



PHYSICS

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Harmonisation and standardisation in SBRT planning

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The applications of stereotactic body radiotherapy (SBRT) are continuously increasing, in terms of treating different disease sites (targeting tumours in several organs rather than only in the lungs and liver as previously), using new treatment paradigms (treating oligometastatic disease rather than only primary cancer and solitary metastases) and widening its use beyond academic centres. However, due to large variability in SBRT planning, delivery and reporting between institutions, the interpretation of published SBRT studies can be challenging and more harmonisation is warranted. This harmonisation was the main purpose of this workshop.

Thirty participants who represented more than 12 nationalities and came from both European Union (EU) and non-EU institutions, companies and organisations that undertook radiotherapy clinical trials, met first in late May 2021. The workshop opened with enlightening talks about clinical needs (Piet Ost, radiation oncologist, Iridium Netwerk, Antwerp, Belgium) and confounding factors in the outcome of SBRT treatments because of the heterogeneous management of SBRT practices (Jan Seuntjens (radiation physicist, McGill University, Canada), Paul Keall (radiation physicist, University of Sydney, Australia) and Angela Davey (radiotherapy researcher, University of Manchester, UK)). The talks were followed by pitches from all the participants, in which each presented their background and SBRT expertise and pointed out what they considered to be the biggest challenges in SBRT. These pitches resulted in lively discussions - which extended into another day - and highlighted the reasons for holding this workshop: that SBRT practices are so different from institution to institution that meaningful comparison is difficult. Although there are published guidelines and recommendations (for instance from the International Commission on Radiation Units and Measurements and from the European Society for Radiotherapy and Oncology's advisory committee for radiation oncology practice (ESTRO ACROP)), the involvement of physicists and practices related to SBRT delivery are far from being clearly stated.

Based on participants' pitches, we identified a list of potential outcomes on which we wanted to focus:

- publication of a paper on the challenges regarding SBRT planning and delivery;
- production of an editorial on minimum requirements regarding prescription/dose distribution/delivery for publication of SBRT studies;
- performance of a critical review of the physics guidance that is available for SBRT clinical trials;
- performance of a survey on SBRT practice (focused on physics aspects);
- production of a definition of SBRT planning scores to harmonise practice; and
- the drawing up of guidance on how to set an end-to-end test for SBRT.

After democratic voting among the participants and further discussion, two outcomes were prioritised for further work. Therefore, at the beginning of the summer, the group split into two sub-groups, which met and worked separately. The groups joined again virtually in the last plenary session.

Despite the lack of physical contact and the impossibility of seasoning the scientific discussion with some amusing conviviality, the group was lively and productive, partially thanks to the use of online collaborative platforms. The effort will continue in the next months while the participants wait for the opportunity to meet.



Figure 1 Some of the working group participants during a Zoom meeting

Subgroup dedicated to SBRT practice survey

The group discussion highlighted a need to track and, somehow, measure the variety of everyday clinical practices that are employed around the world to manage SBRT treatments. To this end, an online survey is under preparation. The survey has been developed following a guide produced by Burns [1] and it will be focused on SBRT lung treatments. It will consist of approximately 25 questions covering: dose specification and target-volume definition; planning and quality assurance details; motion management techniques; and image-guided radiation therapy procedures. A first draft is undergoing pilot testing among the group members. Our goal is to distribute it before the end of this year. We hope to analyse and publish the results within the first quarter of 2022.

Subgroup dedicated to systematic review of treatment planning, delivery and reporting parameters in SBRT clinical trials

We are aiming for a systematic review of phase II and III SBRT trials, to investigate whether peer-reviewed publications and clinical trials protocols in SBRT report enough dosimetric data to ensure safe and robust implementation in real-world clinics. The timeline is presented in Figure 2 below. Some steps involve the whole subgroup, while in others, the core group members have specific tasks. The systematic review is registered to the international prospective register of systematic reviews (PROSPERO); data collection templates are prepared. The core group is screening abstracts for inclusion in the review. A draft paper is expected to be ready before ESTRO 2022.

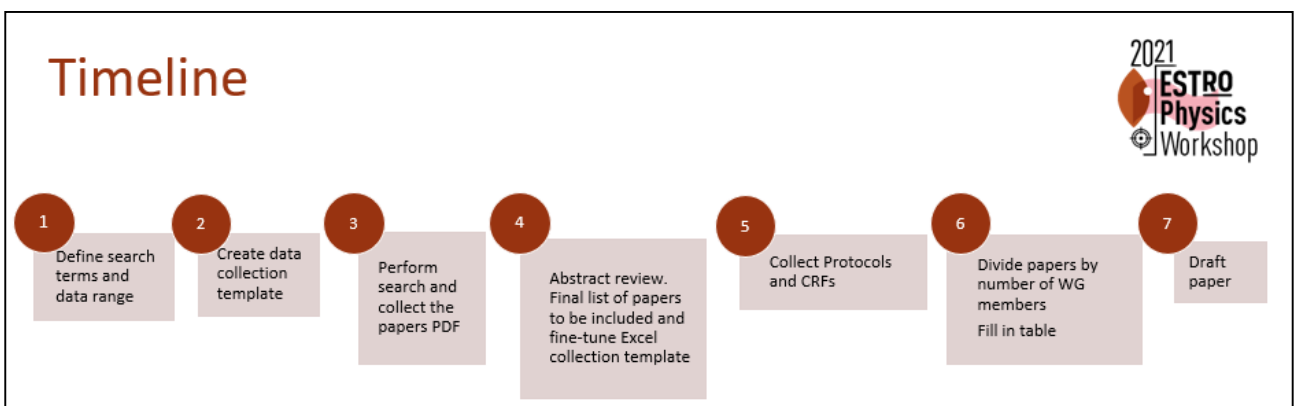


Figure 2 Timeline for the systematic review of treatment planning, delivery and reporting parameters in SBRT publications

Following the results of the survey and the systematic review, two next steps will follow: the development of quality indices for the reporting of SBRT plans; and the establishment of recommendations on minimum requirements regarding the reporting of dosimetric SBRT parameters in peer-reviewed papers.





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Reference

[1] Karen E.A. Burns et al. CMAJ Jul 2008, 179 (3) 245-252; DOI: 10.1503/cmaj.080372

