Cleft Palate Craniofacial Center Symposium

April 13, 2026

Welcome!

Stony Brook Children's

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History

- Established 1985
- Coordinator
- Specialists: Genetics, Otolaryngology, Speech and Hearing, Plastics, Orthodontics, Pediatric (MD + DDS), OMFS, Parent advocate, Social Work etc.
- Team conferences (monthly)

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Mission

- To provide **patient centered care** for children with CP/CF deformities
- To **guide and support families** to negotiate financial and social barriers

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What We Do

- Provide diagnostics
- Prepare families for the timing and coordination of diagnostics and services
- Provide services
- Assist families and Communicate with managed care
- Assist primary care physicians
- Refer to specialists
- Educate community

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Team Presentations

- Genetics
- Feeding/Lactation Specialist
- Pediatric Dentist
- Plastic Surgeon
- Otolaryngology (ENT)
- Audiology
- Speech
- Orthodontics
- Maxillofacial Surgery
- Prosthodontist
- Social Work
- Caregivers

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ACPA

American Cleft Palate Craniofacial Association

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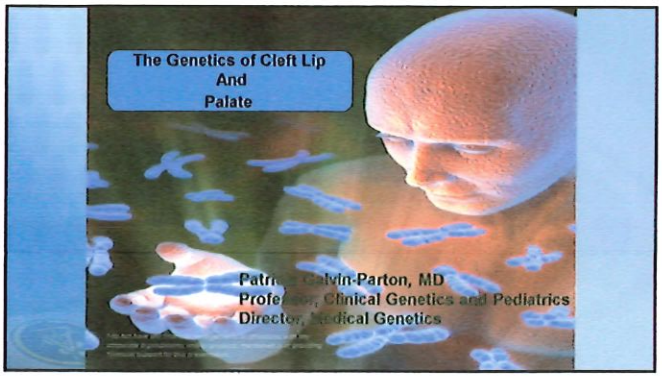

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What is Cleft Lip and Palate?

A Cleft is a separation in the Lip or in the Roof of the mouth.

The lip forms at about the 7th Week of Pregnancy

Approximately, 1 in 600 babies born in the United States has some type of Cleft.

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What Causes this Condition?

In most cases, the exact cause of clefting is unknown.

There seems to be 2 interrelated factors:

Our Genes
The Environment

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GENETIC:

Cleft conditions may be considered Genetic, even if there are no other affected family members.

Genetic disorders occur when:

- Something happens to change a gene (mutation)
- An individual inherits a disordered gene from one or both parents who may or may not know they have the gene
- An individual inherits multiple genes which, in combination, give rise to a syndrome

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What Causes this Condition?

In most cases, the exact cause of clefting is unknown.

There seems to be 2 interrelated factors:

Our Genes
The Environment

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Environment

This term refers to all those factors that are not in the genes and chromosomes. It can be exposure to drugs, chemicals and infectious agents as well as where the baby begins to grow in the uterus.

- These include heavy alcohol consumption, smoking and certain meds for acne and others necessary to control epilepsy in the mother. To cause a cleft, an environmental exposure must have occurred before the formation of these structures. Anything that happened after this time has no bearing on the cause of the cleft.

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What is Involved in a Genetic Evaluation

The most essential part of a genetic evaluation is verifying that the cleft is isolated, not part of a syndrome. Majority of children who have clefts do not have other genetic problems.

TOOLS

- History
  - Prenatal & medical
- Family history
  - 3 generation pedigree
- Physical examination
- Further testing
  - Radiology
  - Genetic testing as indicated
- Determination of Recurrence Risk

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Examples of Genetic Causes

Genes

- *Single Gene Defects*
  - Dominant
  - Recessive
  - X-Linked
- *Chromosomal Defects*
  - Trisomy 13 (Patau)
  - 5p- (Cri-du-chat)
  - 4p- (Wolf-Hirschhorn

Tools

Chromosome analysis, Chromosome MicroArray, Gene Panels, Whole Exome Sequencing via blood, amniotic fluid or tissue/saliva.

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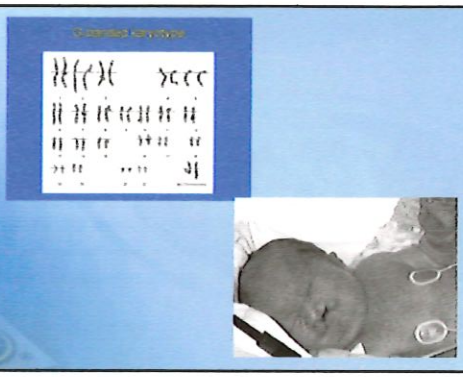

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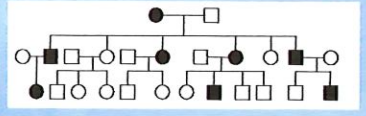
Autosomal Dominant Inheritance



- Van der Woude Syndrome

- Facial Cleft (37%)
- +/- Lower Lip Pits (86%)
- +/- Hypodontia
- +/- Family History
  - Single Most Common Inherited Cause of Isolated Clefts (2-12%)
- AD, incomplete penetrance & variable expressivity

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Velocardiofacial Syndrome

- Velo – Cleft palate (overt or submucous), hypemasal speech
- Cardio – Contruncal defects (VSD, TOF)
- Facial – Microcephaly, long face with malar flattening, small palpebral fissures, long nose with bulbous tip and notched alae nasi, dysplastic ears, micrognathia
- CNS – Developmental delay/MR
- Ext – Long, thin fingers

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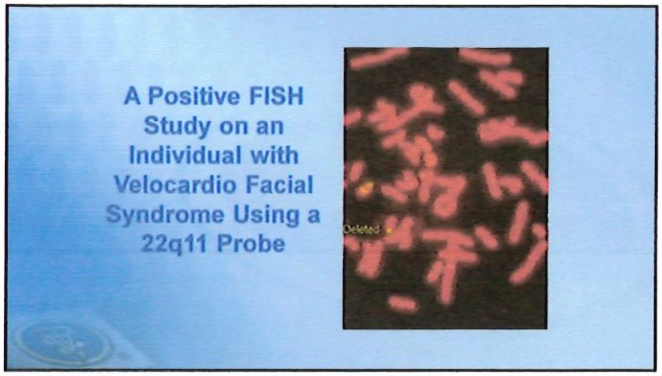

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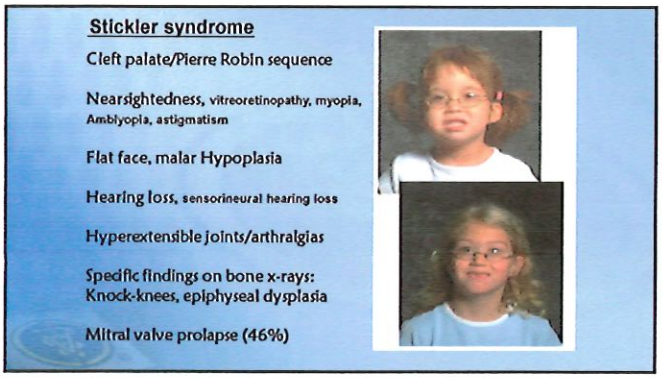

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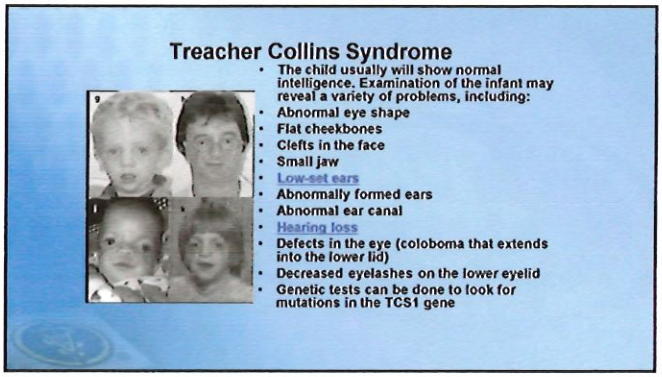

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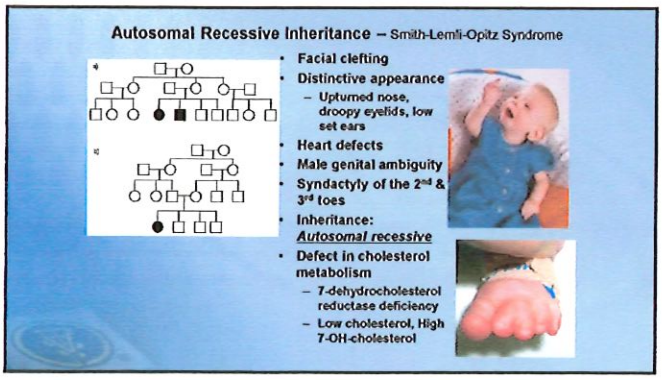

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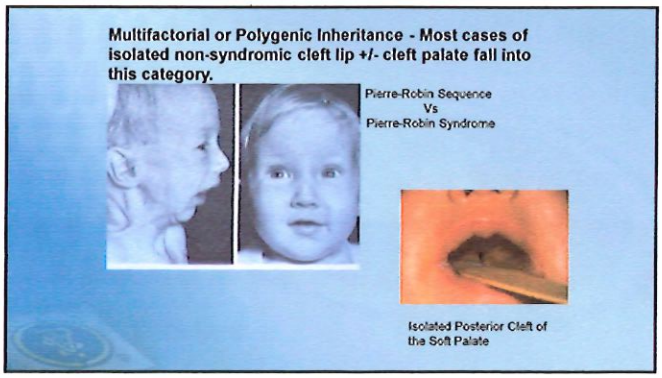

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Environmental
Teratogenic

Main offending agents are
Retinoic Acid
Valproic Acid
Warfarin or Coumadin
Alcohol

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Discussion of various kinds of Prenatal Dagnosis if couple is interested

Non-syndromic Unilateral Cleft Lip and Palate



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FOLIC ACID

ALL WOMEN OF CHILD-BEARING AGE SHOULD BE ON A FOLIC ACID SUPPLEMENT – 0.4 MG OR

FOR HIGH RISK, 4 MG

3 months preconception through the second trimester

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TO SUMMARIZE:

The most essential part of a genetic evaluation is verifying that the cleft is isolated, not part of a syndrome. Majority of children who have clefts do not have other genetic problems.

TOOLS

- History
  - Prenatal & medical
- Family history
  - 3 generation pedigree
- Physical examination
- Further testing
  - Radiology
  - Genetic testing as indicated
- Determination of Recurrence Risk
- Most cases are isolated and Multifactorial in origin
- Recommendations of Folic Acid for all future Pregnancies

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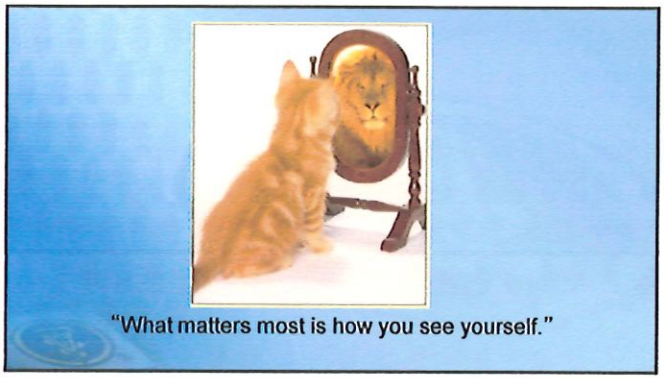

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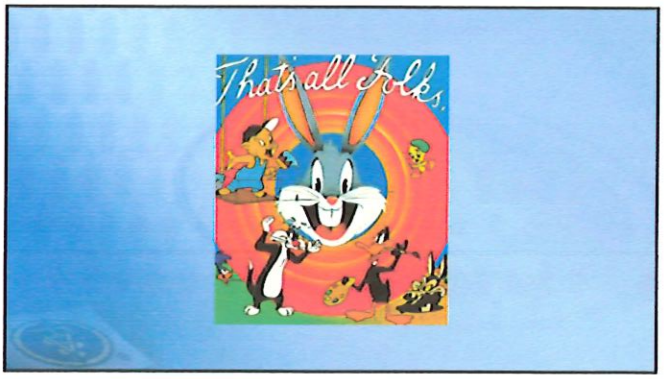

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Feeding infants with cleft lip and palate

Kerri Elorriaga, TSSLD
M.S., CCC-SLP Stony Brook Medicine
Cleft Palate-Craniofacial Team
Infant Feeding

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Feeding Goals

Create an individualize feeding plan to promote a positive feeding experience

- **adequate nutrition**
- **weight gain**

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Feeding Factors

- Time
- Calories
- Bottle Type
- Nipple flow

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Infants with Cleft Lip Only

- Typically feed with limited difficulty
- Maybe be able to breast feed
  - Latching baby to the breast can show what lip repair will resemble
- Standard bottles for expressed breasts milk or formula

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Infants with a Cleft Palate (with or without Cleft Lip)

Loss of/ reduced suction results in:

- Difficulty feeding at the breast or with standard bottles
- Longer feeding sessions
- Burning too many calories
- Poor weight gain patterns
- Reflux
- Feeding Avoidance

Exclusive breastfeeding is often not possible

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Bottles and Nipples

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Popular Bottles

- Medela Special Needs Feeder (aka Haberman)
  - Feeder expressed
  - Valve that allows forward flow of nipple (slow, medium, fast)
- Dr. Brown's Specialty Feeding System
  - Infant paced feeding valve infant expressed with lingual/chomping movements
  - Various nipple options for improved flow rates

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Poor Weight Gain

- Increase Caloric Content of breastmilk with fortifier
- Increase calories in formula
- Strict feeding duration
- Alternative feeding methods
- Feeding Evaluation/therapy

"Use it or loose it"

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Infant Healthcare Providers

- Support during acute hospital stay
- Refer to other healthcare providers and Early Intervention (if not already involved)
- Craniofacial team for continuity in care

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Thank you.

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Oral Health and Appliance Therapy for the Cleft Patient

Hygienic Concerns for both Patient and Appliance

April 13, 2026

Kimberly K. Patterson DDS MS

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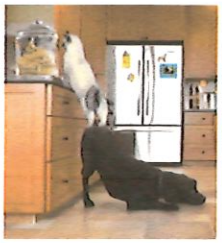
Teamwork...

- Pediatrician
- Plastic Surgeon
- Feeding Specialist
- OMFS
- Orthodontist
- Pediatric Dentist
- ENT
- Audiologist
- Speech Pathologist
- Prosthodontist
- Psychiatrist
- Geneticist
- Nurse Coordinator
- Social Worker



Patient and FAMILY

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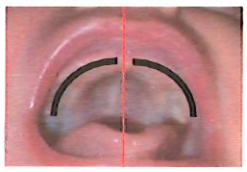
Neonatal Orthopedics - goals



Dean Ch. 24

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Neonatal Orthopedics - goals

Nowak p. 82

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Neonatal Orthopedics - taping

Unilateral cleft lip and palate

Bilateral cleft lip and palate

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Neonatal Orthopedics - taping

https://youtube.com/clip/UgkxBDFwpnSfDOwd2A8hbpT4bTvRYiMwLmS2z?si=NMxHNZuA9MsaG_a3

Courtesy Nicklaus Children's

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Neonatal Orthopedics - taping

Time in proper counseling of parents regarding tape application…..

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Neonatal Orthopedics - taping

Unilateral cleft lip and palate

Bilateral cleft lip and palate

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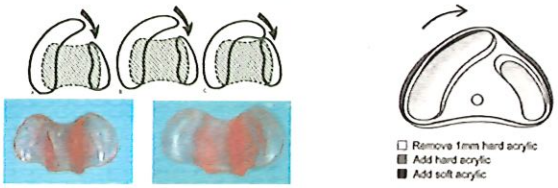
Neonatal Orthopedics

Taped lip guides alveolar growth along with adjustments to obturator



Weekly modifications to obturator guide alveolar growth

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Neonatal Orthopedics

Dean fig 24.12

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Neonatal Orthopedics – digital workflow

Scan of cleft

digitally blocked out cleft site

digitally designed passive presurgical orthopedic plate ready for 3D printing

Zarean et al. 2022

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Neonatal Orthopedics – digital workflow

orientation of presurgical plate to minimize support joints and finishing steps

digitally designed and 3D printed passive presurgical plate with cleft model

Zarean et al. 2022

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Perspective on Size of Appliance

Dean Fig 24.14

Courtesy Dr. Adewumi

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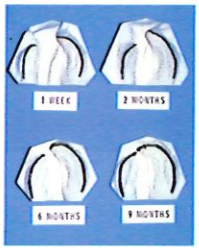
Neonatal Orthopedics

Sequential maxillary arch dental models demonstrating maxillary orthopedic molding in an infant with a unilateral complete cleft lip and palate.

Notice that as the cleft defect closes with time, lateral arch dimension is maintained, which produces optimal maxillary arch symmetry



Dean Fig 24.18

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Neonatal Orthopedics

Relief areas to encourage directional growth

Presurgical or moulding plate feeding plate

NAM appliance

Dean fig. 24.15

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Neonatal Orthopedics

NAM appliance

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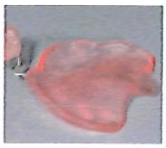
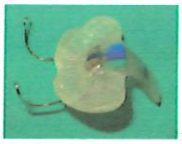
Neonatal Orthopedics





Extraoral NAM appliance separate from obturator

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Infections

Candida Albicans

- opportunistic
- Clean appliances with dish soap and warm water
- Leave appliances out until infection resolves
- Nystatin drops / gel tid x 10d

Nur'aeny and Widiasta 2023
Khan et al. 2023

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Pediatric Dentist's Role:

Role in the Team:
Coordinating with team members
Provision of ongoing dental care
Preventive treatments
Restorative procedures
Interceptive orthodontic therapy as requested

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Pediatric Dentist's Role:

Pre-Operative Role	Post-Operative Role
Parental counselling for diet and oral hygiene maintenance	Post-operative oral hygiene maintenance through professional oral hygiene maintenance aids
Early preventive advice for the child for caries prevention	Preventive care: topical fluoride and sealants application
Construction of feeding plate	Restorative care for the carious teeth and endodontic treatment for involved teeth
Presurgical orthopedics for correction of rotated premaxilla	Orthodontic correction of misaligned teeth
Instils positive attitude towards the dental treatment in a child by behaviour shaping or modification as required	Palatal plate for correction of speech problems

Luzzi et al. Table 1

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Oral Hygiene

Caries Risk Factors:	
Enamel defects (hypoplasia)	
Parents overwhelmed, oral health low priority	Orthodontic appliances
Use of an acrylic obturator	Significant scarring / malalignment cleft area more difficult to clean
Longer oral clearance times	
Permissive parenting, highly cariogenic diet, less-than-adequate oral hygiene home care	Oral aversion / fear of toothbrushing
	Cognitive or motor impairment

Dean Table 24.3

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Oral Hygiene

Periodontitis Risk Factors
Poorly developed osseous support / connective tissue attachment
Abnormalities of size, shape, and number, malalignment
Inadequate oral hygiene
Orthodontic appliances
Subgingival restorations
Sporadic and infrequent dental evaluations

Dean Table 24.3

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Oral Hygiene

Swabs ("Toothette") or Fingertip Brush acclimate infant to having oral tissues manipulated

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Oral Hygiene

developed at University of Porto -

Smaller head toothbrushes –
rubber grip of handle of a second toothbrush
can be used to keep mouth open during oral hygiene

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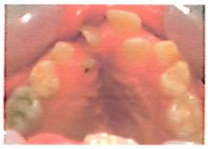
Oral Hygiene

Denture brush – curve cleans cleft site,
brush can clean appliances



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Oral Hygiene

With orthodontic appliances...

end-tufted toothbrush

Proxy brushes

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Oral Hygiene

Without orthodontic appliances...

Proxy brushes

Three-sided toothbrush

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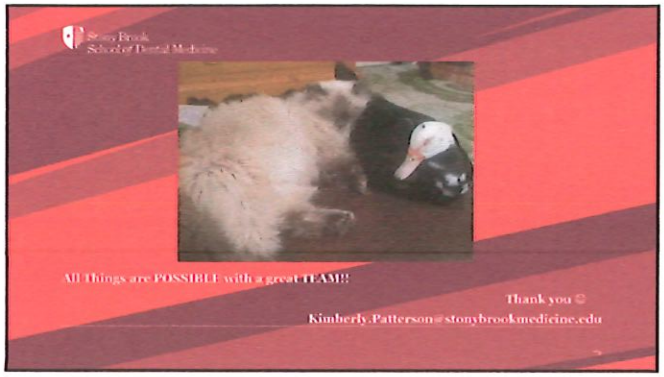

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Cleft Lip and Palate

Alvin Wong, MD
Assistant Professor of Surgery
Co-Director, Cleft Palate-Craniofacial Center
Craniofacial & Cleft Palate Symposium
April 13, 2026

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Cleft Care is Team Care

- Stony Brook Cleft Palate-Craniofacial Center
  - 39 years of service
  - Comprehensive, centralized patient care
  - Continuity, long-term follow up
  - Our overarching goal is outstanding outcomes for patients and parents in Suffolk County

ACPA
American Cleft Palate Craniofacial Association

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Cleft Care is Team Care

Multidisciplinary Team Approach

- Genetics
- Feeding/Lactation
- Speech
- Audiology
- Otolaryngology
- Dentistry
- Orthodontics
- Prosthodontists
- Oral Surgery
- Social Work
- Plastic Surgery
- **Parents**

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Cleft Lip and Palate

- Incidence: 1/700 births worldwide
- Can cause difficulty with:
  - Eating
  - Breathing
  - Hearing
  - Speaking
  - Social integration
  - Thriving

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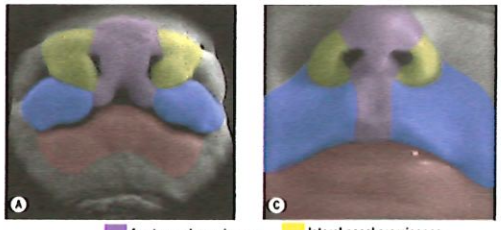
Cleft Lip Embryology



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Neligan Ed., Plastic Surgery, 2018

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Prenatal Diagnosis

- Allows for prenatal counseling
  - Better prepared when child arrives
  - Higher satisfaction with overall care
- About 15% of babies born with cleft lip/palate will have other associated anomalies
  - Fetal ECHO
  - Some parents may choose to have genetic testing

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Bentz, Bauer, Zuker. Pediatric Plastic Surgery, 2nd Edition.

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Cleft Lip and Palate: Timing of Treatments Shows Need for Multidisciplinary Team

- Birth: Diagnosis, genetics, feeding, +/- presurgical orthopedics
- 3-6 months: Cleft lip repair
- 9-18 months: Cleft palate repair and myringotomy tubes, speech therapy
- 4-6 years: Pharyngoplasty if needed
- 5-6 years: Minor lip/nose revision if needed
- 8 years: Closure of alveolar cleft and orthodontic treatment
- 16-18 years: Orthognathic surgery if needed
- 16-18 years: Scar revisions +/- cleft rhinoplasty if needed

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Cleft Lip

- Congenital deformity of the lip and often nose secondary to abnormal development
- Missing and abnormal tissue
  - Shortened philtrum
  - Abnormal orbicularis oris muscle
  - Abnormal vermilion
  - Nasal deformity
    - Short columella
    - Cartilage collapse
    - Alar base malposition
  - Bony deformity (complete clefts)

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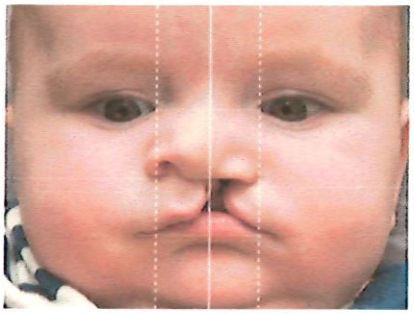

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Tse et al, 2020

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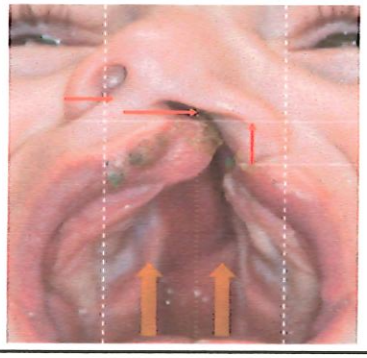

Tse et al, 2020

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Cleft Lip Classification

Microform | Incomplete

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Cleft Lip Classification

Complete Unilateral

Complete Bilateral

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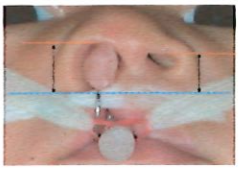
Presurgical Orthopedics

- Taping
- Naso-alveolar molding (NAM)
  - Custom appliance
  - Used to mold the protruding premaxillary segment and alveolar processes into more favorable position
  - Requires frequent adjustments by skilled orthodontist in order to properly mold alveolus and nares

Worley et al, 2018



Multani et al, 2026

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Presurgical Orthopedics

- Presurgical Lip, Alveolus, and Nose Approximation (PLANA)
  - Combines lip taping and nasal molding using nostril retainers
  - No intraoral plate
  - Fewer office visits vs. NAM (61.2% reduction)

Multani et al, 2026

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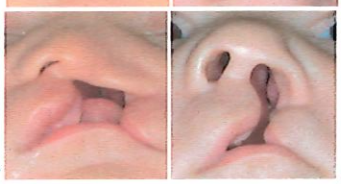
Presurgical Orthopedics

- NAM

- PLANA



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Multani et al, 2026

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Surgical Goals

- **Lip:** normalize length, balance, scar along natural contours
- **Orbicularis:** re-establish continuity across cleft
- **Alar base:** raise, project
- **Nasal tip:** narrow and elevate slumped lower lateral cartilage
- **Septum:** Centralize

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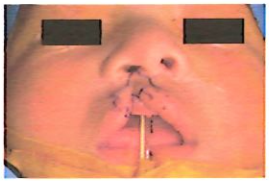
Types of Cleft Lip Repair

Millard Rotation Advancement

Anatomic Subunit (Fisher)



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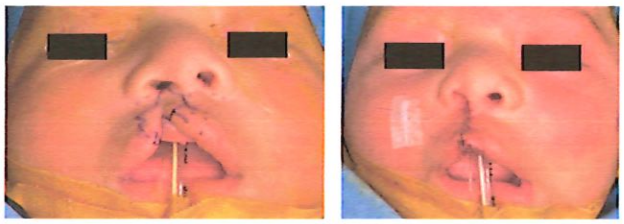
Unilateral Incomplete Cleft Lip (Fisher)



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Unilateral Incomplete Cleft Lip (Fisher)

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Unilateral Complete Cleft Lip

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Bilateral Incomplete Cleft Lip

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Bilateral Incomplete Cleft Lip

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Bilateral Complete Cleft Lip

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Bilateral Complete Cleft Lip

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Cleft Lip Rhinoplasty

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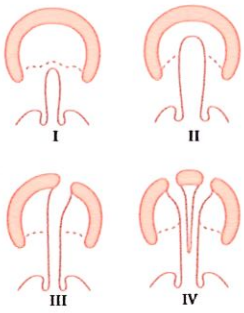
Cleft Palate

- Veau Classification
  - I: Soft palate only
  - II: Hard and soft palate
    - Secondary Palate only
    - Uvula to incisive foramen
  - III: Complete unilateral defect from soft palate to alveolus
    - Usually involves lip
  - IV: Complete bilateral cleft



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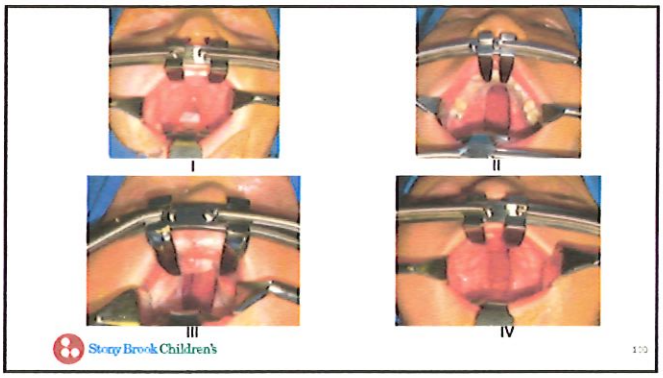

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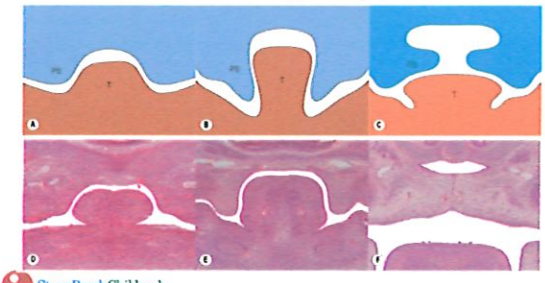
Cleft Palate Embryology



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Neligan Ed., Plastic Surgery, 2018

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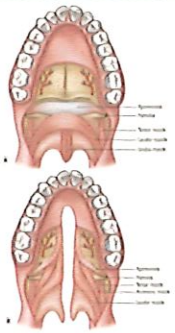
Cleft Palate Anatomy

- Disruption of levator sling, central insertions of palatal aponeurosis
- Muscles instead insert along posterior edge of hard palate
- Sphincter function compromise
  - Velopharyngeal insufficiency
  - Problems with speech development
- Inadequate Eustachian tube drainage
  - Chronic otitis media
- Reflux from oral to nasal cavity



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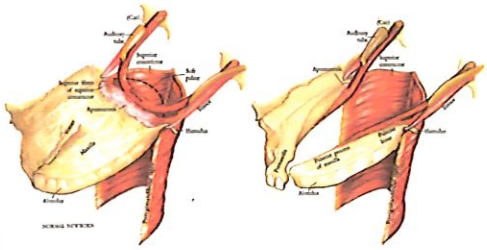
Cleft Palate Anatomy



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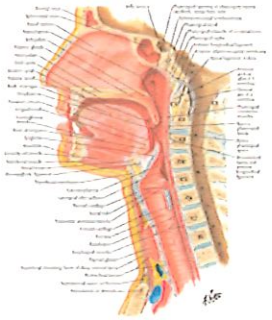
Palate Function

- Acts as a sphincter to separate the nasopharynx from the oropharynx during speech and eating
- Critical in production of speech
- Palate can be negatively impacted by either anatomic or functional causes
  - Cleft, scarring, velar dysplasia
  - Motor tone



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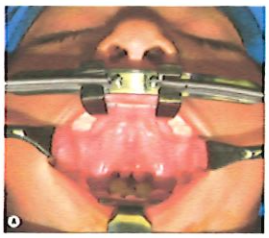
Submucous Cleft

- Incidence 2-8/10,000
- Failure of fusion of palatal musculature, while overlying mucosa intact
  - Zona pellucida
- Bifid uvula, notched hard palate
- Rarely, can manifest as VPI



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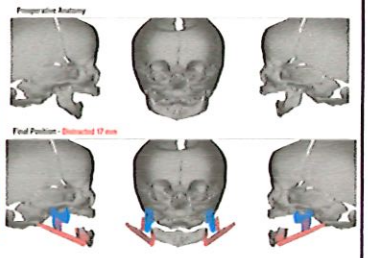
Pierre Robin Sequence



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Treacher Collins

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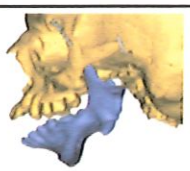
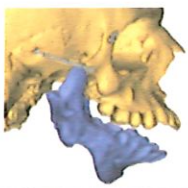
Treacher Collins





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Associated Syndromes

- Velocardiofacial (DiGeorge) Syndrome
  - Deletion of 22q11.2
  - Congenital heart disease
  - Hypoplastic thymus or athymic
    - Immune issue
    - Hypocalcemia
  - Speech issues
- Trisomy 13 (Patau Syndrome)
- Trisomy 18 (Edward's Syndrome)

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Velopharyngeal Insufficiency (VPI)

- Failure of complete closure of nasopharynx from oropharynx leads to air escape
- Manifests as hypernasal speech
- Children develop maladaptive speech patterns to compensate
- Early palate repair, before speech development is essential

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CLEFT PALATE REPAIR

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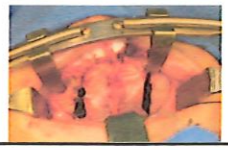
Cleft Palate Repair Goals

- Achieve complete and intact closure of the palate
  - Nasal mucosa
  - Muscle
  - Oral mucosa
- Separate oral and nasal cavities
- Restore velopharyngeal function
- Normal swallow
- Normal hearing
- Optimize maxillary growth
- Prevent fistula formation



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Timing for Palate Repair

- Controversial
- Very early repair (3-6 months)
- Early repair (6-18 months)
  - Improved speech
  - Improved hearing
  - Impaired midface growth
- Delayed repair (>24 months)
  - Impaired speech
  - Improved midface growth
- Staged repair
  - Uncommonly done

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Surgical Principles

- Early repair increases likelihood of normal speech development
  - Theory: palate must be functional when palate related sounds are first learned to avoid poor habits
- Timing of surgery affects maxillofacial growth
- Inherent growth retardation and maxillary deficiency because of clefting
- Impaired tensor function = reduced ventilation/drainage middle ear = Eustachian tube obstruction = recurrent OM = middle ear infections = hearing loss
- Hearing loss is less with palate repaired earlier: 10% < 1 yr, 60% > 1 yr
  (Chaudhuri 1978, Watson 1986, Bennett 1972)
  - Routine prophylactic insertion of tympanostomy tubes at palatal surgery

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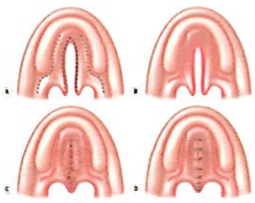
Techniques: von Langenbeck



- Relaxing incisions along lateral edge of the hard palate, vleft mucosa also incised
- 2 bipedicled flaps of oral mucoperiosteum raised
  - Preserve greater palatine pedicle posteriorly and incisive pedicle anteriorly
- Close in 3 layers:
  - Nasal side: edges of cleft mucoperiosteum
  - Muscle: **intra-velar veloplasty**
  - Oral side: approximate bipedicled flaps in midline

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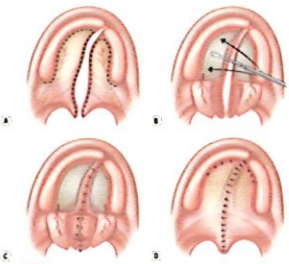
Techniques: Two-Flap Palatoplasty



- Bardach variation
- Entire palatal mucosa elevated as 2 flaps, based on greater palatine pedicle posteriorly
- Careful dissection and release of pedicle
- Useful for larger clefts of the soft and hard palate

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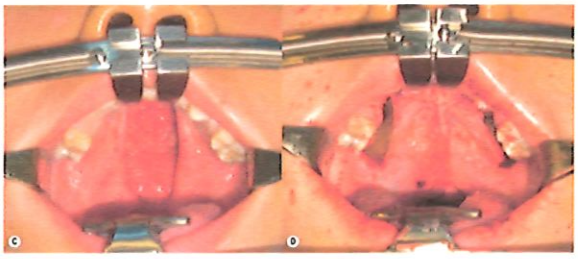
Techniques: Two-Flap Palatoplasty



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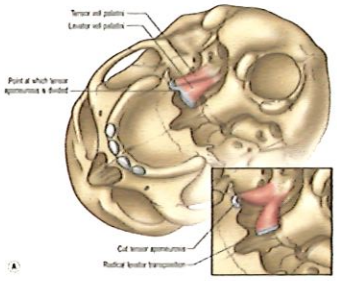
Techniques: Intra-velar veloplasty

- Dissection of musculature from abnormal attachments and re-approximation in the midline
- Restoration of velopharyngeal function



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Techniques: Intra-velar veloplasty

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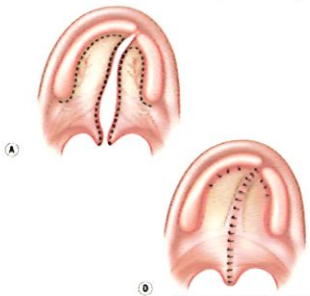

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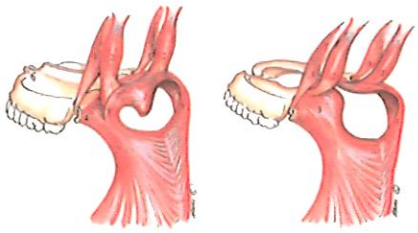
"Complete" IVVP: Total Release LVP



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Bardach, Salyer & Bardach's Atlas, 2008

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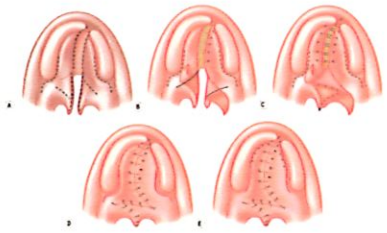
Techniques: Furlow Z-Plasty



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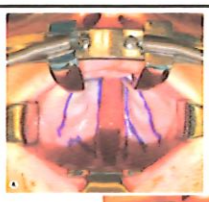
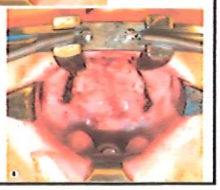
Furlow Z-Plasty

- Lengthens palate
- Prevents longitudinal scarring
- Reconstructs levator palatini sling
- Intravelar veloplasty without dissecting muscle free
- Pharyngoplasty by lengthening palate and narrowing caliber of airway





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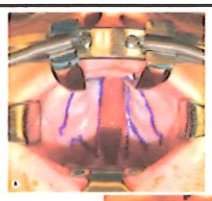
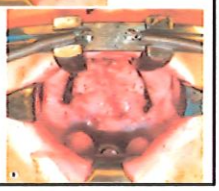
Furlow Z-Plasty

- **Several Studies show:**
- Velopharyngeal Insufficiency (VPI)
  - 4-15% vs. 15-60% with straight line repairs
- Fistulae
  - 2-10% vs. 2-3%% straight line repairs





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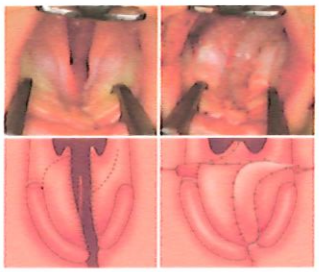
Techniques: Buccal flaps



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Mann et al, 2017

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Table 6. Outcomes of Double Opposing Z-Plasty Alone versus Double Opposing Z-Plasty with Buccal Flaps*

	Fistula Rate	Nasal Resonance Score	Secondary Speech Surgery
All patients			
DOZP	1.18%	1.38	5.43%
DOZP and buccal flaps	8.78%	1.38	7.11%
p	0.0009	0.99	0.59
Nonsyndromic			
DOZP	0.70%	1.38	3.26%
DOZP and buccal flaps	7.19%	1.28	4.37%
p	0.004	0.33	0.71
Syndromic			
DOZP	3.57%	1.38	6.67%
DOZP and buccal flaps	19.3%	2.07	25.9%
p	0.05	0.04	0.13

DOZP, double opposing Z-plasty.
*Comparison of outcomes between the two study groups, those who underwent repair with a Z-plasty (Furlow) alone compared to those who received a Z-plasty with the addition of buccal flaps. The fistula rate was higher in the buccal flap group, which had wider and more complex clefts; despite this, speech outcomes were similar in the two groups.

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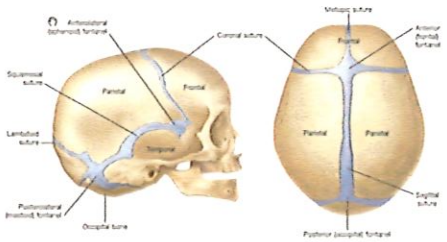
Craniosynostosis



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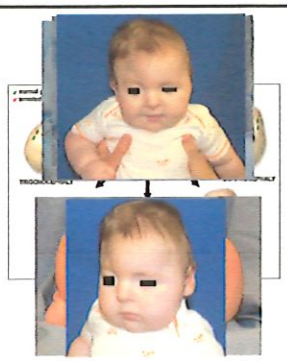
Types of synostosis

- Sagittal (40-50%)
  - Morphology: scaphocephaly (boat shaped, long AP)
- Metopic (23-28%)
  - Morphology: Trigonocephaly (keel shaped, triangular forehead)
- Unilateral coronal (13-20%)
  - Morphology: anterior plagiocephaly, harlequin deformity



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Types of synostosis

- Bilateral coronal (5—10%)
  - Morphology: Brachycephaly (broad flat forehead, short AP)
- Lambdoid (<3%)
  - Morphology: posterior plagiocephaly (ipsilateral flat occiput), mastoid bulge

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Indications for repair

> 15 mmHg	Single suture – 5-15%	Multiple suture- 42%	Role early surgery	Aesthetic concerns
	Coronal has increased risk		Papilledema Direct ICP probe Beaten copper Symptomatic	

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Craniosynostosis

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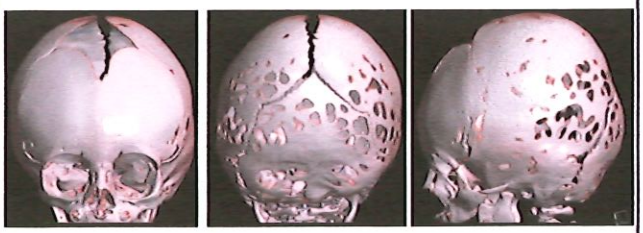
Craniosynostosis



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Craniosynostosis

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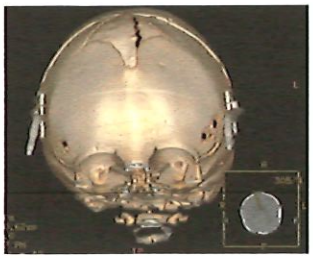
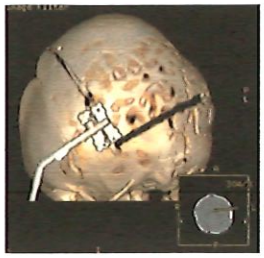
Craniosynostosis

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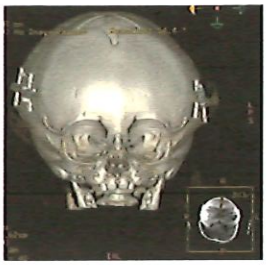
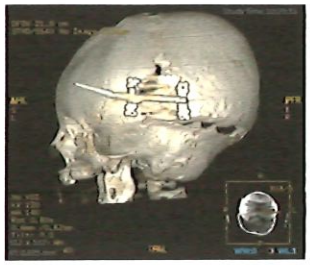
Craniosynostosis

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Craniosynostosis



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Craniosynostosis



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Craniosynostosis


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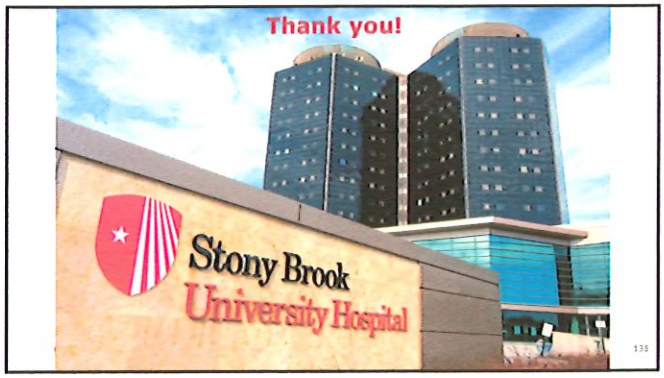

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Audiology and the Cleft Palate Child

Jamie Cluna, AuD
Doctor of Audiology
Speech and Hearing Department
Stony Brook University Medical Center

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Causes of Hearing Loss in the Cleft Palate Child

- Eustachian tube dysfunction
- Ear malformation
- Syndrome
- Heredity factors

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Role of Audiologist on Cleft Palate Team

- Diagnose hearing loss (at any age)
- Monitor hearing status
- Refer for medical management
- (Re)habilitation/assistive listening devices
- Advocate for appropriate services

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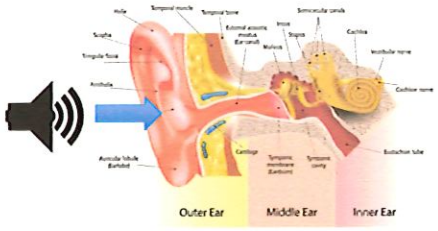
The acoustic pathway



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Three Types of Hearing Loss

- Conductive
- Sensorineural
- Mixed

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Hearing loss in the cleft palate population

- Conductive hearing loss exists in 90% of children with cleft palate.
- Otitis media with effusion is the most common cause of hearing loss in the cleft palate child. This can cause a mild to moderate hearing loss in the affected ear.

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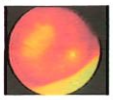
Conductive Hearing Loss (CHL)

- Blockage/malfunction in outer or middle ear
- Usually treatable/temporary
- Common causes:
  - Cerumen
  - Ear malformation (atresia/ossicular abnormalities)
  - Perforated eardrum
  - Fluid (otitis media)



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Sensorineural Hearing Loss (SNHL)

- Inner ear/auditory nerve damage
- Typically irreversible
  - Hearing aids
  - ALDs (FM system)
  - Cochlear implant
- Common causes:
  - Syndromes associated with hearing loss (CHARGE, Pierre Robin, Cornelia de Lange)
  - Hereditary Factors
  - CMV, Meningitis, Syphilis
  - Ototoxic medications

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Mixed Hearing Loss (MHL)

- CHL & SNHL simultaneously present
  - -ex. Syndrome-related SNHL (ex. Stickler Syndrome) in addition to middle ear fluid
- Conductive portion medically treatable; Sensorineural component permanent

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"Minimal Hearing Loss"

Even mild/temporary hearing loss can affect:

- Speech/language and cognitive development
- Peer relations (stress/low self-esteem)
- Behavior/attention (frustration/boredom)
- Academic achievement (37% higher failure rate in school)
- Central Auditory Processing abilities (difficulty understanding speech in background noise—life-long)

Untreated infections>tissue damage/permanent hearing loss

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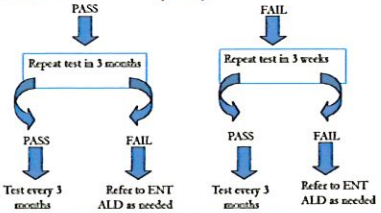
Newborn Hearing Screen



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Early identification and (re)habilitation is essential in facilitating a more favorable outcome AND promoting normal development!!!

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Thank you.

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Intermission

Please complete the survey at the end of the presentation.
Available at QR code below or printed version at front desk.

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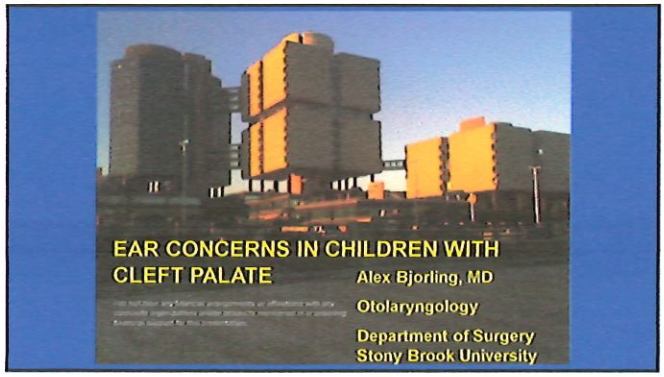

EAR CONCERNS IN CHILDREN WITH CLEFT PALATE

Alex Bjorling, MD
Otolaryngology
Department of Surgery
Stony Brook University

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INCIDENCE

THE UNIVERSALITY OF OTITIS MEDIA IN 50 INFANTS WITH CLEFT PALATE

PARADISE BLUESTONE & FELDER: 1969

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NATURAL HISTORY?

CLEFT PALATE

3 MONTHS – 12 YEARS AND OLDER

(∿ 25% problems-infection/hearing loss in mid-teens*)

NON-CLEFT

2 YEARS – 6 YEARS

*Sheahan et al. 2003

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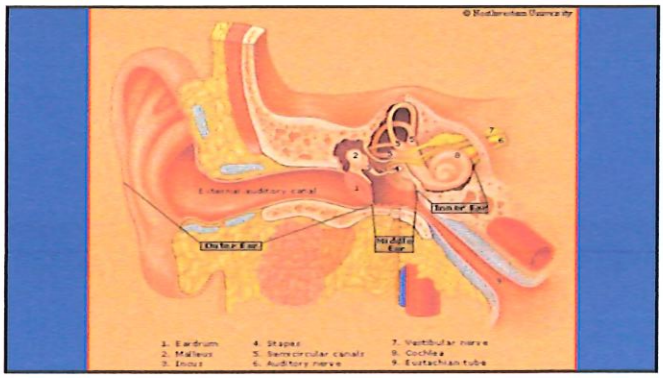

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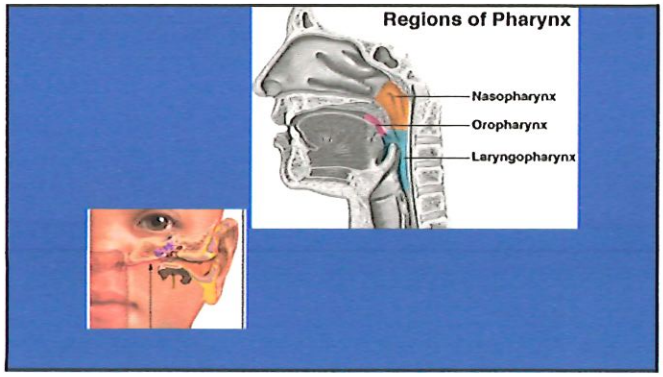

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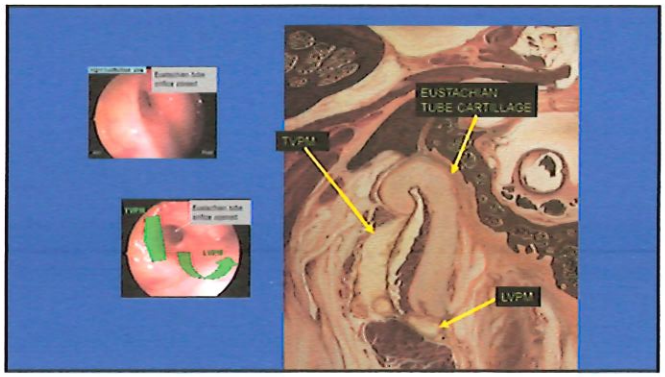

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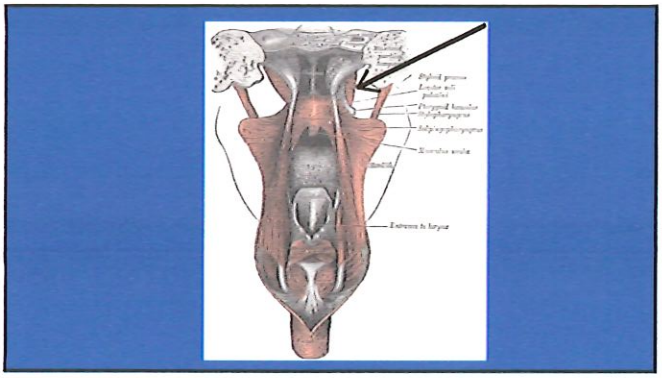

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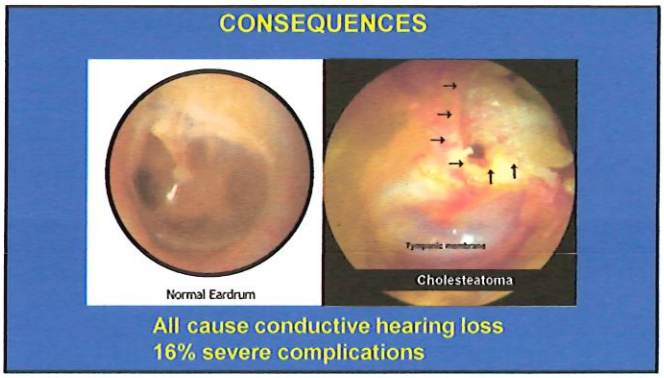

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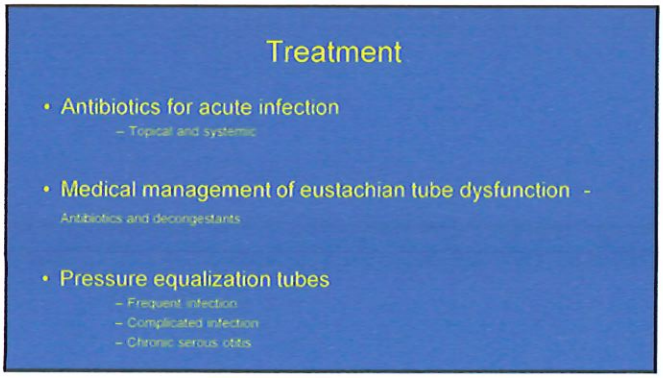

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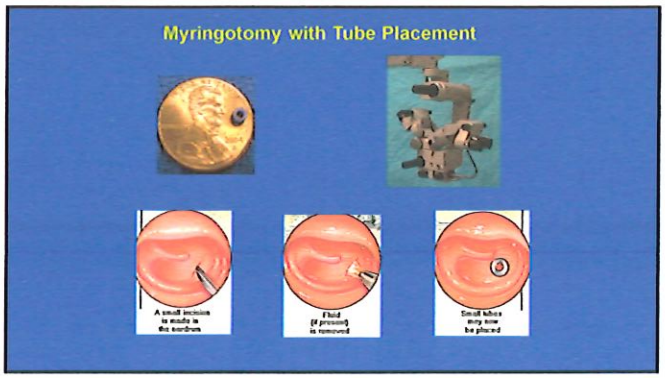

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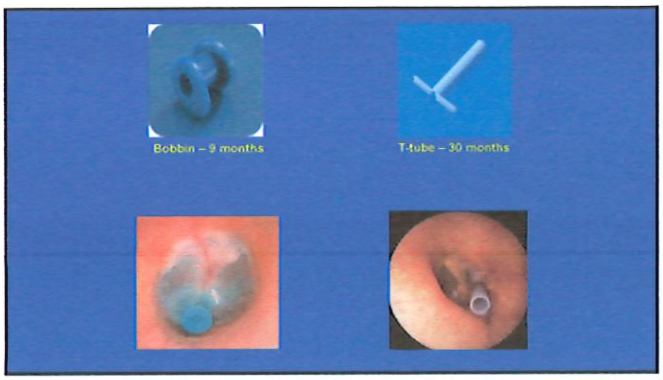

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Controversies

Who gets tubes?

Everyone?

Complications of tubes?

Scarring predisposes to:

hearing loss, chronic otitis and cholesteatoma

Significant symptoms?

Pain, infection & severe hearing loss

Presence of eustachian tube problems

Reflection of longevity of eustachian tube dysfunction

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Conclusion

1) Eustachian tube dysfunction is common
2) begins earlier in life and lasts longer
3) maintaining optimal function is important
   (normal hearing, prevent infection and complications of chronic otitis)
4) above requires continued & prolonged follow-up

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Speech Pathology Intervention with Cleft Lip/Palate

Kerri Elorriaga M.S. CCC/SLP
Stony Brook University Medical Center

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Speech Therapy Timeline

- Initial Meeting- feeding concerns/speech-language milestones, EI referral
- Speech-Language Evaluation ~2 yrs
  - Focus on articulation (sound production across word positions)
  - Assess for developmental errors and maladaptive/compensatory errors (related to CP)
- Speech Resonance Evaluation ~4 yrs.
  - Focus on resonance (oral vs nasal airflow)
- Videonasoendoscopy- as needed

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Speech Resonance Evaluation

- Articulation Testing
- Floxite Mirror for sounds and phrases
- Computerized Nasometry

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Floxite Mirror Test

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Computerized Nasometry

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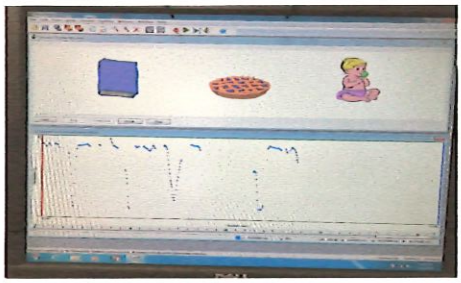

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Videonasoendoscopy

- Flexible endoscope passed through nose
- VP port viewed and videoed recorded during speech
- Sounds in isolation, phrases, connected speech
- Assess for pattern of closure (velar movement, lateral wall movement, posterior pharyngeal wall)

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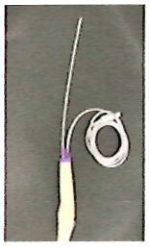

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Videonasoendoscopy

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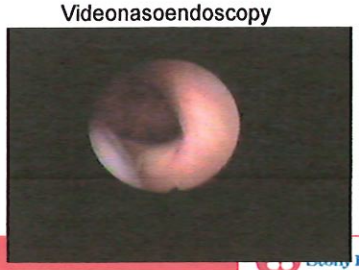
Videonasoendoscopy



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Management of Velopharyngeal Insufficiency

- Surgical Intervention
- Speech Therapy
  - Articulation drill with home carryover

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Thank you.

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ORTHODONTIC CARE OF PATIENTS WITH CLEFT LIP AND PALATE

RICHARD FABER, D.D.S., M.S.
DIRECTOR OF DENTOFACIAL DEFORMATIES AND DENTOFACIAL ORTHOPEDICS
SCHOOL OF DENTAL MEDICINE
STONY BROOK UNIVERSITY MEDICAL CENTER
PRIVATE PRACTICE MELVILLE, NY

ADA CERP

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Role of the Orthodontist

- TIMING AND SEQUENCING OF ORTHODONTIC CARE –DETERMINED BY:
  - AGE OF PATIENT –
  - CHRONOLOGIC/SOMATIC
  - DENTAL DEVELOPMENT STAGE
  - PSYCHOSOCIAL DEVELOPMENT
  - SPEECH AND HEARING ISSUES
  - ORAL FUNCTION

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Basic Four Time Periods of Treatment

- NEONATE/INFANT (BIRTH>2 yrs) Previously Discussed
- PRIMARY DENTITION (2-6 yrs) Limited tx /Orthopedics
- MIXED DENTITION (7-12 yrs)
- PERMANENT DENTITION (12yrs-Adult)

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Primary Dentition (2-6yrs)

- ESTABLISH TYPE OF OCCLUSION
- ESTABLISH SKELETAL GROWTH TYPE
- CHECK FOR MISSING TEETH
- STAGE OF DEVELOPMENT OF TEETH
- DENTAL ARCH WIDTH AND SHAPE ISSUES
- OCCLUSAL FUNCTION AND SHIFTING BITE
- IDENTIFY FUTURE SURGICAL ISSUES

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Primary Dentition

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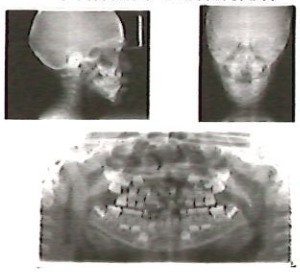
Primary Dentition



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Mixed Dentition (7-12yrs)

- PALATAL EXPANSION-TRANSVERSE
- ALIGN ARCHES AND COORDINATE THEM
- BONE GRAFT FOR ERUPTING CUSPID
- DETERMINE GROWTH PATTERN
- ACCOUNT FOR MISSING TEETH
- ESTABLISH LONG TERM TXPL
- EVALUATE SOFT TISSUE DRAPE

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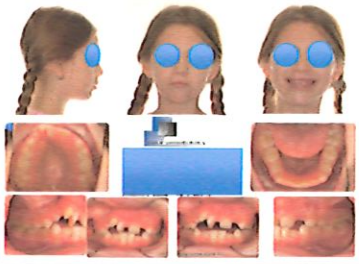
Mixed Dentition and Bone Graft



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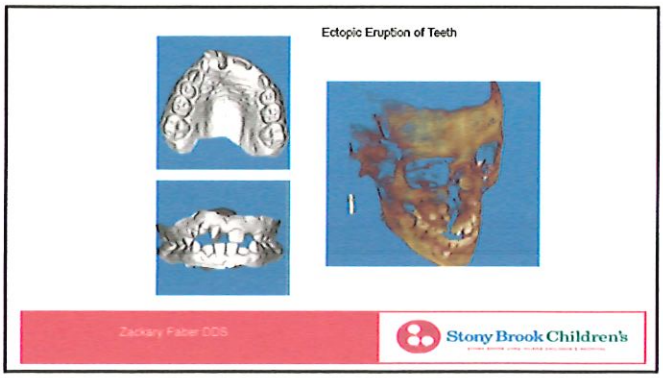

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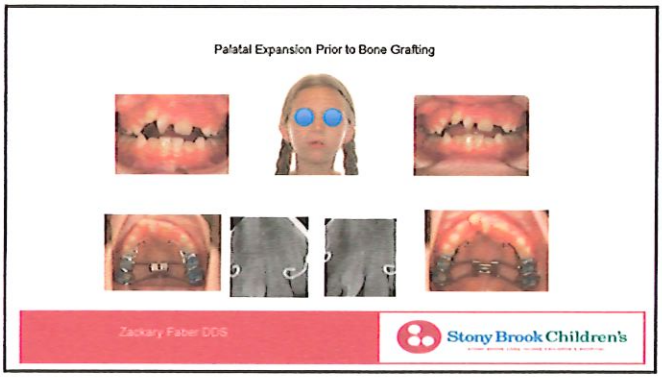

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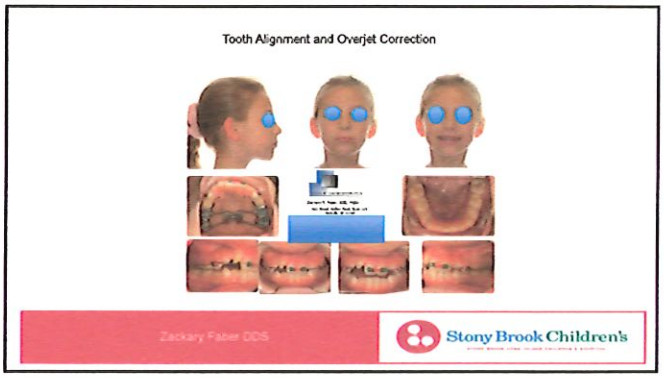

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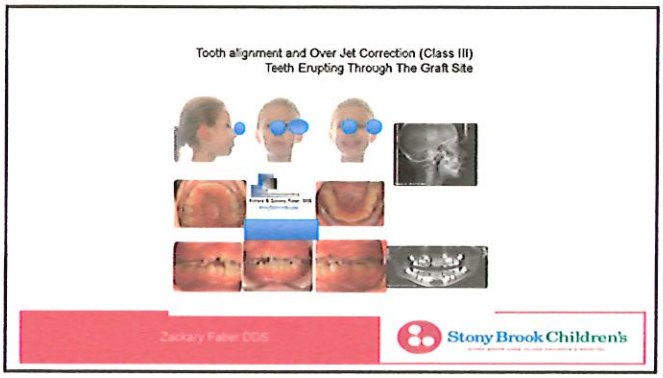

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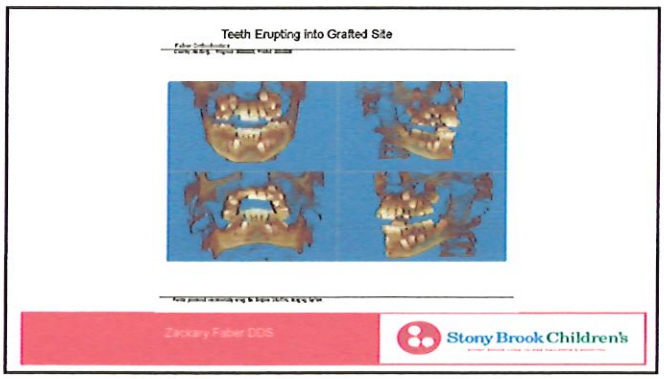

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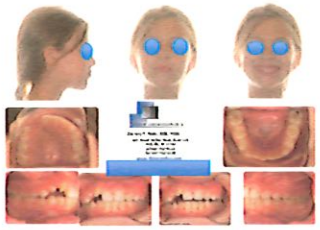
End of Phase I Treatment –Awaiting Start Phase II Treatment



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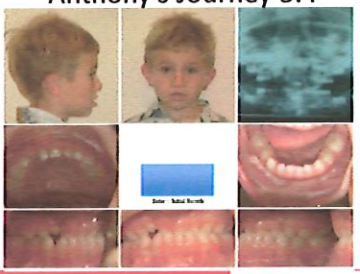
Anthony's Journey 5.4



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Anthony's Journey 7.3

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Anthony's Journey 9.1

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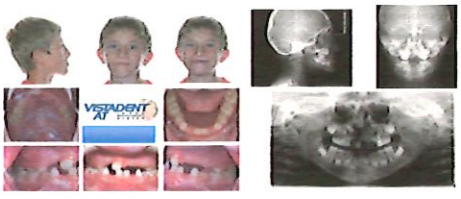
Anthony's Journey 9.3



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Anthony's Journey 9.8

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Anthony's Journey 10.5

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Anthony's Journey 11.2

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Permanent Dentition (12-Adult)

- ALIGN AND COORDINTATE ARCHES
- LEVEL DENTITION
- SET UP FOR SURGICAL PROCEEDURE
- EVALUATE GROWTH
- TIME FOR BONE GRAFT AND IMPLANT
- RETENTION—LONG TERM FOR CLEFT PT
- PROSTHETICS

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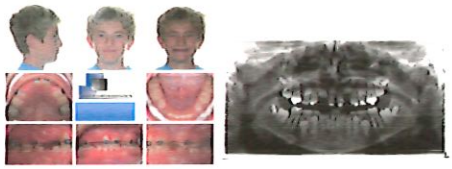
Anthony's Journey 12. 3

Post Bone Graft –Cuspids Erupting



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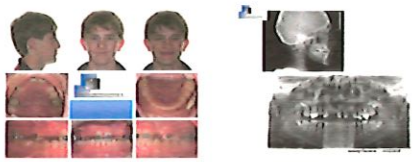
Anthony's Journey 13.6

Cuspids Erupting and Growth Occurring CL III



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Anthony's Journey 14.2

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Along the Journey EAGLE SCOUT

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Anthony's Journey 17.8
Discussion of Orthognathic Surgery Maxillary Advancement

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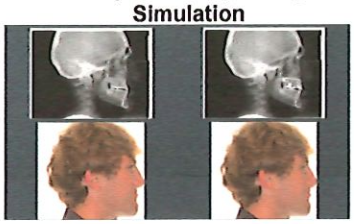
Anthony's Journey –Surgical Simulation



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The Journey continues 18.4yrs old
Waiting for the completion of growth

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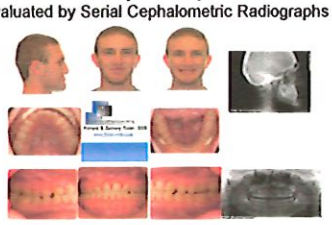
Growth Finally Completed 19.11
Evaluated by Serial Cephalometric Radiographs



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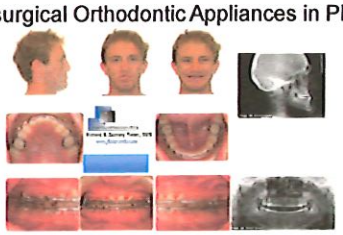
Presurgical Orthodontic Appliances in Place



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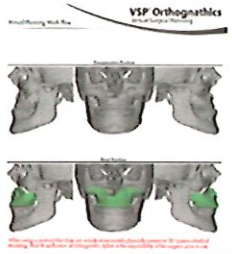
Surgical Treatment Planning with VSP



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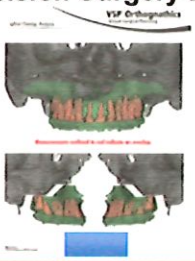
Precision Surgery Details



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Post Surgical Radiographs

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Post Surgical Occlusion

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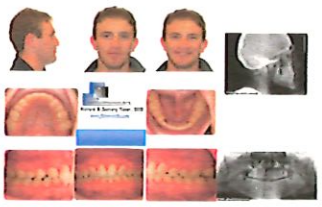
The Journey is Over



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Life Goes On

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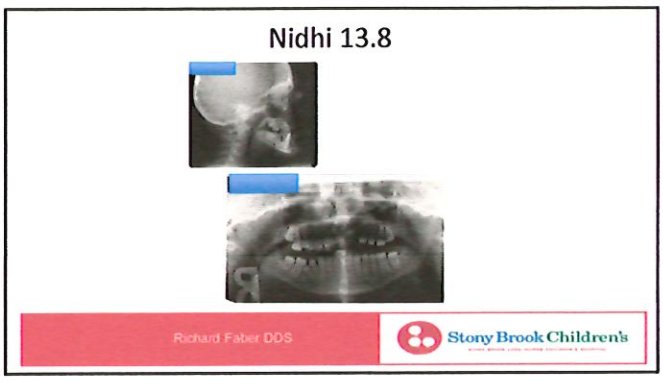

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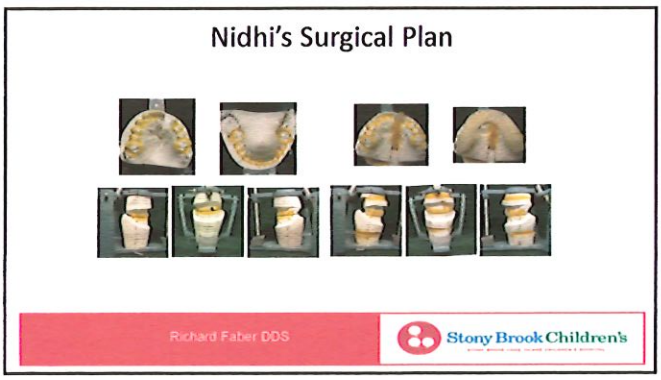

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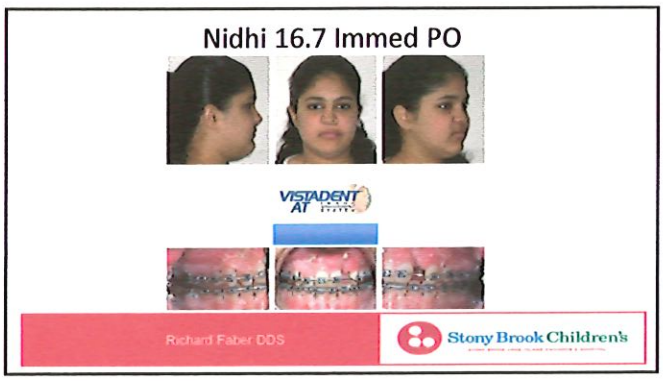

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Nidhi 18.11 Post Ortho

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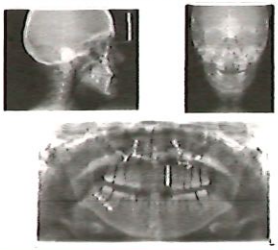
Nidhi 18.7 Post Ortho



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Nidhi TX Completed

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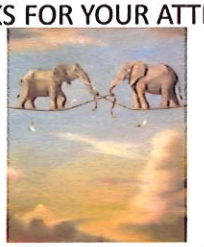
THANKS FOR YOUR ATTENTION



IT TAKES A TEAM EFFORT

Thank you to Dr.Stephen Sachs and Dr Sal Ruggiero of the NYCOMS group for the Surgery and Dr Zack Faber Orthodontist

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Prosthetic Rehabilitation of the Cleft Patient

Tanya Somohano-Marquez DMD FACP

ADA CERP

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Introduction

- Cleft lip and palate is one of the most common congenital anomalies.
- Treatment is dictated by its severity and usually not completed until the patient's second decade.
- Multidisciplinary management among the various specialties is essential to achieving optimal results.

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Role of the Prosthodontist

- Has changed significantly over the years.
- Definitive prosthetics are usually one of the final therapies and they attempt to reduce any remaining deficiencies.
- In the past, bulky removable prostheses were often necessary to replace missing teeth and correct vertical/horizontal discrepancies.
- In recent years these have decreased with more effective surgical and orthodontic treatments available in the multidisciplinary team settings.

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Role of the Prosthodontist

- Nasoalveolar Molding, Feeding aids
- Interim Obturators or Speech Aids
- Management of Edentulous Spaces
- Treatment planning restorations for missing teeth
- Unrepaired Cleft Palates

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Nasoalveolar Molding & Feeding Aids/Obturators

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Nasolaveolar Molding (NAM)

- Reduce the size of the intraoral alveolar cleft.
- Mold and position the surrounding soft tissues including the nose.
- Tissue expansion-columella.
- <u>Aim:</u>
  - Overall improve the esthetics of the naso-labial complex
  - Have less scaring
  - Minimize the extent/number of surgical procedures

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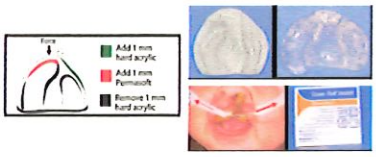
Nasolaveolar Molding: Greyson's Method



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Greyson Method

- Early Intervention: <1 week.
- Labor intensive: weekly appointments for 12-24 weeks.
- Unilateral: 3 months then lip repair.
- Bilateral: 5-6 months, then lip repair.

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Unilateral Cleft Lip/Palate

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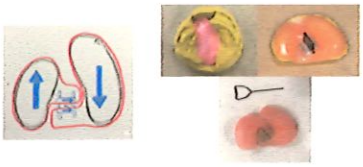
Stony Brook NAM Technique



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Stony Brook Technique: Nasal Stent

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DynaCleft® Products

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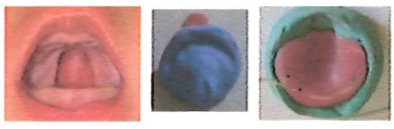
Feeding Aids/Obturators



Lodhi, Tulsi & Patil, Surendra & Bahetwar, Surendrakumar & Sharma, Aparna & Ninawe, Nupur & Dolas, Arti. (2019). Fabrication of Feeding Plate in Cleft Palate Patient: A Case Report. Dental Journal of Advance Studies. 07. 10.1055/s-0039-1684106.

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Interim Obturators & Speech Aids

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Role of the Obturator Prosthesis

- Most velopharyngeal discrepancies for cleft patients are managed surgically and functional aspects improved with speech therapy.
- Two types of cleft patients might require an obturator prosthesis:
  - Clefts confined to the secondary palate with wide posterior maxillo-mandibular width, residual tissues and anesthetic risks.
  - Patients that exhibit hypernasality and inadequate speech following surgical therapies.

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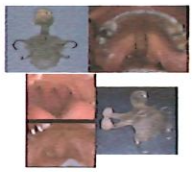
Obturator and/or Speech Aid

- Prosthesis for these patients are usually fabricated of acrylic resin with adapted wire retainers.
- Some problems include:
  - Retention (no undercuts, consider ortho brackets)
  - Access to area



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Management of Edentulous Spaces

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Management of Edentulous Spaces: Removable Partial Dentures

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Management of Edentulous Spaces: Resin Bonded Bridges

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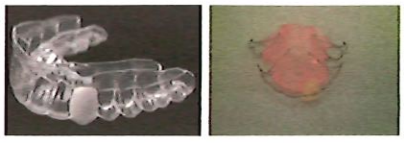
Management of Edentulous Spaces: Essix Appliances or Retainers with Pontics



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Treatment Planning Restorations

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Restoration of Missing Dentition

- **Dental discrepancies include:**
  - Missing lateral incisors ~40%
  - Undersized maxillary central incisors next to cleft
  - Shortened roots of teeth in premaxilla
  - Missing premolars ~20%
  - Hypocalcified enamel present
  - Hypodontia ~50%

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Implants in Growing Children

- Advisable to wait until two consecutive cephalometric films one year apart show no evidence of growth.
- Site development due to horizontal and vertical discrepancies present.

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Complex Treatment Planning

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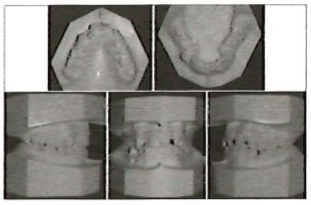
Complex Treatment Planning



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Complex Treatment Planning

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Unrepaired Cleft Palates

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Unrepaired Cleft Palates

- Adults mostly partially or completely edentulous.
- Challenges and difficulties include:
  - Reduce denture foundation area
  - Excessive interarch space
  - Lack of bony palate
  - Scarring from lip closure
  - Presence of oro-nasal communication
  - Opposing natural dentition

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Prosthetic Considerations

- Vertical Dimension:
  - Increased in patients with small maxilla and alveolar ridge.
  - Tendency to a Class III relationship: posterior teeth set in crossbite and anterior edge to edge
- Esthetics:
  - Anterior tooth display in harmony with lip thickness and scar
  - Protruding lateral incisors could mask scar
- Records:
  - Repeatability is an issue, consider process record bases

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Prosthetic Options

- Removable Partial Dentures
- Overlay or Overdentures
  - Partial or Complete
- Implant retained and/or supported
- Tooth borne retained and/or support

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Adult Cleft: Tooth Borne-Removable Partial Denture

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Adult Cleft: Complete Overdenture

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Cleft Lip and Palate Symposium

University Hospital at Stony Brook

Salvatore L. Ruggiero DMD, MD, FACS
Clinical Professor
Department of Oral and Maxillofacial Surgery
Stony Brook School of Dental Medicine

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Treatment Sequence

1. Maxillary orthopedics *vs* lip adhesion (4-6 weeks)
2. Definitive lip repair (rule of 10's)
3. Repair of the soft and hard palate (12-18 months)
4. Ear tubes
5. Speech therapy
6. Orthodontic therapy
7. Correction of velopharyngeal incompetence
8. Dentoalveolar cleft repair (canine eruption)
9. Orthognathic surgery
10. Nasal surgery
11. Lip revisions

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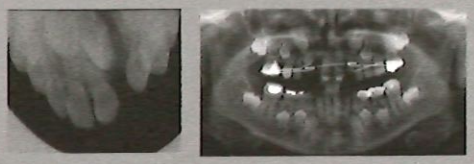
Treatment Sequence



The timing of dentoalveolar cleft repair is dependent on the canine eruption

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Goals of Alveolar Cleft Bone Grafting

- Closure of the oronasal and palatal fistula
- Stabilization of the expanded arch and the premaxilla
- Provide bone support for the erupting canine
- Improve the bone support and periodontal status of the incisor(s)
- Provide bone support for the alar base of the nose

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Alveolar Cleft Grafting

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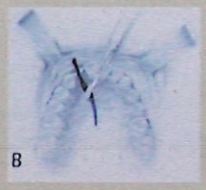
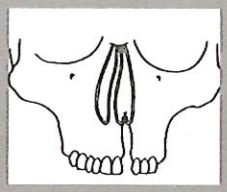
Alveolar Cleft Grafting





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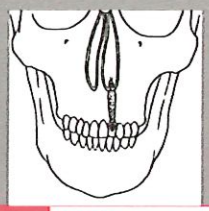
Alveolar Cleft Grafting

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Alveolar cleft grating

- Autologous bone marrow
- Bone morphogenic protein (BMP)

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Corrective Jaw Surgery


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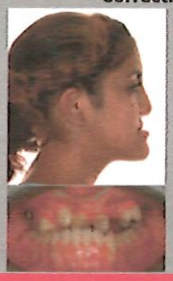
Corrective Jaw Surgery

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Cleft Lip and Palate Symposium: Treatment of the Adult Cleft Patient

University Hospital at Stony Brook

Michael Proothi, DMD, MD, FACS
Salvatore L. Ruggiere, DMD, MD, FACS
Clinical Assistant Professor
Department of Oral and Maxillofacial Surgery
Stony Brook University School of Dental Medicine

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Treatment Sequence

1. Maxillary orthopedics vs lip adhesion (4-6 weeks)
2. Definitive lip repair (rule of 10's)
3. Repair of the soft and hard palate (12-18 months)
4. Ear tubes
5. Speech therapy
6. Orthodontic therapy
7. Correction of velopharyngeal incompetence
8. Dentoalveolar cleft repair (canine eruption)
9. Orthognathic surgery

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Treatment Sequence

9. Orthognathic surgery

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14 Year Old Female

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14 Year Old Female: Past Procedures

- Lip adhesion
- Lip repair @ 3 months
- Hard and soft palate repair @ 12 months
- Lip and nose revision @ 4 years
- Alveolar cleft graft @ 10 years

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14 Year Old Female

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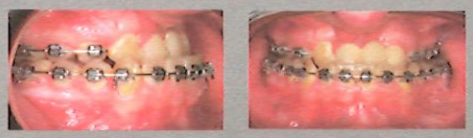
14 Year Old Female



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14 Year Old Female

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Lefort 1 Maxillary Advancement

- Horizontal advancement of the maxilla
- Correction of facial disharmony (maxillary hypoplasia/deficiency)

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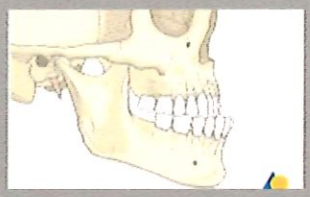
Lefort 1 Maxillary Advancement



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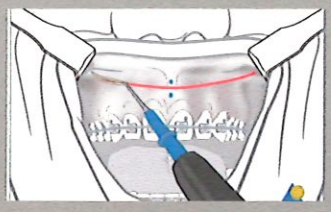
Lefort 1 Maxillary Advancement



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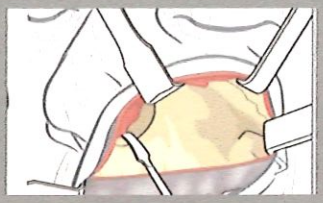
Lefort 1 Maxillary Advancement



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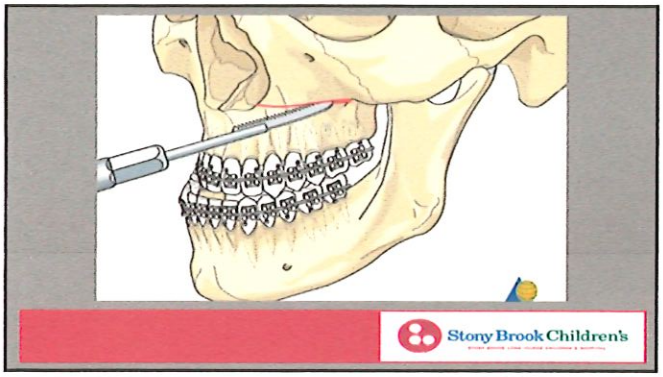

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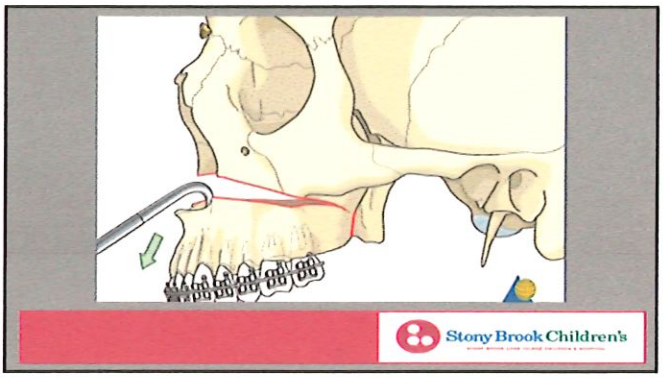

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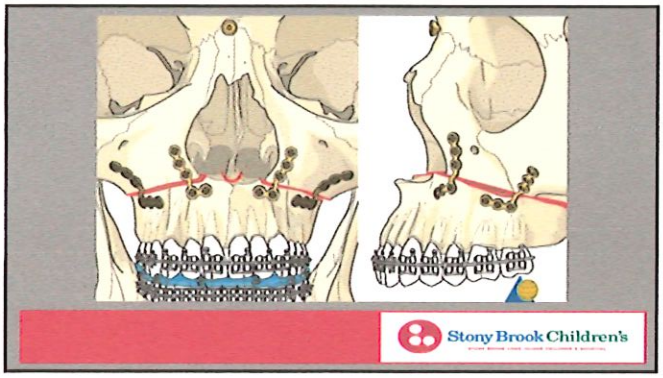

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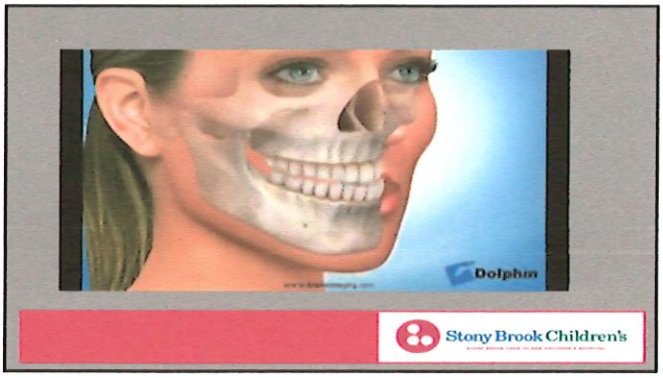

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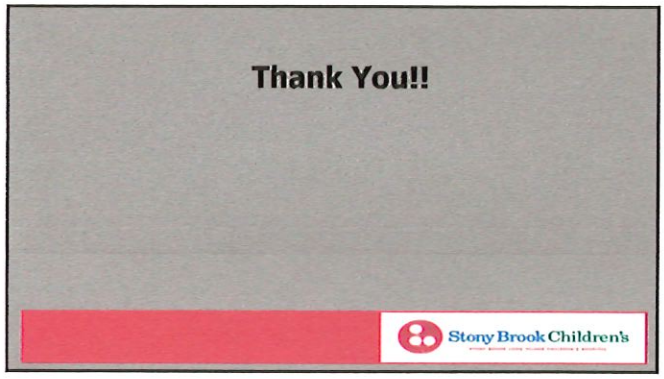
Thank You!!
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Please complete survey.
THANK YOU.
Survey QR code:
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Insurance Issues for Cleft Lip/Palate Families

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Geoffrey O'Connell, LCSW
Licensed Clinical Social Worker
Department of Care Management
Stony Brook University Medical Center
631 444 4343

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1

Services for Cleft Palate Children & Health Insurance

- Services are driven by medical necessity VS. reimbursement. What to do if your specialist is outside your plan? Single case agreement!
- Know your appeal options and COB (coordination of benefits) Keep EOB's (explanation of benefits)
- Insurance emphasis is on stock price, collecting premiums and denial of claims therefore making patients and healthcare providers jump through hoops for precertification, payments and denials of such. Appeal Options must be used timely.

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2

Managed Medicaid Programs

- Medicaid and Child Health Plus with NY slamming: (forcing patients into an HMO) Vs. having straight Medicaid. What is a fair hearing?
- The need for disabled children and managed Medicaid, prior approval & referrals for the many specialists needed and should be requested at the Medicaid office. Parental Refusalment !
- Educational needs & Mental Health needs.

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3

Disabilities for Children

- Children with disabilities may be entitled to SSI (supplemental security income)

1-800-772-1213

- Patient's families must call to file a claim; they do not offer this benefit unsolicited.
- Assess for Mental Health, school bullying and Stigma association and reaction/coping

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4

Gatekeeper of Our Own Health

- We must be the gatekeepers of our own family's health and insurance.
- Ask Ques. take names of Ins. Rep.
- http://www.suffolkcountyny.gov/departments/
- healthservices/children.aspx
- N.Y.S.D.F.S. Dept. of Financial Services Hotline
  800-342-3736

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Thank you.

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