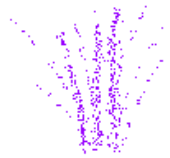
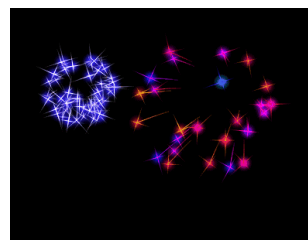


... **Have a Safe, Happy 4<sup>th</sup> of July!!**



**BI 121  
Lecture 8**



**I. Announcements** Next Tues HR & BP Lab 4 + **Required Notebook Check**. Turn in today? Next Thurs Blood Chemistry Lab 5. Please read Lab 5 twice < Thurs. Thanks!

**II. Cardiovascular System** LS 2012 ch 9, Torstar Books 1984, DC 2013 Module 4, Guyton & Hall (G&H) 2011 +...

A. Circulatory vs Cardiovascular (CV)? cf + parts  
LS pp 229, CV vs Lymphatic, DC pp 23, 31

B. CV Pulmonary & Systemic circuits  
DC fig 4-1 p 24, LS fig 9-2b p 231

C. Arteries, capillaries, veins G&H + Torstar

D. Varicose veins? Phlebitis? DC

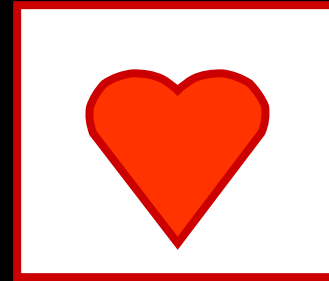
E. ♥ layers, box, chambers, valves, inlets, outlets  
LS fig 9-4 p 233, fig 9-2a p 231; DC pp 23-6

F. Normal vs abnormal blood flow thru ♥ & CV system  
Billy has a hole in his ♥ SI Fox 2009 fig 13.16, 13.17

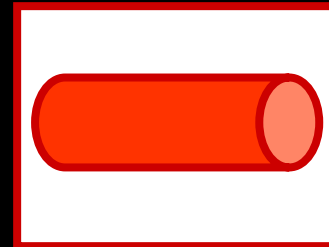


**III. Comments on Midterm & Tests Returned?**

***Cardiovascular (CV) = Heart + Vessels + Blood!***



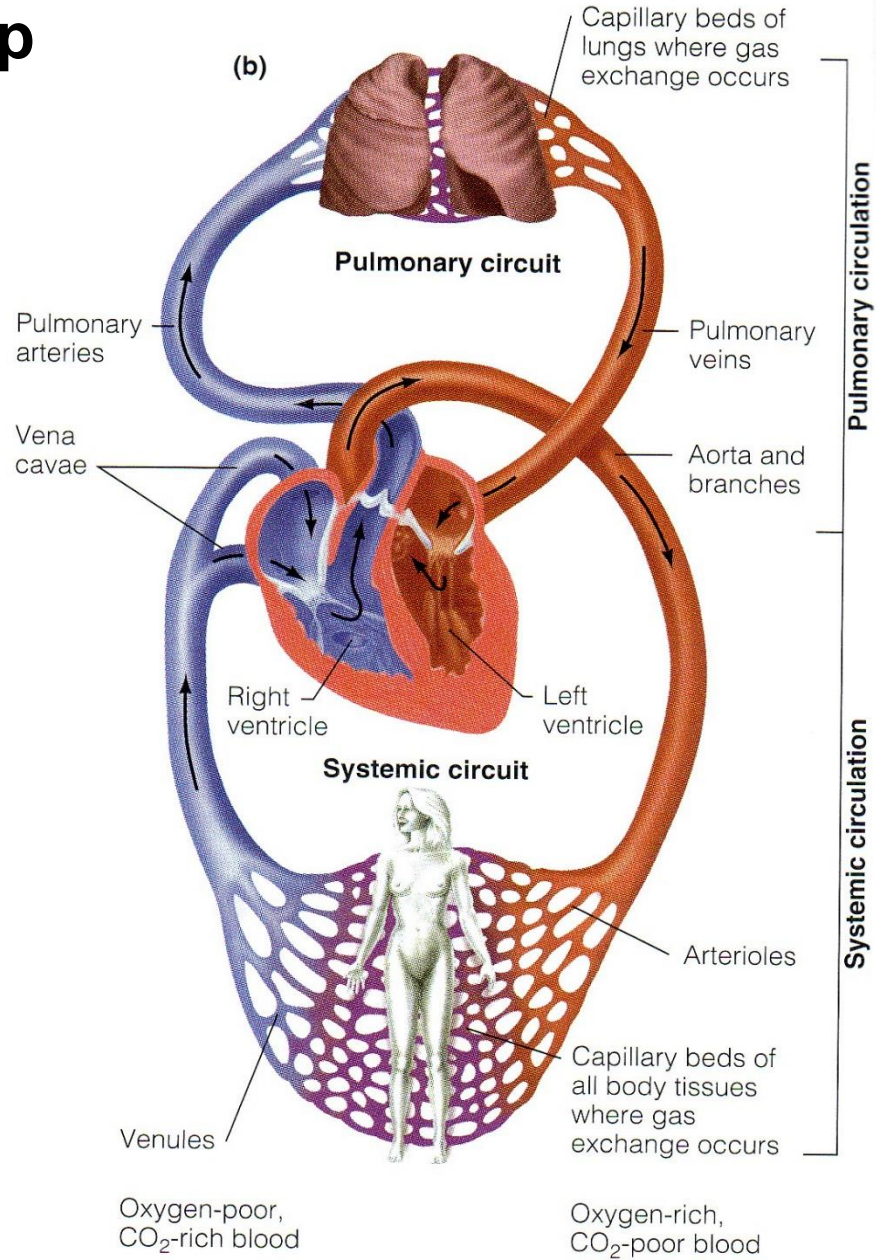
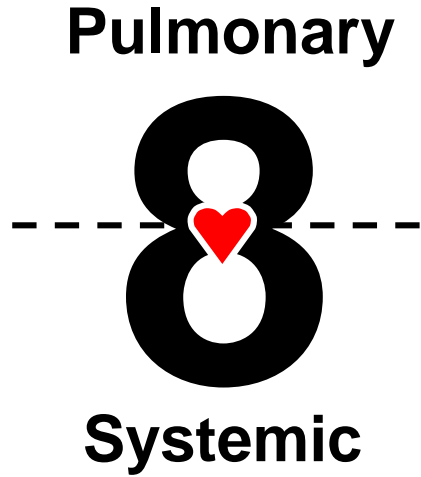
+



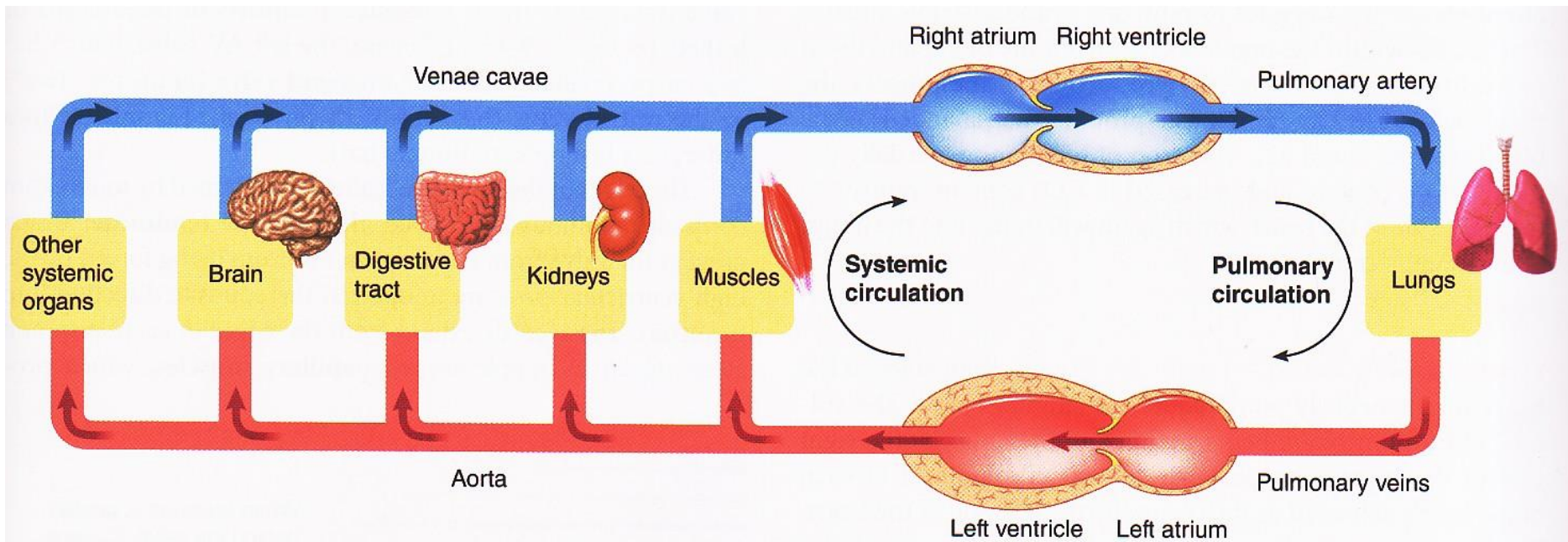
+

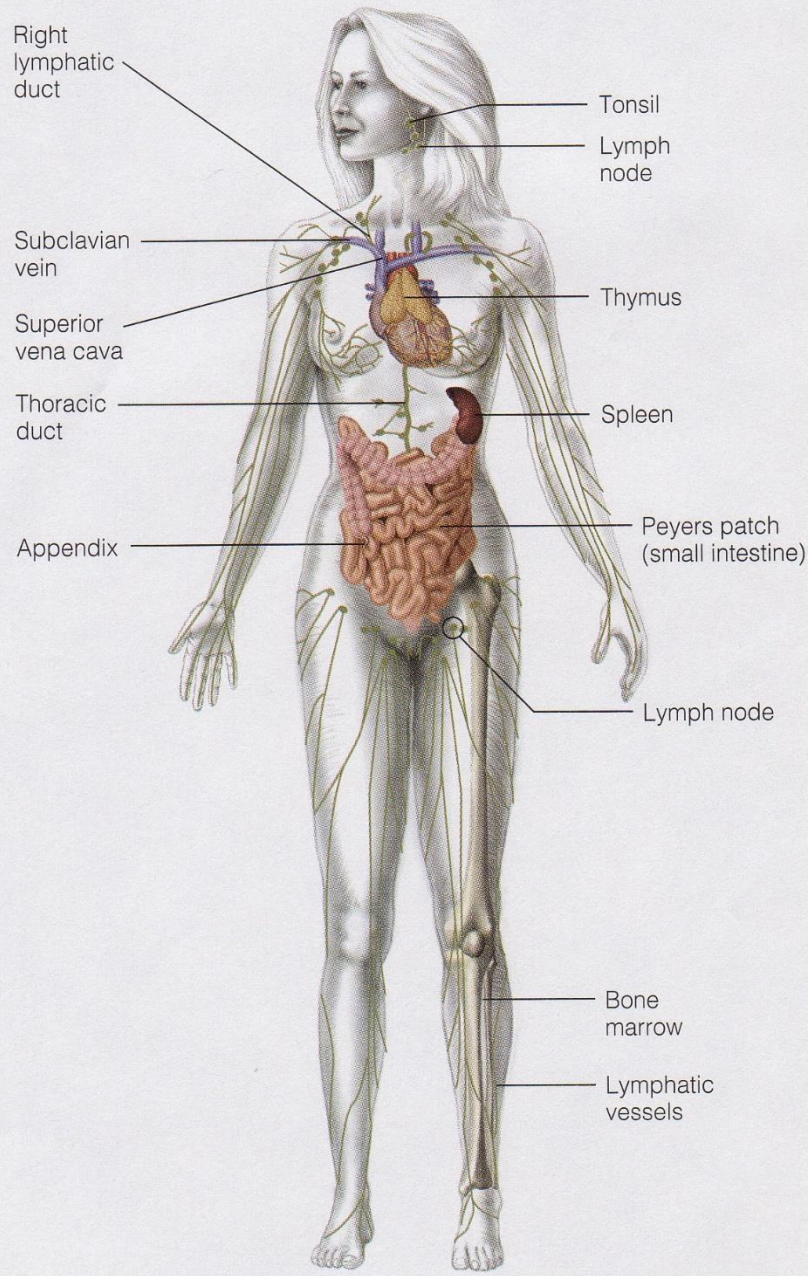


**NB: Figure-8 loop**



# Dual Pump Action & Parallel Circulation



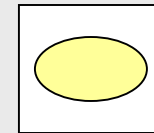


# *Lymphatic System*

## 1. Lymph Nodes

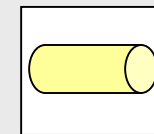
## 2. Vessels

## 3. Lymph

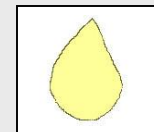


**No pump!**

+



+



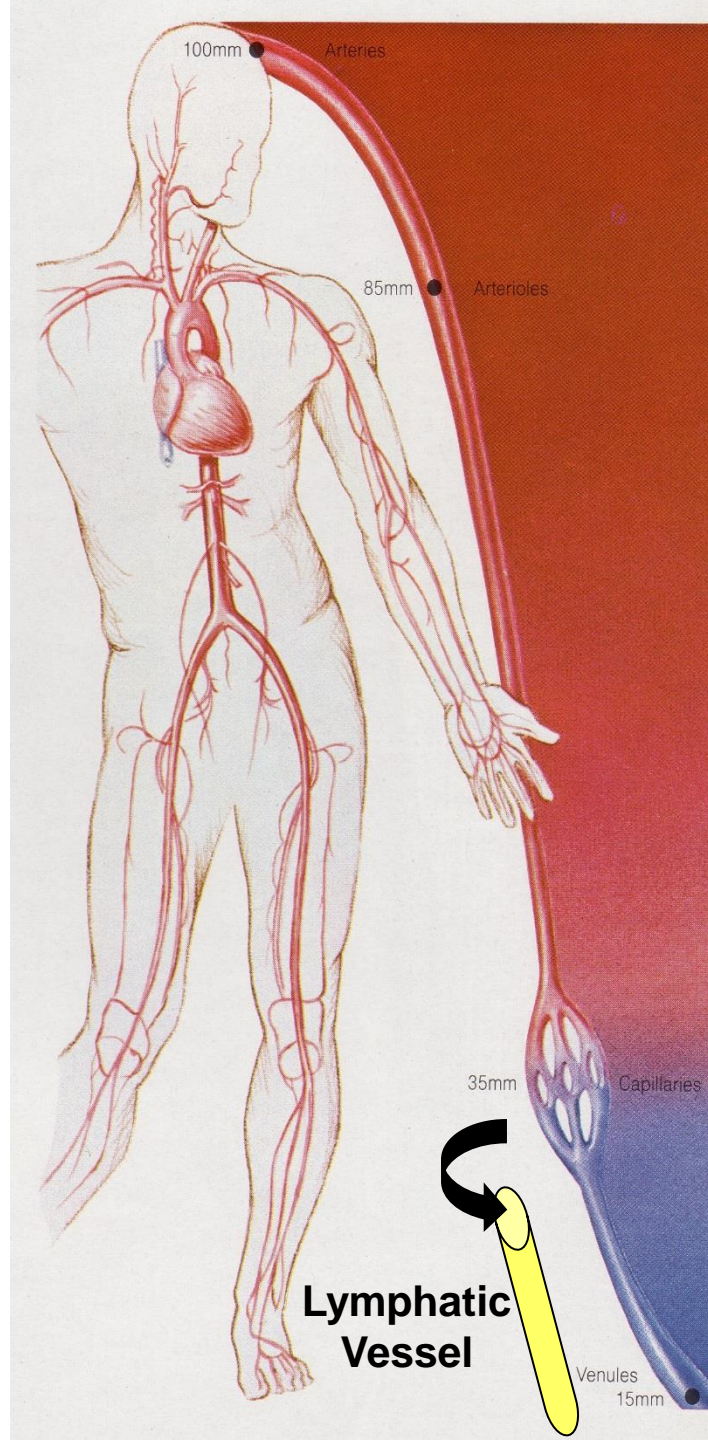
# *Lymphatic System*

**Alternative System of  
Circulation  
or  
Drainage System**

***Lymph Vessels || Veins***

# ***Lymphatic System Blockage in Elephantiasis from Mosquito-borne Parasitic Filaria Worm***



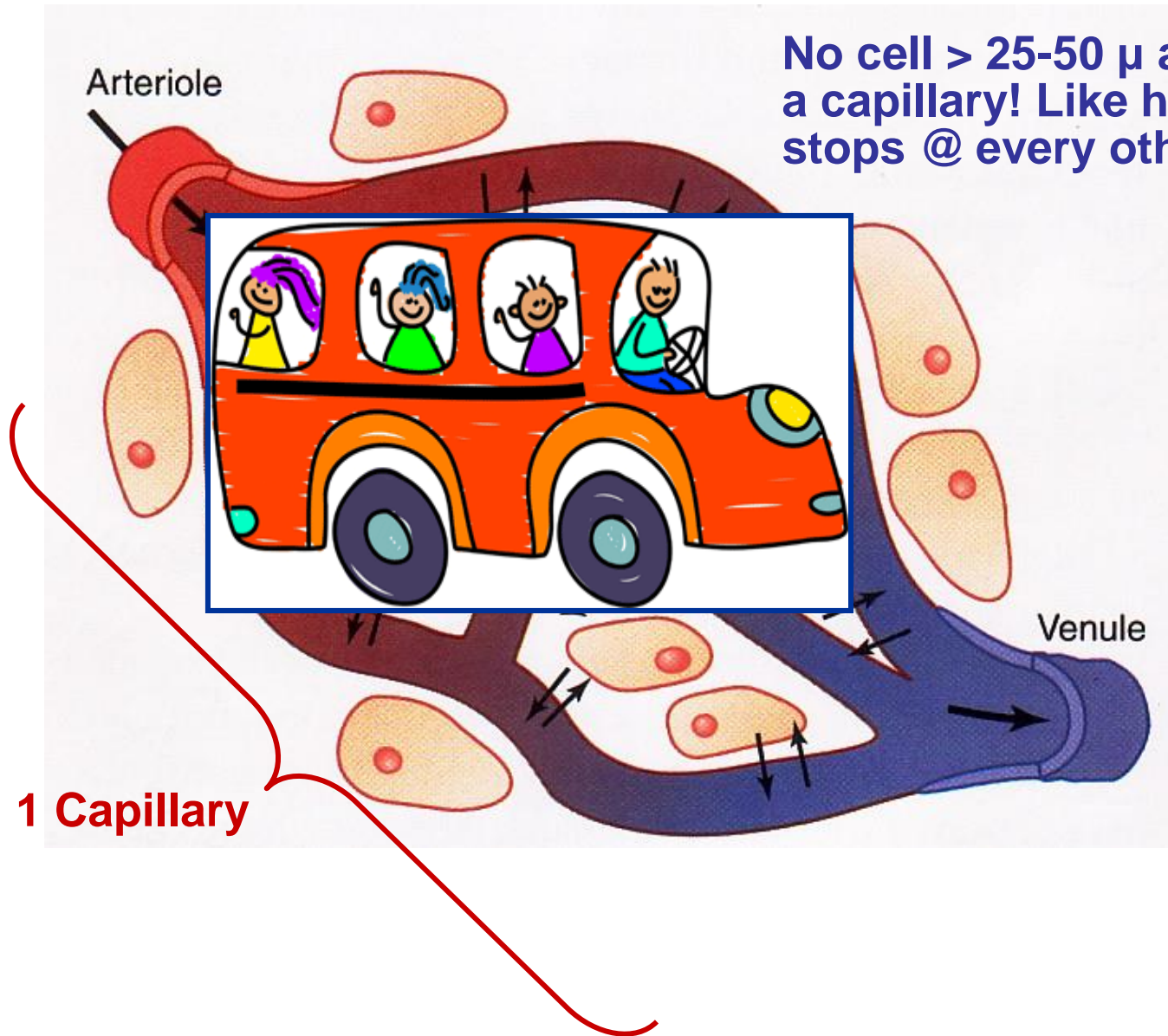


**Lymphatics collect run-off & are parallel to venules/small veins!**

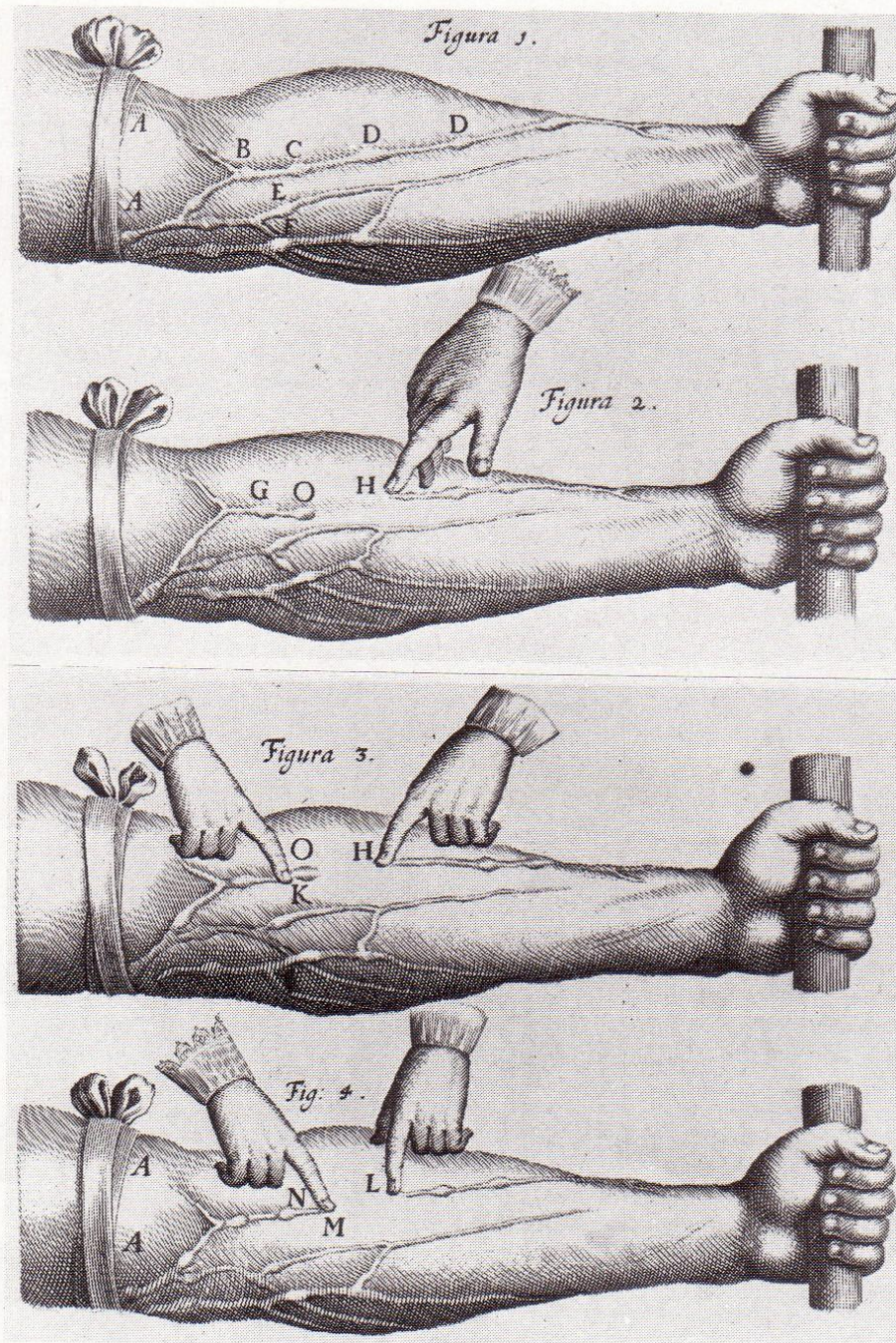




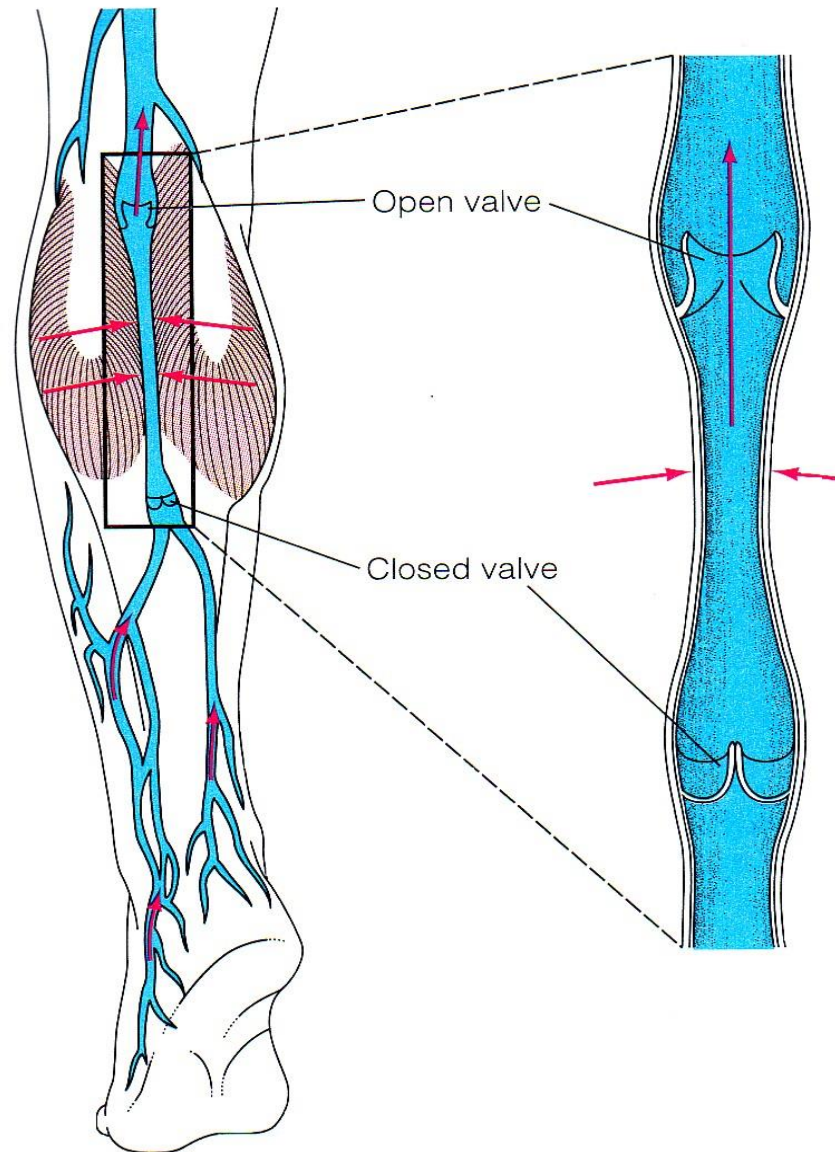
# Microcirculation Exchange: 10 Billion Capillaries!



**Harvey  
Experiments:  
1-way system  
of venous  
valves!**



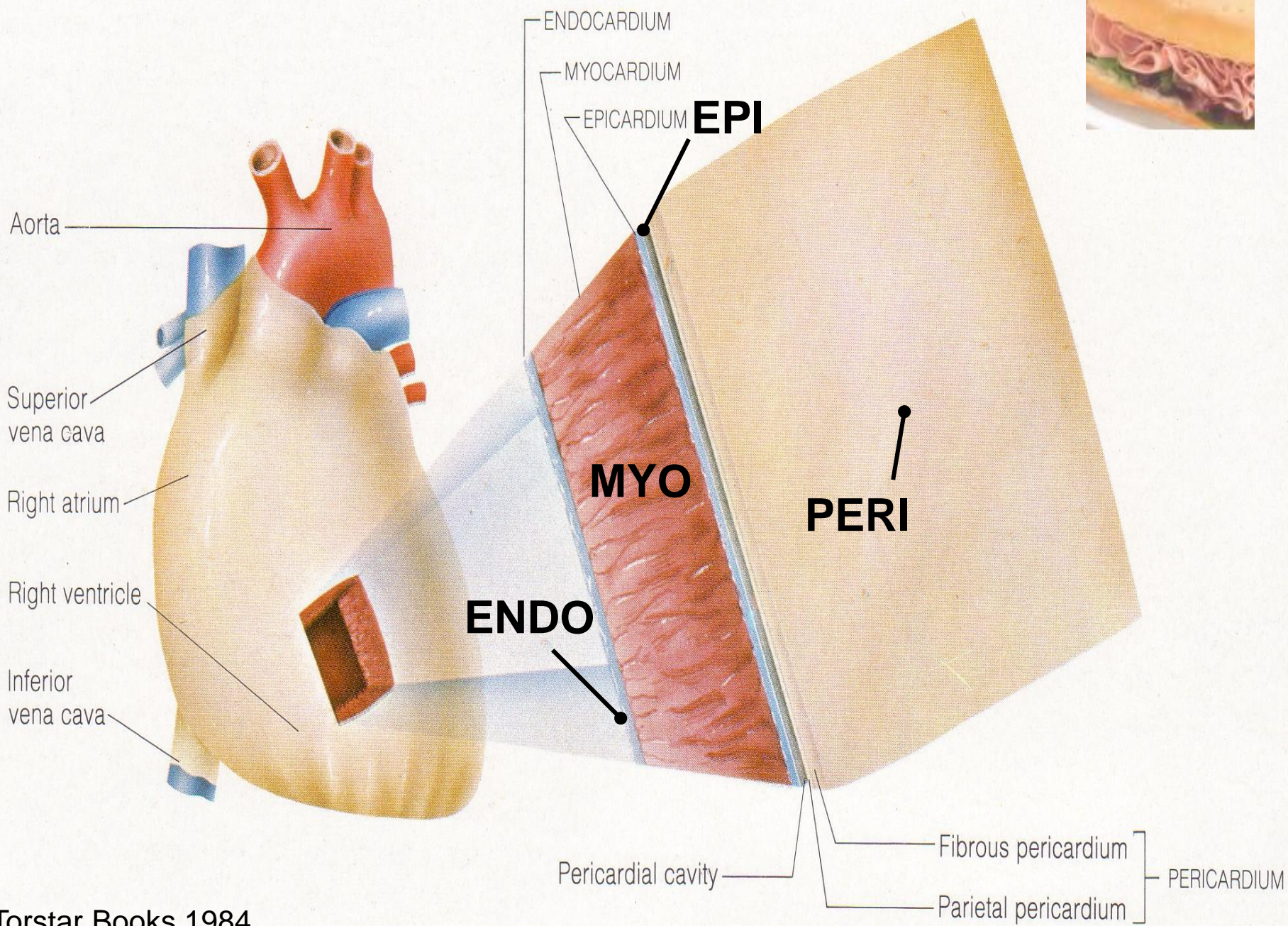
# Skeletal Muscle Pump



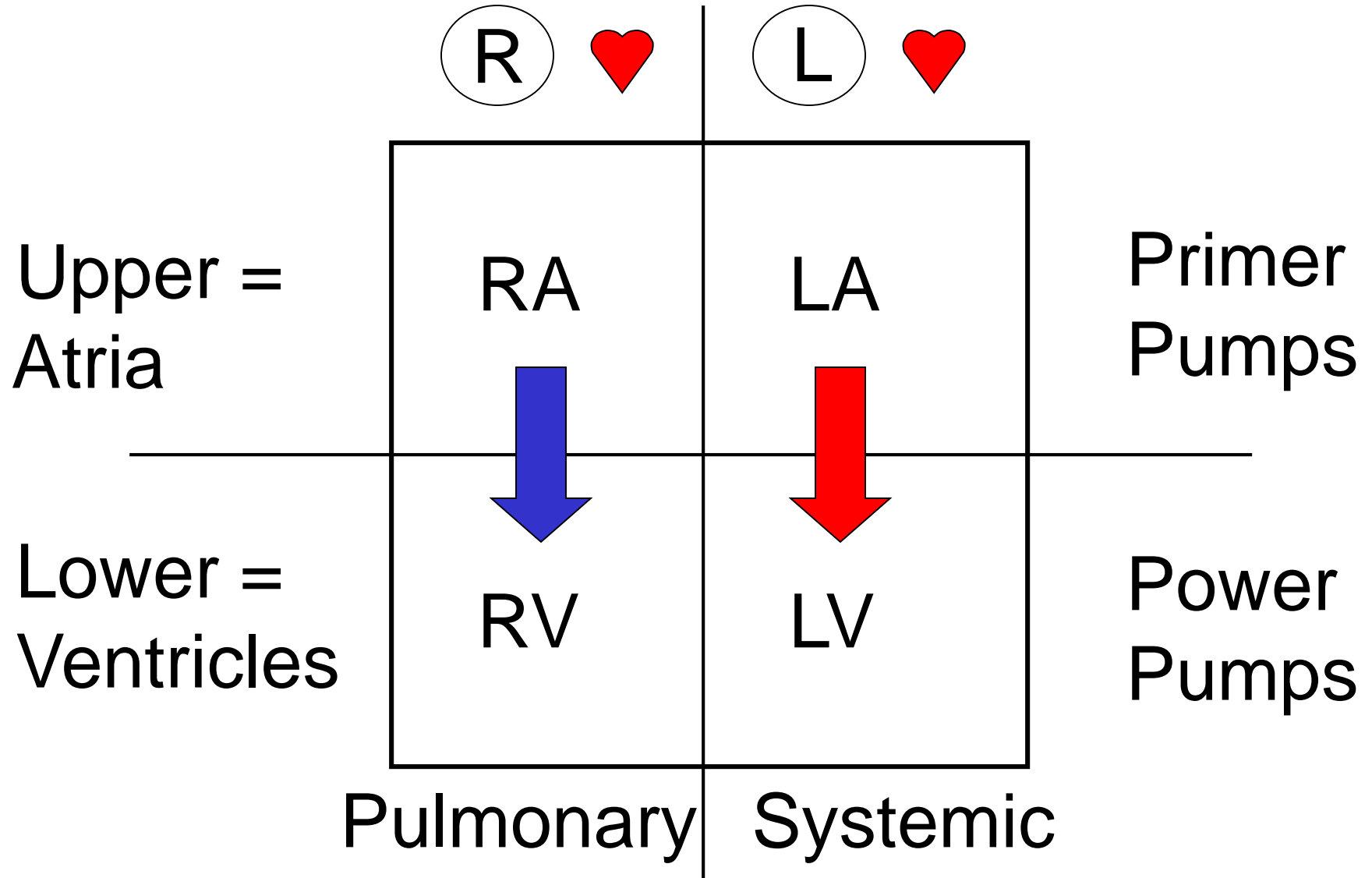


# The Heart

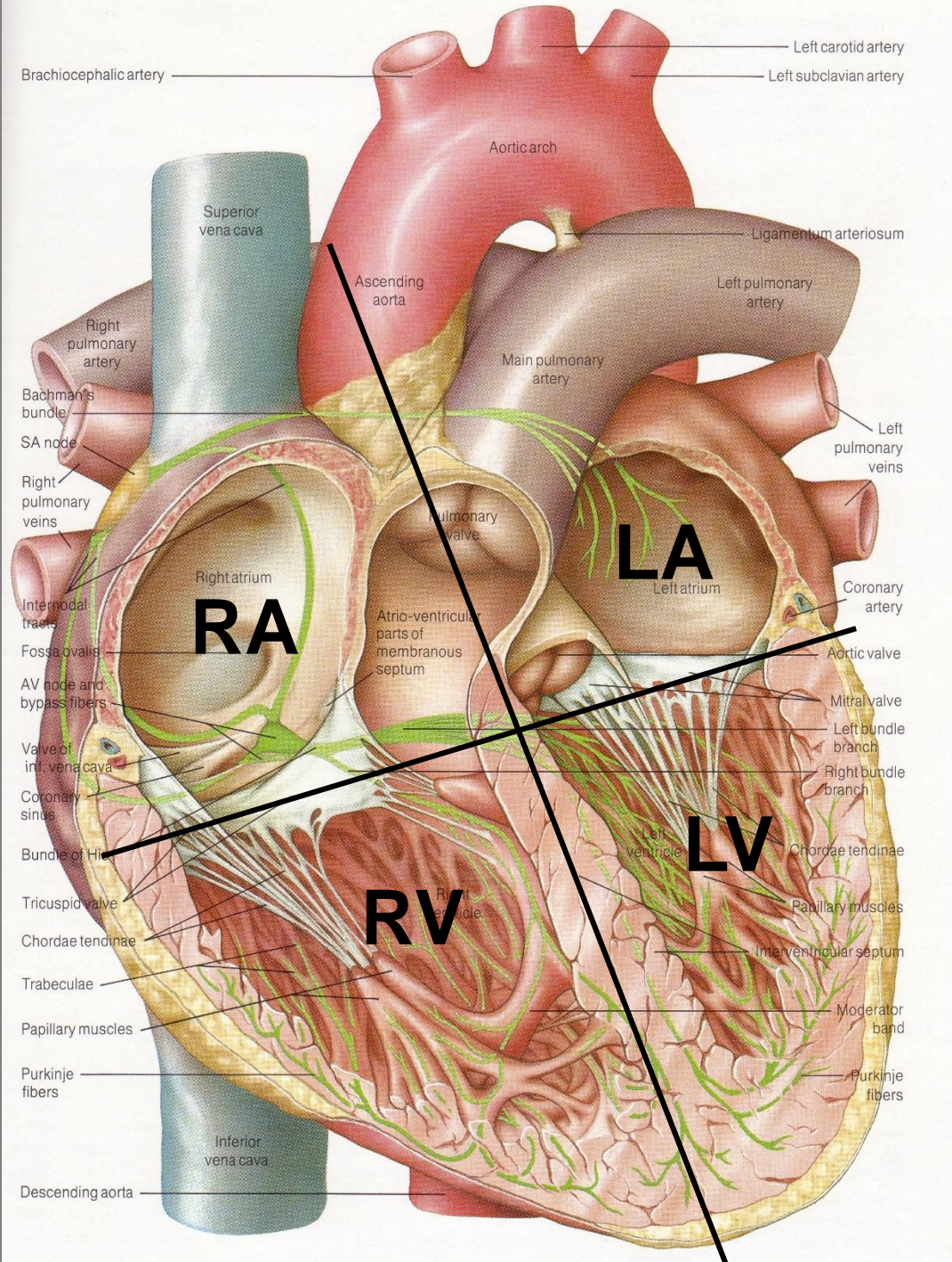
The Living Pump



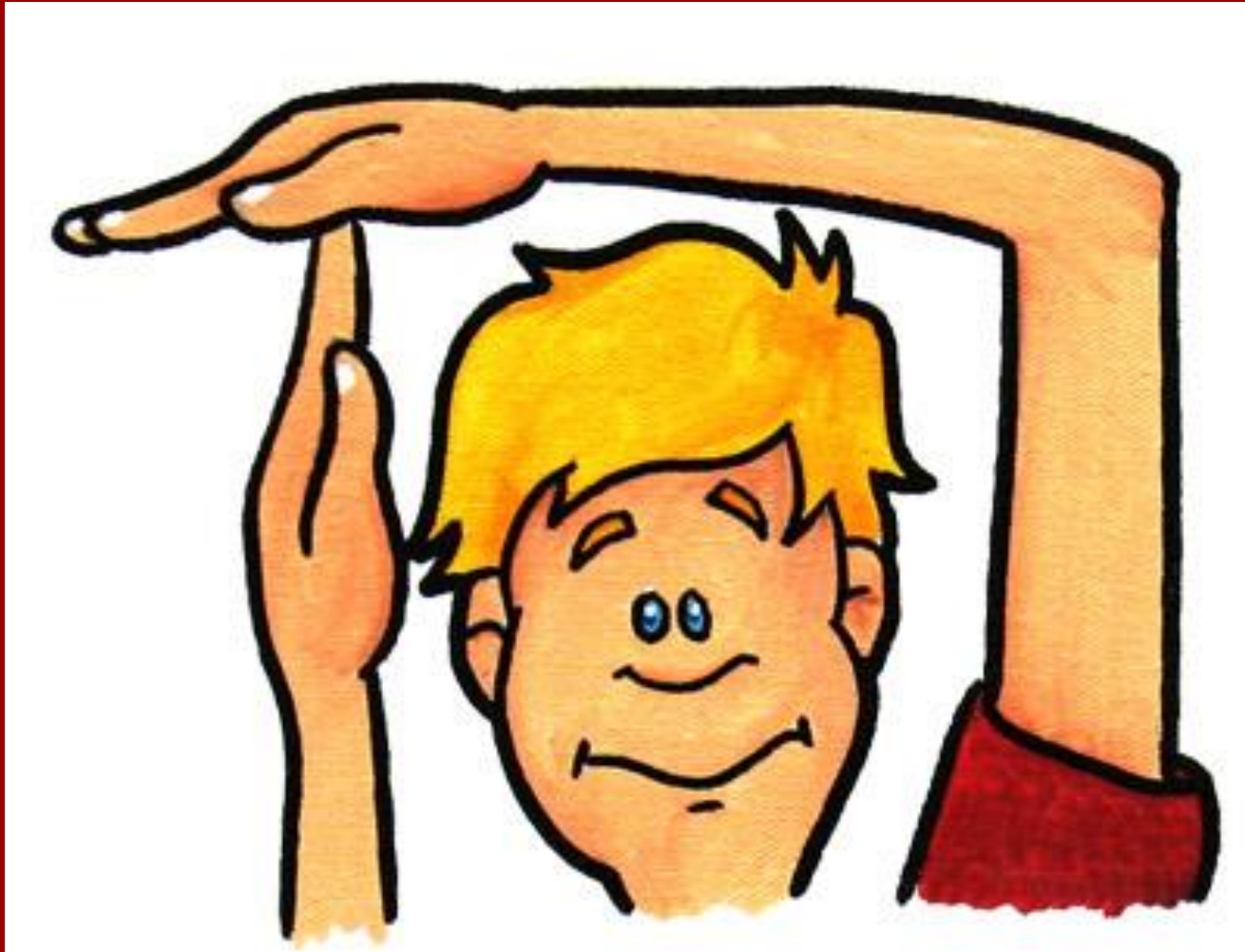
Human  = 4-chambered box?  
2 separate pumps?



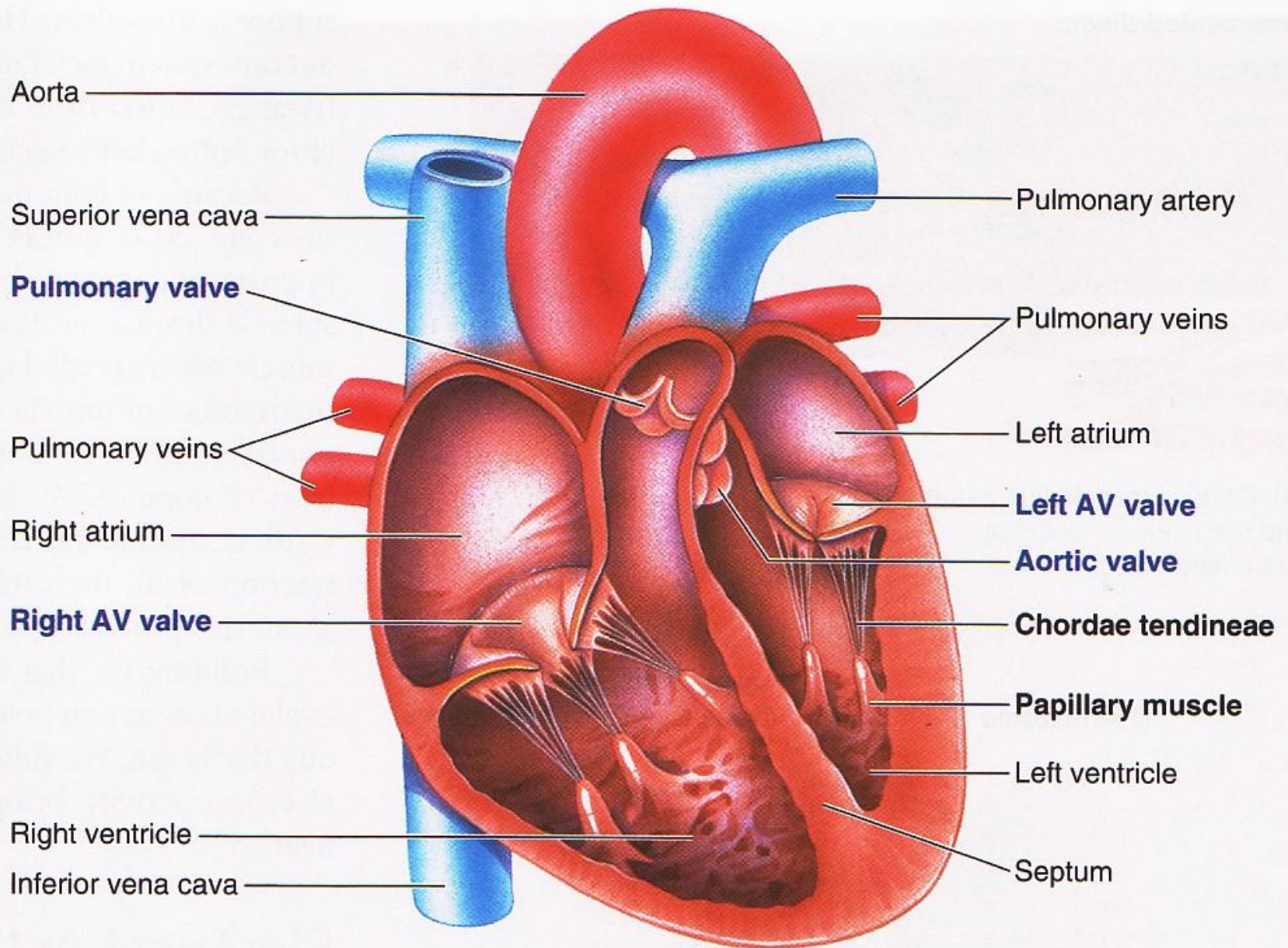




***Time-out for Questions!***



***+ Brief Break!***



(a) Location of the heart valves in a longitudinal section of the heart

# Heart Valves Ensure Unidirectional Blood Flow!



Right AV valve



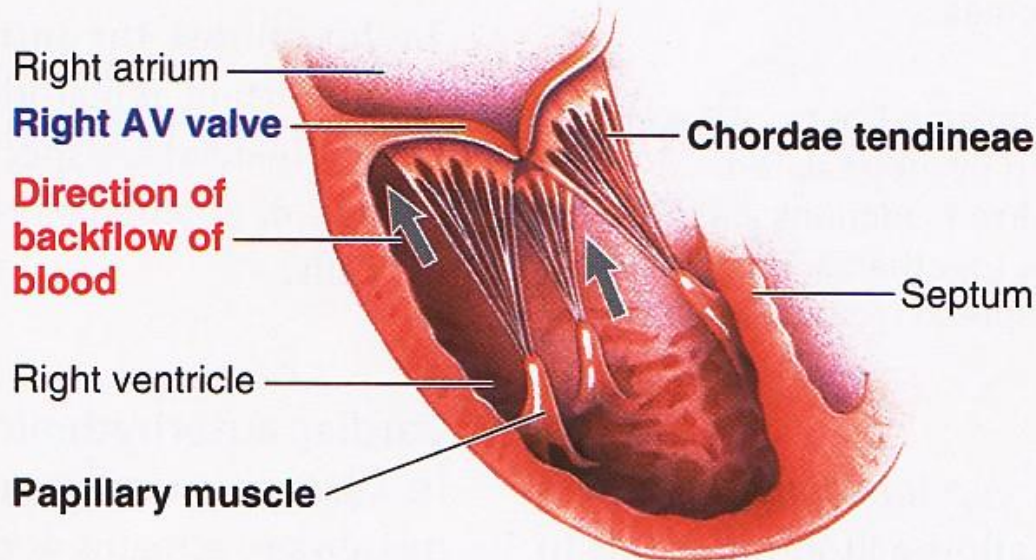
Left AV valve

Mom's valve!



Aortic or pulmonary valve

(b) Heart valves in closed position, viewed from above



(c) Prevention of eversion of AV valves

● **FIGURE 9-4** Heart valves.



Human ♥ = 4 unique valves?  
2 valve sets?

Semilunar = Half-moon shaped

More  
rigid

1. Pulmonic/Pulmonary
2. Aortic



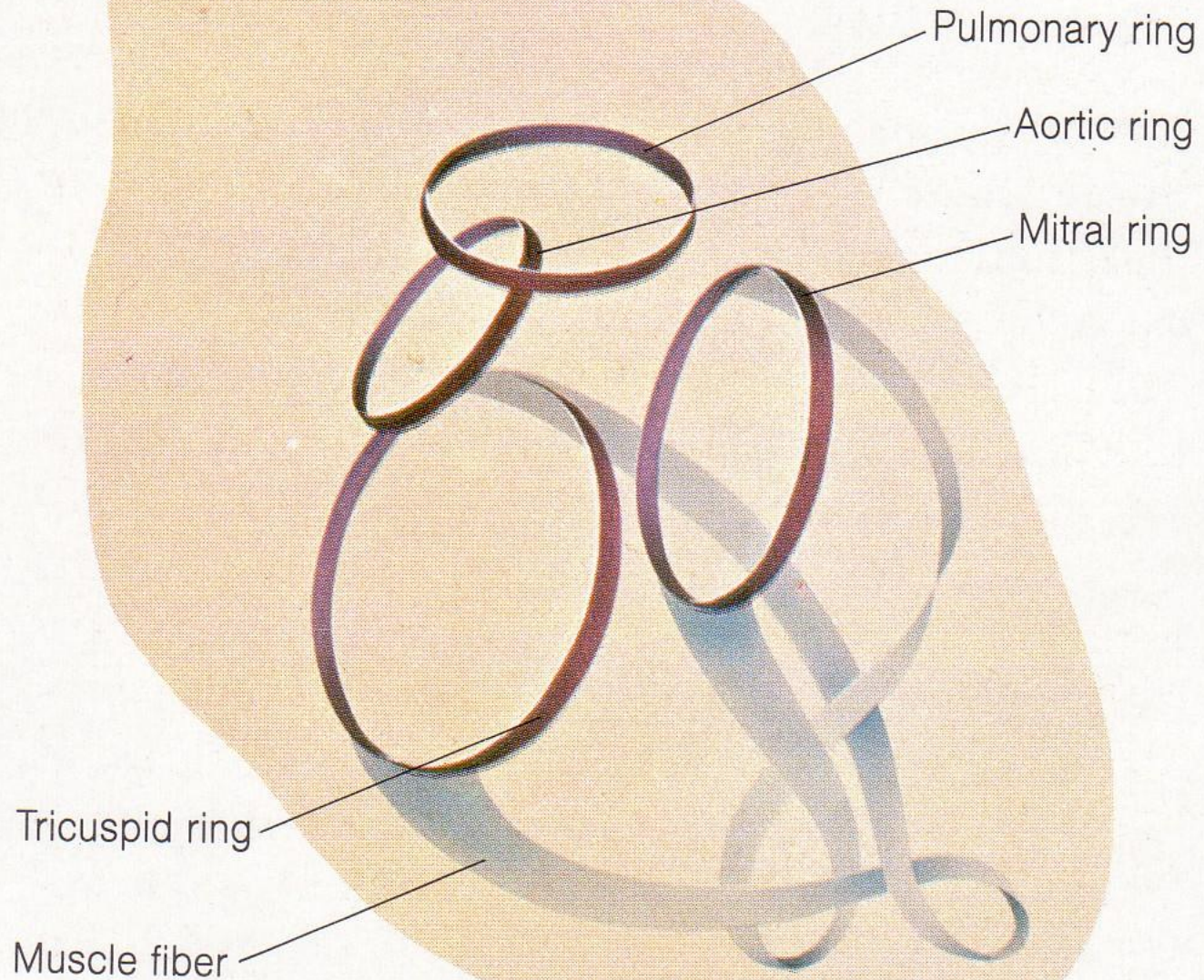
AV = Atrioventricular

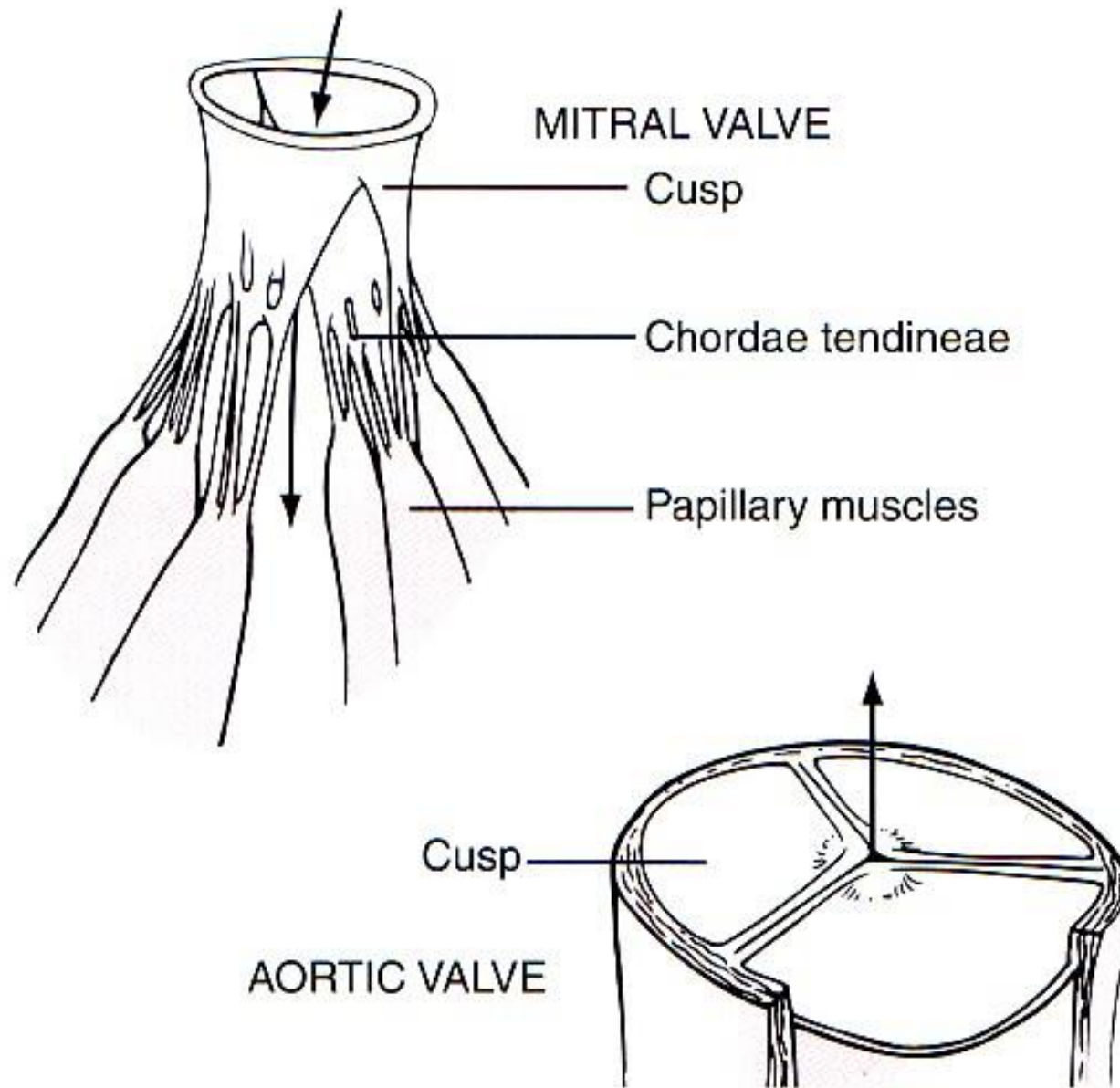
More  
flimsy

3. (R) AV = Tricuspid
4. (L) AV = Mitral/Bicuspid



# Heart Valve Orientation & Scaffolding



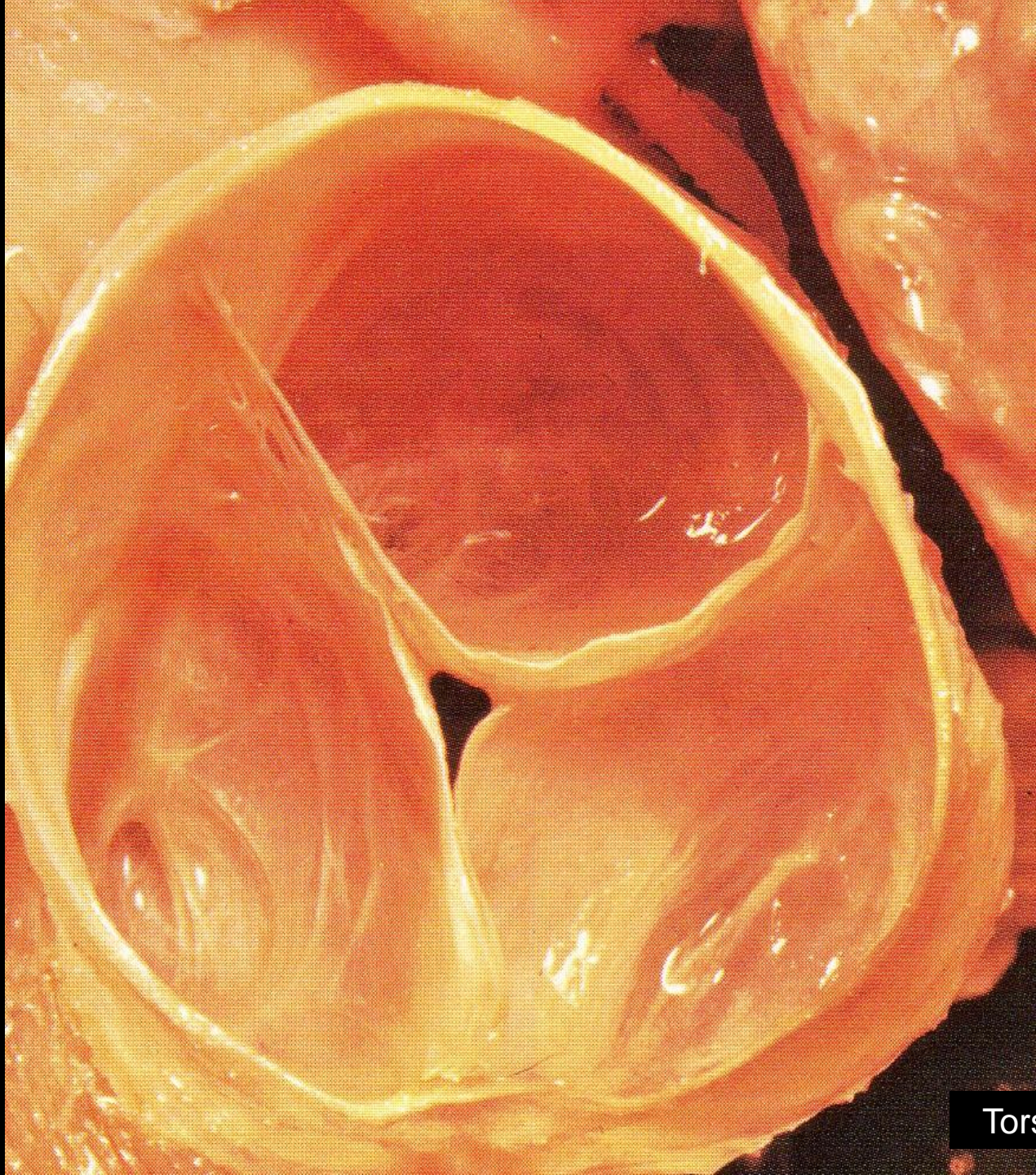


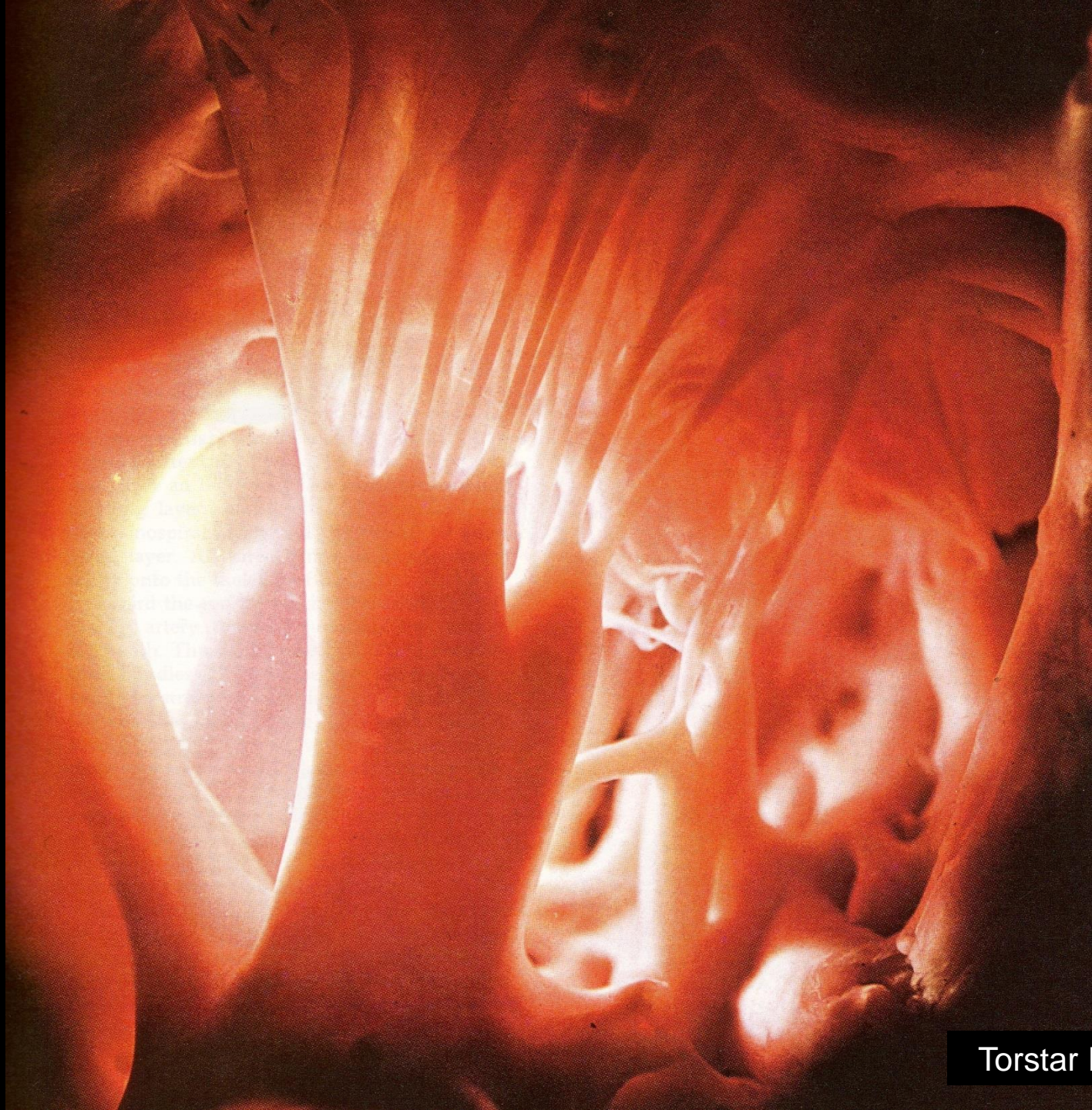
**FIGURE 9-6**

Mitral and aortic valves.



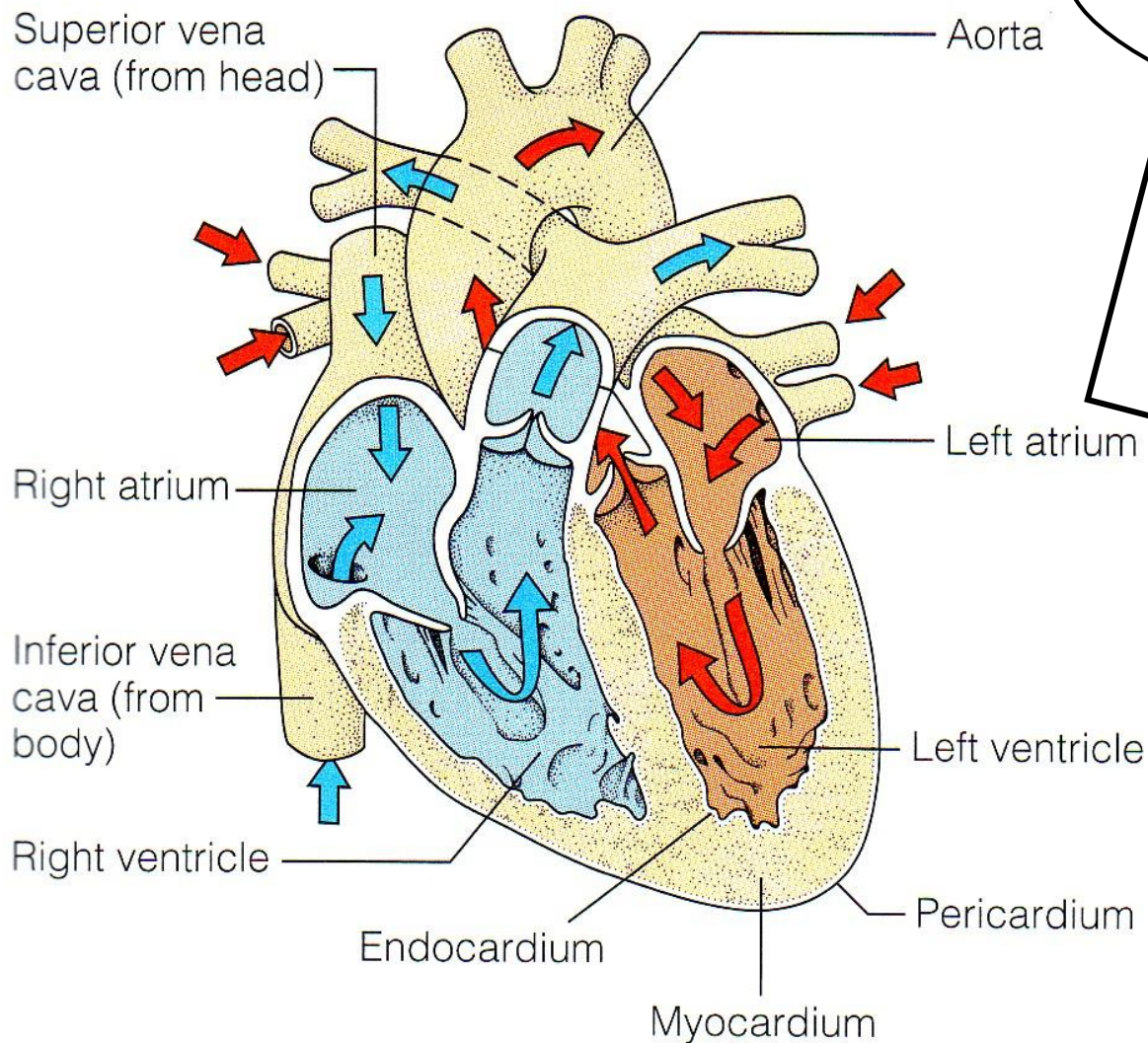




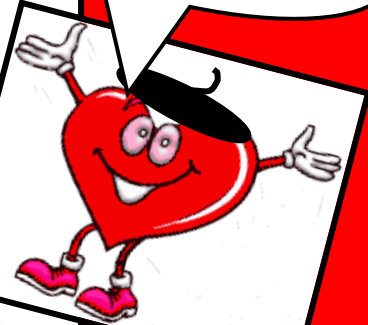


Torstar Books 1984

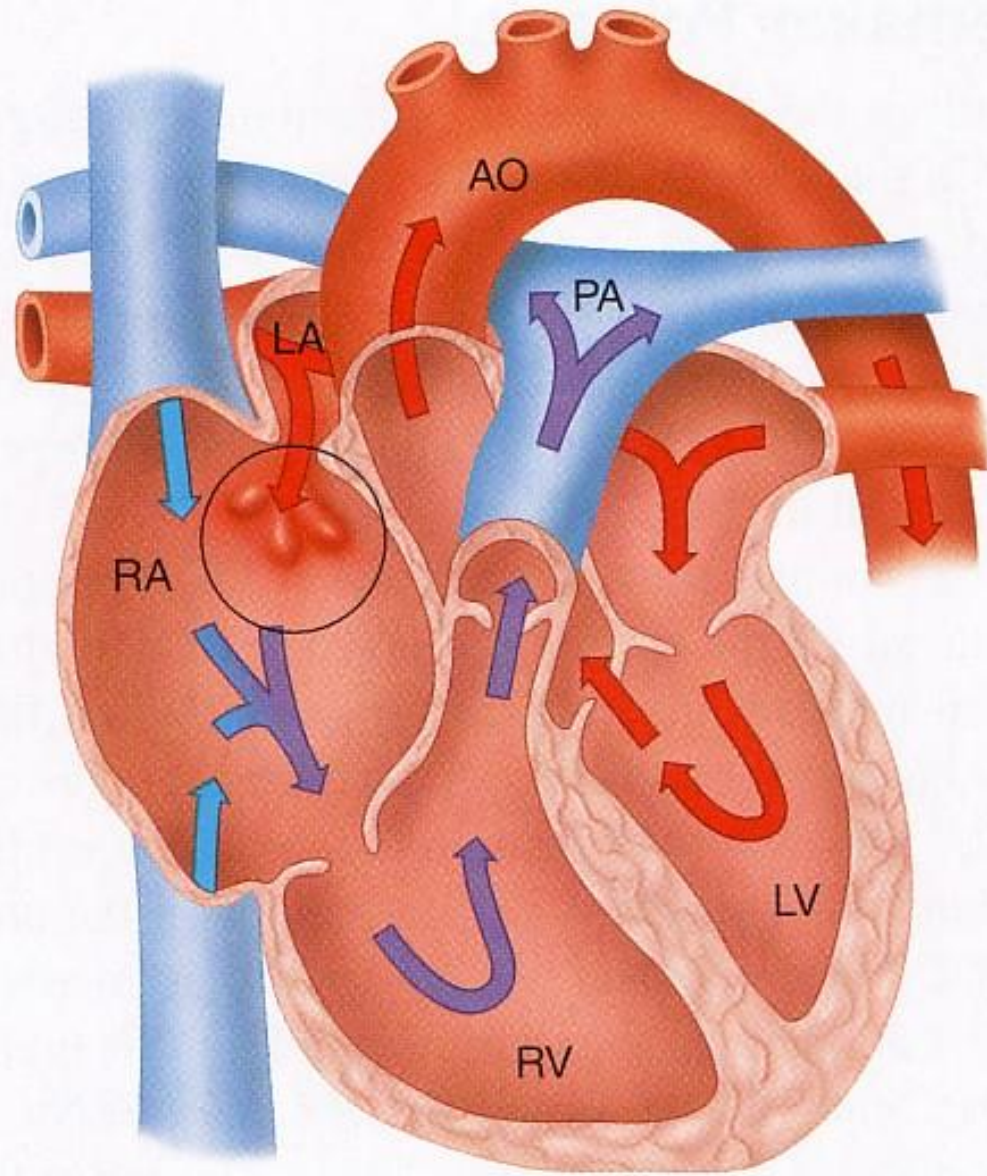
# Veins → Atria → Ventricles → Arteries



VAVA!



<http://www.nhlbi.nih.gov/health/health-topics/topics/hhw/contraction.html>



SI Fox 2009 fig 13.16 p 419

Septal defect  
in atria

