

Il ciclo cardiaco



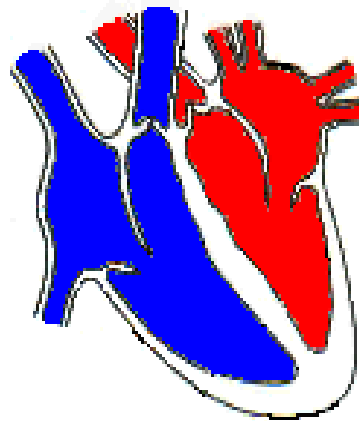
Pompa emodinamica



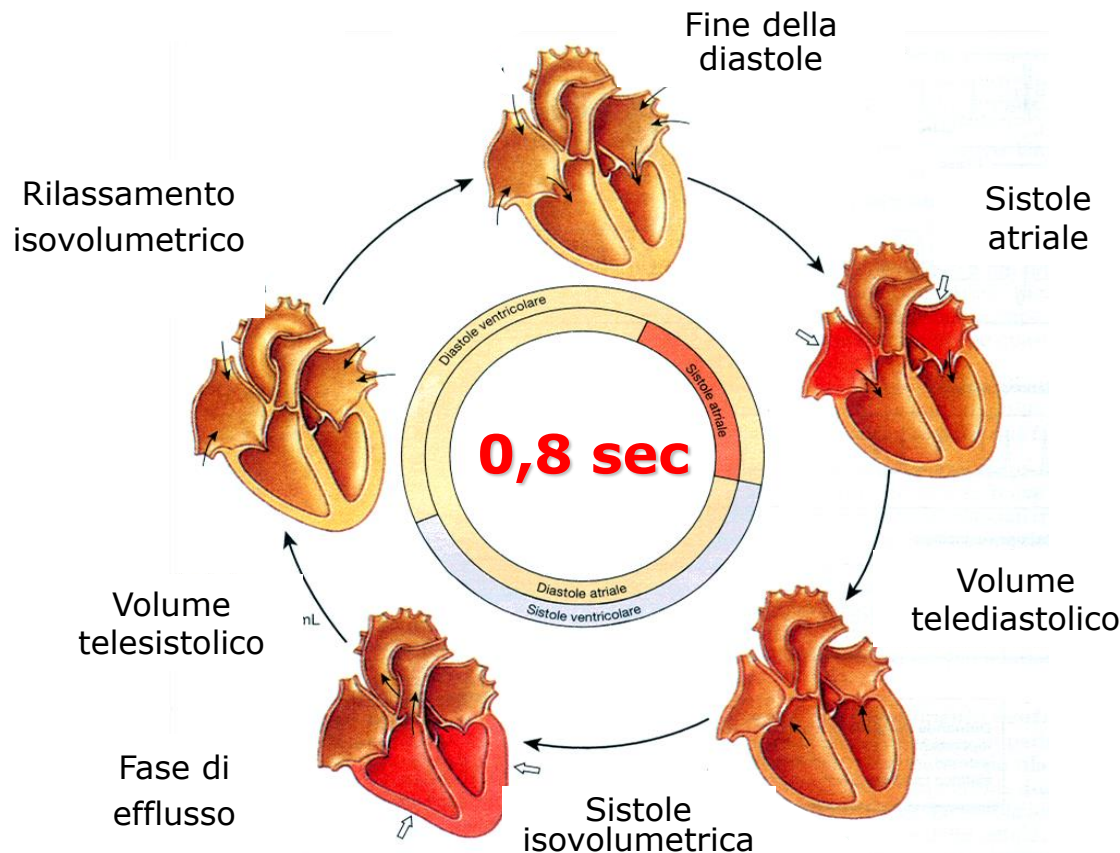
Alternanza di sistole e diastole

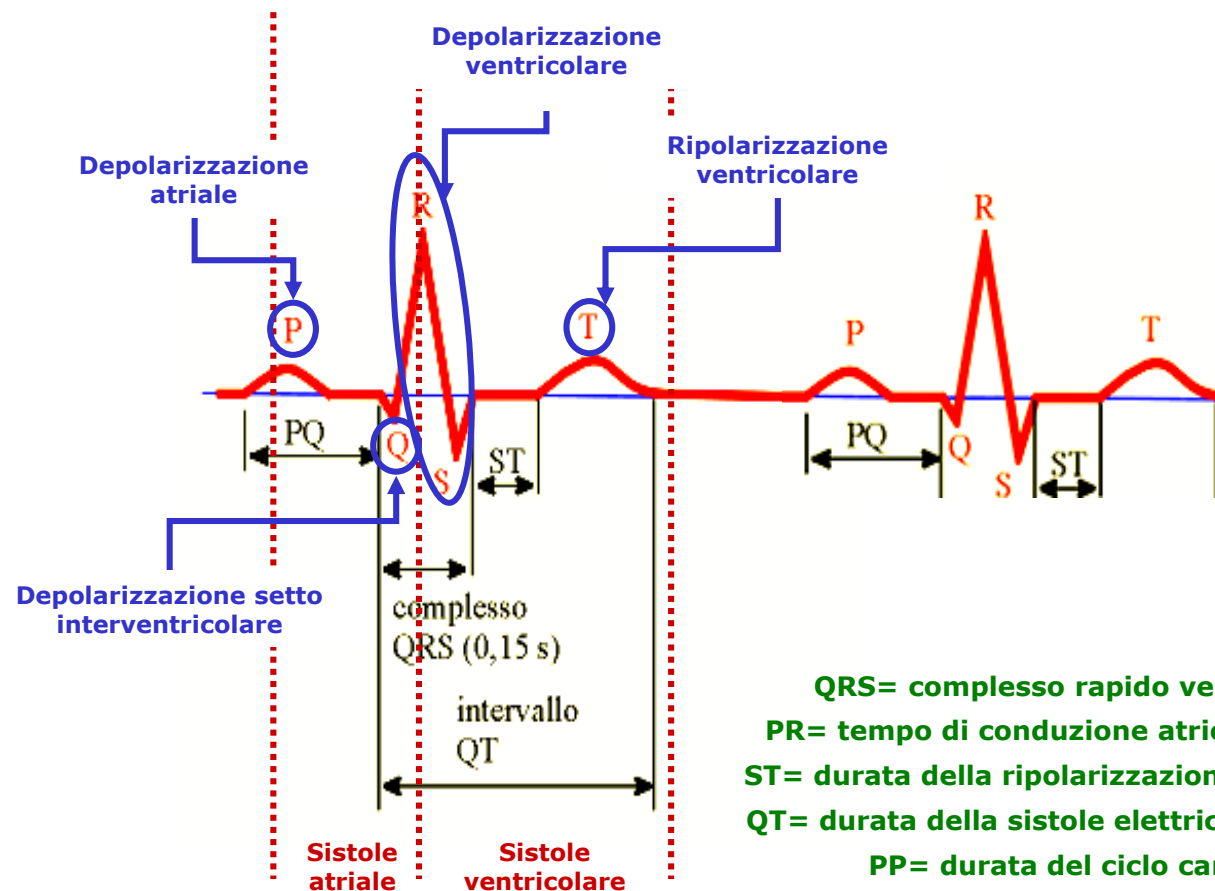
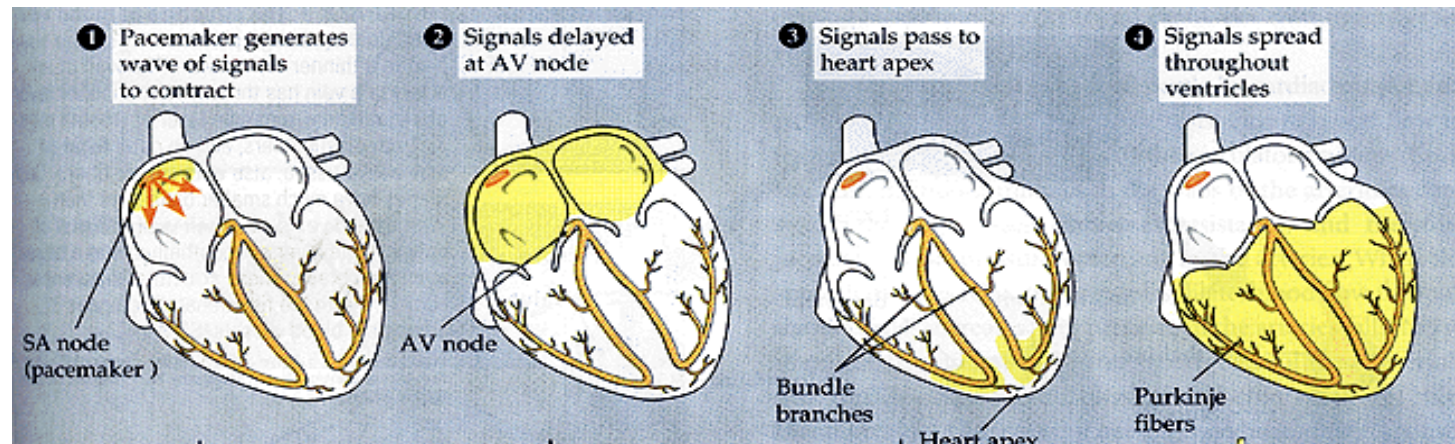


Eventi elettrici



Fasi del ciclo cardiaco dei ventricoli			Durata (sec)
Sistole	sistole isovolumetrica		0,06
	fase di efflusso	con accelerazione	0,13
		con decelerazione	0,16
Protodiastole			0,02
Diastole	rilassamento isovolumetrico		0,05-0,07
	riempimento rapido		0,11-0,12
	riempimento lento o diastasi		0,16-0,23
	sistole atriale		0,10-0,11



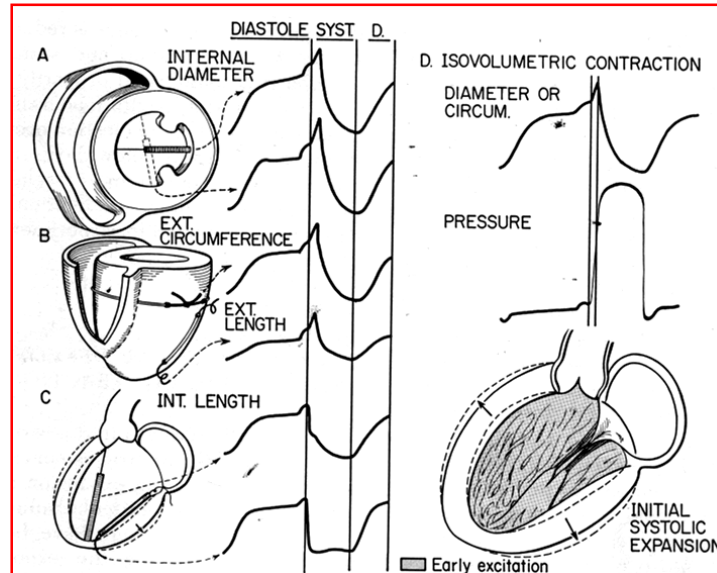
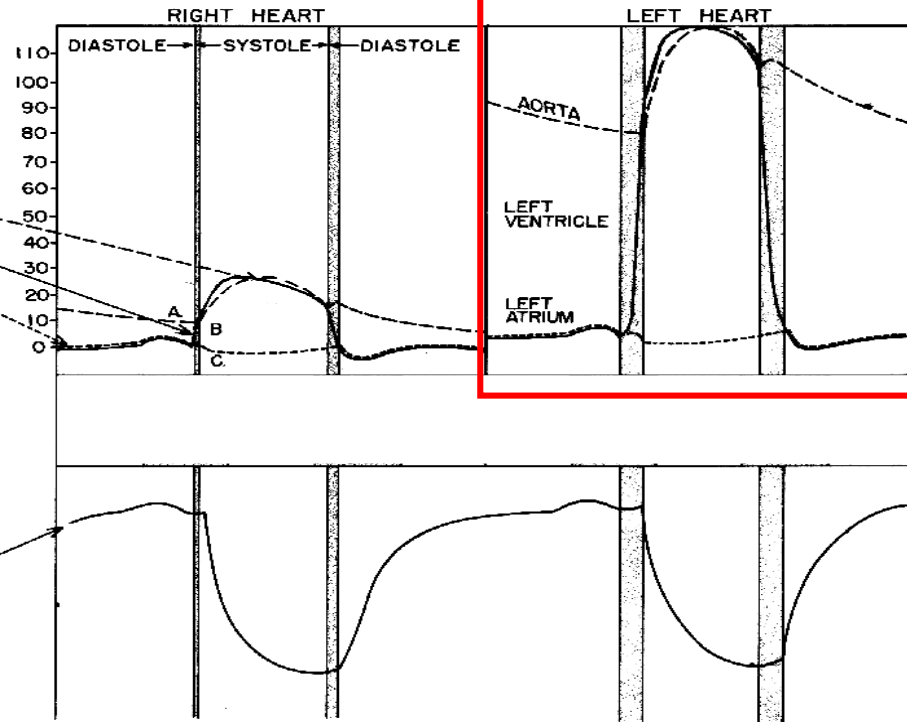


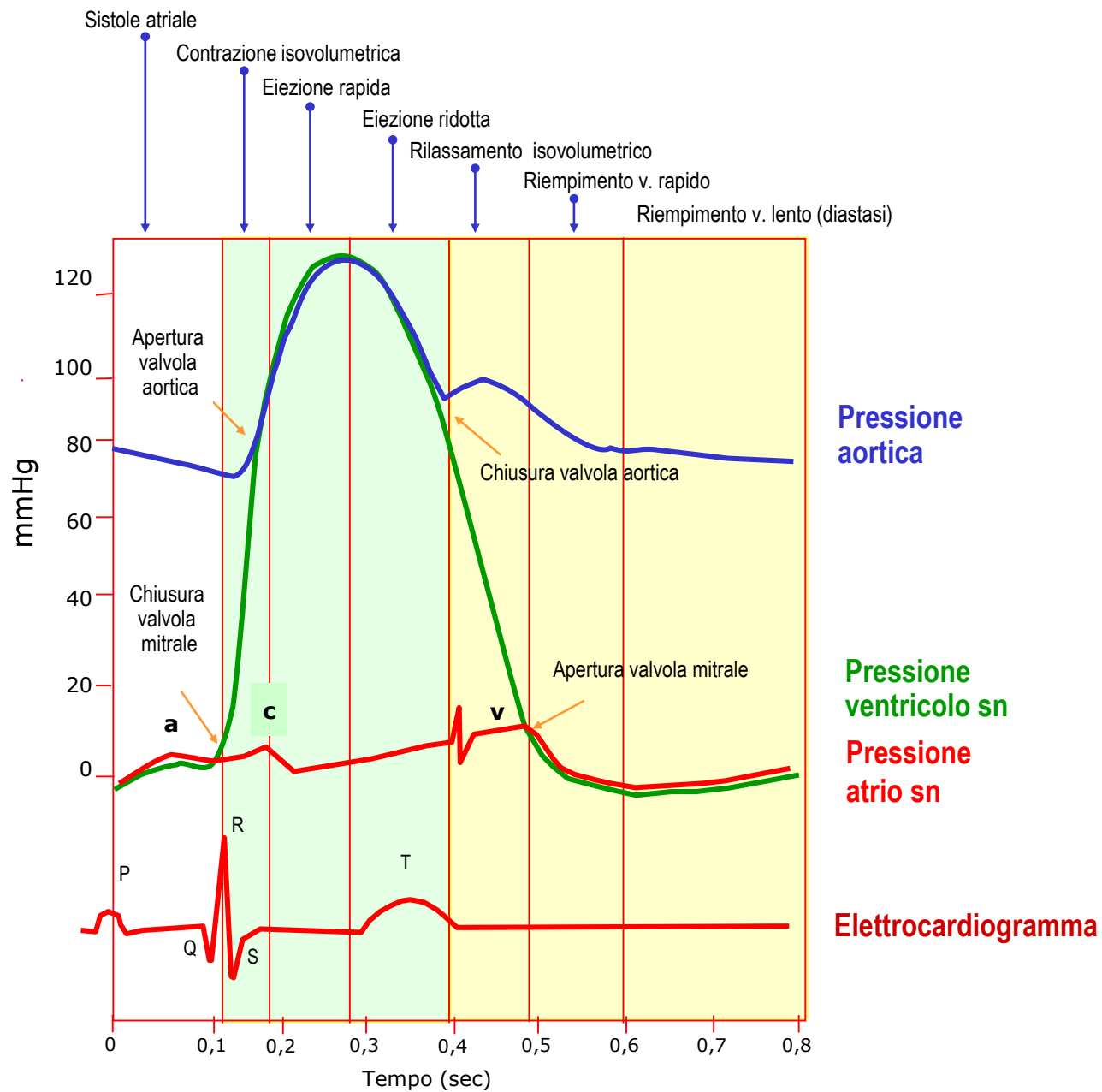
Registrazione delle pressioni (mmHg)
 Arteria polmonare / Arteria aorta (A)
 Ventricolare (B)
 Atriale (C)

Trasduttori

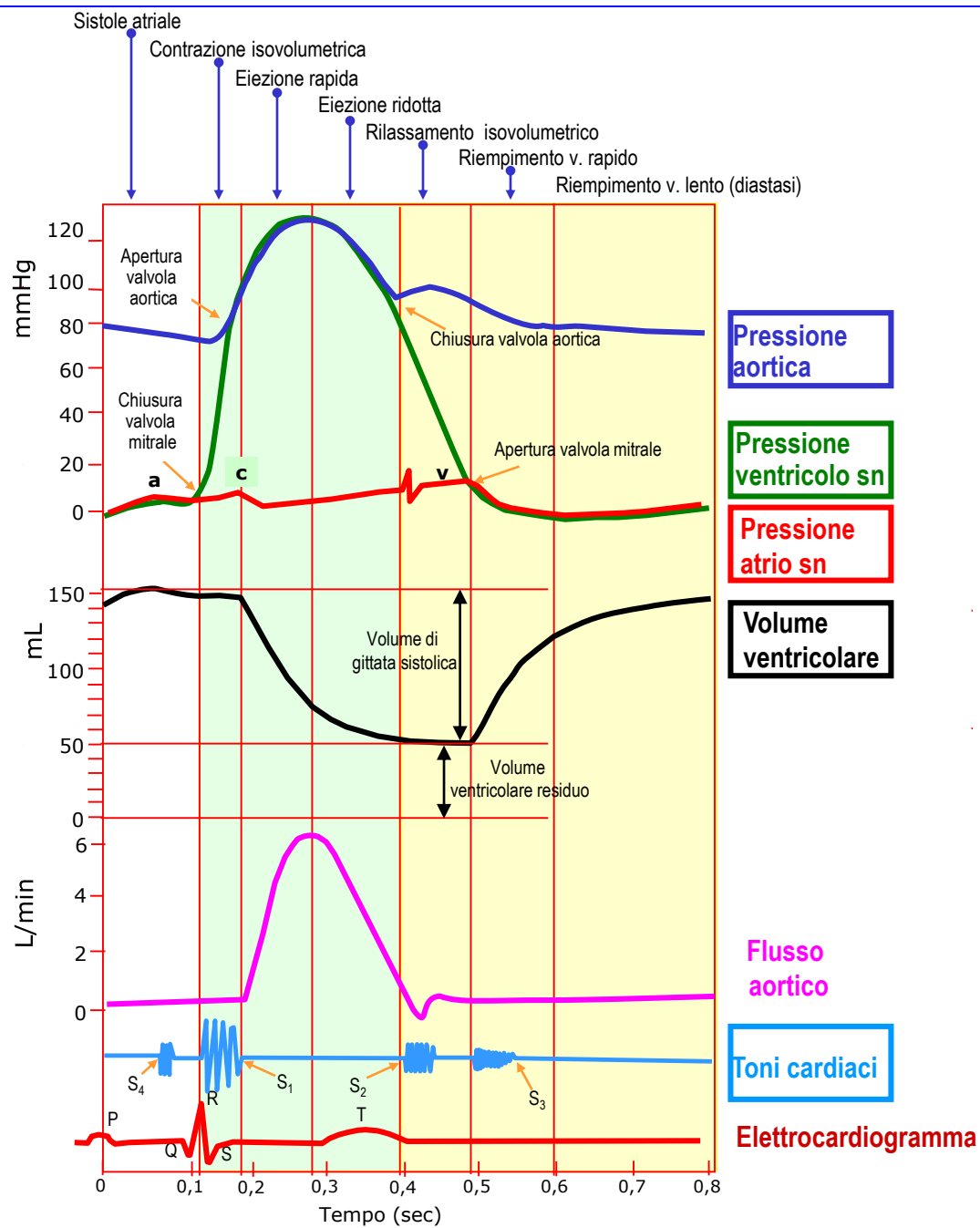
Cardiometro

COMBINED VENTRICULAR
 VOLUME

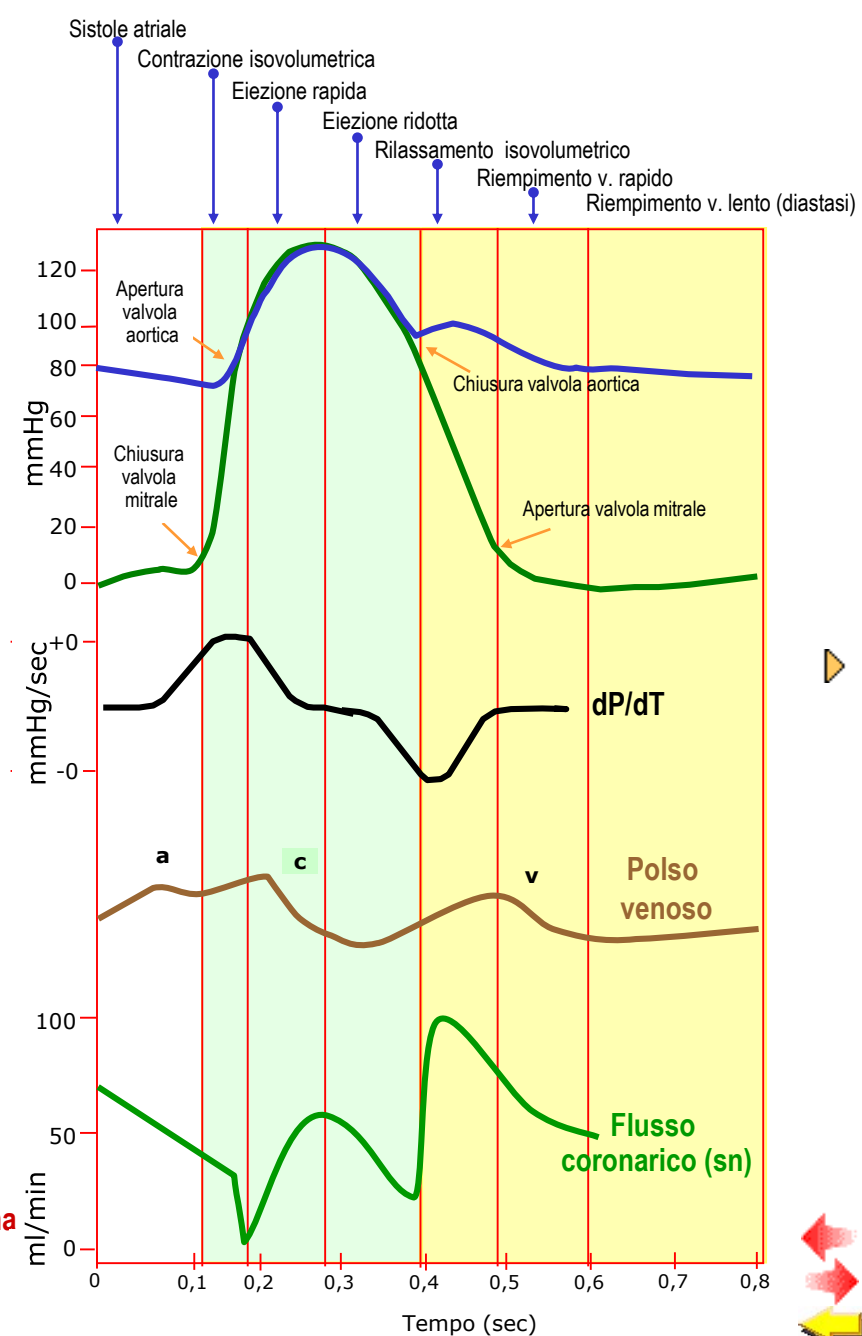


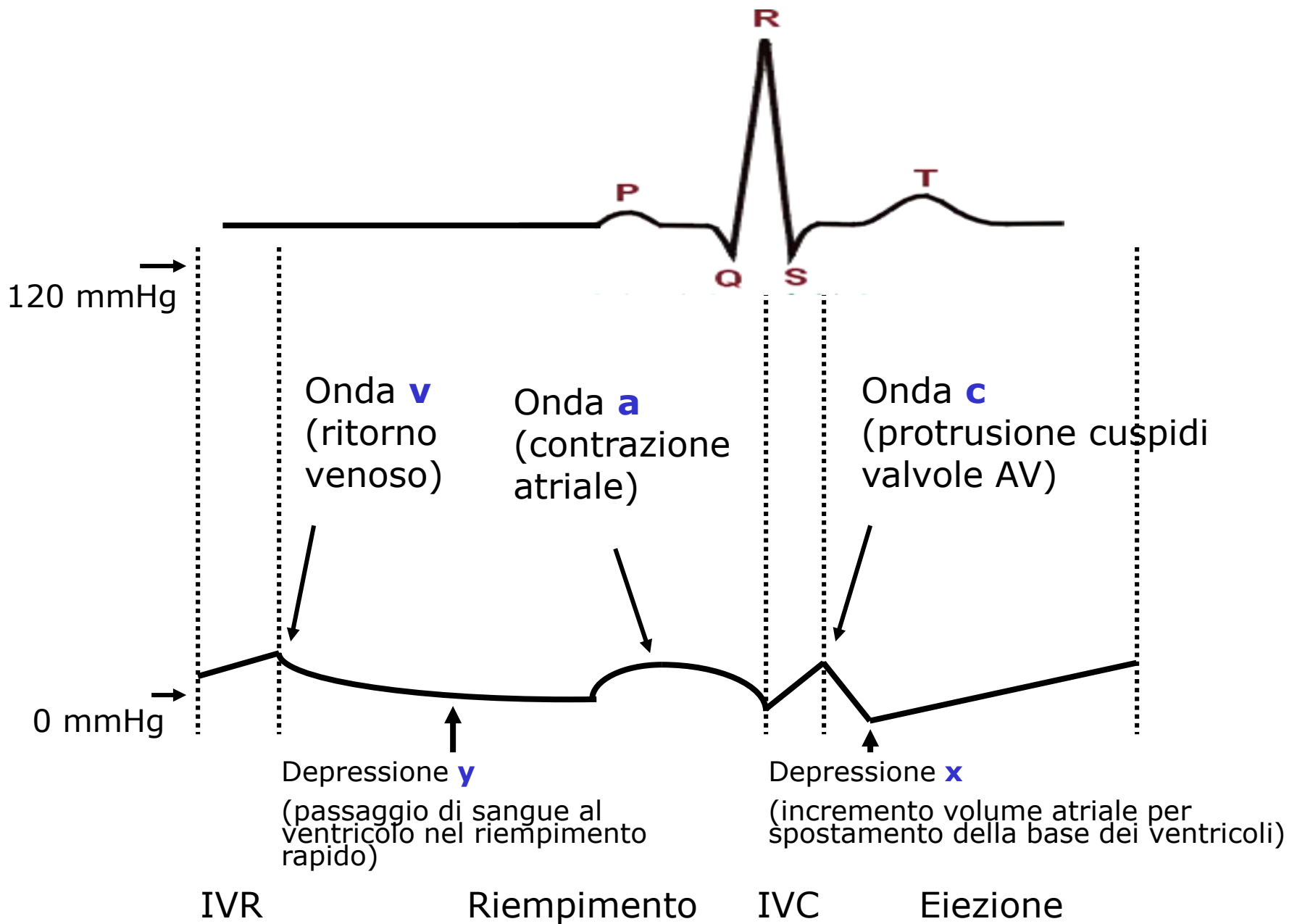


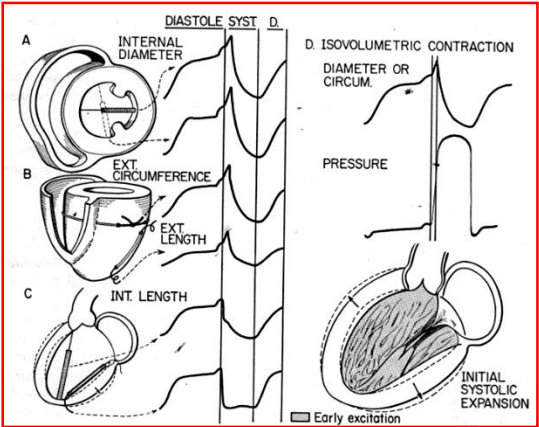
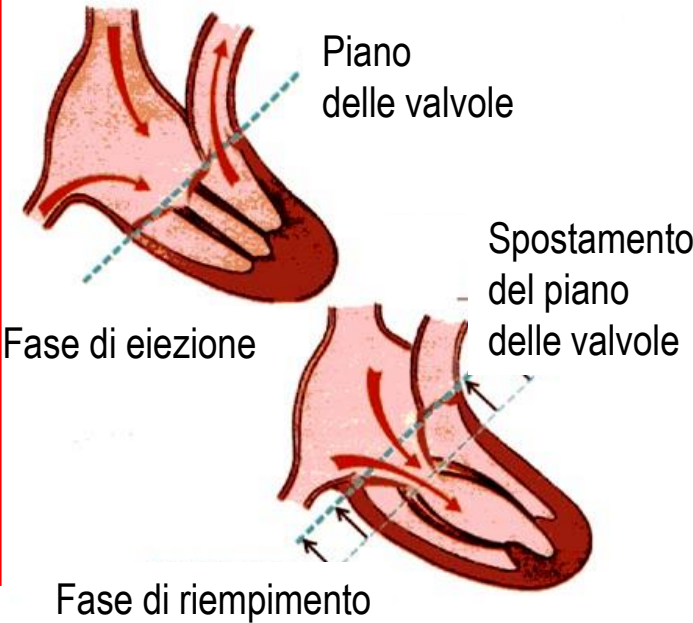
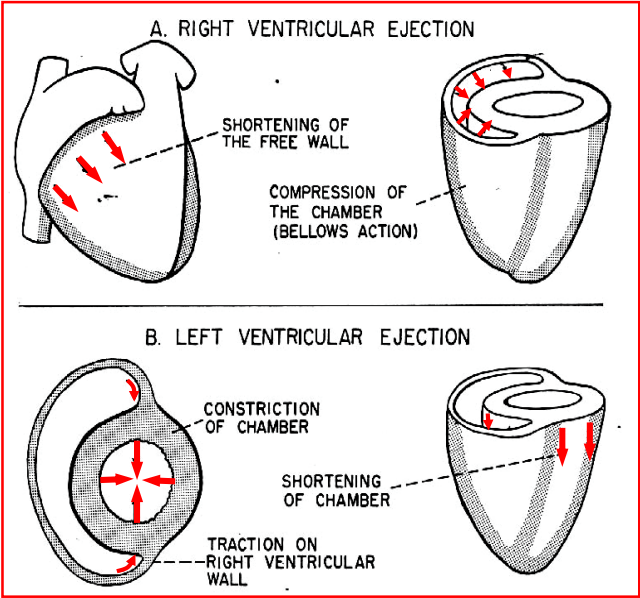
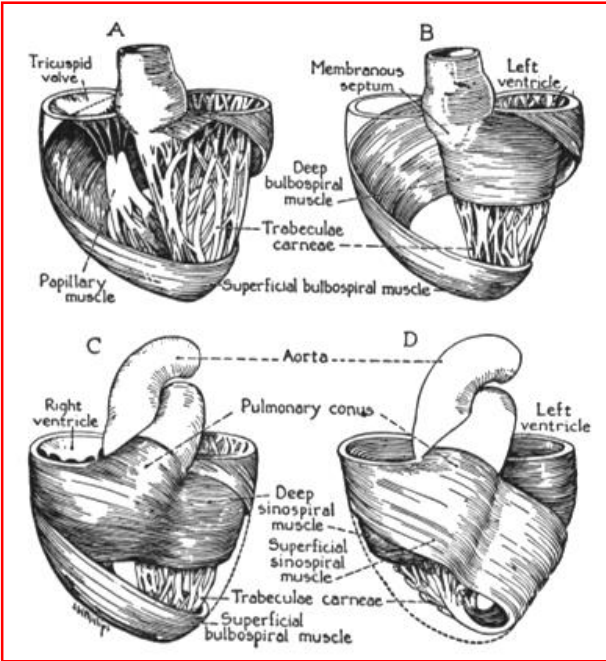
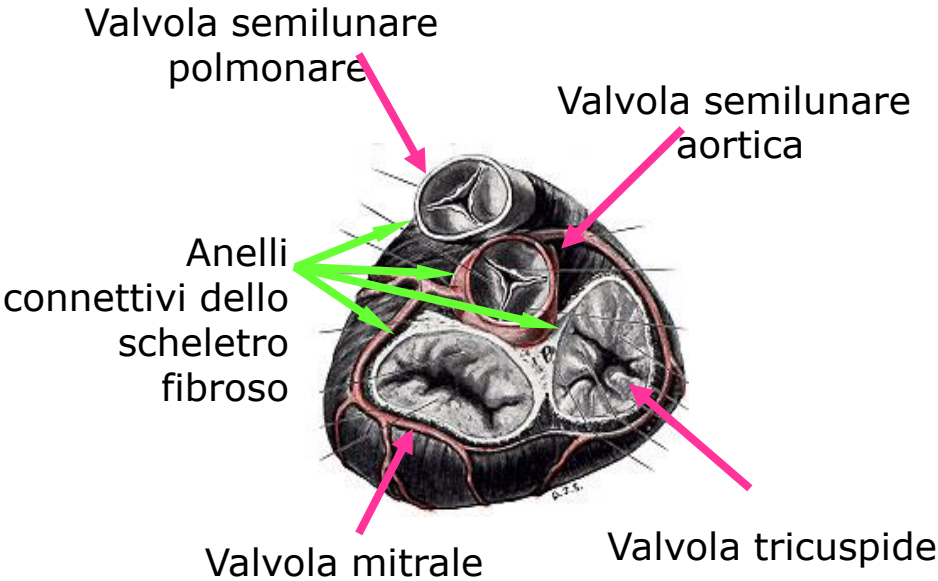
Il ciclo cardiaco

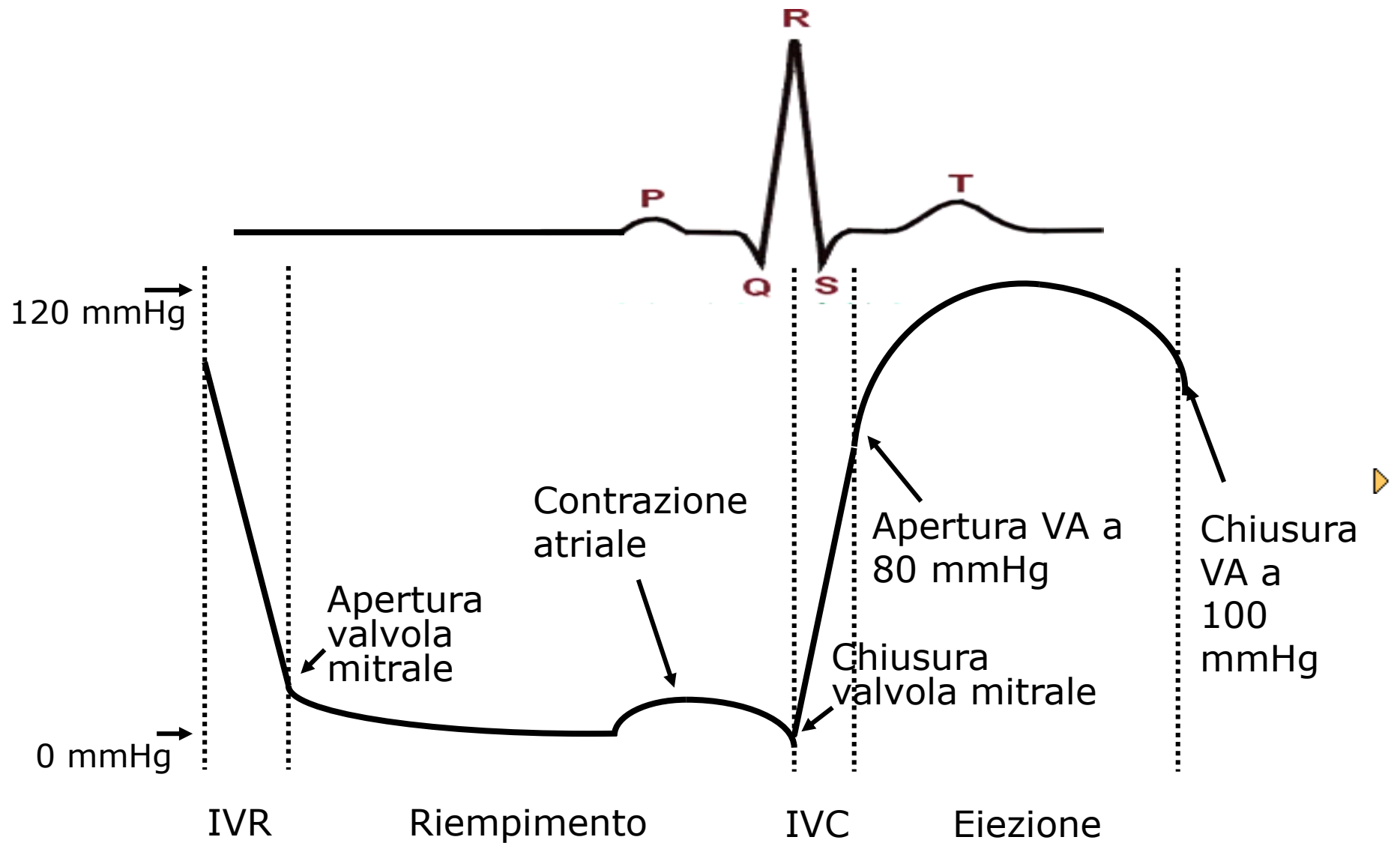


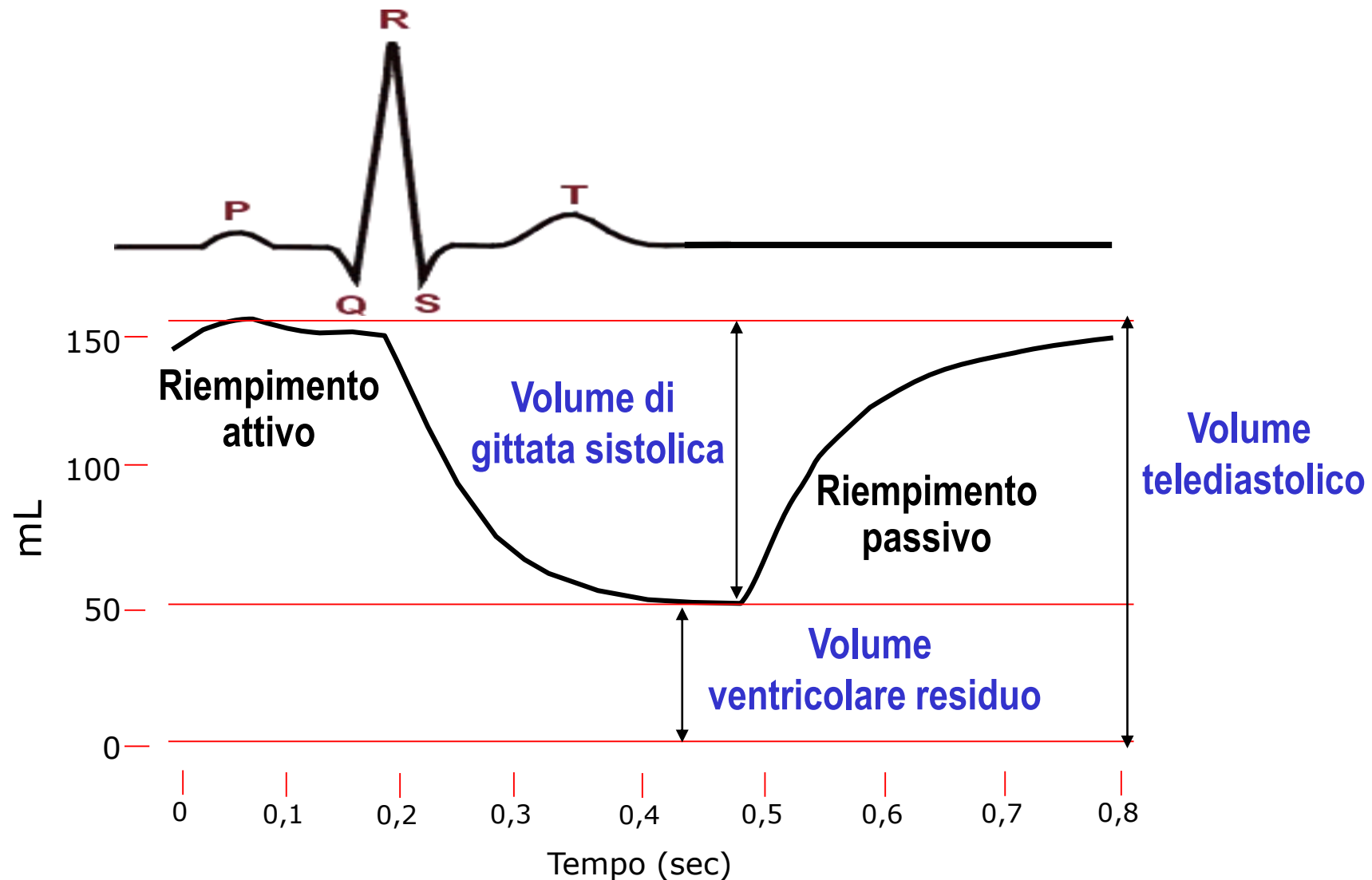
Il diagramma di Wiggers







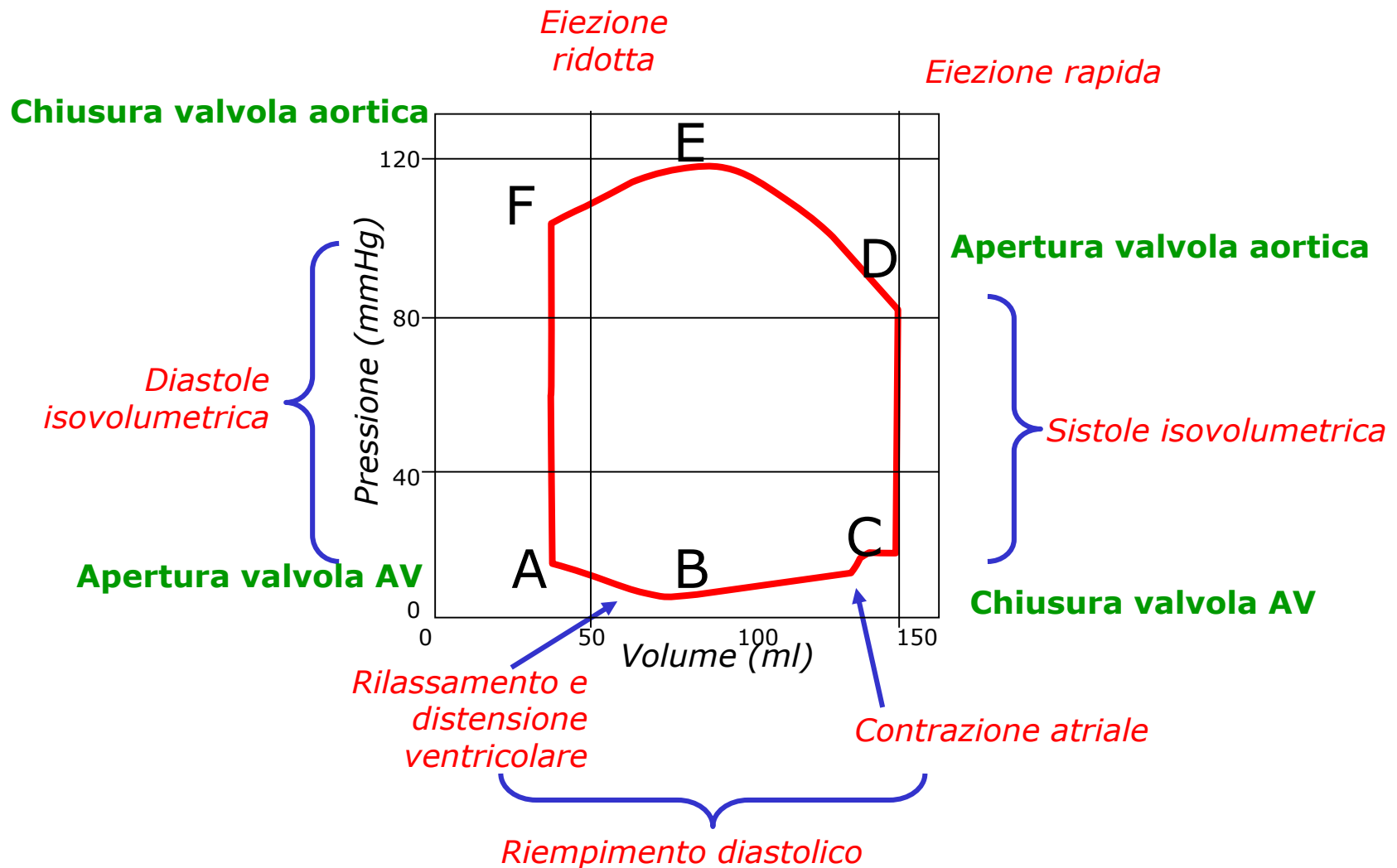




Frazione di eiezione $\approx 0,6 \div 0,75$

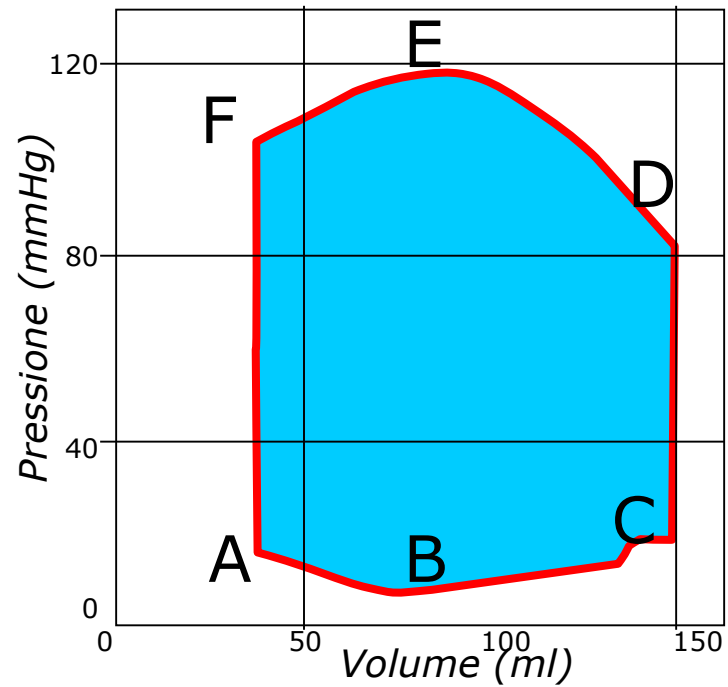
Volume sistolico
Volume telediastolico

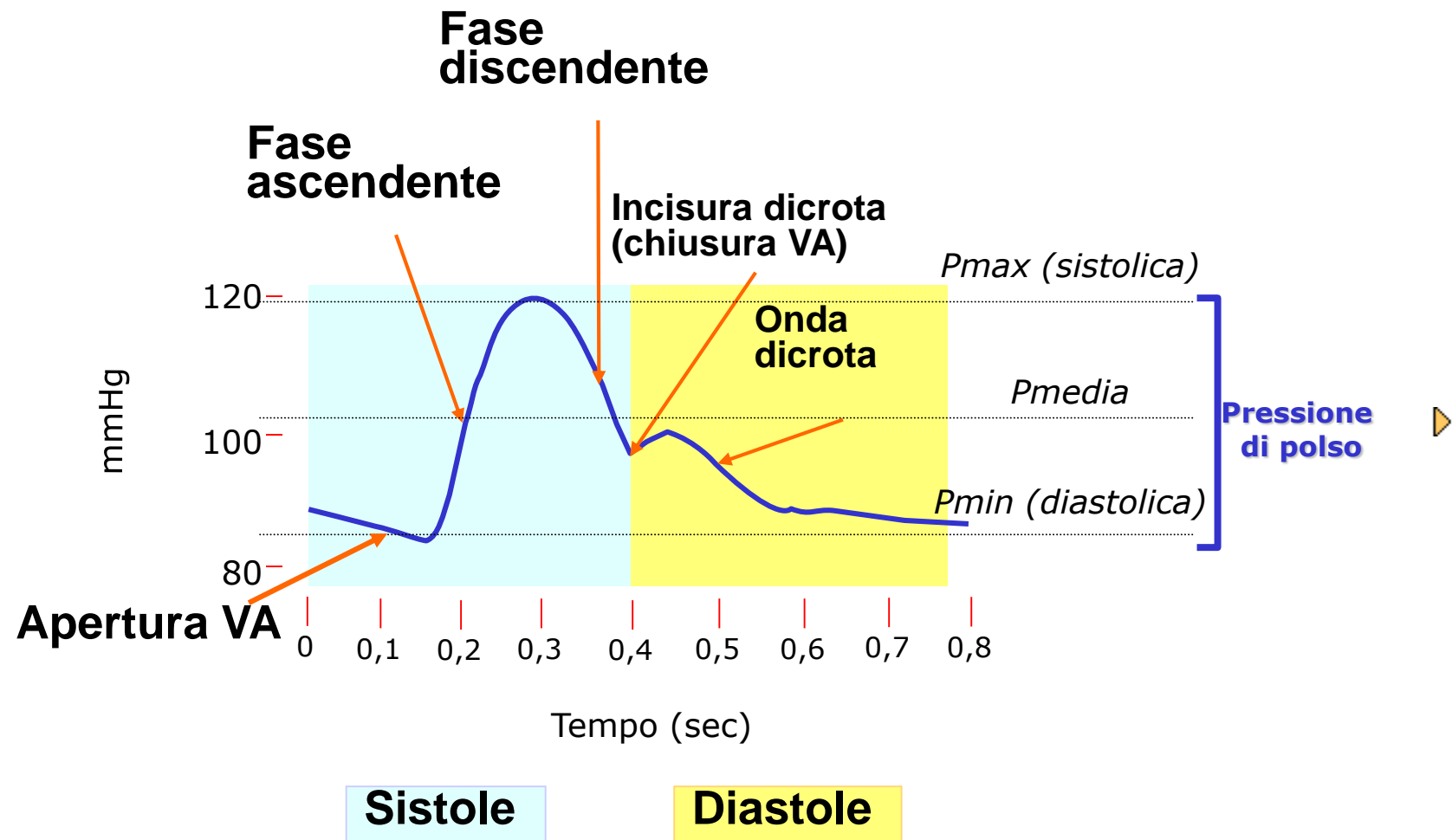




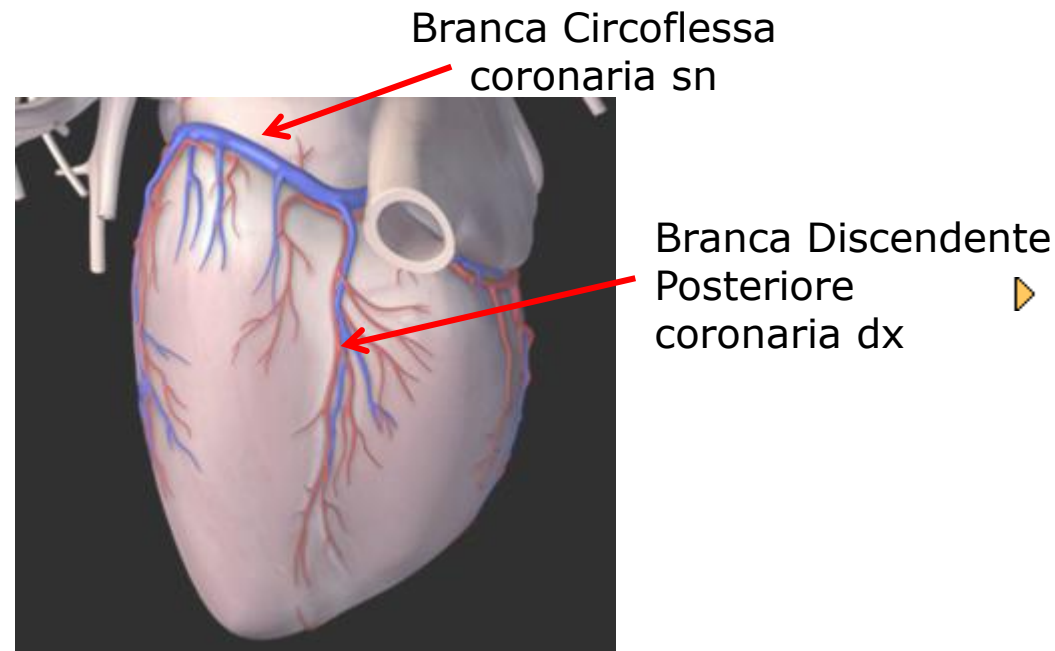
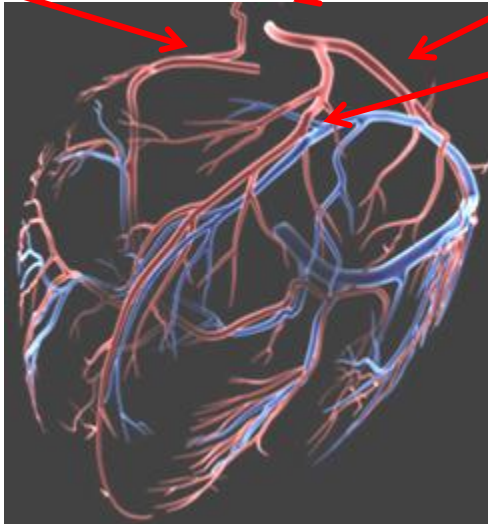
$$L = PV$$

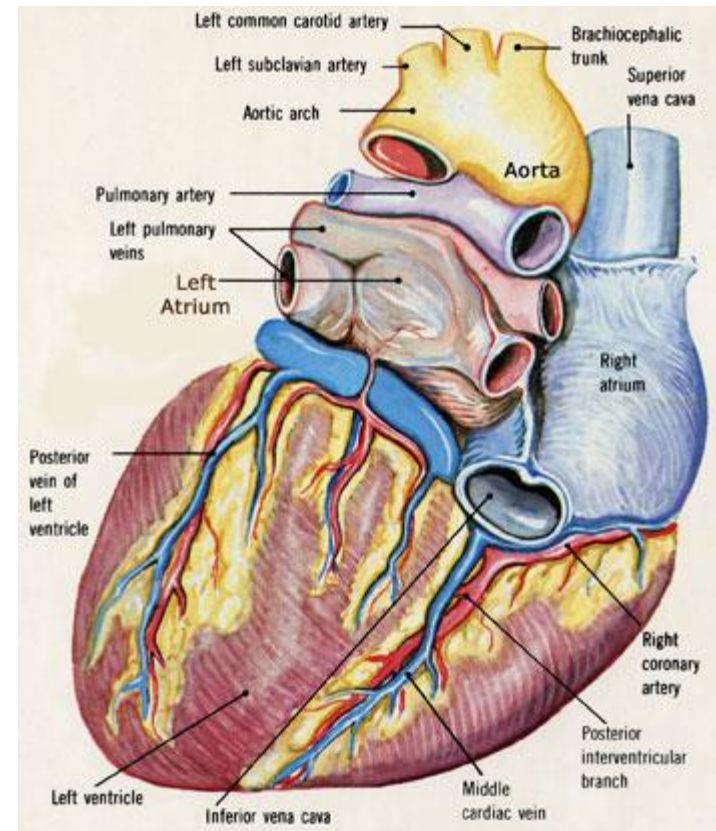
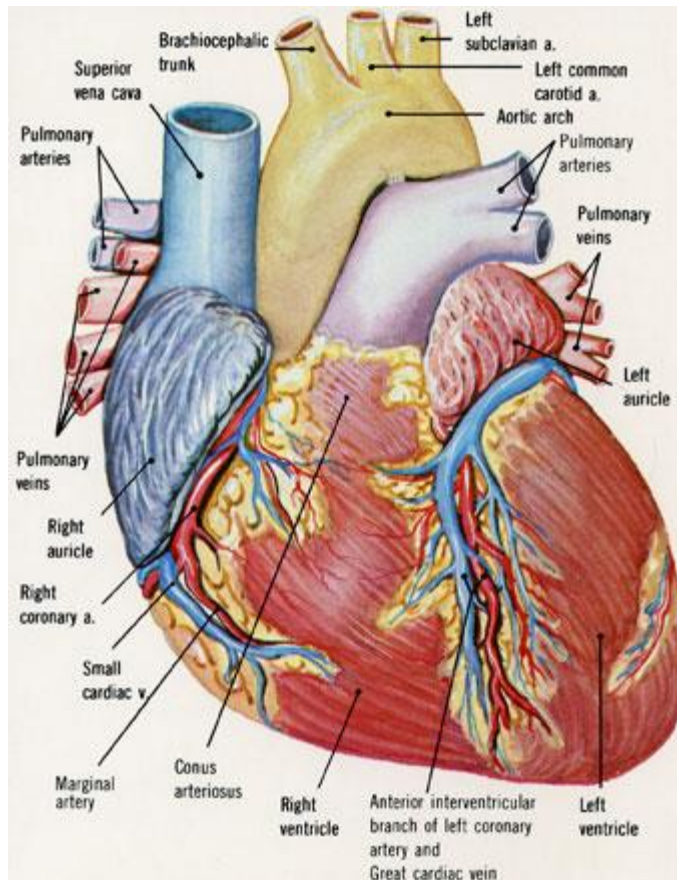
$$L = \int_{t_0}^{t_1} P \bullet dV$$

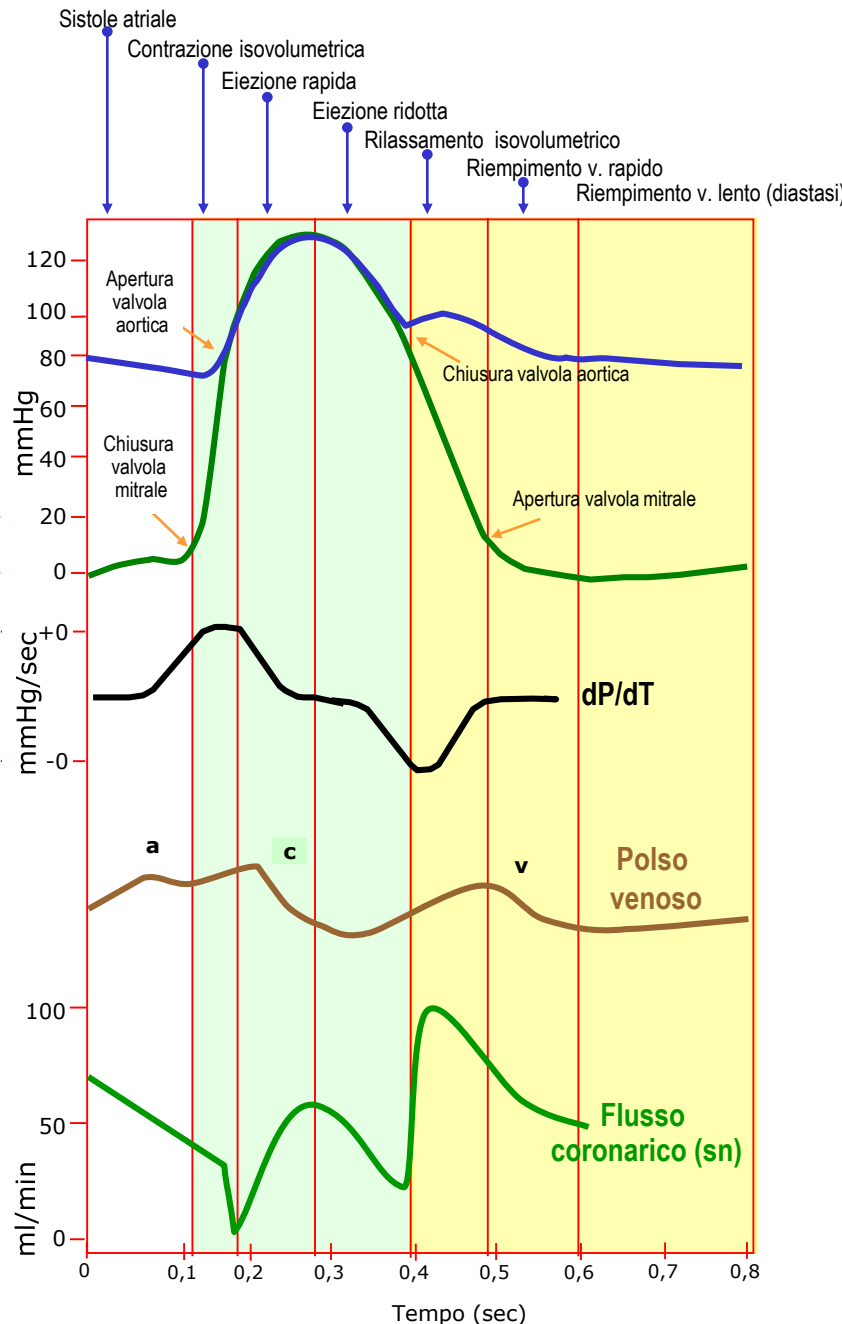




Arteria Coronaria destra
 Arteria Coronaria sinistra
 Branca Circoflessa
 Branca Discendente







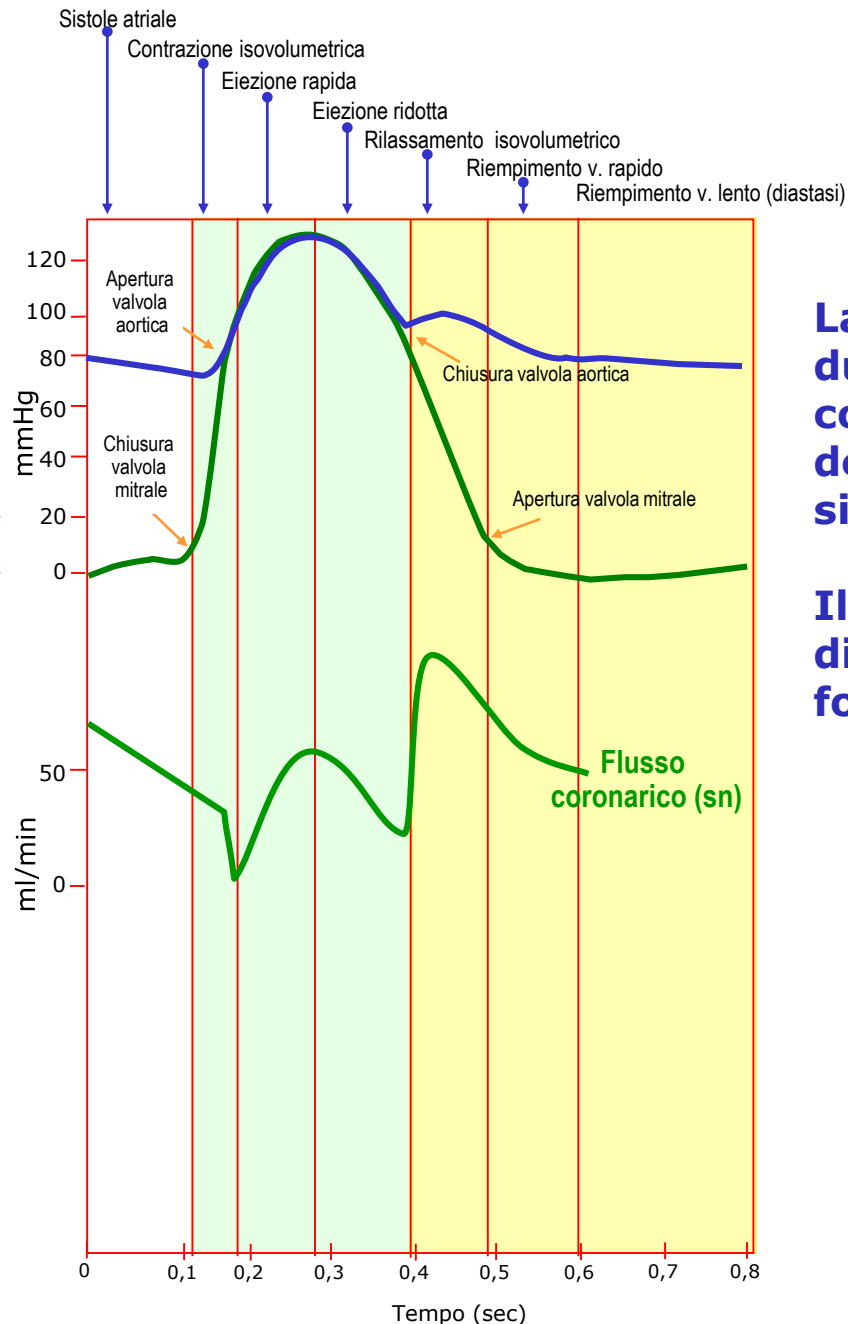
Principale fattore della perfusione coronarica: pressione arteria aorta

Principale meccanismo di regolazione del flusso aortico: variazione resistenza arteriolare dovuta all'aumento del metabolismo del cuore

La spremitura miocardica (forze extravasali) regola la perfusione aortica

Pressione ventricolare maggiore nell'endocardio che nell'epicario

Perfusione coronarica uguale in quanto durante la diastole vi è un maggior flusso nell'endocardio



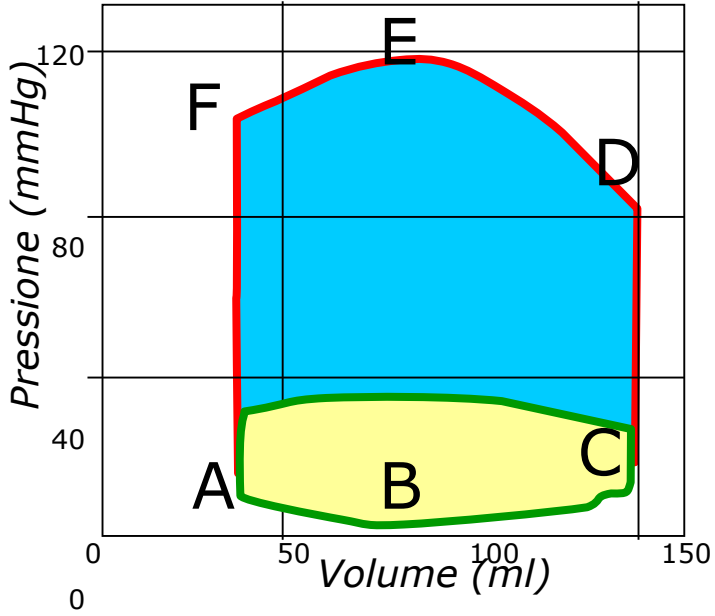
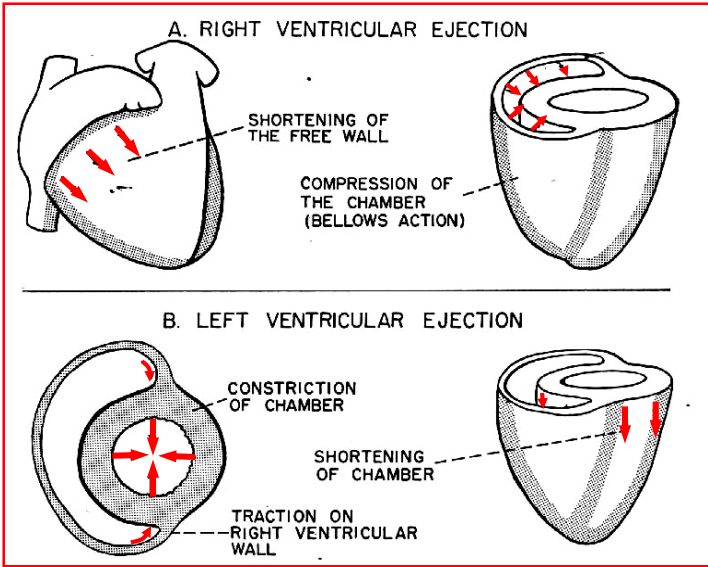
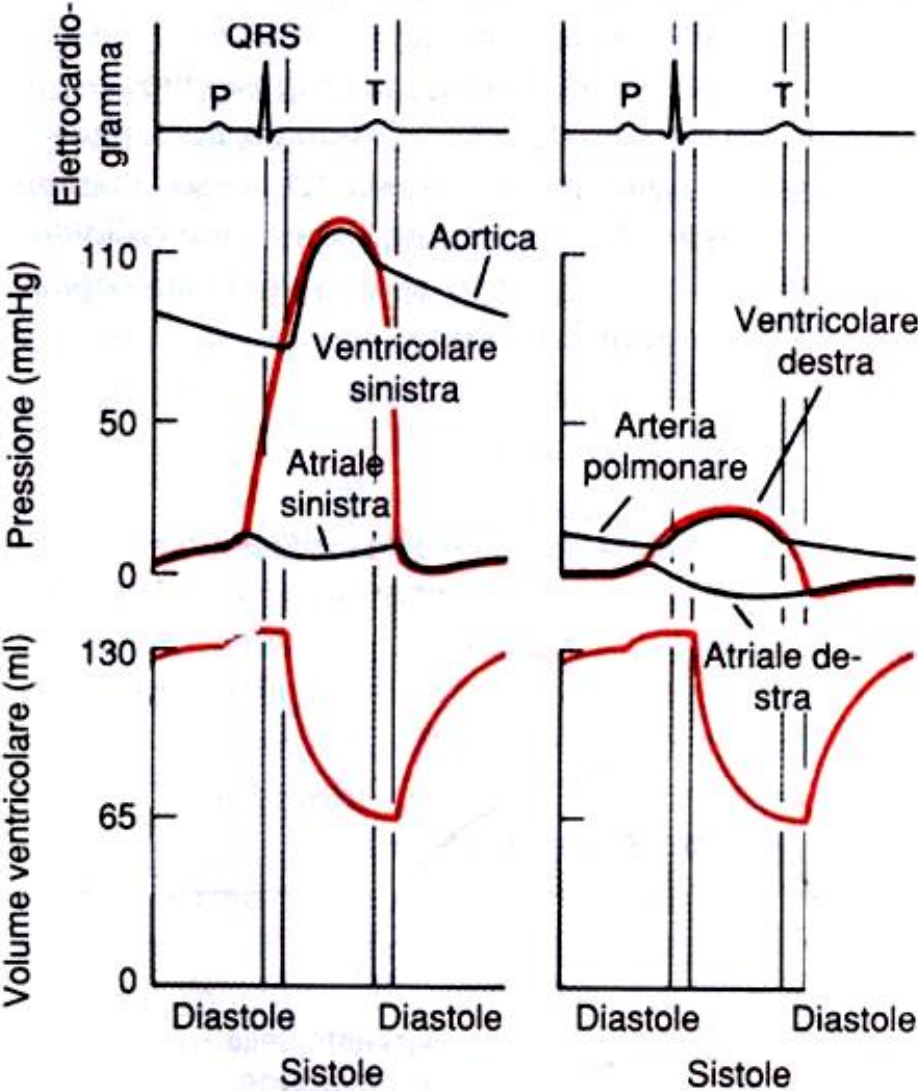
La compressione extravascolare durante la prima fase della sistole è così forte che il flusso coronarico delle grandi arterie del ventricolo sinistro si inverte.

Il massimo flusso si ha durante la diastole ventricolare quando le forze extravasali sono pari a zero

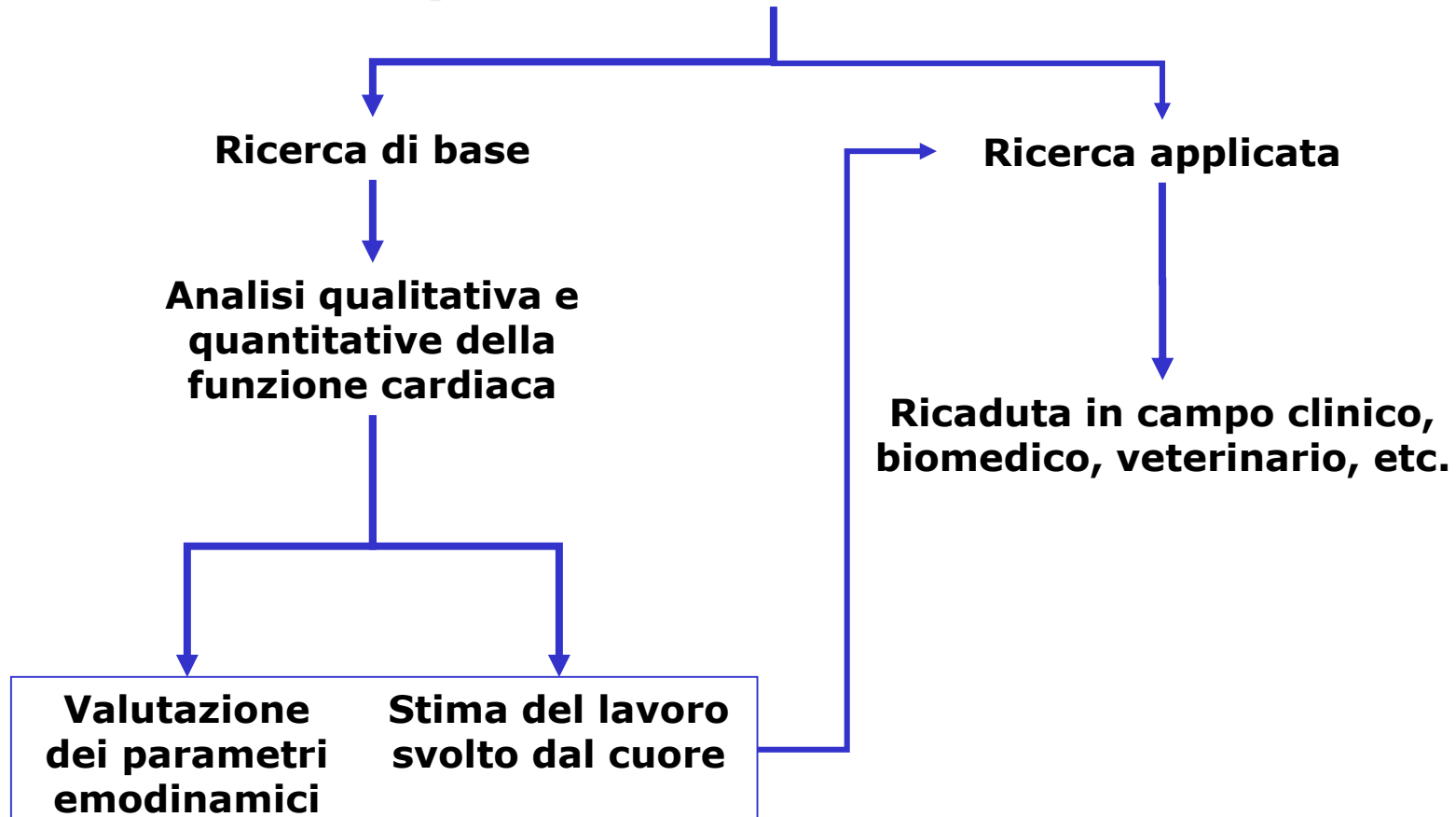


Parte sinistra del cuore

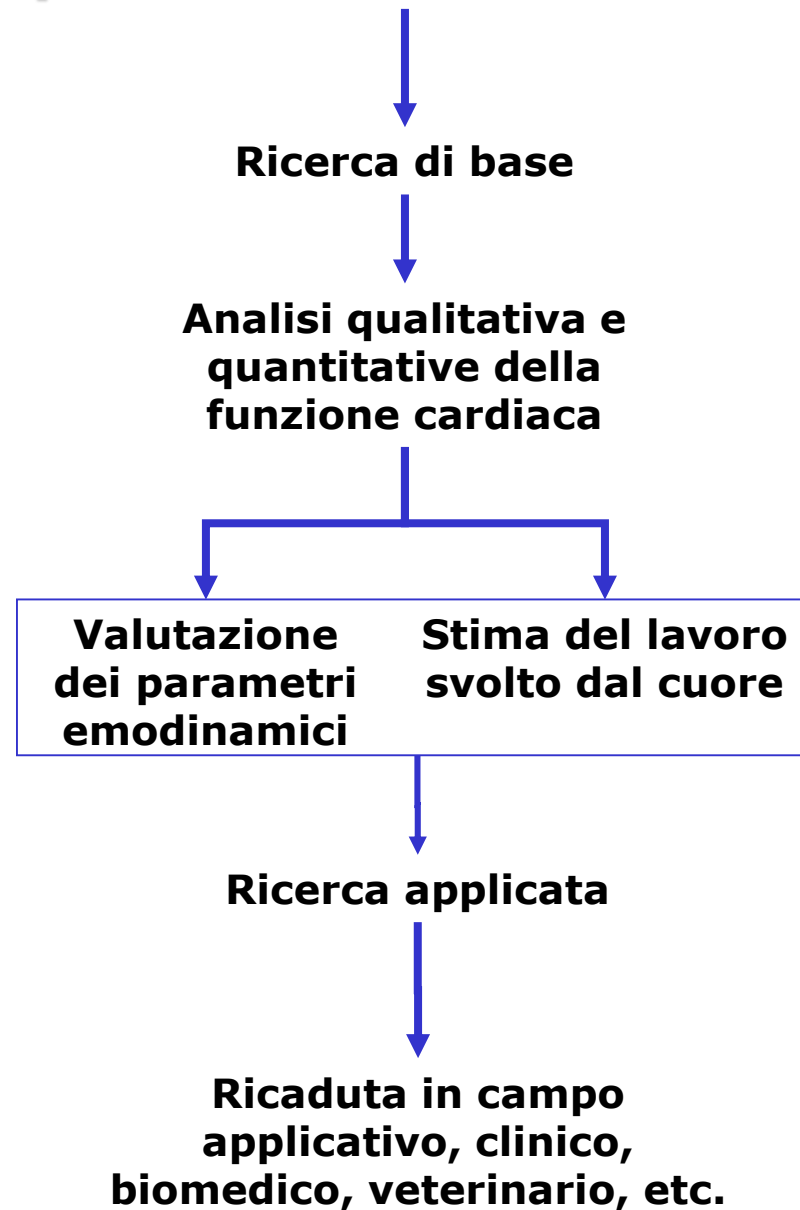
Parte destra del cuore



Importanza del ciclo cardiaco

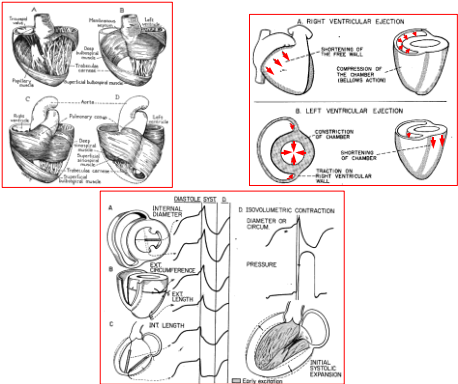


Importanza del ciclo cardiaco

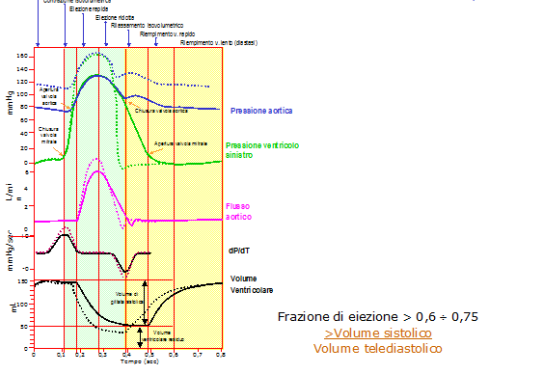


Il ciclo cardiaco

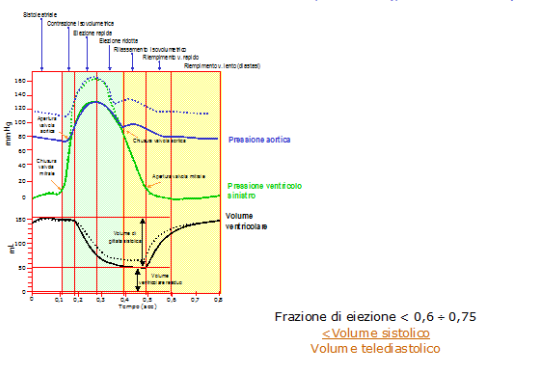
Il ciclo cardiaco Geometria della contrazione ventricolare



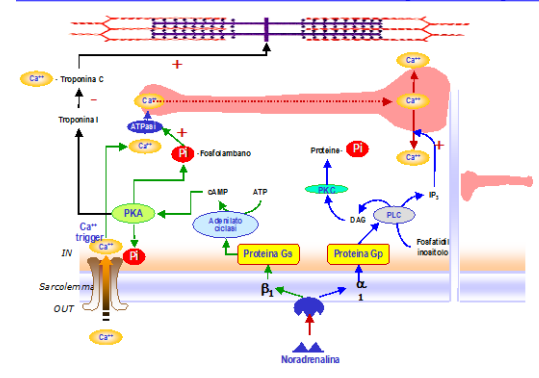
Il ciclo cardiaco Variazioni del ciclo cardiaco: effetto della stimolazione simpatica



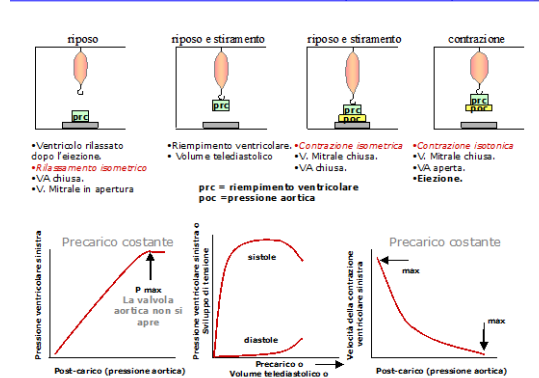
Il ciclo cardiaco Variazioni del ciclo cardiaco: effetto dell'incremento del postcarico (pressione aortica)



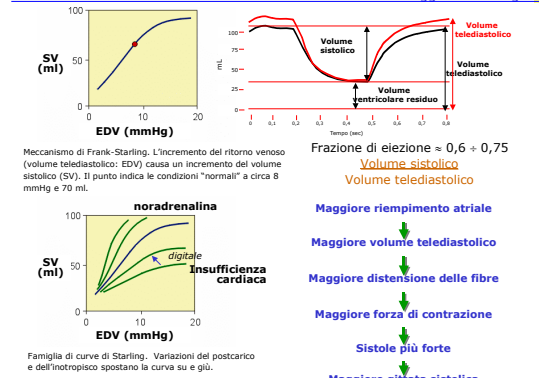
Il ciclo cardiaco Trasduzione segnale adrenergico



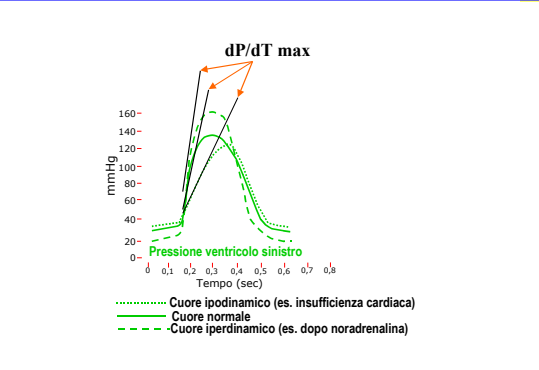
Il ciclo cardiaco Effetto del precarico e del postcarico

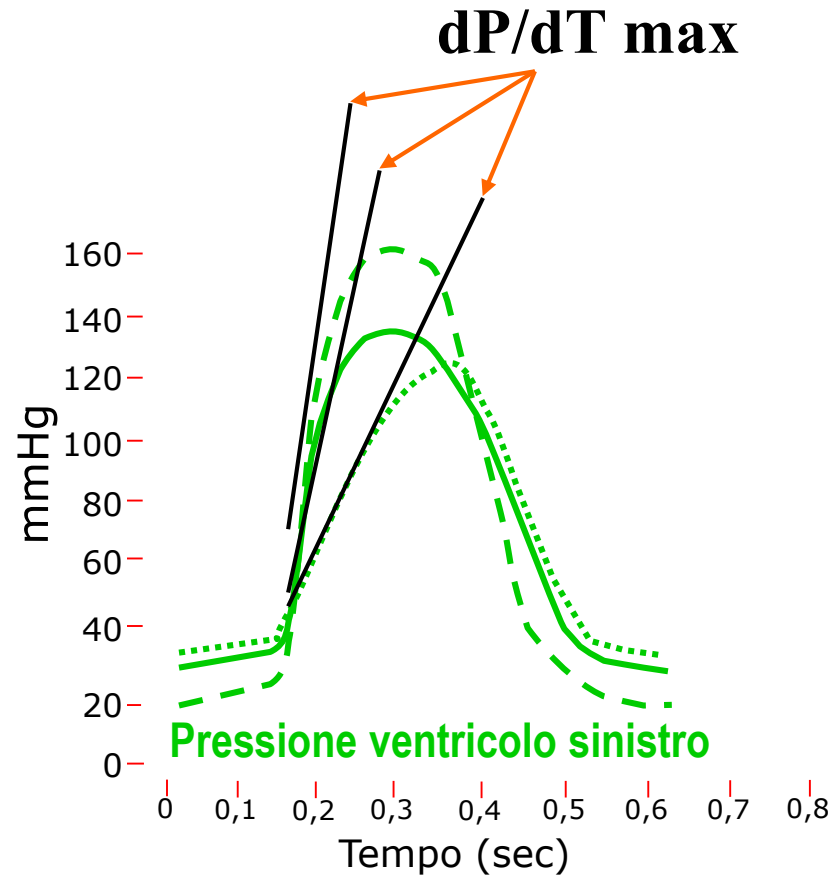


Il ciclo cardiaco Legge di Starling



Il ciclo cardiaco Velocità di contrazione





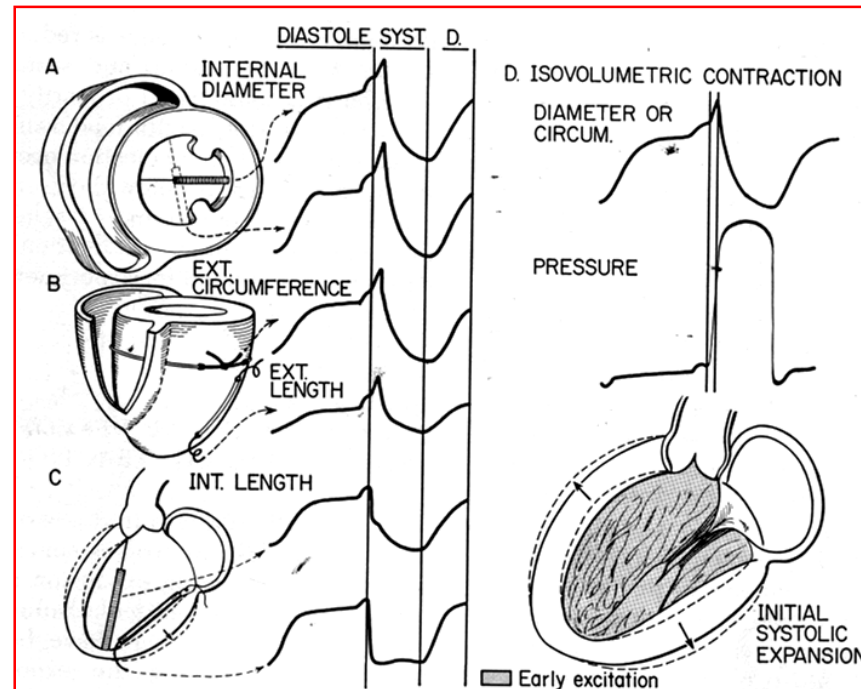
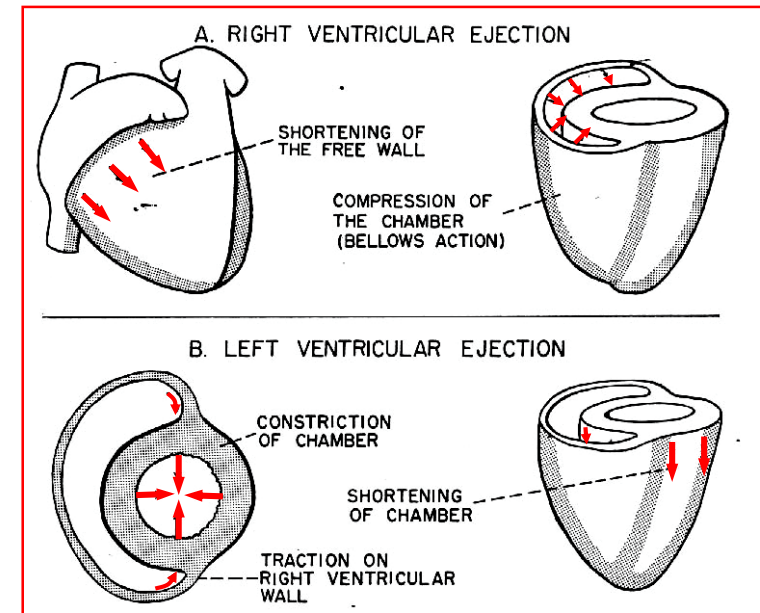
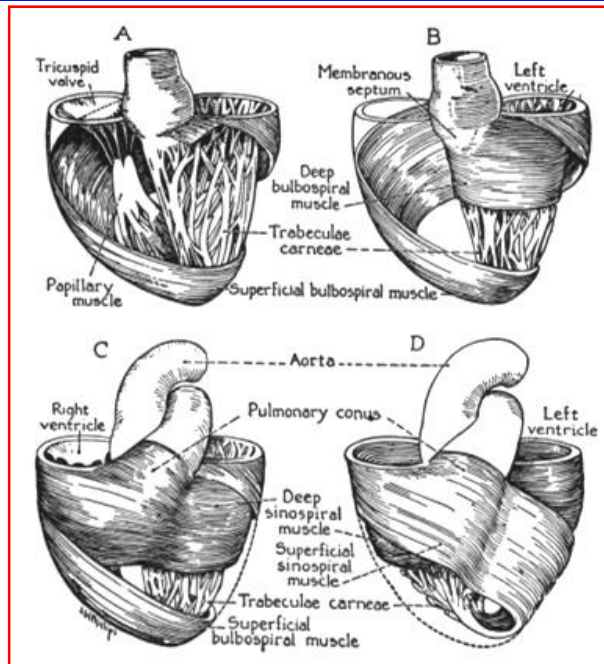
- Cuore ipodinamico (es. insufficienza cardiaca)
- Cuore normale
- - - - - Cuore iperdinamico (es. dopo noradrenalina)

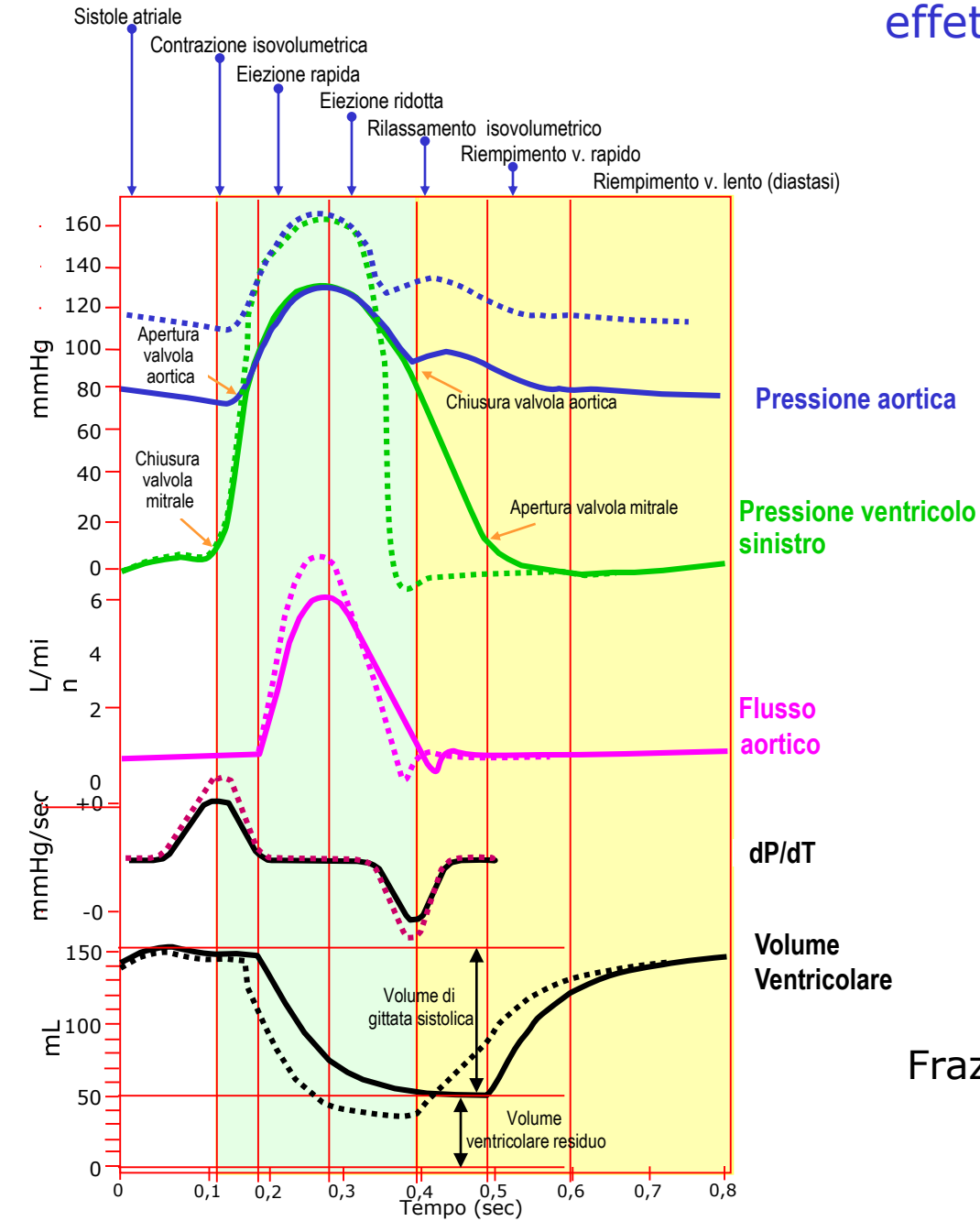


Determinanti del riempimento ventricolare

- *Differenza pressoria atrio-ventricolare*
 - *Ritorno venoso*
 - *Compliance ventricolare*
 - *Frequenza*
 - *Contrattilità atriale*
- *Meccanismo del piano delle valvole*

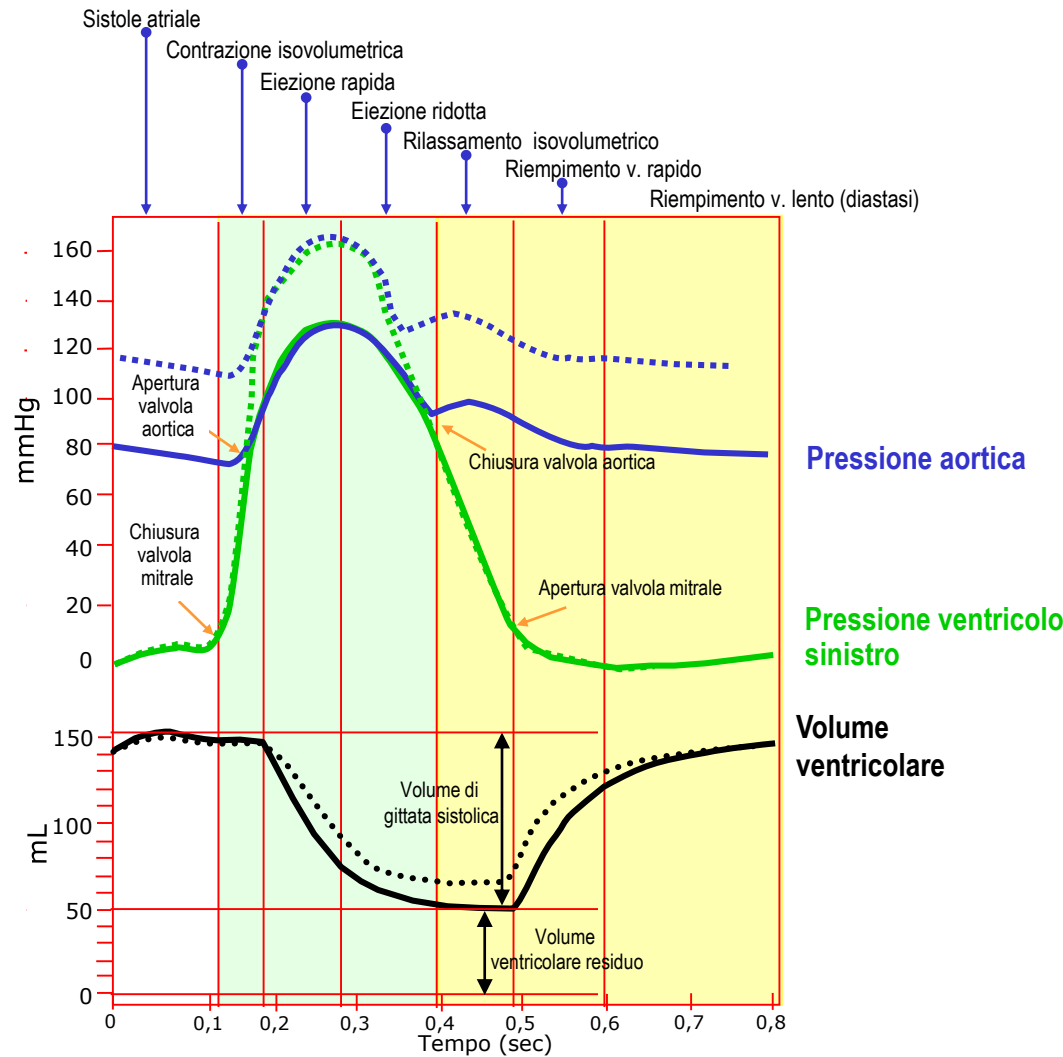






Frazione di eiezione $> 0,6 \div 0,75$
 $> \frac{\text{Volume sistolico}}{\text{Volume telediastolico}}$

effetto dell'incremento del postcarico (pressione aortica)



Frazione di eiezione $< 0,6 \div 0,75$

$\frac{\text{Volume sistolico}}{\text{Volume telediastolico}}$