

DMS 333 Obstetrics I Winter 2021

## How to Scan Planes & Structures: the Fetal Face (Outline)

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### Objectives

- Explain embryonic development of the face.
- Discuss sonographic approach to obtaining the images of the fetal face.
- Classify cleft lip and palate defects.
- Discuss embryology of the eye and leading orbital and periorbital anomalies.

### Embryonic Development: the Face

- pg . 469 from textbook (condensed)
- During the fifth gestational week, the development of the face occurs
  - begins with neural crest cells
  - forms the brachial artery.
  - Total of six sets of arches
  - The first appearance is of the swellings called, *frontal nasal prominences*
  - The result of the intermaxillary segment fusing ultimately results in a normal facial structure

### The Face

- Orbits and eyes
  - The same plane that measure the BPD should show also present the orbits and eyes
  - To determine gestational age and abnormal spaced orbits, take a measurement between the eyes.
    - Hypotelorism, closely spaced
    - Hypertelorism, widely spaced
  - Compared to the inner orbital distance, outer orbit distance has a greater range of normal variation
  - Outlines the lens of the fetal eye
    - Ciliaris muscles

- Zonular fibers
  - May image within the fetal globe
    - Hyaloid artery
- Ears
  - Pinna of the ear
    - Best seen with 3D surface rendering
  - In accordance with a linear growth pattern, the fetal ear length can be useful as a possible biometric measurement
- Lower Face
  - Nares and upper lip, seen at a coronal scan, and the face
    - can be searched for cleft lip
  - Fetal tongue motion/swallowing can be seen
  - Midline sagittal view = the fetal profile
    - Confirms the shape and position of the fetal nose and chin
  - Color flow doppler
    - Demonstrates normal fetal breathing
      - Because of amniotic fluid motion through the fetal nares
- Minimum Brain and Face Views Obtained During the Sonography CHART
  - Pg. 477 from textbook

### **Normal Sonographic Anatomy**

The visualization of the fetal face requires multiple approaches from the midsagittal, coronal, and axial planes.

- ***Sagittal Planes (Profile view)***
  - the forehead
    - “frontal bossing”
  - nose with nasal bone
    - “equal sign”
  - mouth with maxilla
    - Recognized as a developing bone region in the fetal face
  - mandible anteriorly
    - An echogenic dot under the anterior maxilla .

- ***Coronal Planes***
  - Relationship between the orbits/ eyes and the nasal bridge/ maxilla.
  - The retranasal triangle
  - A mandibular gap, seen between the maxilla and the mandible
- ***Axial Planes***
  - demonstration of orbits, nasal bridge, the maxilla, and the mandible.
- ***Three-Dimensional Ultrasound of the Fetal Face***
  - Good visualization of facial structures
  - Can often be transabdominal, but transvaginal provides the best resolution and details
  - Helps evaluates for facial anomalies

### **Anomalies of the Fetal Head**

Understanding the face embryology helps us acknowledge the whole understanding of the origin and normalities of the fetus.

- Embryology of the Eye
  - optic vessels
  - Hypotelorism
    - Decreased interorbital distance
    - Typically found with other severe anomalies
      - holoprosencephaly
  - Hypertelorism
    - Increased orbital distance
    - Isolation or with another malformation and syndrome.
  - Microphthalmia
    - Decreased orbit size
    - Typically isolated
  - Anophthalmia
    - Absence of the eye
- Embryology of the Lower Face
  - Macroglossia
  - Micrognathia
- Facial Clefts
  - Cleft Lip
  - Cleft Palate

## Resources:

- Ultrasound Evaluation Of The Fetal Face And Neck  
UFO Themes -  
<https://radiologykey.com/ultrasound-evaluation-of-the-fetal-face-and-neck/>
- Nicolaides, Ximenes & Jeanty. "FACE." *FACE - DIAGNOSIS OF CONGENITAL ABNORMALITIES - THE 18-23 WEEKS SCAN*, Pilu, 2000,  
[sonoworld.com/client/fetus/html/chapter-03/face/facefmf.html](http://sonoworld.com/client/fetus/html/chapter-03/face/facefmf.html).
- Şorop-Florea, Maria, et al. "Congenital Abnormalities of the Fetal Face."  
*IntechOpen*, IntechOpen, 2 May 2018,  
[www.intechopen.com/books/congenital-anomalies-from-the-embryo-to-the-neonate/congenital-abnormalities-of-the-fetal-face](http://www.intechopen.com/books/congenital-anomalies-from-the-embryo-to-the-neonate/congenital-abnormalities-of-the-fetal-face).
- Barnes, Sam. "Development of the Face and Palate." *TeachMeAnatomy*, TeachMe Series, 17 Sept. 2020,  
[teachmeanatomy.info/the-basics/embryology/head-neck/face-palate/](http://teachmeanatomy.info/the-basics/embryology/head-neck/face-palate/).
- Stephenson, Susan Raatz, and Julia Dmitrieva. *Diagnostic Medical Sonography*. 4th ed., Wolters Kluwer Health, 2018.