



### Aortic Arches of Adult Amphibians

- Loss of circular cranial artery
- Evolution of "tetrapod" carotid artery system
  - Loss of aortic arches I & II
  - Loss of dorsal aorta between aortic arches III & IV
  - \_\_\_\_\_ (arch III) supplies **internal** & **external** carotid aa.
- Loss of aortic arch V
- Aortic arch IV becomes** \_\_\_\_\_
- Aortic arch VI is** \_\_\_\_\_

Liem et al. Focus 19-1; Fig. 19-10

### Larval & Adult Amphibians

- Tadpole**
  - Retains aortic arches III, IV, V, VI
    - \_\_\_\_\_ : Gills
    - \_\_\_\_\_ : Bypass lungs
    - Ductus arteriosus
- Adult**
  - Typical tetrapod circulation
  - Aortic arch III: carotid
  - Aortic arch IV: systemic
  - Aortic arch VI: pulmocutaneous

Liem et al. Fig. 19-10

### Aortic Arches of "Reptiles"

- How does this differ from the adult amphibian?
  - Basics the same
  - \_\_\_\_\_ division of ventral aorta
  - Slight asymmetry in systemic circulation
  - Carotid duct increases connectivity between head and body
  - No pulmonary circulation to \_\_\_\_\_

Liem et al. Focus 19-1; Fig. 19-12

### Aortic Arches in Birds

- How does this differ from a turtle?
  - Carotid circulation is similar
  - Subclavian aa. come off common carotid a
  - Left aortic arch IV
  - Right aortic arch IV is \_\_\_\_\_ !

Liem et al. Fig. 19-14

### Aortic Arches in Mammals

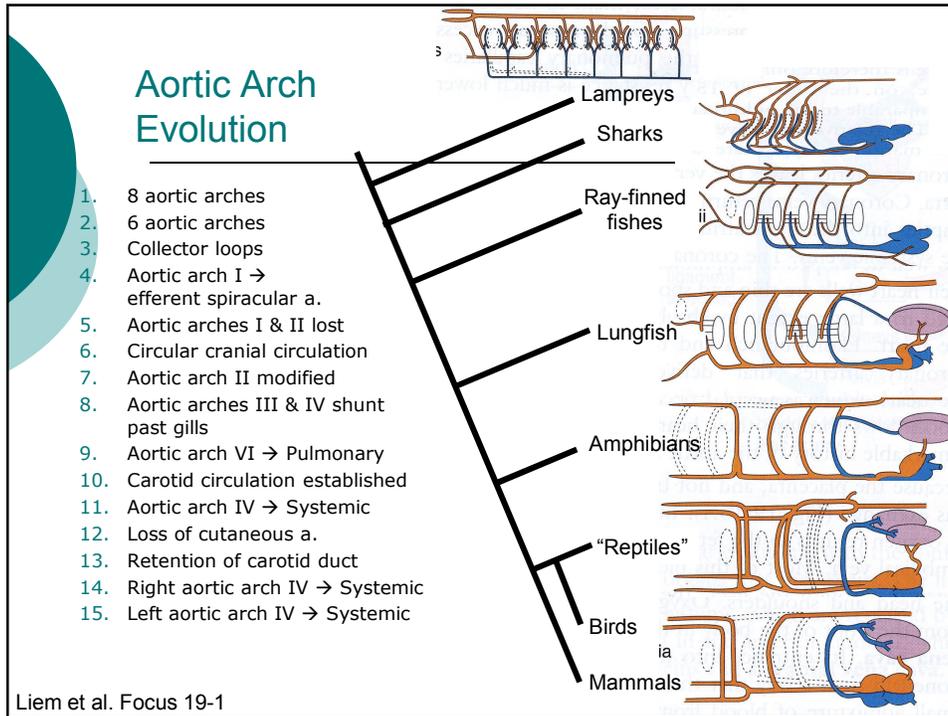
- Similar to birds, but left aortic arch IV is systemic
  - What does this tell us?
- Even more asymmetry
  - Left subclavian a. comes off L aortic arch IV
  - Right subclavian a. is right aortic arch IV

Liem et al. Fig. 19-14

### Aortic Arches in Mammals

- Aortic arch developmental homology with adult circulation

Liem et al. Fig. 19-15



## Mammalian Embryonic Circulation

- Why would embryonic circulatory needs differ from those of the adult?

Human Embryo

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### Human Embryonic Circulation

- Blood to placenta
- Oxygenated blood from placenta to body
- Mixes with deoxygenated blood from tissues
- Shunt to bypass liver
- Fetal alcohol syndrome
- Shunt from R atrium to L atrium
- Blood bypasses lungs
- Shunt from pulmonary a. to aorta
- Blood bypasses lungs

Liem et al. Fig. 19-16

### Human Embryonic Circulation

- Become **medial umbilical ligament**
- Become **round ligament** of liver
- Closes and disappears
- All blood from the guts now goes to the liver via hepatic portal v.
- Closes and becomes **fossa ovale**
- Closes and becomes the **ligamentum arteriosum**

Liem et al. Fig. 19-16

### Human Embryonic Circulation

- FO - fossa ovale

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