

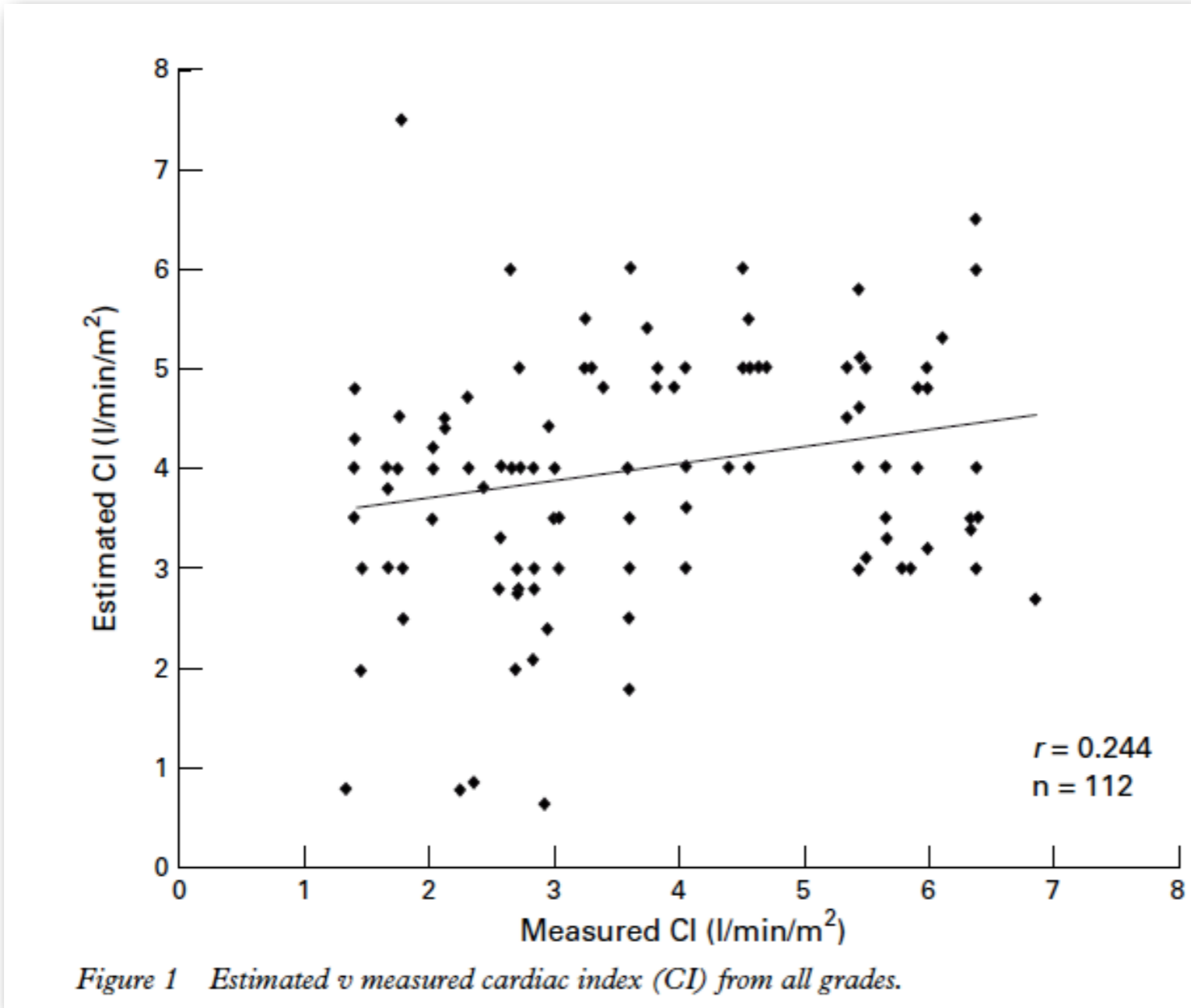
# Workshop PiCCO bij kinderen

## *Fysiologie*

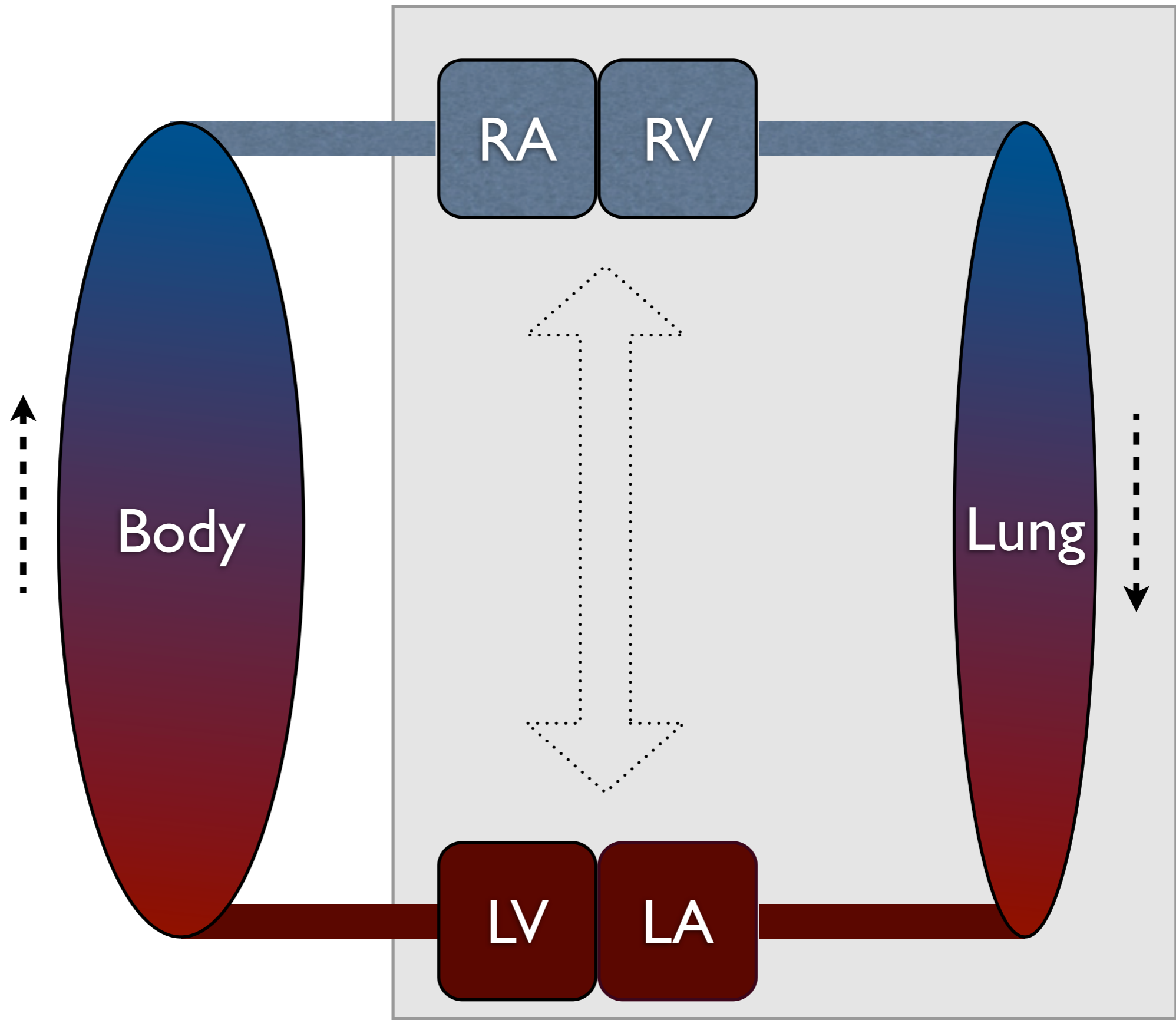
Joris Lemson, MD PhD  
Anesthesiologist and pediatric intensivist

*Radboud University Nijmegen Medical Centre  
The Netherlands*

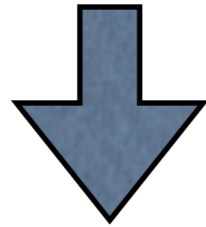
# Clinical estimation of CO



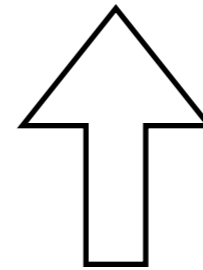
Arch Dis Child 1997;77:516-518



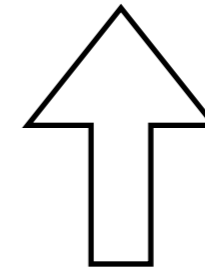
regulated



$$\text{Blood pressure} = \text{CO} \times \text{SVR}$$

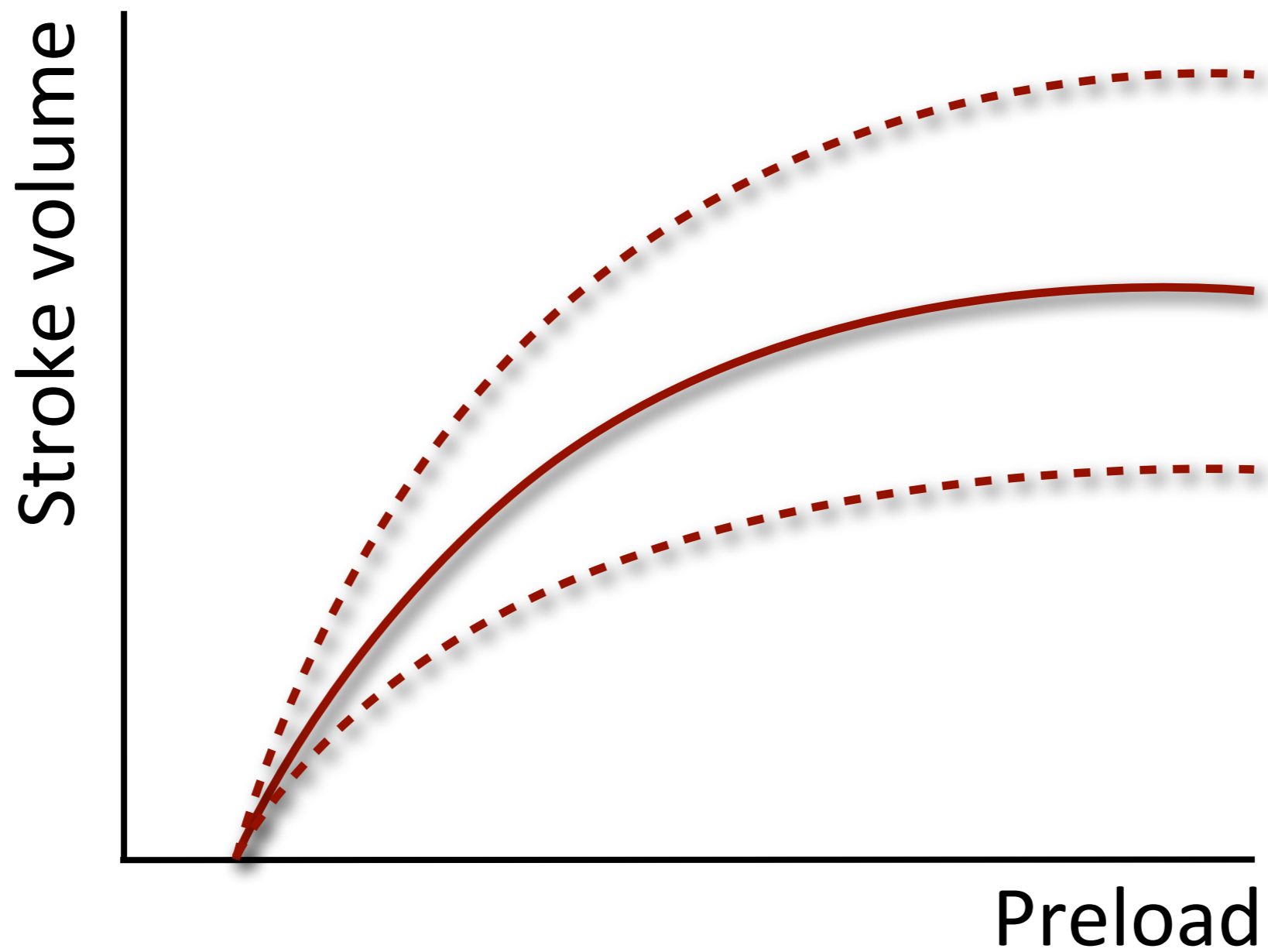


$$\text{HR} \times \text{SV}$$

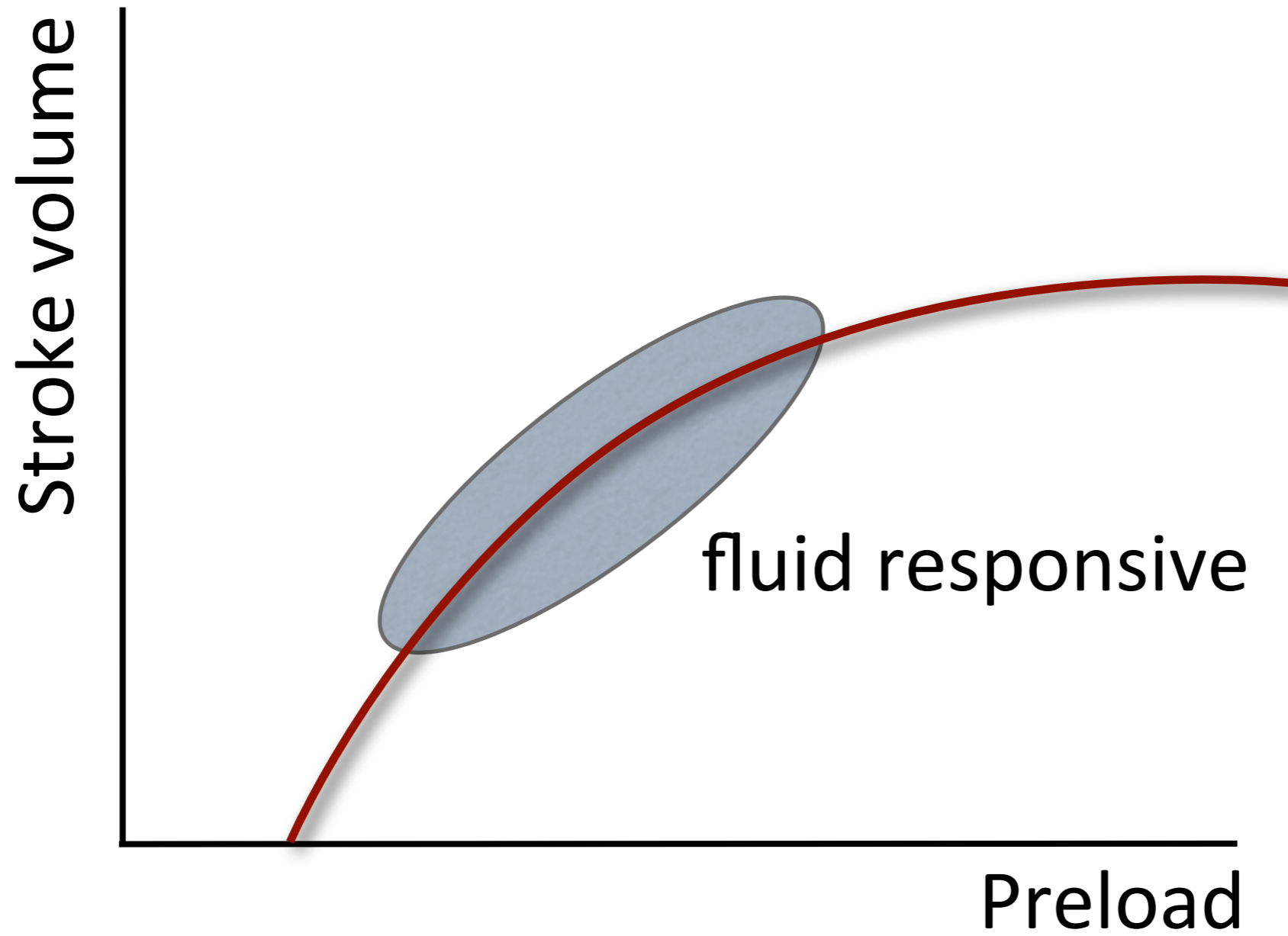


preload  
afterload  
contractility

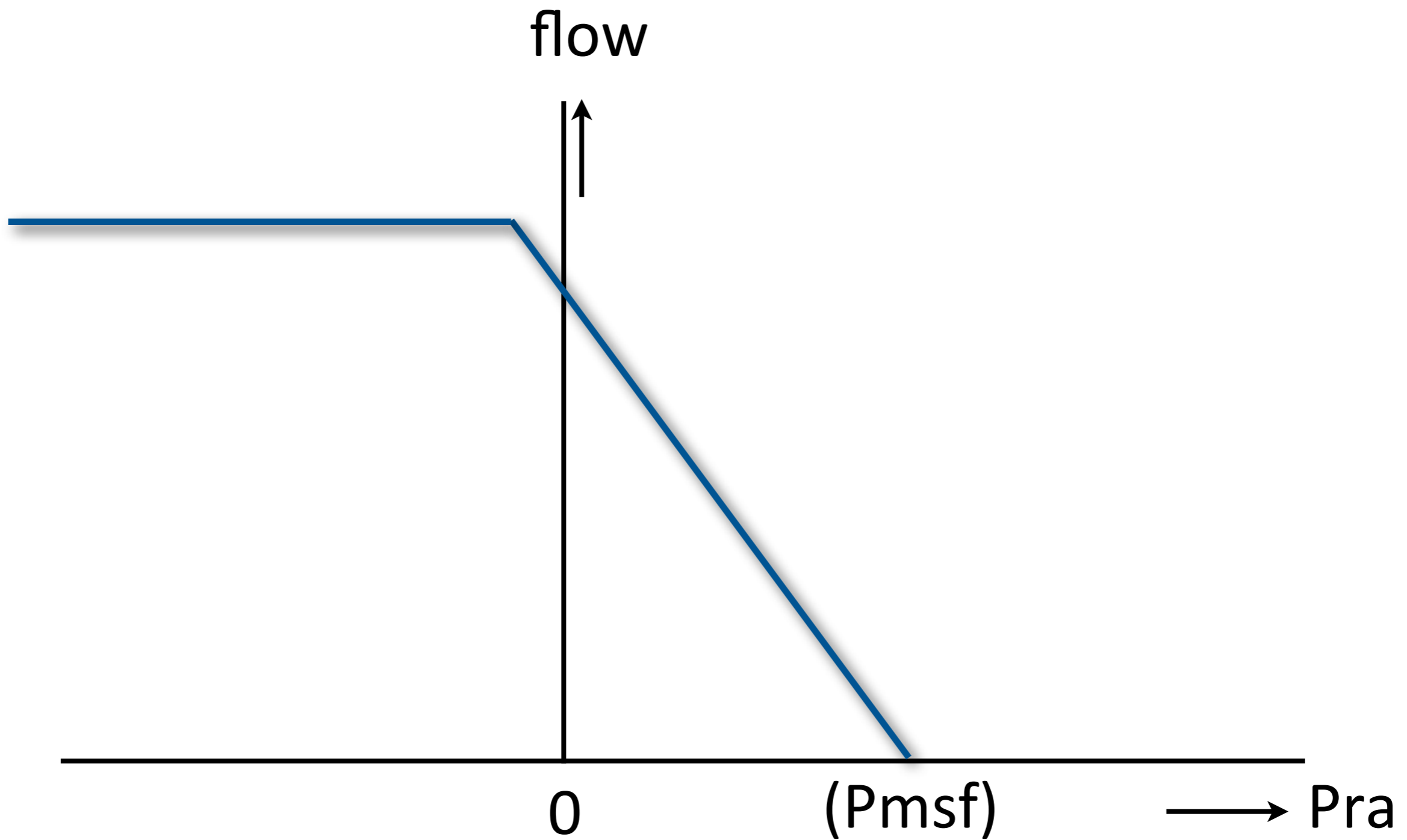
# The Frank Starling curve



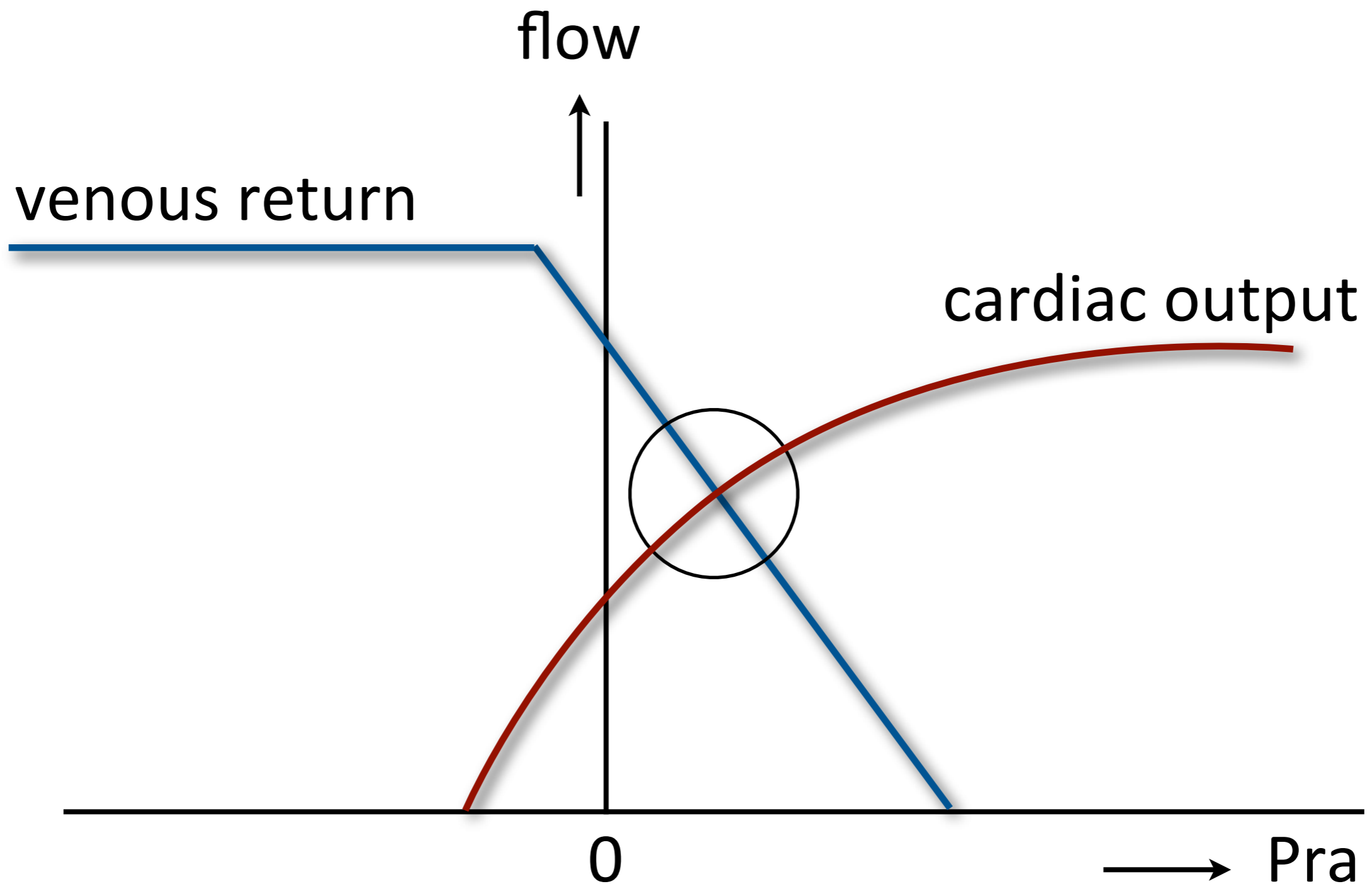
# Fluid responsiveness



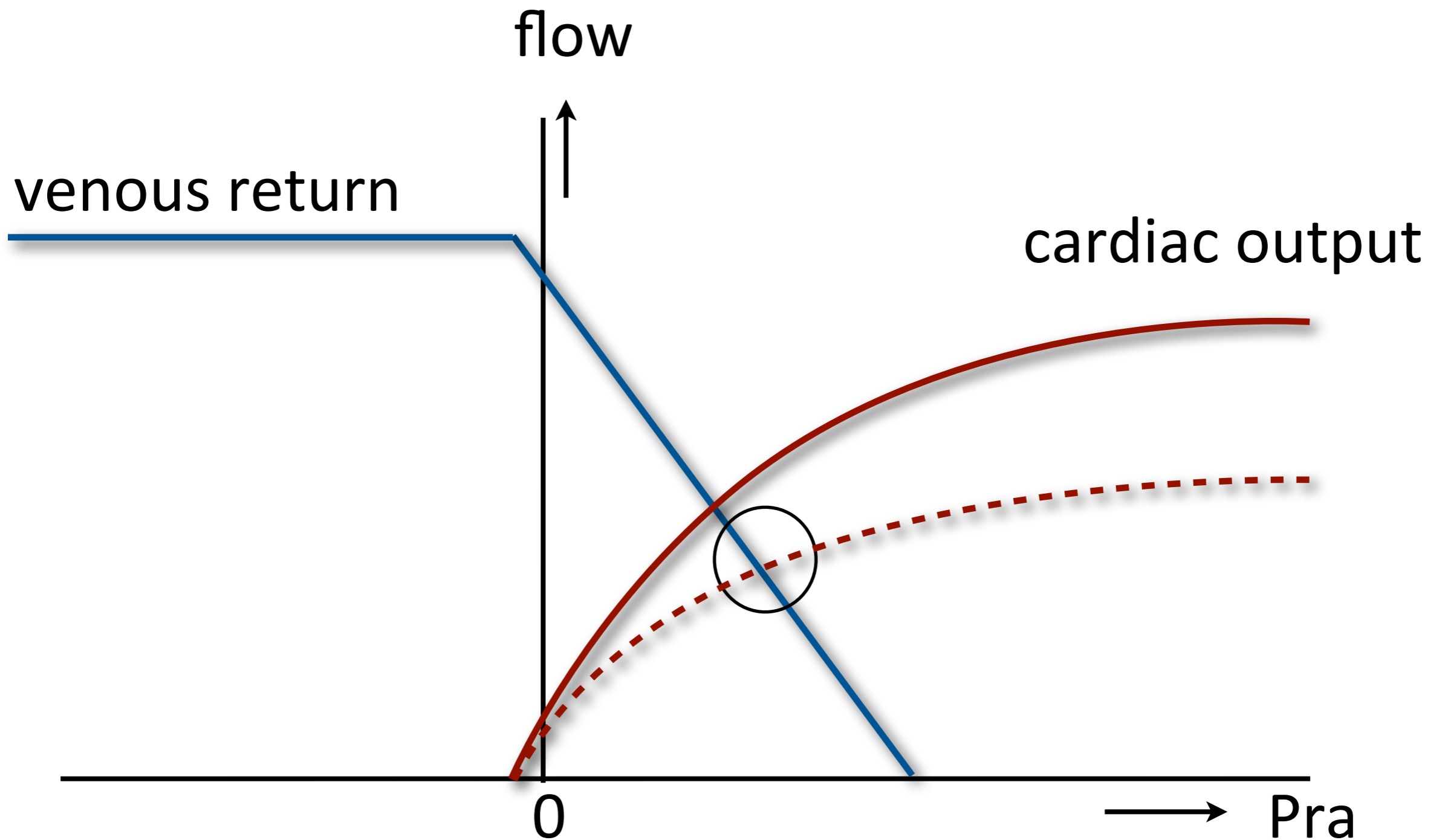
# Venous return



# CO and venous return



# Decreased contractility



# Venous return

stressed volume

unstressed  
volume

=

$P_{msf} - P_{ra}$

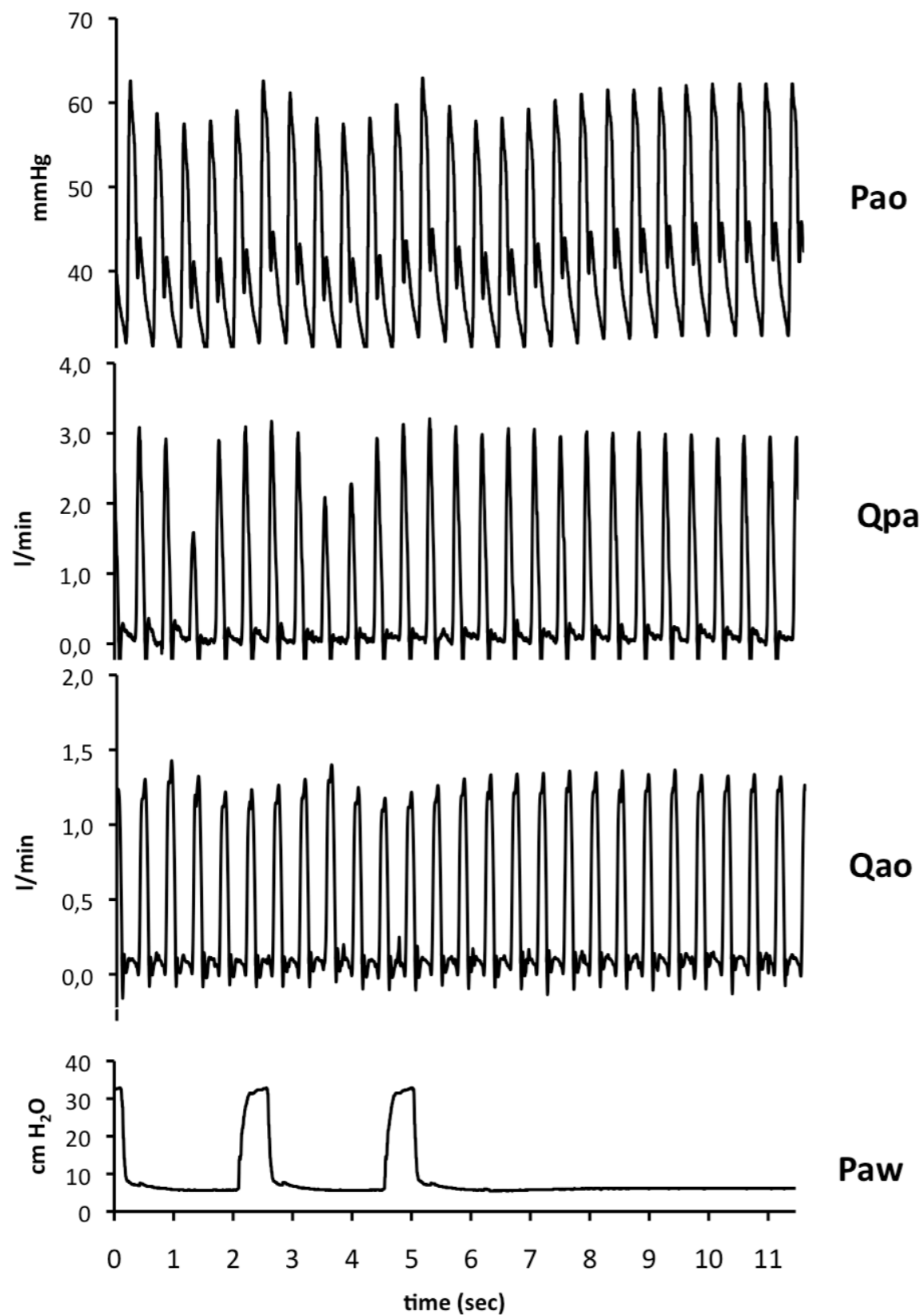
contractility

$R_v$

$P_{abd}$

mechanical  
ventilation

# Arterial pressure variations



# Summary

- Blood pressure  $\neq$  cardiac output
- Cardiac output is a vital sign
- Preload is dependent on many parameters
- Arterial pressure variations reflect preload status
- Fluids are only effective in a state of fluid responsiveness