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Abstract
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Prospective Peer Review of Nearly 1,000 Courses of Stereotactic Body and Intracranial Radiation Over 3.5 Years Shows A Consistent 15-20% Revision Rate

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Abstract

Objectives:

Peer review is a core value in the practice of radiation oncology. Prospective peer review offers the advantage of allowing revisions prior to the initiation of treatment. This is of greater value in the setting of stereotactic treatment courses, which consist of 1-5 treatments in total.
Here, we report the logistics and results of a prospective, stereotactic radiation peer review program implemented at a community-based multi-location network of radiation oncology clinics, which are part of a large academic medical center.

Methods:

Weekly prospective peer review rounds of all stereotactic courses were performed March 2019 – September 2022. Attendees included physicians, physician assistants, physicists, dosimetrists and radiation therapists (RTTs) from 4 clinic locations with a total of 6 linear accelerators. Rounds were conducted virtually and scheduled for 45 minutes a week. Cases were reviewed for prescription intent as well as target and critical normal structure contours prior to planning, and then reviewed a second time to evaluate the radiation plan and achieved metrics prior to the delivery of the first fraction. Peer review rounds attendance, contour revision and plan revision recommendations were tracked prospectively. If peer review at rounds was not possible (e.g. due to the timing of treatment initiation), an offline review of contours and/or plan was performed by a peer physician.

Results:

977 stereotactic treatment courses were reviewed from 3/2019 - 9/2022. Data on whether revisions were recommended or not was available for all courses. 50% (n=492) of courses were stereotactic body radiation therapy (SBRT) and 50% (n=485) were intracranial stereotactic radiation. Of intracranial radiation courses, 62% (n=301) were stereotactic radiosurgery (SRS), 37% (n=179) were stereotactic fractionated radiotherapy (SRT), and 1% (n=5) were combined SRS & SRT.

Overall attendance at each peer review rounds ranged from 12 - 26, with a median of 18. By role group, attendance for physicians ranged from 4 - 12, with a median of 7; for physics/dosimetry ranged from 4 - 12 with a median of 9; for RTTs ranged from 0 - 5, with a median of 1. Attendance did not significantly change over time.

Peer review led to revision recommendations for 18% (n=174) of all cases. A change in modality to a non-stereotactic form of treatment (e.g. to a hypofractionated radiation plan) was recommended in 1.6% (n=16) of all reviewed courses, or 9% (16/174) of recommended revisions.

The revision rate did not significantly change over time. In 2019 it was 21%, in 2020 it was 16%, in 2021 it was 17%, and in 2022 it was 17%.

Conclusion(s):

Prospective peer review of stereotactic radiotherapy courses is feasible and beneficial. Attendance was robust and stable over the 3.5 year duration, allowing for strong peer review and multidisciplinary learning and improvement opportunities.

These data suggest that there is a baseline revision rate of approximately 15-20%, and that this rate is independent of the maturity of the stereotactic prospective peer review program. Given the limited number of fractions in a stereotactic radiotherapy course, there is significant value to prospective peer review.