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Delis-Kaplan Executive Function System™ (D-KEFS™)

Availability:	**Please visit this website for more information about the instrument: Delis-Kaplan Executive Function System.**
Classification:	**Supplemental – Highly Recommended**: Cerebral Palsy (CP) and Stroke (based on study type, disease stage and disease type) **Supplemental**: Epilepsy, Mitochondrial Disease (Mito), Multiple Sclerosis (MS), Huntington's Disease (HD), and Traumatic Brain Injury (TBI). **Exploratory**: Friedreichs Ataxia (FA)
Short Description of Instrument:	The Delis-Kaplan Executive Function System™ (D-KEFS™) is the first nationally standardized set of tests to evaluate higher level cognitive functions in both children and adults. With nine stand-alone tests, the D-KEFS™ comprehensively assesses the key components of executive functions believed to be mediated primarily by the frontal lobe. **Engaging Materials:** Its game-like format is engaging for examinees, encouraging optimal performance without providing "right/wrong" feedback that can create frustration in some children and adults. **Multiple Uses**: • Assess the integrity of the frontal system of the brain • Determine how deficits in abstract, creative thinking may impact daily life • Plan coping strategies and rehabilitation programs tailored to each patient's profile of executive-function strengths and weaknesses **Two Forms:** D-KEFS™ offers two forms: The Standard Record Forms include all nine D-KEFS™ tests, while the Alternate Record Forms include alternate versions of D-KEFS™ Sorting, Verbal Fluency, and 20 Questions Tests. An alternate set of Sorting Cards is also available. **Correlates with the California Verbal Learning Test–II (CVLT-II):** D-KEFS™ is correlated with the CVLT–II, providing information concerning the role of memory on D-KEFS™ performance.
Scoring:	Each subtest generates one or more scaled scores and percentiles characterizing performance in relation to typically performing controls. Administrators can also elect to calculate optional process scores that provide cumulative percentile ranks characterizing performance strategies. Contrast scores are also available within each subtest to assess the degree to which performance is affected by particular aspects of cognitive functioning (e.g., motor speed or inhibition or cognitive flexibility).

Rationale/ Justification:	**Strengths/Weaknesses:** The battery provides an updated normative sample for a number of classic neuropsychological tests of executive function and has been widely employed in research and clinical use. **Specific to Mitochondrial Disease:** **Advantages:** Analagous subtests (Stroop/Color Word, Trail Making Test) have been found to differentiate inviduals with symptomatic mitochondrial disorders from asymptomatic carriers and controls (Sprouse et al, 2014). The test has been validated for use in a variety of populations including multiple sclerosis, Parkinson's Disease, and Autism Spectrum Disorders, suggesting that it is a valid measure for use in a mitochondrial disorder population as well (Delis et al, 2004). Materials are engaging, and clinicians and researchers can select a subset of tests within the battery to assess specific executive skills that are of interest to them providing an opportunity to minimize fatigue. Selected subtests of the D-KEFS have been shown to differentiate performance in indiviudals with multiple sclerosis, even after controlling for depression, suggesting that this may be a more sensitive instrument for detecting executive dysfunction than other instruments in populations, like mitochondrial disorder, that may be at higher risk of developing co-occurring psychiatric symptoms (Parmenter et al, 2007). **Limitations:** The test is normed for use in those aged 8 and above and is fairly demanding in terms of language skills. The Tower subtest is particularly demanding of fine motor speed and coordination, and the Verbal Fluency and Color-Word Interference subtests require rapid verbal responding. It is not appropriate to administer to individuals with lower IQs or as a whole for individuals with more motor involvement. The instrument may be slightly less sensitive than other measures for executive dysfunction in pediatric medical populations (Parrish et al., 2007), and test scores may exaggerate discrepancies between IQ and executive dysfunction for individuals at the very high and very low end of the IQ distribution (McGee et al., 2009)

References:	Delis DC, Kaplan E, Kramer JH. Delis-Kaplan Executive Function System™ (D-KEFS™) [Internet] 2001. Available from: http://www.pearsonclinical.com/psychology/products/100000618/deliskaplan-executive-function-system-d-kefs.html?Pid=015-8091-108. Delis DC, Kramer JH, Kaplan E, Holdnack J. Reliability and validity of the Delis-Kaplan Executive Function System: an update. J Int Neuropsychol Soc. 2004;10(2):301–303. McGee CL, Delis DC, Holdnack JA. Cognitive discrepancies in children at the ends of the bell curve: a note of caution for clinical interpretation. Clin Neuropsychol. 2009;23(7):1160–1172. Parmenter BA, Zivadinov R, Kerenyi L, Gavett R, Weinstock-Guttman B, Dwyer MG, Garg N, Munschauer F, Benedict RH. Validity of the Wisconsin Card Sorting and Delis-Kaplan Executive Function System (DKEFS) Sorting Tests in multiple sclerosis. J Clin Exp Neuropsychol. 2007;29(2):215–223. Sprouse C, King J, Helman G, Pacheco-Colon I, Shattuck K, Breeden A, Seltzer R, VanMeter JW, Gropman AL. Investigating neurological deficits in carriers and affected patients with ornithine transcarbamylase deficiency. Mol Genet Metab. 2014;113(1-2):136–141.