

Outcome Measure	Symbol Digit Modalities Test (SDMT)
Sensitivity to Change	Yes
Population	Adult
Domain	Neuropsychological Impairment
Type of Measure	Objective Test
ICF-Code/s	b1
Description	<p>The Symbol Digit Modalities Test (SDMT) is used to assess divided attention, visual scanning, tracking and motor speed. Using a reference key, the examinee has 90 seconds to pair specific numbers with given geometric figures. Because examinees can give either written or spoken responses, the test is well suited for use with individuals who have motor disabilities or speech disorders. Because it involves only geometric figures and numbers, the SDMT is relatively culture free as well and can be administered to individuals who do not speak English.</p> <p>It takes approximately 5 minutes to complete the entire test.</p> <p>Scoring involves summing the number of correct substitutions within the 90 second interval (max = 110).</p>
Properties	<p><u>Test-retest reliability</u>: .80 for the written version and .76 for the oral version in normal adults with an average retest interval of 29 days (Smith, 1991). Test-retest reliability is .70 for a population with sports concussion (Echemendia et al., 1999).</p> <p><u>Construct validity</u>: The correlation between oral and written forms is .78 (Smith, 1991) suggesting the two forms are not interchangeable. Correlations between SDMT and the Wechsler Digit Symbol/Coding subtest range from .62 to .91 (Bowler et al., 1992; Hinton-Bayre et al., 1997; Morgan & Wheelock, 1992), which is not surprising given the similar format. SDMT taps scanning and tracking aspects of attention, similar to the TMT (Shum et al., 1990) and measures aspects of selective attention, demonstrated through relationships to the TEA (Bate et al., 2001; Chan, 2003).</p> <p><u>Concurrent validity</u>: The oral form has been shown to be superior to other tasks of reaction time (Stroop and PASAT) in assessing information processing impairments in TBI (Ponsford & Kinsella, 1992). TBI patients perform significantly poorer than controls, and performance differentiates between individuals in the early versus late stages of the recovery process (Bate et al., 2001). SDMT is sensitive to diffuse axonal injury, as well as recovery, in patients with severe TBI (Felmingham et al., 2004).</p>
Advantages	<ul style="list-style-type: none"> • Alternate forms are available. • Quick and easy to administer. • Both oral and written versions allows administration to patients

	<p>with motor disabilities or language disorders.</p> <ul style="list-style-type: none"> • Sensitive to TBI, including diffuse axonal injury.
Disadvantages	<ul style="list-style-type: none"> • Similar to the Wechsler subtest Digit Symbol/Coding. • Original adult norms are outdated (1975) – need to acquire alternate norm sources (e.g. Jorm et al., 2004). • Difficult to differentiate between attentional deficits and processing speed when performance is impaired.
Additional Information	
Reviewers	Skye McDonald

References

- Bate, A. J., Mathias, J. L., & Crawford, J. R. (2001). Performance on the Test of Everyday Attention and standard tests of attention following severe traumatic brain injury. *The Clinical Neuropsychologist*, *15*(3), 405-422.
- Bowler, R., Sudia, S., Mergler, D., Harrison, R., & Cone, J. (1992). Comparison of digit symbol and symbol digit modalities tests for assessing neurotoxic exposure. *The Clinical Neuropsychologist*, *6*(1), 103-104.
- Chan, R. C., Hoosain, R., Lee, T. M., Fan, Y., & Fong, D. (2003). Are there sub-types of attentional deficits in patients with persisting post-concussive symptoms? A cluster analytical study. *Brain Injury*, *17*(2), 131-148.
- Echemendia, R. J., Putukian, M., Mackin, R. S., Julian, L., & Shoss, N. (2001). Neuropsychological test performance prior to and following sports-related mild traumatic brain injury. *Clinical Journal of Sport Medicine*, *11*(1), 23-31.
- Felmingham, K. L., Baguley, I. J., & Green, A. M. (2004). Effects of diffuse axonal injury on speed of information processing following severe traumatic brain injury. *Neuropsychology*, *18*(3), 564.
- Hinton-Bayre, A. D., Geffen, G., & McFarland, K. (1997). Mild head injury and speed of information processing: a prospective study of professional rugby league players. *Journal of Clinical and Experimental Neuropsychology*, *19*(2), 275-289.
- Jorm, A., Butterworth, P., Anstey, K., Christensen, H., Easta, S., Maller, J., . . . Sachdev, P. (2004). Memory complaints in a community sample aged 60–64 years: associations with cognitive functioning, psychiatric symptoms, medical conditions, APOE genotype, hippocampus and amygdala volumes, and white-matter hyperintensities. *Psychological medicine*, *34*(08), 1495-1506.
- Morgan, S. F., & Wheelock, J. (1992). Digit symbol and symbol digit modalities tests: are they directly interchangeable? *Neuropsychology*, *6*(4), 327.
- Ponsford, J., & Kinsella, G. (1992). Attentional deficits following closed-head injury. *Journal of Clinical and Experimental Neuropsychology*, *14*(5), 822-838.
- Shum, D. H., McFarland, K. A., & Bain, J. D. (1990). Construct validity of eight tests of attention: Comparison of normal and closed head injured samples. *The Clinical Neuropsychologist*, *4*(2), 151-162.
- Smith, A. (2002). *Symbol digit modalities test: Manual*: Western Psychological Corporation.