considered when choosing this therapeutic approach for younger patients.

PO-1005
AAPM TG-158: assessing and lowering doses outside the treatment volume from external-beam radiation therapy
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Purpose/Objective: Measuring, calculating, and reducing non-target doses present unique challenges with which many medical physicists may have limited experience. The American Association of Physicists in Medicine Task Group (TG) 158 report: 'Measurement and calculation of doses outside the treatment volume from external-beam radiation therapy' provides guidance for physicists in assessing and managing non-target doses. The primary objectives of this presentation are to (1) highlight major concerns with non-target radiation, (2) provide a rough estimate of doses associated with different treatment approaches in clinical practice, and (3) to highlight techniques that may be considered for reducing non-target doses and (4) summarize TG-158 recommendations for both clinical and research practice.

Materials and Methods: The TG-158 report reviewed approximately 300 publications in the literature to provide guidance on management of non-target doses. This presentation will summarize key components of the report and its recommendations.

Results: The Task Group 158 report generated guidance for physicists in terms of doses to non-target structures, dosimetry and computational techniques for assessing non-target doses, as well as potential treatment and patient management options for minimizing non-target doses. This was done by addressing the following charges:
1. Highlight major concerns with non-target radiation
2. Provide a rough estimate of doses associated with different treatment approaches in clinical practice
3. Discuss the uses of dosimeters and phantoms for measuring photon, electron, and neutron exposures
4. Discuss the use of calculation techniques (including Monte Carlo) for dosimetric evaluations
5. Highlight techniques that may be considered for reducing non-target doses
6. Make recommendations for clinical and research practice

This presentation will summarize the Task Group report’s findings on topics 1, 2, 5, and 6 from the list above. Topics 3 and 4, measurement and calculation of non-target doses, are each broad topics and separate abstracts detailing these topics are separate submitted abstracts at this meeting.

Conclusions: This presentation will summarize key components of the AAPM TG-158 report and its recommendations.

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Investigation into out-of-field dosimetry
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Purpose/Objective: The literature has reported that some TPSs underestimate the dose outside the radiation field edge (out-of-field). Sources of out-of-field dose are phantom scatter, head scatter and head and MLC leakage and transmission. The issues associated with inaccurate out-of-field dose reporting is with secondary cancer risk estimation, incorrect clinical decisions based on inaccurate OAR doses, incorrect estimation of dose to implanted devices and pregnant patients, etc. The aim of this study was to understand how different detectors respond to out-of-field radiation and compare measurements to Monte Carlo (MC).

Materials and Methods: Profiles extending ~20 cm outside the radiation field edge and divergent out-of-field PDDs were acquired with a range of clinically available detectors (PTW microDiamond, EDiode, Pinpoint and SRS Diode) using a PTW MP3 Watertank for a 10x10cm2 field and 90cm SSD on an Elekta Precise linac operating at 6MV. X, Y and diagonal profiles were acquired at depths of dmax, 5, 10, 15 and 20cm. Divergent PDDs were acquired at 1,2,3,4,5,7,10 and 15 cm from the field edge using in-house software to correct for daily beam inclination changes. A MC linac model was created in BEAMnrc and dose calculations were performed using DOSXYZnrc.

Results: All profiles were normalised to their respective CAX dose and agreed to within 0.5% at depths of dmax and 5cm and within 1% at depths between 5 and 20cm. Comparison of the measured out-of-field profiles to MC reveals agreement to within 1%. The SRS diode deviates from both MC and the other detectors at depths greater than 5 cm better agreement is observed at shallower depths.

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All divergent PDDs were normalised to their respective average dose. The divergent PDDs (Fig. 1) display an initial build-up and down portion followed by a second smaller build-up region for PDDs acquired at 1-10cm from the field edge.