

Speech and language support: How physicians can identify and treat speech and language delays in the office setting

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Failure to recognize and intervene early in speech and language delays can lead to multifaceted and potentially severe consequences for early child development and later literacy skills. While routine evaluations of speech and language during well-child visits are recommended, there is no standardized (office) approach to facilitate this. Furthermore, extensive wait times for speech and language pathology consultation represent valuable lost time for the child and family. Using speech and language expertise, and paediatric collaboration, key content for an office-based tool was developed.

The tool aimed to help physicians achieve three main goals: early and accurate identification of speech and language delays as well as children at risk for literacy challenges; appropriate referral to speech and language services when required; and teaching and, thus, empowering parents to create rich and responsive language environments at home. Using this tool, in combination with the Canadian Paediatric Society's Read, Speak, Sing and Grow Literacy Initiative, physicians will be better positioned to offer practical strategies to caregivers to enhance children's speech and language capabilities.

The tool represents a strategy to evaluate speech and language delays. It depicts age-specific linguistic/phonetic milestones and suggests interventions. The tool represents a practical interim treatment while the family is waiting for formal speech and language therapy consultation.

Key Words: *Child development; Early years; Health care delivery; Language; Speech*

Speech and language delays are a significant risk factor for delayed development, poor school performance, and a wide range of personal and social difficulties extending into adulthood (1,2). Currently, Canada is experiencing a crisis of low literacy – approximately nine million working-age adults (42% of Canadians 16 to 65 years of age) lack the minimum literacy skills to cope with everyday life and work (3).

Paediatricians, family doctors and primary health care providers play a fundamental role in early identification of and intervention for speech, language and literacy delays (3-5). The objective of this tool is to provide clinicians with concrete strategies for identification of and interventions for various speech and language disorders, while facilitating referral to speech and language service providers.

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Le soutien en orthophonie : comment les médecins peuvent dépister et traiter les retards de la parole et du langage en cabinet

Le défaut de dépister et d'intervenir rapidement en cas de retards de la parole et du langage peut avoir des conséquences multiples au potentiel grave en matière de développement de la petite enfance et d'aptitudes à la littératie plus tard. Il est recommandé de procéder à l'évaluation systématique de la parole et du langage pendant les bilans de santé des enfants, mais il n'existe pas d'approche normalisée (en cabinet) pour la faciliter. De plus, les temps d'attente prolongés avant d'obtenir une consultation en orthophonie constituent une perte de temps précieuse pour l'enfant et sa famille. Faisant appel à des compétences en orthophonie et à la collaboration de pédiatres, les chercheurs ont préparé le contenu essentiel d'un outil à utiliser en cabinet.

L'outil visait à aider les médecins à réaliser trois grands objectifs : le dépistage rapide et précis des retards de la parole et du langage et des enfants vulnérables à des problèmes de littératie, l'aiguillage convenable vers des services d'orthophonie, au besoin, et l'enseignement aux parents, afin de les habiliter à créer des environnements de langage riches et réceptifs à la maison. À l'aide de cet outil, en collaboration avec le programme *Lisez, parlez, chantez* de la Société canadienne de pédiatrie et l'initiative *Grow Literacy*, les médecins seront mieux placés pour offrir des stratégies pratiques aux personnes qui s'occupent d'enfants afin de renforcer les capacités des enfants sur le plan de la parole et du langage.

L'outil représente une stratégie pour évaluer les retards de la parole et du langage. Il dépeint les étapes linguistiques et phonétiques propres à l'âge et propose des interventions. L'outil représente un traitement provisoire pratique tandis que la famille attend une consultation officielle en orthophonie.

DEVELOPMENT OF THE TOOL

With ongoing, serious concerns about clinical wait times for speech and language support, two social paediatrics paediatricians (LL, ELF-J) and social paediatrics trainees (MM, JT) at The Hospital for Sick Children (Toronto, Ontario) met in collaboration with a Toronto Public Health speech and language pathologist (NB) and program manager (MC) in November 2011 to address this critical gap in paediatric care and how it may be ameliorated by providing interim support to caregivers during the initial physician visit.

Existing standard treatment approaches for common speech and language disorders were reviewed. Preference was given to those demonstrating a strong emphasis on caregiver training through the use of simplified therapy processes (eg, Toronto Public Health Speech and

Language Services' comprehensive series of fundamental early-language stimulation strategies) (available from the authors on request) (6). Caregiver-centred interventions typically facilitate increased exposure to treatment targets and are essential to achieving long-term success in treatment (7).

To satisfy the needs of clinicians' busy office practices, standard treatment approaches were organized, summarized and modified for use in the paediatric clinical setting. Design and development of the tool occurred over a five-month period with participation of the medical illustration team at The Hospital for Sick Children. The tool was presented at the 2012 Canadian Paediatric Society Annual Conference (London, Ontario; June 6 to 9, 2012).

VALIDATION OF THE TOOL

The tool focuses on parent-based interventions while awaiting formal therapy from speech and language pathologists. Research demonstrates that parent-based interventions are not only effective (8), but in some cases are more so than treatment administered by clinicians (9). The significant improvements of children engaged in treatment curriculums that involve basic clinical education for caregivers include both increased expressive vocabulary and average mean length of utterance (10). The tool itself has not yet been validated; however, validation is a future goal. The interventions and recommendations therein demonstrate best-practice standards derived from empirical and peer-reviewed academic and clinical data.

EXPLANATION OF THE TOOL

Receptive and/or expressive language delay

Receptive and/or expressive language delays are very common impairments in comprehension and/or use of a spoken, written and/or other symbolic language system. The disorder may involve the form of language (ie, sound, grammar and word-combining systems), the content of language (ie, semantic systems) and/or the function of language in communication (pragmatic system), in any combination (11,12).

If an expressive language delay is identified, parents are encouraged to:

- Face their child when communicating to establish and maintain eye contact, share focus and enable the child to observe them saying different sounds (13,14).
- Actively label what interests their child. Participate in play using an excited voice and gestures to engage their child and maintain their attention while creating opportunities for them to practice talking about their interests (14).
- Simplify their language and repeat new words frequently in context to support their child's attempts to associate words with the corresponding objects or actions they represent. Set the pace for sentence length by remaining a 'communicative step' ahead of their child (eg, child: "Car!"; parent: "Car go! Vroom!") and providing grammatical cues where possible (15).
- Be patient and wait for their child to request rather than anticipating their need and offering. Pause after labelling to elicit imitation. Turn questions into comments (eg, parent: "I see a fire truck!" rather than: "What is that?"). When the child's utterance is unintelligible, interpret their intended meaning using the context of the immediate situation and add real words to replace jargon.

Special advice for parents in multilingual environments: In multilingual environments, the tool suggests that languages should not be mixed (eg, inserting an English word into a Spanish phrase or sentence). Children benefit from the distinct code recognition

provided when one parent speaks one language consistently while the other parent speaks another language (16,17) or, if required, when both parents speak language A except at predetermined routine intervals that the child can anticipate and recognizes as unique (eg, bath time, snack, story time), when language B is introduced.

Social language delay

Delays in social use of language (ie, pragmatic function/social communication skills) include impairments of social uses of verbal and/or nonverbal communication affecting the development of interpersonal relationships. Often marked by impaired comprehension and expressive communication, social language delays are commonly identified as a significant feature of autism spectrum disorder when associated with reduced joint attention (18), poor eye contact and irregular interactive play (19).

The following goals are relevant across a broad range of specific diagnoses (eg, intellectual disability, autism spectrum disorder, fetal alcohol spectrum disorder, fragile X syndrome, Prader-Willi syndrome, Rett's syndrome, etc). The interventions are intended for preschool children or children at an equivalent developmental age who are also engaged in the early stages of communication development.

If a social language delay is identified, parents are encouraged to:

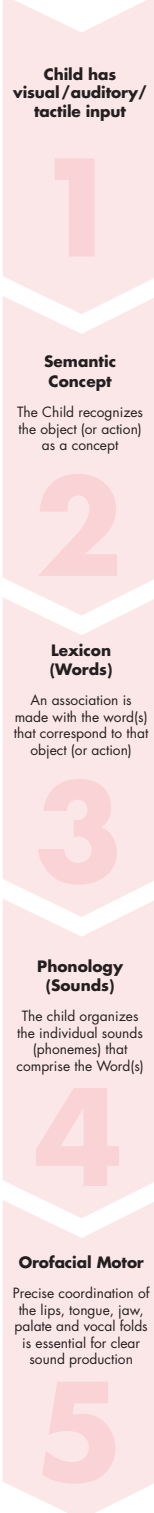
- Follow their child's lead by attending to what captures their attention. Wait for their child to select a toy or choose an activity first and then join them in their chosen activity while providing descriptive comments of objects and actions. In doing so, their child retains a measure of control during play, engages in his/her interests and is positively rewarded with the parent's attention. This may increase the length of the interaction and improve opportunities to share the language associated with the activity (20,21).
- Model simple, pretend actions associated with basic daily living tasks in context (eg, washing, feeding, dressing, etc) for their child and use the associated language (eg, transition to snack time by introducing a hand-washing gesture with appropriate script or song).
- Encourage the child to initiate communicative events. For example, the parent can:
 - Place a desirable object in a sealable jar, requiring the child to seek and request help (22).
 - Offer choices (eg, show and label options: "Do you want car or block?"), then wait for the child to indicate a preference using whatever expressive means are available to them at the time (eg, directed gaze, vocalizations, gestures or signs, word approximations, pointing, etc).
 - Create a 'silly situation' with familiar items that is contrary to the child's expectation or understanding of their use (eg, placing pajama pants on his/her head and waiting for a reaction). This type of playful sabotage potentially engenders salient moments of joint attention wherein the parent can encourage the child to react using appropriate language following a model.

In certain cases, interventions overlap and there is flexibility of the physician's application of the tool. For example, the general suggestions in receptive/expressive language delays are all applicable to social language delays.

Some of the aforementioned social language delay interventions involve modelling and encouraging nonverbal communication. Nonverbal behaviours include: direct eye gaze; facial expression; body postures; and gestures used spontaneously to regulate social interaction or emotional reciprocity (seeking to share enjoyment, interests or achievements with others) by showing,

Office Guide to Paediatric Speech and Language Assessment

Sequence of speech and language skills acquisition



Word Milestones	
CHILD AGE	WORD COUNT
12 months	3-5
18 months	20
2 years	100-200 (2 word phrases)
2½ years	350 (3 word sentences)
3 years	700 + (5-8 word sentences)

Sound Milestones	
AGE	SOUNDS ACQUIRED
0-3 years	p, b, m, n, t, d, w, h & vowels
3½ years	k, g, f, y, ng
4 years	s, s-blends, z
4½ years	l, l-blends, sh
5 years	ch, j
8 years	v, th, r, r-blends

Types of Speech and Language Delays and Interventions

Age	Type	Clinical Presentation	Interventions
Earliest age of onset	Speech or Language Domain		Strategies to suggest to Parents with corresponding handouts
LANGUAGE			
12 months	Comprehension and Expressive Language	A 'word' can be defined as: <ul style="list-style-type: none"> a spontaneous verbal utterance that is a recognizable approximation of the intended target word (e.g. "mama" for "mommy") a spontaneous physical gesture with firmly established meaning used in the appropriate context (e.g. vertical head nodding for "yes") 	Be FACE TO FACE when communicating LABEL what interests your child JOIN IN PLAY with an excited voice and gestures SIMPLIFY YOUR LANGUAGE REPEAT new words frequently WAIT – don't speak for your child TURN QUESTIONS INTO COMMENTS that use new words INTERPRET AND ADD real words to replace jargon e.g. During feeding time: Child: "Umm-ah-bah." Parent: "Yes! Yummy milk." DON'T MIX THE LANGUAGES e.g. One parent speaks Language A and the other parent speaks Language B; Or a parent always speaks Language A except for bathtime, snack and storytime when they introduce Language B
18 month well baby visit	Social Use of Language (Pragmatic Skills, Social Communication)	Monitor for an impairment of social uses of verbal and nonverbal communication affecting the development of social relationships. Query interactive play, comprehension and effective communication	FOLLOW YOUR CHILD'S LEAD JOIN IN PLAY GIVE A REASON TO COMMUNICATE AND WAIT e.g. Put a desirable toy in sealable jar that requires your child to ask for help
18 month well baby visit	Voice disorders	Atypical changes in voice quality (e.g. hoarse, stridor) Query vocal behaviour and vocal fold pathology (e.g. nodules, polyps)	Reduce vocal abuse/stress (e.g. shouting, screaming) Refer to ENT
18 month well baby visit	Motor Speech (Apraxia, Dyspraxia, Dysarthria, Prolonged bottle/pacifier use, digit-sucking)	An impairment in motor planning as characterized by inaccurate and inconsistent orofacial movements critical to the production of intelligible speech	REPETITION of target word to establish precise movement Deconstruct and simplify the difficult word to improve child's success e.g. For "up" try: 1. "uh" 2. "uh-p" 3. "uhp"
SPEECH			
Therapy indicated at 3 yrs.	Articulation	Poor speech intelligibility as characterized by omissions, substitutions, additions of individual sounds Child has not acquired target sounds by the appropriate age (see sound chart) Monitor for hearing loss, speech regression	LABELLING Isolate and label target sound SAY WHAT YOU THINK YOUR CHILD MEANS Encourage imitation of target sound through emphasis and example e.g. Child: "Look mom, tat." Parent: "Yes! It's a cat."
Normal developmental variant in children earlier than 3 yrs.	Dysfluency (stuttering)	Concomitant tension, struggle and sudden, repetitive, non-rhythmic motor movement (tics) Impediment to the flow of speaking Irregular rate, rhythm and repetition	TALK SLOWLY when speaking with your child BE PATIENT when listening to your child to help reduce their anxiety DO NOT TELL YOUR CHILD TO SLOW DOWN in order to help reduce anxiety
Identify and monitor onset later than 3 yrs.			

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Figure 1) Office guide to paediatric speech and language assessment. Reproduced with permission from Toronto Public Health and The Hospital for Sick Children (Toronto, Ontario)

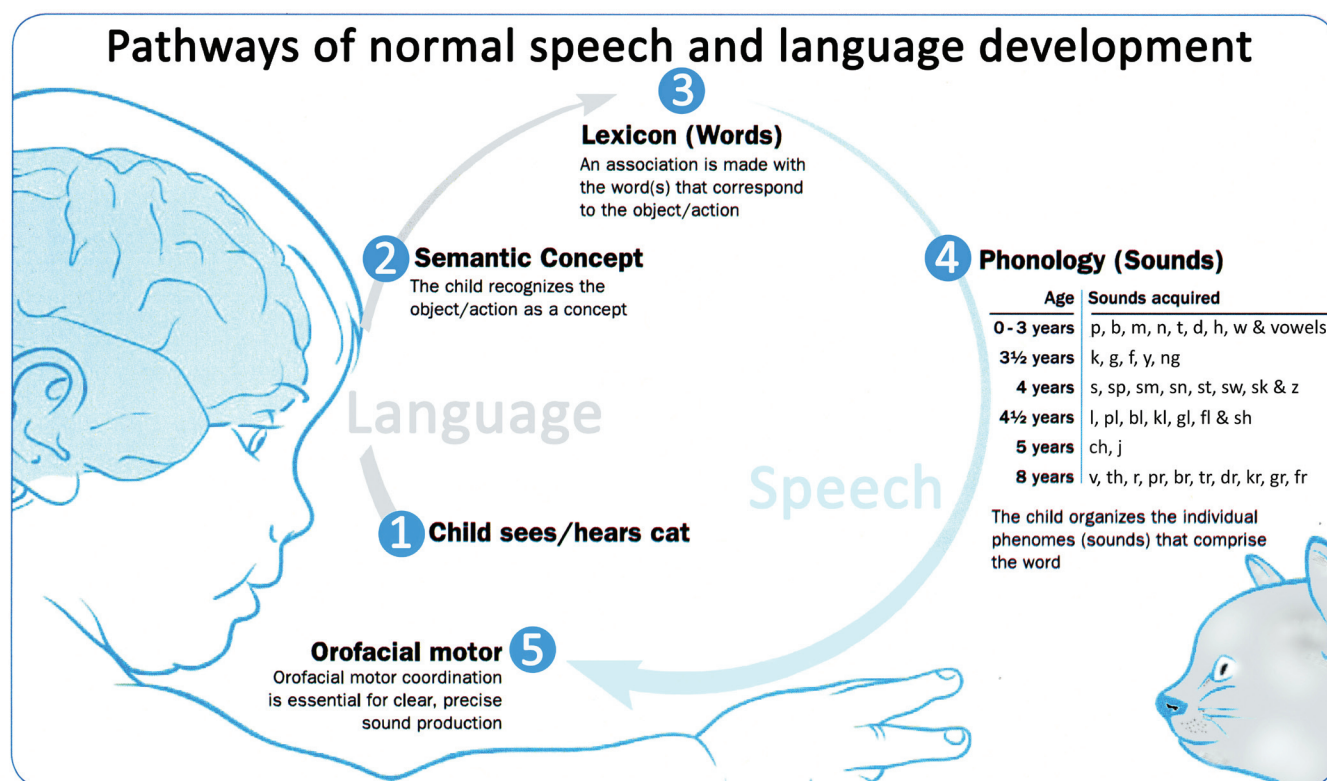


Figure 2) Pathways of normal speech and language development. Reproduced with permission from Toronto Public Health and The Hospital for Sick Children (Toronto, Ontario). This image was produced by Noel W Barnett (Toronto Public Health) and Luke Itani (The Hospital for Sick Children)

bringing or pointing out objects of interest (23,24). Use of nonverbal symbolic communication (eg, gestures, signs, symbols) supports rather than hinders the development of verbal communication (ie, receptive and expressive language) (25,26).

Speech disorders

Four types of speech disorders are addressed by the tool: voice disorders; motor speech disorders; articulation delays; and dysfluency (ie, stuttering).

Voice disorders: Voice disorders are marked by an atypical change in voice quality (eg, hoarse, stridor), which may indicate vocal-fold pathology (eg, nodules, paralysis) or a more complex disease process (27). Referral to an otolaryngologist is required where appropriate. Instruct the parent to encourage the child to reduce his/her vocal abuse and stress.

Motor speech disorders: Motor speech disorders are defined as the result of neurological impairment affecting motor programming or neuromuscular execution of speech. They encompass apraxia of speech and dysarthrias (28). Apraxia is defined as difficulty in motor planning and poor coordination of speech movements resulting in irregular distortion patterns of speech and poor intelligibility, marked by oral groping or struggling behaviours. Patient history may include early feeding difficulty, limited early vocalization/babbling and gross motor coordination issues (29). Dysarthria is characterized by poor strength and muscular control causing poor intelligibility and a slower rate of speech, and may involve compromised velopharyngeal function resulting in hyper- or hyponasal speech. Patient history may include feeding difficulty, drooling, open-mouthed posture and tongue protrusion (29). These impairments are characterized by inaccurate and inconsistent orofacial movements critical to the production of intelligible speech (30).

If a motor speech delay is identified:

- The physician can instruct parents to deconstruct and simplify difficult words to improve the child's success. For example, if the target word is "up", the parent can practice with the child by isolating the salient vowel of the word (eg, "uh") thus helping the child to produce a functional word approximation that is intelligible. Where appropriate, the caregiver can subsequently add the weight of a key consonant (eg, "uh-p") or additional vowel to assist the child's transition between distinct oral movements.

Articulation delays: Articulation delays are marked by poor speech intelligibility characterized by omissions, substitutions or additions of individual sounds, or that the child has not acquired target sounds by the appropriate age as indicated by the sound milestone chart (Figure 1) (31).

These delays (ie, phonological processes) are appropriate for clinical identification if they remain present in children approaching three years of age. For example, if the child is between zero and three years of age and says "tat" instead of "cat", this does not constitute an articulation delay because the 'k' sound is not expected until 3.5 years of age. If not present after that age, an articulation delay is present. The tool suggests that the child undergo a comprehensive audiology examination for hearing loss and be monitored for speech regression.

Cases warranting referral before three years of age include scenarios in which the child's utterances contains vowel distortions and/or produces an array of seemingly random substitutions and omissions resulting in unintelligible speech (eg, 'puh' for 'cup', 'humpeh' for scissors, 'powpo' for 'telephone'). Such observations would warrant further scrutiny related to the possibility of a motor speech disorder.

The parent-centred strategies validated to help reduce and/or treat articulations delays are similar in principal to those used in motor speech treatment:

- Clear, concise labelling of objects, people, actions and functional words in everyday situations, with emphasis on the specific sounds identified as delayed.
- If the child's utterance is unintelligible, the parent can use the situational context to best discern their child's intended word and subsequently express something semantically consistent with the moment (eg, if during bath time the child says: "Is-ab-ah-duh", the parent can respond: "Yes! It's a bubble... lots of bubbles!").

Dysfluency: The tool describes dysfluency (ie, stuttering) as concomitant tension, struggle and sudden repetitive, nonrhythmic motor movements (tics), impediments to the flow of speaking, and irregular rate, rhythm and repetition of words. Dysfluencies are typically normal developmental variants in children with onset before three years of age, but should be identified for referral and monitored if impairing communicative function or onset occurs after three years of age. If a dysfluency is identified, parents are advised to talk slowly when speaking to the child, be patient, not interrupt and not tell the child to slow down (to help reduce anxiety). Parents should also coach siblings to be less competitive in a group so that each member believes that they have a chance to speak during conversations.

INSTRUCTIONS FOR USE OF THE TOOL

The tool is not meant to replace more formal assessment, which would be performed at a subsequent 'assessment' visit by a speech and language pathologist, as indicated. The tool is a 'while-you-wait' strategy intended to fill the critical gap between speech and language delay identification, and formal therapy.

The tool contents are visually arranged into four separate sections, which cumulatively offer information regarding:

- The sequence of language and speech skills acquisition;
- Age and stage milestones (words, sounds) for:
 - language; and
 - speech acquisition;
- Pathological descriptions cross-referenced by age, presentation and recommended interventions.

To highlight the sequence of speech and language skills acquisition, a vertical numerical column on the left provides a concise summary of the process involved in normal language and speech production. A visual summary of normal language and speech production is provided in Figure 2.

For quick reference, age and stage milestone charts are prominently placed at the top of the tool. The word-milestone chart reflects the gold standard for word and utterance-length milestones at 12, 18, 24, 30 and 36 months of age, which are similarly used in the Rourke Baby Record, Nippissing District Developmental Screener and Ministry of Child and Youth Services' Communication Checklist (32). These commonly used milestones range from the 10th to 50th percentiles and are largely based on the MacArthur-Bates Communicative Development Inventories (32,33). These milestone percentiles will ultimately identify some nondelayed children as false positives. This strategy ensures immediate help for children with true delays and, for falsely identified children, communication interventions suggested in the tool would not be wasted because they are essential to parent-child relationship and, thus, crucial to healthy social-emotional and intellectual development (33).

The sound milestones chart provides a generally accepted indication of the sequence of phoneme (ie, a contrastive phonological segment in a language) acquisition according to the age at which treatment would be indicated for absent sounds.

Finally, the tool is anchored by a central chart outlining the types of language and speech delays, and their earliest age of onset, clinical presentation (including defined nomenclature) and relevant interventions. The intervention strategies are augmented by accompanying handouts, which expand on each strategy through descriptions and images (available from the authors on request) (6).

FUTURE PLANS

The process of designing this concise tool has been identified as the initial step in this collaborative effort. We hope to undertake further research to identify the user response to this tool, including the creation of a survey to assess the utility of the tool in the clinician's office; and to develop a parent-friendly version with multi-language translations that provides greater emphasis and description of the suggested interventions.

CONCLUSION

The tool provides a simple and practical aid for physicians in the diagnosis and intervention of speech and language disorders by empowering caregivers, potentially the most effective source of therapy, to help their children at home. It offers guidance for initiating practical interim intervention while patients await formal speech-language therapy consultation. It is not a replacement for speech-language pathology expertise, nor does it compete with existing validated paediatric developmental screening tools. Rather, using a simple and concise format, it augments more accurate diagnosis by outlining delays and providing the office physician with immediate and economical treatment suggestions created for the purpose of parent involvement. In combination with intervention summary handouts for parents and the Canadian Paediatric Society's Read, Speak, Sing and Grow Literacy Initiative, physicians will be better positioned to offer practical strategies to caregivers seeking to enhance their children's speech and language capabilities.

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