

## Speech and Language Abilities of Children with Down Syndrome: Practical Strategies

DSAQ  
Endless Possibilities  
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## Presentation Overview

- Strengths and Weaknesses
- Typical development in Down syndrome
- Why? Why? Why?
- Practical Strategies : First Words, Vocabulary, Grammar, Speech, Key Word Sign, AAC and Reading
- What to focus on and when
- Concerns about progress



## Strengths & Weaknesses

Successful Communicator

Effective Intervention

- Grammar
- Clear speech
- Verbal Working Memory

**Weaknesses**

Lifelong Impacts

- Social Inclusion
- Intellectual abilities



Build On

**Strengths**

- Great communicators
- Keen to interact
- Rely on gesture for longer
- Communicate for a range of purposes
- Visual Memory



## What Happens in Typical Development?

### COMPREHENSION FIRST

**50 WORDS** → Two word combinations

**300 WORDS** → Early Grammar  
-ing, plural s, in, on, possessive s

Later Grammar  
a, the, I, he, she, is, are, can, have, -ed, and, then, because



*Does the brain have a timetable?  
Yes!  
Birth to 6-8 years of age*



## Typical Communication Milestones for Children with Down syndrome

Age	Interaction	Vocabulary	Grammar	Speech
0-12 months	Crying Eye contact Smiling Listening/ Looking Vocalising Social turn-taking	Understanding words		Babble
1-2 years	Joint Attention Body Language Communicate needs & wants through natural gestures & early words	Begins to sign Begins to say words First 10 words		Beginning sounds and sound combinations
2-3 years	Starting conversations – pointing & requesting	First 30 -50 words Understanding ahead of talking	Two words together	Unclear words

Buckley, S and Bird, G (2012) Speech and Language Development for infants with Down Syndrome DSEI



## Typical Communication Milestones for Children with Down syndrome

Age	Interaction	Vocabulary	Grammar	Speech
3-5 years	Repairing conversations when not understood – tries again	First 100 words Increase in rate of word learning By 5 years, 300 words	2-3 word combinations Early grammar begins	Improving accuracy
5-7 years	Learning to tell short stories	Continued acceleration in vocabulary . At 7 years about 400 words	"Telegraphic" sentences – using key words only Increasingly correct short sentences	Improving accuracy

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### Typical Communication Milestones for Children with Down syndrome

Age	Interaction	Vocabulary	Grammar	Speech
7-16 years	<ul style="list-style-type: none"> <li>Taking part in longer conversations</li> <li>Requesting clarification with 'what' and 'where' questions</li> <li>Telling stories</li> <li>Developing social language skills and small talk</li> <li>Takes into account listener knowledge and can match appropriate amounts of information to person and situations</li> <li>Longer explanations and instructions</li> <li>Telling jokes</li> <li>Retelling experiences</li> </ul>	More new words learned each year	Slow and steady growth in longer and more complex sentences with joining words such as and, then and because  Errors in grammar are common  Grammar often learned and used in reading and writing and then later in speaking	Speech becomes slowly and steadily clearer  Improvement in clusters (e.g. sp, st, tr)  Speech rate and speech clarity continue to improve, influenced by reading

Buckley, S and Bird, G (2012) Speech and Language Development for infants with Down Syndrome DSEI



- ### Why?
- Cognitive delays
  - Hearing loss
    - High risk mild-moderate conductive hearing loss and severe-profound sensori-neural hearing loss
  - Physical differences
    - Anatomical differences in facial structures
    - Low tone
    - Over or under sensitive reactions to touch around the mouth
  - Learning interaction and opportunities
- 

### Why? Working Memory

- Mental workspace temporarily holding and manipulating verbal and visual/spatial information (seconds)
- ↑ Visual-spatial short term memory better than
- ↓ Verbal short term memory




- ### Why? Working Memory
- Shorter verbal short term memory span
  - Slow increase in memory span over time
  - Information fades quicker and is poorer quality
  - Lack of rehearsal strategies
  - Working memory easily overloaded with multiple tasks
- Unique effects on speech, speed of vocabulary learning, grammar and reading*
- 

### Why? Multiple Causes that Interact

Small, narrow upper jaw	Tongue Thrust	Feeding difficulties	Low tone
"Glue ear"			Cognitive Abilities
Hearing Loss			Learning Environment & Interactions
Upper Respiratory Infections			
Mouth Breathing & Open Mouth			
Sleep Apnea		Working Memory	
High Arched Palate			




- ### Why? Other Complications
- 10-15% of children make slower progress
    - Autism Spectrum Disorder
    - Additional Brain Injuries
    - Additional Medical Complications
- 

## Practical Strategies



- First Words
- Vocabulary
- Grammar
- Speech
- Key Word Sign + Augmentative & Alternative Communication (AAC)
- Reading



## Teaching First Words

Methodically monitor and provide opportunities for targeted vocabulary that includes words:

- the child can understand but not express
- typically in the first 50 words
- that are motivating
- that have a sound that the child can already say
- that are interactive and used frequently in the day
- that can be shown through objects or signs

- Use Key Word Sign as a bridge to first words



## Building Vocabulary

- Teach a target vocabulary (variety of words)
- Use natural opportunities and books
- Matching, selecting and naming activities
- Focus on words for comprehension and production
- Need structured help to learn through modelling and imitation
- Use AAC (often signing) to support



## Building Vocabulary

- Read
- Play
- Experience
- Keep a record of words learnt
- Checklists from Down Syndrome <https://store.dseusa.org/collectio>
- See and Learn Kits & Apps




## Teaching Grammar

- Direct instruction requiring imitation (say ...) more effective than modelling alone
- Use imitation with expansion
- Use fill in the blanks cues
- Use "Pacing Board" (visual and tactile cue)
- Use sentences in everyday routines
- Teach small function words and word endings
- Train with reading (even for non-readers)
- Use conversation diaries (pictures & written sentences)
- Use Key Word Signing and other AAC
- Link with speech goals especially for final consonants and/or syllable words



## Grammar : What to teach Small Function words & Endings

Brown's Stage	Age in Months	Average Length of sentence	Morphological Structure	Examples
Stage II	27-30	2.25	Present progressive (-ing)	It <b>going</b>
			in	in <b>box</b>
			on	on <b>box</b>
Stage III	31-34	2.75	s-plurals (regular plurals)	my <b>cars</b>
			Irregular past tense	me <b>fell</b> down
			's possessive	man's <b>book</b>
Stage IV	35-40	3.5	Uncontractible copula (full form - verb to be)	<b>Is</b> it Alison? <b>Yes, it is.</b> <b>Was</b> it Alison? <b>Yes, it was.</b>
			Articles (a and the)	<b>A</b> ball on the <b>book</b> .
			Regular past tense -ed	She <b>jumped</b> .
Stage V	41-46+	4.0	Third person regular, present tense -s	The puppy <b>chews</b> it.
			Third person irregular	She <b>does</b> . He <b>has</b> .
Uncontractible auxiliary (full form of the verb 'to be' when helping a verb - is, are, am etc)				<b>Are</b> they swimming? She <b>is</b> laughing
Contractible copula & auxiliary (shortened form of the verb 'to be' - is, 'm for am 're for are etc)				<b>She's</b> ready. <b>I'm</b> opening it up. <b>We're</b> hiding.



## Grammar : What to teach Word Order & Sentences

- Verbs (action words)
- Develop the ends of sentences and start with the verb (Verb + Place & Verb + Object)
- Pattern the basics of English
  - Subject + Verb + Object - The boy + is eating + the apple
  - Subject + Verb + Location - The boy + jumped + on the bed
  - Subject + Verb + Object + Location - He put the apple on the bed
- Include pronouns – I, you, he, she, they we
- Develop Negation – not ... isn't ... can't ... hasn't
- Develop Question forms
- Add Conjunctions (joining words) and, then, because



## Resources to Help: Grammar Apps

- Key Word Kids
- PicSentenceHD
- Fun with Verbs
- iPractice Verbs
- Rainbow sentences
- Spingo Pronouns
- inTense Pro
- Sentence workout
- Syntax City
- Tense Builder
- Kids Vocabulary, Grammar & Language Learning Games
- Key Verbs with Steffy & James
- Sentence Ninja
- iSequence
- Sequences for Autism
- Speech with Milo: Sequencing
- Clicker sentences
- Clicker connect
- AAC apps(Proloquo2go)
- Fun Deck
- Sentence Builder



## Resources to Help: Grammar

- Sentence Builder flip book [www.smartkids.com.au](http://www.smartkids.com.au)
- Silly Sentences
- <https://www.superduperinc.com/>
- See and Learn <https://www.seeandlearn.org/en-us/language-and-reading/>
- Sequence cards
- Use technology & AAC: Word prediction & Text to speech



## Extending Grammar into Narratives: The importance of story-telling

- Social connection
- Conversational skills
- Memory
- Making sense of life events
- Diarising your life
- Written Expression
- Reading Comprehension



## Speech

- Language takes priority in intervention  
*Having something to say is more important than how you say it*
- *Being able to comprehend what the speaker has to say involves more than just speech*
  - Language skills (vocabulary, sentences & understanding)
  - Motor control skills
  - Voice control
  - Speech of talking
  - Resonance
  - Pragmatic skills



## Unclear Speech: How to help

- Be patient.
- Give the child time to communicate their message.
- Find a time and place for the child to talk to you without interruptions or a lot of background noise.
- Listen carefully to what the child says rather than how they say it.
- Know the child's speech error patterns and sounds they have trouble with.
- Get to know the way they say particular words.
- Know the child's interests and favourite conversation topics.
- Use a conversation diary between home and school.
- Use the child's peers



### Unclear Speech: How to help

- Encourage the use of other strategies if communication breaks down. Don't just keep asking them to repeat a word over and over again. Try:
  - Can you show me?
  - Can you point to it?
  - Can you use your body (language)?
  - Can you find a picture in a book?
  - Ask yes/no rather than open ended questions.
  - Ask another peer for help.
- Respect the child's need for AAC & use visual support aids to help the child (e.g. signing or communication boards).



### Unclear speech: How to help

- Try not to talk for the child but do paraphrase what the child has said to check that you have interpreted their speech correctly.
- If communication fails:
  - acknowledge the child's feelings of frustration,
  - let them know that what they have said is important
  - take the onus on yourself,



### Types of Speech Sound Disorders

- Articulation disorder (inability to pronounce a sound)
- Dysarthria (imprecise speech)
- Phonological Delay (delayed error patterns)
  - Final consonant deletion
  - Cluster reduction
- Phonological Disorder (consistently applied atypical error patterns)
- Inconsistent speech sound disorder (variable word attempts)
- *Childhood Apraxia of speech (difficulties with motor planning and programming)*



### Differential diagnosis directs appropriate treatment

- Working on one sound at a time :
  - Articulation Disorders
- Core vocabulary therapy works for:
  - Inconsistent speech disorders
- Working across multiple sounds that use the same error pattern and contrasting the meaning difference in the errors works for:
  - Phonological disorders (delay and disorder)
- Intensively shaping the motor movement patterns for sounds in words at multiple levels works for:
  - Childhood apraxia of speech



### Making Speech Clear

- Parental involvement is key to intensity (home practice)
- Build imitation skills and confidence to speak in sounds
- Wait until foundation language skills are developed
- Introduce sound cards from an early age
  - See and Learn Kits & App
- Link sound cards to letters (3-5 years)
- Use hand cues (e.g. Cued Articulation)
- Use touch cues (e.g. PROMPT)
- Do phonological awareness tasks (isolate, segment, blend and manipulate sounds in words)



### What doesn't help Speech?

- ☒ No evidence for tongue reduction surgery
- ☒ No evidence for listening therapies
  - ☒ Forebrain / The Listening Program / Therapeutic Listening Program / The Tomatis Method
- ☒ No evidence for Gemini video modelling\*
- ☒ No evidence for non-speech isolated exercises of the lips and tongue  
(need to work on speech to improve speech)



### Use of Key Word Sign (KWS)

- Use of gesture is a strength
- Gestures are easy to understand
- Always sign and speak together
- Aids comprehension
- Compensates for poor attention, listening and memory skills
- Facilitates more effective language learning
- As a bridge to talking
- Reduces frustration
- Helps when speech is unclear
- Tends to fade off as language develops



### Use of Key Word Sign (KWS)

- Parents often worry that signing will replace speech or the child will not talk (MYTH)
- Speech is more intelligible when paired with sign
- Listeners rate speech clarity higher when sign used
- Children in sign supported therapy interventions have larger spoken vocabularies at 5 years
- No one is harmed by the use of KWS
- [www.scopeaust.org.au/key-word-sign-australia](http://www.scopeaust.org.au/key-word-sign-australia)



### Use of other forms of AAC Multi-modal Communication



### Reading Intervention

- Visual learning is easier than learning by listening
- Strong visual memory skills can be a strength in a whole-word approach to reading
- Written words easier to remember than spoken words
- Supports vocabulary and grammar learning
- Integrate written words into therapy sessions, educational programs and everyday life
- [www.readingourway.com.au](http://www.readingourway.com.au)
- [www.seeandlearn.org](http://www.seeandlearn.org)
- Four Blocks Literacy Framework <http://www.willanshills.schools.nsw.edu.au/literacy-and-communication>



### Reading Intervention

- Can introduce from 2 years of age although 3-4 years of age reported as optimal
- Can start with matching, selecting and naming games
- Early readers are found clinically to have more advanced speech and language skills
- Learning to read in the school years leads to accelerated language and memory skills
- Reading & writing is beneficial for all children with Down syndrome (non-readers to independent readers and writers)



### Reading Intervention – How does it help?

- Reading, phonics, writing and spelling improves phonological awareness which improves the quality of words stored in memory
- Printed word is a visual cue to speech
- Reading aloud provides spoken language practice and develops clearer speech
- Reading and writing sentences that are not typically used in their speech advances grammar and working memory for sentences



### Reading with AAC & Assistive Technology

- Use key word sign, Auslan and other AAC to help.
- Respect the way the child shows you they can read
- Use text to speech
- Teach speech to text early
- Use word prediction
- Use word grids
- **DO NOT** symbolise readers
- OK to put symbols on key words to aid communication but never for reading.



### Reading with AAC & Assistive Technology Help

- Clicker 7 Computer Software Program
  - Word processing program for emergent, developing and struggling readers and writers with symbol support and text to speech support
  - Matching apps
    - Clicker sentences
    - Clicker connect
    - Clicker docs
    - Clicker books
- Proloquo2Go (Typing Mode)
- Pictello (talking powerpoint)



### What to Focus on When?

- Social Communication : ALWAYS
- Understanding : ALWAYS
- AAC : From birth until needed by the person
- Vocabulary : From First 50 words
- Grammar : From First 2 word combinations
- Speech : From 4-6 word sentences
- Reading : From preschool



### Concerned About Progress

- Look objectively at where the child is at across all areas
- What's happening in other areas of development?
- Are they consolidating depth & frequency of skills at one stage before moving to the next
- What is going on with their hearing & health?
- Is intervention (home and therapy) at suitable intensity?
- Talk to your speech pathologist



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Learn to Talk & Learn*  
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### How could a secure web portal change the way children with Down syndrome receive speech pathology services?



Recruiting parents of children with Down syndrome (0-6 yrs) across Australia

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Or speak with her today at the conference!

