

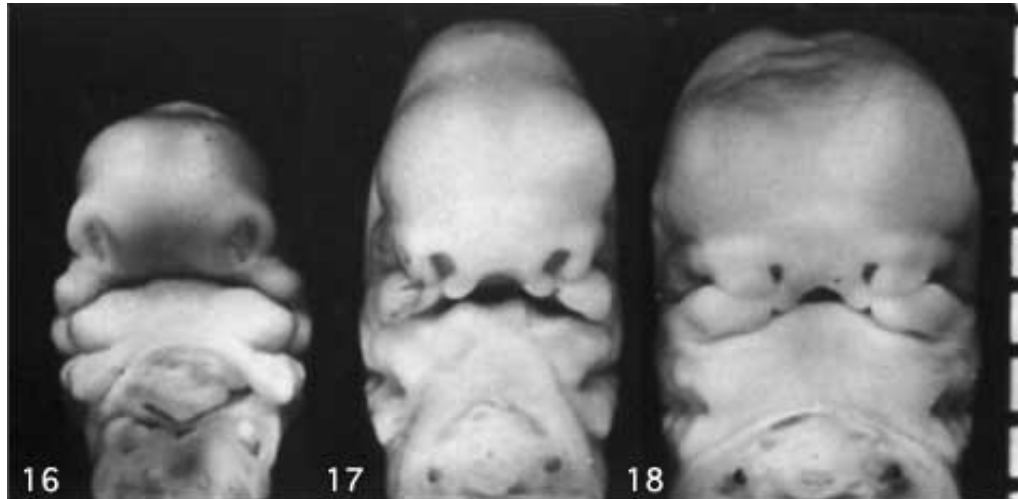


Practical 6: Embryology of the Face and Ear

Principal Teacher: Dr Mark Hill

Aim:

To introduce the developmental embryology of both the face and ear, and their associated abnormalities.



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 (<http://php.med.unsw.edu.au/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. There is an online Quiz to test your knowledge after completing the practical. The additional notes shown below will not be covered in the laboratory.

Practical Class Link:

[http://php.med.unsw.edu.au/embryology/index.php?title=BGDB Practical -
_Face and Ear Development](http://php.med.unsw.edu.au/embryology/index.php?title=BGDB_Practical_-_Face_and_Ear_Development)

Lecture Link:

[http://php.med.unsw.edu.au/embryology/index.php?title=BGD Lecture -
_Face and Ear Development](http://php.med.unsw.edu.au/embryology/index.php?title=BGD_Lecture_-_Face_and_Ear_Development)



Textbook:

There are many good embryology textbooks available, select the one that best suits your studying style. The first two listed below are also available online through the UNSW library and are also linked from your online classes.

(More textbooks http://php.med.unsw.edu.au/embryology/index.php?title=Embryology_Textbooks)

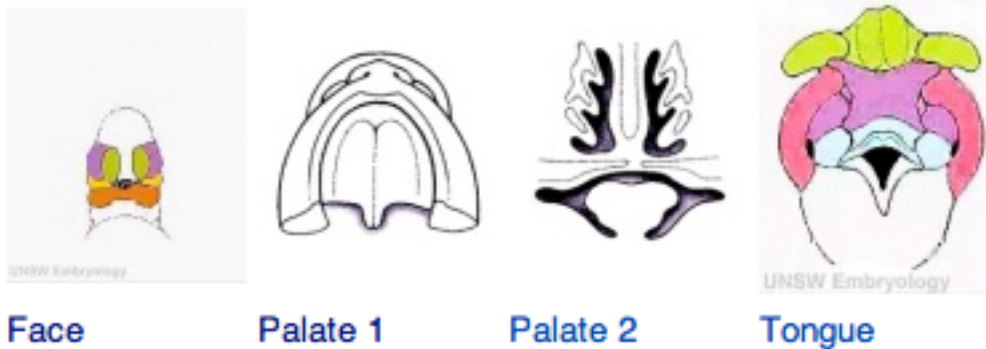
1. **The Developing Human : Clinically Oriented Embryology** (8th ed.) Moore, Keith L; Persaud, T V N; Torchia, Mark G Philadelphia, PA : Saunders/Elsevier, (2008). Chapter 9 and 18
2. **Larsen's Human Embryology** (4th ed.) Schoenwolf, Gary C; Larsen, William J, (William James). Philadelphia, PA : Elsevier/Churchill Livingstone (2009). Chapter 16 and 17
3. **UNSW Embryology** (11th ed.) Hill, Mark (2011)

http://php.med.unsw.edu.au/embryology/index.php?title=Head_Development

[http://php.med.unsw.edu.au/embryology/index.php?title=Sensory -
Hearing and Balance Development](http://php.med.unsw.edu.au/embryology/index.php?title=Sensory-_Hearing_and_Balance_Development)

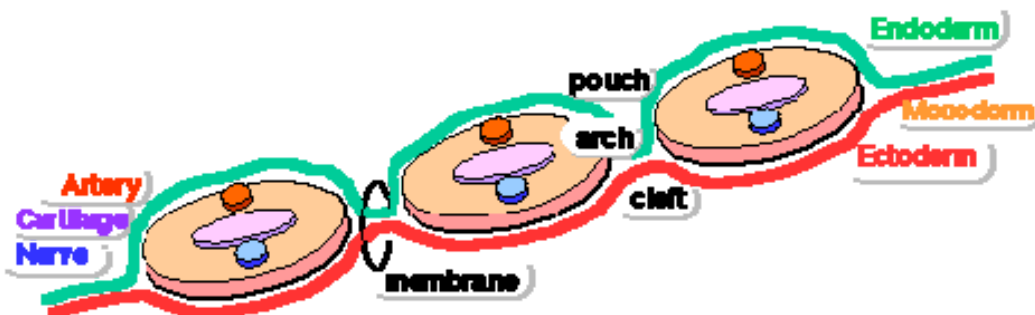
Background Information:

Head and Face

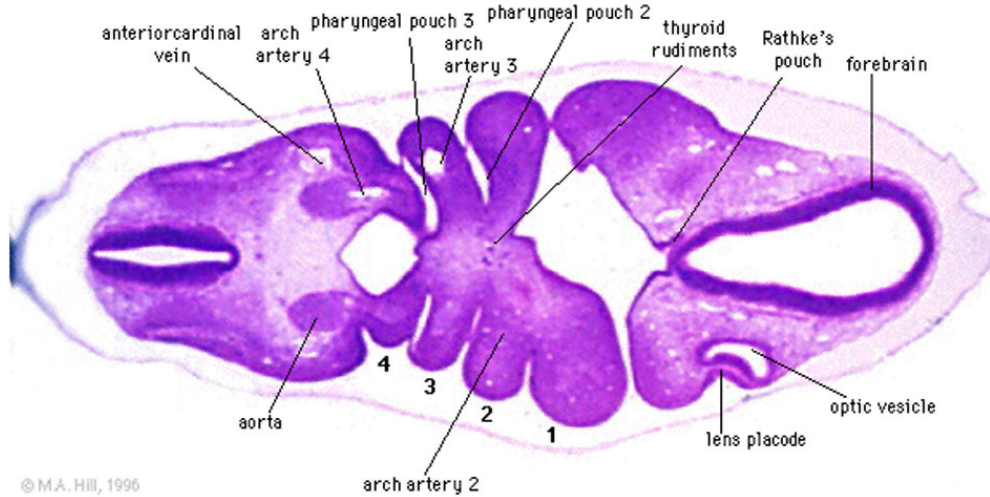


There are three main parts to this practical class.

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.

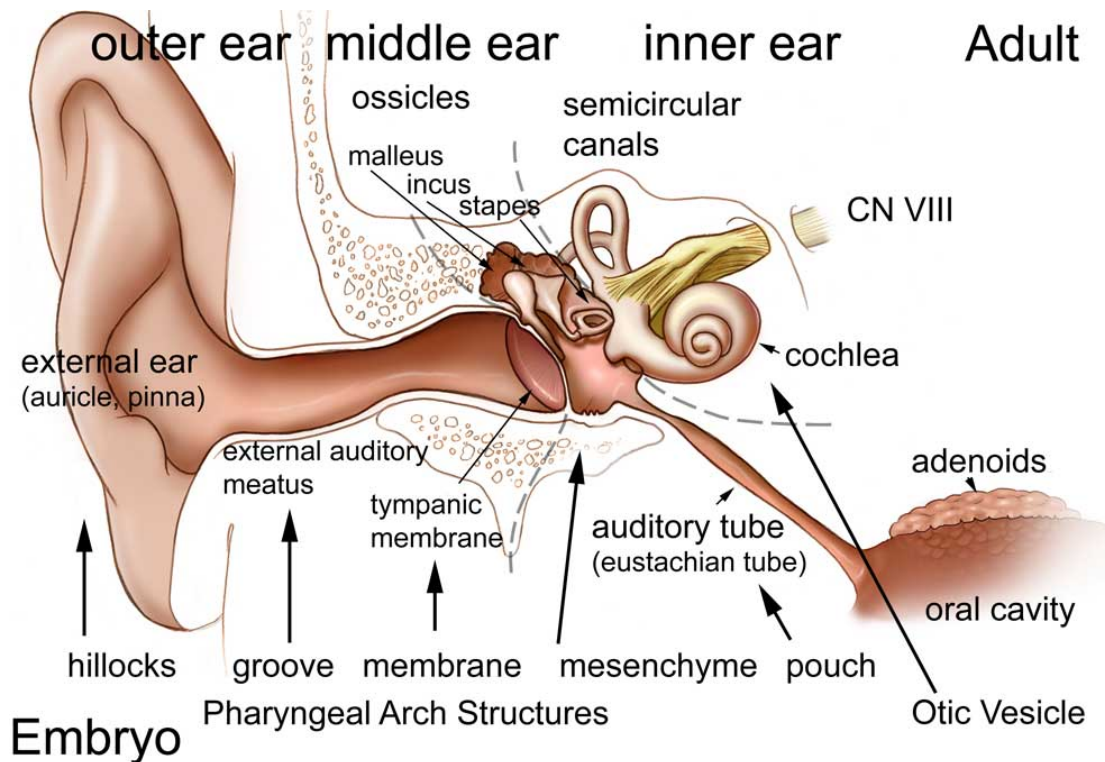


Cartoon of the Pharyngeal Arch Structure



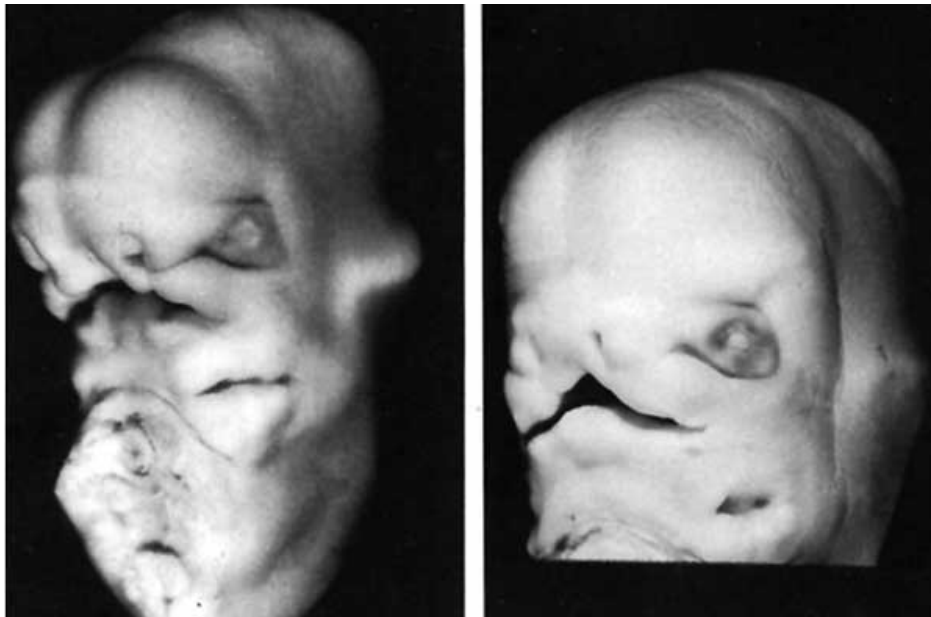
Cross-section of early embryo (Stage 13, week 4) head region

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 adult ear structures showing their embryonic origins.

3. 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)

Questions:

1. Which of the pharyngeal arches contribute mainly to the face and which contribute mainly to the neck?
2. Which of the lips has the most common clefting during development and why?
3. Which is the more common cleft lip or cleft palate?
4. What environmental factors may contribute to abnormalities of both the face and ear?
5. What is the Eustachian tube and what is its function?
6. What are preauricular tags and what may they indicate?
7. At what age is hearing tested with Australian children?
8. What is otitis media and how does it occur?