

POLYGRAPHY

Evaluation of systolic time intervals

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

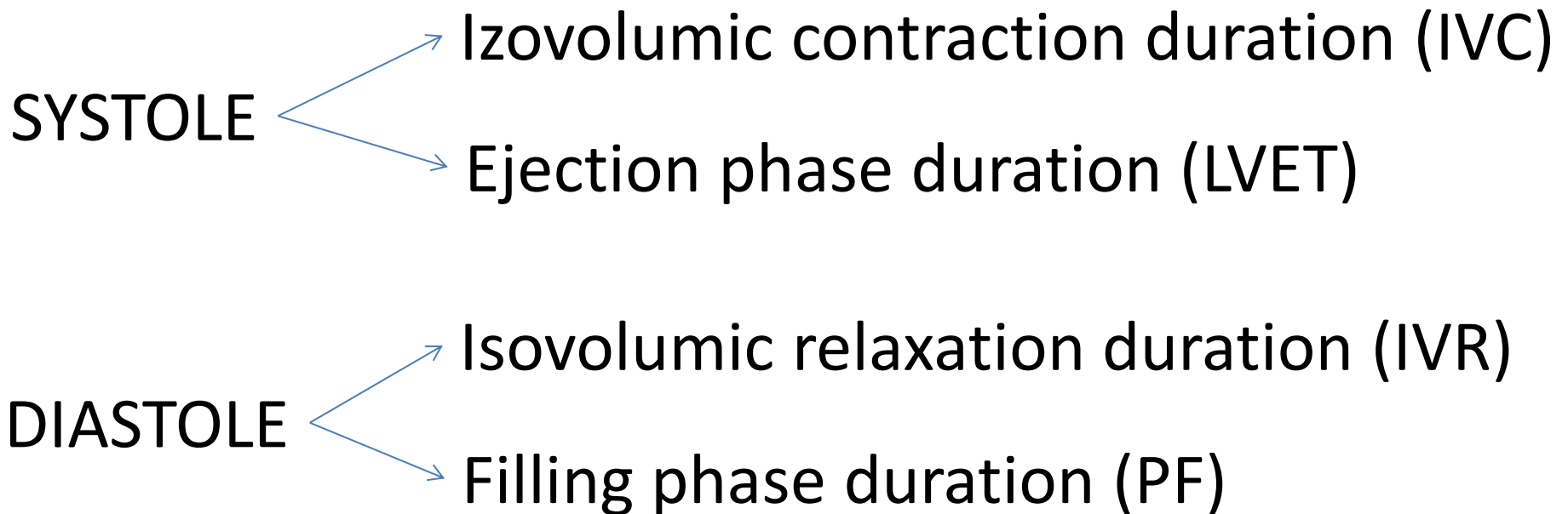
PHONOCARDIOGRAPHY - recording of heart sounds

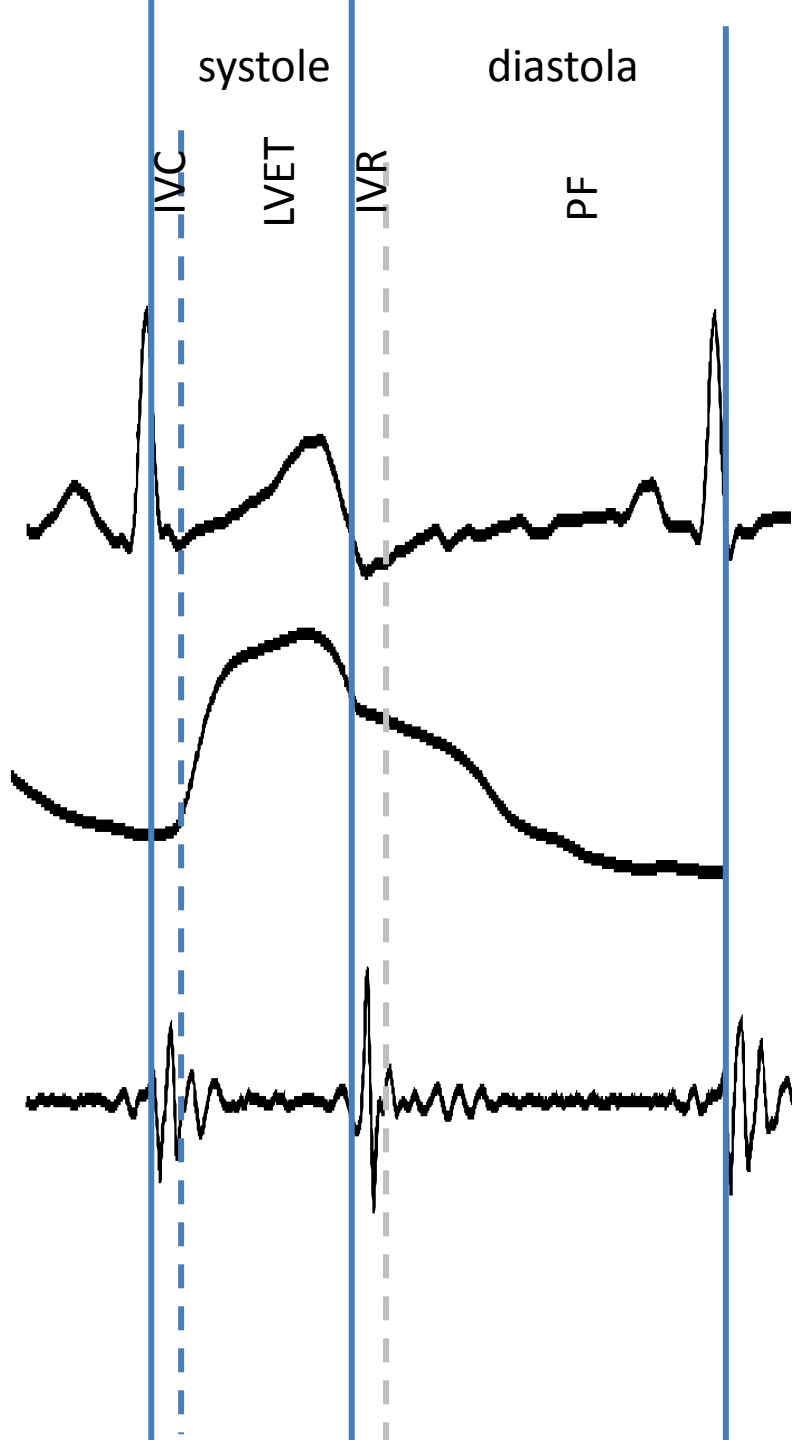
ELECTROCARDIOGRAPHY - recording of cardiac electrical activity

SPHYGMOGRAPHY - graphical record of the arterial pulse

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

CARDIAC CYCLE





systole

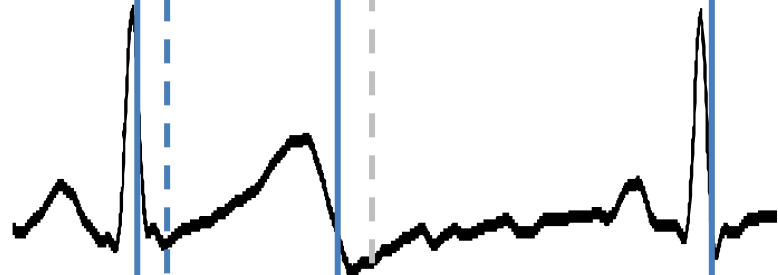
diastole

IVC

LVET

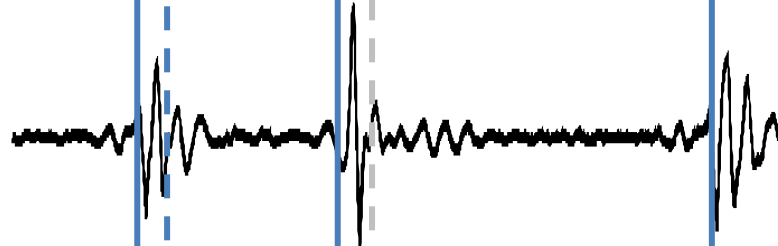
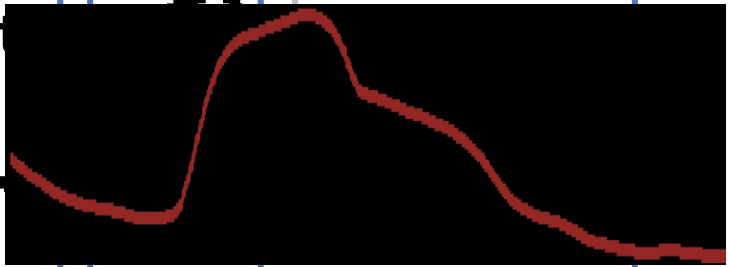
JVR

PF

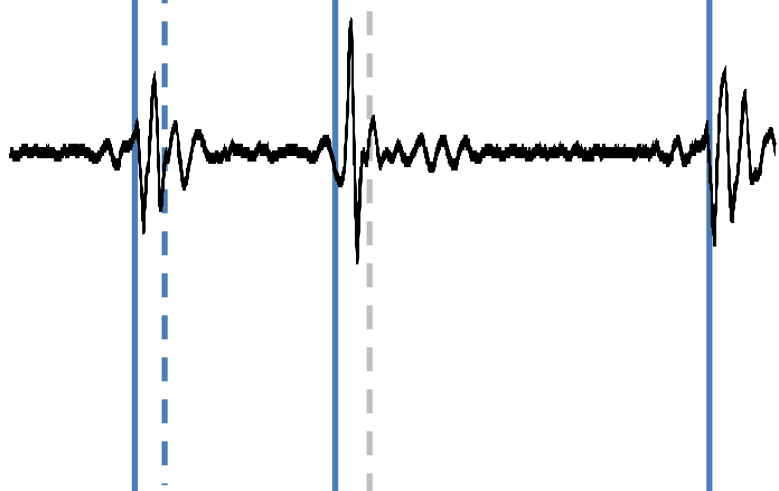
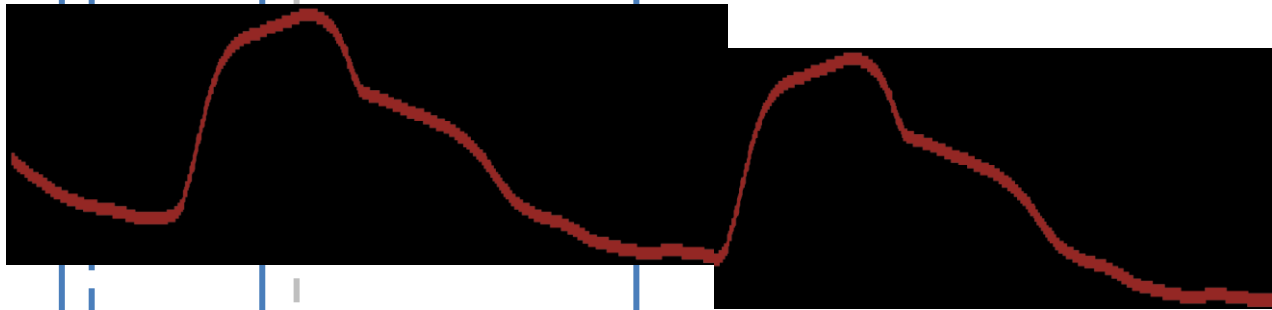
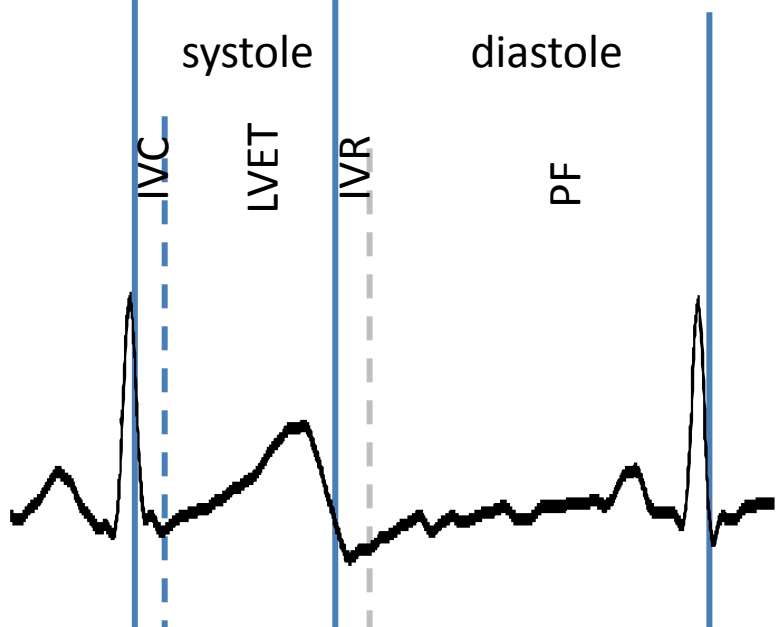


begining of aor

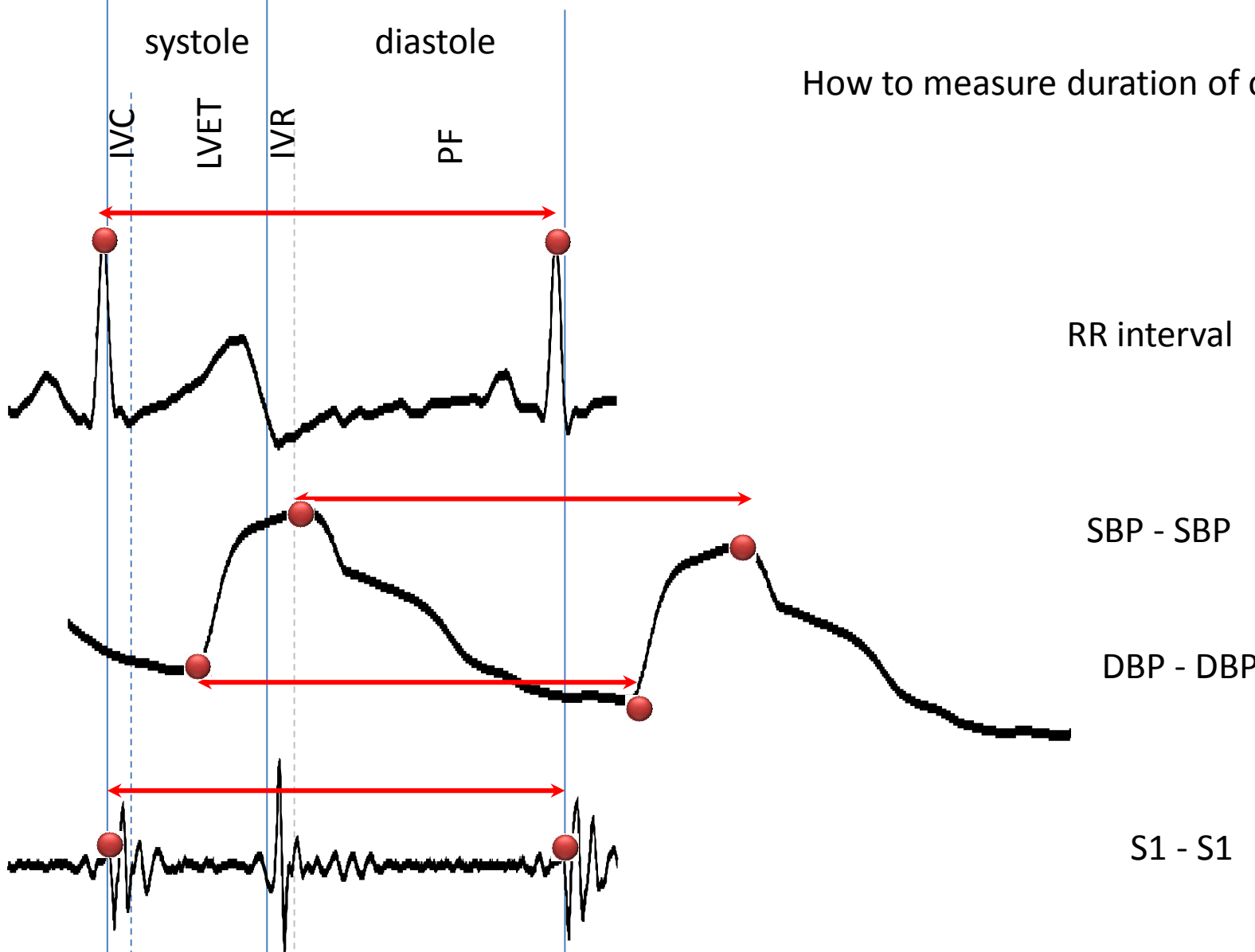
!!! a. carotis



How to measure duration of cardiac cycle?



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RR interval

SBP - SBP

DBP - DBP

S1 - S1

systole

diastole

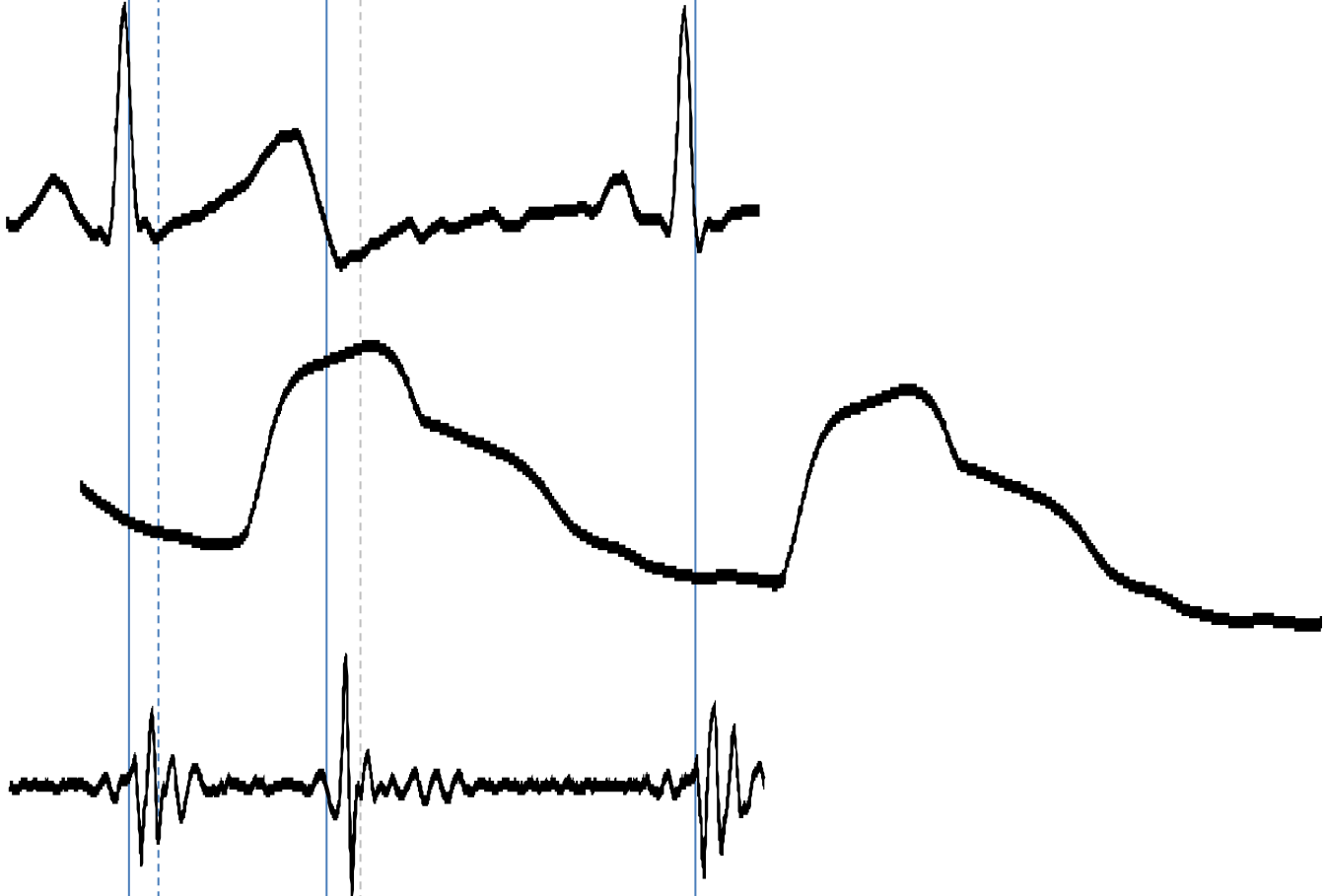
IVC

LVET

IVR

PF

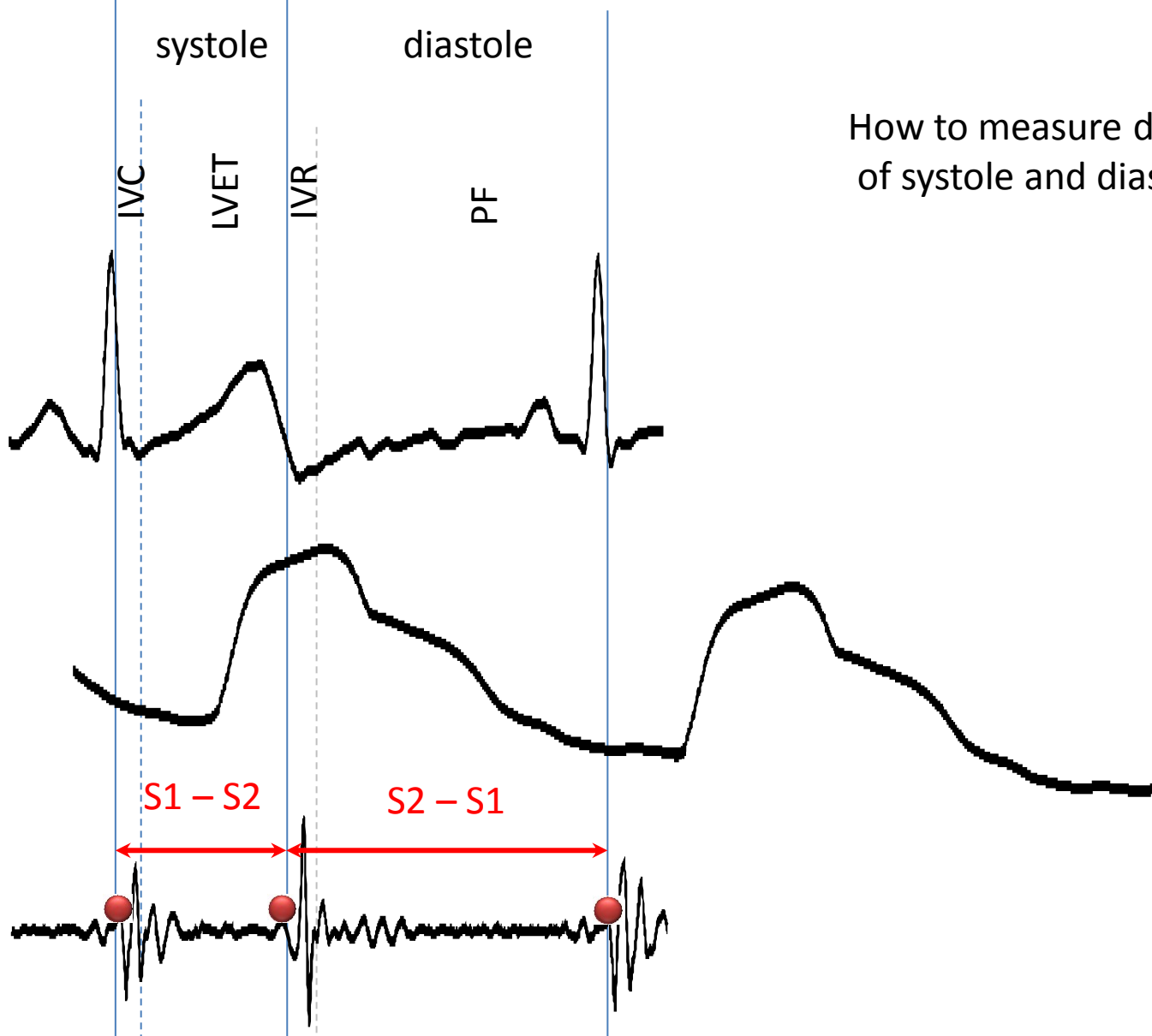
How to measure duration of systole and diastole?



systole

diastole

How to measure duration of systole and diastole?



IVC

LVET

IVR

PF

S1 - S2

S2 - S1

systole

diastole

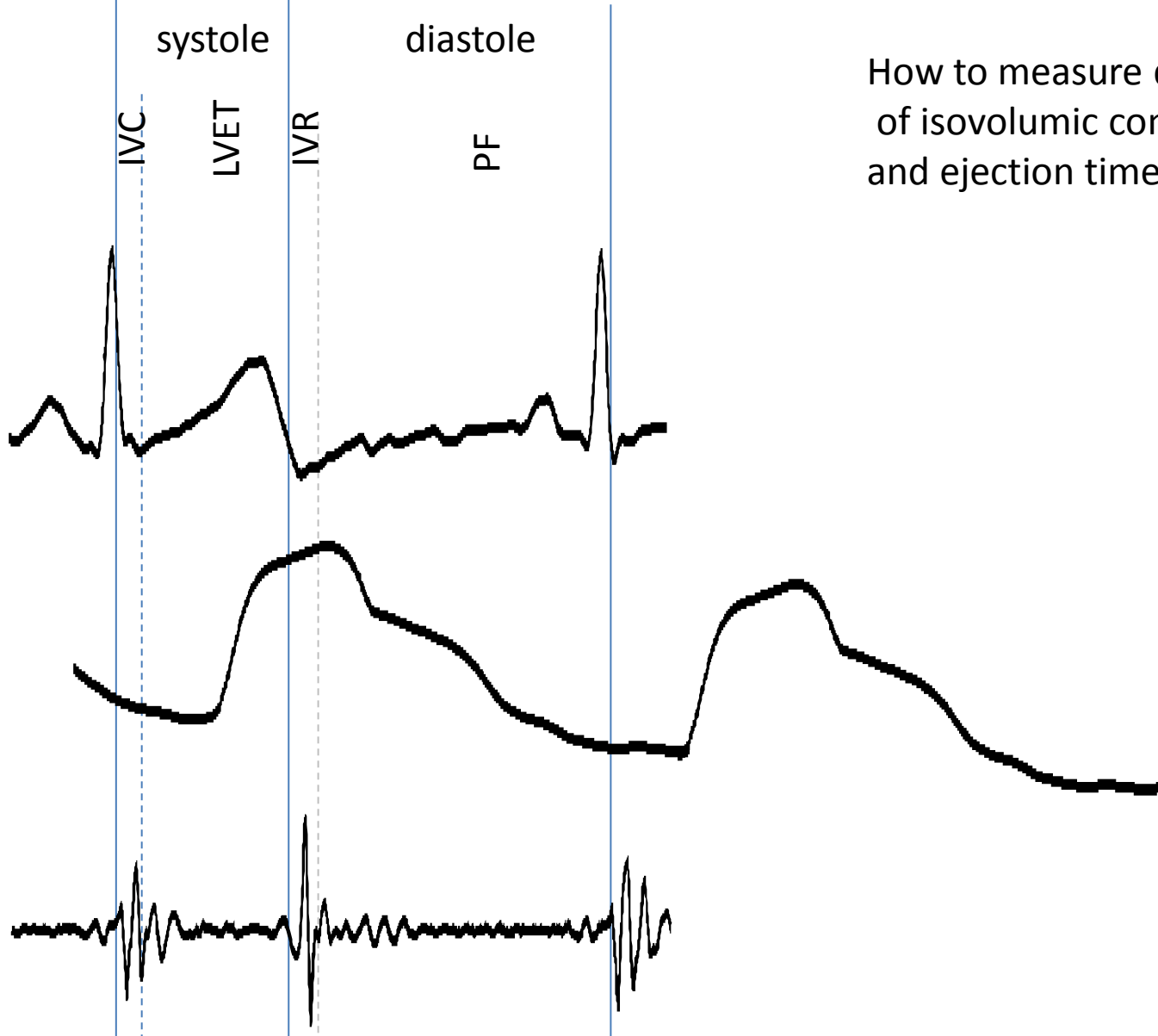
IVC

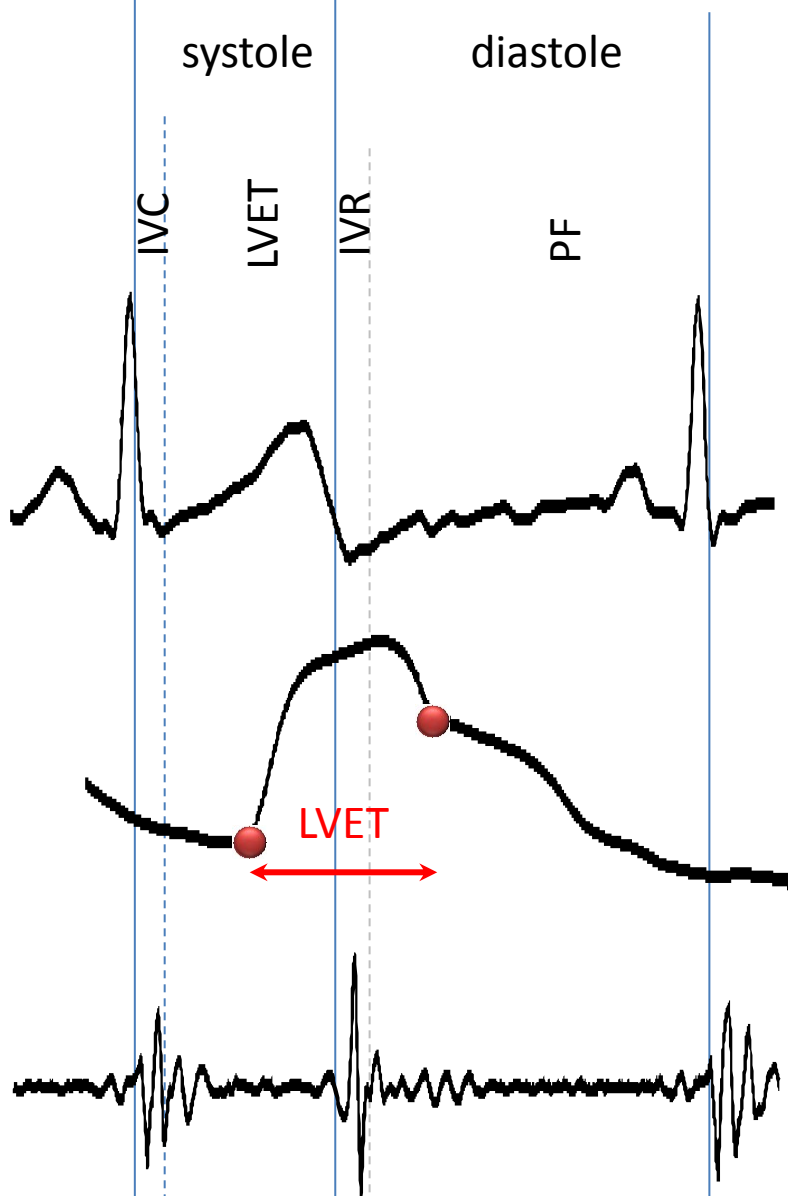
LVET

IVR

PF

How to measure duration of isovolumic contraction and ejection time?





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

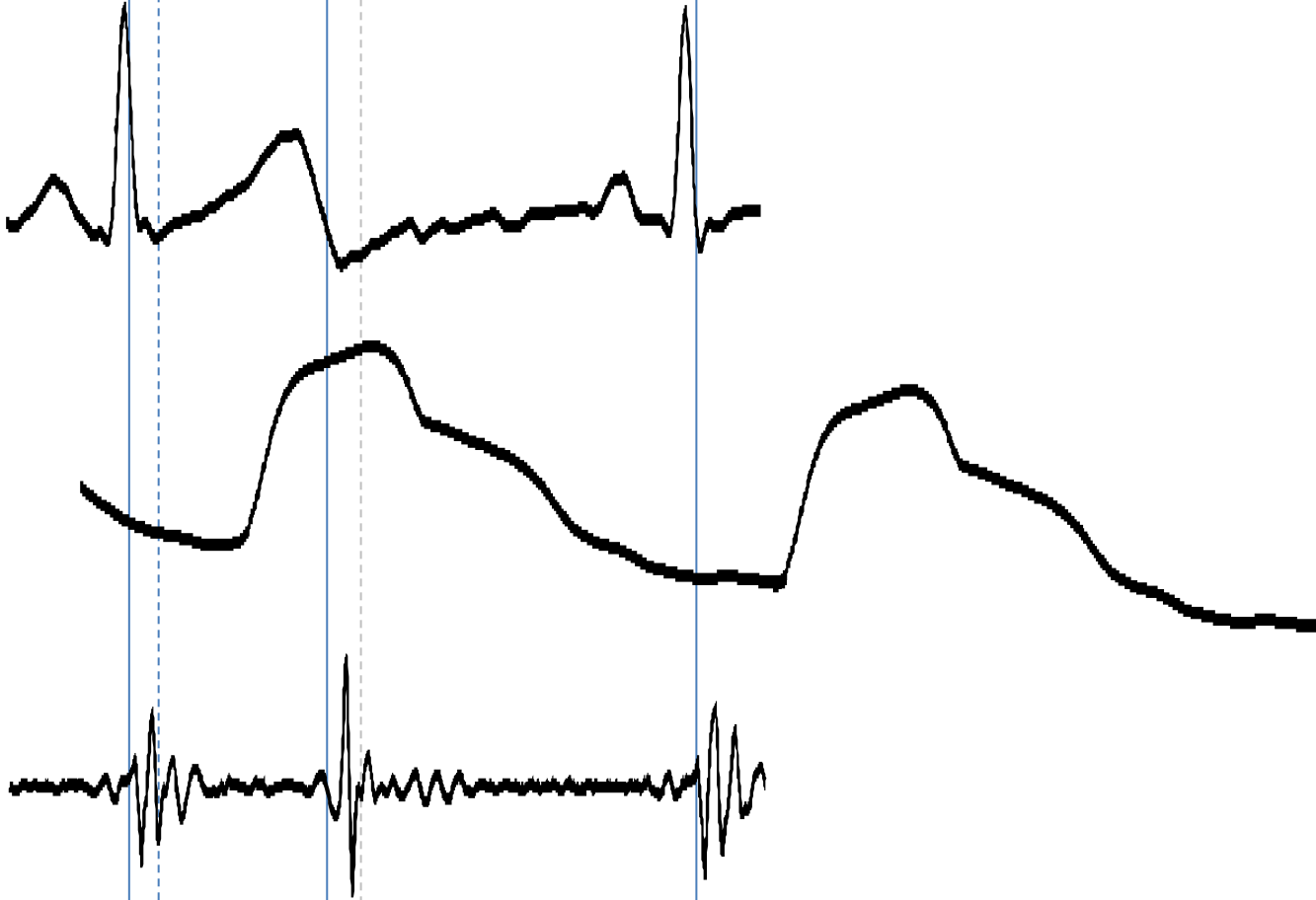
IVC

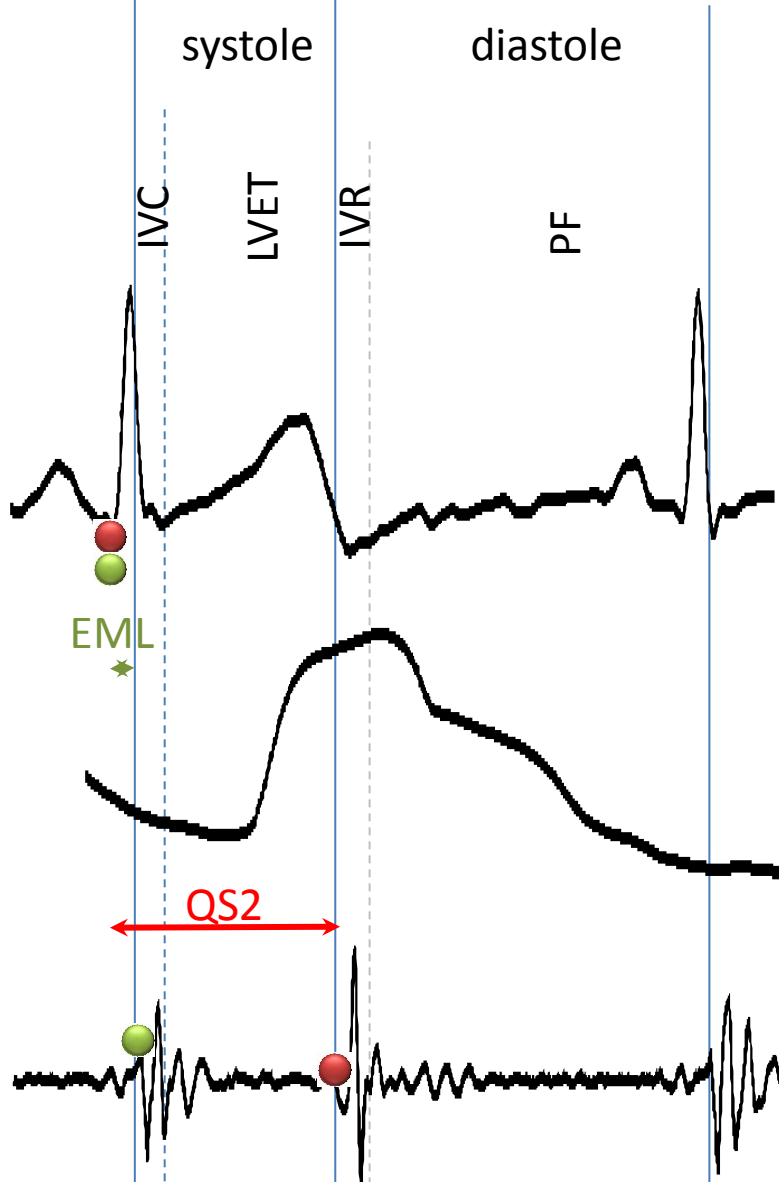
LVET

IVR

PF

How to measure
electromechanical systole (QS₂)
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)