

# POLYGRAPHY

Evaluation of systolic time intervals

**POLYGRAPHY** – simultaneous recording of several physiological parameters using various non-invasive or invasive methods

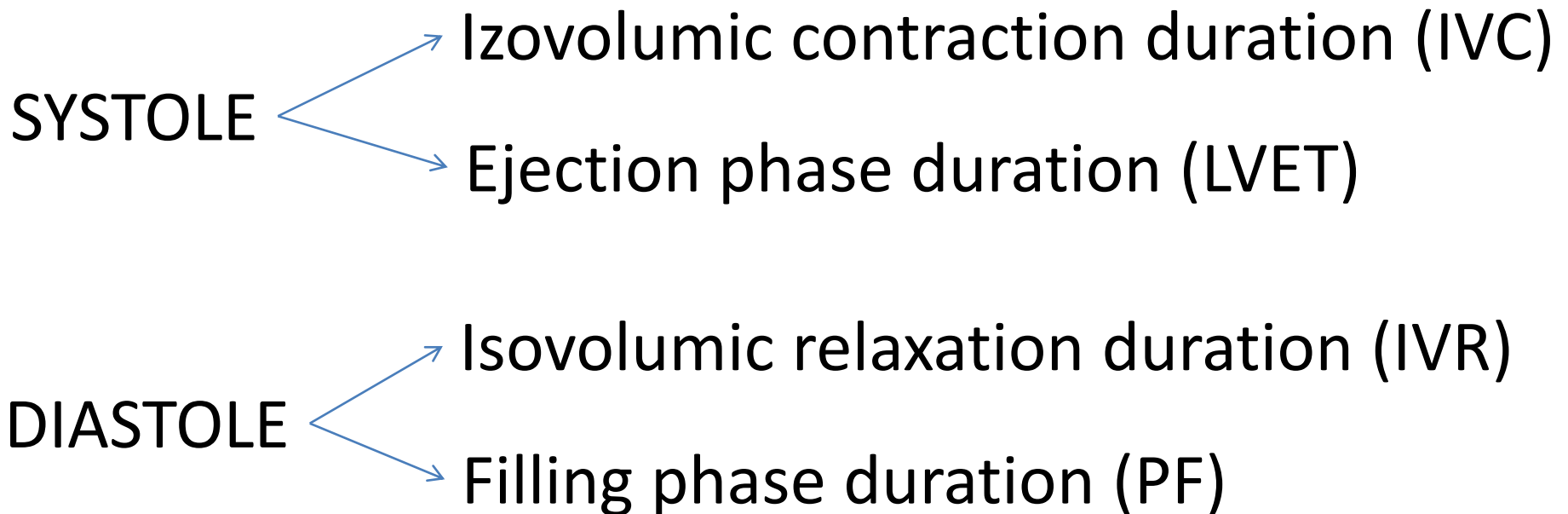
**PHONOCARDIOGRAPHY** - recording of heart sounds

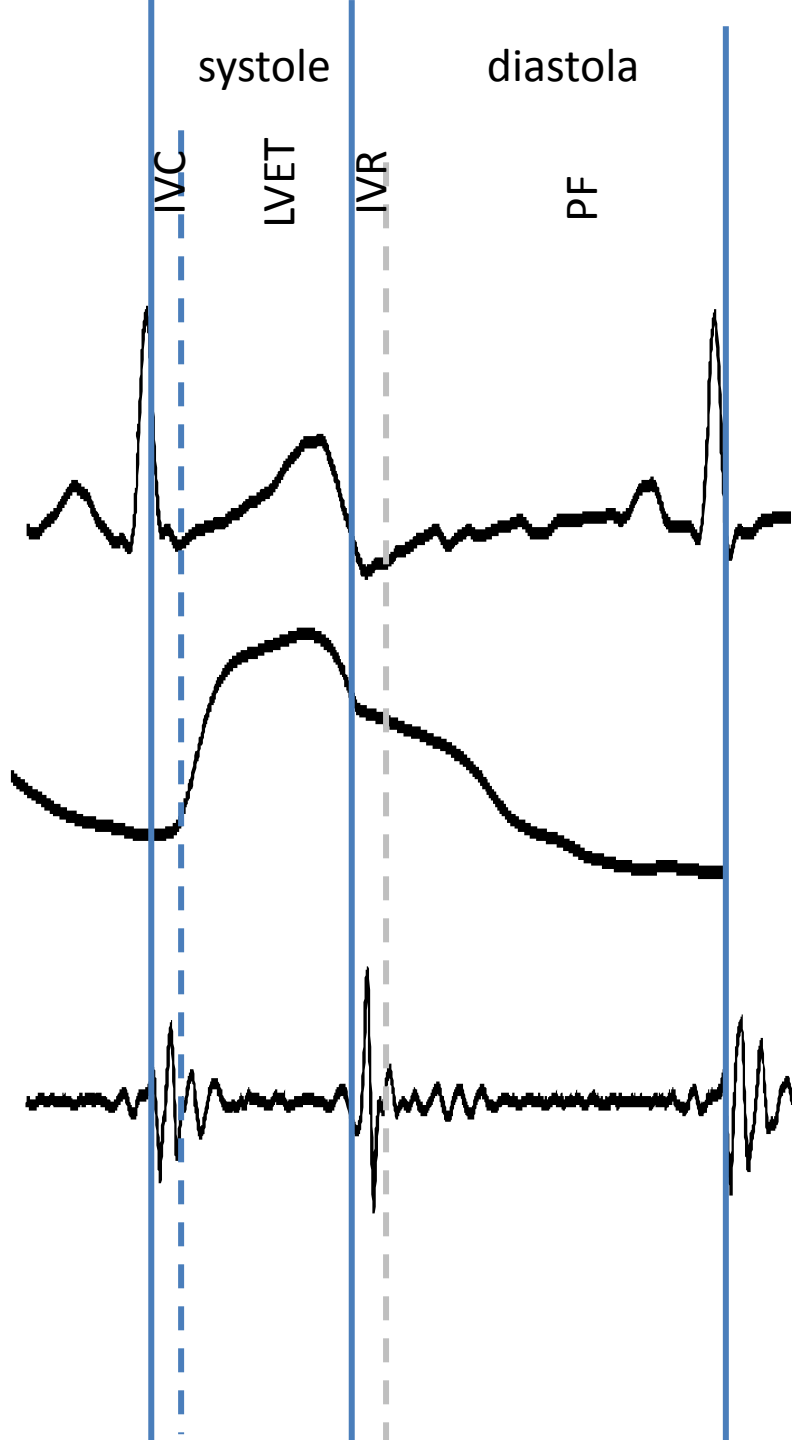
**ELECTROCARDIOGRAPHY** - recording of cardiac electrical activity

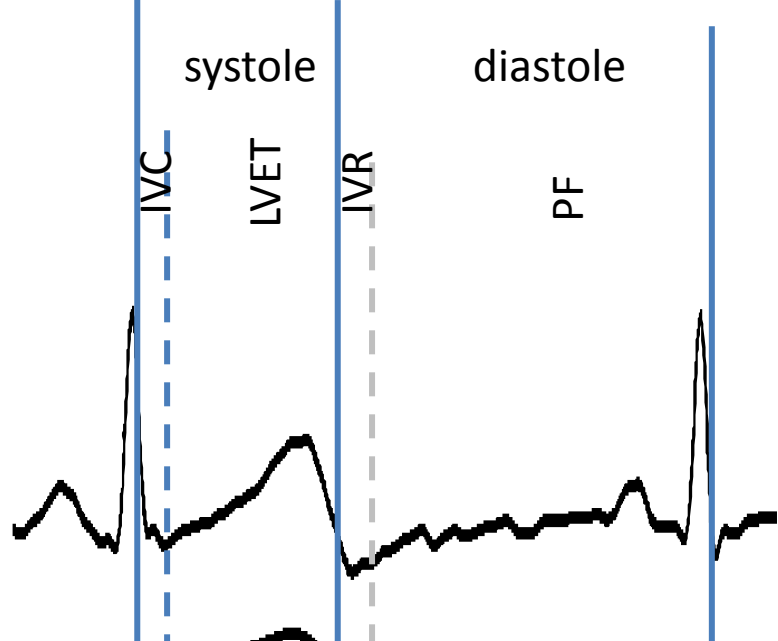
**SPHYGMOGRAPHY** - graphical record of the arterial pulse

*!pulse recorded on a. carotis is shifted in time axis regarding aortal pulse!*

# CARDIAC CYCLE

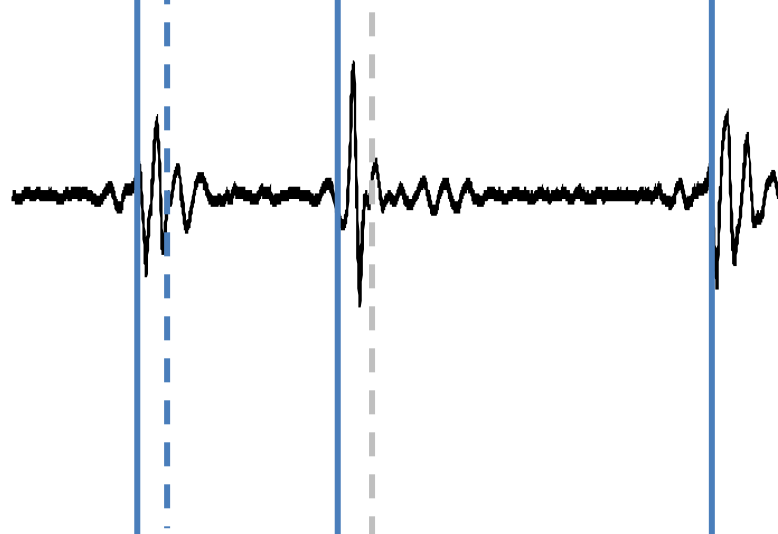
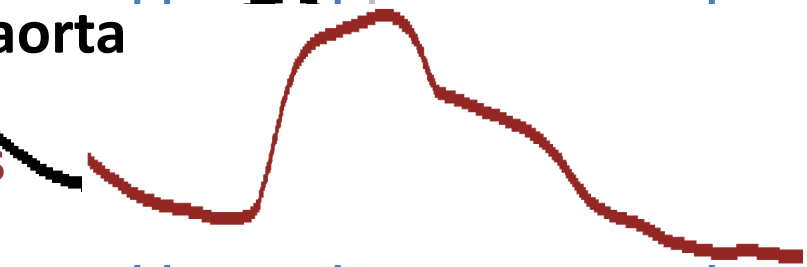




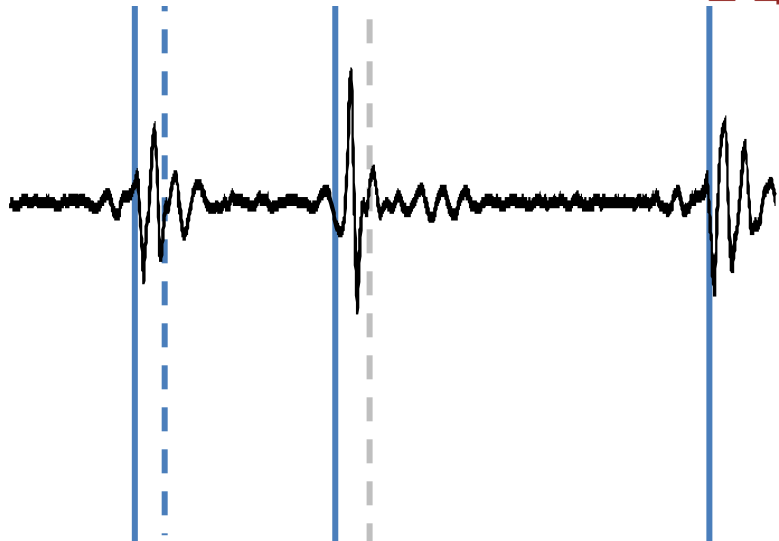
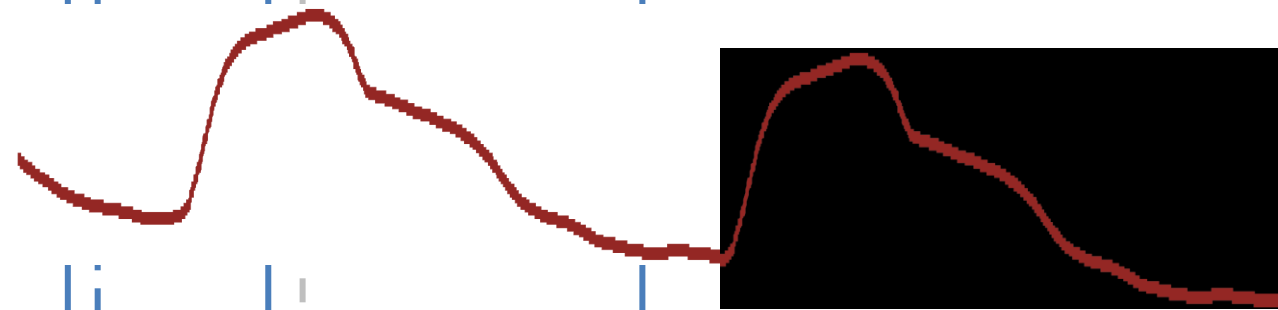
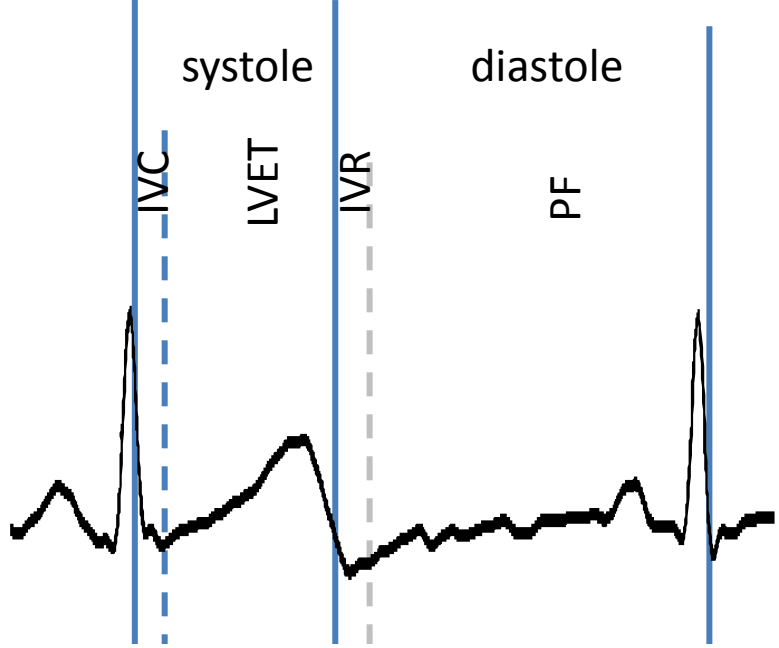


beginning of aorta

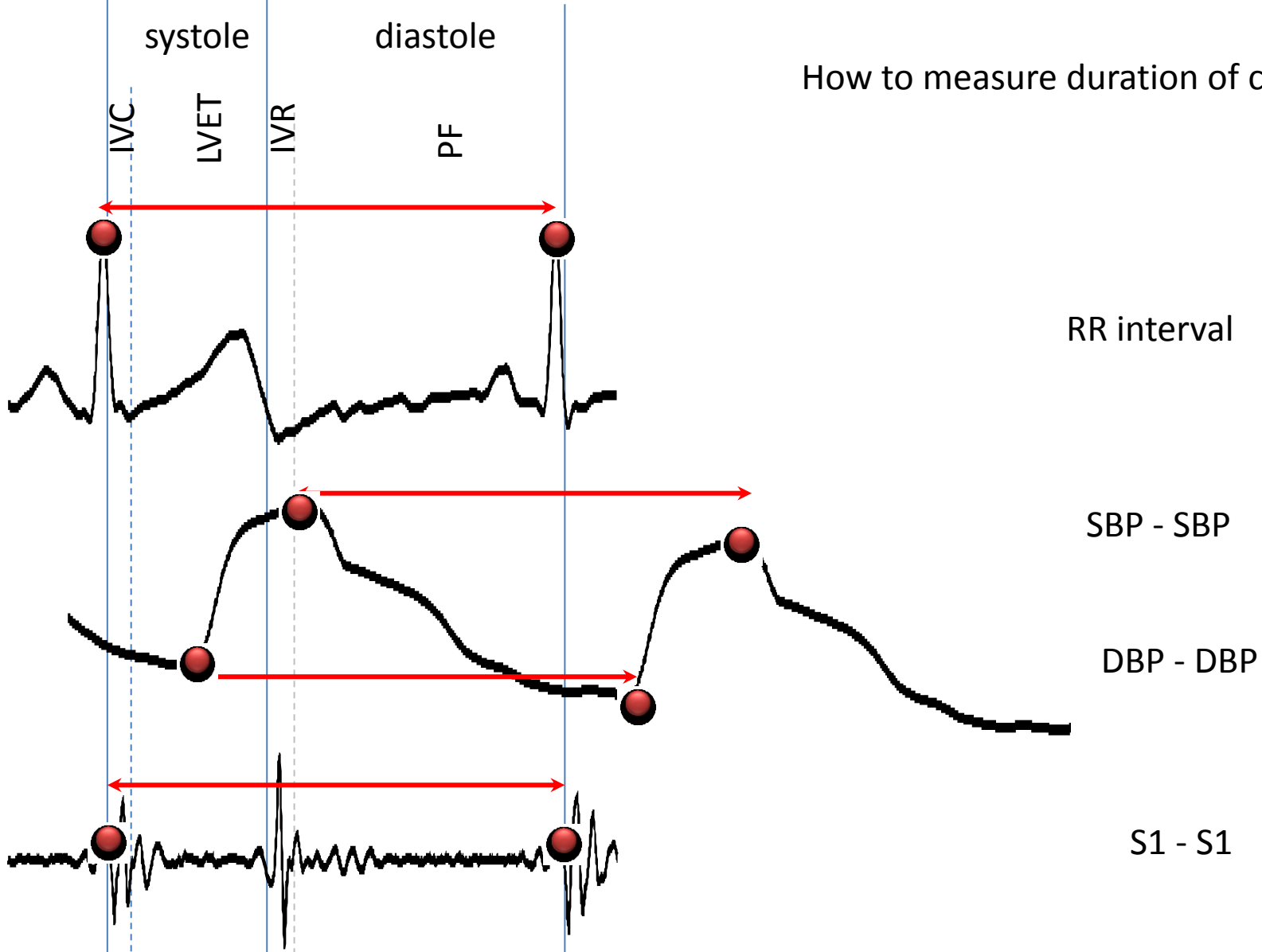
!!! a. carotis



How to measure duration of cardiac cycle?



How to measure duration of cardiac cycle?



systole

diastole

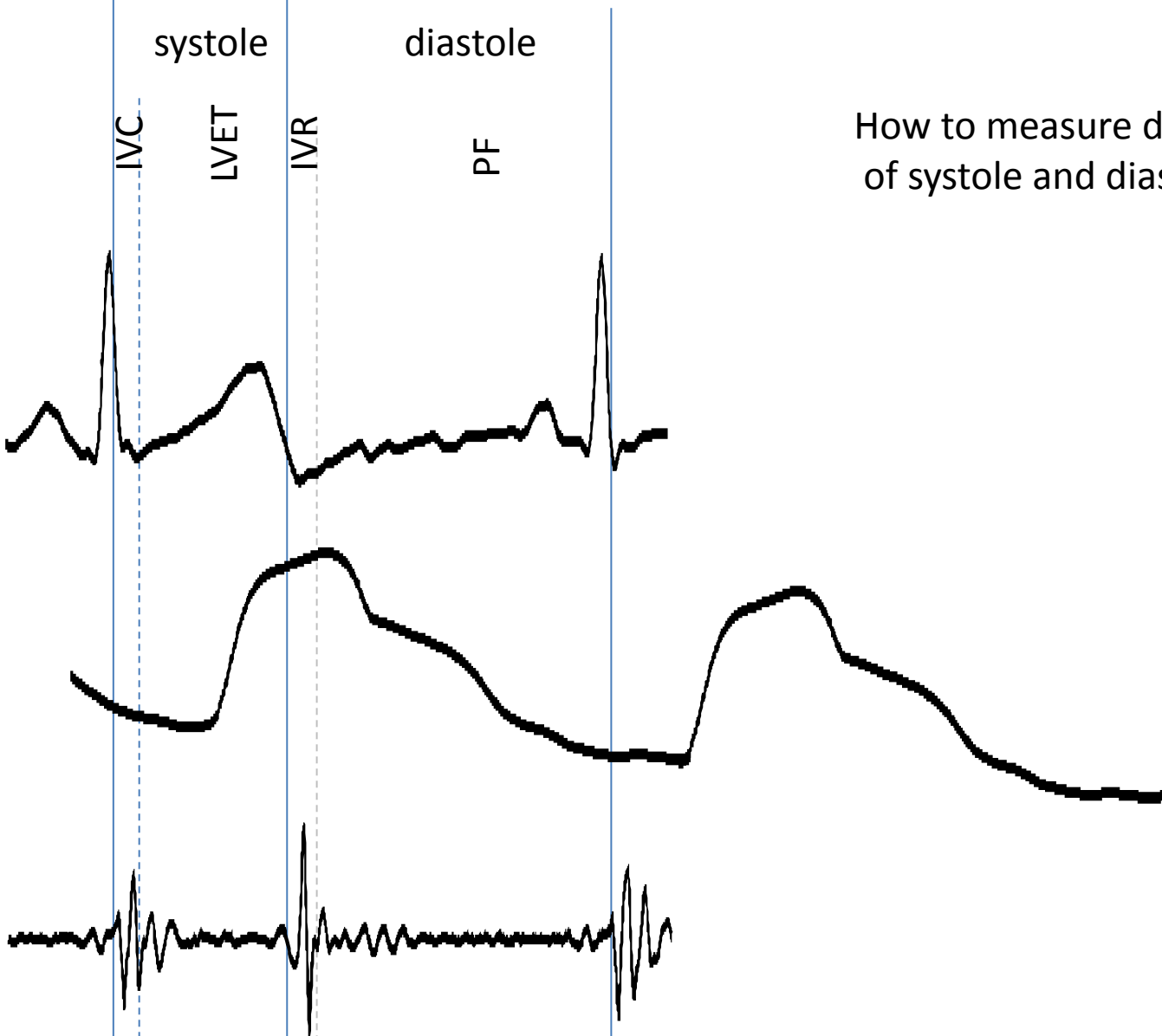
IVC

LVET

IVR

PF

How to measure duration of systole and diastole?

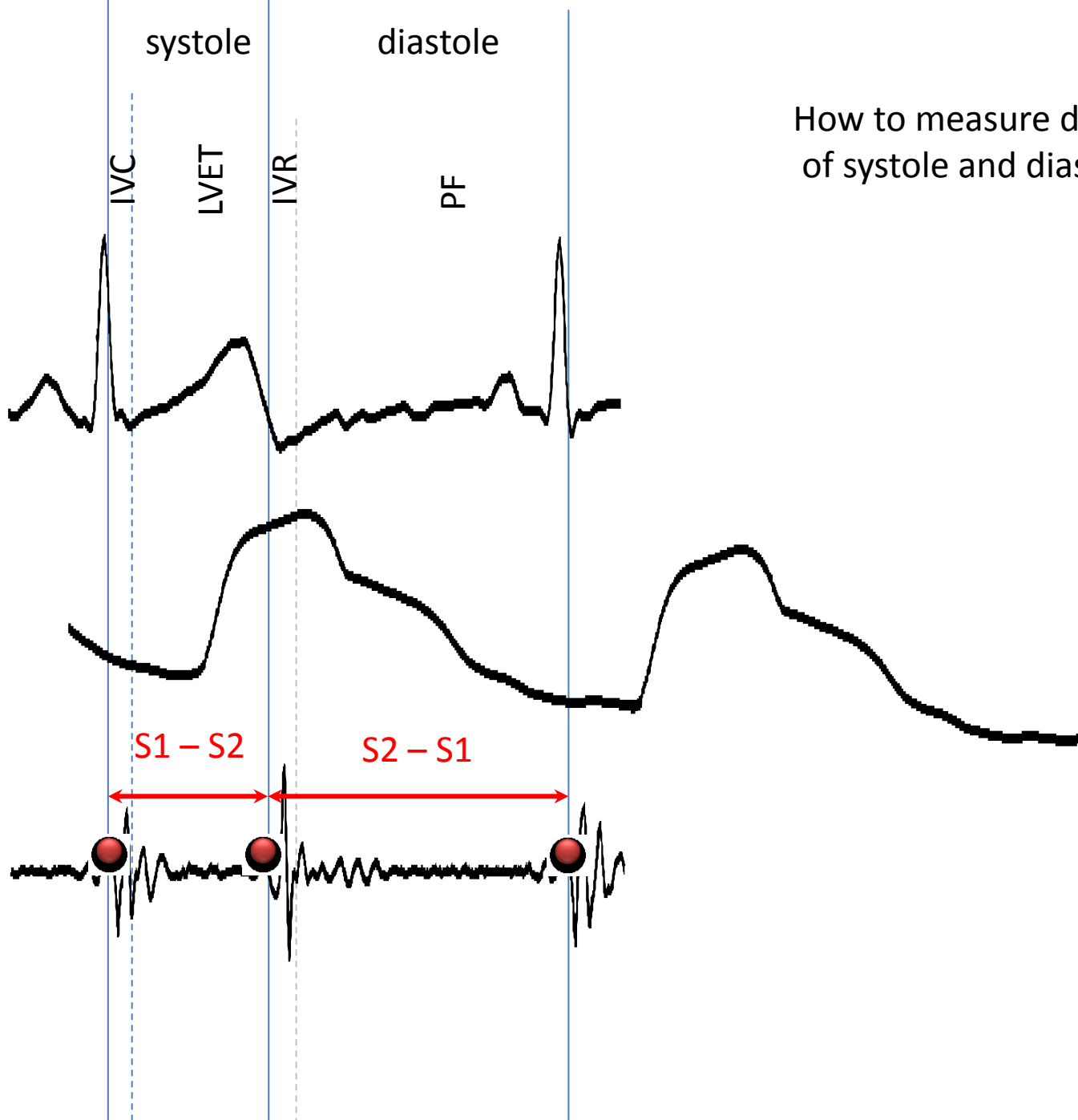




systole

diastole

How to measure duration of systole and diastole?



systole

diastole

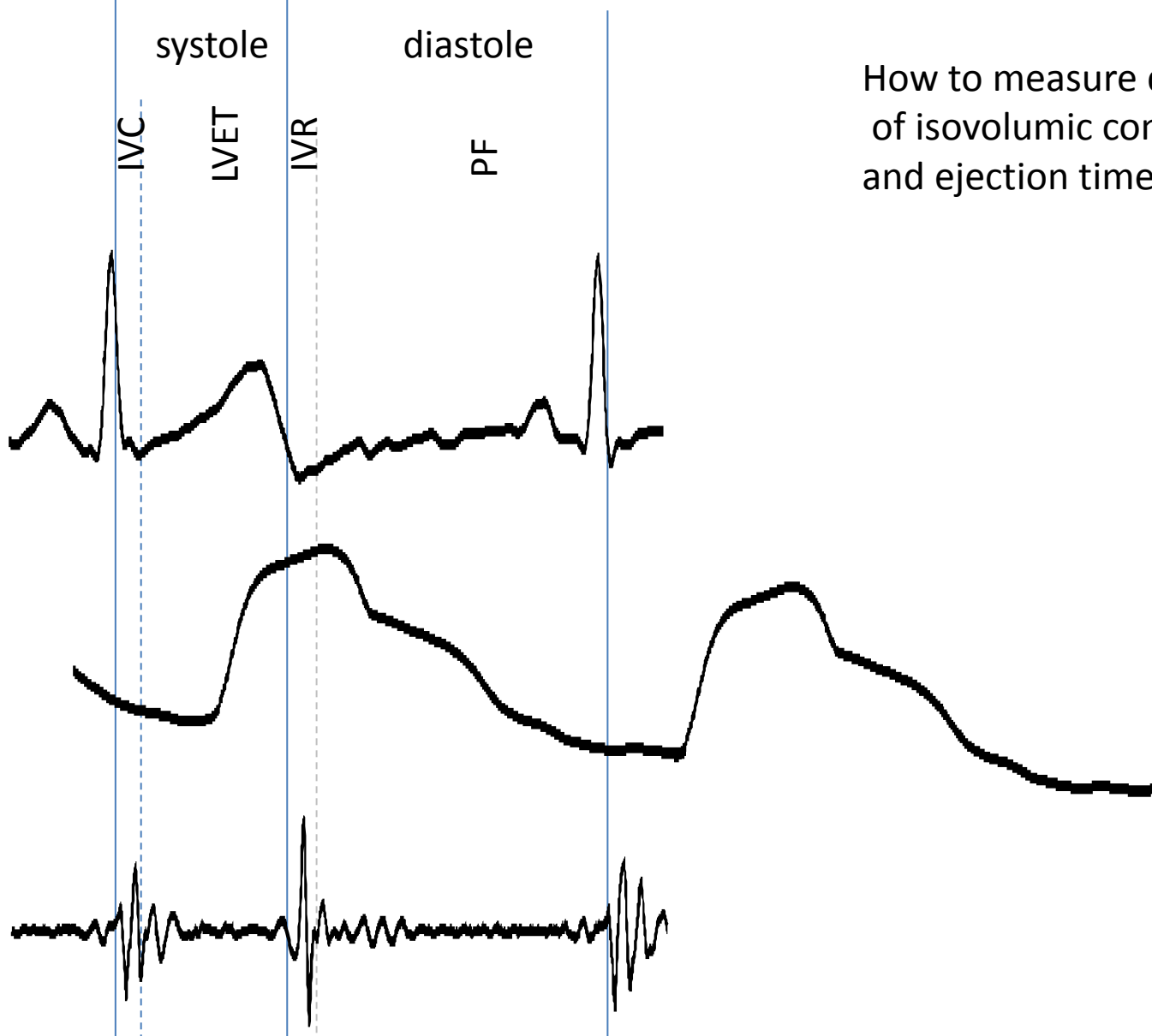
IVC

LVET

IVR

PF

How to measure duration  
of isovolumic contraction  
and ejection time?

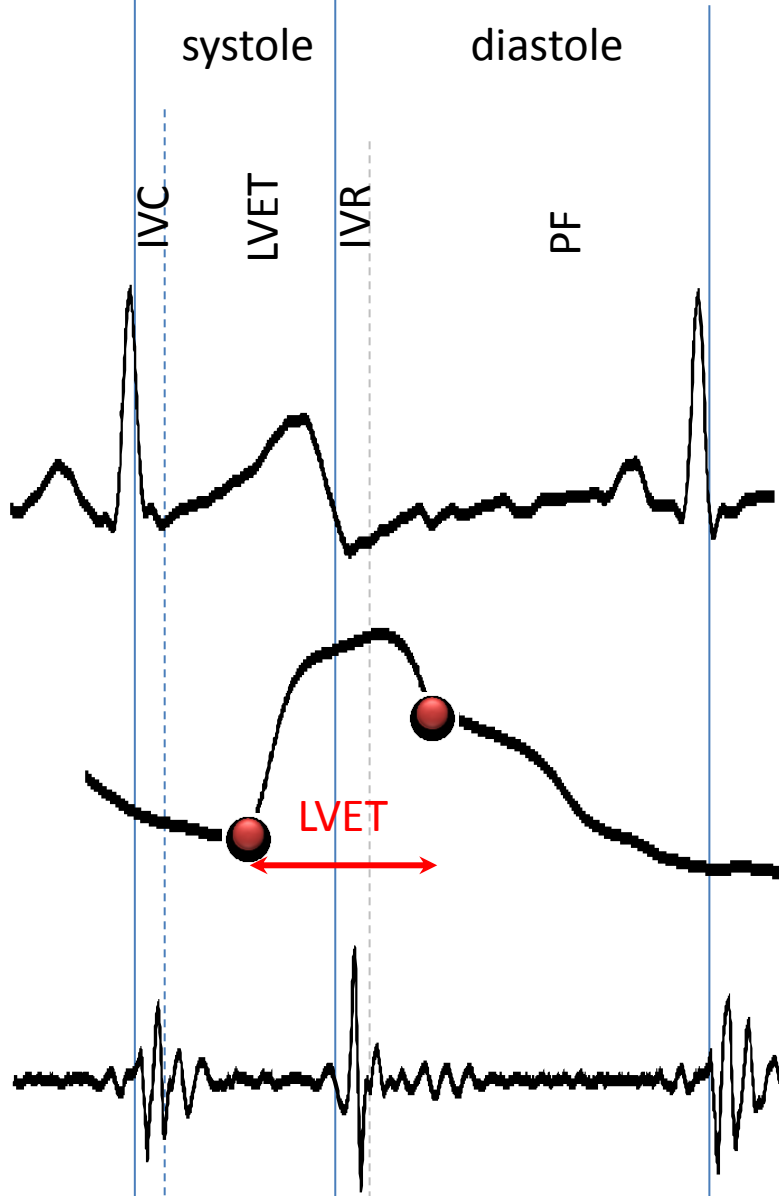


systole

diastole

How to measure duration  
of isovolumic contraction  
and ejection time?

LVET = left ventricle ejection time



IVC from aortal sphygmography  
(S1 – DBP)

By computing because of time shift:  
 $IVC = \text{systole} - \text{ejection phase} = S1S2 - LVET$

systole

diastole

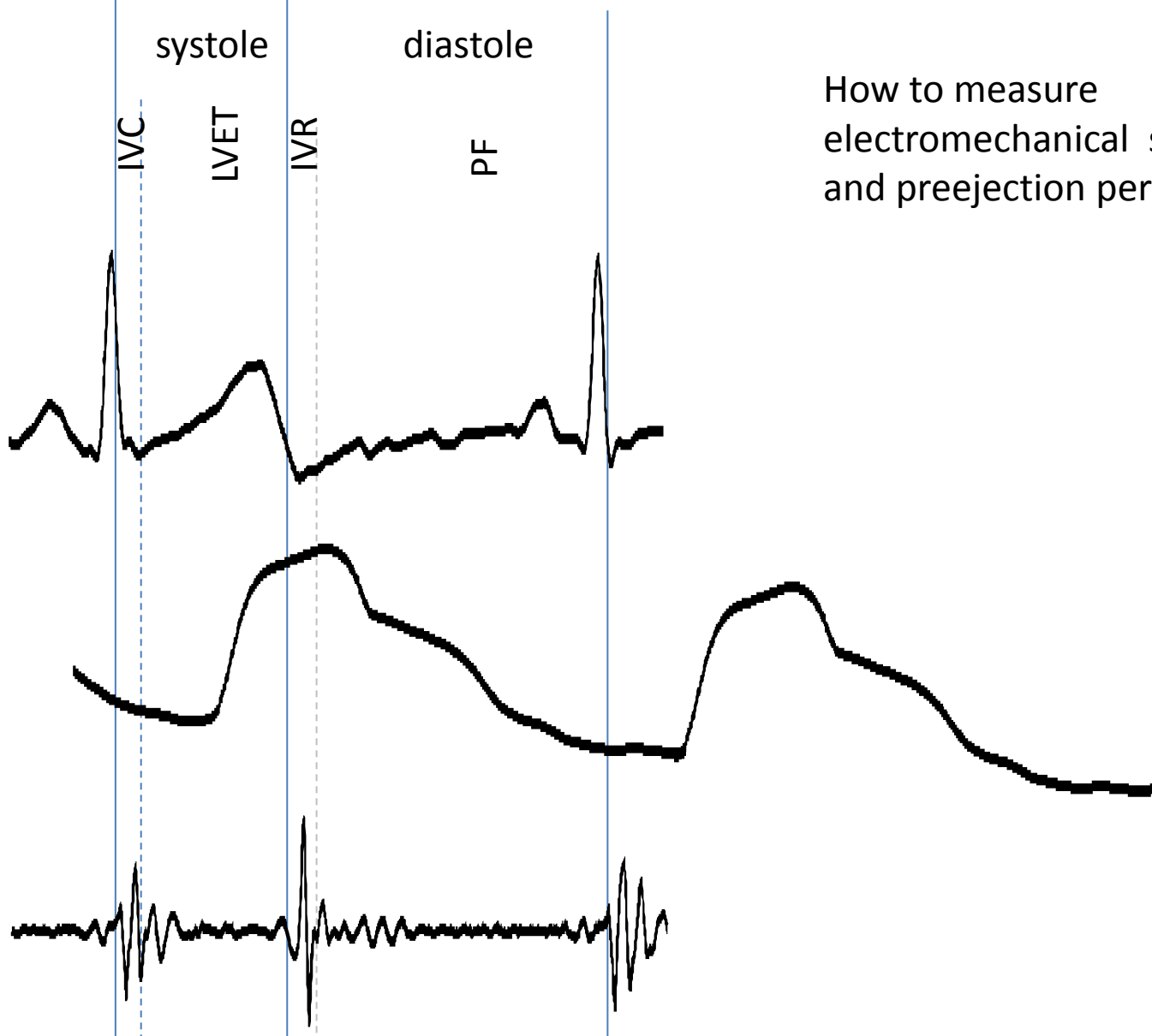
IVC

LVET

IVR

PF

How to measure  
electromechanical systole ( $QS_2$ )  
and preejection period (PEP)?



systole

diastole

IVC

LVET

IVR

PF

EML

QS2

How to measure  
electromechanical systole (QS2)  
and preejection period (PEP)?

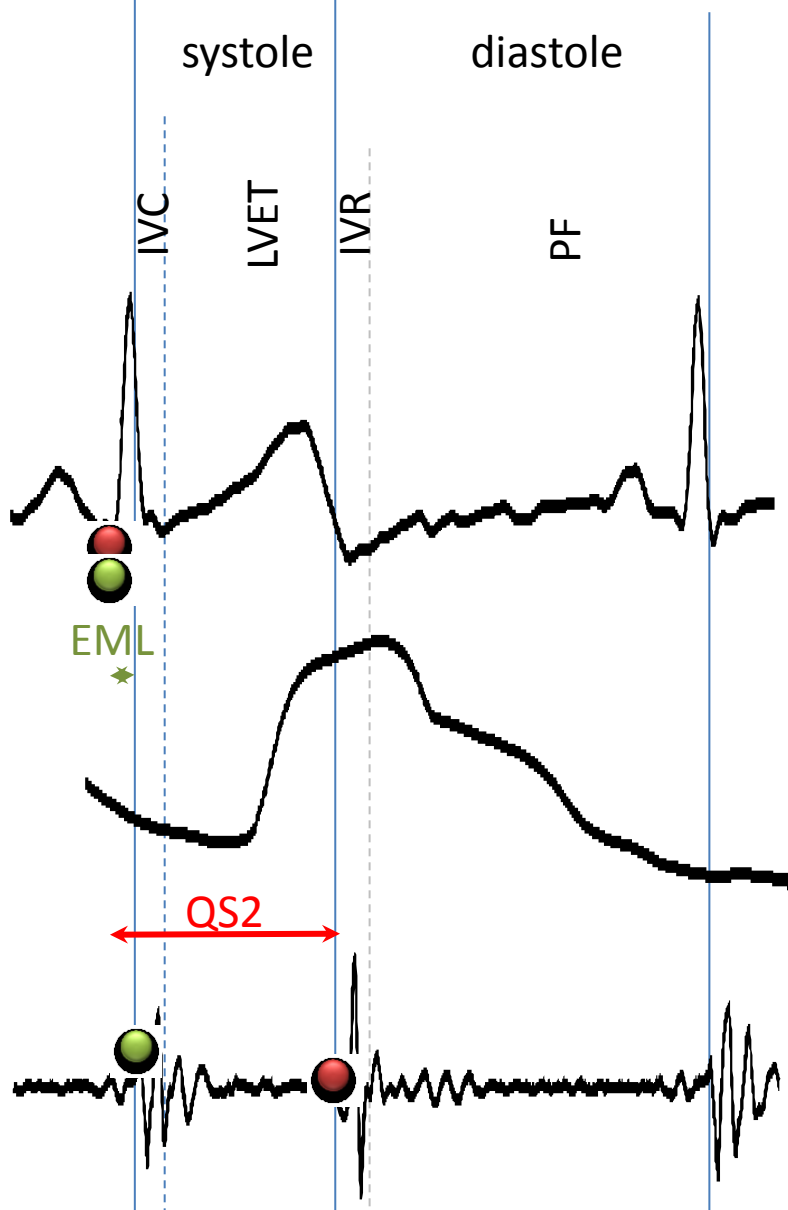
Elektromechanická systola QS2

preejection period from aortal  
sphygmography (Q – DBP)

By computing because of time shift:  
 $PEP = QS2 - LVET$

Elektromechanical latency (EML) can be  
measured:  $Q - S1$

In other case by computing  
 $EML = QS2 - S1S2$



What does an index  $dP/dt$  mean?

# What does an index dP/dt mean?

## INDEX of CONTRACTILITY

In clinics: the maximal speed of the pressure increase during IVC (immediately before opening of aortal valve, at the end of IVC)

In practicals: average speed of pressure increase during IVC:

$$\frac{\text{Pressure difference between the end and the beginning of IVC}}{\text{Duration of IVC}} = \frac{\text{DBP} - 8}{\text{IVC}}$$

*(8 mmHg approximately corresponds to the pressure in the end of diastole, beginning of the left ventricular systole, and the left atrial pressure)*