

Developmental Scale for Children with Down Syndrome

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Social and Communication Issues

One of the most frequently asked questions by parents of children with Down syndrome is how their child is doing compared to other children with Down syndrome? They are curious as to whether their child is keeping up with typically developing children, but realize that it is more important to judge their child with other children with a similar syndrome. To assist in the answer to this question, I have developed a *Developmental Scale for Children with Down syndrome*. The *Developmental Scale* provides the best information I know about young children with Down syndrome seen in our clinic as well as what we have read in the literature. It also provides what typically developing children demonstrate during infancy, toddler, and preschool ages. The *Developmental Scale* has not been scrutinized by colleagues or parents, and, therefore, provides only our best judgment of what can be expected.

It is important to point out that all children, even typically developing children, do not look alike. Each child is different and progresses at his or her own rate: each presents with particular strengths and demonstrates inherited weaknesses. This, of course, is the same for children with Down syndrome. It is hard to just present a picture of what a child with Down syndrome looks like at a particular age. A lot depends upon the child's medical and health issues. For instance, has the child had a problem with hearing, especially middle ear pathology? If so, this can slow down or affect the development of speech production and

expressive language. Does the child demonstrate related difficulties such as autism? This clearly can affect the social interaction and rate of language acquisition. Does the child have a severe oral-motor problem? Again, this problem can delay speech production, can affect the quality of spoken speech, and can alter expressive language skills.

It is important, therefore, for a parent to understand these issues when seeking information about what to for their child and what services are available. How a speech-language pathologist helps a child is clearly related to these and other social, cognitive, emotional, and health issues.

There are several publications available to help parents better understand these issues. It is not the intent to delve deeply into these areas, but instead to present the communicative skills of young children with Down syndrome.

Developmental Scale for Children with Down Syndrome

The *Developmental Scale for Children with Down Syndrome* begins at Birth and increases in 4 months steps until age 24 months, at this point it progresses in 12-month steps. The Scale ends when the child is just turning 6 years of age (or 71 months). The reason for the difference in the early ages compared to the later ages is that younger children, even children with Down syndrome, progress more rapidly in the younger ages than they do in the older ages. This is

especially true for motor skills as well as language skills.

Birth to 5 months

During the first stage, Birth to 5 months, a parent can expect their child to react to a sound sometimes and not at other times. The reason for this is that the child may be congested with a middle ear fluid, or just may not be attending as readily to his environment. Inconsistent responses to sounds are a common occurrence at this age.

Because of this, the child with Down syndrome may or may not turn his/her head toward the sound source and may or may not be watching the parents' face when they talk. It is strongly suggested that a child should be seen for an audiologic evaluation since it is well known that middle ear problems are common and children with Down syndrome are more often prone to have a sensori-neural hearing loss. It is, therefore, important to have the child's hearing checked early.

Children with Down syndrome seldom vocalize during the first 5 months of life, which often concerns parents. This concerns us too, but as long as the child's hearing has been checked and the child does not demonstrate oral-motor problems, it should not be too alarming. Just keep talking to your child and read books together on a daily basis. Reading is an excellent teaching tool for speech, language, and cognitive development. We find many young children, even 4 – 5 months of age, love to be read too.

6 – 10 months

The children during the second stage, or 6-11 months, begin to watch their parents' face when being talk too and localize where a sound has come from, especially when the sound is sudden or unexpected. These children notice their parents' reprimands, such as, saying "no-no";

but, understanding of words is not really expected yet.

Most children with Down syndrome do not begin to babble or "talk to themselves" until around 10 months of age. Babbling is an important indicator as to how well the child is doing and whether he or she will be a talker later on, it helps to determine whether a child will or will not have trouble with spoken speech. Just because a child does not babble does not necessarily mean he or she will not talk later on. It may, however, indicate that more oral-stimulation and speech-stimulation is needed to assist the child in developing the needed movements for later speech productions.

11 – 15 months

The children at this age are beginning to show signs of language understanding. Parental reports of vocabulary development indicate that these children demonstrate an understanding of about 20 words and try to communicate by looking at the parent, gesturing, or moving as if to say something. These children want to communicate but the motor speech area in the brain is not developed sufficiently to allow for it. Thus, we encourage the use of manual signs to allow the children to express his/her wants and needs. Oral-motor skills have improved so that now they can chew semi-solid foods, blow bubbles, and can stand up if allowed to hold onto something. When this occurs, it is a strong indicator that spoken words are about to appear.

16 – 20 months

Comprehension of words, during this stage, has grown to 40-60 words. The child now should be chewing solid foods, sucking through a straw, standing, and walking. Children now like to listen to simple stories and are beginning to point to objects and pictures in the story. These children are more interested in producing sounds and attempt to repeat sounds, especially sounds of animals. However, there are still no intelligible spoken words yet. Feelings are

beginning to be displayed more openly, such as showing displeasure when a toy is removed or throwing a toy on the floor when it will not work. The child, at this stage, has a clear choice of favorite toys and seeks or requests them, often with gestures.

21 – 25 months

This stage is marked by the obvious comprehension of language. The child has a wide understanding of words, including nouns, verbs, adjectives, and some prepositions. He or she is a social person: one who wants to interact with others and be a part of family “events.” The child wants to show others a favorite toy or retrieve an object on request: the child watches others carefully, by holding good eye contact, waiting, and responding when talked too, or repeating an activity when asked to do something again. Unfortunately, many children (i.e., approximately 40%) demonstrate signs of poor oral motor skills. These poor oral motor skills are quite obvious at this stage and can have an effect on the child’s eating, chewing and swallowing. They also can have an effect on spoken words.

Typically, most children with Down syndrome, at this stage, still do not produce spoken words.

26 – 30 months

The child of 26-30 months is now ready to begin to speak. This is when the child says his/her own name, labels animals, requests “bottle” or “juice”, and calls for “mommy” and “daddy.” During this stage, the child should have approximately 10-20 intelligible words. Comprehension also has grown to where the child understands as many as 150-175 different words. The child points to his/her toes, eyes, and nose, and follows a simple one step command, such as, “put the block on the chair,” or “put the book away, please.” The child is also interested in listening to simple stories, either those being read or those being told by

someone else, especially about the child’s adventures for that day.

The child with an oral motor problem, however, is less productive in spoken words. He or she may attempt to speak several words, but few individuals, or only a family member, can understand them. There may be one or two words that others understand clearly.

31 – 35 months

Children at this stage are more talkative and typically produce 30–80 intelligible words, combined with other non-intelligible words. Parents often report that the child, at this stage, is trying to say phrases and sentences, but no really understand them. Comprehension has now grown to where the child understands as many as 250 words. These children listen to much longer stories and attend to stories that are 15 – 20 minutes long. Some spoken two-word combinations are heard, and the child may ask a question by raising his/her pitch at the end of the phrase. The word “why” is often heard.

Speech sounds, produced during this stage, are typically those that develop early: p, m, n, w, h.; however, they are often omitted at the ends of words. Since these children have a weak auditory memory and demonstrate poor sound-to-symbol associations, this could account for the poor speech production.

Children with oral motor impairments tend to produce words with just vowels and produce more sounds that are formed toward the back of oral cavity, such as, k and g. They have less ability to use their tongue tip or close their lips when producing sounds. It is for this reason that intelligibility is so poor for this group of children.

36 – 40 months

During this stage, the children become conversationalists: they engage in short dialogues with others and often use 2 word

sentences. They actually produce up to 150 intelligible words, although there still may be many sound errors. Typically, these sound errors include substitutions (i.e., t for s, t for th, p for f) or distortions, especially fricatives (i.e., f, v, s, z, sh, ch, zh). These fricatives distortions are not produced with a high clear frequency sound, but instead are produced more like a “slushy” sound.

Children now begin to ask simple questions, recognize nearly all of the primary colors, use both verbs and adjectives in their sentences, and use some morphemes like plurals (dog, dogs), irregular past tense (went), and actions (-ing, running). Pronoun use includes I and me in the subject position; as well as, you, mine, and your. Sometimes the child uses the pronouns he and she appropriately, while other times they are confused with the gender.

Children, with oral motor impairments, produce many omitted sounds. The omitted sounds occur in the initial position (“-ar” for “car”), in the medial position (“bo-el” for “bottle”) as well as the final position (“bi-” for “big”). However, their comprehension is similar to other children with Down syndrome, i.e., approximately 250 – words: it is the production of speech that clearly differentiates the two groups.

41 – 59 months

At this stage of development, children with Down syndrome now have a comprehension vocabulary that can reach 900 words. They are easily producing oral words, with 2-3 word sentences, and retelling short stories. They are beginning to recognize environmental symbols like stop signs, McDonald’s arches, and open. They may know most letters of the alphabet and have a sight word reading vocabulary of 15-20 words.

60 – 71 months

The highest stage of development for the scale is when the child reaches about 5 years old.

Here the child is producing longer sentences that are usually 3-4 words long but can be some 5-6 word phrases. Their comprehension vocabulary can exceed 10,000 words. They may be producing 400 or more intelligible words, but few signs. At this age, usually children with Down syndrome drop off and do not use their signs any more. They can count 10 objects, know their primary colors, use both verbs and adjectives in their sentences, refer to them self with a pronoun form, and use regular plural verb forms. They are now reading short dialogues in stories and will have some word attack skills.

Comparison with Typical Children

It is obvious that children with Down syndrome do not keep up with the rate of communication skills of typically developing children, although there are some noticeable similarities between the groups. For one thing, at the younger stages (i.e., Birth to months, 6 – 10 months, 11 – 15 months, and 16-20 months), the children with Down syndrome seem to be only around 6 months behind their typically developing peers. An exception to this is the number of spoken words, where the children with Down syndrome tend to lag as much as a year behind. Also a dissimilarity exists in the rate of vocabulary comprehension, where the children with Down syndrome appear to increase their vocabulary comprehension from stage to stage, but just not as fast as their typically developing peers. There are, however, quite a few similarities in gestures, socialization, and playing with toys. These areas seem to lag only slightly behind.

At the later stages, beginning at around 26 months of age, the gap between the children with Down syndrome and the typically developing peers widens. For instance, comprehension and spoken words increase, but even at the 60 – 71 month stage, these skills are comparable only to the typically developing children at 31-35 months of age. Older children with Down syndrome do have concepts and social exchanges that are more like the typically

developing at 36-40 months of age. Thus, some developmental skills appear to be above their measurable vocabulary and spoken language skills

Conclusion

It is hoped that the *Developmental Scale* has provided clarification for where children with Down syndrome fit compared to typically developing peers. It is hoped that it sheds some light on how your individual child is doing. The value of early intervention, oral motor training, speech stimulation, joint-book reading, and language training has not been discussed. It is important to realize that many children with

Down syndrome are fully included in regular education classrooms. These children started off much different from their typically developing peers, but through strong parent advocacy and professional assistance, they made outstanding gains. Your child can do this too.

It is my expectation that in the next few years the *Developmental Scale* will be outdated: the stages will need to be altered because early and appropriate intervention has made a difference among children with Down syndrome. Until then, use the chart to determine your child's progress and use it to help plan for the next stage.

Scoring

The *Developmental Scale for Children with Down Syndrome* is scored either with a parent's input or by directly observing the child's behavior. Often times, the actual number of spoken words and oral words are scored by including test results from other tools, like the *MacArthur's Scale for Infants and Toddlers*. The author has normative data on children with Down syndrome acquiring their first oral and sign words and number of word comprehended on the *MacArthur*. To score the *Developmental Scale for Children with Down syndrome* the examiner should merely place a + sign for all behaviors observed or reported that are frequently present. A score of 0 should be marked for all behaviors that are not present. A mark of \pm is provided for all behaviors that occur but not frequently, or in transition.

Only the + scores are calculated per stage. If a child has all but one + score at a particular age, the child is considered to be at that age. If the child passes with a + mark for half of the items at any stage, the examiner should take the youngest age and add two years to determine the child developmental age. For example, if the child has the following scores at the 16-20 month

level, would be considered to be at 18 months of age.

- _+_Identifies by pointing
- _+_Sucks threw a straw
- _+_Chews solid foods
- _0_Walks (at around 18 months)
- _+_Seeks toy for appropriate play
- _0_Listens to simple stories being read
(single lines per page)
- _+_Indicates displeasure when toy is removed
- _0_Comprehends 40-60 words
- _0_Recognizes family names
- _+_Gestures and vocalizes needs
- _+_Points to objects and pictures
- _0_Tries to repeat sounds
- _0_1-2 oral words

DS--CDS

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Name: _____ Test Date Year ____ Month ____ Day ____

Guardian's Name _____ Birth Date Year ____ Month ____ Day ____

Examiner _____ Chronological Age Months ____

Examiner's title _____ Gender Boy ____ Girl ____

Address _____ Zip _____

Telephone: _____

Highest Age Scale:

Typical Developing Child: _____

Child with Down Syndrome: _____



Developmental Scale for Children with Down Syndrome

Typical Developing Children

Children with Down syndrome

Birth to 5 months

<ul style="list-style-type: none"> — Reacts to sound — Turns head toward sound source — Watches face when parent speaks — Vocalizes (coos, laughs, giggles, cries, fusses) — Differentiated cry for different needs — Makes noise when talked too — Begins to blow bubbles — Fixes eyes on spoon or bottle — Anticipates feeding when sees bottle — Laughs when playing with toy — Smiles at parent — Localizes sound source/speaker 	<ul style="list-style-type: none"> — Reacts to sound occasionally — Does not necessarily turn head toward sound source — Does not necessarily watch face when parent speaks — Needs audiologic evaluation — Minimal vocalization (cries, fusses) — Ceases sounds when talked too
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6 – 10 months

<ul style="list-style-type: none"> — Understands some verbal commands (“no-no”, “sh”-quiet) — Understands gestures (“come here”, “look”) — Babbles (says, “ba-ba-ba”, “ma-ma”) — Waves “bye” — Tries to communicate by action or gestures — Gestures and vocalizes to protest — Points to objects and pictures — Tries to repeat sounds — Comprehends 10-15 words — Recognized own name — Extends arms to be picked up — Sucks threw a straw — Sits unsupported — Stands holding on — Seeks toys for appropriate play 	<ul style="list-style-type: none"> — Comprehends “no-no” — Does not babble until 10-12 months — Watches face when someone speaks — Smiles at parent — Localizes sound source/speaker — Comprehends less than 2-4 words — No oral words — No signs — Engages with parent
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Typical Developing Children

Children with Down syndrome

11 – 15 months

<ul style="list-style-type: none"> — Produces less than 10 words — Produces animal sounds — Comprehends 50 words — Recognizes family names — Listens to simple stories — Responds to yes/no questions — Gives toy or object on request — Indicates displeasure when toy is remove — Initiates vocalizations to others — Imitates familiar sounds and actions — Brings object to show others — Feeds others — Imitates patting a doll — Follows one step commands — Walks at 12 months 	<ul style="list-style-type: none"> — Comprehends 20 words — Able to blow bubbles — Tries to communicate by action or gestures — Stands holding on (at around 12 months) — Chews semi-solid foods — Understands some verbal commands (“no-no”, “sh” –quiet) — Understands gestures (‘come here’, “look”) — Waves “bye” — Limited use of manual signs — First oral word
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16-20 months

<ul style="list-style-type: none"> — Produces 10-15 words — Produces familiar objects — Says own name on request — Verbalizes “no” — Comprehends 50-100 words — Asks questions by raising intonation at end of phrase — Asks for “more.” — Points to toes, eyes, and nose — Follows simple one step commands — Acknowledges others by eye contact, responding, or repeating 	<ul style="list-style-type: none"> — Identifies by pointing — Sucks threw a straw — Chews solid foods — Walks (at around 18 months) — Seeks toy for appropriate play — Listens to simple stories being read (single lines per page) — Indicates displeasure when toy is removed — Comprehends 40-60 words — Recognizes family names — Gestures and vocalizes needs — Points to objects and pictures — Tries to repeat sounds — 1-2 oral words — 1-2 signs
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Typical Developing Children

Children with Down syndrome

21 – 25 months

<ul style="list-style-type: none">— Comprehends 200-300 words— Produces 50 intelligible words— May omit final consonants— Beginning of two word phrases— Begins to use some verbs and adjectives— Refers to self with pronoun— Answers “where” and “what” questions— Listens to longer stories— Carries out two stage commands	<ul style="list-style-type: none">— Comprehends 100-125 words— 3-6 oral words— 10-15 signs— Feeds others— Imitates patting a doll— Follows one step command— Gives toy or object on request— Initiates vocalizations to others— Imitates familiar sounds and actions— Produces animal sounds— Brings object to show others— Acknowledges others by eye contact, responding, or repeating
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26-30 months

<ul style="list-style-type: none">— Comprehends 300-500 words— Produces 50 intelligible words— Matches colors— Developed routines for bedtime— Names one or two colors— Uses negatives— Shares toys— Refers to self with pronoun— Use some two word sentences— Refers to self by name— Understands concept of first	<ul style="list-style-type: none">— Comprehends 150-175 words— Produces first 10 –20 oral words— Uses 20-25 signs— Says own name on request— Verbalizes “no”— Points to toes, eyes, and nose— Follows simple one step commands— Listens to simple stories (2-3 lines per page)— Responds to yes/no questions— Gives toy or object on request
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Typical Developing Children

Children with Down syndrome

31 - 35 months

<ul style="list-style-type: none"> — Comprehends 500-900 words — Understands several action words — Produces 100 words — Consonants mastered: p, m, n, w, h — Imitates three digit numbers — Uses some prepositions — Some pronouns are emerging — Uses first and last name — Counts to five — Interested in how things work — Knows parts of objects 	<ul style="list-style-type: none"> — Comprehends 180-250 words — Produces 30-80 intelligible words — Produces 13-20 signs (starts to loose many signs) — Produces most familiar objects — Omits many final consonants — Responds to simple questions — Listens to longer stories (e.g., Good Night Moon.) — Carries out one stage commands — Understands concept of first
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36 – 40 months

<ul style="list-style-type: none"> — Consonants mastered: b, d, k, g, f, y — Comprehends 1,200 words — Produces 200-500 intelligible words — Listens to 20 minutes stories — Matches colors — Knows in/on/under; big/little — Answers “who, why, where, how many” questions — Asks simple questions (What’s that?) — Uses “a” and “an in utterances — Uses regular plurals (dog, dogs) — Repeats sentence of six or seven syllables — Engages in short dialogues — Uses language in imaginative ways — Requests for clarifications — Narratives are heaps: collection of unrelated ideas 	<ul style="list-style-type: none"> — Comprehends 250-400 words — Produces 90-150 intelligible words — Produces 10-15 signs — Beginning of two word utterances — Names several colors — Counts 3 objects — Selects own story — Carries out two stage commands — Asks questions by raising intonation at end of phrase — Attends to longer stories
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Typical Developing Children

Children with Down syndrome

41-59 months	
<ul style="list-style-type: none"> — Comprehends 2,500 words — Produces 1,500 –2,000 words — Very intelligible speech — Recognizes most primary colors — Counts 10 objects — Repeats four digits — Uses “what do...does” questions — Classifies according shape, color — Asks meaning of words — Tells long stories — Uses terms this, that, here, there — Narratives: unfocused -sequence of events but no central character — Recognized icon symbols like McDonald’s arches, stop sign 	<ul style="list-style-type: none"> — Comprehends 500-900 words — Produces 200-300 words — Limited sound-symbol association — Repeats three digits — Knows in/on/under; big/little — Uses negatives — Tells short stories — Recognizes icon symbols like McDonald’s arches, stop signs — Knows most letters of the alphabet — Reads 15-20 sight words — Knows first and last

60 – 71 months	
<ul style="list-style-type: none"> — Consonants mastered: t, ing, r, l — Comprehends 13,000 words — Understands opposites — Understands more/less, some/many, several/few, most/least/ before/after, now/later — Knows half and whole — Counts 12 – 20 objects — Names letters of alphabet — Knows first, second, third — Names days of week — Uses all pronouns — Uses comparatives (bigger) and superlatives (biggest) — Uses 6 – 7 word sentences — Narratives: focused – central character with logical sequence but ending is unclear — Reads 15 – 20 words 	<ul style="list-style-type: none"> — Uses 3-4 word sentences — Produces 100-400 intelligible words — Comprehends 500-900 words — Produces substitutions and distortions of most fricatives (f, v, s, z, sh, ch,zh) — Uses “a” and “an” in sentences — Recognized most primary colors — Counts 10 objects — Uses some verbs and adjectives — Refers to self with pronoun — Uses regular plurals (dog, dogs) — Uses some pronouns — Asks simple questions — Engages in short dialogues — Reads short stories — Has sound phonics with some word-attach skills