

**NINDS CDE Notice of Copyright
Modified Japanese Orthopaedic Association Score**

Availability:	Please visit this website for more information about the instrument: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4383381/#pone.0123022.s002 .
Classification:	Supplemental: Chiari I Malformation (CM)
Short Description of Instrument:	The Japanese Orthopaedic Association (JOA) Score (Japanese Orthopaedic Association, 1976) assesses the severity of clinical symptoms in patients with cervical compressive myelopathy particularly in East Asian countries (Kato et al., 2015). The Modified JOA (Japanese Orthopaedic Association, 1994) Score is the standard tool of assessment in Western countries (Kato et al., 2015).
Comments / Special instructions:	Motor dysfunction: Upper extremities 0-unable to move hands, 1-unable to eat with spoon, but able to move hands, 2-Unable to button shirt but able to eat with spoon, 3-Able to button shirt with difficulty, 4-Able to button shirt with some difficulty, 5-No dysfunction; MD Lower extremities 0-Complete loss of motor/sensory function, 1-Sensory preservation without leg movement, 2-Able to move legs but unable to walk, 3-Able to walk on flat floor with walking aid, 4-Able to walk up/down stairs with handrail, 5-Moderate to significant lack of stability but able to walk up/down stairs without handrail, 6-Mild lack of stability but able to walk unaided with smooth reciprocation, 7-No dysfunction. Sensory dysfunction: UE 0-Complete loss of hand sensation, 1-Severe sensory loss/pain, 2-Mild sensory loss, 3-No sensory loss; LE 0-Unable to micturate voluntarily, 1-Marked difficulty in micturition, 2-Mild to moderate difficulty in micturition, 3-Normal micturition.
Scoring:	The JOA scoring system consists of seven categories: motor function of fingers, shoulder and elbow, and lower extremity; sensory function of upper extremity, trunk and lower extremity; and function of the bladder. It evaluates the severity of myelopathy by allocating points based on degree of dysfunction in each category. Severe (JOA score lower than 9) Moderate (JOA score 9 to 13) Mild (JOA score higher than 13)
Rationale / Justification:	This is a widely used functional scale of motor, sensory, stability and micturition function, and as such has been validated.

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References:	<p>Key References:</p> <p>Japanese Orthopaedic Association. [Japanese Orthopaedic Association scoring system for cervical spondylotic myelopathy]. J Jpn Orthop Assoc. 1976;50:18–19.</p> <p>Japanese Orthopaedic Association. [Scoring system (17-2) for cervical myelopathy]. J Jpn Orthop Assoc. 1994;68:490–503.</p> <p>Additional References:</p> <p>Azimi P, Mohammadi HR, Montazeri A. An outcome measure of functionality and pain in patients with lumbar disc herniation: a validation study of the Japanese Orthopedic Association (JOA) score. J Orthop Sci. 2012;17(4):341–345.</p> <p>Benzel EC, Lancon J, Kesterson L, Hadden T. Cervical laminectomy and dentate ligament section for cervical spondylotic myelopathy. J Spinal Disord. 1991;4(3):286–295.</p> <p>Kato S, Oshima Y, Oka H, Chikuda H, Takeshita Y, Miyoshi K, Kawamura N, Masuda K, Kunogi J, Okazaki R, Azuma S, Hara N, Tanaka S, Takeshita K. Comparison of the Japanese Orthopaedic Association (JOA) score and modified JOA (mJOA) score for the assessment of cervical myelopathy: a multicenter observational study. PLoS One. 2015 Apr 2;10(4):e0123022. Erratum in: PLoS One. 2015;10(5):e0128392.</p> <p>Parker SL, Godil SS, Zuckerman SL, Mendenhall SK, Tulipan NB, McGirt MJ. Effect of symptomatic pseudomeningocele on improvement in pain, disability, and quality of life following suboccipital decompression for adult Chiari malformation type I. J Neurosurg. 2013;119(5):1159–1165.</p> <p>Yonenobu K, Abumi K, Nagata K, Taketomi E, Ueyama K. Interobserver and intraobserver reliability of the Japanese orthopaedic association scoring system for evaluation of cervical compression myelopathy. Spine. 2001;26(17):1890–1894.</p>
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