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Cleft Palate Speech and Feeding

Train the Trainer

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Module 5:

- **Syndromes**
  - Treacher Collins Syndrome
  - 22q11.2 Deletion Syndrome
  - Pierre Robin Sequence
  - Moebius Syndrome

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Genetics of cleft lip

(with or without cleft palate)

- Substantial underlying genetic pathogenesis

- Most cases are isolated
  - No associated syndromes or other birth defects

Genetics of cleft palate only

- A substantial number are caused by
  - multiple congenital syndromes or
  - multiple congenital anomaly disorder

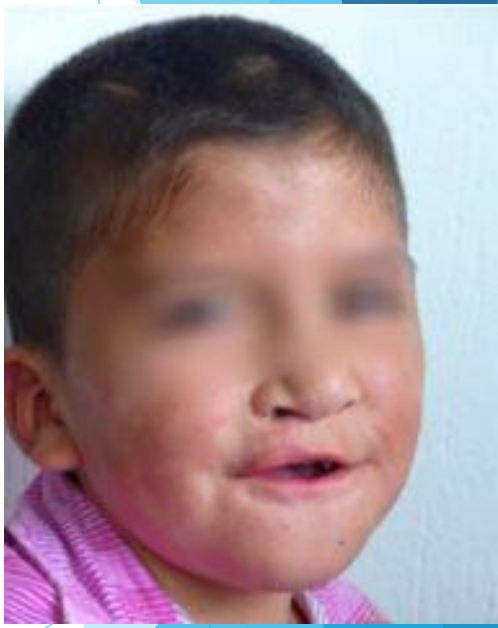
Treacher Collins Syndrome

- Underdeveloped facial bones (especially impacted are the cheekbones).
- Cleft palate (possibly)
- Small jaw and chin and skull shape is atypical.
- Tiny nose, mouth, and throat airways.
- Potential eye, dental, and hearing issues.
- Typically, no delays in cognition or language.

Treacher Collins Syndrome

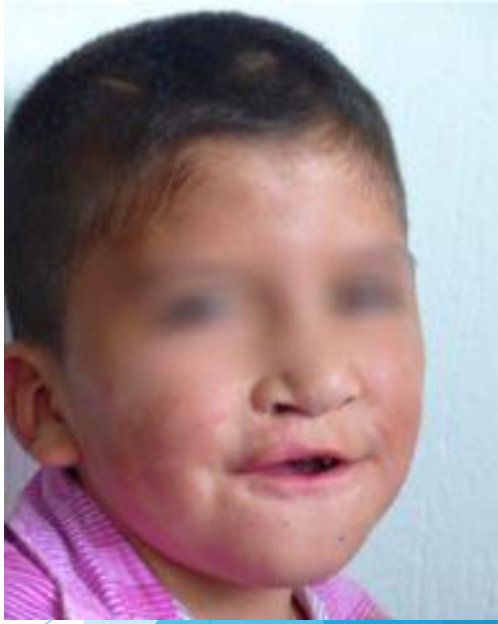
22q11.2 is a Common Genetic Disorder

- According to the International 22q11.2 Foundation Inc., 22q11.2 occurs 1 in every 2000-4000 births
- Second leading cause of congenital heart defects
- No differences in regards to gender (impacts males and females at equal rates and severities)



Areas Affected by 22q11.2
Significant Variability across Affected Individuals

- Heart abnormalities
- Cognitive deficits
- Language deficits
- Immune dysfunction
- Growth disturbances
- Developmental abnormalities
- Psychiatric abnormalities
- Learning difficulty

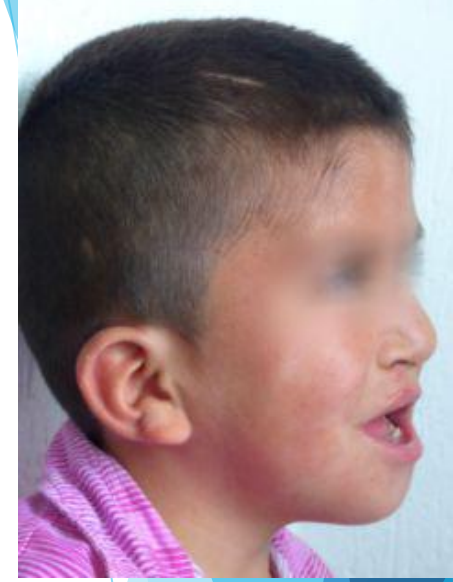


22q11.2 previously known as...

- DeGeorge Syndrome
- Velocardiofacial Syndrome
- Shprintzen Syndrome

Now all called 22q11.2 deletion syndrome. All are caused by the same chromosomal deletion.

Underdiagnosis of Africans and Others From The African Diaspora with 22q11.2



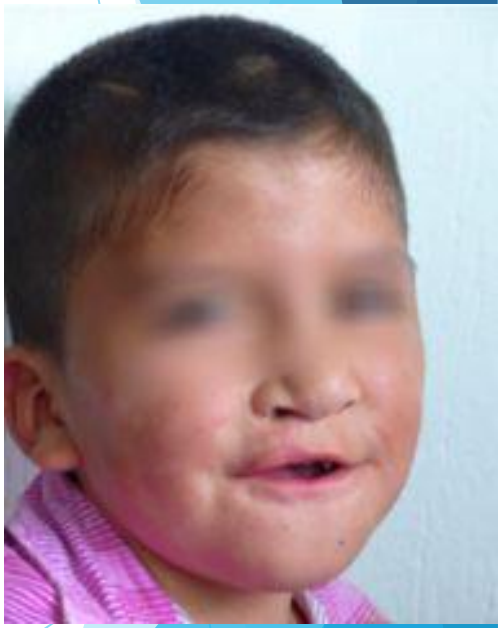
- No race differences in terms of prevalence

BUT

- There has been shown to be an *underdiagnosis* in Africans and those from the African diaspora due to similar facial features associated with 22q11.2

How is 22q11.2 Diagnosed?

- Diagnosed with a blood test
- FISH test used to diagnose (finds the 22q11.2 deletion)
- Microarray analysis
  - More sensitive. Identifies 22q deletion and 22q duplications



Velopharyngeal Dysfunction and 22q11.2

Only 5-10% of those with 22q11.2 have a visible cleft palate that requires surgical repair

Majority of patients with 22q11.2 have hypernasal speech with either:

- A submucous cleft; or
- A palate that appears adequate, but does not function appropriately for speech due to velopharyngeal disproportion, that is the posterior pharyngeal wall is set back

Velopharyngeal Dysfunction and 22q11.2

Palatopharyngeal disproportion

- The palate (although may appear typical) is unable to touch the posterior pharyngeal wall
  - This is very typical in children with 22q11.2
- The palate structure and palate length is normal, however, the posterior pharyngeal wall is set further back (deep pharynx) in patients who have 22q11.2

The Role of Speech and Language Therapy in 22q11.2

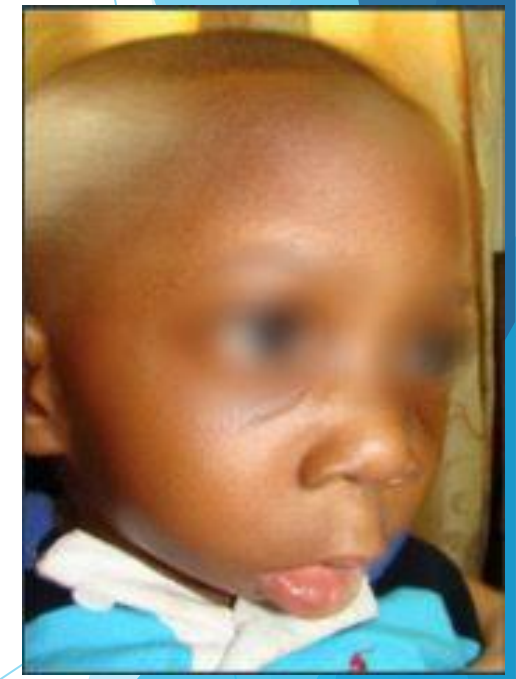
- Approximately 90-95% of those with 22q11.2 have a speech and or language delay such as:
  - Articulation deficits in 75% of patients, with poor speech intelligibility;
  - Difficulty producing speech sounds;
  - Delayed onset of first words, with 70% nonverbal at age 2;
  - Delayed expressive skills;
  - Comprehension issues, but generally stronger than expressive; and/or
  - Social language skills.

Role of speech language therapy in 22q11.2

- **Hypernasal speech,** due to palatal dysfunction
- **Voice disorders**
  - Hoarse, Breathy, Low volume
- **Vocal fold paralysis and/or laryngeal web**
- **Motor speech disorders**
  - Dysarthria
  - Cranial nerve abnormalities
  - Apraxia

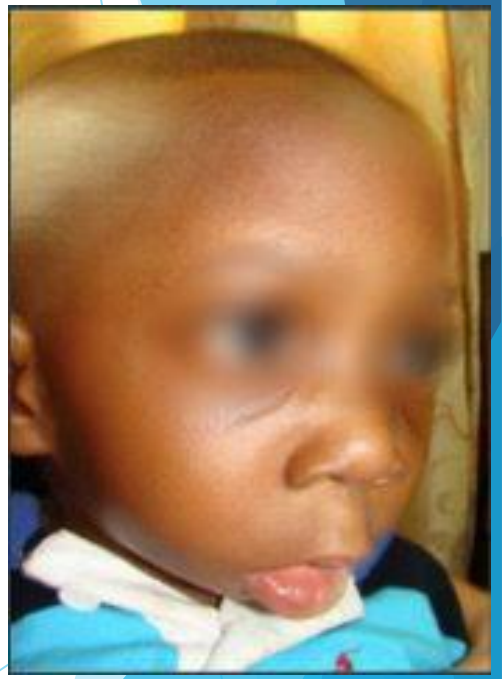
Pierre Robin Sequence

1. Wide, bell-shaped cleft palate
2. Micrognathia
    - Small jaw or mandible, also known as *retrognathia*
3. Glossoptosis
    - Atypical placement in the back of the tongue (tongue typically is downward and back)



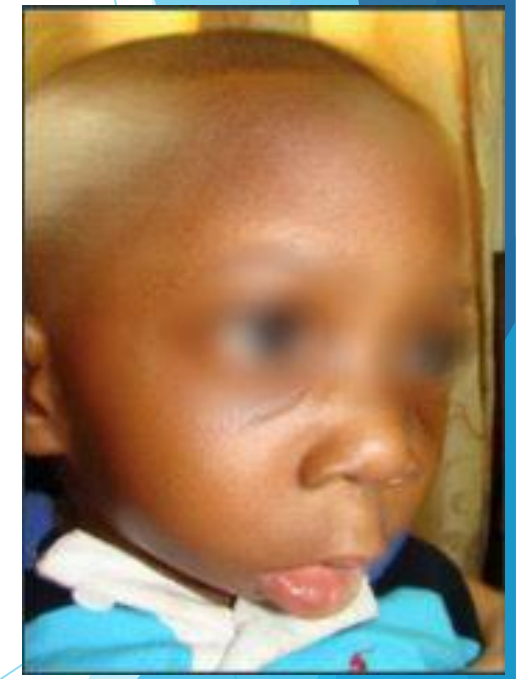
Pierre Robin Sequence

- Cause
  - Small mandible makes the tongue stay high in the oral cavity
  - This position of the tongue Interfere with the closing of the velum



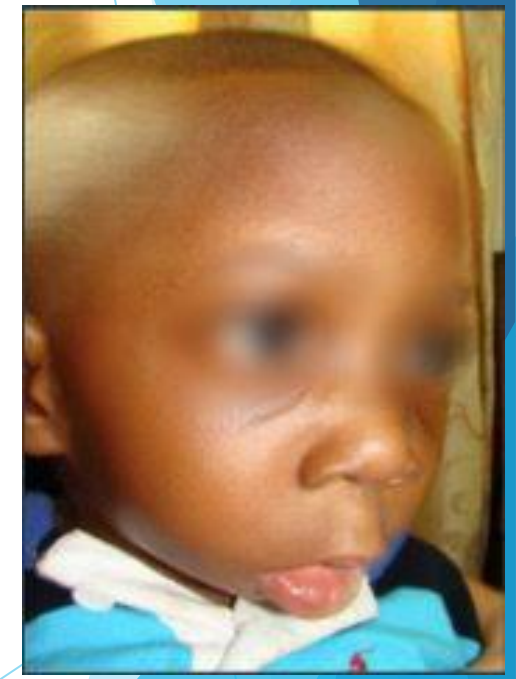
Pierre Robin Sequence: Breathing Complications

- Following birth, glossoptosis (tongue typically is downward and back) can block the upper airway
- This may cause *severe* respiratory distress



Prevalence of Pierre Robin Sequence

- 1 in 14,000 live births
  - 66% classic U-shaped cleft palate
  - 33% had other malformations
  - Stickler Syndrome 6 in 10



Printzlau and Andersen 2007 Cleft Palate Craniofacial J. 2004 41(1) 47-52. Study in Denmark. But they had to have a cleft to be included—so this study probably understates the problem.

Moebius Syndrome

- Predominantly affects the 6th-Abducens and 7th-Facial cranial nerves, but other cranial nerves can be affected
- Often cannot smile, frown, or blink eyes
- Difficulty with lateral eye movements
- Generally normal intelligence and cognition
- Prevalence estimated at 2-20 per 1 million people.

Moebius Syndrome: Physical Appearance

- Small chin (micrognathia)
- Small mouth (microstomia)
- Short or atypical shape/movement of tongue
- Cleft palate
- Could have high arch in the oral cavity
- Missing teeth
- May have limb disturbances

Moebius Syndrome Foundation

Moebius Syndrome Impairments

- Respiratory issues
- Speech, feeding, and swallowing issues
- Impaired vision
- Sensory integration deficits
- Problems sleeping
- Upper body strength weakness

Credits

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References

Baylis, A. (2014, June 11). Speech disorders – Nasal speech & velopharyngeal dysfunction [Episode 289]. PediaCast. Podcast retrieved from iTunes.

Kirschner, R., & Baylis A. (2012, September 12). All about 22q11.2 [Episode 226]. PediaCast. Podcast retrieved from iTunes.

Kirschner, R., & Baylis A. (2014, July 10). Hypernasal speech and velopharyngeal dysfunction in 22q11.2 deletion syndrome. Retrived from https://www.youtube.com/watch?v=HJzlw4Ez198

Kummer, A. (n.d.). Velocardiofacial Syndrome (VCFS). Cincinnati Children's Hospital Medical Center, 1-2.

McDonald-McGinn, D. M., Minugh-Purvis, N., Kirschner, R. E., Jawad, A., Tonnesen, M. K., Catanzaro, J. R., ... & Zackai, E. H. (2005). The 22q11. 2 deletion in African-American patients: An underdiagnosed population?. *American Journal of Medical Genetics Part A, 134*(3), 242-246.

References

Peterson-Falzone, S.J., Hardin-Jones, M.A., Karnell, M.P. (2010). Cleft Palate Speech (4th Edition). St. Louis, MO: Mosby Elsevier.Printzlau and Andersen 2007 Cleft Palate Craniofacial J. 2004 41(1) 47-52. Study in Denmark. But they had to have a cleft to be included—so this study probably understates the problem.

The International 22q11.2 Foundation (2015). 22q11.2 Deletion. Retrieved from http://www.22q.org/about-22q/faqs/22q11-2-deletion/

Veerapandiyan, A., Abdul-Rahman, O. A., Adam, M. P., Lyons, M. J., Manning, M., Coleman, K., ... & Shashi, V. (2011). Chromosome 22q11. 2 deletion syndrome in African-American patients: A diagnostic challenge. *American Journal of Medical Genetics Part A*, *155*(9), 2186-2195.

What is Moebius syndrome? (2015). Moebius Syndrome Foundation. Retrieved from http://moebiussyndrome.org/about-moebius-syndrome/what-is-moebius-syndrome/