# Toronto Western Hospital

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At the Toronto Western Hospital they have historically treated Brain metastases (BM) ≤ 2cm in eloquent brain with a radiosurgery (SRS) lower prescription dose (PD) to reduce the risk of radionecrosis (RN). They sought to evaluate the impact of this practice on outcomes and analyzed a prospective registry of BM patients treated with SRS between 2008 and 2017. Incidences of local failure (LF) and RN were determined and Cox regression was performed for univariate and multivariable analyses (MVA).

1,533 BM ≤2cm were evaluated. Median radiographic follow-up post SRS was 12.7 months (1.4-100). Overall, the 2year incidence of LF was lower for BM treated with PD≥21Gy (9.3%) compared with PD≤15Gy (19.5%);(subHR 2.3; 95CI 1.4-3.7;p=0.0006). The 2-year incidence of RN was not significantly higher for the group treated with PD ≥21Gy (9.5%) compared to the PD ≤15Gy group (7.5%) (p=0.16). MVA demonstrated that PD (≤15 Gy) and tumor size (>1cm) were significantly correlated (p<0.05) with higher rates of LF, and RN, respectively. For tumors ≤1 cm, when comparing PD ≤15Gy to ≥21Gy, the risks of LF and RN are equivalent. However, for lesions >1cm, PD ≥21Gy is associated with a lower incidence of LF without significantly increasing the risk of RN.

The results indicate that rates of LF or RN following SRS for BM are strongly correlated to size and PD. Based on this results, they now, depending upon the clinical context, consider increasing PD to 21 Gy for BM in eloquent brain, excluding the brain stem [1)].

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Because of the long tradition and level of academic activity in neurosurgery at the University of Toronto, Lozano et al. sought to compare that program's publication and citation metrics with those of established programs in the US as documented in the literature. So as to not rely on historical achievements that may be of less relevance, they focused on recent works, that is, those published in the most recent complete 5-year period.

The authors sought to make their data comparable to existing published data from other programs. To this end, they compiled a list of published papers by neurosurgical faculty at the University of Toronto for the period from 2009 through 2013 using the Scopus database. Individual author names were disambiguated; the total numbers of papers and citations were compiled on a yearly basis. They computed a number of indices, including the ih(5)-index (i.e., the number of citations the papers received over a 5-year period), the summed h-index of the current faculty over time, and a number of secondary measures, including the ig(5), ie(5), and i10(5)-indices. They also determined the impact of individual authors in driving the results using Gini coefficients. To address the issue of author ambiguity, which can be problematic in multicenter bibliometric analyses, they have provided a source dataset used to determine the ih(5) index for the Toronto program.

The University of Toronto Neurosurgery Program had approximately 29 full-time surgically active faculty per year (not including nonneurosurgical faculty) in the 5-year period from 2009 to 2013. These faculty published a total of 1217 papers in these 5 years. The total number of citations from these papers was 13,434. The ih(5)-index at the University of Toronto was 50.

On the basis of comparison with published bibliometric data of US programs, the University of Toronto ranks first in terms of number of publications, number of citations, and ih(5)-index among neurosurgical programs in North America and most likely in the world [2].

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Using patient-level data for NVU-eligible patients, a discrete event simulation was created to study changes in patient flow and length of stay pre- and post-NVU implementation. Varying patient volumes and resources were tested to determine the ideal number of beds under various conditions. In the first year of operation, the NVU admitted 507 patients, over 66% of NVU-eligible patient volumes. With the introduction of the NVU, length of stay decreased by around 8%. Scenario testing showed that the current level of 20 beds is sufficient for accommodating the current demand and would continue to be sufficient with an increase in demand of up to 20% [3].

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Moraes FY, Winter J, Atenafu EG, Dasgputa A, Raziee H, Coolens C, Millar BA, Laperriere N, Patel M, Bernstein M, Kongkham P, Zadeh G, Conrad T, Chung C, Berlin A, Shultz DB. Outcomes following SRS for small- to medium-sized brain metastases are exceptionally dependent upon tumor size and prescribed dose. Neuro Oncol. 2018 Sep 28. doi: 10.1093/neuonc/noy159. [Epub ahead of print] PubMed PMID: 30265328.
2)
Lozano CS, Tam J, Kulkarni AV, Lozano AM. The academic productivity and impact of the University of Toronto Neurosurgery Program as assessed by manuscripts published and their number of citations. J Neurosurg. 2015 Sep;123(3):561-70. doi: 10.3171/2014.12.JNS142553. Epub 2015 Jun 26. PubMed PMID: 26115471.
3)
Hahn-Goldberg S, Chow E, Appel E, Ko FT, Tan P, Gavin MB, Ng T, Abrams HB, Casaubon LK, Carter MW. Discrete Event Simulation of Patient Admissions to a Neurovascular Unit. J Healthc Eng. 2014 Sep 1;5(3):347-360. PubMed PMID: 25193372.