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Developmental Milestones

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Speech and Phonological Development

The First Year

	Platform	Emerges	Description	Treatment Indicated
1	Phonating	0 months	Expressive speech begins with reflexive vocalizations, such as sneezing, burping, or crying that require exhalation and voicing. Excessive flexor tone restricts lung volume and oral position, which contributes to the QRN.	No voice Weak QRN
2	Prolonging	2 to 3 months	Changes in trunk extension and oral development allow greater volumes of air to prolong sounds (e.g., coo), then the addition of vowels, nasals, and grossly fricated back sounds embed into the coo, resulting in "goo".	Unable to prolong vocalizations during play
	VOCAL PLAY: Raspberries, frication, pitch, intonation, nasals, oral movements, occlusions, and vowel sequences			
3	Expanding	4 to 6 months	Trunk & head stability and mobility enhance vocal changes and differentiation of oral versus nasal sounds. Emergence of pre-babbling vocalizations with CV combinations at the end of the stage.	Limited babbling or use of consonants Reduced upper body strength or control
4	Oscillating	6 months	Head, trunk, hip, & shoulders stability supports sitting, breath support, and rhythmic jaw oscillation for vowel and reduplicated babbling.	Few or no consonants Reduced jaw mobility (up-down)
5	Variegating	8 months	Lip and tongue movements begin during jaw oscillation. Intonation is in place. Able to stand upright, produce most consonants and vowels.	Flat affect Few consonants Reduced lip and tongue movements
6	Words	12 months	First word produced in the form of V, VC, CVC, CVCV.	Reduced repertoire of pre-speech vocalizations

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Speech Sound Norms

		AGE 2	AGE 3	AGE 4	AGE 5	AGE 6
OBSTRUENTS	Stops	P - B - D	T - K - G			
	Fricatives	H	F	V - S - Z - SH	VOICED TH - ZH	VOICELESS TH
	Affricates			CH - J		
SONORANTS	Nasals	M - N	NG			
	Liquids			L - R		
	Glides	W	Y			

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Language Development

Communication Matrix Guide

TYPE	AGE	DESCRIPTION	EXAMPLES
Pre-intentional Behaviors	0-3 months	Expressing the state of the individual, such as crying. The ability to follow gaze starts at 2 months of age.	Joint Attention Gazing Pointing Symbolic play Gestures Vocalizations Babbling
Intentional Behaviors	3-8 months	Behaviors are intentional; but, not intentionally communicative. Observers are left to infer the individual's intent based on behavior (e.g., eye gaze). Shifts eye gaze and follows pointing gestures by 3 months of age.	
Non-conventional Pre-symbolic Communication	6 - 12 months	Non-conventional gestures (e.g., tugging) intended to influence the observer's behavior.	
Conventional Pre-symbolic Communication	12 - 18 months	Conventional gestures (e.g., pointing, nodding,vocal intonation) intended to influence the observer's behavior. Engages in turn-taking games by 12 months.	
Concrete Symbols	12-24 months	Not considered a developmental stage; but, may be used by many individuals (e.g. pat on chair for sit). This may be a bridge to abstract symbols or serve as the only stage easily processed. Understand familiar object names, respond to simple requests	Phonotactic abilities Imitation Vocabulary Multi-word combination Pragmatic functions
Abstract Symbols	12 - 24 months	Printed words and symbols singularly. Uses gestures and vocalizations to request, refuse, and comment. By 18 months, gestures are used to direct attention or control others behaviors. 50 words after 18 months.	
Language	24 months	Combines two to three symbols according to syntactic rules. Able to introduce topics of conversation and repair conversations. Narratives lack organization. 200 words, and 50 verbs.	

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Pronouns

12-26 months	27 – 30 months	31 – 34 months	35 – 40 months	41 – 46 months	47+ months
I It	My Me Mine You	Your She He Yours We	They Us Hers His Them Her	Its Our/ours Him Myself Yourself Their/theirs	Herself Himself Itself Ourselves Yourselves Themselves

Grammar

19 - 28 months	29 - 38 months	39 - 42 months	43 - 46 months	47 - 50 months
Present progressive –ing	Regular plural –s Present progressive –ing without auxiliary Semiauxiliaries Overgeneralization of past tense –ed Possessive –s Present tense auxiliary	Past tense modals “Be” verb + present progressive –ing	Regular past tense –ed Irregular past tense Regular third-person-singular, present tense Articles	Contractible auxiliary Uncontractible copula Uncontractible auxiliary Irregular third person singular Past tense “be” verb

Sensorimotor Development

Early Skills

		HEAD & NECK	SHOULDER GIRDLE	TRUNK	UPPER EXTREMITIES	LOWER EXTREMITIES
0 months	Newborn	Short neck Head turned to one side *Weight bearing surface is the FACE.*	High Elevated	Flexed C-curve	Elbows and forearms flexed on the surface. Elbows positioned below shoulders. Palms facing INWARD. Hands are loose fists near the mouth.	Pelvis higher than head. Hip/femur flexed with external rotated and abducted. Knees flexed. Ankles dorsiflexed.
1 month	4 weeks	Short neck Turns head with ease bilaterally Holds head up for 5 seconds	Less elevated	Mainly flexed Emerging extension *Weight bearing surface is inferior to the upper CHEST.*	Elbows and forearms flexed on the surface. Elbows positioned below shoulders. Palms facing OUTWARD. Hands are loose fists near the mouth.	Hips flexed or neutral. <u>Leg Position A</u>: externally rotated and slightly abducted. <u>Leg Position B</u>: Extended straight back. <u>Leg Position C</u>: Somewhere in between. Knees flexed or extended. Neutral to slight plantar flexed ankle. Toe movements emerging.

		HEAD & NECK	SHOULDER GIRDLE	TRUNK	UPPER EXTREMITIES	LOWER EXTREMITIES
2 months	8 weeks	Full head rotation Lifts head 45 degrees Neck elongated	Less elevated Symmetric More mobile during weight shifts	Trunk moves bilaterally C-curve resolved *Weight bearing surface is the CHEST.*	Elbow and forearm wt bearing to the surface. Hands more open than closed. Elbow less flexed; almost under the shoulder	Hips A: Flexed, externally rotated Hips B: Extended Ankles neutral or degrees of plantarflexion Feet active
3 months	12 weeks	Consistent head control Able to lift head to 90 degrees Holds head up minutes at a time	Engaged in UE weight bearing *Weight bearing surface is the lower chest and upper abdomen..*	Extension notable	Begins extending elbows intermittently Elbow is under the shoulder Weight shifts to one arm to play with the other Hands open and active	Anterior hip opening Hip rotation noted Active pelvis on the surface (up/down with movement) Increased ankle mobility Toes engaged on the surface
4 months	16 weeks	Able to look towards the ceiling in prone	Active	Rounding of the spine Extension *Weight bearing surface is the lower abdomen*	Shifts weight side to side Elbows under shoulders with one extended and one bent while playing toys	LE lengthened in extension Moving out of pelvic block Elongation of anterior hip

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		HEAD & NECK	SHOULDER GIRDLE	TRUNK	UPPER EXTREMITIES	LOWER EXTREMITIES
5 months	20 weeks	Free movement in all planes	Free movement of the shoulder girdle and weight shifting	Emerging mobility in rotation and diagonals Anterior trunk elongated	Pushes up bilaterally Fingers active Elbows in front of shoulders	Feet/toes used to push Ankles mobile in all planes *Weight bearing surface is the lower abdomen and pelvis*
6 months	24 weeks +	Neck elongation is notable	Free movement of the shoulder girdle and weight shifting	Trunk control and mobility in all positions	Holds crawling position +/- rocking movements Open hands most of the time unless holding a toy	Ankles and feet mobile Up on knees +/- assist *Weight bearing surface is the pelvis and knees*

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Sensory

Begins between **22 and 40 weeks PMA**.
Continues through the next **3 to 5** months.

Tactile → Touch

Visual → Sight

Auditory → Hearing

Proprioception → Body awareness in Space

Gustatory → Taste

Vestibular → Balance

Olfactory → Scent

Primitive Reflexes

Oral

Rooting	Suckling	Tongue Protrusion	Tongue Lateralization	Phasic bite	Gag
Adaptive Expect until 3-4 months	Adaptive Expect until 4-6 months	Protective Expect until 4-6 months	Protective Expect until 9-12 months	Protective Expect until 9-12 months	Protective Expect until adulthood

Cranial Nerves

I Olfactory	Sensory	sense of smell perception of taste
V Trigeminal	Mixed	*Sensory* cheeks, nose, lips, teeth, skin over the mandible *Motor*

		muscles of mastication rooting, sucking, initiation of swallow response
VII Facial	Mixed	*Sensory* taste on anterior ⅔ of the tongue (sweet, salty, sour) bolus formation *Motor* facial expression, salivary glands
IX Glossopharyngeal	Mixed	*Sensory* taste on posterior ⅓ of the tongue (bitter) *Motor* swallowing & salivary glands
X Vagus	Mixed	*Sensory* Pharynx, larynx, esophagus, visceral organs *Somatic Motor* Muscles of pharynx and larynx *Autonomic Fibers* Heart, smooth muscles, glands to alter gastric mobility, heart rate, respiration, and blood pressure
XII Hypoglossal	Motor	Contraction of the muscles of the tongue Bolus prep, sucking, and swallowing

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Feeding Development

0 to 3 months	Gag on front ⅓ of the tongue Tongue cupping Sucking pads, lips, tongue, and palate synchronized	**Physiological Flexion** Fisted hands Suckles breast or bottle
4 to 6 months	Munch chew activates More active suck Gag reflex is moving back/slightly sensitive A-P movements of the tongue Tongue thrust fades Discriminative mouthing begins	Head Control, Seated with Arm Support & **Rolling** Hands to mouth Mouths toys
7 to 9 months	Cup drinking (stabilizes with jaw): 1-3 sips Some lip-jaw dissociation Rhythmic / Munch-chew	**Sitting unsupported** Finger feeding Utensil play
10 to 12 months	Cleans lower lip with teeth Upper lip moves down and forward Developing diagonal/rotary chew	**Crawling & Pull to stand** Refined Pincer Grasp Bites soft cookie
13 to 15 months	Developing jaw - lip - tongue dissociation Able to maintain continuous cup drinking	Walking unassisted Open cup & straw cup Bites hard cookie Scoops food with a spoon (messy)
16 to 18 months	Controlled bite without associated head movement	
19 to 24 months	Uses tongue to clean lips Continuous straw drinking Chews with lips closed Rotary chew	Running Refined use of utensils Chews meat competently
25 to 36 months	Circular rotary chew (adult-like chew) Mature swallow pattern Jaw grading for biting and chewing	Jumps Wipes face with napkin, stabs food with fork, self-fed by spoon without spillage

Prerequisite Feeding Skills

Breast & Bottle-feeding

- ➔ Suck-swallow-breathe coordination
- ➔ Tongue bowling to support nipple
- ➔ Oral structures functioning as single unit

Spoon-feeding

- ➔ Jaw stability & grading
- ➔ Upper lip movements down & forward
- ➔ Lower lip rolls for stabilizing the spoon
- ➔ Tongue retraction to facilitate oral transport
- ➔ Contraction of the lateral borders of the tongue
- ➔ Contraction of the cheeks for intraoral pressure
- ➔ Dissociated tongue tip elevation

Mastication of Solids

- ➔ Jaw stability
- ➔ Jaw grading for bite
- ➔ Tongue mobility for oral transport (tongue tip & lateral margins)
- ➔ Contraction of cheeks
- ➔ Lip closure

Cup drinking

- ➔ Jaw stability
- ➔ Cheek contraction
- ➔ Lip closure
    - ◆ Upper lip = down + forward
    - ◆ Lower lip = stabilizes cup

Straw drinking

- ➔ Lip rounding
- ➔ Cheek contraction
- ➔ Jaw stability
- ➔ Contraction of lateral borders for retraction
- ➔ Dissociation of jaw-lip-tongue
- ➔ Tongue retraction with dissociated tongue tip movement

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GLOSSARY

1. **Co-regulation**: The symbiotic nature of an interaction rather than the child's regulation in isolation; how people regulate each other's behavior through a mutual exchange of information. This involves continuous reading of a partner's affect cues (e.g., facial expression, body positioning, tone of voice, etc.) and adjusting our own actions and intentions in response to the partner. Young children rely heavily on caregivers to co-regulate that it can be attributed to the gradual development of the prefrontal cortex.
2. **Dissociation**: separation of movement in order to complete a controlled task, which is secondary to stability
3. **Fixing**: an abnormal posture used to compensate for reduced stability, dissociation, and/or grading
4. **Grading**: Appropriately matching movements to the controlled task
5. **Infant Speech Perception**: intonation patterns, voiced affect, and differentiated voices. If an infant is not perceiving speech, then an audiological examination is warranted. This is before recognition of the meaning of speech.
6. **Infant Speech Production**: Production of speech—like Vocalizations (e.g., crying, cooing, babbling)
7. **Meta-phonology:** The more general features of phonologies and the background parameters upon which languages build individual concrete phonological systems during the first year of life. This occurs before the first words are produced within the first 12 months of life.
8. **Phonology**: The study of the sound systems of language and culture.
9. **Phonotactic Rules:** The rules of a language that dictates how consonants can be combined for acceptable segments (e.g., /qu/, /r/ blends, etc).
10. **Quasi-resonant nuclei (QRN):** Syllabic nasal consonant or high, mid, unrounded nasalized vowel; newborn vocalizations it can sound.
11. **Reduplicated Babbling**: Also known as canonical babbling is characterized by identical sequences of syllables (i.e., voiced nasals, glides, stops) produced with rhythmic timing properties.
12. **Reflexive Communication**: No intent to communicate with others in early infancy; however, infants learn to read intent from others. In return, they will develop the ability to vocalize or gesture in order to express emotion
13. **Stability**: the ability to maintain the center of mass over the base of support
14. **Tone**: the amount of contraction in a muscle
15. **Vowel Babbling**: Early, weak jaw oscillations resulting in vowel sequences

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