An Audit of the value of the Linac Plan Check Appointment for Stereotactic Radiosurgery (SRS) / Stereotactic Radiotherapy SRT

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Background

The Radiotherapy department at Guy's and St Thomas' NHS Trust (GSTT) delivered their first stereotactic radiosurgery (SRS) treatment in August 2017. The implementation of the SRS service followed UK NHS guidance. Patients requiring more than one treatment due to size of the volume received Stereotactic Radiotherapy (SRT). As this was a new technique, the tolerance was 1mm and the majority of patients would be treated with a single fraction, a Linac plan check appointment 48 hours before the commencement of treatment was recommended. CTV-PTV margins for SRS and SRT treatment are 0.1cm therefore it is necessary to set the action level at 0.05cm and image at every couch angle prior to treatment delivery and if AlignRT indicated that the patient has moved.

The purpose of the Linac plan check appointment was to:

- Ensure that the patient is still fit for treatment
- Ensure that the patient is able to maintain the treatment position for a sustained period of time
- Confirm that all of the planned beams are deliverable
- Ensure that the gantry angles required for KV-KV pairs at non-coplanar angles are possible (Because of clearance issues it is necessary to use KV-KV orthogonal pair, verification at non-cardinal angles when at non-coplanar couch angles)
- Anecdotally, it was felt by the radiographers that it was rare for changes to be made following the plan check appointment and that the plan check appointment was not a good predictor or test of the patient's ability to cope with treatment delivery.

Aim

The primary aim of the audit is to ascertain if a plan check appointment is necessary for patients referred for SRS treatment. Necessity is defined by the requirement to make changes or re-plan the patient prior to fraction 1 of treatment following a discovery made at the plan check appointment. The following questions were asked:

- Was the treatment amended or re-planned as a result of the plan check?
- Was there any benefit to patient compliance for the patient on the day of treatment

Method

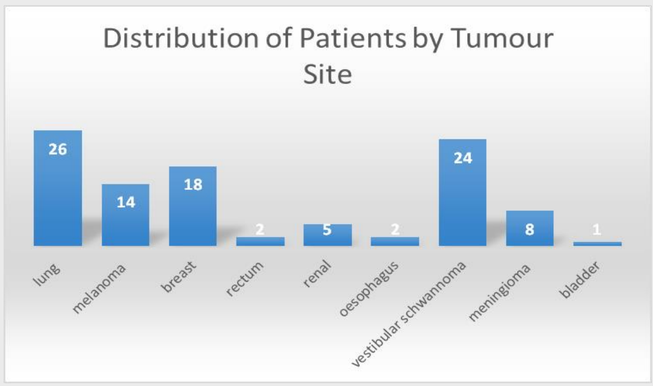
All patients who completed a course of SRS/SRT at GSTT between 7th June 2018 and 7th March 2019 were reviewed. This represented a total of 100 patients and 122 plan checks and treatment day 1 as 20 patients had two isocentres requiring 2 plan checks and two treatment appointments/ 1 patients had an extra image and recordings due to one patient had rotation of 3.3 and one patient moved.

Electronic patient records on Mosaiq were reviewed for all patients to evaluate the plan check and treatment data from the SSD recording sheet.

Data from the plan check and day one treatment were compared to determine if there was a benefit for patients having a "practice session" and were there any problems that were identified that needed resolving before treatment.

Results

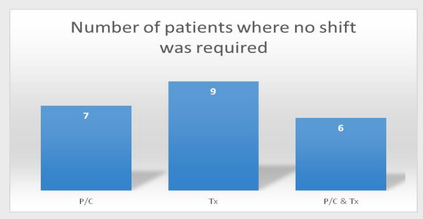
100 patient records were reviewed. No patients required a re-plan during this period. One benign patient declined treatment after his plan check and one benign patient's treatment could not be delivered due to an issue with movement on imaging due to lack of bone covering and a meningocele.



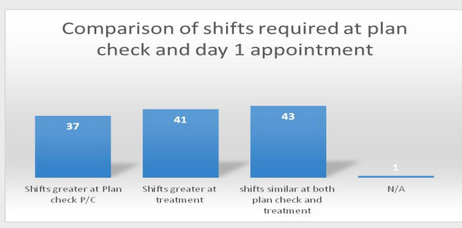
Discussion

In the 12 month period covered by the audit no patient had a re-plan as a result of the Linac plan check process. The removal of the plan check appointment for patients having SRS would save 120 hours (100 patients of which 20 had 2 isocentres assuming that each plan check takes 1 hour of delivery time) of Linac time, which equates to 15 full days based on a 8 hour day. As SRS is a specialist commissioned service, treatment delivery including Linac plan check, is paid as a package and consequently there would be no associated loss of revenue if the plan check appointment was removed. This saving needs to be off set against the estimated extra time on day 1 treatment day of up to 15 minutes to carry out the machine and collision checks prior to delivery of the treatment. This would equate to 30 hours still leaving a net saving of 90 hours equating to 11 days.

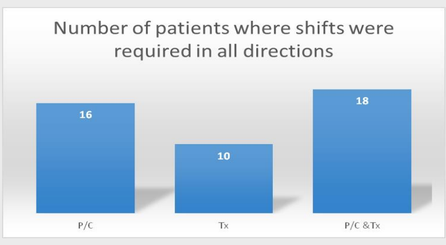
Graph showing comparison between plan check and day 1 treatment of patients requiring no correctional shifts in all three directions



Graph comparing shifts at plan check and day 1 treatment



Graph showing the number of patients requiring correctional shifts in all directions



Conclusion

Based on the outcomes from the audit the Linac plan check appointment does not pre-empt any problems prior to the commencement of treatment. Data analysed did not show an improved conformance resulting in a smaller shift on the day of treatment, indicating that a "rehearsal" did not improve compliance. In view of the advantages the removal of this appointment would afford to the patient, and the saving in Linac capacity for the department, the Linac plan check should be removed from the SRS/SRT patient.

Outcomes

Remove the Linac plan check from the SRS/SRT pathway and increase the day 1 appointment by 15 minutes to allow time to check for collisions

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