



Recognizing Childhood Speech/Language and Motor Developmental Delays



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Course Objectives

Upon completion of this course the participant should be able to:

- Understand why dental hygienists and dental team members need to be aware of basic childhood developmental communication delays and disorders
- Identify the parts of communication
- Recognize basic childhood developmental communication and motor delays and disorders, including their manifestations
- Detect oral health issues associated with childhood developmental delays
- List the ways hygienists can help parents/caregivers locate information regarding developmental delays

Why Hygienists Need To Be Aware of Developmental Delays

- Hygienists and dental professionals are educators of oral health
- Oral health is an integral part of overall systemic health, even for the youngest patients
- Recognition and referral to appropriate treatment sources helps alleviate frustration and problems as children age
 - The earlier the child is treated the better the outcome

Delay vs. Disorder

- **Delay** = Skills developing at a slower rate than normal
- **Disorder** = Skills developing abnormally
- Children are unique individuals who develop at varying rates but will develop skills within age appropriate ranges
- Children who are “slow” usually are **delayed** but catch up with peers at some point
- Premature infants have age adjustment - What age would child be if born at full term?
 - Child born at 36 weeks gestation (4 weeks premature) should do at 8 weeks what a full term infant would do at 4 weeks (based on 40 week gestational period)
- Age adjustment usually involved in the first 2-3 years - then premature children usually “catch” up with full term children – **delayed** child
- Children whose skills develop abnormally are considered to have a **disorder** (may develop skill then regress or lose skill)
- Child may have age appropriate communication skills and then for some reason skills are lost - **disorder**

Children Who Are At High Risk for Delays

- Spend time in NICU (neonatal intensive care unit)
- Possess low APGAR scores at birth
 - Activity, Pulse, Grimace, Appearance, and Respiration
- APGAR rated on a scale of 0 -10 during birth and 5 minutes - if needed 10 - 30 minutes after birth
- Healthy child = 5 - 7 APGAR at birth and then would increase at 5 minutes
- Have frequent ear infections, allergies, or colds
- Have genetic defects: Down Syndrome
- Have nasal-gastric feeding tubes; cleft lip-cleft palate
- Have neurological disorders
 - Autism, cerebral palsy, seizure disorders

Domains of Early Childhood Development

Children develop at varying rates and in areas of:

- Cognition
- Communication
- Gross and fine motor
- Social/Emotional
- Self-help

Childhood Domains

- Cognition
 - Information processing or knowledge (i.e. knowing name)
- Social/emotional
 - Stages from crying for wants, to pointing, to communication – less egocentric as child ages (i.e. temper tantrums)
- Self-help
 - Ability to take care of one's self independently (i.e. learning to feed oneself)

Cognition

- Perception of light occurs at birth
- Reflexes and all the rest (perception of forms, sizes, positions) is acquired through the combination of reflex activities with higher activities

Jean Piaget – developmental theorist in his studies of cognitive development

Jean Piaget

- Piaget – Swiss
- Aug 9, 1896 – Sept 16, 1980
- Developed 4 stages of childhood development
- **Sensorimotor Stage** - Birth – Age 2: children experience the world through movement and senses only and learn object permanence; egocentric = cannot view world from others viewpoints and explore by using the senses (touch/cry – imitation)
- **Preoperational Stage** – Ages 2 – 7: magical thinking predominates with acquisition of motor skills – egocentric, no logical thinking – child uses mental imagery to view world and place in it (imaginary friends)
Piaget's Stages
- **Concrete Operational Stage** – Ages 7-11: children begin to think logically but only concretely; no longer egocentric – deal with story problems that do not ask for abstracts but deal with only facts – volume/mass/weight/area, etc
- **Formal Operational Stage** – After age 11: development of abstract reasoning and logic – ability to use symbols – continue to grow in knowledge base – self-motivation – continues into adulthood

Communication

$$C = S+L+L$$

Communication equals **S**peech plus **L**anguage plus **L**istening

- **Speech** = process of making meaningful sounds or words
- **Language** = content of speech, the meaning of words
- **Listening** = process of receiving and understanding the words

What Is Speech?

- **Phonation** = rules of sound system that involve the sound sequences that make up words (i.e. "i" before "e", except after "c")
- **Resonation** = voice and fluency, vocal quality, pitch, loudness, rate and rhythm; can be affected by problems in larynx and breathing pathways
- Phonation and Resonation involve pharyngeal, oral, and nasal cavities can be effected such as when one has a cold or sinus infection (hypo or hypernasal sounds)
- **Articulation** = sound errors which can be substituting, distorting or omitting normal speech sounds; involves the rapid and precise movement of teeth, tongue, lips, mandible which shapes vocal tract to allow speech production (i.e. "wabbit" for "rabbit")

What is Language?

- Tool that is symbolized and communicated to others
- Set of concepts (words) that are governed by a rule system (syntax and grammar)
- Involves expressive and receptive language

Increasing Speech

- Talking naturally even to infants
- Maintain eye contact
- Raise pitch and intensity of voice and vocal patterns
- Take time to listen to child
- Don't interrupt or constantly correct
- Model correct words and sounds for child to imitate
- Use correct pronunciation and word forms - no baby talk
- Use short 1-2 word combinations and increase length as age increases
- Use pictures and stories, sing songs, rhymes, finger play

Warning Signs

- Minimal or no babbling as an infant (quiet baby)
- No words by 18 months of age
- No simple phrases by age 2
- Inappropriate responses to questions
- Excessive drooling – open mouth posturing
- Lack or poor non-verbal communication skills: lack of eye contact or excessive use of pointing or gestures
- Poor intelligibility (varies with age)
- Underdeveloped play skills for age
- Tendency to overstuff food in mouth due to inability of muscles to sense appropriately

From First Words to First Books

- From birth – age 3: read simple books to child, show picture books, cuddling/floor time (getting on floor and playing with child)
- Child begins to identify and name objects

Pre-Reading and Reading Skills

- In kindergarten/first grade if warning signs are present child should be evaluated for learning problems
- Examples of difficulties in:
 - Rhyming
 - Recognizing letters
 - Identifying sounds at beginning/middle/end of words
 - Breaking words into sounds
 - Blending sounds

Good Speech Needs Good Hearing

- **Newborn-3 months:** turns to noise, startles, smiles when spoken to
- **4-6 months:** responds to "no" and looks for new sounds
- **7-12 months:** recognizes name and simple requests
- **1-2 years:** points to objects in book, can name body parts
- **2-3 years:** understands simple differences, and 2 combined commands
- **3-4 years:** respond to calls, who, what, when, where questions

Hearing Experience

- Female child was third child of family of boys – child tested "normal" at hospital but parents found she was not progressing as fast as boys had at same ages
- Had child tested and was found to have progressive hearing disorder which eventually would lead to deafness
- Child was placed in early intervention program and received extensive therapy and was able to attend school with peers and has progressed normally in school with hearing disability
- Parents were aware of signs/symptoms and received early services to allow child to achieve full potential

Fine/Gross Motor Skills

- Fine motor: small muscle movements, occurs in the fingers in coordination with the eyes (hand/eye coordination and dexterity)
 - Treated by occupational therapists
- Gross motor: large muscles and/or whole body movement
 - Treated by physical therapists

Motor Issues

- Motor issues can be seen early in child's life including in infancy with how:
 - Infant takes nutrition (breast or bottle) - how coordinated child is, length of time it takes to feed
 - Eyes move - tracking - do eyes track symmetrically or deviant
 - Vision therapy may be necessary – can be subtle with child testing “normal” on vision tests but may not be “seeing” correctly
- Motor issues can be seen early in child's life by how:
 - Child controls and maneuvers through her/his surroundings
 - Uses markers/crayons and food utensils – age appropriate handling of materials

Oral Motor Issues

Dental professionals need to be aware of oral motor issues since these can cause an inability to use the oral mechanism for functional speech or feeding, including activities such as chewing, blowing or making specific sounds

Dyspraxia

- Children who experience motor difficulties (fine, gross or oral) are experiencing dyspraxia
- Dyspraxia is the partial loss of the ability to coordinate and perform purposeful movements or gestures in the absence of motor or sensory impairments

Formal Ways to Help Delayed Children

There are two sources depending on age of child:
Early Intervention and Special Education

- Early Intervention – birth to age 3 or 5 (depending on state laws)
- Special Education Department of local school system (3 or 5 years of age depending on state laws to 21 years of age)
- State Department of Public Health provides information on each area

Early Intervention – EI

- Early intervention applies to children from birth to age 3 who are discovered to have or be at risk of developing a handicapping condition or other special need, disability or delay that may affect their normal development – due to birth or other environmental circumstances
- Early intervention provides services to these children and their families for the purpose of lessening the effects of the condition
- Early intervention can be remedial or preventive in nature - remediating existing developmental problems or preventing their occurrence

EI Programs

- Early intervention may focus on the child alone or on the child and the family together
- May be center-based, home-based, hospital-based, or a combination
- Services range from identification -- that is, hospital or school screening and referral services--to diagnostic and direct intervention programs
- Early intervention may begin at any time between birth and school age; however, there are many reasons for it to begin as early as possible
- Each state has individual requirements for age and eligibility
- All children can be screened for eligibility, but not all qualify for services

Special Education – SPED

- Special education is instruction that is modified or particularized for those students with special needs, such as learning differences, mental health problems, or specific disabilities that are physical or developmental
- In North America, "special education" refers specifically to students with learning disabilities or other mental or physical problems
- SPED services children 3 – 21 years
- The provision of education for people with disabilities or learning differences differs from state to state
- The ability of a student to access a particular setting may be dependent on their specific needs, location, family choice, or government policy
- Special educators describe a cascade of services, in which students with special needs receive services in varying degrees based on the degree to which they interact with the general school population
- Federal law requires "free and appropriate education" (FAPE) in the "least restrictive environment" (LRE)
- Special education will be provided in one, or a combination, of the following ways: inclusion, mainstreaming, segregation, exclusion
- Modifications can consist of changes in curriculum, supplementary aides or equipment, and the provision of specialized facilities that allow students to participate in the educational environment to the fullest extent possible

EI vs. SPED

- EI = family centered, IFSP, individualized family service plan (family focused)
- SPED = school centered, IEP (individualized educational plan) (child focused)
- SPED principles: free & appropriate public education, appropriate evaluations, IEP's, least restrictive environment, parent/student involvement, procedural safeguards

EI and SPED Staff

- Speech/Language Pathologists
- Physical and Occupational Therapists
- Family Therapists (EI) - Psychologists (SPED)
- Pediatricians – EI only
- Nurses
- Social Workers
- Developmental Educators (EI) – Special Educators (SPED)

SPED Legislation

- "No Child Left Behind" Pres. Bush, 2001, importance of EI and other early childhood learning experiences in developing skills needed for future success, birth to 5 years
- 504 Plan: any students not eligible for IEP's but have significant physical or mental impairment, which impact major life functions
- Each legislation provides for services to children who would not have previously received services thus offering benefits earlier

Oral Health Issues Affecting Communication Delays

Several oral health issues that effect communication can be evaluated by the dental professional and referred to the appropriate source for further evaluation/treatment:

- Tongue thrust swallowing
- Tonsils/Adenoids
- Oral Sensitivity

Tongue Thrust Swallowing

- Child presses tongue forward against teeth each time there is swallowing; Normal rest position of the tongue = on rugae behind maxillary anterior teeth
- Tongue thrust places great forward pressure against teeth, causing protrusive positioning
- Patterns:
 - **Anterior** - tongue rests on lingual of max. teeth
 - **Lateral** - exaggerated pressure of tongue causes bite to close down, teeth can't erupt to fullest position
 - **Fan** - occurs from molar to molar, tongue thrusts out occlusal surfaces, occlusal pressure only on first molars, refer to myofunctional or speech therapist

Myofunctional Therapy

- Series of exercises and activities that develop the oral-stage of mature chewing and swallowing function to their maximum ability
- Does not move teeth but uses structural, functional and behavioral techniques
- Investigates the chewing and swallowing habits and provides correction; involves hard and soft tissues of oral-facial and cranial-facial development and respiration (nasal and mouth breathing patterns)
- Example: crossbite = lack of tongue pressure during growth/development; 2/3 of anterior teeth covered by lip = lip competence
- Treatment providers are speech therapists or myofunctional therapists

Other Variables to Evaluate

- Thumb and/or finger sucking, pacifier use
- Tongue sucking is uncommon but can occur in infants if thumb sucking is prevented (usually disappears by 2 – 3 years)
- Mouth breathing (adenoidal breathing) causes narrowing of maxilla resulting in pinched face appearance, caused by allergies, sinus infections, colds, tonsils/adenoids

Tonsils and Adenoids

- Tonsils = palatine tonsil located in oropharynx "tonsil"
- Adenoids = nasopharyngeal tonsil located at back of nasal cavity
- Lingual tonsil = located back of tongue, lingual tonsil and adenoid tissues are not readily visible
- Adenoids usually begin shrinking around 5 years of age, tonsils around 7 years, 6-7 years is the average age of tonsil and adenoid surgery
- Tonsils and adenoids can enlarge in nasal allergy patients

Indications for Tonsil and Adenoid Removal

- Tonsil removal
 - Repeated throat infections (7 or more sore throats in a year)
 - Tonsillar infection can spread to neck (peritonsillar abscess)
 - One tonsil larger than another
- Adenoid removal
 - Evaluation by radiograph and long mirror with illumination at back of throat to determine airway space to determine if limited
 - Sleep apnea
 - Persistent mouth odors
 - Some studies indicate removal of tonsil/adenoids help with otitis media and otitis media with effusion
 - Hypo-nasality of voice

Complications

- Bleeding
- Dehydration
- Fever
- Throat/ear pain and headache
- Stomach Upset, Vomiting
- Mouth Odor
- Hyper-nasality of voice
- Limited activities for 14 days with soft diet

Tonsil and Adenoid Evaluation

- Note tonsils for signs of infection or enlargement
- Evaluate texture, cratering, fissuring along tonsil surface indicating bacteria collection areas
- Is there enough space around uvula for speech production and swallowing (reduced airway space does not allow for normal airflow into oral cavity)
- Uvula in front of tonsil area usually sign of enlargement
- Repeated bed-wetting episodes beyond age appropriateness, slow growth, child struggling with air while sleeping
- Irritability and lack of focus
- Sleep apnea can result in developmental delays, and later in life, hypertension at middle to end of day due to lack of deep sleep and heart disease

Oral Sensitivity

- Limited food repertoire
- Appear to avoid certain food textures
- Doesn't like teeth brushed/face washed/body touched
- Eats food from utensils using only teeth with lips retracted
- Doesn't like messy sensory materials like finger-paints
- Doesn't like mixed textures
- Gags easily
- Wants to wash food down by taking a drink rather than by chewing it

Caring for Oral Sensitivity

- Mouth is extension of the body
- You may need to touch child's body before going near face/mouth/teeth
- Use firm pressure with slow movements
- Describe, show, tell
- Treat child by making child comfortable with you by touching cheeks, jaw, then mouth/teeth

Hygienist's Role in Recognizing Delays

- Don't interrogate parent, let parent offer information; let parent guide conversation
- Have information available in reception/education area
- Ask developmental questions on child's medical history form (including mealtime questions)
- Ask parent if there are any concerns regarding child that they would like information about
- Investigate individual State Department of Public Health for information about Early Intervention and Special Education (EI/SPED) in your area

Hygienist's Role in Recognizing Delays

- Evaluate tonsil areas for enlargement (position of uvula, for swallowing and speech)
- Mouth breather
- Evaluate texture, craters, fissures of tonsillar surface for bacterial infection
- Ask parent/caregiver if child experiences excessive bedwetting, slow growth, struggles to breath while sleeping/snoring, irritable/lacking focus at middle to end of day
- CDT 07-08: Code D0145: Oral evaluation for patient under age of 3 and counseling with primary caregiver - Dental code to allow dental professionals to charge for services provided for children from birth – age 3
- Recommendation of American Academy of Pediatrics and the American Academy of Pediatric Dentistry is to see children prior to first birthday
- Initial visit is designed to review with parent/caregivers oral habits, provide family dental "home" and possible evaluation/referral to other care providers
- Education

Referral Information

- Individual State Public Health Departments – Early Intervention programs
- American Speech, Language and Hearing Association – www.asha.org, 800-638-8255
- ERIC Clearinghouse on Disabilities and Gifted Education – www.hoagiesgifted.org (governmental agency no longer active, but with archival information)
- National Institute on Deafness and Other Communication Disorders (NIH) – www.nidcd.nih.gov, 800-241-1044
- Easter Seals – www.easterseals.com, 800-221-6827
- Pathways Awareness Foundation – www.pathwaysawareness.org, 1-800-955-2445
- National Association for Education of Young Children – www.naeyc.org, 800-424-2460
- Autism Society of America – www.autism-society.org, 800-328-8476 (each state has individual chapters)
- First Signs – www.firstsigns.org, 978-346-4380
- First Words Project, Florida State University – <http://firstwords.fsu.edu>, 850-488-5780
- Jean Piaget Society – www.piaget.com
- National Institute of Dental and Craniofacial Research – www.nidcr.nih.gov
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Thank you!

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