

# Auditory Processing Disorders and the Fast ForWord program

By  
Dana Heno, Audiologist  
[dhen@pathwayscentre.org](mailto:dhen@pathwayscentre.org)  
Charlene Crozier, CDA  
[crozier@pathwayscentre.org](mailto:crozier@pathwayscentre.org)  
Pathways Health Centre for Children

- **What do we mean by auditory processing disorders?**
  - Difficulty with paying attention to, discriminating, recognizing, remembering or understanding information that is heard
  - What you do with what you hear (brain function)
  - Not related to hearing sensitivity or intelligence
  - Auditory processes are responsible for:
    - Sound localization
    - Auditory discrimination
    - Temporal aspects of audition – temporal resolution, temporal masking, temporal integration and temporal ordering
    - Auditory performance with competing acoustic signals
    - Auditory performance with degraded signals

- **Common behavioural characteristics of APD:**
  - Difficulty hearing in noisy situations
  - Difficulty paying attention to and remembering information presented orally
  - Difficulty maintaining focus on an activity if other sounds are present (easily distracted by sounds around them)
  - Difficulty with organizational skills
  - Difficulty with following multi-step directions
  - Difficulty in sustaining attention
  - Unusually sensitive to sounds
  - Confuses similar -sounding words
  - Memorizes poorly (numbers, letters, words or other information)
  - Problems following rapid speech
  - Needs more time to process information
  - Low academic performance (reading, comprehension, spelling, vocabulary)
  - Better performance in a small group or one on one
  - Unorganized and messy
  - Asks for statements to be repeated

- **APD is easily confused with the following:**
  - Attention Deficit /Hyperactivity Disorder
  - Learning disabilities
  - Speech and Language disorders or delays
  - Autism spectrum disorder
  - Sensory integration dysfunction
  - Developmental delays
  - Hearing loss
- **Audiologists can diagnose APD but a multidisciplinary team approach is best including:**
  1. Parent –experts on their child
  2. Physician – can rule out ADHD , Autism, developmental delays
  3. Psychologists – test measures maybe consistent with APD
  4. Occupational therapists – can rule out sensory issues
  5. Speech-language Pathologists- diagnose language disorders
  6. Teacher – sees child's in a difficult listening situation

- **How is APD assessed?**
  - Comprehensive testing to check the whole auditory pathway – from the outer ear, middle ear, inner ear, brainstem and up to the auditory cortex in the temporal lobe
  - Using a battery of tests – no consensus exists on this
  - Using a model to interpret results and provide specific suggestions (Buffalo Model)
    - Uses one of oldest APD test which has norms for 5-69 year olds
    - Other 2 tests have norms for as young as 4 year olds
    - Appears to agree with parent, teacher and clinician observations
- **Buffalo Model of interpretation indicates type of APD:**
  1. Decoding- difficulty with synthesizing smaller units of information into larger ones
    - confused when speech is rapid, articulation errors, word-finding difficulties, reading and spelling difficulties, delayed responses, poor phonics, difficulty with oral discussions
  2. Tolerance-Fading Memory – poor ability to understand speech in the presence of noise and weak short-term memory
    - quick responses, poor reading comprehension, poor expressive language skills, impulsivity, poor handwriting
  3. Integration – difficulty integrating information which is seen with information that is heard
    - very delayed responses, characteristics of both decoding and tolerance-fading memory, severe receptive and expressive language delays, severe reading and writing difficulties, poor phonics, may have visual perceptual difficulties
  4. Organization –disorganized language, sentences, discourse, writing, work space, bedroom
    - poor sequencing, difficulty with problem-solving, difficulty taking the listener's perspective, poor writing

- **What causes APD?**
  - The simple answer is we usually don't know. For many children, there is a maturation delay in the development of the auditory system. More research is needed.
  - For some children, it can be attributed to any of the following: lead poisoning, lack of oxygen, auditory deprivation, frequent ear infections, trauma, tumors, degenerative disorders, viral infections, surgical compromise
- **What can be done?**
  - Maturation - takes place normally
  - Compensatory strategies
  - Therapy

- **Compensatory Strategies**

- Depends on type and severity of APD and child
  - Enhancing the environment/speaker/ child
    - how to get the child's attention, check comprehension, reduce background noise, approach reading, reduce auditory load, enhance memory, improve classroom acoustics, use of a FM system in classrooms, use visual supports, use visualization

- **Therapies:**

- Depends again on type and severity of APD
- May include:
  - Language Therapy
  - Occupational Therapy
  - Earobics (Cognitive Concepts)
  - Lindamood Phoneme Sequencing Program
  - Phonemic Synthesis Therapy
  - Hooked on Phonics
  - Noise Desensitization Protocols
  - Fast ForWord (Scientific Learning)

- **Why choose Fast ForWord?**

- Based on 30 years of research on learning
- Multiple skills are trained simultaneously- improvements appear in multiple skills
- Has a proven track record ([www.scilearn.com](http://www.scilearn.com))
- Provides much positive reinforcement which builds as they progress
- Progresses at the child's speed
- Has support to track progress so that obstacles are reduced
- Content is age-appropriate
- Has a variety of products and protocols
- Computer games appear to hold their interest
- Parents requesting more help (**most important reason!**)

- **Disadvantages to Fast ForWord:**

- Initial Training time
- Cost - charge a per- user fee plus cost of program
- Time commitment for staff and child(32 -40 hours)
  - 2 children using program at the same time with one staff person
  - Family has to commit to daily sessions for multiple weeks
- Need devoted laptop, headphones and quiet room

- **Effectiveness of Fast ForWord:**

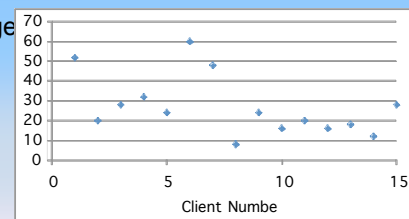
- assessed with pre and post test battery of 3 AP tests
- assessed using short, family survey

Family survey results(11 responses):

1. Do you think your child has shown positive change from participating in Fast ForWord?
  - Absolutely – 55%
  - Somewhat-18%
  - No – 0%
  - Not sure – 27%
2. Do you feel that your family has gained from your child's involvement?
  - Absolutely – 55%
  - Somewhat – 36%
  - No – 9%
  - Not sure – 0%
3. Were your expectations met?
  - Absolutely – 64%
  - Somewhat – 27%
  - No- 9%
  - Not sure – 0%

## Pre and Post Test Data:

Greatest Percentage Of change



- Differences in success due to:
  - Number of hours attended
  - Presence of permanent or temporary hearing loss
  - Presence of co-existing difficulties
  - Motivation, interest, personality
  - Age?
  - Test battery too restrictive- they may have improved in other areas we did not test specifically (language, reading, integration, etc)

- What does Fast ForWord (Language to Reading program) claim to do?

Develops processing efficiency in 4 areas:

1. builds memory – both working and long-term
2. improves attention by developing the ability to focus on tasks and ignore distractions
3. develops auditory, visual and linguistic processing of orally presented words, sentences and stories for meaning and comprehension
4. develops sequencing skills using word order to comprehend statements and instructions

- Skills developed from Fast ForWord:

1. advanced listening accuracy-distinguish between sounds and identify sequences of 3 or more sounds
2. auditory sequencing- recognize and remember the order of a series of sounds
3. word analysis- recognize words, identify multi-syllabic words, understand letter-sound relationship
4. sustained attention- remain focused while ignoring distractions
5. phonological memory-holding speech sounds in memory
6. listening comprehension – ability to understand sentences and derive meaning from a story
7. following directions – listening to directions of increasing length and complexity and carrying out the required action
8. English language conventions – proper word order, syntax, vocabulary, prefixes and suffixes, plurals, subject-verb agreement
9. vocabulary – knowledge of the phonological structure and meaning of words to support listening and reading comprehension

- Classroom results:

- Improved reading readiness – recognize words, map letters to sounds, improved understanding of sounds and words
- Better understanding and use of language – derive meaning from what they read and hear
- Improved concentration – able to stay on track, be attentive, absorb and integrate information
- More engaged students – improved ability to follow directions and benefit from curriculum

- Future Directions:

- offering FF as a fee- for- service option outside of work/school hours
- marketing to schools and community agencies
- possible company sponsorship

- Demonstration of FF program
- Question Period