



LKN Speech Language Pathology  
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## The Buffalo Model of Therapy for Central Auditory Processing

This therapy protocol is established based on the individual's diagnostic profile. The diagnostic profile is done by the comprehensive audiological assessments by an audiologist. There are 4 basic categories identified in the Buffalo Model. (Katz & Smith 1991 & 1992) It should be noted that Bellis and Ferre (2002) have also developed a similar category system that is similar. Usually those with CAPD demonstrate problems in two or more of the categories. By breaking down the disorder into categories it helps us better break down the complex problem into areas that are easier to understand and thus provide the appropriate treatment plan. The Buffalo Questionnaire has 48 items dealing with potential problems and specific therapy that can improve the disorder.

### 1. The Decoding Category

This category refers to quickly and correctly understanding and interpreting speech at the phonemic level. There is poor speech-sound discrimination and problems with phonics. They say "huh" and "what" quite often. There may also be articulation problems due to the mixed up auditory system. This occurs in the auditory cortex of the brain. The middle-posterior portion of the superior temporal lobe is responsible for phonemic discrimination, phonemic memory, and phonemic synthesis-analysis.

### 2. Tolerance-Fading Memory (TFM) Category

Two skills are necessary to work together. Tolerance refers to being able to understand speech in noise by being able to differentiate between background noise and foreground noise. An individual must process only that in the foreground or what one is "supposed" to be listening to. Fading-memory refers to auditory short-term memory, working auditory memory, and attention. They are distracted by background noise and forget in a few seconds what was said. They attend auditorilly for a few seconds, they fatigue and change behavior. Usually we see more errors on the latter part of testing as the auditory system becomes overloaded. In aphasia therapy we call this "noise build-up". The area of the brain responsible for this is located within the anterior portion.

### 3. Integration Category

This is a very complex and variable disorder and is associated with the corpus callosum. The individual has severe reading and spelling problems and are sometimes labeled dyslexic. These are more difficult to treat. They have difficulty relating to both visual and auditory information. This is because language in the left hemisphere and vision in the right hemisphere and with input on both sides it must cross over the corpus collosum. In young children there may sometimes be extreme delays.

### 4. Organization Category

The skills affected in this category are sequencing and organization. These individuals are generally disorganized; have difficulty following directions in order. Regions of the brain associated with these problems are in the fronto-temporal and fronto-temporal parietal regions of the brain.

## The Therapy for Auditory Processing Disorders

As therapists we all come from different experiences, backgrounds, and levels of expertise. Our patients are all unique as well so to say one way is the only way to provide therapy would be an unjustified statement. The model described here is a protocol by Jack Katz and it makes sense to address the categories affected with the right therapy. Using creative and innovative thinking alongside a very specific plan is necessary to meet the needs of individual patients. As therapists we are equipped with a “toolbox” of interventions and treatment plans to meet the end goals and improve our patients. Taking experience paired with best practices and ongoing clinical education are the responsibility of therapists in order to provide the best and most current methods. Do what is best for our clients, but within limits you can do it your way.

The Buffalo Model by Jack Katz recommends a 2-part therapy program:

Round 1: 14 sessions, 50 minutes each (re-test via parent interview, Dx measures, data analysis)

Vacation: Give an 8 week (2 month) break to allow brain to generalize, generate, and change. Provide a home program with parent intervention 1-2 x per week. Keep it fresh and don't drown them in therapy.

Part 2: 8 sessions; 50 minutes each. This could be 1x per week, but then every other week.

### Therapy Interventions for the Decoding Category

1. Phonemic Training Program – Goal is to improve the brain's concept of speech sounds. Complete a phonemic error analysis – what sounds are missed? Start with the most difficult sound and work down. Create a level that is “easy” to create success and then increase the level of difficulty gradually. Repetition in various contexts over time enables the brain to process speech quickly and accurately. Encourage speed if slow.
2. Phonemic Synthesis – A sound by sound presentation to produce a word or a nonsense word. The child has to say the synthesized word. This helps associate sounds with words and also clarity of articulation. The PS program is on a CD provided from precision acoustics.

### Therapy Interventions for Tolerance Fading Memory Category

1. Speech-in-Noise Desensitization Training – To desensitize understanding speech in noise we gradually add noise to train listening. This can be analogous to an allergist who increases one's tolerance for allergens by gradually increasing doses of the allergens. It is the same principle. When one has more difficulty with noise in one ear compared to the other, it makes sense to give that ear more training.
2. Short Term Auditory Memory Training – Auditory memory problems are almost always associated with CAPD. In each of the therapies we start at a level that is easy and gradually increase the complexity. Digit recall is generally a good one to start with because it is easy to find the baseline and measure their progress. However,

with children this task can become monotonous. This is where a trained and highly qualified therapist creates a method to practice auditory memory and provide lessons on listening that are engaging, creative and meets the needs of the client in a functional and meaningful way.

3. Auditory Sequencing Training – This is similar to short term auditory memory however order of sequence is required.

### Therapy Interventions for Integration Category

*These are children who are hopefully receiving occupational therapy and other specialized training and instruction.*

1. Any treatment activities designed to improve the communication between the two hemispheres such as learning to play a musical instrument (piano and guitar), singing, dancing, soccer, swimming, learning to play chess. The toy “Simon” or “bop it”, activities that teach part to whole such as building models, working puzzles, etc are helpful. These treatment activities include the brain training by use of whole body movements during brain training tasks.
2. Dichotic Listening Training – Using 2 Ipods playing 2 books are running at different times into each ear. Adjust the volume which is the signal to sound ratio to make it more challenging to attend to the book playing in the weaker ear so that ear has to work harder and thus build neuropathways.

### Therapy Interventions for Organization Category

1. These are the areas of therapy involving executive function skills and complex language skills. This may include planning, organizing, and formulating complex sentences to explain complex events, as well as providing brain training through cognitive rehabilitation techniques and protocols.

#### References

- Dr. Jack Katz, August 4, 2011 Keynote Speaker at Audiology Conference, Wilmington, NC  
Dr. Teri Bellis, Ph.D. (2002) When the Brain Can't Hear  
Dr. Jack Katz, 2014 Audiology Online: APD Evaluation to Therapy: The Buffalo Model