Background

In February 2020, NHS England Clinical Priorities Advisory Group signalled that funding would continue for stereotactic ablative body radiotherapy (SABR) for adult patients with metachronous extracranial oligometastatic cancer and for hepatocellular carcinoma [1]. Subsequently, the routine commissioning confirmation was published in March 2020 [2].

SABR requires careful implementation due to the high dose per fraction delivered and the complex nature of both planning and delivery. The UK SABR Consortium offers consensus expert guidance on all components of the SABR patient pathway [3].

The consortium has played a key role in facilitating the national adoption of SABR for primary lung cancer in 2009 and subsequent indications via the Commissioning through Evaluation programme in the United Kingdom (UK). It is imperative that SABR should be implemented in an appropriate framework in order to safely translate policy decisions into real clinical improvements.

The framework should include: receiving appropriate training in clinical and technical aspects of SABR; receiving appropriate mentorship for all clinical and technical aspects of SABR; and undergoing external validation.

Scope

This guidance document aims to set out broad guidance to assist in providing a consistent approach and framework in which a more experienced 'mentoring' centre can provide assistance to a 'mentee' centre that wishes to set-up or extend their SABR service.

It is strongly recommended that the mentor centre is tightly aligned with the mentee centre in terms of their approach to motion management/image guided radiotherapy (IGRT), radiotherapy planning and treatment delivery systems. Where this is not practical, alignment between motion management/IGRT and radiotherapy treatment planning systems should be prioritised.

This document is not intended to be prescriptive and of course ultimate responsibility for the safety of SABR delivery lies with the centre delivering the treatment. It is incumbent upon the mentee centre to ensure adherence to all external guidance and principles of best practice.

Definitions

'Mentee centre' is used to describe the centre that is to receive mentoring

'Mentoring centre' is used to describe the centre that is to provide mentoring

The SABR mentoring process

This mentoring scheme should provide end-to-end support of the SABR process, such as motion management including 4-dimensional computed tomography (4DCT), multi-modality imaging and registration, tumour and organs at risk (OARs) delineation, treatment planning and treatment delivery including IGRT. The SABR team from the mentee centre should be composed of at least one identified clinician, one physicist and one radiographer. This team should have agreed clinical protocols for sites intended for treatment, have undertaken appropriate theoretical training in SABR delivery and have agreed a provisional action plan for the clinical implementation of SABR. The linear accelerators and radiotherapy treatment planning systems must be commissioned clinically for SABR.

The process below gives recommendations for components of the mentoring process. If deemed appropriate by the mentor and the mentee then some or all of the visits could

be replaced with video conferencing. The recommended components of mentoring process are:

- Scoping questionnaire completed by the mentee centre
- Scoping visit by the mentoring centre to the mentee centre
- Remote support from the mentoring centre to assist with setting up local protocols including CT scanning, motion management, treatment planning, IGRT and treatment delivery
- QA and planning support visit by the mentoring centre for the first clinical patient of the mentee centre.
- First clinical treatment visit by the mentoring centre
- Remote support to subsequent SABR patients from the mentoring centre for a short subsequent period.

Scoping Questionnaire completed by the mentee centre

A scoping questionnaire will be sent to the mentee centre to ascertain which anatomical sites are of interest for start-up or expansion in to for the mentee centre / Radiotherapy Operational Network. It will be used to ascertain the position that the mentee centre has reached and provide the mentor centre assistance in making an initial assessment of the support that is required and the costs.

Scoping visit by the mentoring centre to the mentee centre

The mentoring centre will ideally send a SABR physicist and radiographer to the mentee centre to meet with the clinicians, physicists and radiographers who will be implementing SABR. It may be decided to have this discussion over video conferencing. The purpose of this visit is to identify barriers and suggest solutions to SABR implementation, to establish the mentoring needs and fit the mentoring process to those needs. The mentoring centre should provide sample clinical protocols and work instructions if needed. Arrangements for the mentoring centre to view or receive patient data securely should be discussed.

One possible suggestion after the scoping visit is that the mentee centre can send their SABR team to the mentoring centre to spend one or two days with experienced SABR planners and clinicians following through the planning and patient dosimetric verification, patient treatment localisation in a live environment. SABR treatments should also be observed including the on-line IGRT process. The team should review SABR patient treatment imaging off-line and discuss image registration methods and potential issues. It is recommended that the mentoring centre should host and allow the mentee centre to access a sample of SABR cases for the anatomical site being mentored.

Remote support from the mentoring centre

Email, telephone and video conferencing support should be used to help guide the mentee centres in the development of their clinical protocol and planning/treatment process documents. It is recommended that the mentoring centre should remotely review and evaluate the SABR treatment plans including target/OAR contours assessment for 3 non-clinical patients and the first clinical patient at the mentee centre.

QA and planning support visit by the mentoring centre

Once remote approval of protocols and work instructions have been given, arrangements will be made for the first clinical patient. A time should be agreed for patient pre-treatment, treatment planning and quality assurance (QA) to be carried out. It is recommended that a SABR physicist from the mentoring centre should visit the mentee centre to support this and to provide guidance on all aspects of the SABR patient pathway. It may be decided that this can be done remotely.

Table 1 Suggested schedule for the support visit

Pre-treatment	• Imaging (including 4DCT and gating and the use of magnetic resonance imaging)

	• Immobilisation (including abdominal compression if required) • Assessment of tumour motion
Planning	• Mutli-modality image registration • Internal target volume (ITV) in respect of motion management and target localisation • Suitable planning target volume (PTV) margin with analysis of errors • Understanding the concept of inhomogeneous PTV dose and rapid dose fall off • Familiarisation with OAR tolerances given the significantly higher dose per fraction • Achieving PTV coverage and conformity • Dose prescription
QA	• Confidence in small-field dosimetry and appropriate equipment/method to use for independent patient QA • Appropriate 4DCT QA • Appropriate conebeam CT (CBCT) QA
Treatment	• CBCT soft tissue matching (including suitable regions of interest for matching) • Appropriate Action level for matching considering uncertainties

First clinical treatment visit by the mentoring centre

If deemed appropriate a SABR radiographer from the mentoring centre should be present for the first clinical treatment at the mentee centre and to help with the IGRT issues described above. A physicist from the mentoring centre should ideally be present or available for advice over the phone or video conferencing if necessary.

Remote support to subsequent SABR patients

The remote support provided as described in the previous sections should be available for a fixed period (for example 3 months) and the mentee centre should ensure that they treat a reasonable number of patients during that period. These could be for the same clinical site or different sites as agreed. The length of the remote support by mentoring centre can be varied depending on patient numbers and should be agreed between the mentor and mentee centres at the outset.

Additional components

Although outside the scope of this guidance, in parallel with mentoring for SABR service set-up or expansion, it is expected and highly recommended that the following components are undertaken. In addition, commissioners may mandate external approval of some or all of the following components prior to clinical SABR treatments being undertaken

- Appropriate RTTQA planning exercise(s)
  to determine the treatment plan quality

- Appropriate RTTQA Clinician contouring exercise(s)
  to determine the accuracy of clinical target and OAR definition

- Appropriate RTTQA/ NPL Dosimetry audit(s)
  to confirm accurate and safe dosimetric delivery. SABR is a high risk technique and the SABR consortium very strongly recommend external audit such as those available through the RTTQA group. RTTQA/NPL offer an audit appropriate for lung SABR and one for spine SABR

References

1. NHS England. November 2019 Prioritisation Decisions. https://www.england.nhs.uk/wp-content/uploads/2020/02/November-2019-prioritisation-decisions.pdf. Accessed on 20th May 2020.

2. NHS England. Stereotactic ablative radiotherapy (SABR) for patients with metachronous extracranial oligometastatic cancer (all ages). https://www.england.nhs.uk/publication/stereotactic-ablative-radiotherapy-sabr-for-patients-with-metachronous-extracranial-oligometastatic-cancer-all-ages/. Accessed on 20th May 2020.

3. The UK SABR Consortium. Stereotactic Ablative Body Radiation Therapy (SABR): A Resource. https://www.sabr.org.uk/wp-content/uploads/2019/04/SABRconsortium-guidelines-2019-v6.1.0.pdf. Accessed on 20th May 2020.

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