AbstractID: 6718 Title: Prostate movement during radation therapy delivery

Purpose: To describe the movement of the prostate gland during the delivery of radiation therapy factions.

Method and Materials: The Calypso® system was used to document the real time position of the prostate in 17 patients during a total of 550 tracking sessions (mean tracking time 10 minutes). The fraction of time that the gland's displacement exceeded 3, 5, 7, and 10 mm is calculated. For different time intervals during the sessions, e.g. the 1st or 8th. minute, the fraction of time that displacements were observed is calculated.

Results: For individual patients the fraction of time that the gland was displaced by a 3-dimensional vector >3 mm ranged from 0.4 to 36.2% of the total observation time. The median value was 10.5%. For a 5 mm displacement the values ranged from 0 to 10.9% with a median of 2%. During the first minute 2% of all observed displacements (averaged over all patients) were larger than 3 mm but this value increased to 23% during the 10th minute. The respective values for displacements larger than 5 mm were 1 and 6%. For individual patients larger percentages were observed. In the worst cases 75% and 31% of the 10th minute was spent at a displacement larger than 3 mm and 5 mm, respectively.

Conclusion: There is a large range of observed prostate motion in individual patients during time periods similar to what is typical for radiation delivery. The likelihood of displacement increases with elapsed time after initial alignment, indicating that the time between initial alignment and radiation delivery should be minimized as much as possible.

Conflict of Interest (only if applicable):

Two co-authors are employed by Calypso Medical.

One co-author has research agreement with Calypso Medical.