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[Journal of Neurosurgery](#)[Journal of Neurosurgery: Spine](#)[Journal of Neurosurgery: Pediatrics](#)[Neurosurgical FOCUS](#)**December 2008 Volume 109****Table of Contents****A validation study of a new prognostic index for patients with brain metastases: the Graded Prognostic Assessment**

Christina Maria Sperduto<sup>1</sup>, Yoichi Watanabe, Ph.D.<sup>2</sup>, John Mullan, M.D.<sup>3</sup>, Terry Hood, M.D.<sup>3</sup>, Gregg Dyste, M.D.<sup>3</sup>, Charles Watts, M.D.<sup>3</sup>, Gail Papermaster Bender, M.D.<sup>4</sup>, and Paul Sperduto, M.D., M.M.P.<sup>1,5</sup>

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*Abbreviations used in this paper:* GPA = Graded Prognostic Assessment; MST = median survival time; RPA = recursive partitioning analysis; SRS = stereotactic radiosurgery; WBRT = whole-brain radiation therapy.

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**DOI: 10.3171/JNS/2008/109/12/S14***Object*

The purpose of this study was to validate a new prognostic index for patients with brain metastases. This index, the Graded Prognostic Assessment (GPA), is based on an analysis of 1960 patients whose data were extracted from the Radiation Therapy Oncology Group (RTOG) database. The GPA is based on 4 criteria: age, Karnofsky Performance Scale score, number of brain metastases, and the presence/absence of extracranial metastases. Each of the 4 criteria is given a score of 0, 0.5, or 1.0, so the patient with best prognosis would have a GPA score of 4.0.

*Methods*

Between April 2005 and December 2006, 140 eligible patients with brain metastases were treated at the Gamma Knife Center at the University of Minnesota. The GPA score was calculated for each patient, and the score was then correlated with survival. Survival duration was calculated from the date treatment began for the brain metastases. Eligibility criteria included patients treated with whole-brain radiation therapy, stereotactic radiosurgery, or both.

*Results*

The median survival time in months observed in the RTOG and Minnesota data by GPA score was as follows: GPA 3.5–4.0, 11.0 and 21.7; GPA 3.0, 8.9 and 17.5; GPA 1.5–2.5, 3.8 and 5.9; and GPA 0–1.0, 2.6 and 3.0, respectively.

*Conclusions*

The University of Minnesota data correlate well with the RTOG data and validate the use of the GPA as an effective prognostic index for patients with brain metastases. Clearly, not all patients with brain metastases have the same prognosis, and treatment decisions should be individualized accordingly. The GPA score does appear to be as prognostic as the RPA and is less subjective (because the RPA requires assessment of whether the primary disease is controlled), more quantitative, and easier to use and remember. A multiinstitutional validation study of the GPA is ongoing.

**KEYWORDS:** brain metastasis; prognosis; radiation therapy; stereotactic radiosurgery.[PDF \(239.968 KB\)](#) | [Full Text](#)

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