

BIAP Recommendation 30/1 :
Central Auditory Processes (CAP)

General foreword

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Recommendation

In practice, the instrumental evaluation of hearing is limited to the functions provided by the peripheral part of corresponding transmissional and perceptual anatomical structures of the ear.

These structures contribute in all or partly to the detection of the presence of the acoustic stimuli, to the function of discrimination, i.e. the detection of their variations of intensity and frequency, to the resolution of their temporal profile and finally to their spectral analysis.

Despite of the normality of this auditory assessment, some subjects present nevertheless difficulties in listening and intelligibility. Such difficulties can be the consequence of disorders related to the cognitive and memory functions in their respective complexities, but also the functions provided by central auditory pathways. One holds for these last the term of '*Central Auditory Processes (CAP)*' and that of '*Central Auditory Processing Disorders (CAPD)*' in the pictures which can result from their dysfunctions.

Non exhaustively, CAP are the neuronal mechanisms responsible for the following behavioural phenomena: binaural interactions such as sound localisation, lateralisation and binaural fusion, phonemic discrimination, recognition of the temporal aspects of audition including detection of changes in frequency, amplitude, duration, shape and pattern of auditory stimuli, detection of time intervals between auditory stimuli, temporal masking, temporal integration and temporal ordering, auditory performances with competing or degraded acoustic signals.

CAPD is an observed deficiency in one or more of the above listed mechanisms dedicated to audition. In its pure form, it should be conceptualized as a deficit in the processing of auditory input : **APD** for *Auditory Processing Disorders*. Nevertheless, CAPD like symptoms may originate from a more general dysfunction that affects performances across modalities. Intellectual faculties, higher level neurocognitive processes, learning, long term language immersion, memory, attention and motivation are to be considered in the assessment of CAPD : **(c)APD** for *(central) Auditory Processing Disorder* !

This definition tends towards the view of the potential for interaction between disorders originating at both mechanisms, the processing of acoustic information and the non-dedicated processes. Their deployment in service of central auditory processing underlies the frequently clinical association between (c)APD and speech and language disorders, learning disabilities, attention deficit and hyperactivity disorders, psychological, emotional and social problems.

Tests of central auditory function can be categorized in a variety of ways, e.g., monotic, diotic, dichotic, speech or nonspeech tests. As test results from meaningful speech items may be influenced by non-dedicated processes, tests based on tonal, noise and phonetic stimuli should be preferred.

A basic set of central auditory evaluation tests should be composed at least of:

- intensity, frequency and phonetic discrimination tests ;
- temporal resolution tests, (e.g. gap detection) ;
- low redundancy speech tests, (i.e. speech in noise, filtered, compressed, expanded, interrupted or reverberated speech signals) ;
- dichotic speech tests ;
- temporal configuration or patterning tests ;
- binaural interaction tests.

Because the potential interaction of dedicated and non auditory dedicated processes dysfunctions, intellectual quotient, basic cognitive, speech and language development, memory, attention and psychological status are to be evaluated. As result of this, a multidisciplinary approach is mandatory.

Every dedicated or not auditory dedicated evaluation test should never be used in rehabilitation programs.

Annex 1: Central Auditory Processing: Symptoms

This recommendation was created and approved in a multidisciplinary cooperation between professionals of all audiophonologic disciplines, which are medicine, pedagogy, speech therapy, psychology and hearing instrument audiology.

The original language of this document is French.

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