

Why We Incorporate Cognitive Screenings as Part of Our Audiological Evaluations



Strong Interrelationship Between Hearing and Cognition

- Increasing evidence has linked age-related hearing loss to more rapid progression of cognitive decline and incidental dementia.¹
- Long-term hearing deprivation of auditory inputs can impact cognitive performance by decreasing the quality of communication leading to social isolation and depression and facilitate dementia.²
- Limited cognitive skills from aging may reduce the cognitive resources available for understanding speech, especially in background noise.³

Three Fundamental Processes Needed to Hear Well and Understand Speech

Interface between the acoustic environment and the brain; detects and codes



Modifies and analyzes

Enhances perception, understanding content, and storing information

Efferent Top-Down Processing Critical to Speech Perception⁴

Efferent Nervous System Top-Down Processing

Emphasizes certain aspects of the incoming signal, allowing for improvements in perception

Used to compensate for poorly resolved bottom-up sensory cues



Cognitive Factors: attention, listening effort, memory, multi-sensory integration, and prediction play a role in helping code sounds



Additional processing refines signal and extracts important elements that are used for higher level processing

Neural signal passed up through auditory system

Sounds are initially coded

Afferent Nervous System Bottom-up Processing

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How We Conduct Cognitive Screenings



Cognivue® Thrive Device

- Based on FDA-cleared technology used by neurologists and other physicians to test for cognitive function
- 5-minute self-administered computerized screening
- Proven superior test-retest reliability
- Evaluates three cognitive domains: memory, visuospatial, and executive function
- Measures two speed performance parameters: reaction time and speed processing

Adaptive Psychophysics Eliminates Bias and Adapts to the Patient's Motor Skills and Visual Acuity



Motor Skill



Visual Acuity



Word Memory



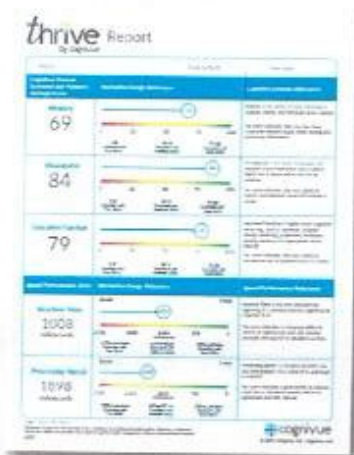
Shape Memory



Word Perception



Shape Perception



Cognivue® Thrive Outcomes Report

- Provides brain health score for each domain and performance parameter
- Utilizes segmented linear graphic to visually reinforce scores are fluid
- Informs on patient's ability with examples of impact on daily activity

We are available to answer any questions and invite you to visit our office to experience first-hand our cognitive screening capabilities.



**Hearing/ Balance/ Diagnostic/ (Re)habilitation Services
Pediatrics & Adults**

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Cognivue Thrive is an adjunctive tool for evaluating cognitive function. It is not a stand-alone diagnostic tool. Clinical contextualization is required.

Fortinbau S, Park K, Cogolotto V, et al. A Review of New Insights on the Association Between Hearing Loss and Cognitive Decline in Aging. *Topical review article*. Cognivue, <https://www.cognivue.com>

1. Robinson J, et al. *Annals of the New York Academy of Sciences*. 2016; 1383: 155-165.

2. Gill TR, Vitte K, Kozl, et al. Hearing loss and cognitive decline in older adults. *JAMA Intern Med*. 2013; 173(4):271-276.

3. Fruchter DC, Kelly MF, Kirby CA, Bressan S, Lewis BA. Association of Age-Related Hearing Loss With Cognitive Function, Cognitive Impairment, and Dementia: A Systematic Review and Meta-analysis [published correction appears in *JAMA Otolaryngol Head Neck Surg*. 2018 Feb; 144(2):149]. *JAMA Otolaryngol Head Neck Surg*. 2018; 144(2): 115-126.

4. Romberg J, Litwin T, Terzold A, et al. The Effect of Language Understanding (LUI) on Intellectual, Emotional, and Clinical Outcomes. *Front Syst Neurosci*. 2013; 7: 71. <https://doi.org/10.3389/fnys.2013.00071>