



---

 **第二十七章**

**心血管系统发生**

occurrence of cardiovascular system

# 授课提纲

---



## 一、心脏的发生

原始心脏的形成

心脏外形的建立

心脏内部分隔



## 二、胎儿血液循环和出生后血液循环的变化

胎儿血液循环途径

出生后的变化



## 三、先天畸形

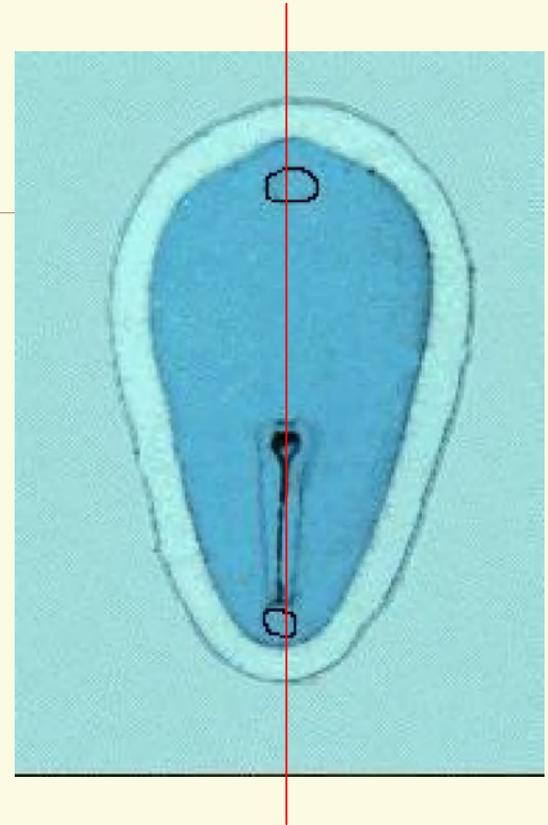
# 一、心脏的发生

## (一) 原始心脏的形成

时间：第3周

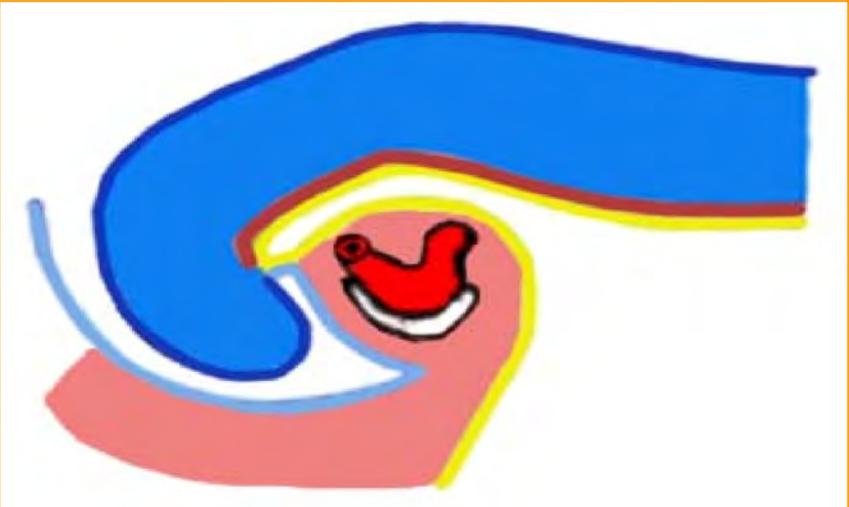
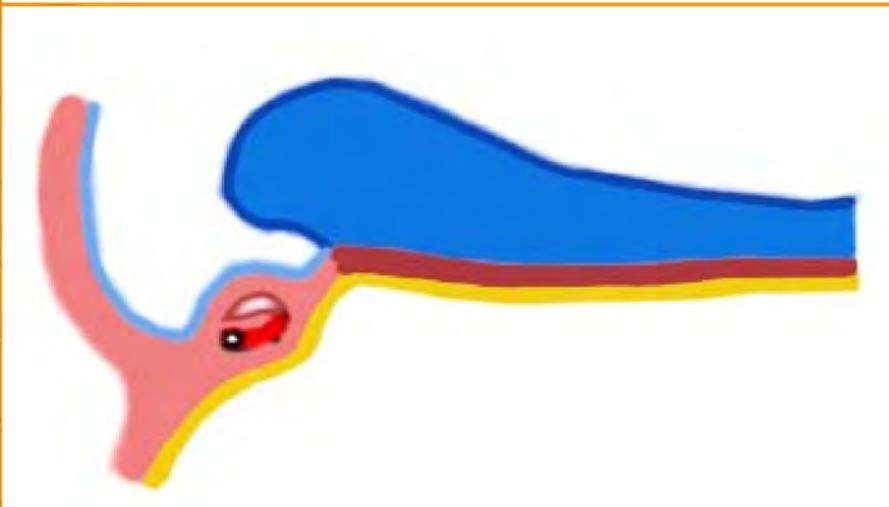
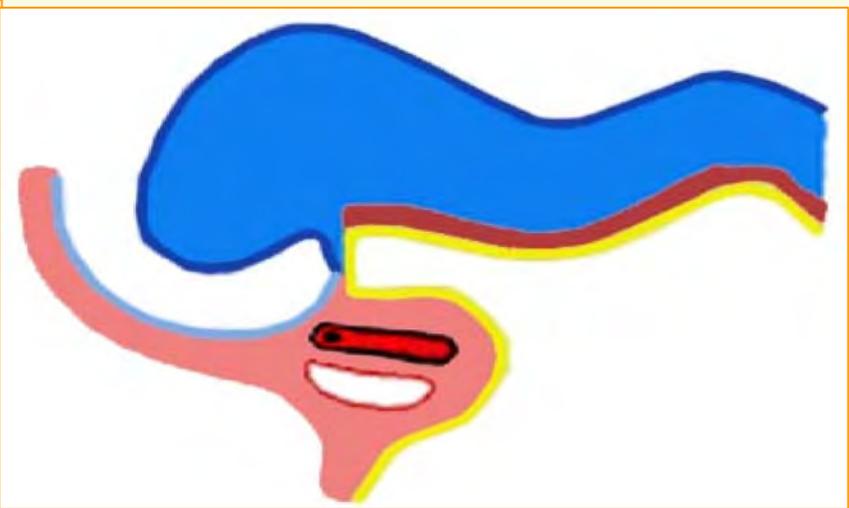
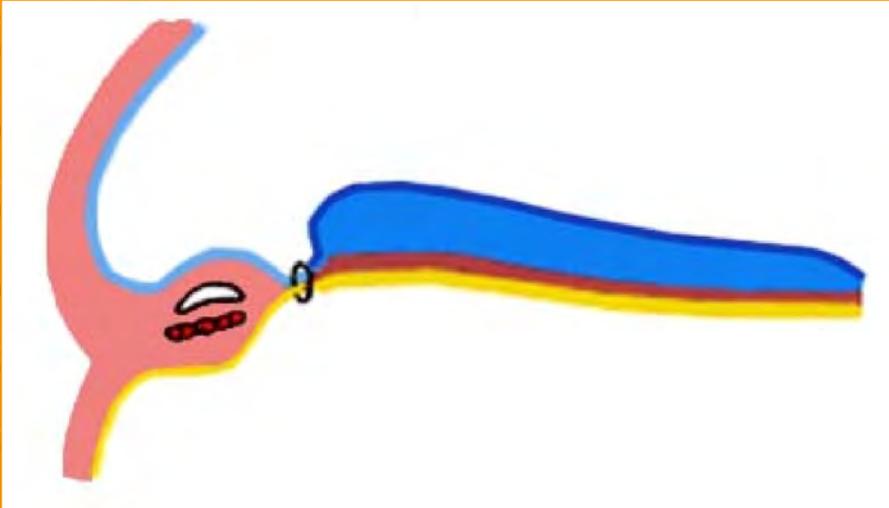
部位：口咽膜头端

来源：中胚层

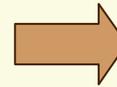
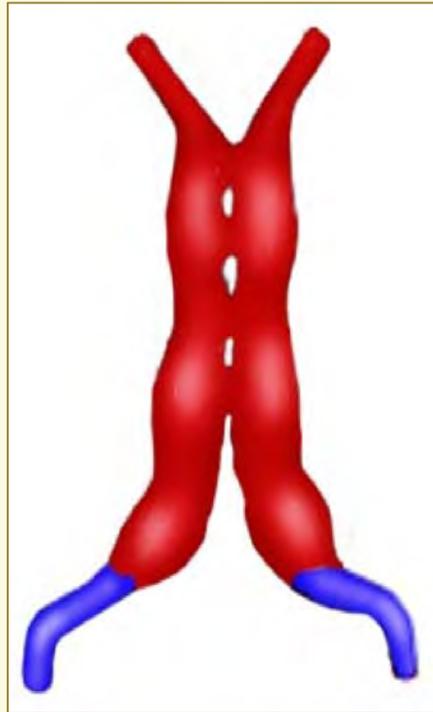
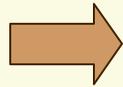
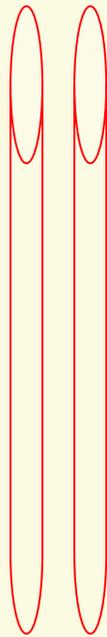
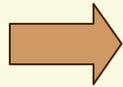
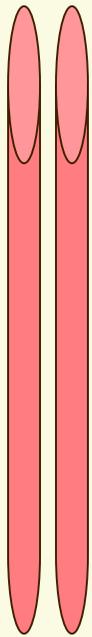


**生心区** { 围心腔 → 心包腔  
生心板 → 心管 → **一条心管**  
(一对) (一对)

# cardiogenic area



## formation of heart tube



生心板  
(一对)

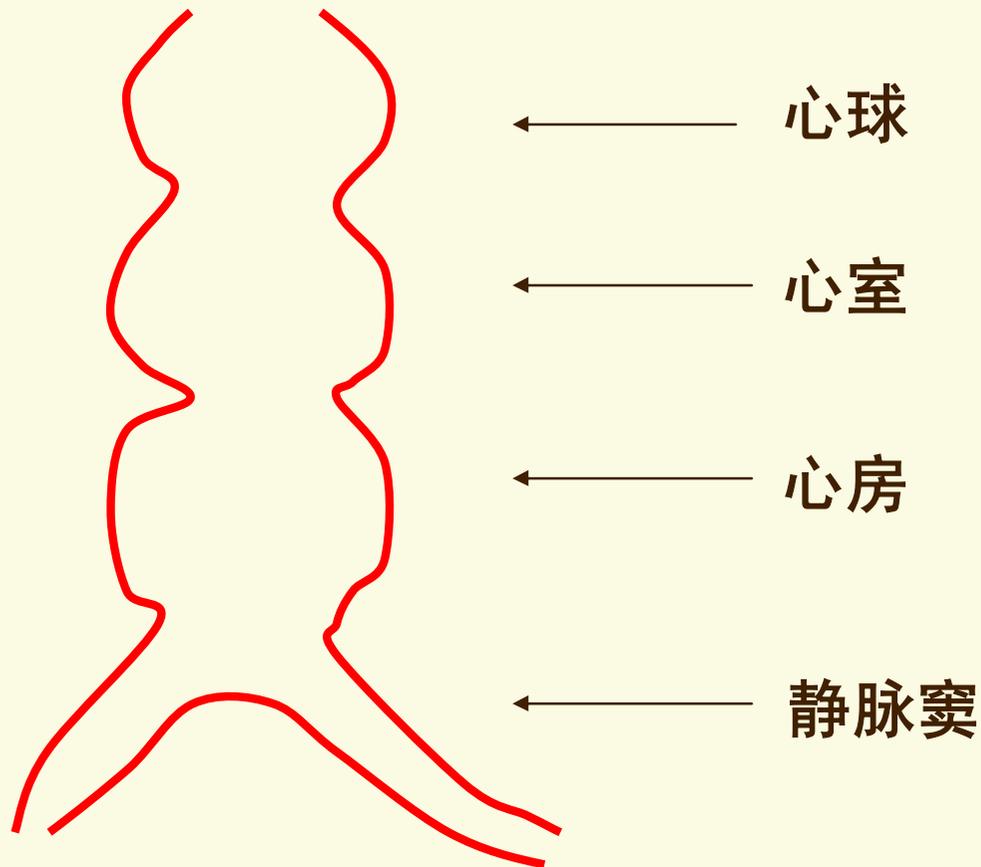
心管  
(一对)

一条心管

## 📄 (二) 心脏外形的建立

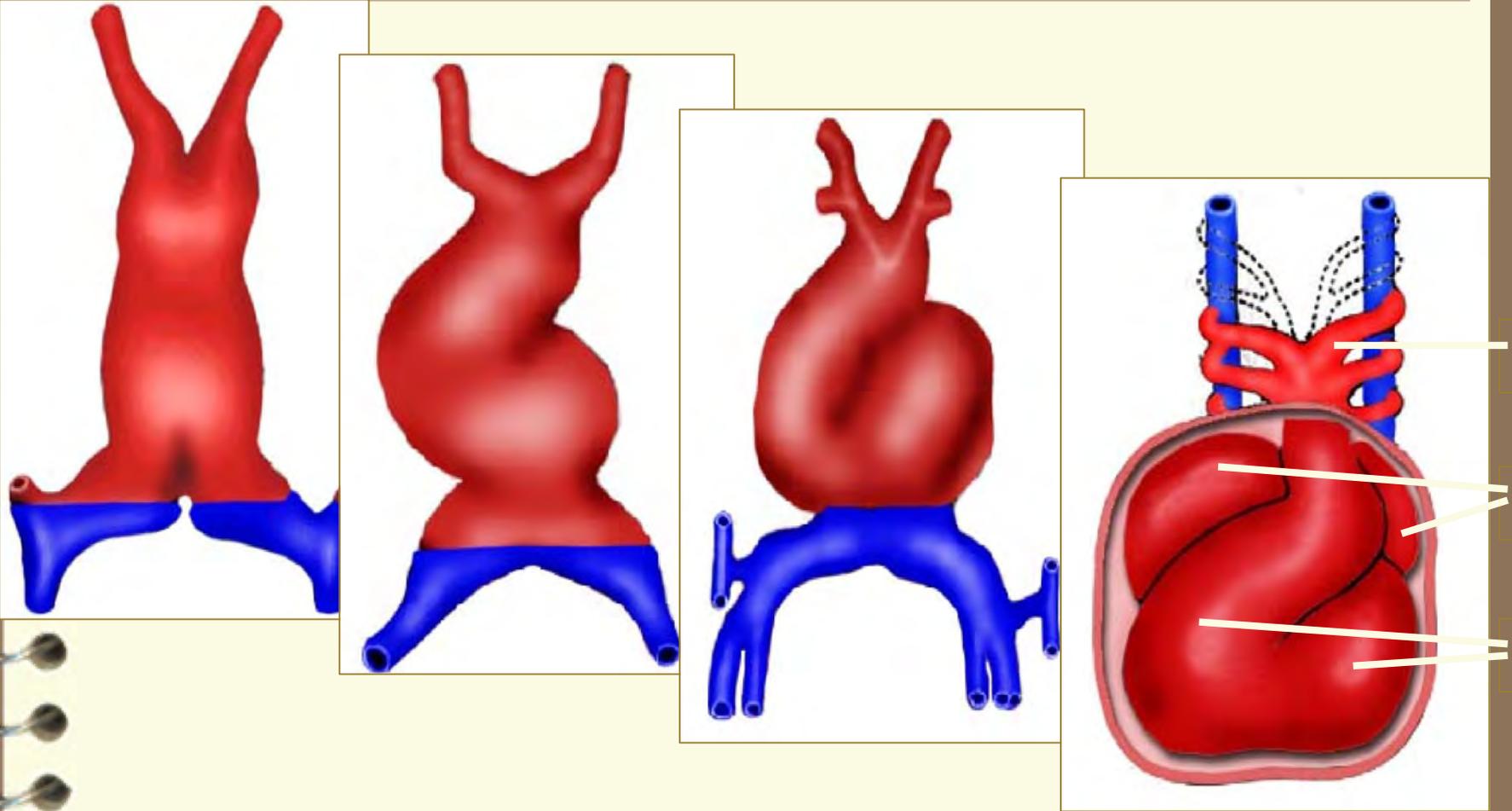
📄 心血管出现三个膨大：**心球、心室、心房**

原因：生长速度不同



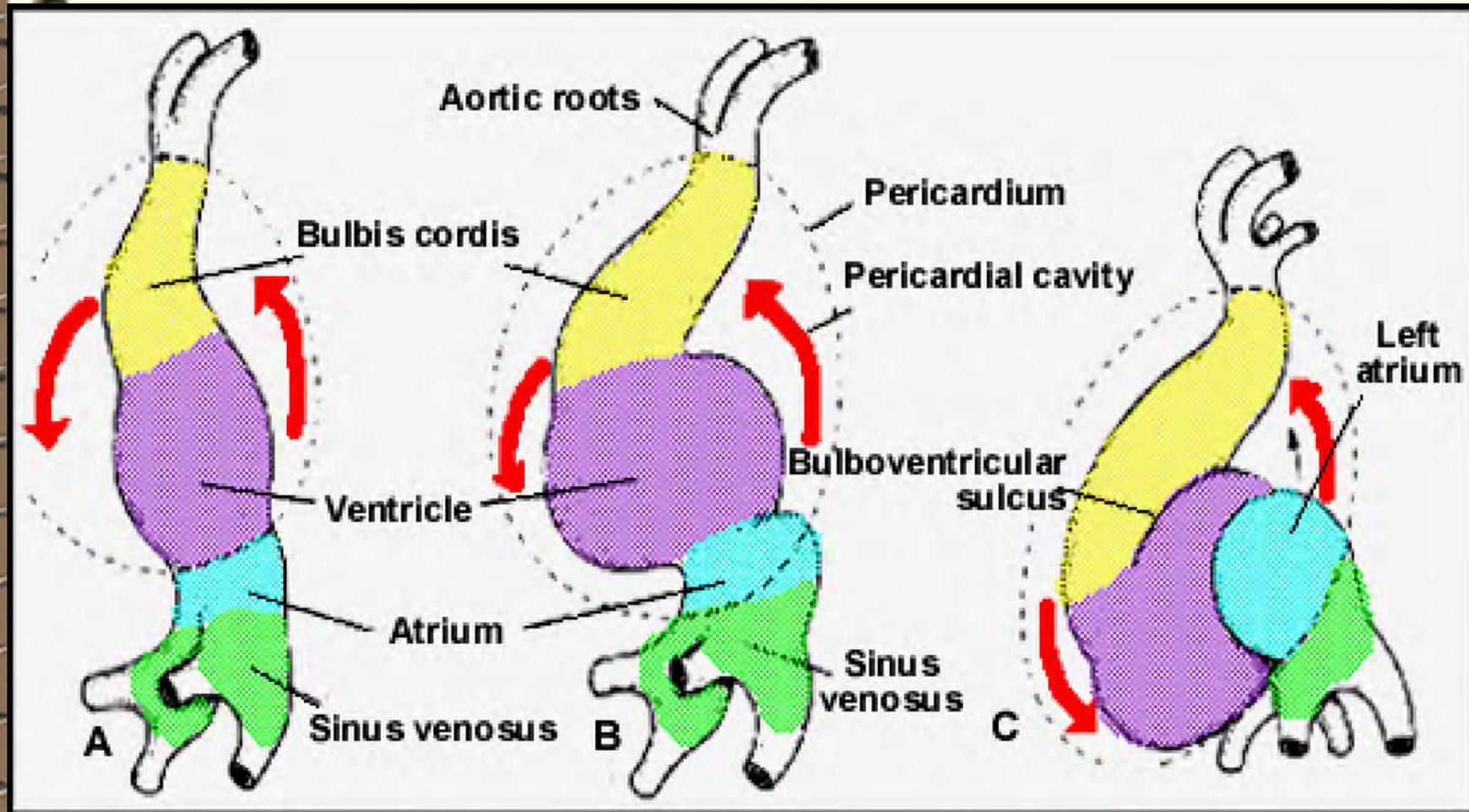
📄 心血管出现二个弯曲:

“U”形弯曲 球室袢  
“S”形弯曲



第5W初

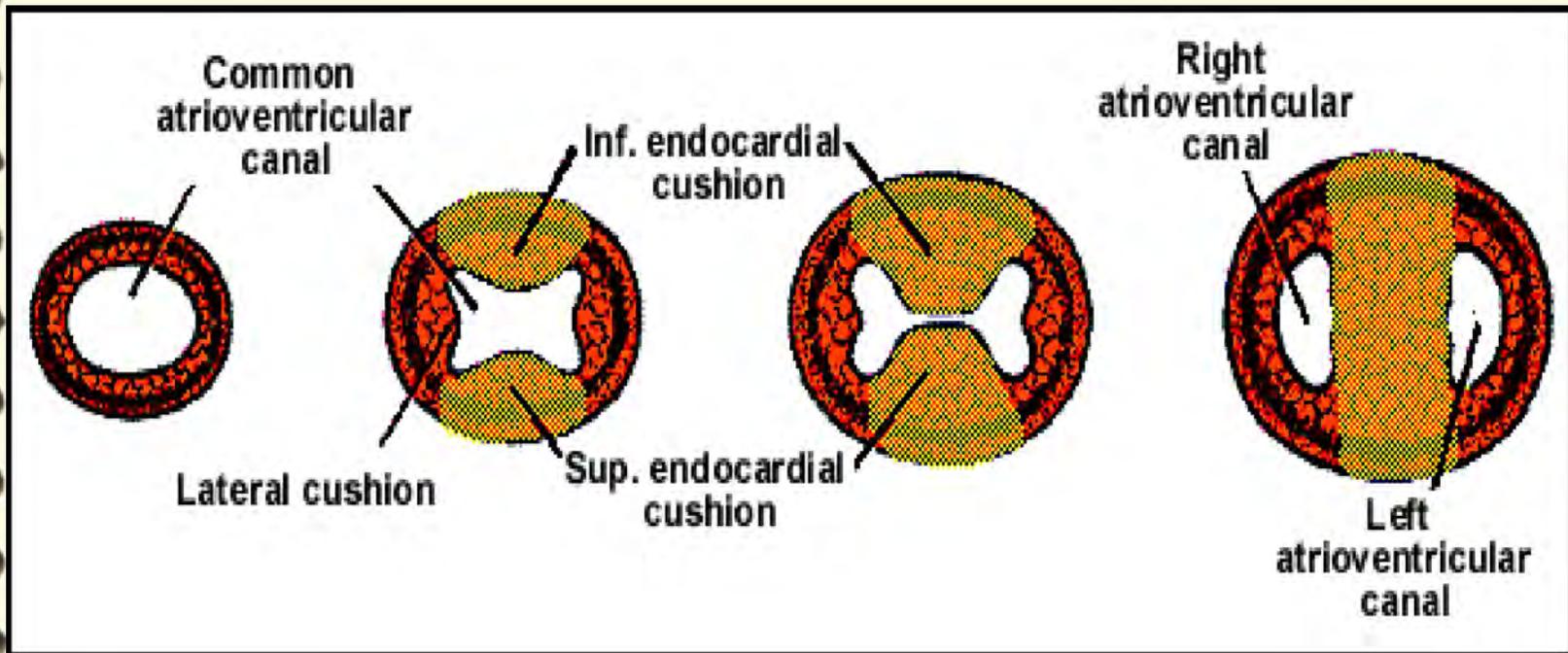
## formation of heart outline form



### (三) 心脏内部分隔

#### 1、房室管的分隔

背 心内膜垫      对应生长      左、右房室孔  
腹 心内膜垫      →      左、右房室孔



partition of atrioventricular canal

## 2、原始心房的分隔

---

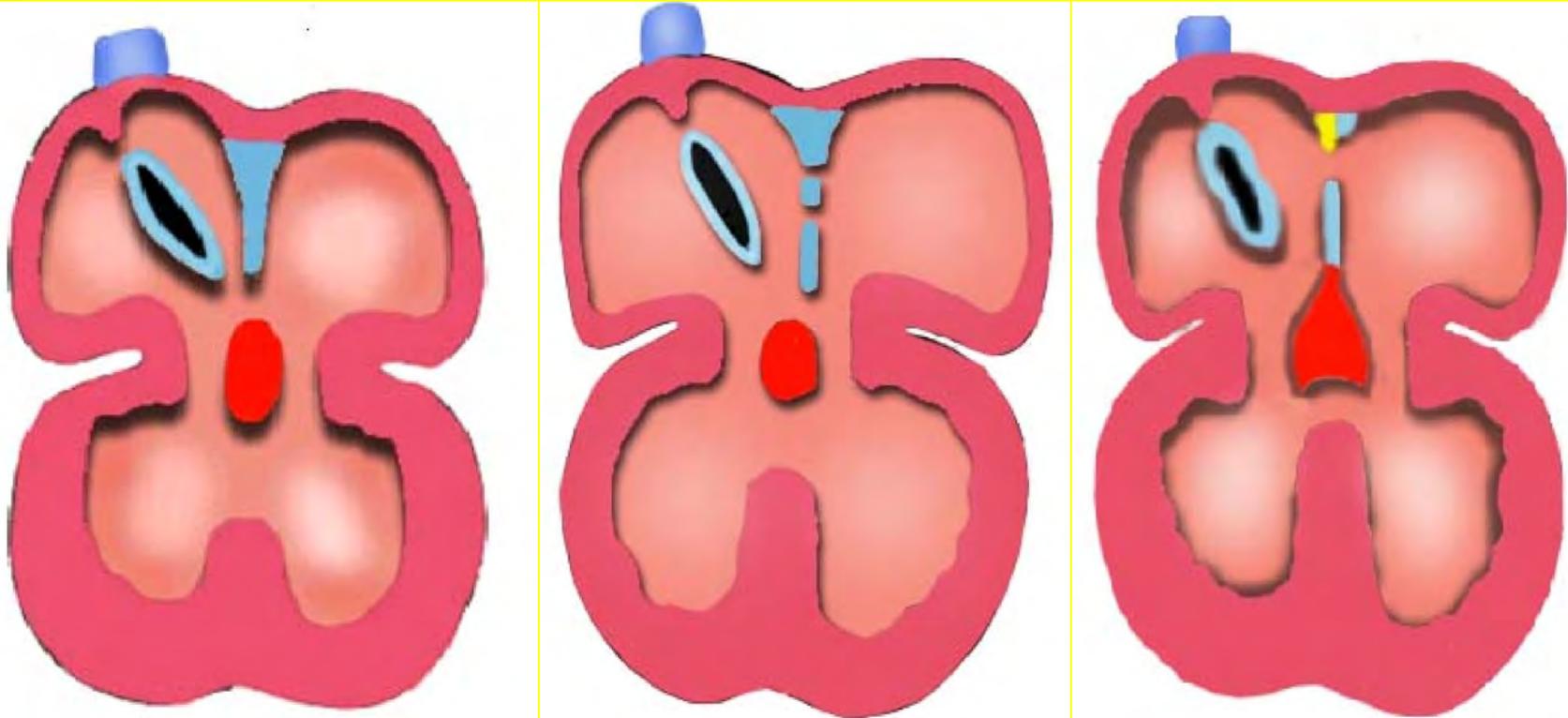
— 第4周末

— 第 I 房间隔 原始心房顶端背侧  
生长出一半月形薄膜

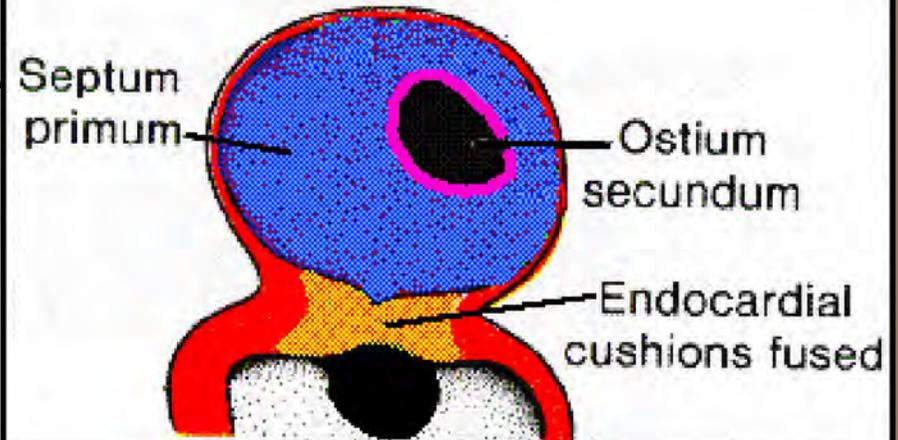
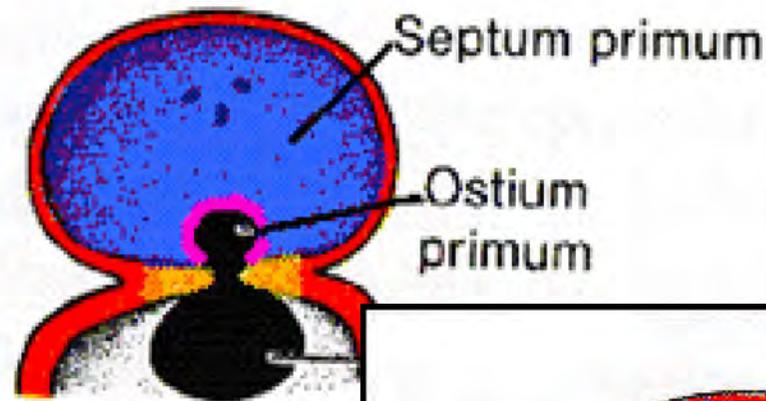
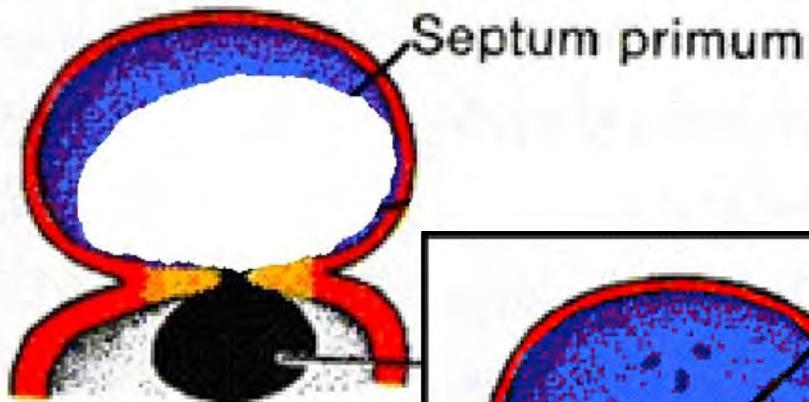
— 第 I 房间孔 第 I 房间隔向心内膜垫生长，  
与心内膜垫之间暂留一孔

— 第 II 房间孔 第 I 房间孔闭合前，  
第 I 房间隔上方出现一孔

# septum primum



# septum primum



## 第5周末

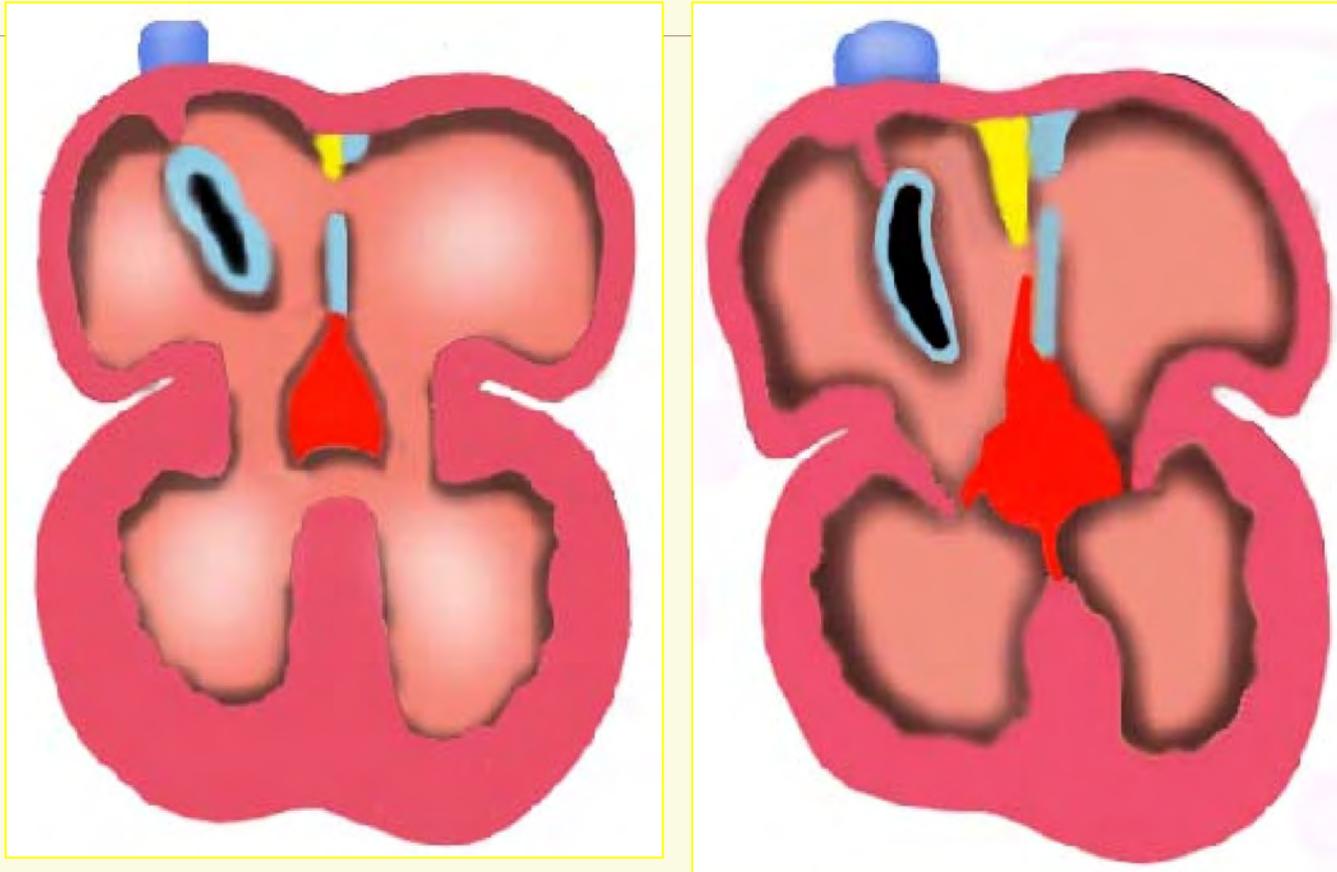
---

**第 II 房间隔** 在第 I 房间隔右侧，心房顶端腹侧又生长出一新月形厚膜

**卵圆孔** 第 II 房间隔向心内膜垫生长，与心内膜垫间留有一孔

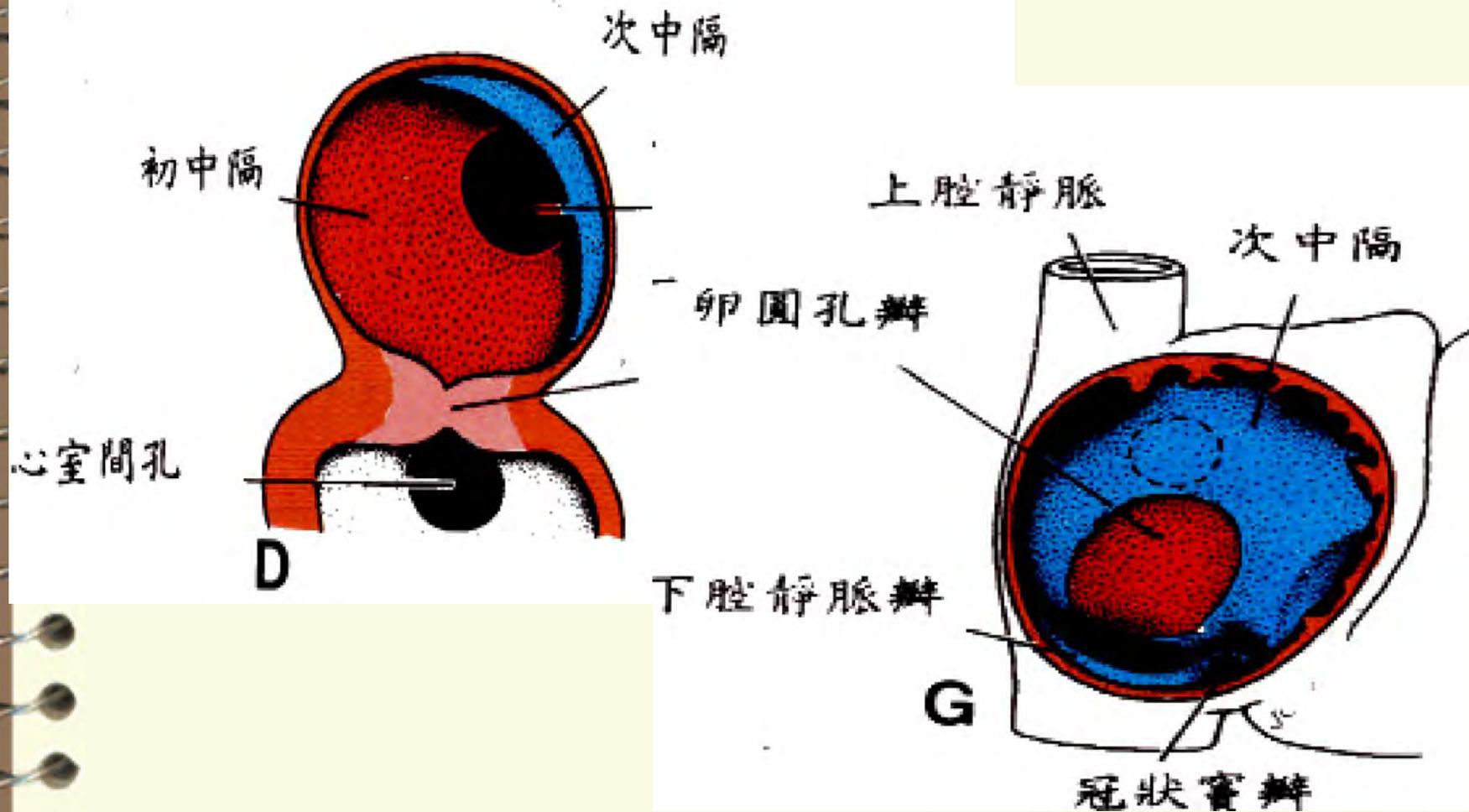
**卵圆孔瓣** 第 I 房间隔

# septum secundum

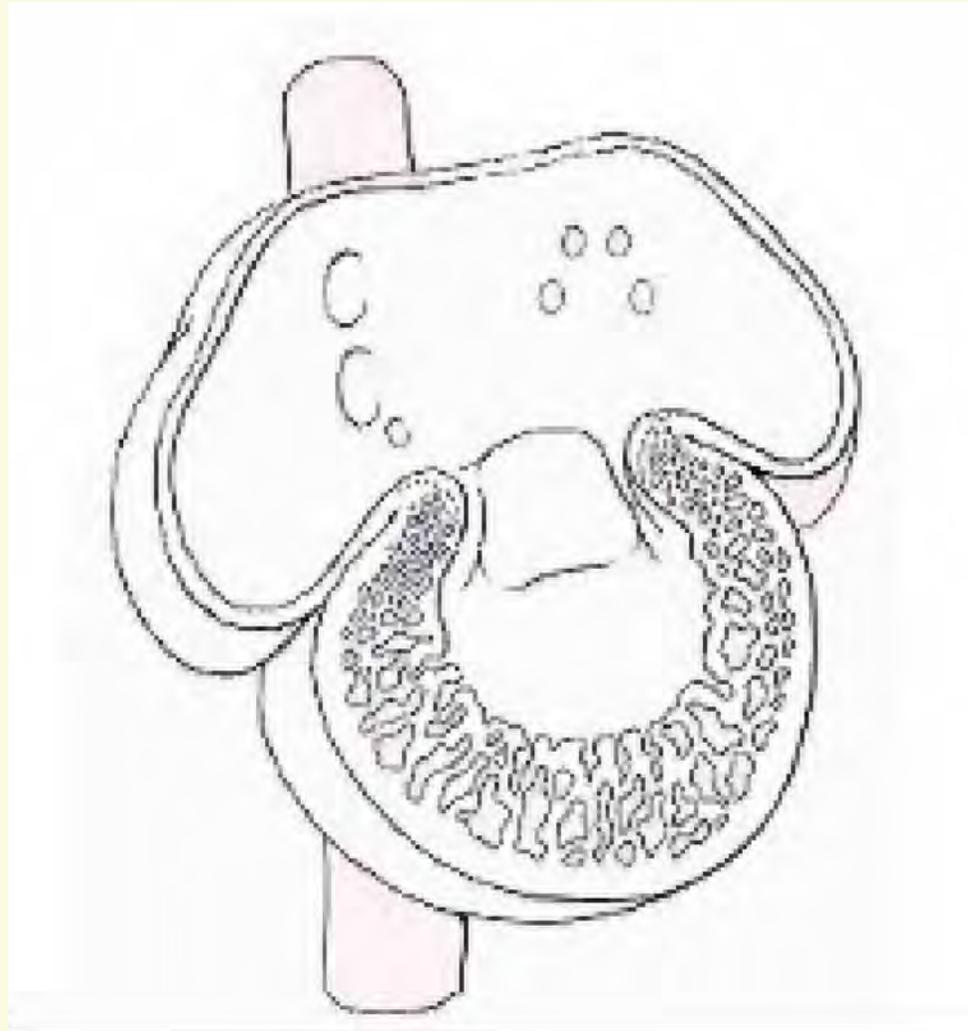


**思考：胎儿心房血流途径？**

# septum secundum



# auricle partition



### 3、原始心室的分隔

第4周末-- 7周末

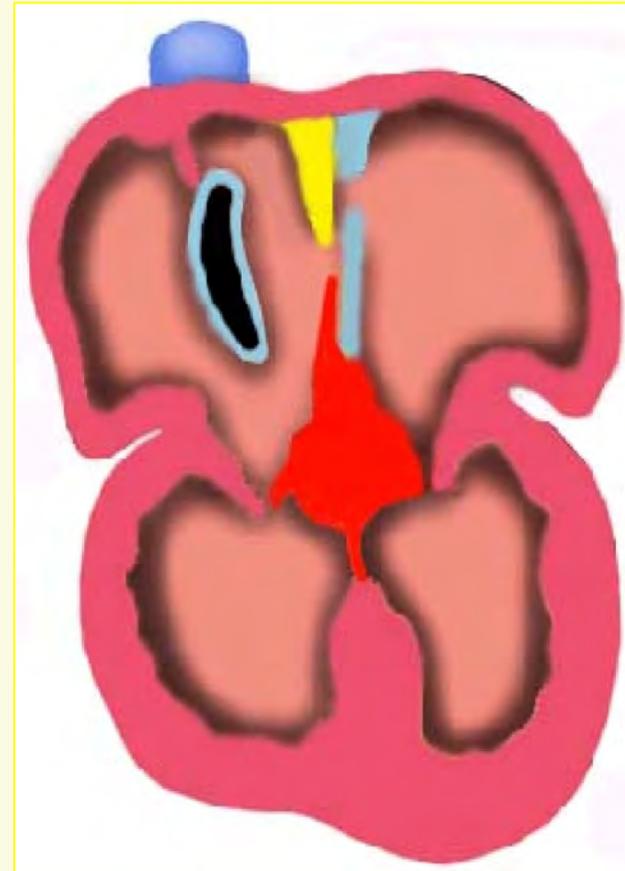
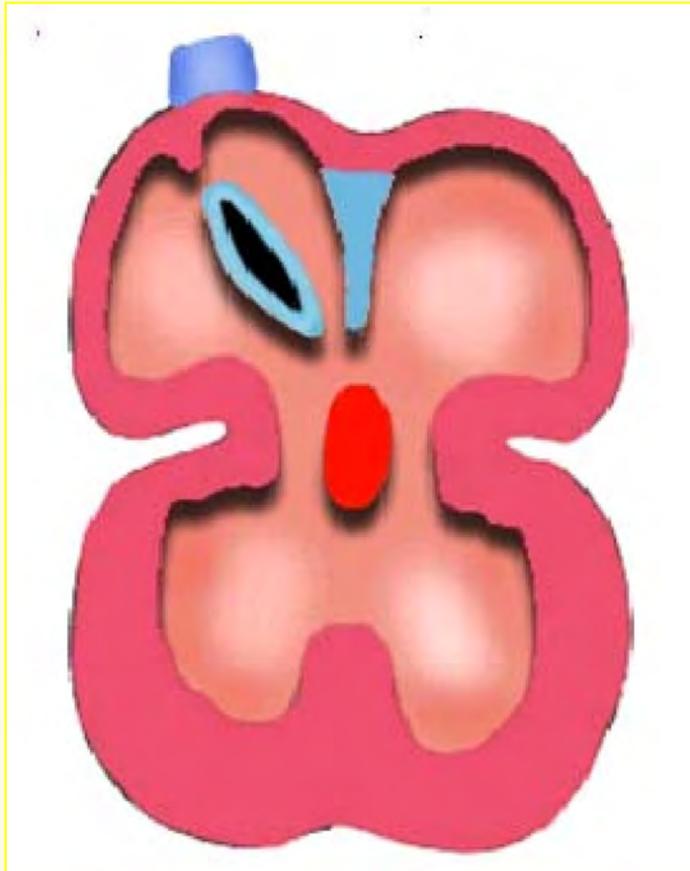
**室间隔肌部**：心室底部生长出一较厚肌性隔膜

**室间孔**：室间隔肌部向心内膜垫生长，与心内膜垫间留有一孔

**室间隔膜部**：3个来源

	{	左球嵴
		右球嵴
		心内膜垫

# ventricle partition



# ventricle partition

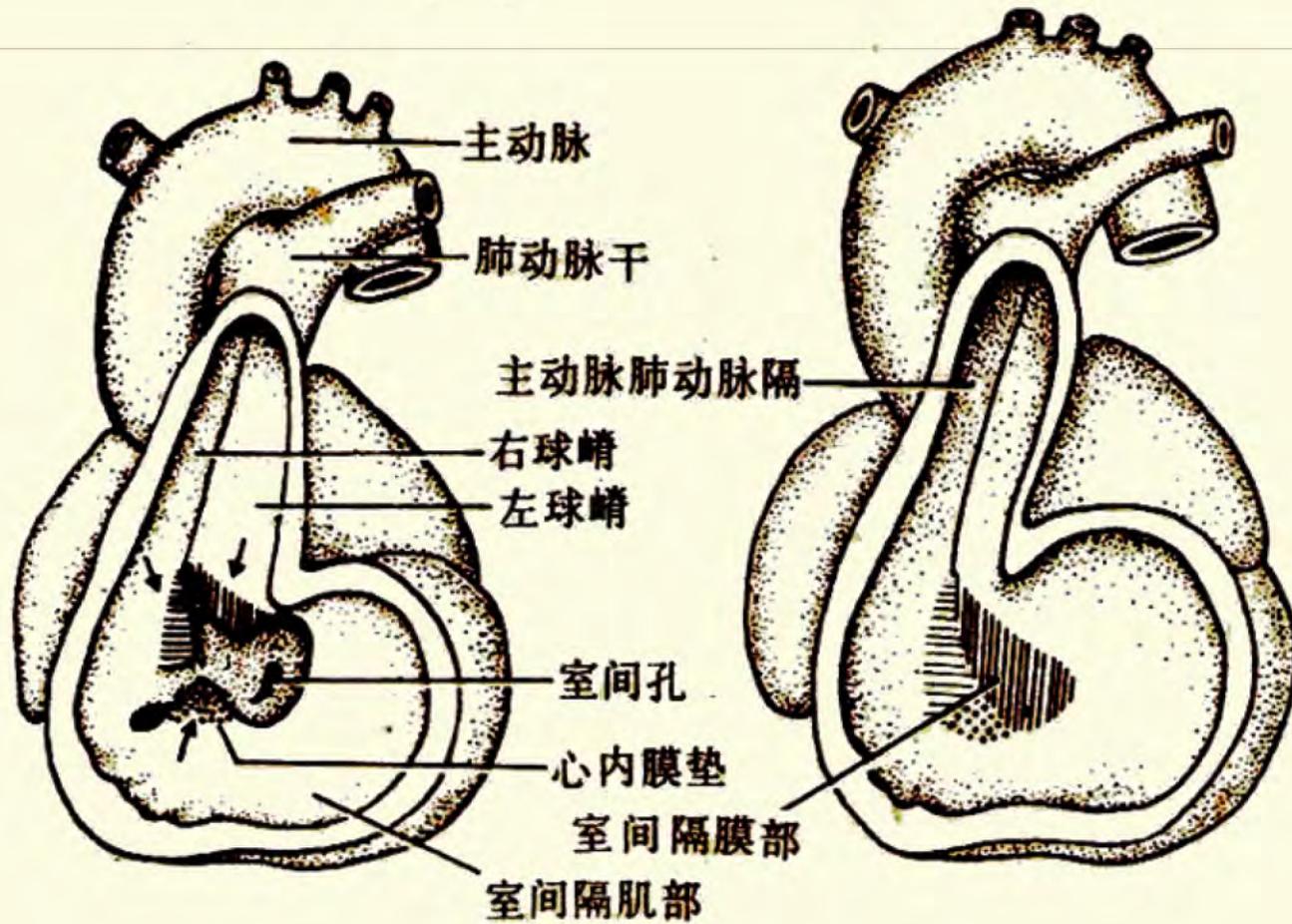


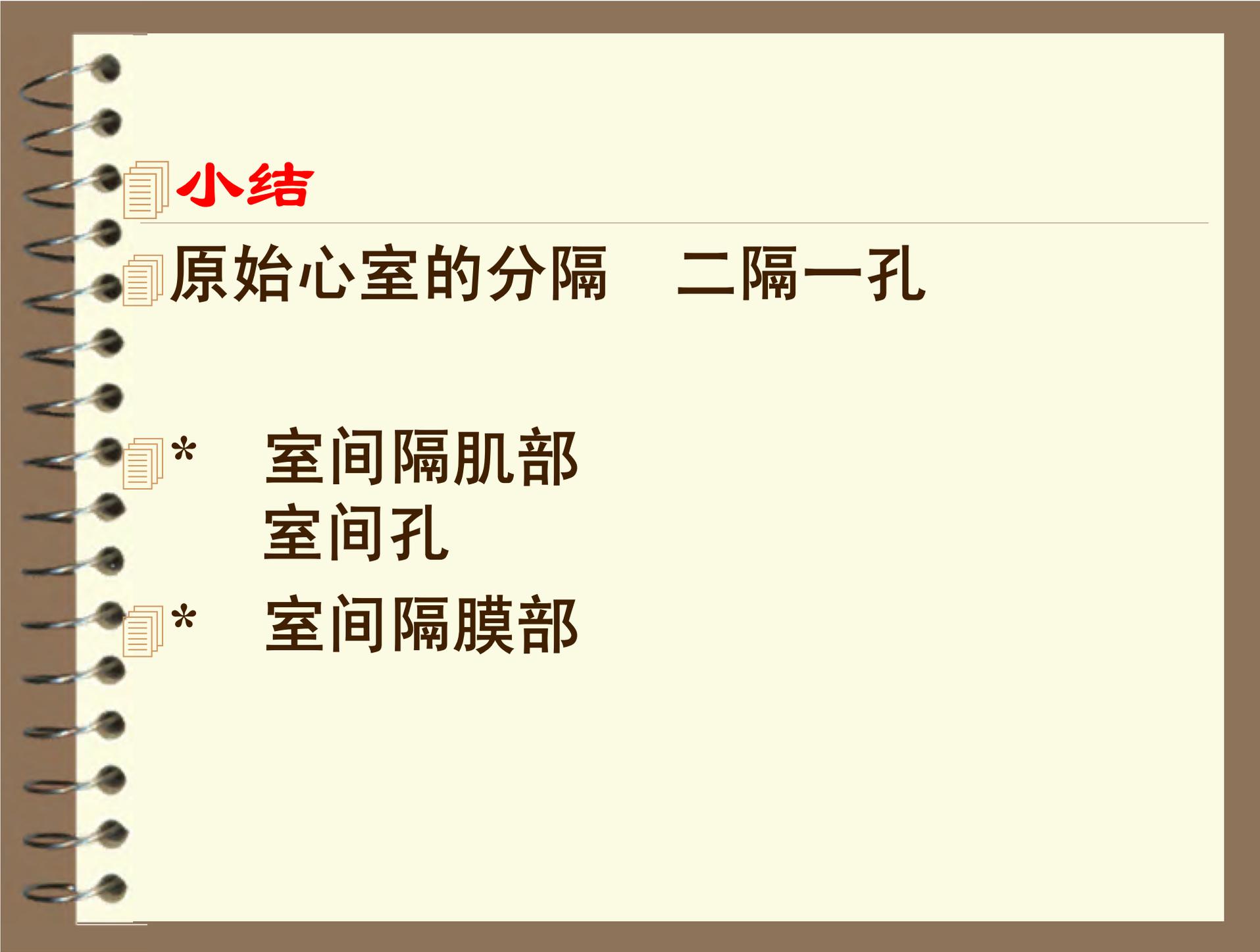
图 24-9 室间隔膜部的形成及室间孔封闭

## 小结

 原始心房的分隔      二隔三孔

 \* 4周末:      第 I 房间隔  
                         第 I 房间孔  
                         第 II 房间孔

 \* 5周末:      第 II 房间隔  
                         卵圆孔



 **小结**

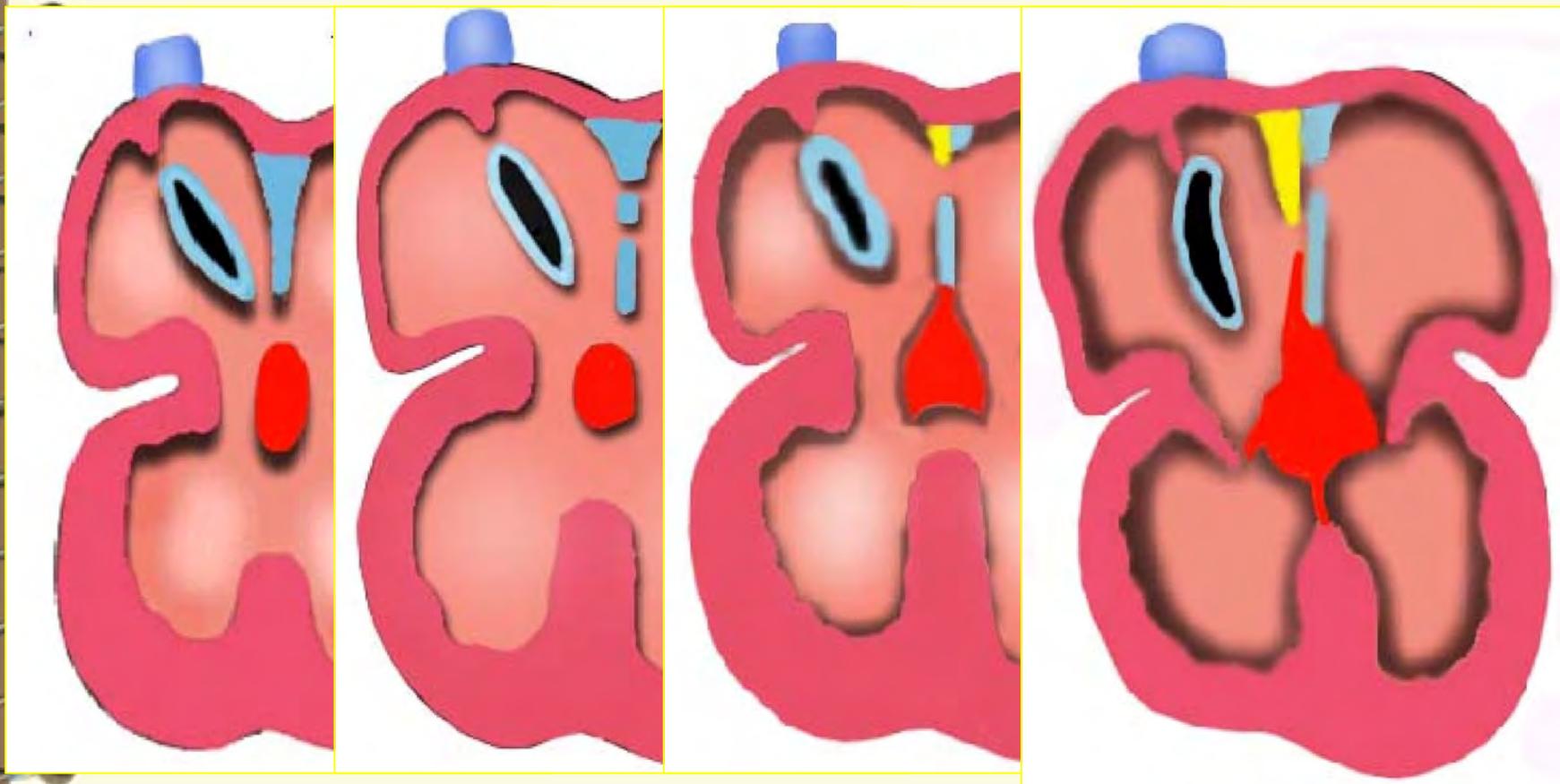
---

 **原始心室的分隔 二隔一孔**

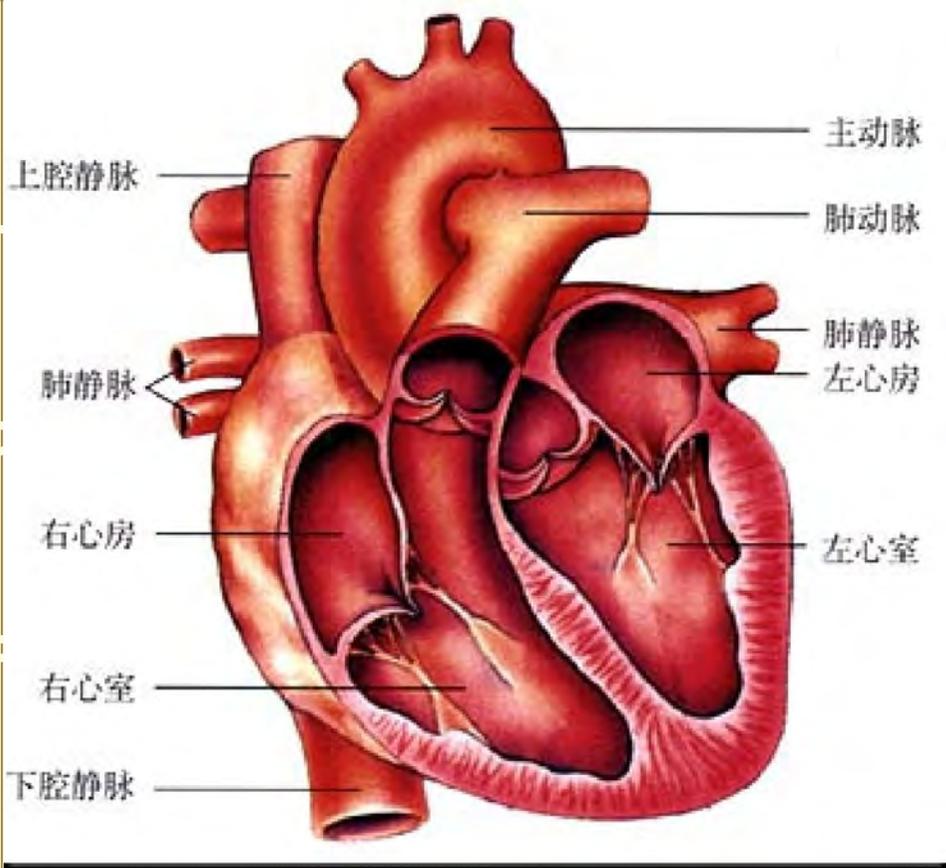
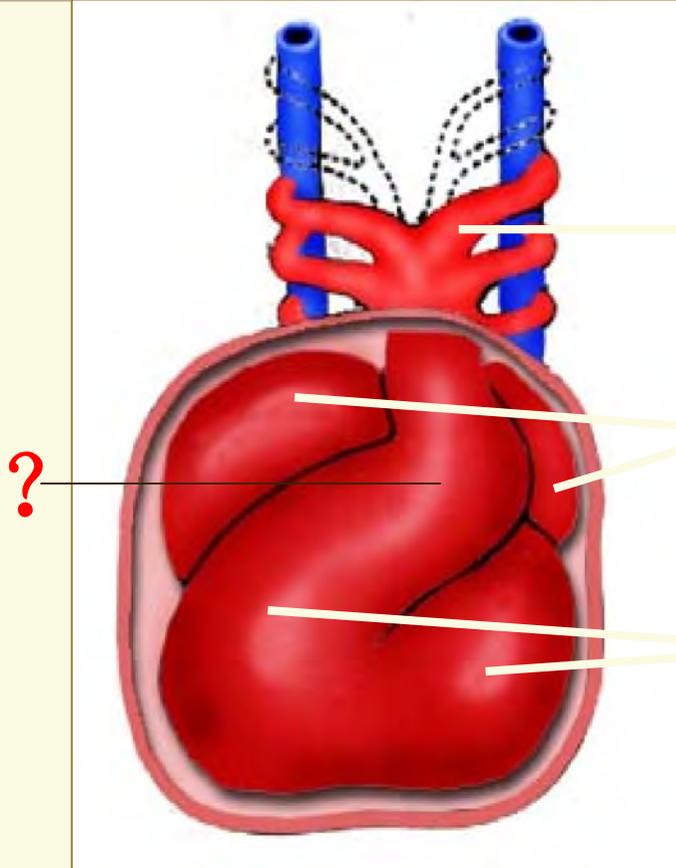
 \* **室间隔肌部**  
**室间孔**

 \* **室间隔膜部**

# 小结







## 4、动脉干和心球的分隔

### 第5周

左 动脉干嵴 球嵴

右 动脉干嵴 球嵴

对应生长

螺旋状

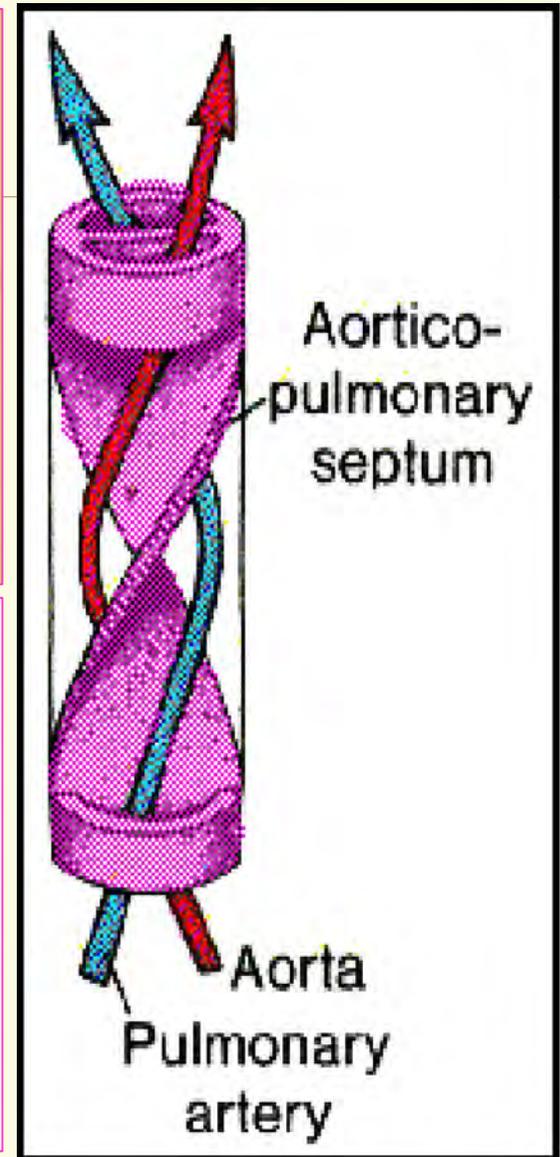
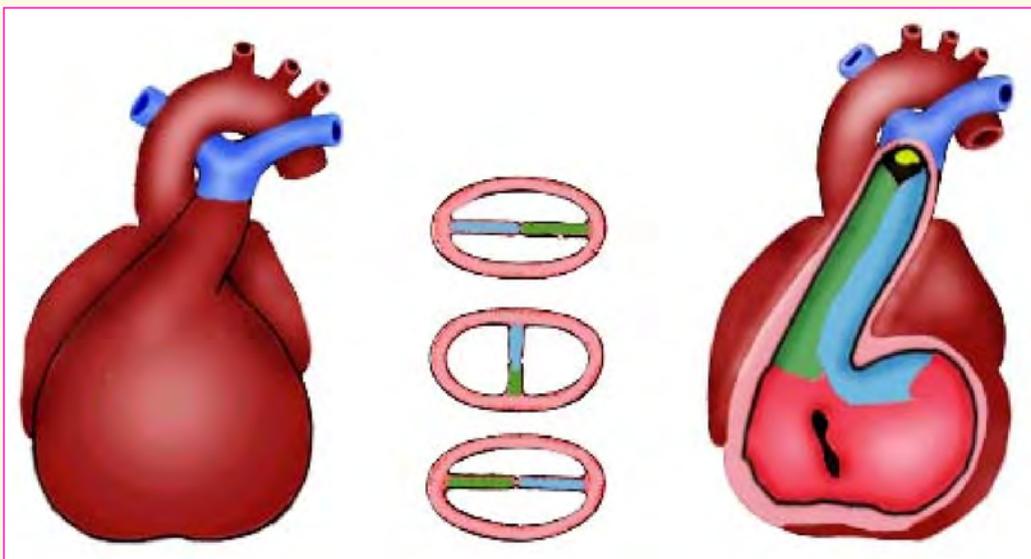
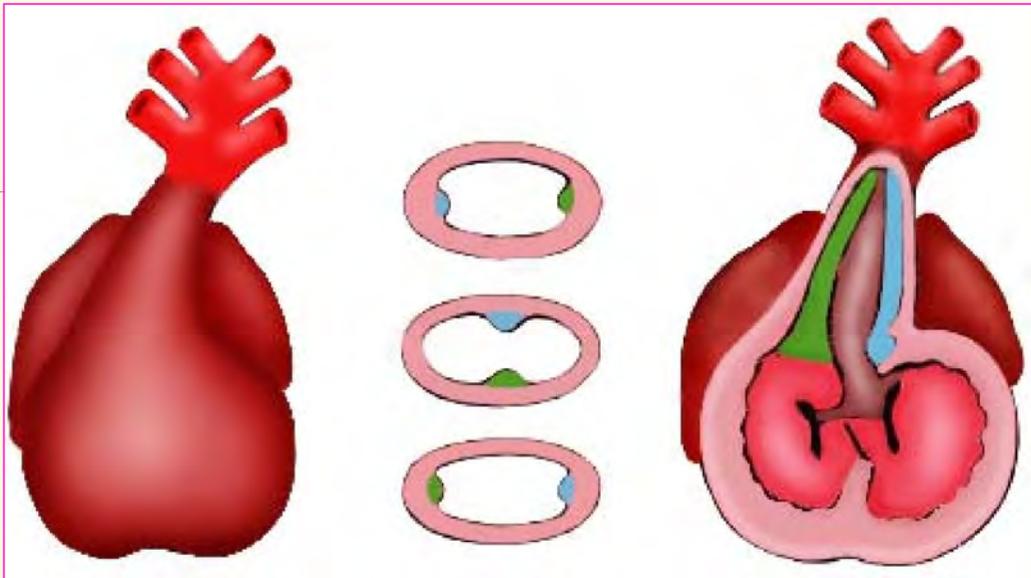
主动脉

肺动脉隔

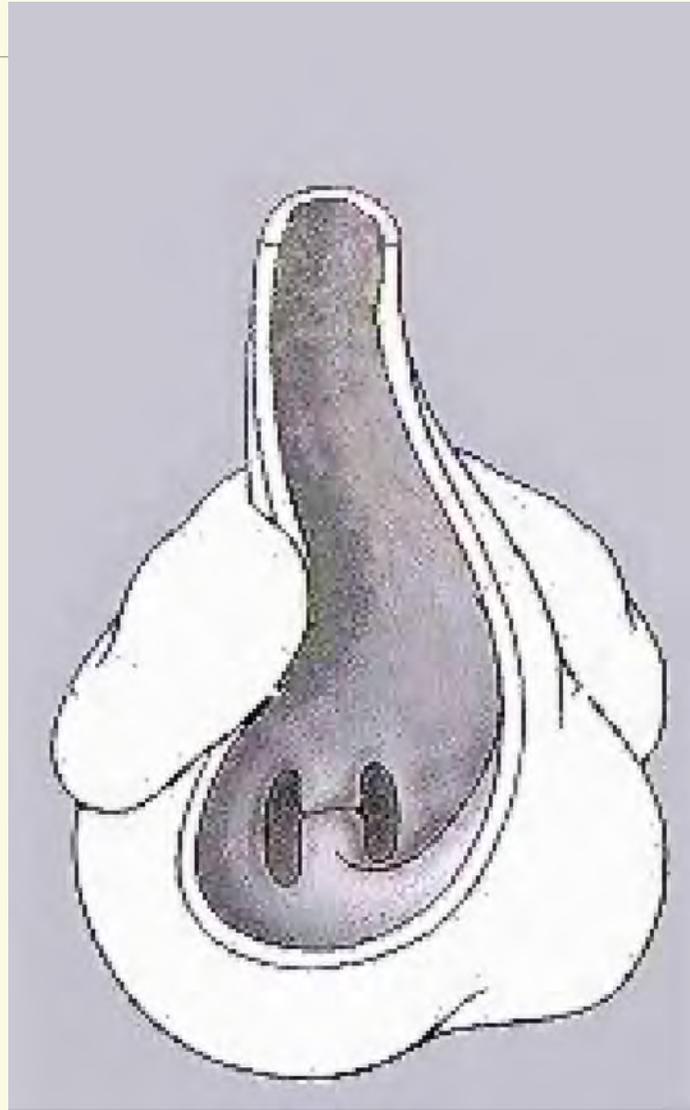
肺动脉干

升主动脉

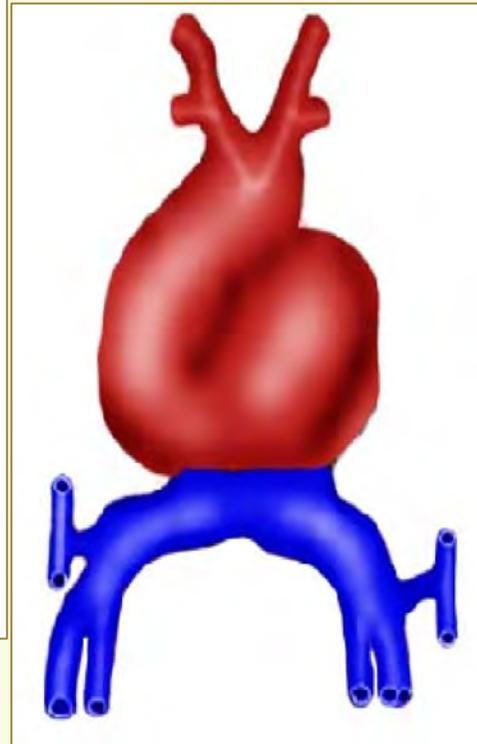
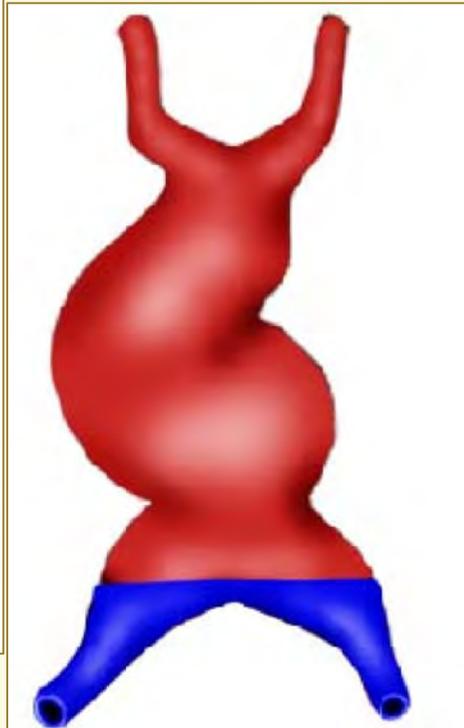
(一对)



partition of trunus arteriosus and bulbus cordis

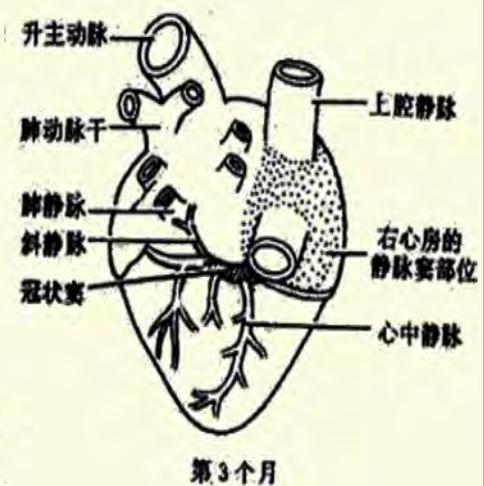
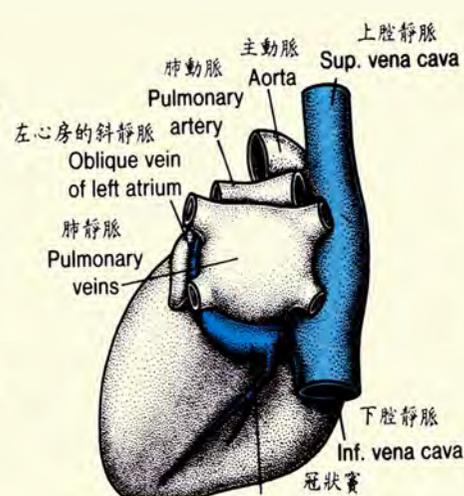
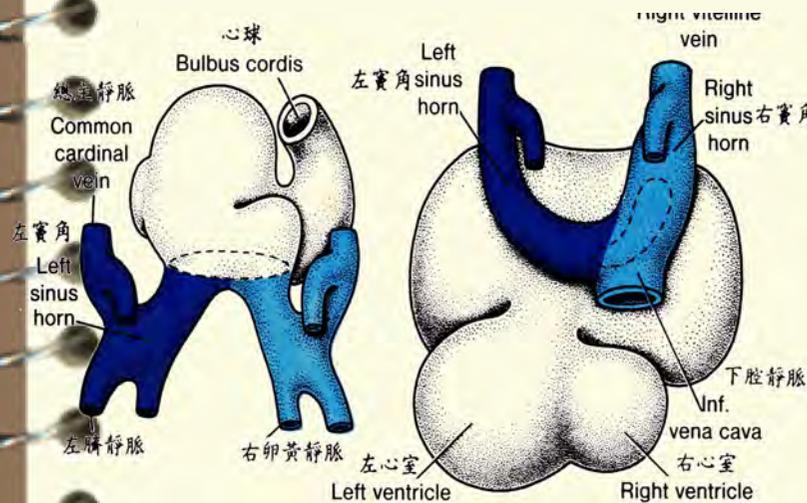


# 📄 静脉窦

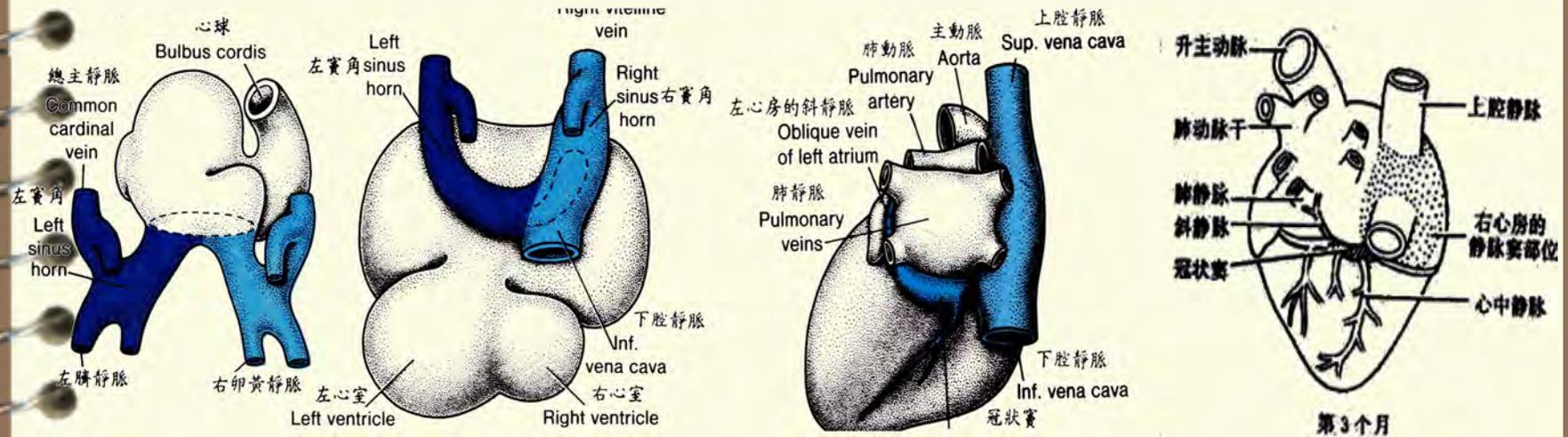


# 5、静脉窦演变

**静脉窦** { 左角 → 左房斜静脉 冠状窦  
 右角 → 永久性右心房光滑部  
 原始右心房 → 右心耳

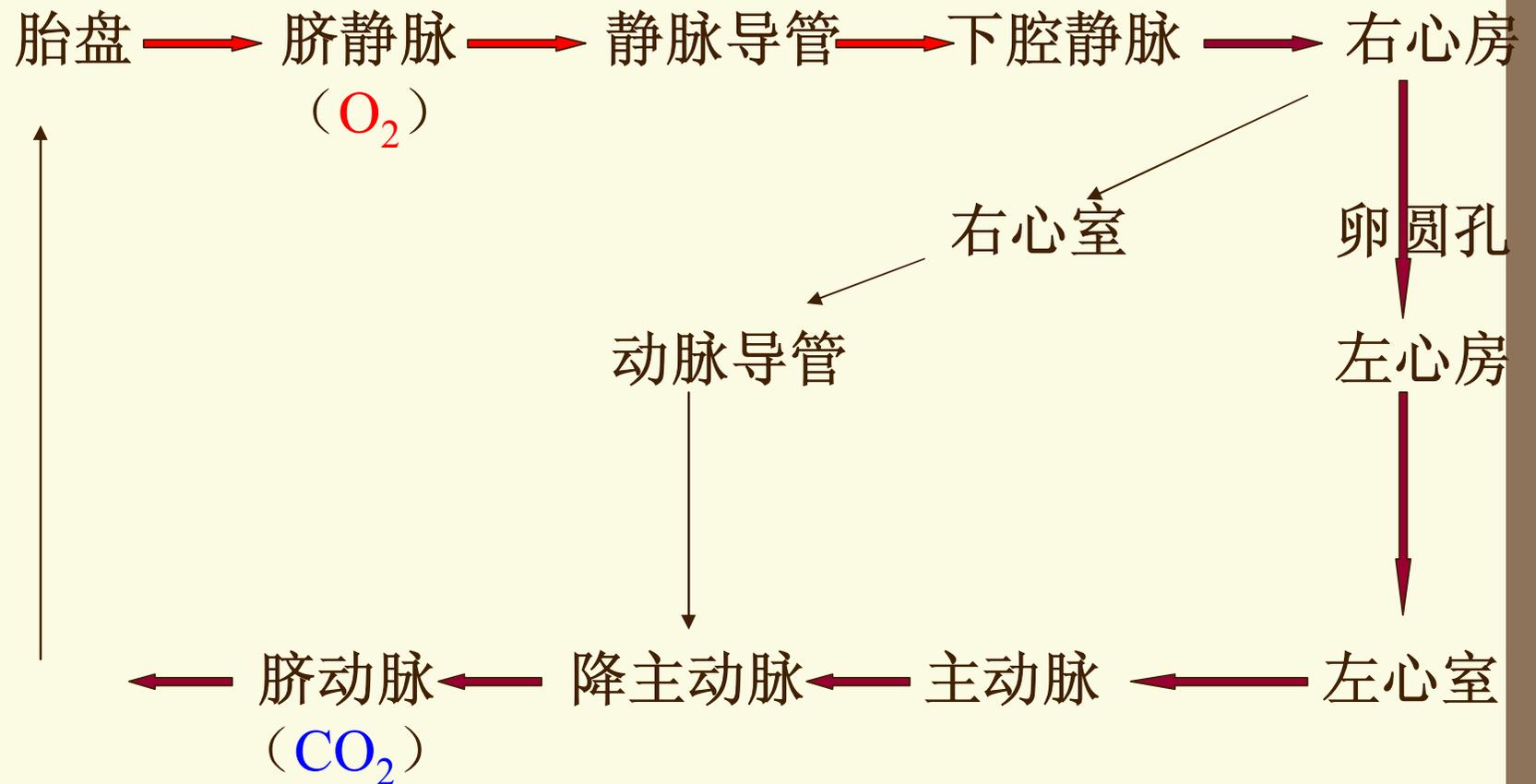


肺静脉根部 → 永久性左心房光滑部  
 原始左心房 → 左心耳



## 二、胎儿血液循环和出生后血循环的变化

### (一) 胎儿血液循环途径



# fetus blood circulation

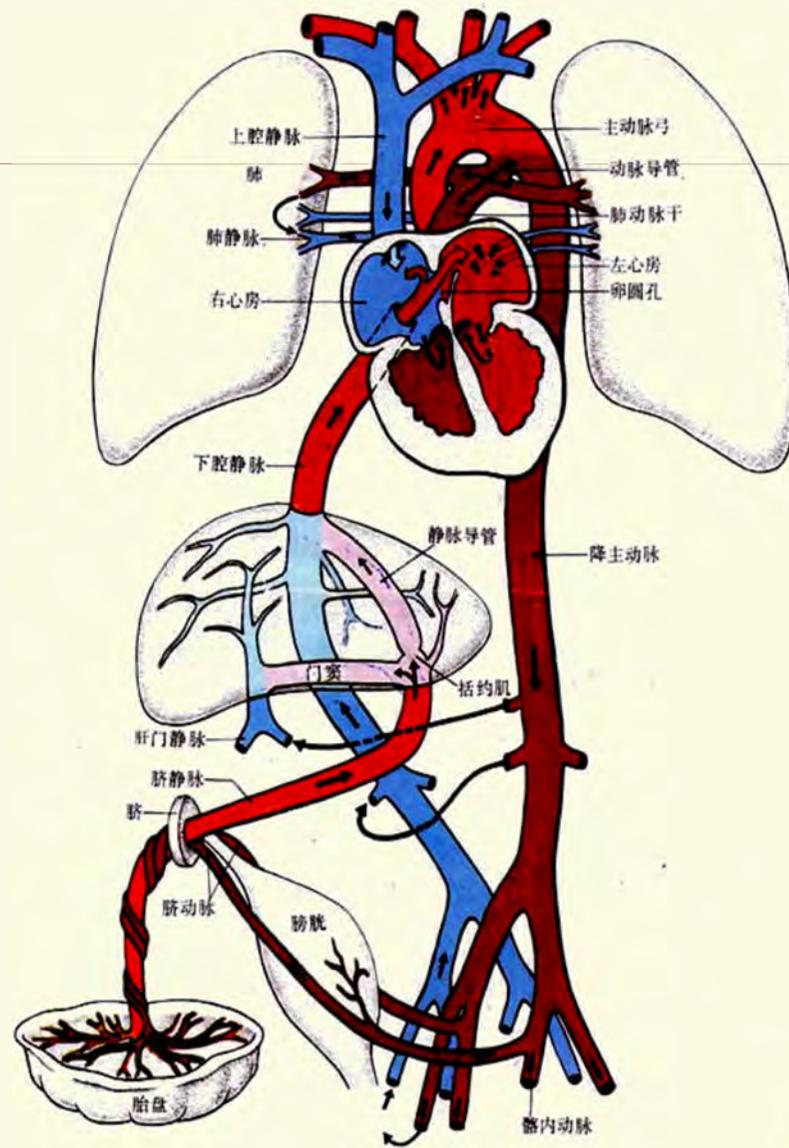


图 23-12 胎儿血液循环经路



## (二) 出生后的变化

脐动脉闭锁 → 脐外侧韧带

脐静脉闭锁 → 肝圆韧带

静脉导管闭锁 → 静脉韧带

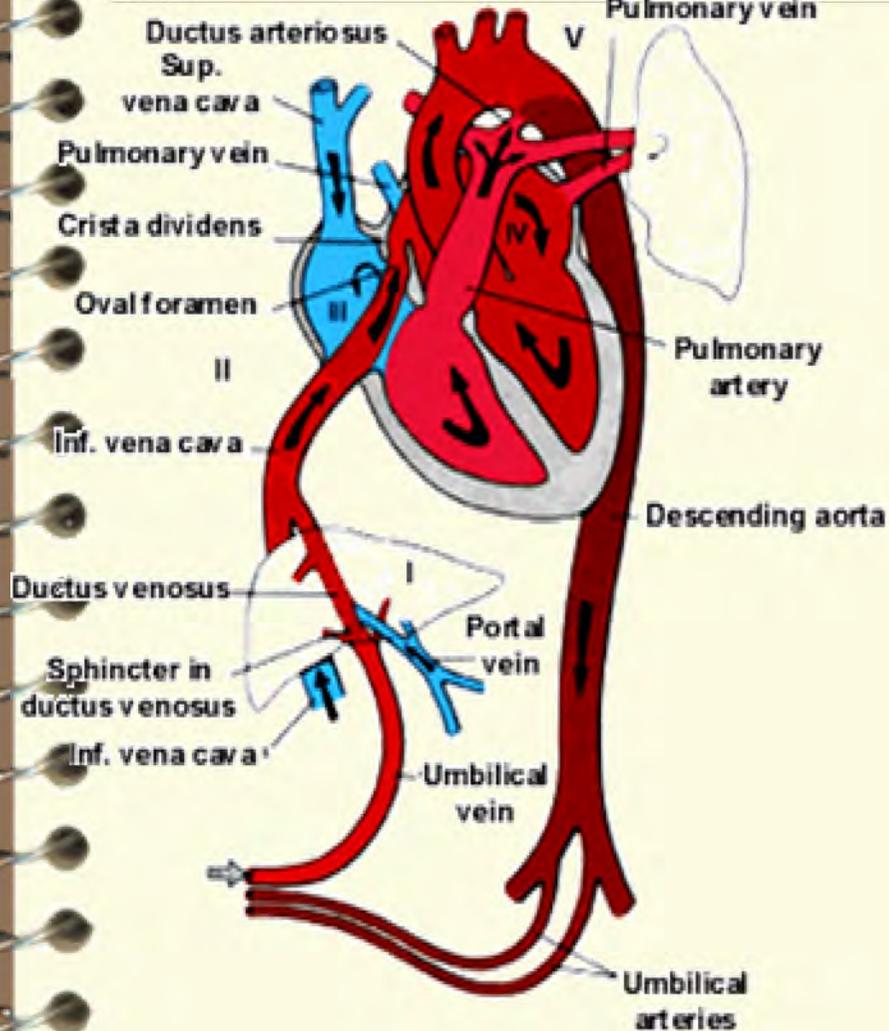
动脉导管闭锁 → 动脉韧带

卵圆孔关闭

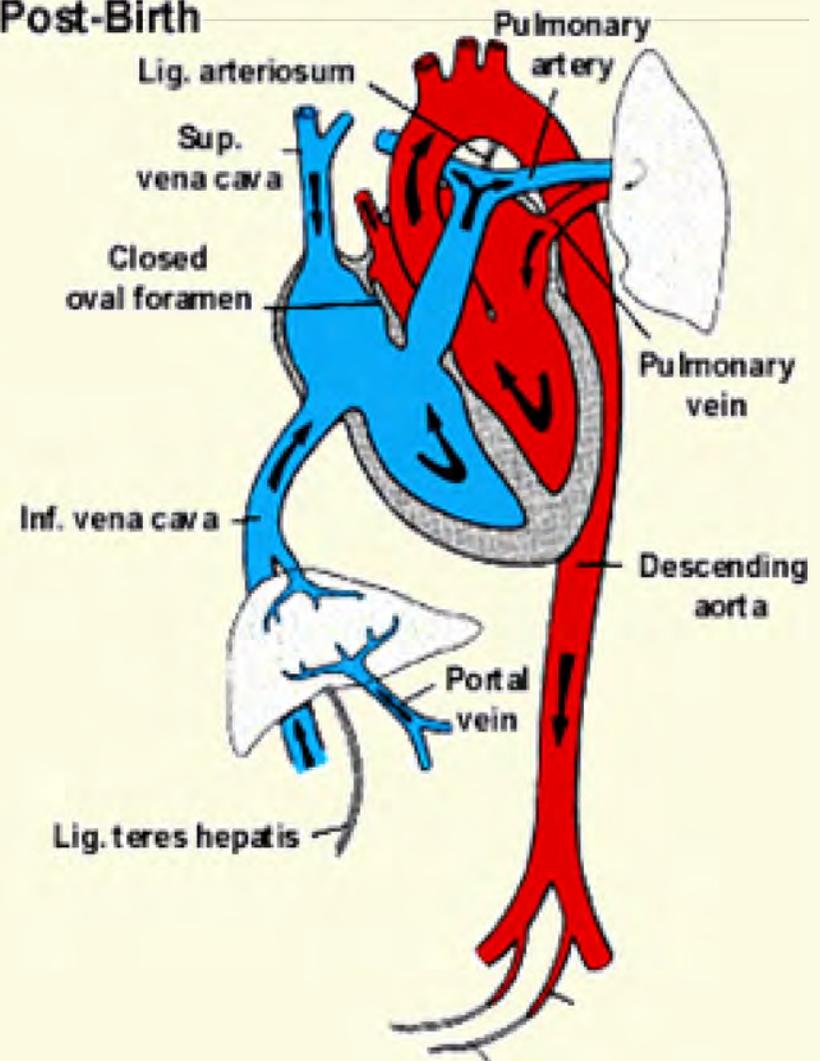
# prenatal

# postnatal

## Pre-Birth

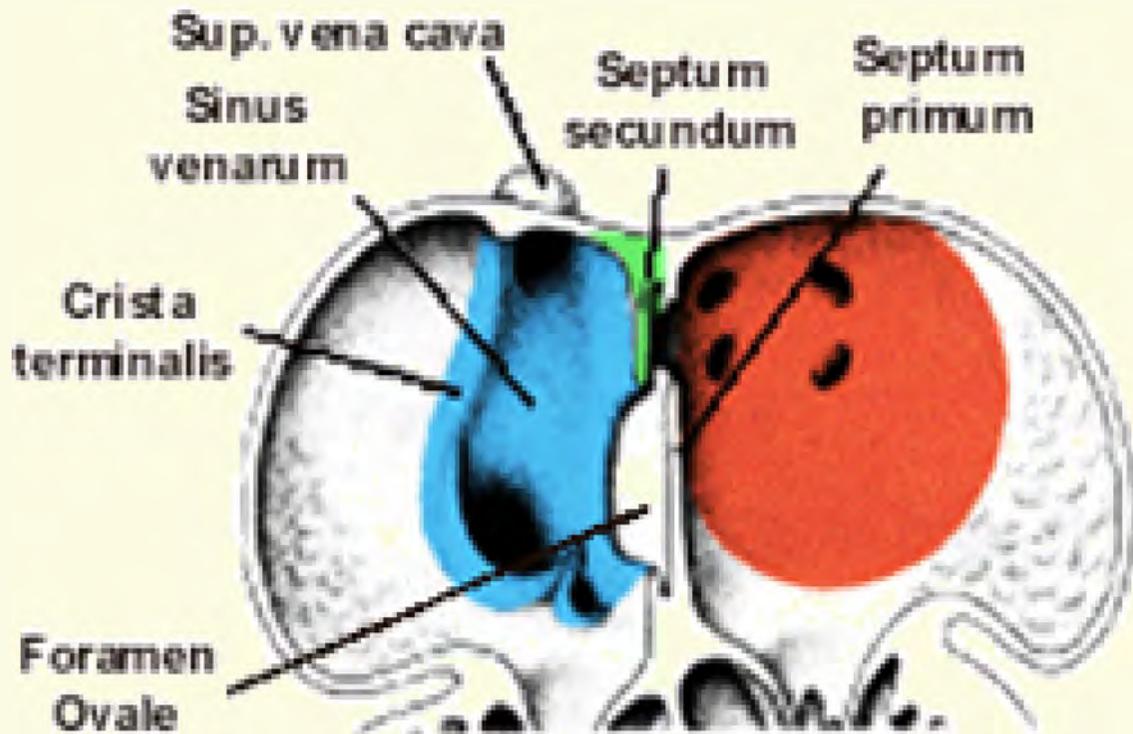


## Post-Birth



### 三、先天畸形

#### 1、房间隔缺损：卵圆孔未闭



## 2、室间隔缺损：心内膜垫扩展延伸不良

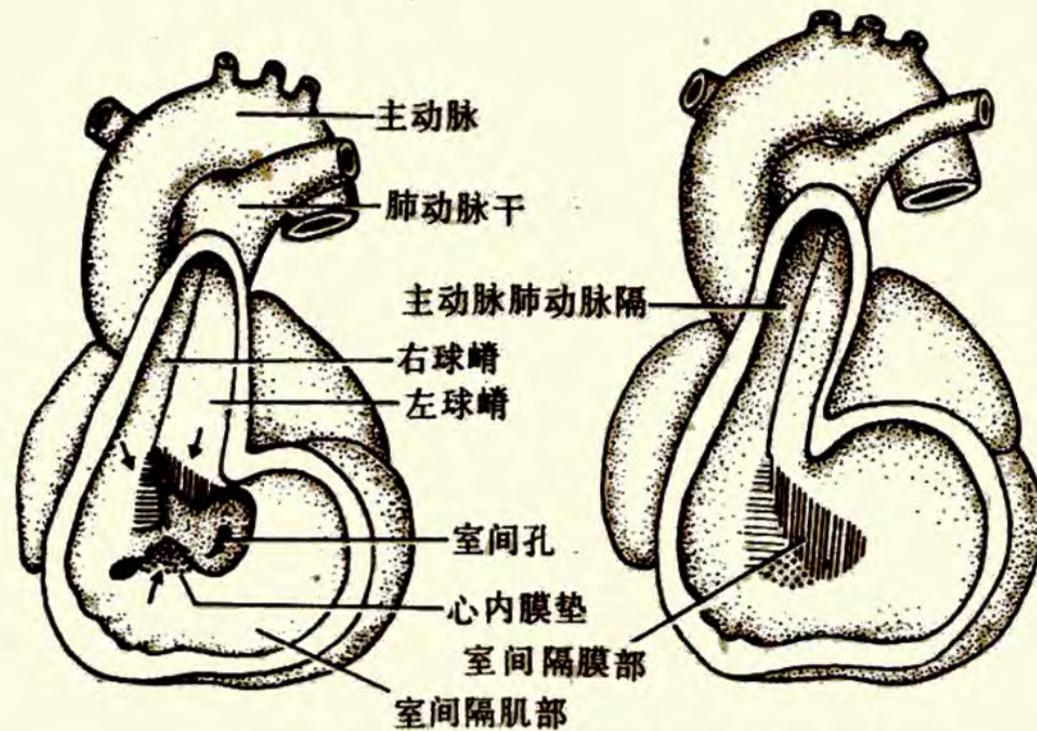


图 24-9 室间隔膜部的形成及室间孔封闭

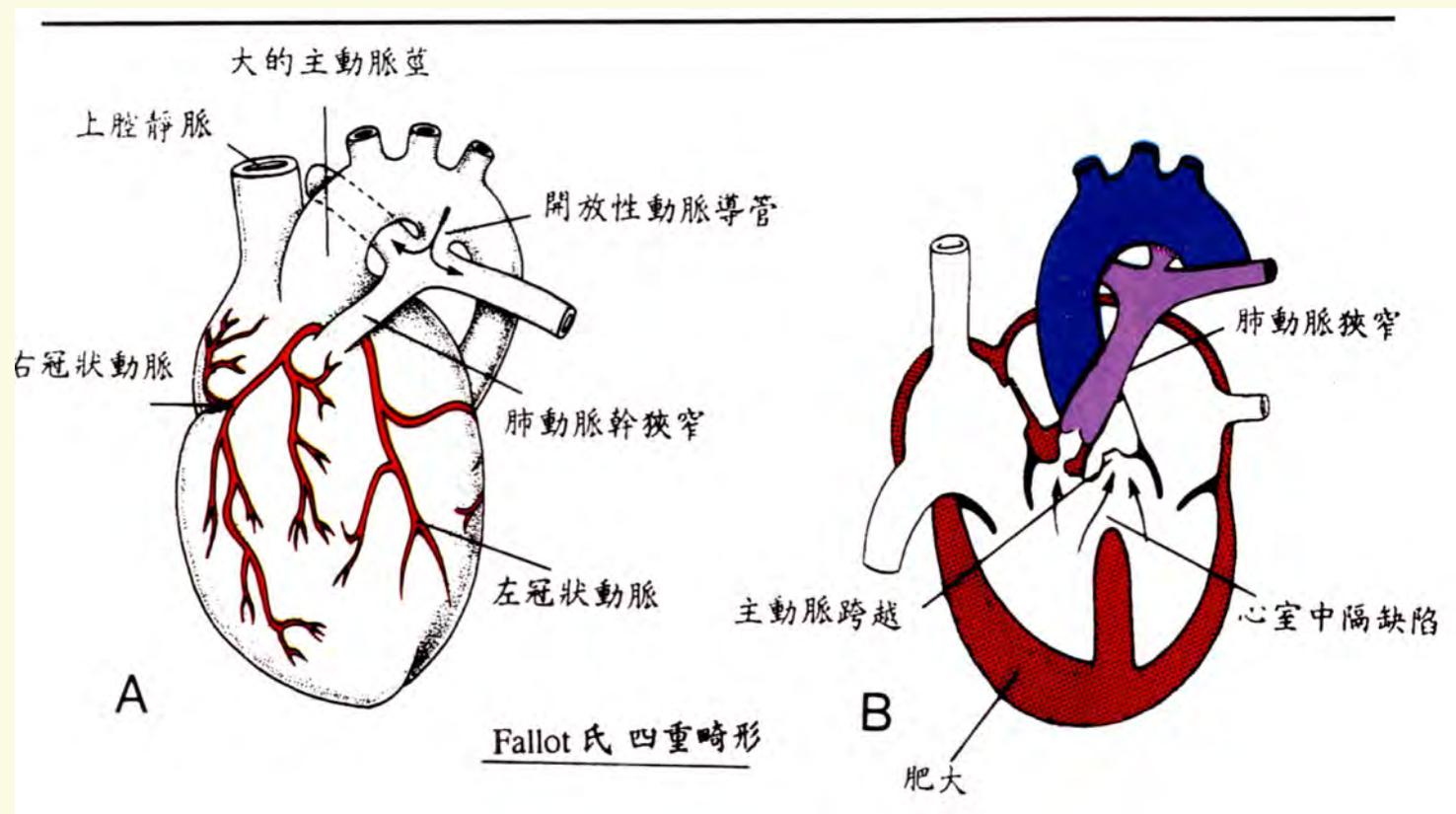


### 3、法洛四联症：

表现：肺动脉狭窄 主动脉骑跨

室间隔缺损 右心室肥大

原因：动脉干、心球分隔不均所致



# 重点

1、心脏内部分隔  
原始心房分隔  
原始心室分隔

2、常见先天性畸形表现及发生原因  
房间隔缺损  
室间隔缺损  
法洛三联症

3、名词：心内膜垫

## 重点图 ---10

- 1、 P88 图8-8 运动神经元
- 2、 P134 图11-6 血-胸腺屏障
- 3、 P178 图15-3 消化管
- 4、 P197 图16-7-A 肝索与肝血窦
- 5、 P209 图17-9 肺泡
- 6、 P216 图18-5 肾小体
- 7、 P240 图20-2 卵巢
- 8、 P244 图20-9 排卵
- 9、 P327 图27-6 心脏内部分隔 (C)
- 10、 P88 图8-10 化学性突触