

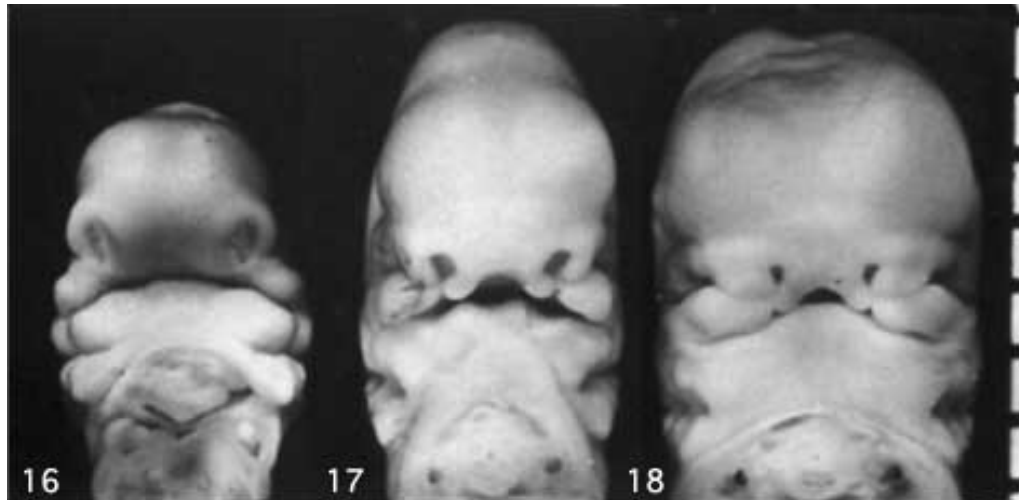


## Practical 6: Embryology of the Face and Ear

**Principal Teacher: Dr Mark Hill**

**Aim:**

To introduce students to the practical embryology of the face and ear.



**The Human Embryo Face** (Carnegie stage 16 to 18, Kyoto collection)

**Specific Objectives:**

1. To understand the formation and contribution of the pharyngeal arches to face and neck development.
2. To know the main structures derived from components of the pharyngeal arches (groove, pouch and arch connective tissue).
3. To know the 3 major parts (external, middle and inner) of hearing development and their embryonic origins.
4. To briefly understand some abnormalities associated with face and hearing development.

**Resources:**

**UNSW Embryology**

This computer-based class will work through a series of **UNSW Embryology** pages (see link below) with links to: histological images, animations, ultrasound, glossary and additional resources. Serial images from selected developmental stages, early embryonic (stage 13), late embryonic (stage 22) and fetal (10 week) will also be used to show key features. Some congenital face and ear abnormalities will be discussed. The additional notes shown below will not be covered in the laboratory.

**Practical – Embryology of the Face and Ear**

<http://embryology.med.unsw.edu.au/Medicine/BGDlabHead.htm>



**Additional Notes**

- <http://embryology.med.unsw.edu.au/Notes/head.htm>
- <http://embryology.med.unsw.edu.au/Notes/face.htm>
- <http://embryology.med.unsw.edu.au/Notes/ear.htm>

**References:**

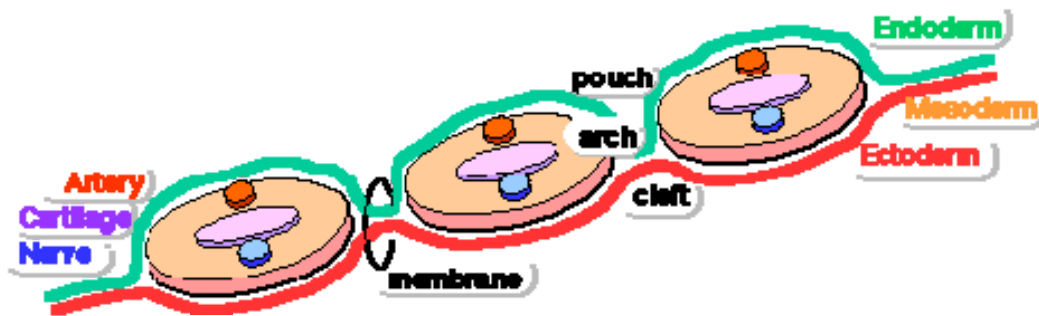
**Textbooks**

1. Larson, W.J. (2001) ed by Sherman, L.S., Potter, S.S. and Scott, W.J. *Human Embryology*. (3rd ed., chapter 12 pp349-417) Edinburgh : Churchill Livingstone
2. Moore, K.L. and Persaud, T.V.N. (1998) *The Developing Human: Clinically Oriented Embryology*, (6th ed., chapter 10 pp 201-239; chapter 19 pp 465-482) Philadelphia : Saunders

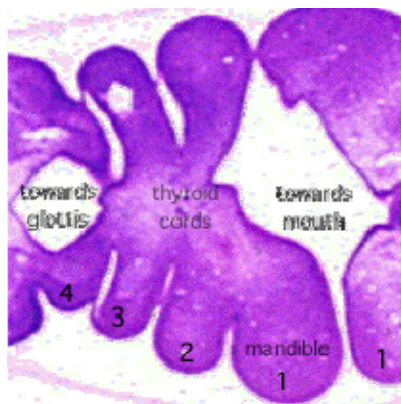
**Background Information:**

There are three main parts to this practical class.

1. The first part of the class will go through a series of online resources covering the early development of the face from its embryonic contributions, pharyngeal arch components and dynamic folding involved in forming the face.



**Cartoon of the Pharyngeal Arch Structure**

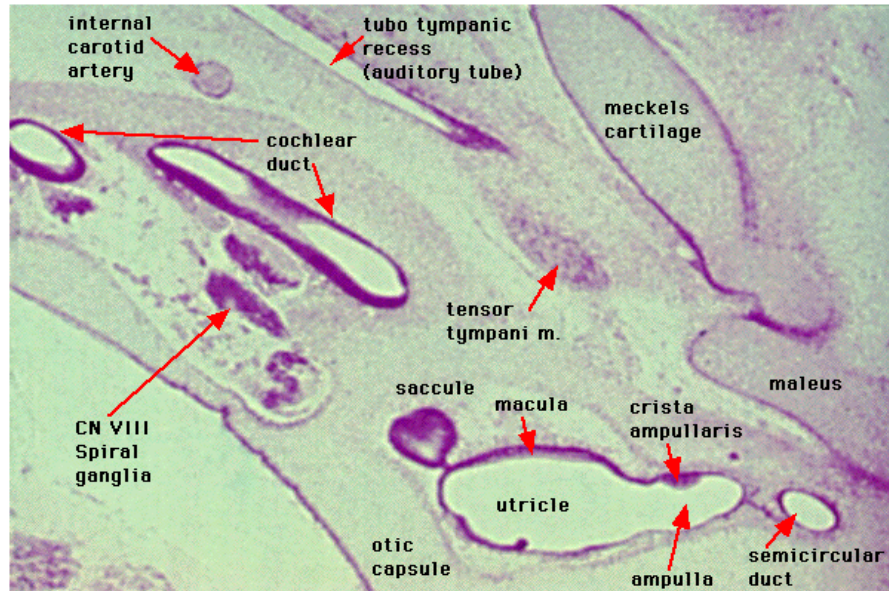


**Cross-section of early embryo head region**

(<http://embryology.med.unsw.edu.au/wwwpig/pigb/B2L.htm>)

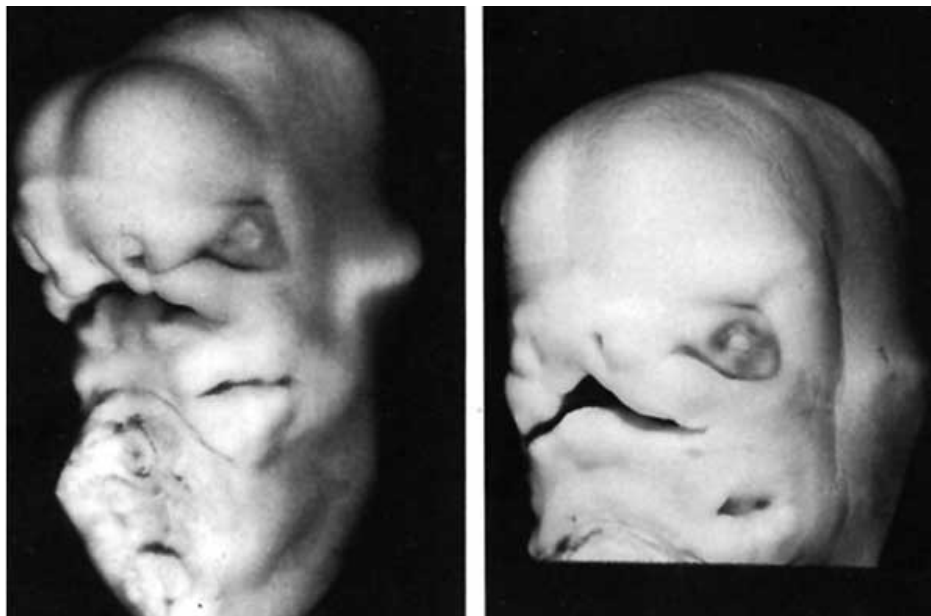


2. The second part of the class will go through a series of online resources covering the way in which the structures associated with the sense hearing develop. This will show how the outer, middle and inner ear form and their embryonic contributions. There will not be coverage of the central nervous pathway in any detail after the origin of the VIII cranial nerve.



**Cross-section of middle and inner ear structures (embryonic stage 22)**  
 (<http://embryology.med.unsw.edu.au/Notes/ear.htm#stage22select>)

The third part will go through abnormalities of the face and hearing. You should explore the major types of abnormalities associated with these systems and their genetic and/or environmental origins.



**Human embryo primary palate cleft (Carnegie stage 18 and 19, Kyoto collection)**  
 (<http://embryology.med.unsw.edu.au/Notes/face2.htm>)

**Questions:**

Which of the pharyngeal arches contribute mainly to the face and which contribute mainly to the neck?

Which of the lips has the most common clefting during development and why?

Which is the more common clefting, cleft lip or cleft palate?

What developmental environmental factors may contribute to abnormalities of both the face and ear position?

What is the Eustachian tube and what is its function?

What are preauricular tags and what may they indicate?

At what age is hearing tested with Australian children?

What is otitis media and how does it occur?