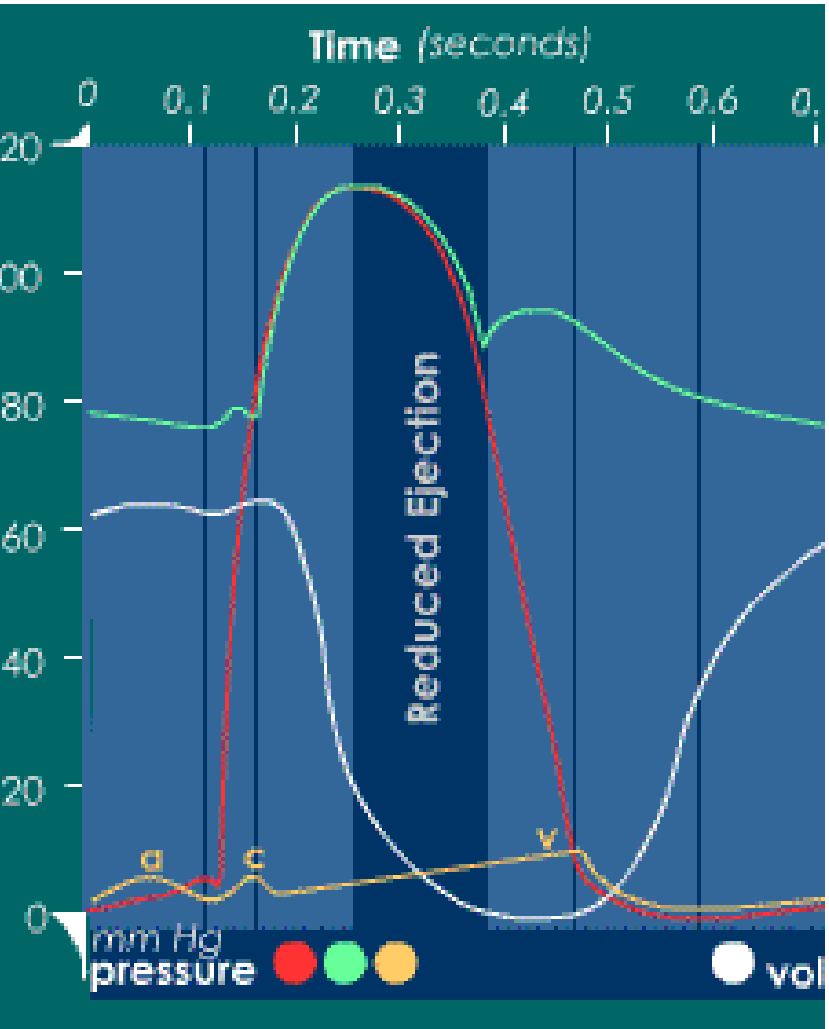
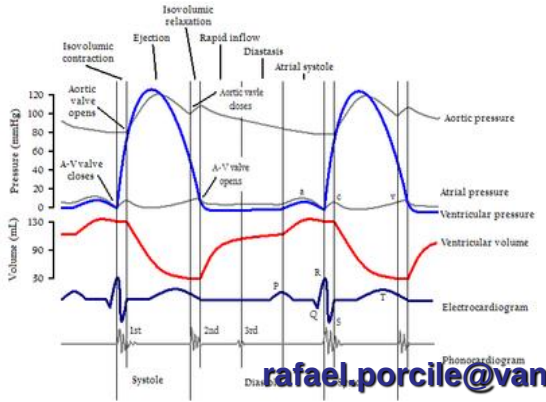
EYECCION LENTA





- LUEGO DEL PICO DE PRESIÓN SISTOLICA (ROJO+VERDE), DECAE EL VOLUMEN VENTRICULAR (BLANCO).
- AL CAER LA PRESIÓN EN LAS ARTERIA EL FLUJO RETROCEDE CERRANDO LAS VALVULAS Y GENERANDO LA INCISURA DÍCROTA .



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EYECCIÓN LENTA
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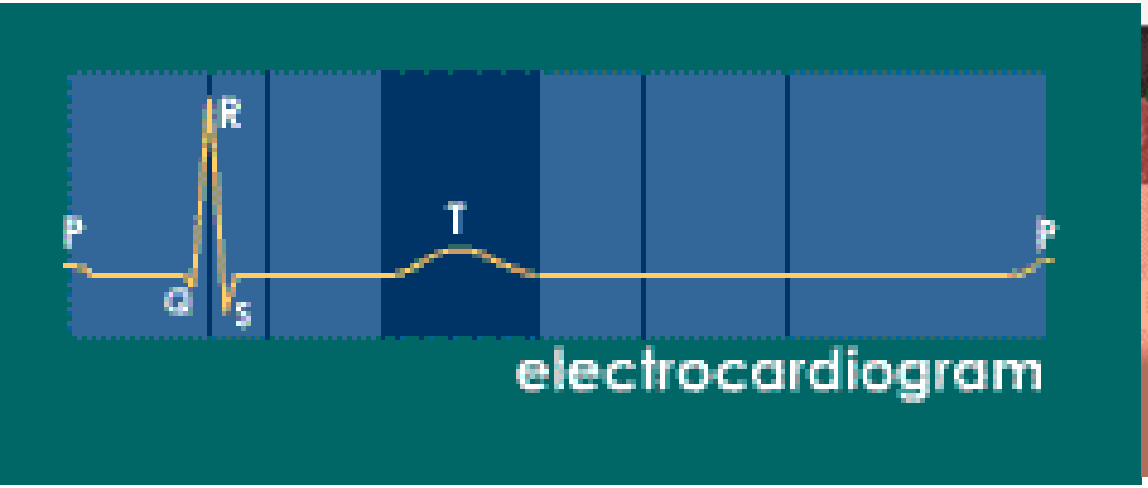
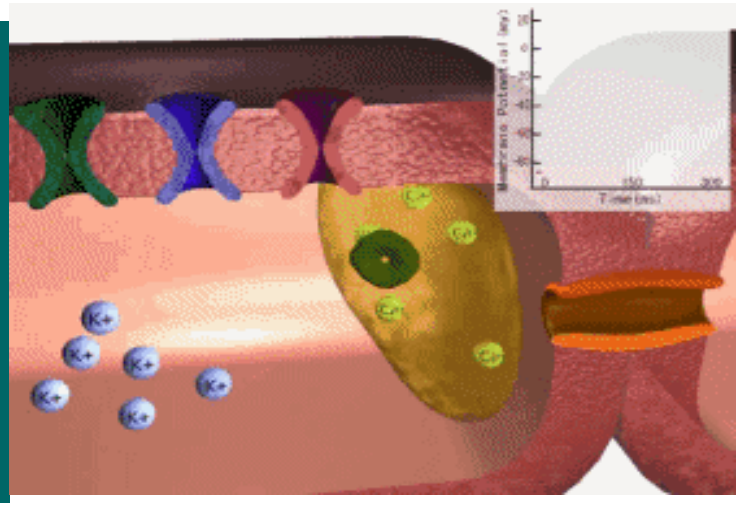
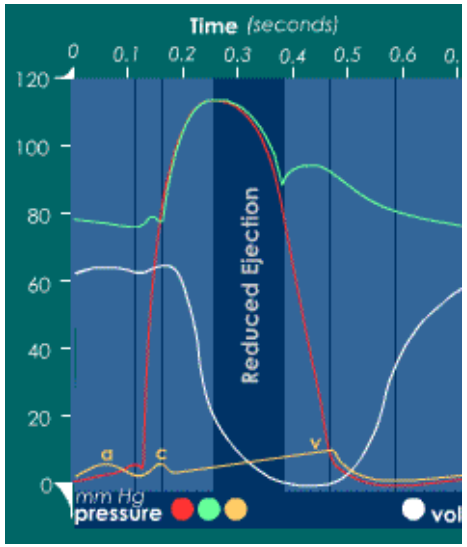




- ONDA T.



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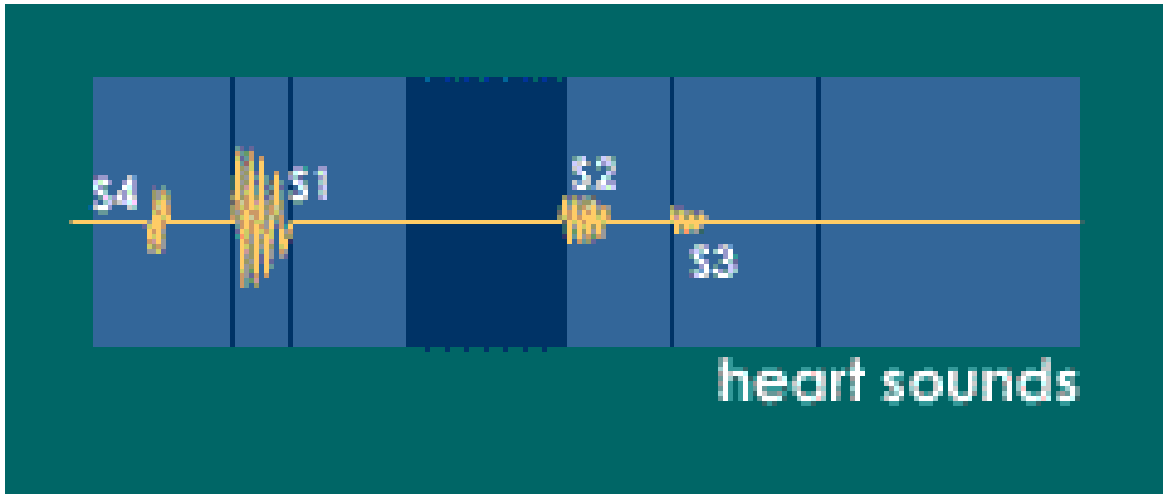

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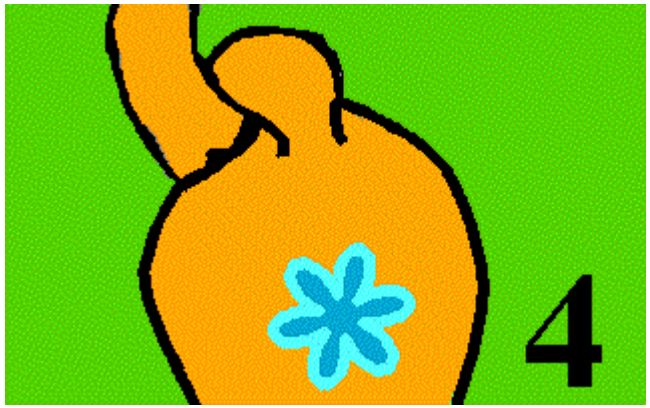

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CUAL ES PUNTO DE MAXIMA POSTCARGA?

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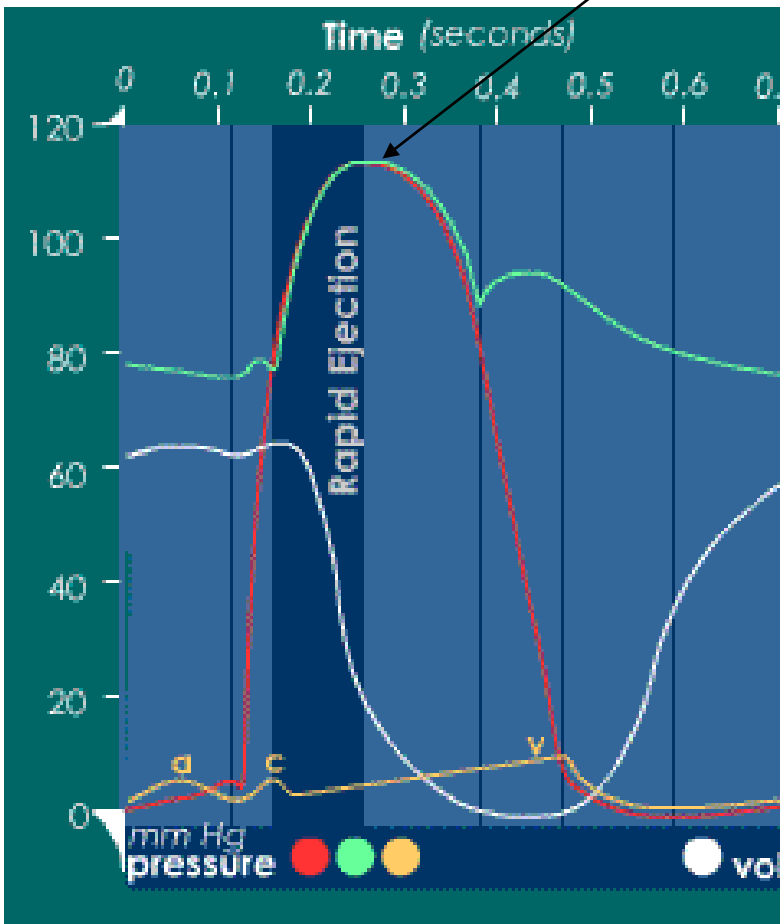
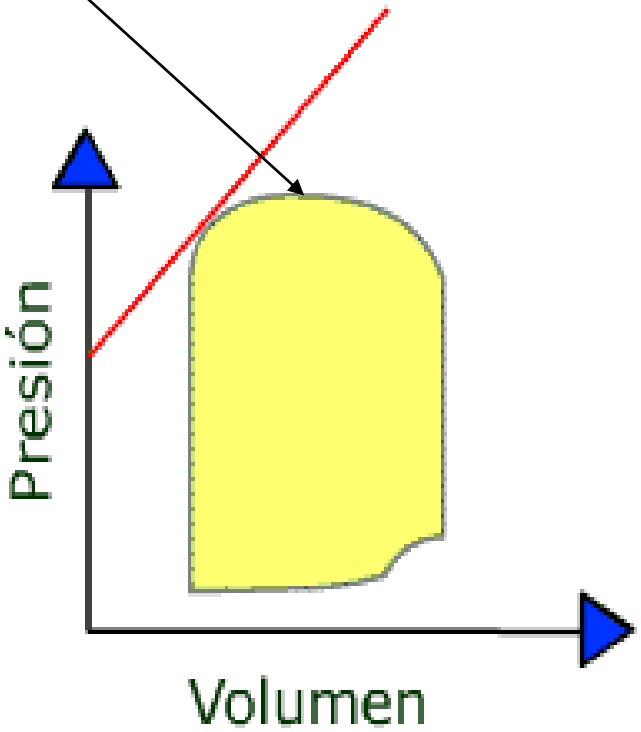
PUNTO DE MAXIMA POSTCARGA





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Relación dP/dt

- Velocidad con la cual el ventriculo logra desarrollar cambios de presion
- La maxima dP/dt se logra al final de la CIS antes de la apertura valvular aortica
- Es el mejor indicador de trabajo ventricular
- Se retrasa con el deterioro inotropico pudiendo producirse aun despues de la apertura aortica con gran perdida de la eficiencia contractil

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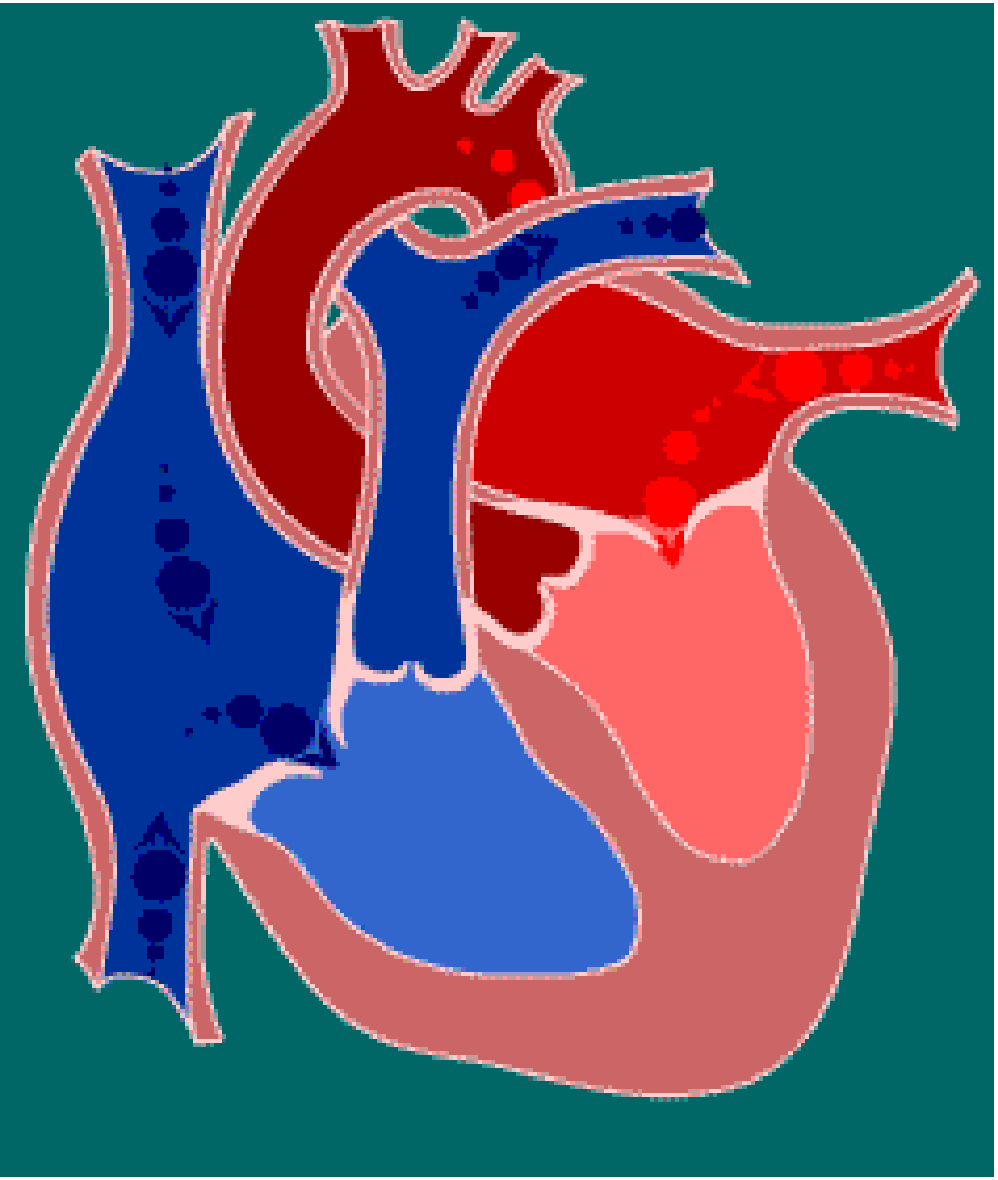
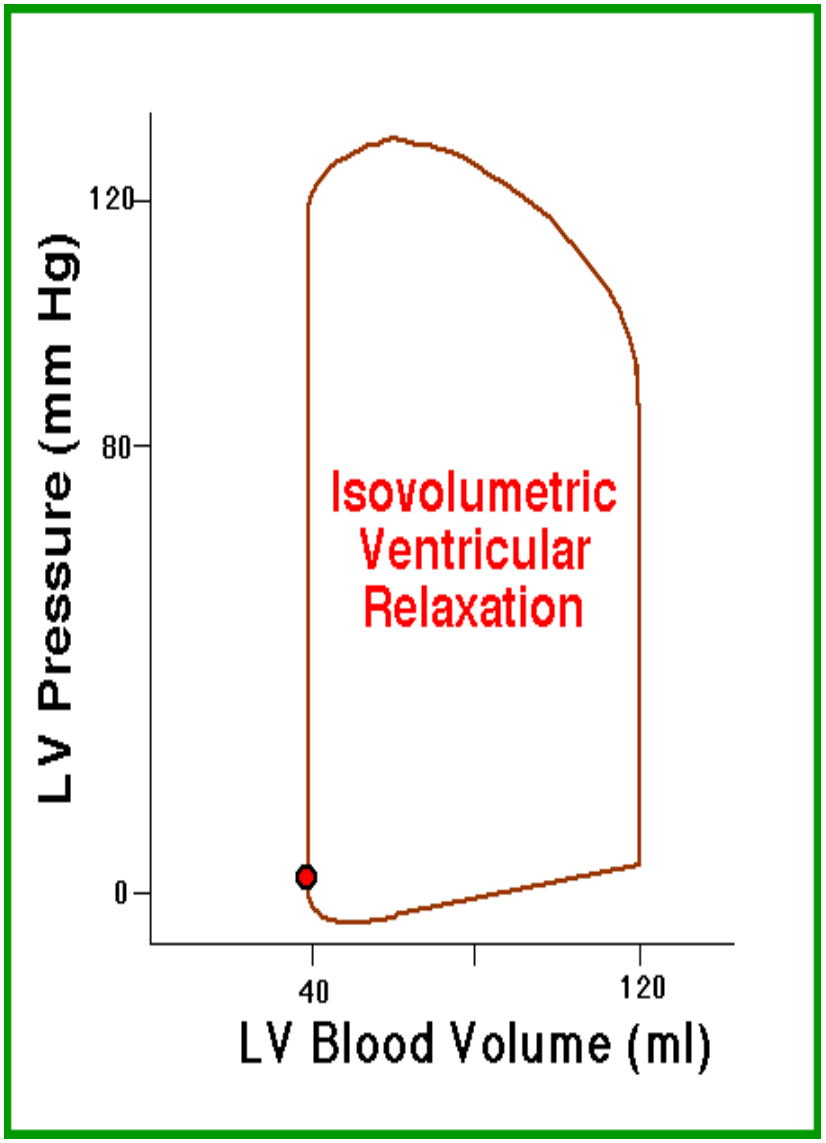
Relajación Isovolumetrica Diastólica





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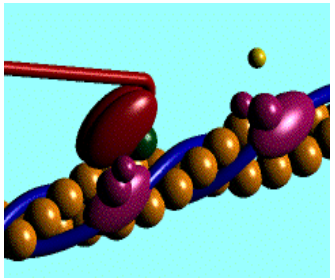
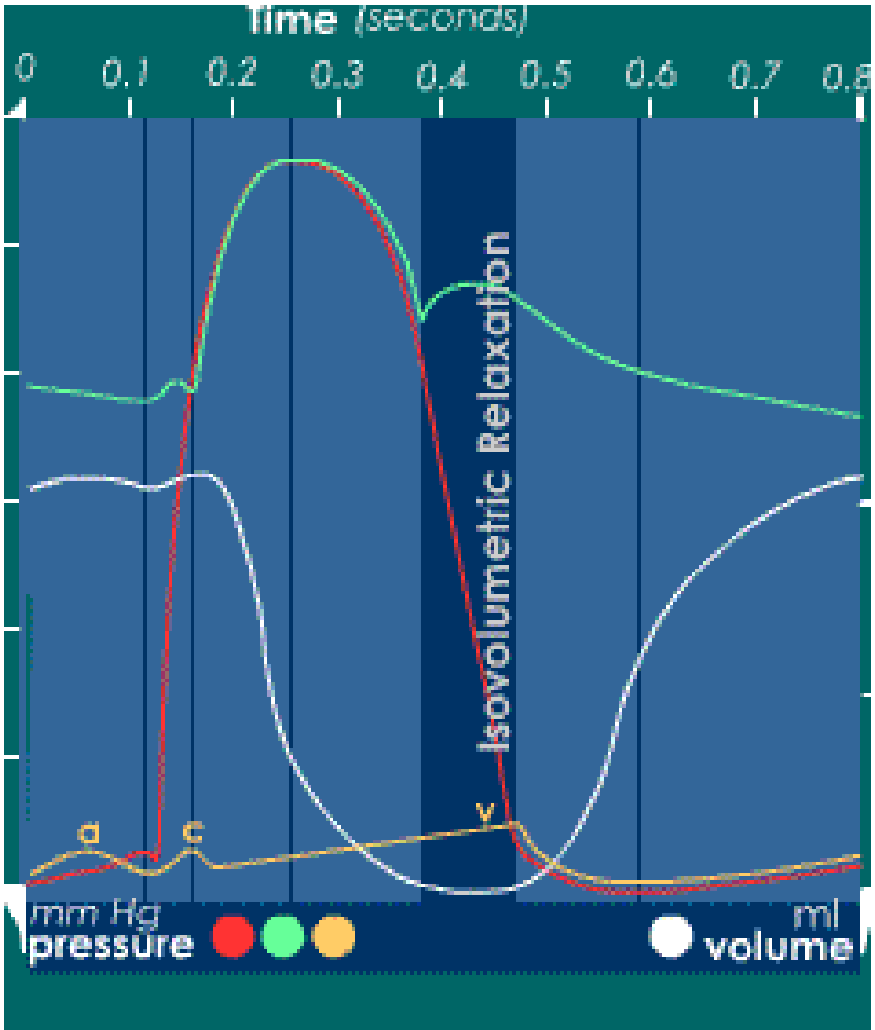
RELAJACIÓN INSOVOLUMETRICA DIASTÓLICA





- Durante este y los dos periodos anteriores , la auricula se fue llenando con la valvula a/v cerrada incrementando su presion (amarillo).
- La onda V es generada por el golpe de la sangre sobre la a/v cerrada .Es la segunda onda obsarvable en el flebograma o yugulograma .
- La presión en el ventriculo (en rojo) continua a caer .
- El volumen ventricuar llega al minimo preparandose para el llenado .

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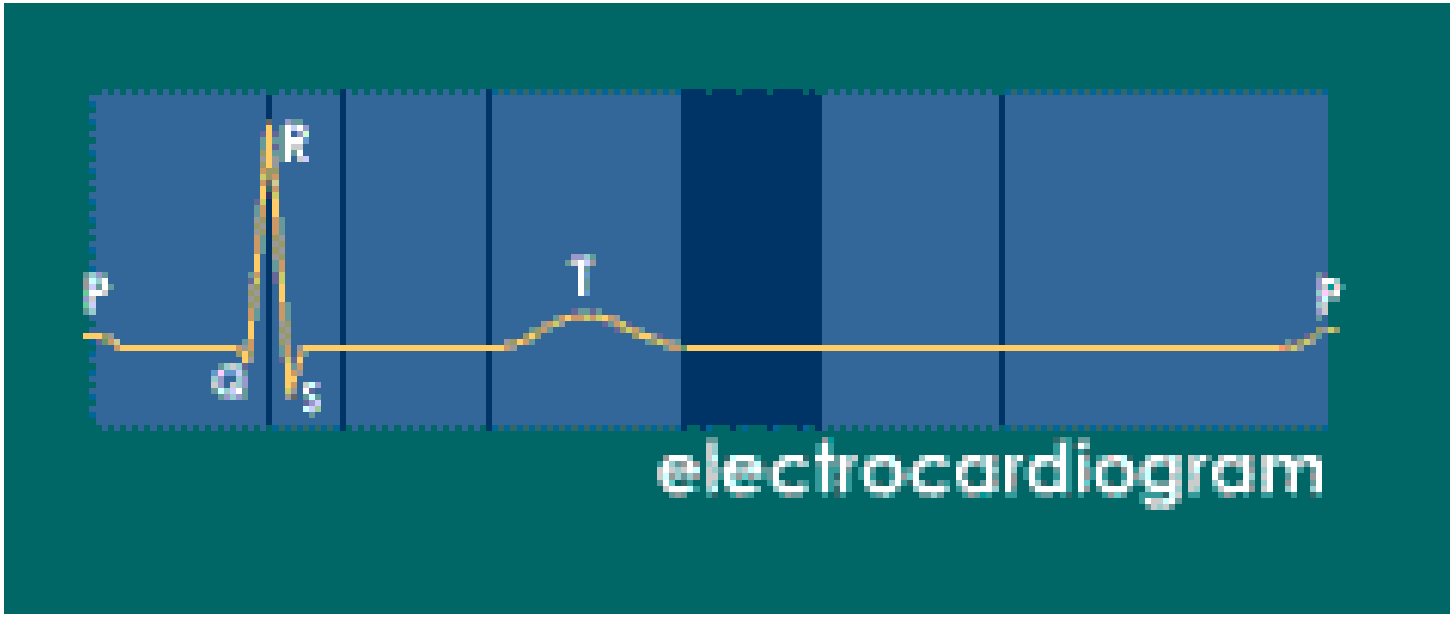
RELAJACIÓN ISOVOLUMETRICA DIASTÓLICA
ECG



SIN DEFLECCIÓNES

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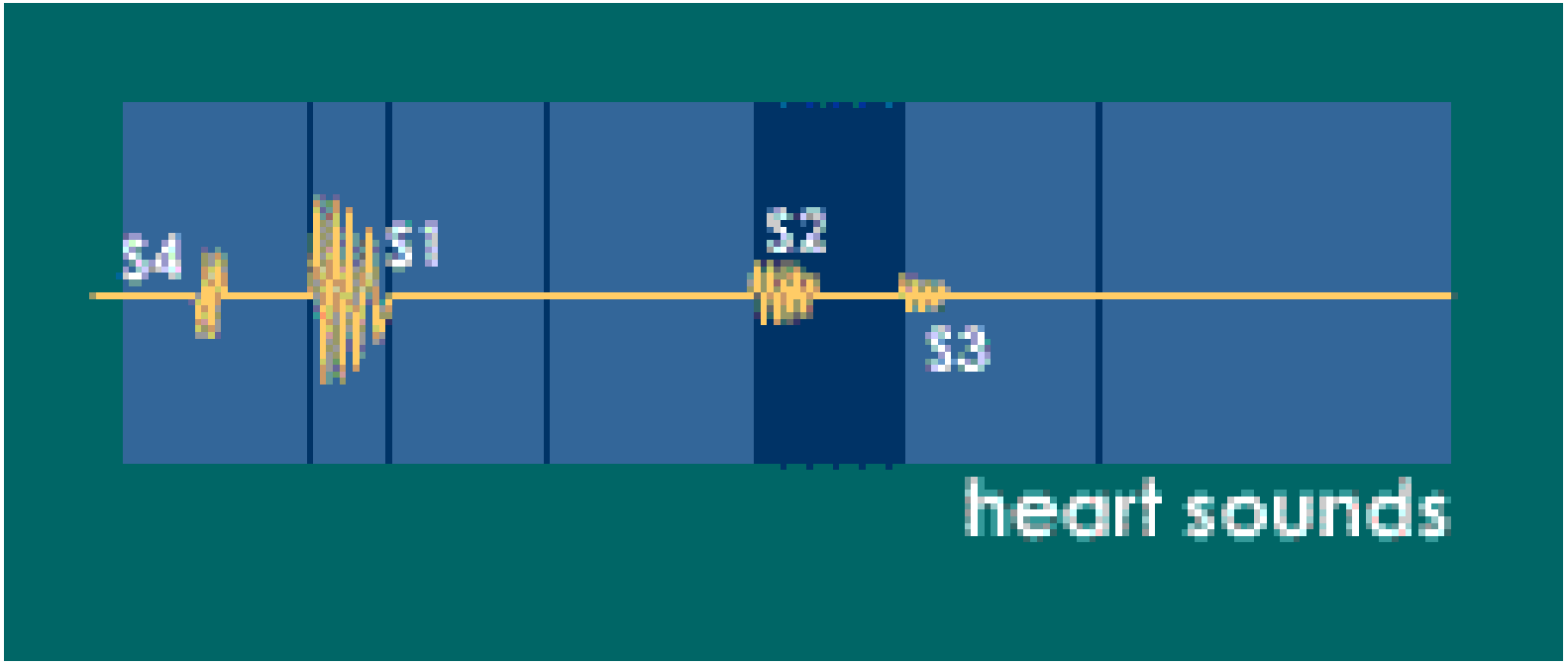
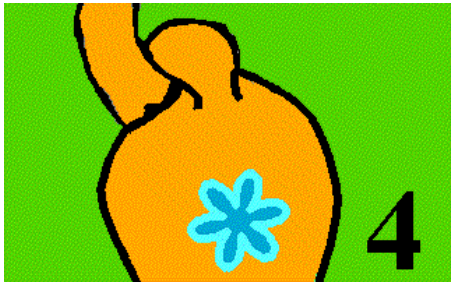
RELAJACIÓN ISOVOLUMETRICA DIASTOLICA
RUIDOS CARDIACOS



- R2 POR CIERRE DE LAS VALVULAS SEMILUNARES .



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