

Speech Management for Children with Cleft Lip & Palate:
State-of-the-art
Webinar series by the **Cleft Palate & Craniofacial Committee**

Webinar #1

Overview of Cleft Palate & Cleft Palate Speech

20th January 2022, 12.00-13.30 GMT

Dr. Triona Sweeney & Dr. Alice Lee, Ireland



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Online Information/Resources

Professional organisations e.g.

- American Cleft Palate-Craniofacial Association
- Australasian Cleft Lip & Palate Association

Associations for clients & their families e.g.

- Cleft Lip & Palate Association
- Hong Kong Association for Cleft Lip and Palate

Other organisations e.g.

- Transforming Faces
- SmileTrain
- Circle of Cleft Professionals: <https://cleftcircle.org/>
- SCR4Cleft: <http://www.scr4cleft.org/>

See webpage of IALP Cleft Palate & Craniofacial Committee: <https://ialpasoc.info/committees/cleft-palate-and-craniofacial-committee/> [Guidelines] [Info for the patient] [Other resources]



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Outline

Part 1

- An overview on facial development
- Different types of clefts & incidence
- General management of cleft palate

Part 2

- Speech, resonance, & voice problems associated with cleft palate and the possible causes
- Potential developmental speech errors
- Impact of hearing on speech



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Embryological Development

BBC. (2011, May 3). *Face development in the womb – Inside the human body: Creation – BBC One* [Video]. YouTube. http://www.youtube.com/watch?v=wFY_KPFS3LA&feature=related



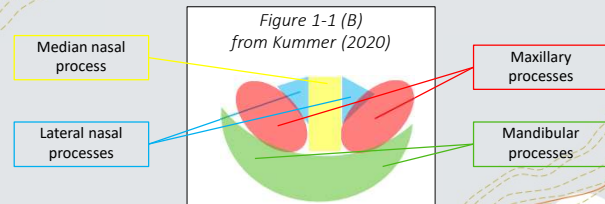
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Embryological Development

Photos from: Kummer, A. W. (2020). *Cleft palate and craniofacial conditions: A comprehensive guide to clinical management* (4th ed.). Jones & Bartlett Learning.

Figure 1-1 (B) from Kummer (2020)



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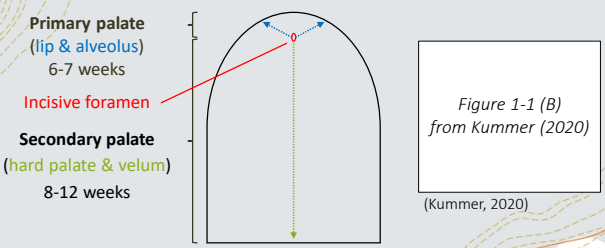
Embryological Development

Primary palate (lip & alveolus) 6-7 weeks

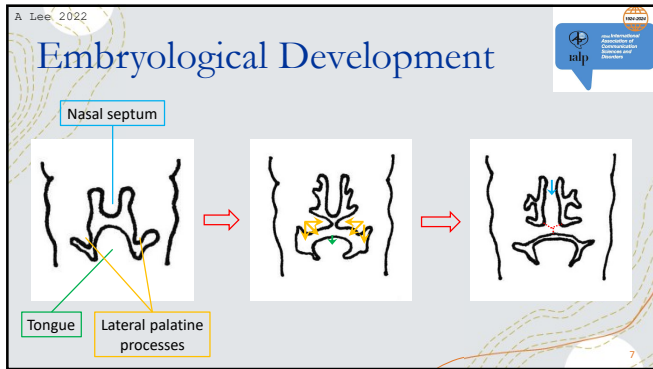
Incisive foramen

Secondary palate (hard palate & velum) 8-12 weeks

Figure 1-1 (B) from Kummer (2020)



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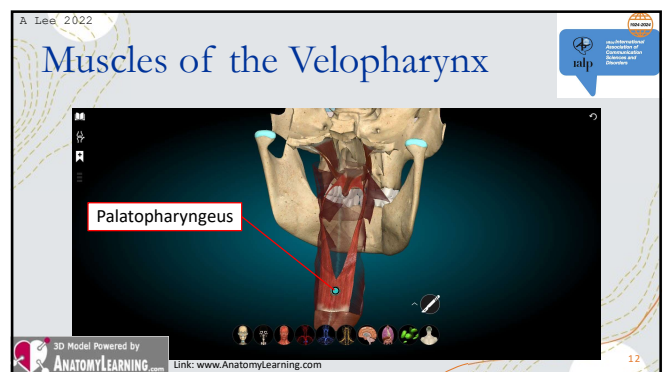
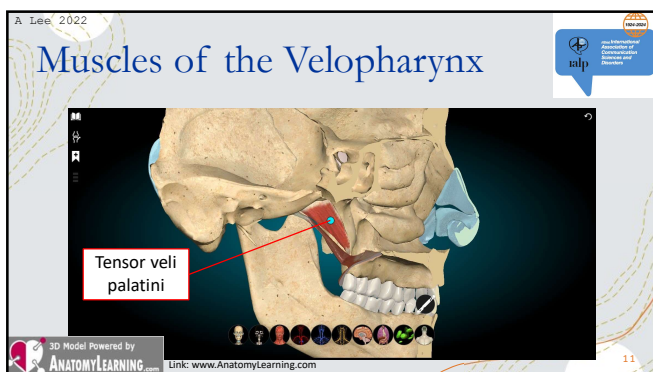
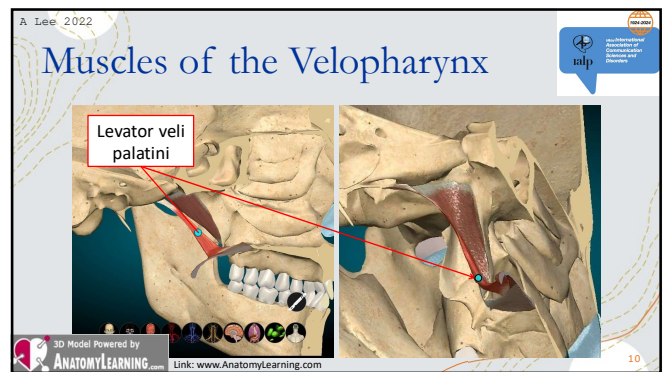
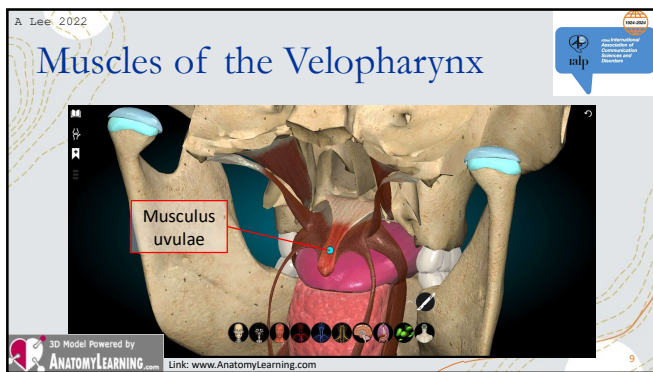
Anatomy of the Palate

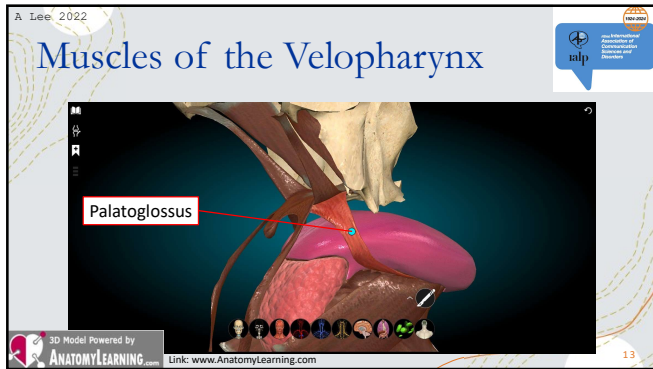
- **Hard palate** – a bony structure
- **Soft palate / velum** – consists of muscles:
 - Musculus uvulae
 - Levator veli palatini
 - Tensor veli palatini
 - Palatopharyngeus
 - Palatoglossus
- **Muscles of velopharynx** incl. also:
 - Superior constrictor
 - Salpingopharyngeus

3D Model Powered by ANATOMYLEARNING.com

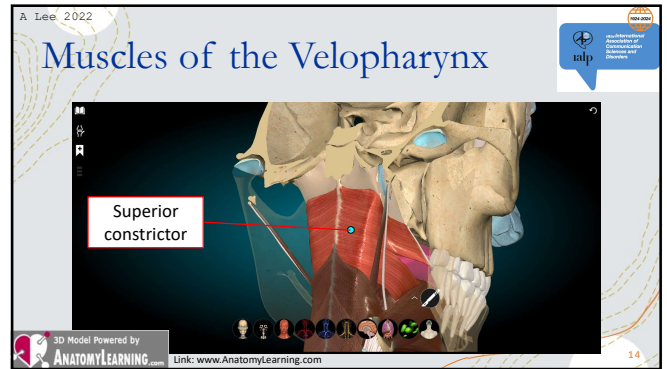
<https://anatomylearning.com/>

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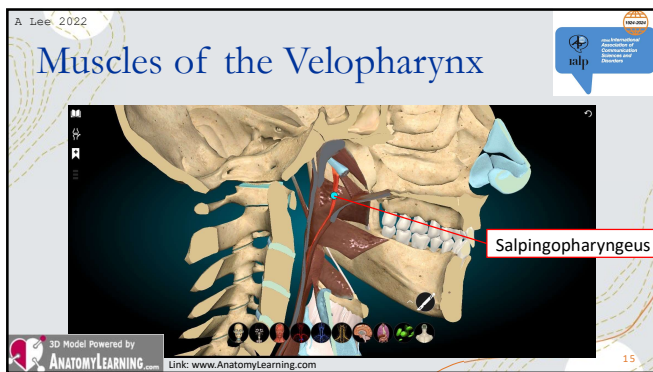




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Cleft Lip & Cleft Palate (Definition)

<p>Cleft lip</p> <ul style="list-style-type: none"> • “A congenital malformation that occurs in utero during the first trimester of pregnancy and involves a fissure of the lip and sometimes alveolus” (Kummer, 2020, p. 585). 	<p>Cleft palate</p> <ul style="list-style-type: none"> • “A congenital malformation that occurs in utero during the first trimester of pregnancy and involves a fissure of the soft palate and sometimes the hard palate” (Kummer, 2020, p. 586).
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Congenital malformation – lack of fusion

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Clefts of the Primary Palate

Figure 3-6 (A) from Kummer (2020)	Figure 3-6 (B) from Kummer (2020)	Unilateral incomplete cleft lip (Kummer, 2020)
Figure 3-8 (D) from Kummer (2020)	Figure 3-8 (E) from Kummer (2020)	
	Figure 3-8 (F) from Kummer (2020)	Unilateral complete cleft lip (Kummer, 2020)

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Clefts of the Primary Palate

Figure 3-7 (A) from Kummer (2020)	Figure 3-7 (B) from Kummer (2020)	Bilateral incomplete cleft lip (Kummer, 2020)
Figure 3-9 (A) from Kummer (2020)	Figure 3-9 (B) from Kummer (2020)	
Figure 3-9 (C) from Kummer (2020)		Bilateral complete cleft lip (Kummer, 2020)

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Clefts of the Secondary Palate

Incomplete cleft palate
(Kummer, 2020)

Complete cleft palate
(Kummer, 2020)

Figure 3-11 (C)
from Kummer
(2020)

Figure 3-11 (D)
from Kummer
(2020)

Figure 3-12 (A)
from Kummer
(2020)

Figure 3-12 (B)
from Kummer
(2020)

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Cleft Lip and/or Palate

Bilateral complete cleft lip & palate
(Kummer, 2020)

Cleft palate only
(Kummer, 2020)

Figure 3-14 (A)
from Kummer (2020)

Figure 3-14 (B)
from Kummer
(2020)

Figure 3-14 (C)
from Kummer
(2020)

Figure 3-15 (A)
from Kummer
(2020)

Figure 3-15 (B)
from Kummer (2020)

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Submucous Cleft Palate

- Intact oral surface mucosa but incomplete development of underlying structure of palate (Kummer, 2020).
- Severity varies – from bifid uvula to cleft of hard palate under the oral mucosa.
- Overt submucous cleft
- Occult submucous cleft

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Overt Submucous Cleft

- Can be seen on oral surface of palate during intraoral exam.
- Characteristics: bifid uvula; zona pellucida in velum; "tenting" of velum during phonation; notch in posterior border of hard palate (Kummer, 2020)

Figure 3-18 (A)
from Kummer
(2020)

Figure 3-18 (B)
from Kummer
(2020)

Figure 3-18 (C)
from Kummer
(2020)

Figure 3-18 (D)
from Kummer
(2020)

(Kummer, 2020)

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Occult Submucous Cleft

- The defect is not apparent on oral surface of soft palate; can be seen by viewing nasal surface (Kummer, 2020).

Figure 16-11
from Kummer (2020)

Figure 3-19
from Kummer (2020)

(Kummer, 2020)

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Oronasal Fistula

- Also known as palatal fistula.
- It is an opening in palate that goes all the way through to nasal cavity.
- Result of failure of palate to heal after palatal repair.
- Location: along embryological or surgical suture lines (Kummer, 2020).

Figure 5-15 (A)
from Kummer (2020)

Figure 5-15 (B)
from Kummer (2020)

Figure 5-15 (C)
from Kummer (2020)

(Kummer, 2020)

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Incidence of Cleft Lip and/or Palate

- **1 in every 500-2000 births**, depending on the population (Marazita & Mooney, 2004).
- Cleft lip and/or palate can be **syndromic** or **non-syndromic**.
 - Occur as **one of the features in >400 recognised syndromes**.
 - About **70% of CL + CL&P cases & 50% of CPO cases** are non-syndromic.
- **Cleft lip & palate occurs more often** than cleft lip alone / cleft palate only.
- **Males more vulnerable** to CL + CL&P than CPO; vice versa for females.

(see Peterson-Falzone et al., 2010; Zajac & Vallino, 2017)

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Incidence of Cleft Lip and/or Palate

- Racial groups (Gorlin et al., 2001):
 - Native American (**1 in 300**)
 - Asian (**1 in 500**)
 - Caucasian (**1 in 800**)
 - African (**1 in 2000**)

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Causes of Clefts

- **Inherited** (genetic or chromosomal) conditions
 - 3-5% recurrence risk
- **Environmental** factors e.g., maternal smoking; maternal alcohol use; exposure to teratogens; **physical interference** e.g., in Pierre Robin sequence

(see e.g., Kummer, 2020; Leslie & Marazita, 2013)

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General Management of Cleft Palate

- **Feeding** problems
- Require **surgical repair** of CL/P
- **Speech** (articulation, resonance, voice), **language, hearing, cognitive** issues
- **Psychosocial** issues
- **Dental/orthodontic** problems
- **Maxillofacial** issues

• A **team approach** for coordinated & integrated CLP management.

(see e.g. Kummer, 2020)

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References

AnatomyLearning.com
 BBC. (2011, May 3). *Face development in the womb – Inside the human body: Creation – BBC One* [Video]. YouTube. http://www.youtube.com/watch?v=wFY_KPFS3LA&feature=related
 Gorlin, R., Cohen, M. J., & Hennekam, R. C. M. (2001). *Syndromes of the head and neck* (4th ed.). Oxford University Press.
 Kummer, A. W. (2020). *Cleft palate and craniofacial conditions: A comprehensive guide to clinical management* (4th ed.). Jones & Bartlett Learning.
 Leslie, E. J., & Marazita, M. L. (2013). Genetics of cleft lip and cleft palate. *American Journal of Medical Genetics Part C: Seminars in Medical Genetics*, 163(4), 246-258.
 Marazita, M. L., & Mooney, M. P. (2004). Current concepts in the embryology and genetics of cleft lip and cleft palate. *Clinics in Plastic Surgery*, 31, 125-140.
 Peterson-Falzone, S. J., Hardin-Jones, M. A., & Karnell, M. P. (2010). *Cleft palate speech* (4th ed.). Mosby.
 Zajac, D. J., & Vallino, L. D. (2017). *Evaluation and management of cleft lip and palate: A developmental perspective*. Plural Publishing Inc.

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