KDA 2022

Navigating the Orofacial Respiratory Complex Epidemic (Creating a Flight Path for Success)

Amanda Chastain

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What drives me?

- Family
- Connection
- Influencing Positive Change

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The Epidemic & Our Current State of Health & Wellness

- A Breathing
- B Sleep
- C Structure
- D Function

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High incidence of malocclusion

"Maloclussion is defined as an alteration in growth and development that affects the dental arches, the facial skeleton or both, and is considered a public health problem, as it has a high prevalence and possibility of prevention and treatment, which may negatively affect quality of life. The etiology is multifactorial and may be due to genetic factors, dental and facial trauma, deleterious and nutritional habits, among others."

Carvalho et al. Braestfeeding, Oral Habits and Malocclusions in the Childhood: A Literature Review
J Young Pharm, 2022; 14(1): 25-29

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J Young Pharm, 2022; 14(1) : 25-29
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Review Article

Breastfeeding, Oral Habits and Malocclusions in the Childhood: A Literature Review

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ABSTRACT

To review in the literature the relationship between lactation, deleterious bucal habits and malocclusion. For this literature review, scientific articles were searched in databases such PubMed and SciELO, in English and Portuguese languages. The search initially resulted in a total of 63 published studies, where 33 were selected, published in the period between 1991 and 2020. In this literature it has been observed that studies on breastfeeding and deleterious bucal habits have a lot of controversy, however, there are several studies that show an inverse association between the time of natural breastfeeding and the deleterious habits, thus suggesting that the feeding method in infants can influence the growth and correct development of the stomatognathic system. It is concluded that deleterious bucal habits are associated with malocclusions, especially anterior open bite and crossbites. Early diagnosis and intervention may prevent future disorders and orthodontic problems for patients.

Key words: Breast Feeding, Habits, Malocclusion, Primary dentition.

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children

MDPI

Article

Conformity between Pacifier Design and Palate Shape in Preterm and Term Infants Considering Age-Specific Palate Size, Facial Profile and Lip Thickness

Gwendolin Sistenich [1,*], Claudius Middelberg [1,†], Thomas Stamm [1,*], Dieter Dirksen [2] and Ariane Hohoff [1,†]

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* Correspondence: gwendolin@sistenich.de (G.S.); stammt@uni-muenster.de (T.S.)
† These authors contributed equally to this work.

Abstract: This retrospective case-control study is the first to examine the spatial conformity between pacifiers and palates in 39 preterm infants (12 females, 27 males) and 34 term infants (19 females, 15 males), taking into account the facial-soft-tissue profile and thickness. The shape of 74 available pacifiers was spatially matched to the palate, and conformity was examined using width, height, and length measurements. In summary, the size concept of pacifiers is highly variable and does not follow a growth pattern, like infant palates do. Pacifiers are too undersized in width, length, and height to physiologically fit the palate structures from 0 to 14 months of age. There are two exceptions, but only

UNDERDEVELOPMENT OF THE OROFACIAL RESPIRATORY COMPLEX

As we transitioned from the hunter-gatherer culture into processed soft food diets the biological potential for an open airway with wide jaw and large teeth has changed.

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Egyptian Journal of Forensic Sciences

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Lifestyle changes and its effect towards the evolution of human dentition

Arofi Kurniawan, Shafa Marwa Moza, Nathania Nuraini, Mayang Aziza Hanif, Dhea Arum Sekar & Patricia Talitha

Egyptian Journal of Forensic Sciences **12**, Article number: 8 (2022

REVIEW ARTICLE

Human Evolution of the Teeth & Jaws: A Mouthful of History

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ABSTRACT

The morphology & function of the teeth & jaws of Homo sapiens has changed with hominid evolution to their present form, when compared to those who lived 25,000 years ago, of the last common ancestor of humans & living apes. The field of human evolution is not normally considered within the scope of dentistry, yet the very same jaws & teeth upon which dentistry depends provide much of the essential evidence of human evolution. This review article tells a story of the patterns of dental morphological evolution in the course of time in relation to human origins. It provides a compelling account of how the interaction of diet, speech & environment has shaped human evolution of the jaws & teeth.

KEYWORDS: Evolution, Teeth, Jaws

ASTHMA IN KENTUCKY

10.6 % of children 11 yrs and younger

13.6 % of middle schoolers

11.8 % of high schoolers

18.6 % of adults

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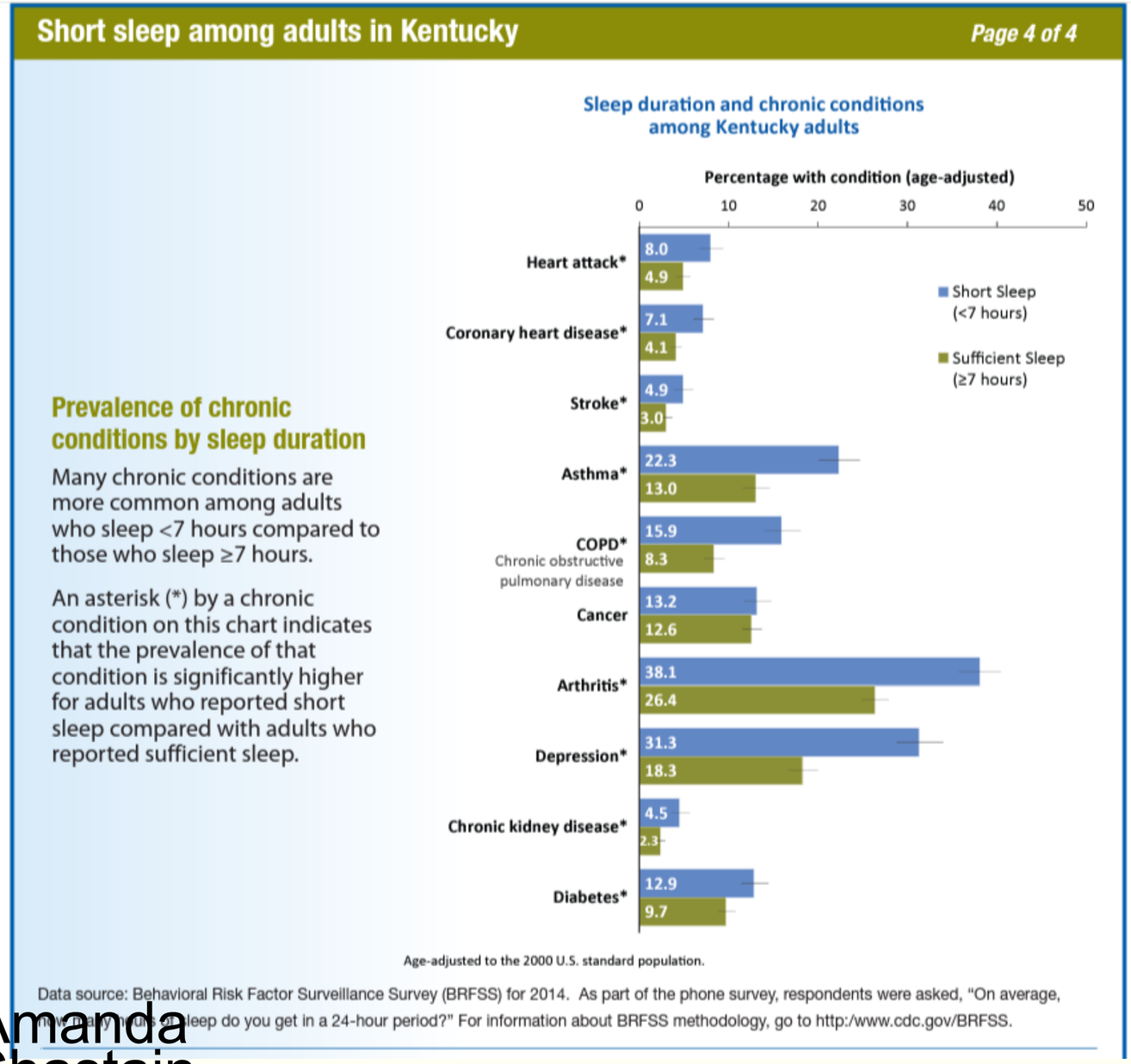

SHORT SLEEP DURATION

Short sleep duration is associated with increased risk for chronic diseases

More than 1/3 of US Adults report insufficient sleep

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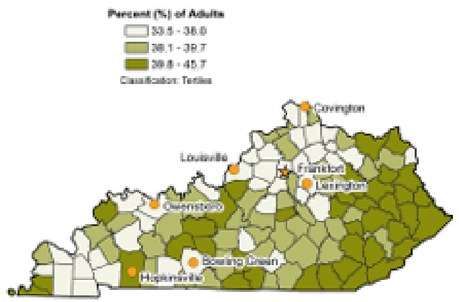
Use the information on the following pages to prioritize your education and outreach efforts to improve the health of residents in your state.

The prevalence of short sleep (<7 hours per day) varies geographically

Model-based* Estimated Age-adjusted Prevalence of Short Sleep# by County, 2014 — Kentucky



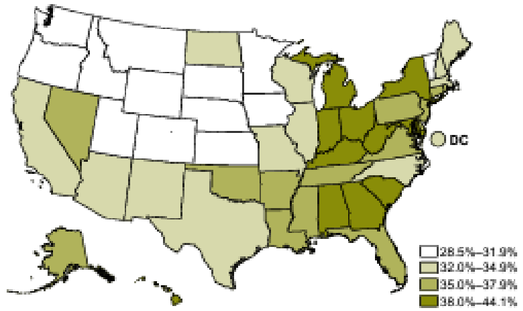
In 2014, 39.0% (age-adjusted = 40.0%) of Kentucky adults reported usually sleeping <7 hours in a 24-hour period.

The state map (left) presents the estimated age-adjusted county-level prevalence of short sleep among Kentucky adults.

For comparison, the national map (below) shows state-by-state adult prevalence of short sleep.

* Method from Zhang X et al. Am J Epidemiol 2014;179 (8):1025-1033. Data sources: Behavioral Risk Factor Surveillance System 2014, Census 2010, American Community Survey 2010-2014.
\# Percentage of adult population that reported usually sleeping <7 hours in a 24-hour period. Age-adjusted to the 2000 U.S. standard population.

Age-adjusted Prevalence of Short Sleep* by State, 2014



Short sleep is more common in the southeastern United States and the Appalachian Mountains and less common in the Great Plains states.

* Percentage of adult population that reported usually sleeping <7 hours in a 24-hour period. Age-adjusted to the 2000 U.S. standard population.

Data source: Behavioral Risk Factor Surveillance Survey (BRFSS) for 2014. As part of the phone survey, respondents were asked, "On average, how many hours of sleep do you get in a 24-hour period?" For information about BRFSS methodology, go to http://www.cdc.gov/BRFSS.

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EXTENDED NOXIOS HABITS

Sucking habits and other noxious oral habits prevent access to normal oral rest posture and oral function. Negative impacts include decreased palatal width, increased palatal height, flaccidity of the oropharyngeal muscles and generalized hypotonicity of the orofacial structures.

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Orofacial Respiratory Complex Health: A Window to the Body

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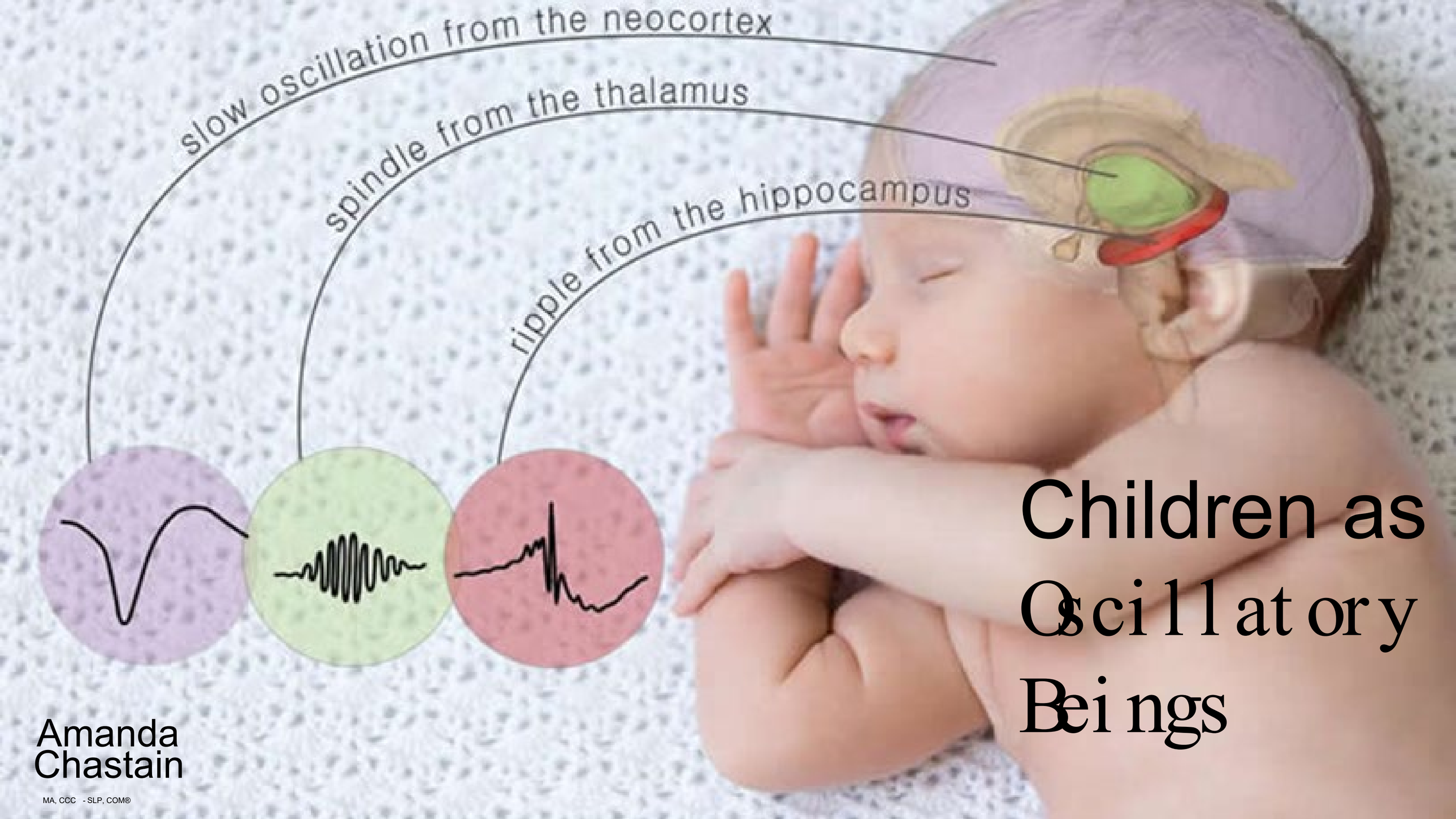

Children as Oscillatory Beings

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Abnormal rhythms impact overall function and change the trajectory of development over time.

Zelano, C., et al., Nasal Respiration Entrains Human Limbic Oscillations and Modulates Cognitive Function. J Neurosci, 2016. 36(49): p. 12448-12467.

Heck, D.H., et al., Breathing as a Fundamental Rhythm of Brain Function. Front Neural Circuits, 2016. 10: p. 115.

Varga, S. and D.H. Heck, Rhythms of the body, rhythms of the brain: Respiration, neural oscillations, and embodied cognition. Conscious Cogn, 2017. 56: p. 77-90.

Delaidelli, A. and A. Moiraghi, Respiration: A New Mechanism for CSF Circulation? Journal of Neuroscience, 2017. 37(30): p. 7076-7078.

Chen, L, et al., Dynamics of respiratory and cardiac CSF motion revealed with real-time simultaneous multi-slice EPI velocity phase contrast imaging. Neuroimage, 2015. 122: p. 281-7.

Dreha-Kulaczewski S, et al., Inspiration is the major regulator of human CSF flow. . J Neurosci Res, 2015. 35(2485-2491).

Dreha-Kulaczewski S, et al., Identification of the upward movement of human CSF in vivo and its relation to the brain venous system. J Neurosci Res, 2017. 37: p. 2395–2402.

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Opportunities for Complete Cycles

Critical for functioning.

Complete cycles/oscillations/rhythms lead to true biologic intention and norms

Interruptions at any point equates to underdevelopment of one or more of these systems

Altered rhythms can lead to miscommunication between systems

Think gut/digestion/sleep/

Functional and behavioral change is the consequence

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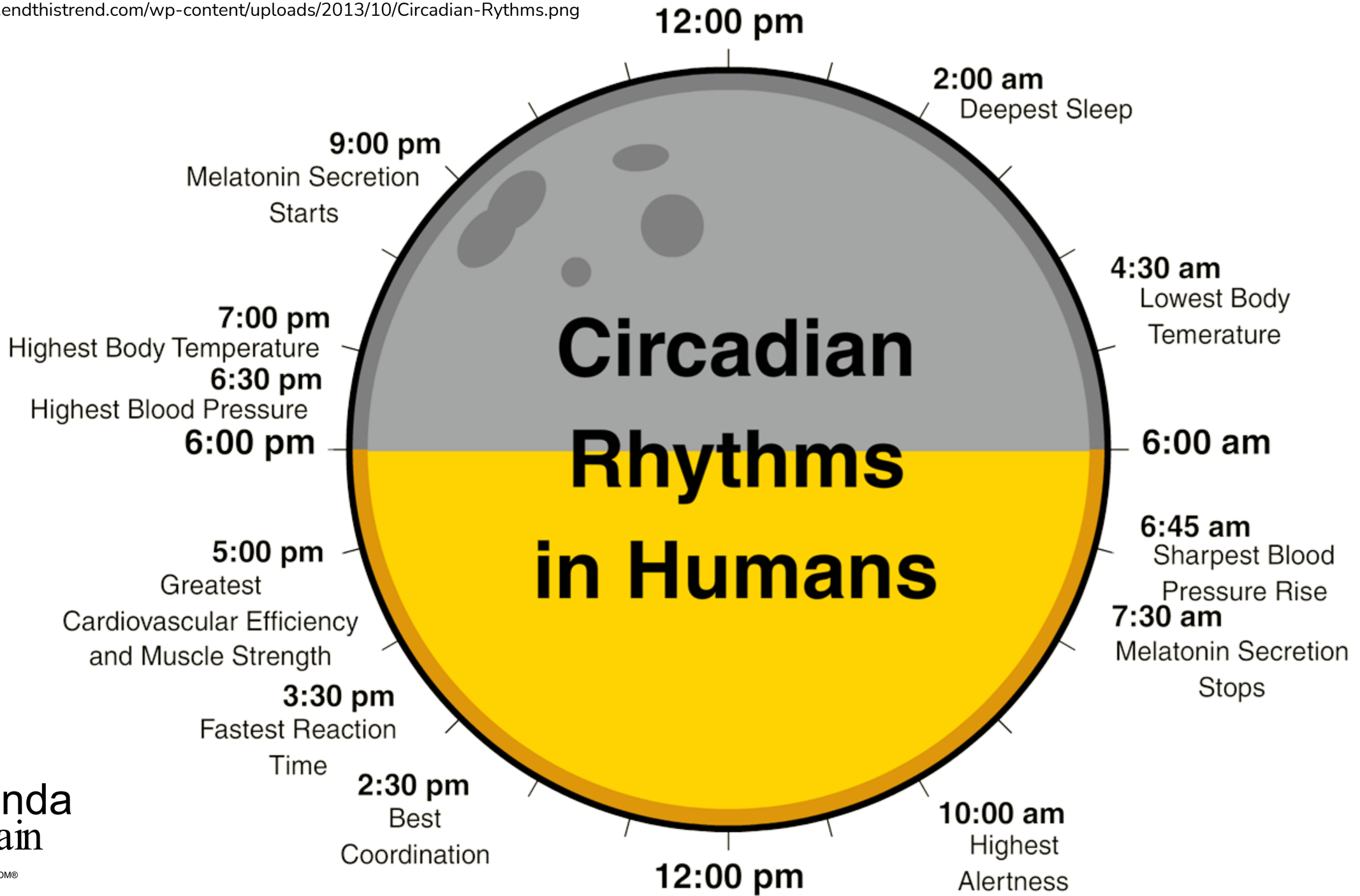
http://www.endthistrend.com/wp-content/uploads/2013/10/Circadian-Rythms.png



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Babies don't keep

Interrupt the "wait and see" model

Create the expectation that NOW is the BEST time to intervene

Early diagnosis and change supports lifelong benefits

Be the influence that changes the way we look at health and wellness to influence best biological potential

Watch the ripple effect of raising healthy children!

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Rhythm Interrupters:

Environmental influence
Toxins
Light exposure
Experience and opportunity
Cultural expectations

Movement
Full range of motion
Sequential patterning
Repetition to build motor pattern in the cortex
Chewing foods
Diaphragmatic breathing patterns
Reflex integration
(through movement &response to external inpu)
Correct swallow function

Sleep hygiene
Rest and restoration
Restless sleep/ interrupted cycles (snoring, restless leg)
Difficulty falling asleep/ staying asleep
Limited time in type 3 sleep (HGH release)
Daytime hyperactivity
Attention/ behavior
Age related changes in circadian rhythms

Feeding/ Nutrition
Breastfeeding
Integration of oral reflexes
Addition of new oral motor skills
Adequate nutrition intake
(fuels brain power, digestion, cell regeneration, energy levels)
Metabolic function
Nutrient absorption

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Adam K. (1980). Dietary Habits And Sleep After Bedtime Food Drinks.SLEEP, 3(1), 47-58.
American Academy of Sleep Medicine. (2008). Circadian Rhythm Sleep Disorders.
Berger, AT et al. "School start time and psychological health in adolescents." Curr Sleep Med Rep. 2018 Jun;4(2):110-117. doi:10.1007/s40675-018-0115-6. Epub 2018 Apr 21.
Division of Sleep Medicine at Harvard Medical School. (2007, December 18). External Factors that Influence Sleep.
Durmer, JS et al. "Pediatric Sleep Medicine." Continuum Neurol. 2007;13(3):182-184.
Peters, BR. "Irregular Bedtimes and Awakenings." Sleep Medicine Clinics. Elsevier. 2014;9(4):481-489.

How can we positively influence their rhythms?

Early intervention

Shared responsibility

Integrated team appraoch

Educate caregivers/public

Direct and specialized intervention

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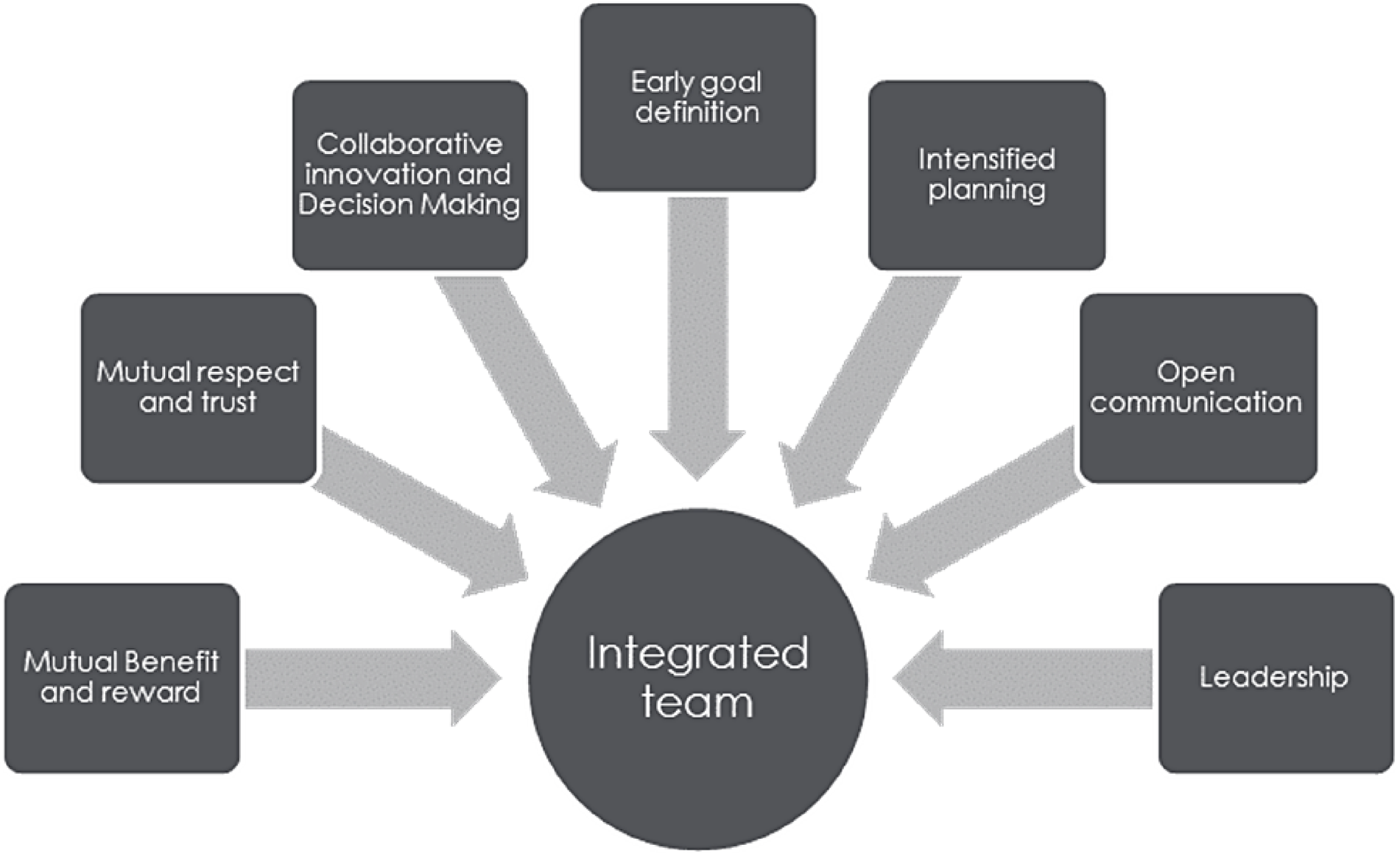

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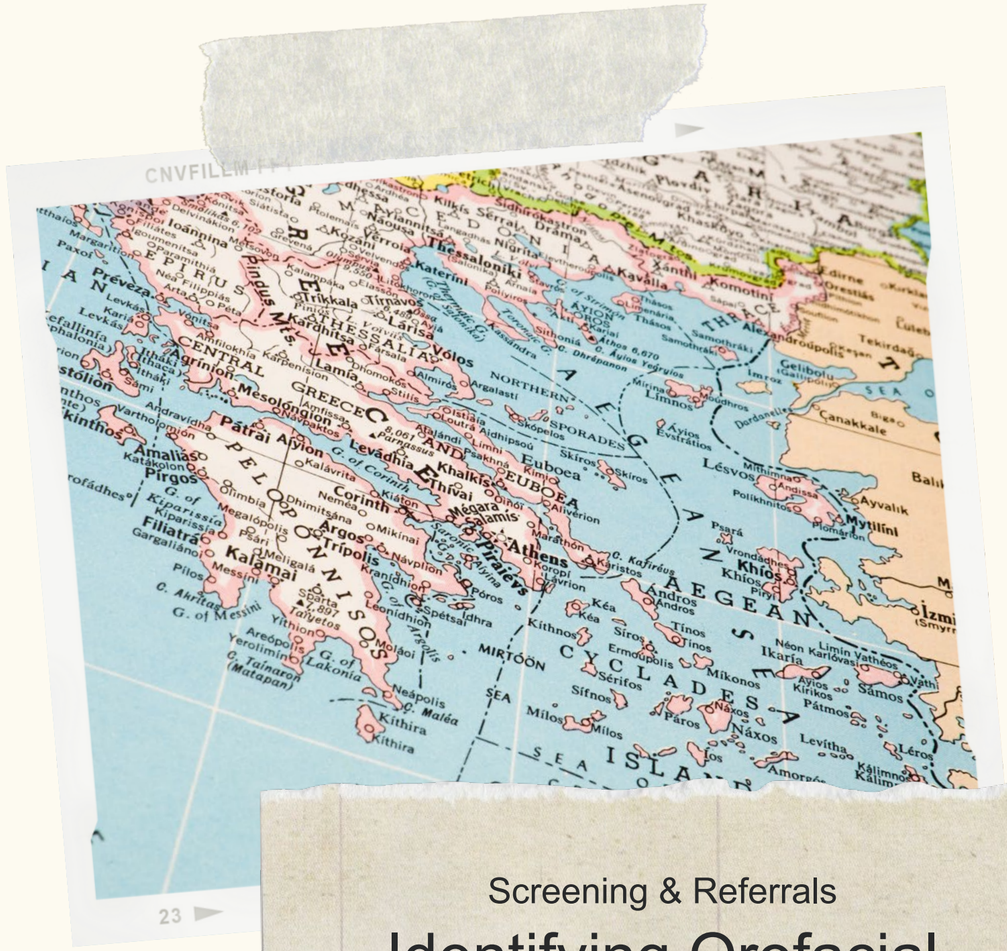

Screening & Referrals

Identifying Orofacial Respiratory Complex Deficits from the Dental Chair

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- A Oral Structures & Postures
- B Airway Space & Breathing
- C Swallowing
- D Speech

What is the orofacial respiratory complex?

Muscles and functions of the face, mouth, digestive and respiratory systems and their interconnected rhythmic interaction that supports health and wellness across the lifespan.

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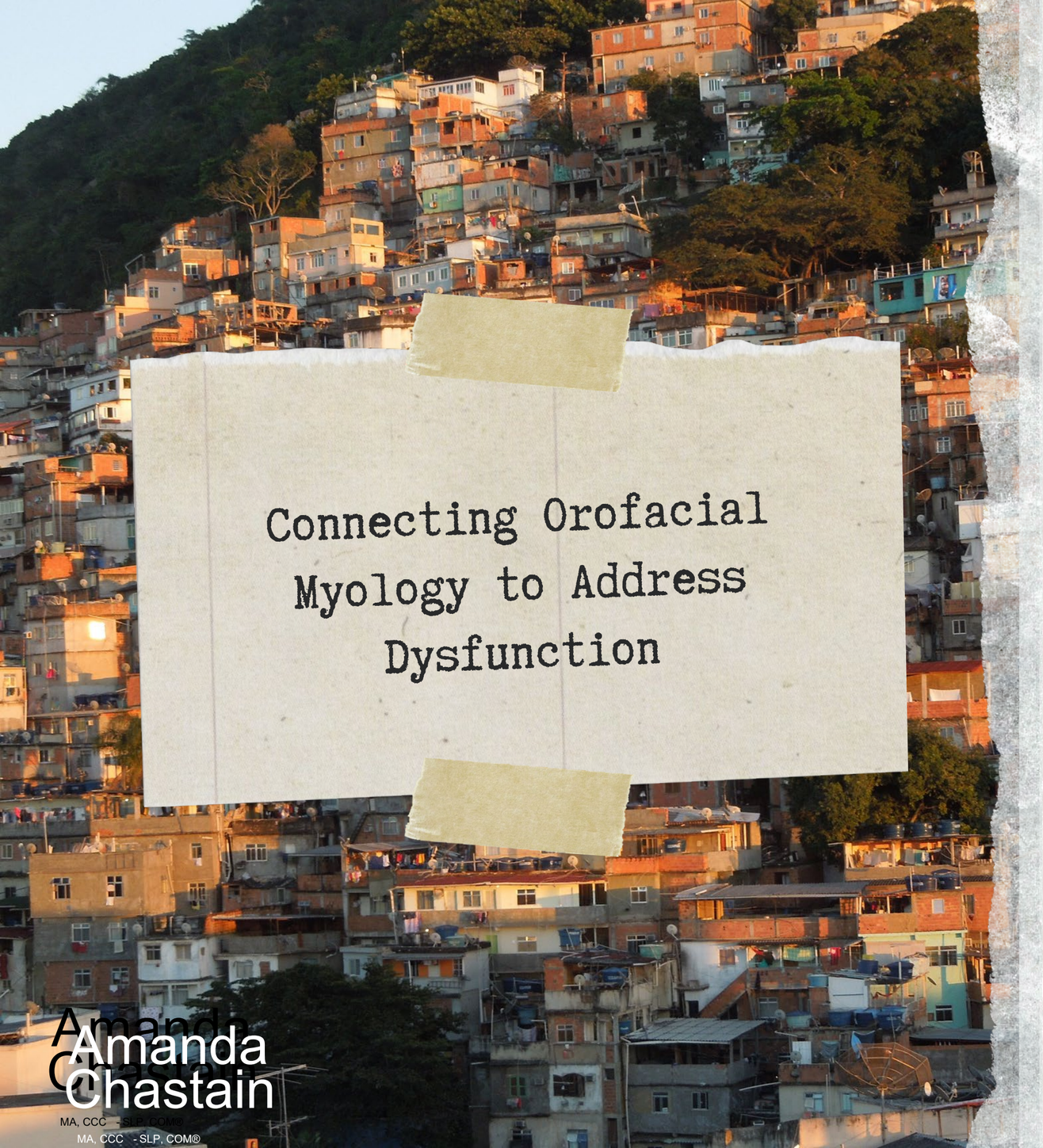

Connecting Orofacial Myology to Address Dysfunction

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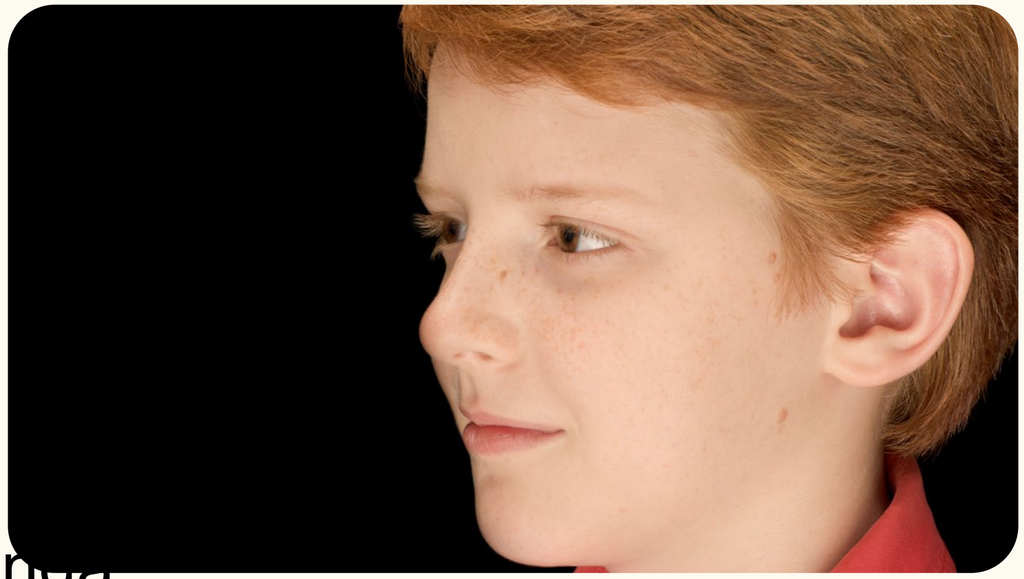
- A Muscle & Function
- B Atypical Patterns
- C Compensations
- D Development



Normal Oral Rest Postures

Lips
- symmetry
- visibility
- seal

Jaw
- normal freeway space (2-3 mm at molars)
- relaxed facial muscles for rest
- grading/dissociation

Tongue
- gentle suction
- contained within the upper dental arch

Body
- ears aligned with shoulders/hips/ankles
- scapula position close to spine (back and down)
- sitting in dynamic 90/90/90 variation

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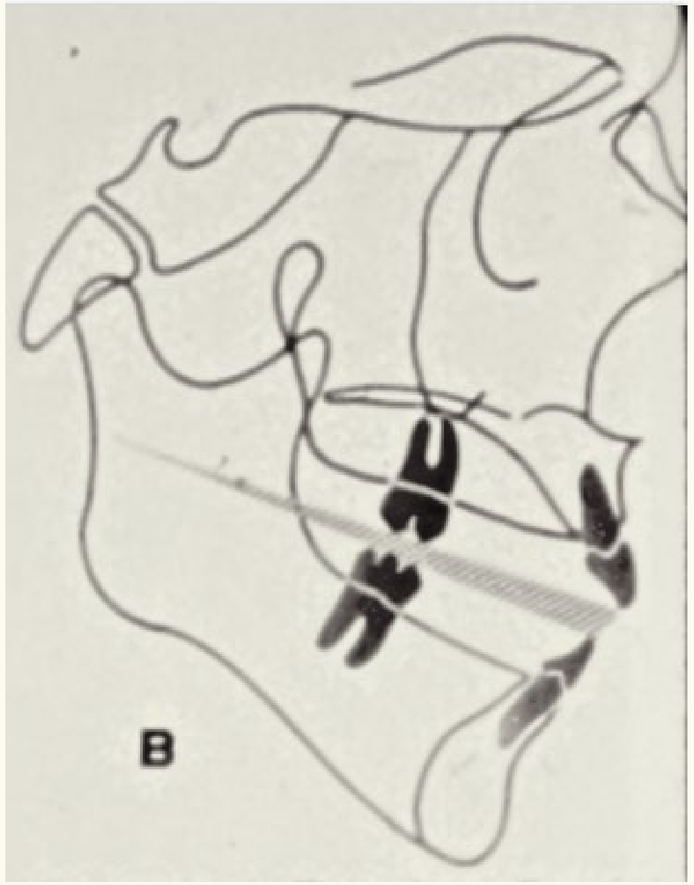
Normal Freeway Space or Interocclusal Rest Position=

2-3 MM AT THE MOLARS

3-5 MM AT THE INCISORS



Mason & Proffit, 1974; Proffit, 1986; Mason, 1988

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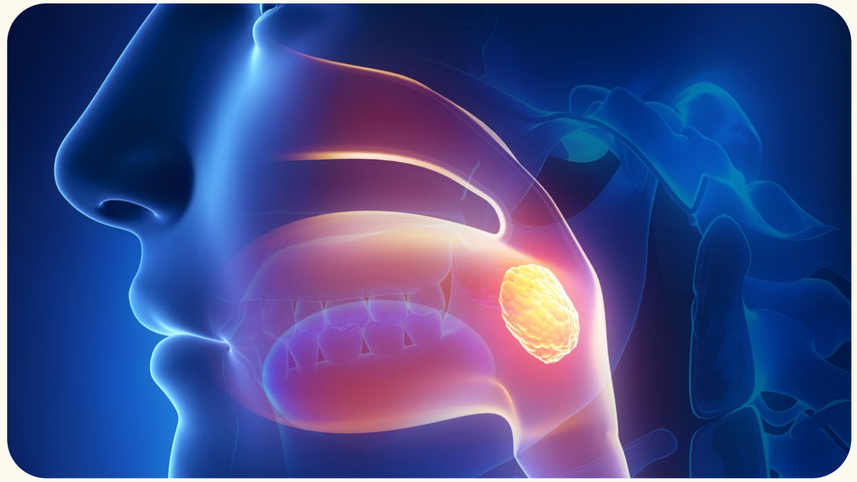

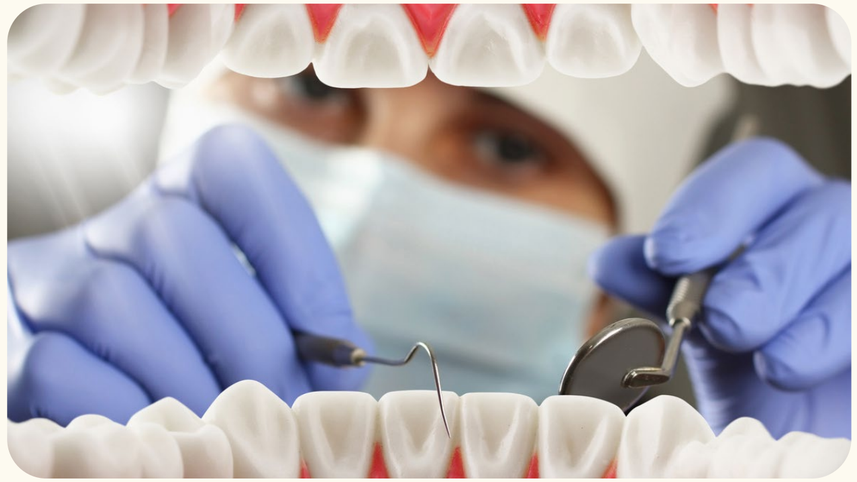

Normal Airway Space

Nasal Airway Space
- turbinates
- equality of nares
- airway resistance

Oral Airway Space
- tonsils
- palatal tone
- pillars and pharyngeal wall

Normal Oral Structures

Maxillary and Mandibular Palatal Width
Palatal vault
Oral frena
Neutroclussion without rotations/crowding
Rest Posture and ROM

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Normal Timeline for Habits

Sucking is innate and is used in infancy for calming and organizing the system

Oral reflexes integrate through exposure, experience, and movement. New skills replace reflexes and lead to higher level oral skill

Habits should organically remediate before 12 months of age

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Normal Feeding

Nutritional Intake
- food variety
- intake amount
- healthy weight gain/growth

Ease and Transitions
- breastfed without pain or challenges
- tolerates typical food allergens
- healthy gut and output
- easy transition to solids

Normal Swallowing

Bolus Management
- collects bolus
- controls bolus
- moves bolus with up and back lingual patterning
- clears oral cavity

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Normal Sleep

- 40-50% of pediatric sleep should be deep sleep
- Sleep duration by age groups
- HGH is released in deep sleep cycles
- Organs slow processed (including the bladder)
- Short and long term memory is estabilshed
- Toxins are flushed out
- Cells regenerate
- Nasal respiration and correct oral rest posture

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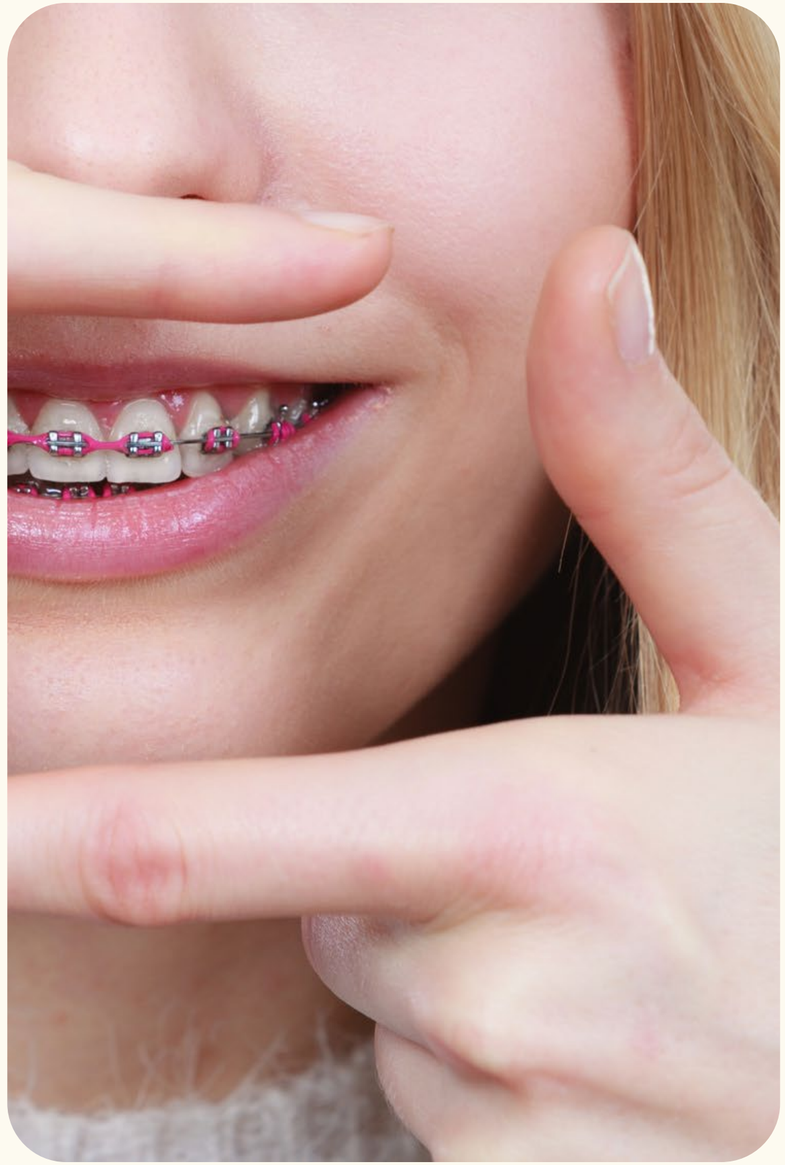

Orofacial Myofunctional Disorders (OMDs)

-parafunctional habits (sucking, cups/pacifiers, lip licking, chewing)

-incorrect oral rest posture (lips apart, excessive freeway space, lack of linguopalatal contact)

-underdeveloped chewing and swallowing (open mouth chewing, messy eating, forward or lateral tongue push for transit, incomplete oral clearing, lack of bolus management)

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Who experiences OMDs?

- Newborns, infants, and toddlers (Abreu, Rocha, Lamounier, & Guerra, 2008b; Aniansson et al., 1994; Neskey, Eloy, & Casiano, 2009; Ricke, Baker, Madlon-Kay, & DeFor, 2005)
- Preschoolers (Barros de Arruda Telles, Ferreira, Magalhaes, & Scavone-Junior, 2009; Dimberg, Lennartsson, Söderfeldt, & Bondemark, 2011; Grabowski, Kundt, & Stahl, 2007)
- School-aged children (Bonuck et al., 2011; Felcar, Bueno, Massan, Torezan, & Cardoso, 2010; Heimer, Tornisiello Katz, & Rosenblatt, 2008)
- Adults in repeat orthodontics (Bakarcic et al., 2015; Grabowski, Kundt, & Stahl, 2007; Jang, Cha, Ngan, Choi, Lee, & Jang, 2011)
- People with craniofacial disorders, cerebral palsy, dysarthria, dyspraxia, and/or sensory-motor based speech disorders (Murray, 2002; Okuro et al, 2011; Parker et al, 2010)
- Children and adults with restricted oral frenula, sleep disordered breathing, temporomandibular dysfunction and/or facial pain
- Those with post facial trauma, post surgery
- People who are weak, chronically ill, or bed bound
- Adults who are elderly

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Causes of OMDs

Restricted Nasal Airway

-hypertrophied tonsils/adenoids
-deviated septum
-allergies (rhinitis, sinusitis)

Structural/ Physiological Deficits

-tethered oral tissues
-fascial restrictions

Noxious Oral Habits

-thumb/finger sucking
-cheek/nail/cuticle biting
-clenching/grinding
-tongue/cheek/lip sucking
-extended pacifier/sippy cup/bottle use

Delays & Deficits

-neurological deficits
-developmental delays
-hereditary predisposition

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Prevalence of Thumb & Finger Sucking Habits

66% for 3 year old children

Dimberg, Bondemark, Soderfelt, Lennartsson; 2010

26% of 6-9 year old children

Van Normal; 1999

9.37% of 7-10 year old children

Vaidergorn; 1991

10.46% of 3-5 year old children

Farsi, Salama, Pedo; 1997

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Prevalence of Routine Habit of Resting with Lips Apart (Mouth-Breathing)

55% of 3-9 year old children

Abreu, Rocha, Lamounier, Guerra; 2008

56.8% of 6-9 year old children

Felcar, Bueno, Massan, Torezan, & Cardoso; 2010

3% of 0-5 year old children

Xiao-na, Hui-shan, Jing-siong, Yu-yan, Lin, Xi-cheng; 2009

53.3% of 8-10 year old children

Menezes, Leal, Pessoa, & Pontes; 2006

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Prevalence of Tongue Thrust

30-40% of general population

Hanson & Mason

41% of 6-18 year old children

Fletcher, Casteel, & Bradley; 1961

30.4% of 6-18 year old children

Werlick; 1963

37.5% of 35-52 year old adults

Hanson & Adrianopoulos; 1987

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Prevalence of Tongue Tie

4. 24% of newborns

Ricke, Baker, Madlon-Kay, Defor; 2005

3.2% of infants

Ballard, Auer, Khoury; 2002

4.8% of newborns

Messener et al; 2000

0.1-2.08% of children, adolescents, adults

Reddy, Marudhappan, Devi, & Narang; 2014

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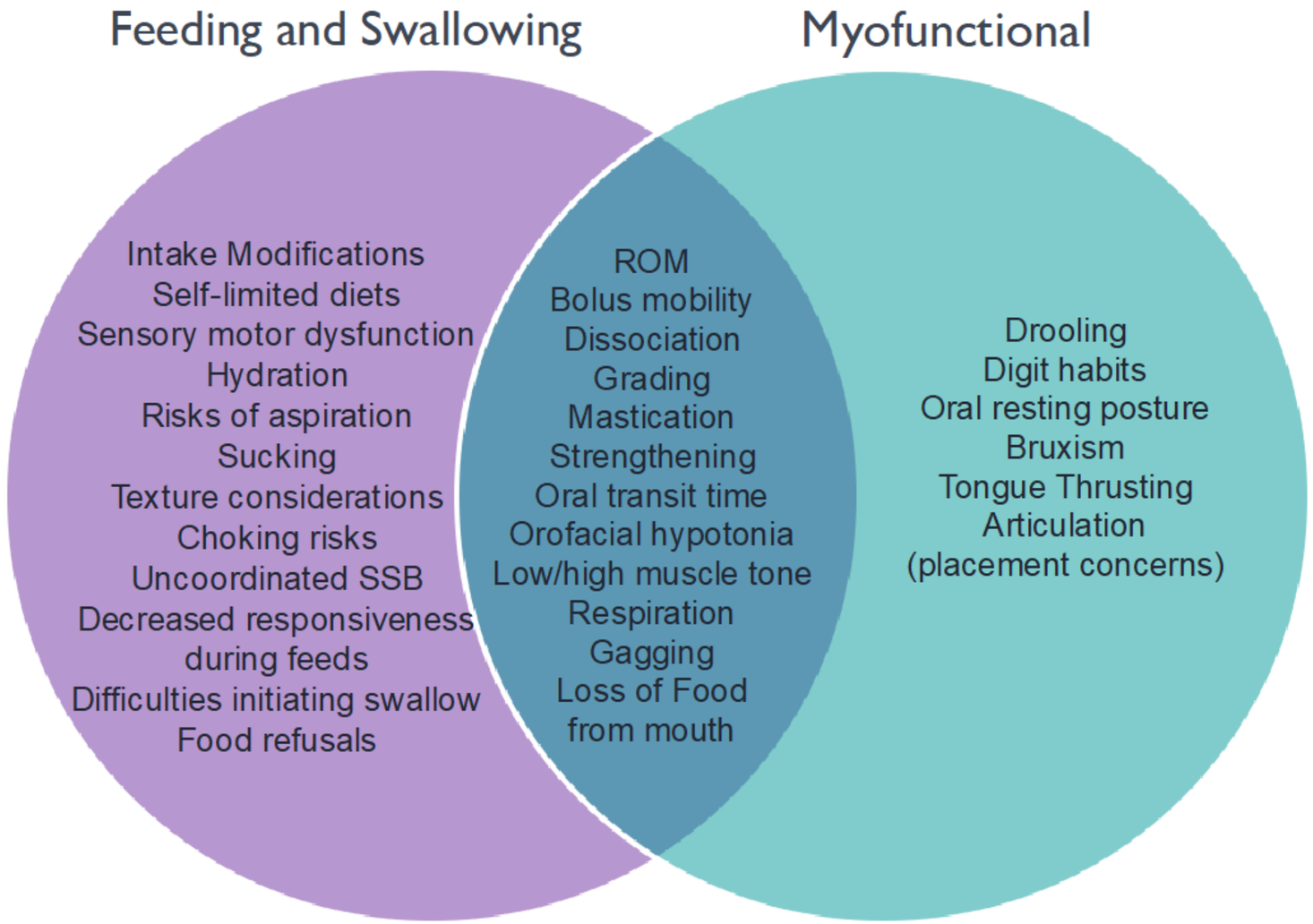
PREVALENCE OF MYOFUNCTIONAL CONCERNS



X Created by Billings, D'Onofrio, Gatto, and Merkel-Walsh, Spring 2017

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Observe Oral Rest Postures

Lips
- asymmetry
- limited visibility of upper lip
- lack of labial seal

Jaw
- excessive freeway space or teeth closed
- flaccid jaw/cheek muscles
- lack of proprioception

Tongue
- low, lax, forward
- dental contact
- low tone

Body
- forward head posture
- slumped shoulders
- lack of core stability
- underdeveloped movement patterns

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Anterior inter-dental rest posture of the tongue for hours per day=

DISRUPTION OF DENTAL ERUPTION

INHIBITS ANTERIOR DENTAL ERUPTION

ACCELERATES POSTERIOR ERUPTION AND VERTICAL DRIFT

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Mason & Proffit, 1974; Proffit, 1986; Mason, 1988

Vertical Eruption Forces

IT ONLY TAKES @5 GR/CM2 OF CONTINUOUS (RESTING) PRESSURE TO INHIBIT ERUPTION OF ANTERIOR TEETH.

FOR POSTERIOR TEETH, THE FIGURE IS @5 GR/CM2

ONLY LIGHT INTERMITTENT OR CONTINUOUS PRESSURES ARE NEEDED TO MOVE TEETH.

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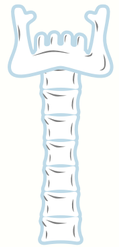
(insights from Proffit et al transducer studies)

Change in Vertical Dimension: Impact of Incorrect Freeway Space



Mandible hinges open

Increase in resting interocclusal space

Increased resting freeway space for hours per day=initiation of continued vertical tooth erruption

Mason 1988

Decreased resting freeway space (clenching) can lead to dental trauma/TMJ dysfunction

Sicher & DuBrul 1970

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Body & Head Posture

FORWARD HEAD POSTURE

Slumped shoulders

Propping

Core instability

Limited crossing midline

Head turn preference

Torticollis

plagiocephaly

CORRELATIONS BETWEEN POSTION/POSTURE AND FUNCTIONING OF THE OROFACIAL STRUCTURES FOR SWALLOWS IS WELL DOCUMENTED (INAGAKI ET AL, 2009)

Biomechanical theory - ”the changes in tissue tension - compression in one region are generated by changes in another” (Munhoz & Marquez, 2009)

Neuromuscular - grounded theories - electromyographic activity of a muscle in one place that is the reflection of a postural change in another location (Muhoz & Marquez, 2009)

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Observe Airway Space

Nasal Airway Space
- encroaching turbinates
- asymmetrical nares
- airway resistance/noisy breathing

Oral Airway Space
- hypertrophied tonsils
- elongated & flaccid soft palate
- small oropharyngeal space

Observe Oral Structures

Narrow dental arches
High palatal arch
Tethered oral tissues
Excessive diastemas, rotations, or crowding
Restricted range of motion

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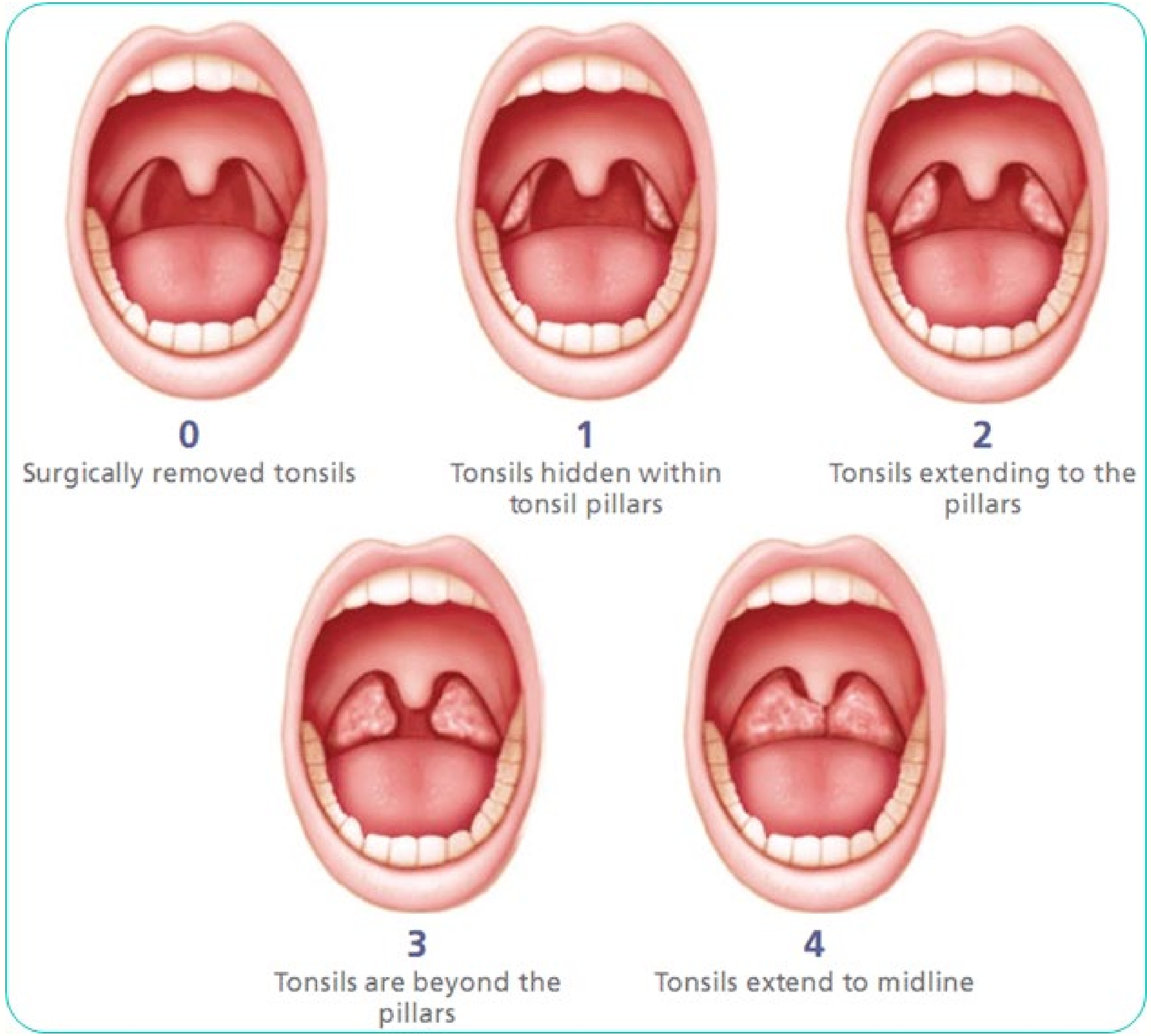
Brodsky Tonsil Scale

Observe airway space and take note of tonsilar tissue quality, size, and encroachment.



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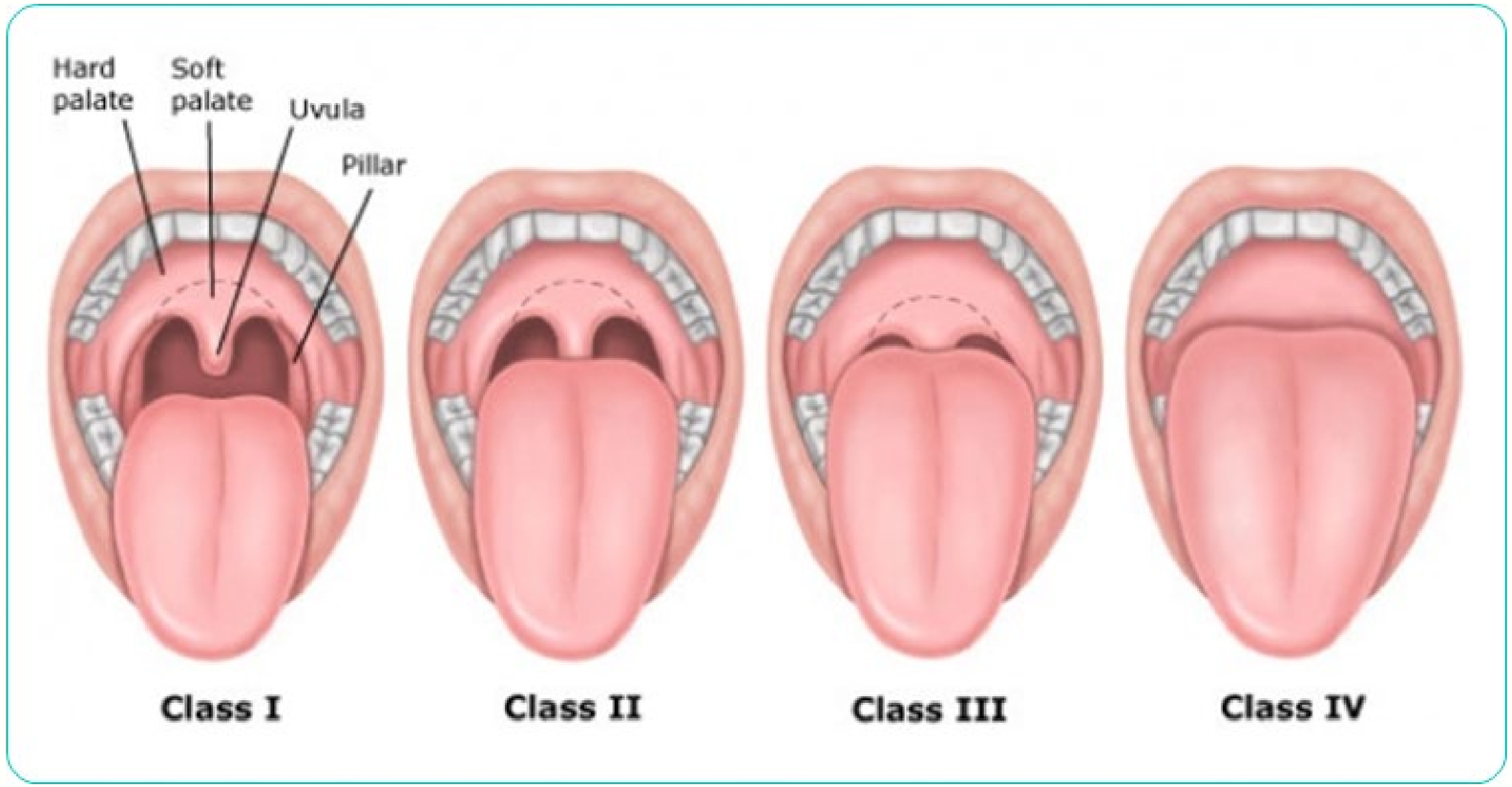
Mallampati Scale

Measurement used by anesthesiologists to determine ease of intubation.

Identifies oropharyngeal/airway space looking at tongue base and uvula relationship



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MOUTH BREATHING

Faria et al., 2002
Das & Beena, 2009

Negative impacts on growth and development

MOUTH BREATHING AS THE RESULT OF HYPERTROPHIED TONSILS/ADENOIDS HAS DIRECT CAUSAL RELATIONSHIP WITH ANTEROPOSTERIOR POSITION OF THE MAXILLA

Reduced airflow through the nasal cavity contributes to this structural development

Nasal hyperplasia develops and impacts vertical growth pattern

Tongue presses against palate less than expected if in a normal environment

Soft tissue change in face and mouth with alterations in normal muscle function

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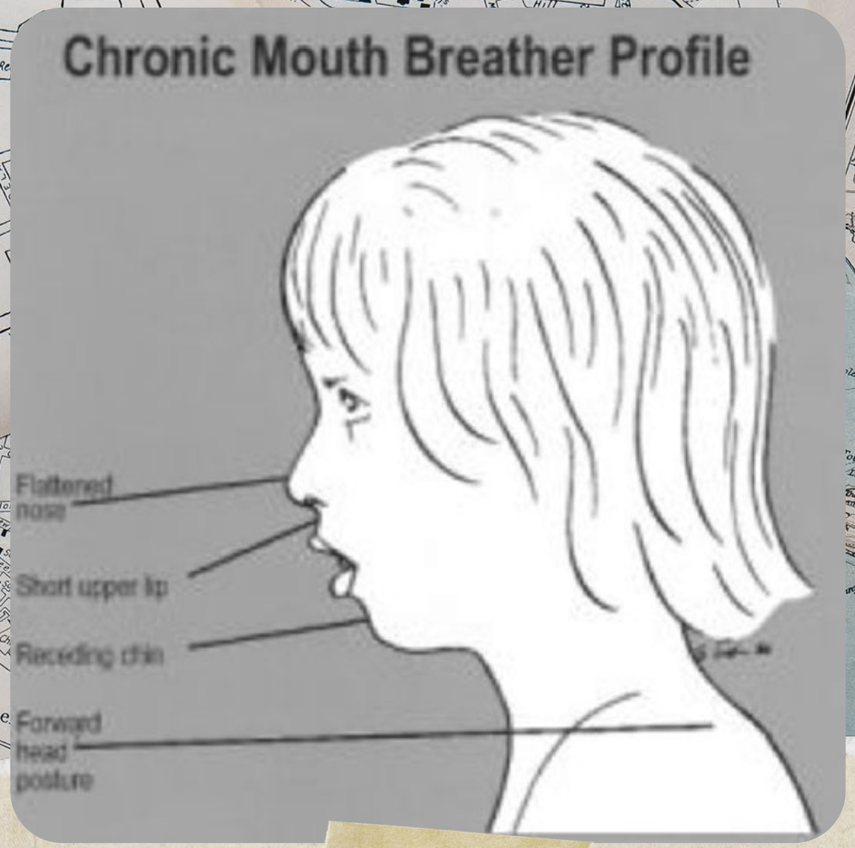

Chronic open mouth posture influences healthy growth patterns

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Profitt, 1986

"Examples of change that can result from a chronic open mouth rest posture include an increased vertical height of the face, a retruded chin, a downward and backward growth of the lower jaw, and flaccid and hypotonic lips."

Observe Parafunctional Habits

Signs and symptoms

- High and narrow maxillary arch
- low and forward tongue posture at rest
- digit callouses
- inflamed oral mucosae
- undefined cheeks

Sucking habits, pacifiers, or sippy cups beyond 12 months of age

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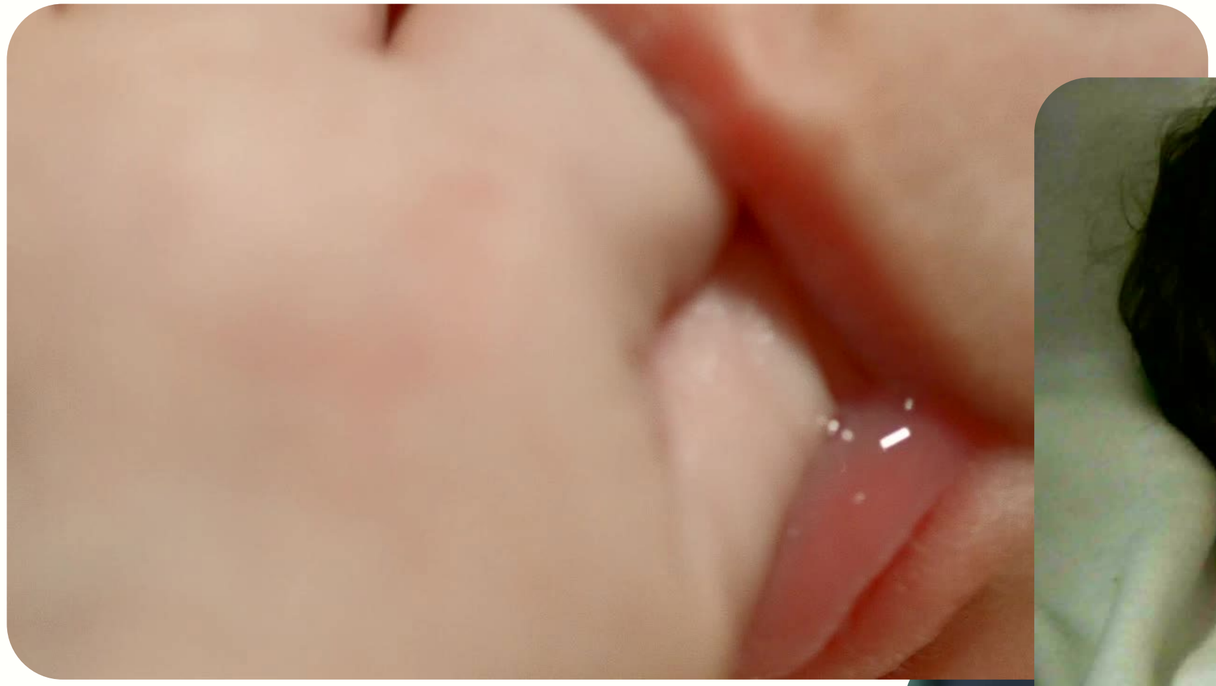

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Observe Feeding

Nutritional Intake
- Restricted diet/picky eater
- Limited intake
- Impacted weight gain/growth

Ease and Transitions
- painful breastfeeding
- maternal diet changes or special formulas
- GI symptoms including reflux
- difficulty transitioning to soilds

Observe Swallowing

Bolus Management
- bolus scatter
- anterior food loss
- forward or lateral tongue push to move food
- oral residue
- use of liquids to wash foods down
- selective consistencies due to fatigue or safety

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Ask about Sleep

- sleep duration
- sleep quality
- restless sleep
- snoring
- noisy breathing
- apneas
- difficulty falling/staying asleep
- enuresis
- daytime sleepiness
- daytime attention/focus
- learning challenges
- drool spots on sheets
- messy bed
- sleep walking
- night terrors
- frequent waking

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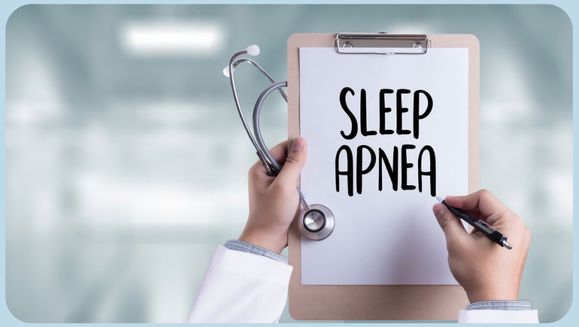
Impact of Sleep Breathing Disorders

SLEEP DISORDERED BREATHING IS LINKED TO EARLY ONSET DEMENTIA, ALZHEIMER'S, OBESITY, DIABETES, CARDIOVASCULAR DISEASE, HIGH BLOOD PRESSURE, GENERAL INFLAMMATION, REFLUX, AND FATAL CANCER

(GELB & HINDIN, 2016)

CHILDHOOD OBESITY
Learning disorders
behavioral disorders
Failure to thrive
Hormone disorders
Metabolic disorders

Takacs (Power Principles for Success)



ADHD AND BEHAVIORAL PROBLEMS
Focus/sustained attention
Impulsivity
Concentration
Energy level deficits
Enuresis
Obesity
jaw development
Immune system development
Epigenetic factor's
Difficulties across 5 domains (early intervention - communication, social emotional, cognitive, motor, adaptive

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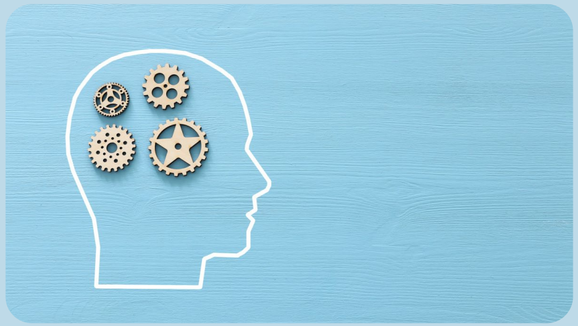
What are the long term impacts?



PEAK AGE FOR TONSILLECTOMY IS GETTING YOUNGER (WAS 4-6 YRS AND NOW 1-2 YEARS)

Hyperactivity is doubled for children with significantly impacted sleep quality

Impacts are persistent at 4 - 6 years even when symptoms have been remediated

Children with most significant symptoms peaking at 2.5 years had most impacted outcomes (snoring 2.5 x above mean, apnea 1.5x above mean, mouth breathing 1.5 x above mean

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Airway Advocates:
The Foundation for Airway Health

BE AN ADVOCATE

Take an active role and responsibility to assess for airway needs

TAKE THE PLEDGE

https://www.airwayhealth.org/take-the-pledge
Non-profit dedicated to educating about airway issues

BUILD A TEAM

Take the Pledge and be ready to refer out to address airway needs

SPREAD THE WORD

Share your knowledge to build a well informed community that seeks wellness across the lifespan

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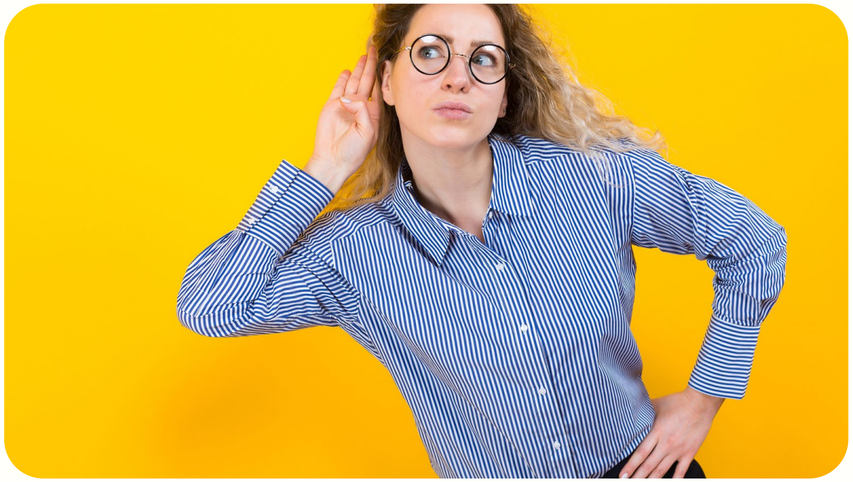

Observe Speech Production

Jaw Stability
- shifting, jutting, inconsistencies

Tongue Position
- visible interdental tongue placement for t/d/n/l/s/z/sh/dg/ch

Auditory Quality
- slushy sounding productions
- difficult to understand

Observe Vocal Quality

Overall Quality
- hoarse
- wet sounding

Loudness
- unable to adjust oudness based on environemtal expectations

Resonance
- blocked nasal resonance
- nasal emissions

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SPEECH SOUND DISTORTIONS

CONTRIBUTE MISARTICULATION OF SIBILANT SOUNDS TO TONGUE THRUSTING PATTERN/FORWARD TONGUE POSTURE

Sensory information is critical for correct speech production evidenced by distortions of fricatives after dental numbing

Significant relationship between open bite and frontal lisps and tongue forward posturing for “lingua - alveolar sounds” /t/d/n/l/ exists

The tongue is the most important of the oral articulators for speech sounds because of its ability to make fast and coordinat ed movements in fast succession

Alteration in function, speech, agility, or coordination of the tongue equate to likelihood that speech sounds will be impact ed

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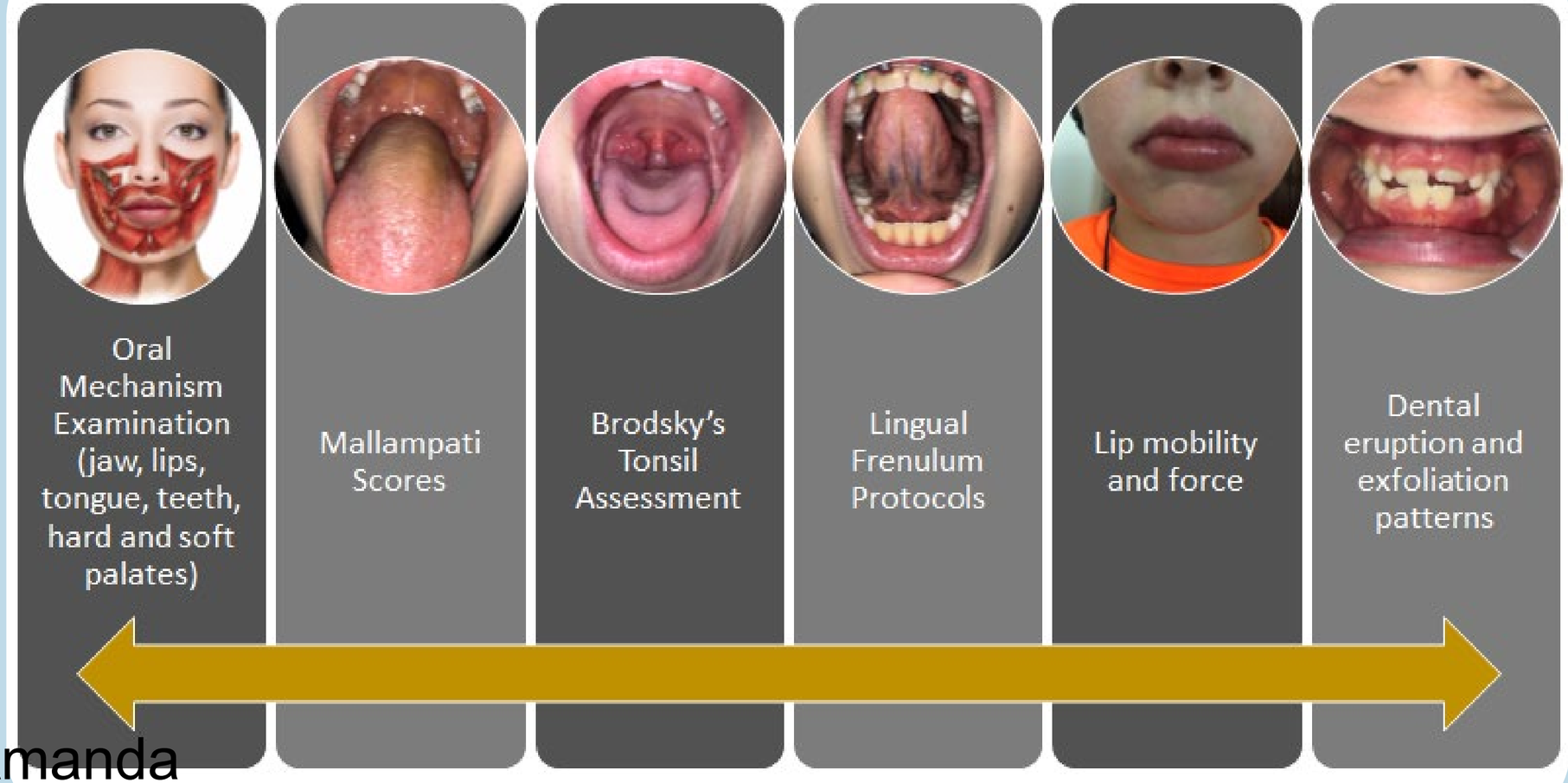
ASSESSMENT OF THE ORAL CAVITY



(Marchesan, 2012; Martinelli, Marchesan, & Berretin-Felix, 2012; Olivi, Signare, Olivi & Genovese, 2012; Kumar, Valenzuela, Kozak, Ludemann, Moxham, Lea, & Chada, 2014; Sjogreen, Lohmander, & Kiliarids, 2011; Hiraki, Yamada, Kurose, Ofusa, Sugiyama, & Ishida, 2017; Manipon, 2016; Leder, Suiter, Murray, & Rademaker, 2013; Walsh, Links, Boss, & Tunkel, 2017)

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Integrating Influences of Breathing Patterns, Body & Oral Postures, Oral Movement Patterns, Sleep & Overall Development

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Anthropological Perspective

https://www.brianpalmerdds.com/

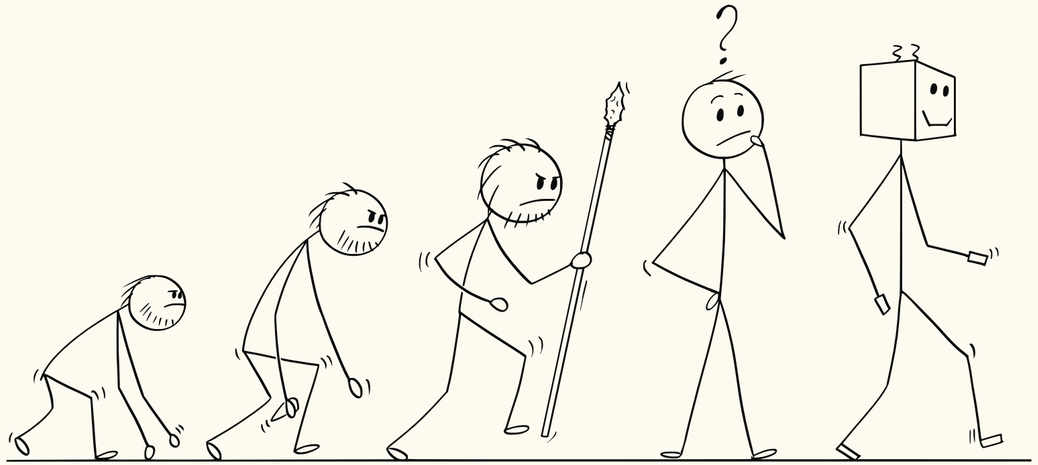
belated Brian Palmer, DDS

Structural Advantage

Soft palate and epiglottis contact allowing nasal respiration and swallowing

Wide Arch Development

Change in cultural expectations for breastfeeding correlate with increase in narrow jaws



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Oropharyngeal Development

Structural Disadvantage

Cadaver dissection demonstrating habitual tongue posture and relationship between soft palate and epiglottis

Discent of the Epiglottis

@ 46 months of age

coincides with peak incidence of SIDS (@ 35 months of age)

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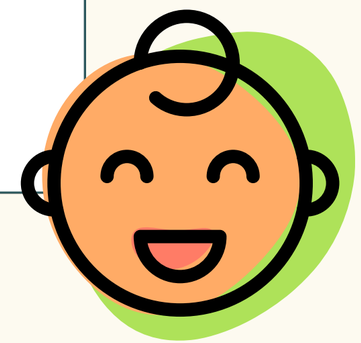
Illustration from Brian Palmer, DDS
Breastfeeding & Frenulum Presentation
http://www.brianpalmerdds.com/pdf/Bfing_Frenum03.pdf

Sasaki CT, Crelin E,S et al. Postnatal Descent of the Epiglottis in Man, March 1977, Arch Otolaryngol, Vol. 103, 169-171.

Influences on Palatal Development

Intrauterine constraint/ positioning	Birth	Post-birth medical interventions	Lips apart/ mouth breathing
Positions (play/sleep) (Emanuel, 2017)	Containers (Emanuel, 2017)	Tethered oral tissues	Nipple placement



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ORIGINAL ARTICLE

Assessment of Intraoral Findings of Neonates, Born in and around Meerut City

Madan M Niranjan[1], Nikhil Srivastava[2], Vivek Rana[3], Preetika Chandna[4]

Abstract

Aim: The aim of this study is to evaluate the occlusal relationships between the gum pads of neonates and to record intraoral findings in neonates and compare with the existing findings.

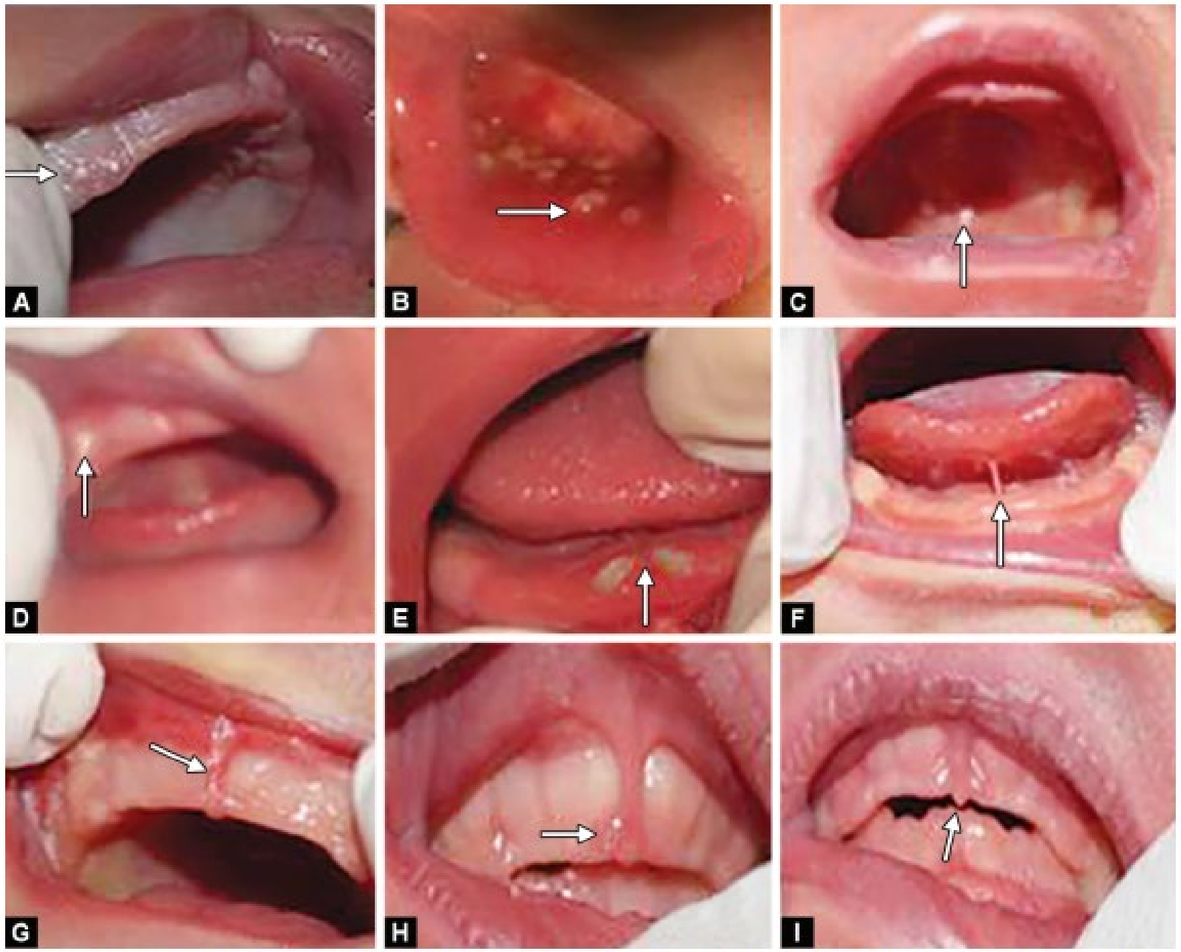
Materials and methods: The oral cavities of 1,000 healthy neonates from birth to 1 month of age were examined to evaluate the occlusal relationships between the gum pads and to record other intraoral findings in neonates and compare with the existing findings. Oral findings recorded were oral mucosal cysts, Fordyce's spot, Epstein's pearls, Bohn's nodules, ankyloglossia, natal or neonatal teeth and attachment of the upper midline frenum. Relationship between the alveolar ridges was also recorded. Obtained data were evaluated and statistically analyzed using the Statistical Package for Social Sciences (SPSS) version 21.0 and Epi-info version 3.0.

Results: The maxillo-mandibular relationship of gum pads in approximately 97% cases, the mandible was found distal and lingual to maxilla. The presence of anterior open bite was observed in 9.1% cases. The most common intraoral finding in examined neonates was an oral mucosal cyst, 61.2%. The presence of Epstein's pearls was the next most common finding 38.3%. Fordyce's spots were found only in 1.2% of cases, while the presence of natal/neonatal teeth was only in 0.6% of cases. Ankyloglossia was present in only 0.5% neonates. Maxillary frenum was present in 79.1% of cases and it was attached on the alveolar crest.

Conclusion: The results of the present study were in accordance with the pre-existing data. However, anterior open-bite was seen in significantly less percentage of the population.

Keywords: Anterior open bite, Epstein's pearls, Fordyce's spots, Maxilla-mandibular relationship, Gum pad relationship, Oral mucosal cyst.

International Journal of Clinical Pediatric Dentistry (2020): 10.5005/jp-journals-10005-1584



Figs 1A to I: (A) Oral mucosal cyst; (B) Fordyce spot; (C) Epstein Pearls; (D) Bohn's nodule; (E) Natal or neonatal teeth; (F) Ankyloglossia; (G) Attachment of upper midline frenum; (H) Buccolingual relationship; (I) Open bite

Digestion begins in the mouth.

There is a critical need for humans to gain optimal breathing and oral phase skills in order to stimulate the correct sequence and rhythms for digestion.

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Breastfeeding Should be Fun & Enjoyable

Why does it hurt when I breastfeed ?

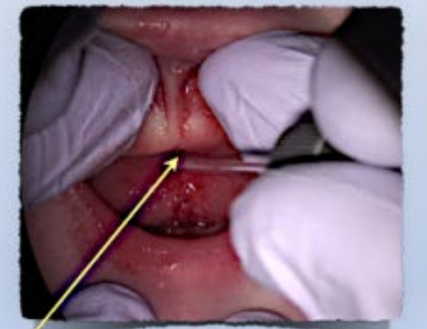
Lawrence A. Kotlow DDS, MALD, FAPD, FABPD
Board Certified in Pediatric Dentistry
Specializing in treating newborn infants and breastfeeding problems

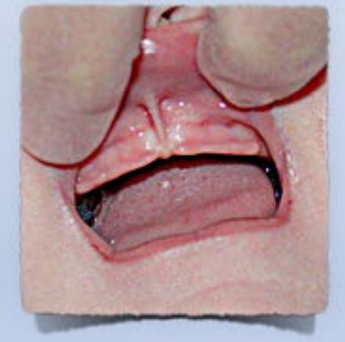
The *KOTLOW* classifications use the position of the lip attachment in the zones of free and or attached gingival tissue.

Kotlow Infant and newborn Lip-Tie classifications

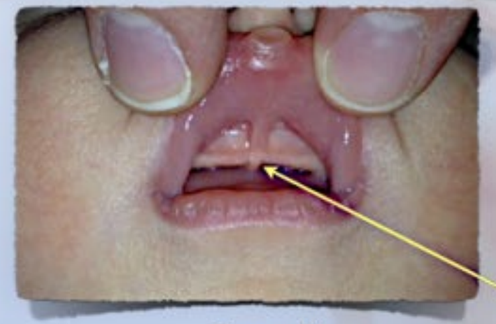
Class I: Attachment primarily above the junction of the attached gingival tissue

Class II
Attachment primarily into the junction of the free and attached gingival tissue





Class III:
Attachment primarily between the attached gingival tissue and the anterior papilla



Class IV
Attachment primarily distal to the anterior papilla and into the palatal tissue

Breastfeeding Should be Fun & Enjoyable

Why does it hurt when I breastfeed ?

Lawrence A. Kotlow DDS, MALD, FAPD, FABPD
Board Certified in Pediatric Dentistry
Specializing in treating newborn infants and breastfeeding problems

The *KOTLOW* diagnosis and classifications of the newborn's lingual frenum is based upon the anatomical location of the tongue's attachment to the floor of the mouth.

Type **IV(1*) -total attachment with tip involvement

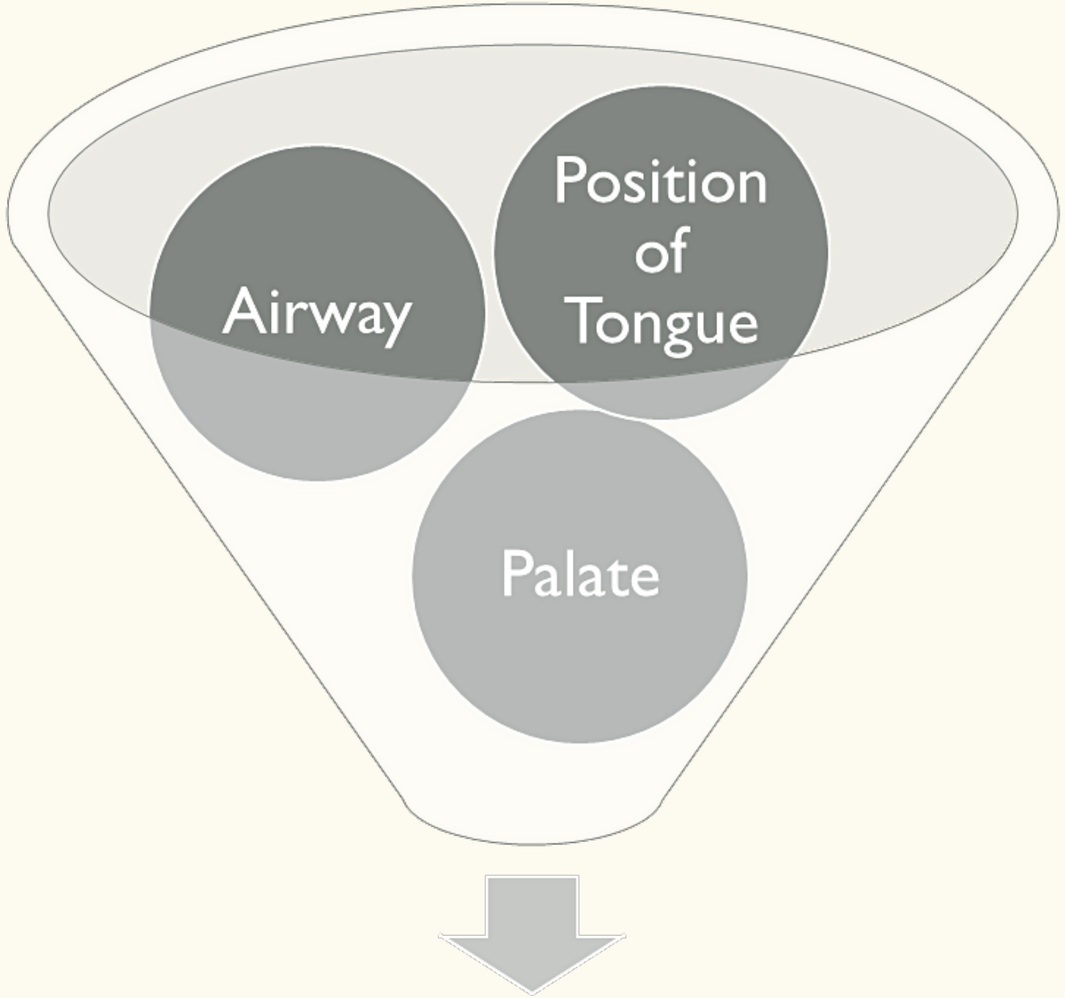
Type -III (2) Midline-area under tongue in front of salivary duct (creating a hump or cupping of the tongue)

Type II (3) Distal to the salivary duct but not at floor of the mouth.The tongue: may appear normal

Type I (4) Posterior area which may not be obvious and only palpable, Some are not visible if they are submucosally located.

Tight guitar string submucosal attachment

*The numbers in parenthesis are used primarily by some IBCLCs.
** The numbers outside the parenthesis are using the Kotlow protocol



Orofacial Respiratory Complex Development

Persistent airway challenges result in compensatory patterns

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Enlarged Tonsils & Adenoids

Increased resistance in upper airway is a contributing factor to deviant facial growth

Enlarged tissues impact the ability of the muscles to work appropriately

Hypertrophy of adenoids/tonsils is a factor in disruption of normal nasal breathing patterns (Faria et al. 2001)

Identified as correlating to malocclusion (Williams & Mohoney, 2007)

- "airway obstruction caused by adenoid hypertrophy and malocclusions are related"

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OSA Symptoms for Peds:

- Snoring
- Hyperactivity
- Developmental Delay
- Poor Concentration
- Bed Wetting
- Nightmares
- Night Terrors
- Headaches
- Restless Sleep
- Obesity
- Large Tonsils
- Noisy Breathing
- Chronic Runny Nose
- Frequent Upper Airway Infections
- Earaches

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Sleep Disordered Breathing & Developmental Issues:

ADHD/ Behavioral Implications
Focus/ Sustained Attention Deficits
Impulsivity
Concentration
Energy Level Deficits
Enuresis
Obesity
Jaw Development
Immune Systems Development
Epigenetic Factors
Negative Impact Across ALL 5 Domains

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Stein et al (April 2001) Pediatrics
Astill et al (2012) Psychological Bulletin
Sadeh et al (March/April 2002) Child Development
Schreck et al (2004) Research in Developmental Disabilities
Gelb & Hindin, (2016) Gasp: Airway Health

Negative Impacts on Growth & Development: Mouth Breathing

Mouth breathing as the result of hypertrophied tonsils/adenoids has direct causal relationship with anterioposterior position of the maxilla

Reduced airflow through the nasal cavity contributes to this structural development

Nasal hyperplasia develops and impacts vertical growth patterns

Tongue presses against palate less than expected if in a normal environment

Soft tissue changes in face and mouth with alterations in normal muscle function

Faria et al., 2002
Das & Beena, 2009

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Using your OM Lens

WATCH, ANALYZE, REFER

Open lips posture	Asymmetrical postural preferences
Mouth breathing	Asymmetrical oral movement patterns
Drooling	Chapped lips
Forward head posture	Messy eating
Slumped shoulders	Tongue thrust
Low forward tongue posture	Open bite (lateral or anterior)
Restricted airway	Tethered oral tissues
Infant feeding difficulties	Selective/ restricted diets
Speech sound distortions	Picky eaters

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Resources, Community Connections, & Patient Education to Support Care Planning

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Building your Integrated Team

PREVENTION &DECREASED RELAPSE

Patients who are treated by integrated teams have less relapse of skills and understand prevention

OPTIMAL OUTCOMES

Provides dynamic support, responsive adjustments to care, and lifelong changes that are sustainable

SUCCESSFUL COMPLETION

Working from the team perspective creates a sense of accountability, ownership, and builds an obtainable timeline with clear measurable goals

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CREATING TIMELINES AND SEQUENCING FOR OMD CARE

Each patient will present with individualized and specific needs. The sequence of care will be guided by primary concerns, medical necessity, and needs for progress per each provider

TEAM MEMBERS

- Acupuncturist
- Allergist
- Chiropractor
- Cranial Osteopath
- Dentist/Orthodontist
- Dietitian/Nutritionist
- General Physician (DO/MD)
- Lactation consultant
- Massage Therapist
- Naturopath
- Occupational Therapist
- Orofacial Myologist (COM or cert track)
- Oral Surgeon
- Otolaryngologist
- Physical Therapist
- Revision Provider
- Sleep Medicine Physician
- Speech Language Pathologist

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IAOM INTERNATIONAL ASSOCIATION of OROFACIAL MYOLOGY

Kristie Gatto, MA, CCC-SLP, COM™
Amanda Chastain, MA, CCC-SLP, COM™
Lorraine Frey, RDH, LDH, BAS, COM™, FAADH
Fabi Moy, MA, CCC-SLP, COM™
Patricia Fisher, MA, CCC-SLP, COM™

Airway and Myofunctional Screening in the Dental Office

Child's Name: _____ DOB: _____ Today's Date: _____

Which specialist is screening in the dental office? Name: _____ Title: _____

What is the purpose of the visit: (select all that apply) ❑ Prophy/Exam ❑ Caries/dental pain ❑ Evaluate oral frena ❑ Trauma ❑ Other _____

Please describe observed oral resting postures:
❑ No difficulties with oral resting postures; lips lightly closed, jaw is in an approximated freeway space of 2 mm, tongue is lightly suctioned to the palate
❑ Low tongue posture ❑ Forward tongue posture ❑ Lips parted ❑ Open mouth posture ❑ Drooling (over age of 2 years) ❑ Lip strain when closed, bunchy chin

Please describe observed airway patency concerns:
❑ No difficulties with airway patency, patient uses nasal breathing with ease
❑ Enlarged tonsils
❑ Suspected enlarged adenoids
❑ Deviated septum
❑ Sinus congestion
❑ Eye shiners
❑ Food or seasonal allergies
❑ Asthma
❑ Dry, chapped lips (chellius)
❑ Snoring or heavy breathing
❑ Restless sleeping/wakes frequently (>1xnightly)
❑ Bedwetting

Please describe observed oral structures:
❑ No difficulties with oral structures; child is in neutrocclusion without rotations, diastemas, or crowding
❑ Oral frena restrictions present (maxillary labial, mandibular labial, lingual, buccal)
❑ Abnormal mandibular growth (micrognathia, macrognathia, asymmetry)
❑ Malocclusions (rotations, diastemas, crossbite, anterior open bite, overjet, overbite)
❑ Atypical palate (narrows anteriorly, narrows posteriorly, asymmetrical)
❑ Limited jaw opening (less than 15 mm)
❑ TM Dysfunction (popping, crepitus, clicking, pain/discomfort)

Please describe observed/reported parafunctional habits:
❑ No prolonged noxious habit usage (pacifier/finger/thumb/etc. sucking ceased before 12 months)
❑ Sucking (tongue, finger, thumb, cheek, shirt, blanket or other item past the age of 12 months)
❑ Pacifier beyond 12 months of age
❑ Chewing on inedible objects (straws, pens, pencils, fingernails, other)
❑ Prolonged sippy cup usage (past 18 months of age)
❑ Bruxing/grinding/clenching

Please describe any difficulties with feeding and/or swallowing?
❑ No difficulties with sucking habits; transition to solid foods without difficulties; by age 2 the child should be eating "adult-like" foods cut in smaller sizes with at least 10 fruits/vegetables, proteins, dairy, and carbohydrates (unless under dietary restrictions)
❑ Reflux or similar issues
❑ Hyperactive oral sensory responses ("gaggy", retching, vomiting) when feeding
❑ Restrictive feeder (less than 30 foods)
❑ Difficulties transitioning from breast/bottle to cup drinking
❑ Sensitivity to different tastes or textures of foods
❑ Food aversions to certain foods or food classes
❑ Difficulties transitioning between food stages
❑ Pocketing of food in cheeks, under tongue, or on palate after swallowing
❑ Food residue on tongue after swallowing
❑ Child stuck in immature feeding pattern (nutrition received primarily from milk, purees, and soft foods versus wide variety of regular food of appropriate consistency)
❑ Growth concerns (consistently low weight and height percentiles)
❑ Limited progression in chewing skills; child may swallow foods whole versus chewing

Please describe oral/swallowing movements past the age of 2 years:
❑ No difficulties noted. The tongue is lightly suctioned to the palate at rest. When liquid is presented, the child will greet the utensil with his lips, creates intra-oral pressures with the cheeks and tongue movement, the tongue tip will anchor to the incisive papilla and use a peristaltic motion posteriorly to trigger the swallow. No residue should be remaining on the lips. In solids, the child will use the same process with the addition of chewing. During the chewing process, the child will pierce with his central incisors, lateralize the foods with his tongue to the molar area for mastication. By the age of two, the child will transfer the foods from one side to the next with rhythmic, fluid movements in a figure "8" pattern prior to gathering on the center of the tongue for bolus transfer and triggering of the swallow.
❑ Tongue tip is rounded
❑ The tongue does not clean the buccal sides of the dentition
❑ The tongue is low, flat and/or forward in the mouth
❑ The tongue movement is asymmetrical
❑ Forward movement of the saliva is noted or salivary buildup is evident on the corners of the mouth
❑ Child is reported as a messy eater
❑ Child's foods are limited to specific brands/types/consistencies of foods
❑ Child snacks consistently throughout the day without eating 3 consistent meals
❑ Uses a bottle beyond 12 months in age

Other observations:
❑ Gagging while taking bitewings? ❑ Use of suction? ❑ Instrumentation during routine treatment? ❑ Aberrant facial movements during communication?

Referral Needed
❑ COM™/Myofunctional ❑ SLP/Feeding ❑ ENT ❑ Orthodontist ❑ Body Worker ❑ Oral Surgeon ❑ Other _____

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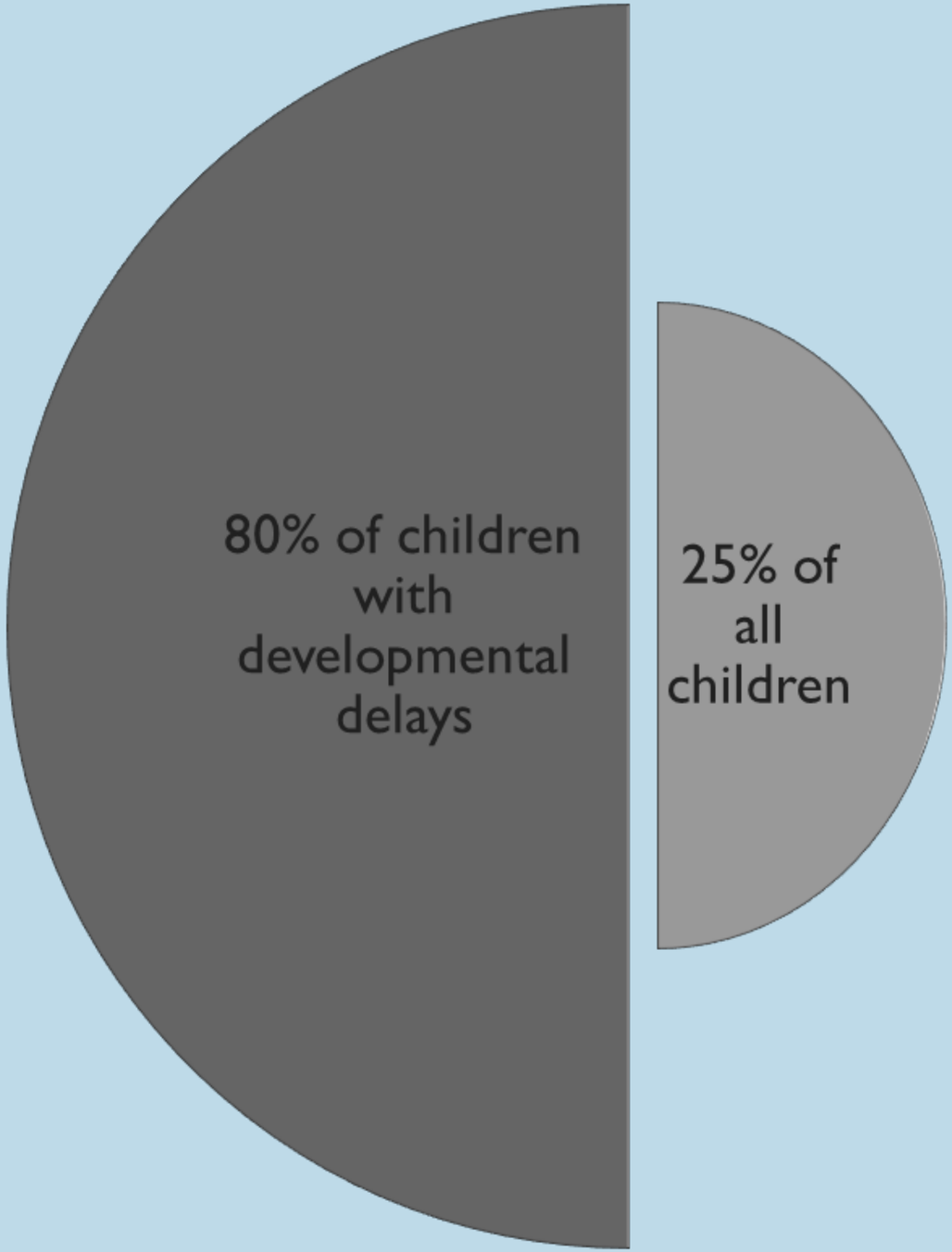
Prevelance



J Clin Gastroenterol. 2000 Jan;30(1):34-46.?Pediatric feeding disorders.?Manikam R1, Perman JA.?

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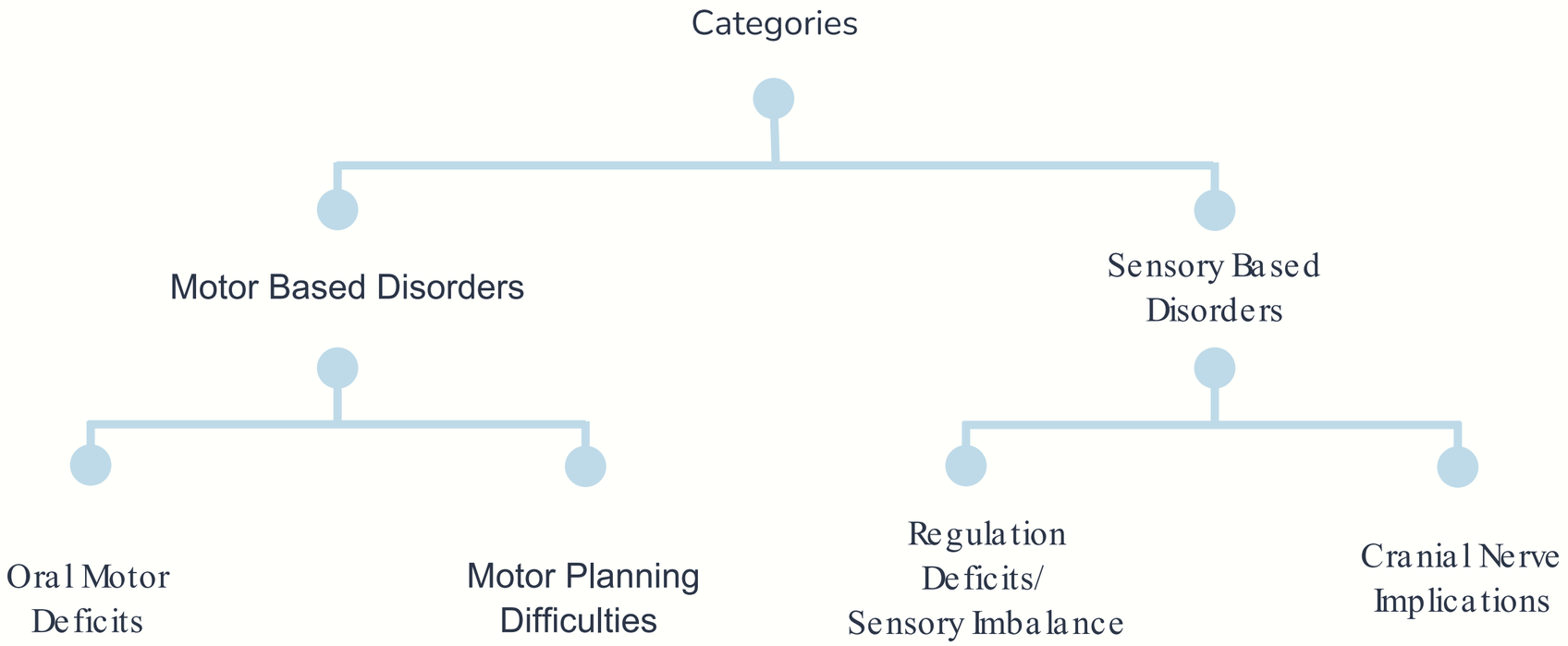
Pediatric Feeding Disorder



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Infant BPM Norms

TERM = 30-40 breaths/min

PRETERM = 40-60 breaths/min

ILLNESS = 60-80 breaths/min

Breathing Rates; Genna 2013

Pediatric BPM Norms

INFANT- 12 months = 30-60 breaths/min

TODDLER 1-2 4 months = 24-40 breaths/min

PRESCHOOLER- 3-5 years = 22-34 breaths/min

SCHOOL AGED CHILD- 6-12 years = 18-30 breaths/min

ADOLESCENT 13-17 years = 12-16 breaths/min

ADULTS 17+ years = 12 18 breaths/min

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Q&A
Case Discussion

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