Equator University of Science and Technology

Anatomy Department

Course: General Histology and Embryology FHS 1102

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Tutorial (6)

4-8 Weeks of Development

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1. During the fourth week, the flat trilaminar embryonic disc begins to fold.

a) What are the two major directions of embryonic folding?
b) What happens to the endoderm during folding?
c) What structure is formed from the incorporated endoderm?

2. During the fourth week, the neural tube develops from the ectoderm.

a) What structure gives rise to the neural tube?
b) What process forms the neural tube?
c) What major structures develop from the neural tube?

3. Failure of closure of the neural tube occurs during early embryonic development.

a) What type of congenital abnormality can result?
b) Give one example of a neural tube defect.
c) Which vitamin supplementation can help reduce the risk of these defects?

4. During the fourth week, the embryo develops prominent somites on both sides of the neural tube.

a) From which embryonic tissue do somites develop?
b) What major tissues develop from somites?
c) What part of the somite gives rise to skeletal muscle?

5. The embryonic heart begins to function very early during development.

a) During approximately which week does the heart begin to beat?
b) From which germ layer does the heart develop?
c) Why does the cardiovascular system develop and function early in embryonic life?

6. During the fourth week, neural crest cells migrate to different parts of the embryo.

a) From which region do neural crest cells originate?
b) Name two structures or tissues that develop from neural crest cells.
c) Why are neural crest cells sometimes described as having a wide developmental potential?

7. During weeks 5–8, the embryo undergoes rapid changes in body shape.

a) What is the major process responsible for the development of a more recognizable human body form?
b) What happens to the embryonic tail during this period?
c) Why is the embryonic period considered particularly sensitive to teratogens?

8. During embryonic development, temporary membranes separate certain parts of the developing digestive tract from the exterior.

a) What membrane separates the primitive oral cavity from the foregut before it ruptures?
b) What membrane temporarily separates the hindgut from the proctodeum?
c) During approximately which week does the cloacal membrane break down to establish the anal opening?

9. A developmental disorder occurs in the caudal region of the embryo.

a) What is this condition called?
b) Which major structures may be affected because of insufficient caudal mesoderm?
c) What is the developmental basis of the abnormalities seen in this condition?

10. By the end of the eighth week, the embryo has undergone major development of its organ systems.

a) What is the embryo called after the beginning of the ninth week?
b) Why is the period from weeks 4–8 particularly important in human development?
c) At the end of week 8, are all organs completely mature?