# Are therapeutic radiographers able to achieve a clinically acceptable match for stereotactic lung radiotherapy treatment (SBRT)?

**Descriptor:**

This audit aimed to prospectively assess the accuracy of radiographer verification of CBCT images for SBRT treatment delivery and the feasibility of local implementation of radiographer-led on-line image verification for SBRT.

**Background:**

SBRT for treatment of early stage peripheral non-small cell lung cancer (NSCLC) improves outcomes [1]. However, daily on-line imaging is essential to ensure accuracy in delivery of these hypo-fractionated high-dose treatments [2,3]. Currently in the department on-line verification of cone beam computerised tomography (CBCT) images for SBRT is performed by a clinical oncologist. The National Radiotherapy Advisory Group (NRAG) recommends more effective use of the skilled multi-professional workforce to meet the demands of an ever expanding radiotherapy service [4]. Utilising therapeutic radiographers to perform on-line verification improves efficiency but requires competency to be assessed before implementation.

## The Cycle

**The standard:**

• 3D images (CT, MRI) should be used to localise target volume and OAR

• 3D images (CT) should be used to plan SBRT treatment

• CBCT images should be acquired and used for verification purposes

• The clinical oncologist’s original online verification match is taken as the audit standard

**Target:**

90% of therapeutic radiographers to be within 2mm of the audit standard in all three planes (left/right, superior/inferior, anterior/ posterior).

## Assess local practice

**Indicators:**

The indicator was defined as a radiographer match within 2 mm of the clinician’s original verification with a target of 90% agreement.

**Data items to be collected:**

• CT localisation image data set

• CBCT data set images from the first fraction of each SBRT treatment

• Age

• Stage of disease

• Size of tumour

• Position of tumour within lung

**Suggested number:**

All patients receiving SBRT for mobile, peripheral lung tumours since the introduction of hypofractionated lung radiotherapy within the department in 2009.

**Suggestions for change if target not met:**

• Identify reasons for not meeting required agreement; look at staff training and experience. Where there any recurring themes such as tumour size and location for example?

• Provide CBCT training workshops specific for SBRT verification imaging

• After SBRT specific training radiographers to retrospectively verify CBCT images replicating the initial guidelines and targets

**Resources:**

• Personnel required: Clinical director, audit lead, clinical oncologist, therapeutic radiographers

• Time: 2.5 hours for each radiographer to complete verifications and associated paperwork, 20 hours for all data to be collated and reviewed

**References:**

1. Grills IS, Hope AJ, Guckenberger M, et al. A collaborative analysis of stereotactic lung radiotherapy outcomes for early-stage non-small-cell lung cancer using daily online cone-beam computed tomography image-guided radiotherapy. J Thorac Oncol.2012;7(9):1382-93.
2. Guckenberger M, Krieger T, Richter A, et al. Potential of image-guidance, gating and real-time tracking to improve accuracy in pulmonary stereotactic body radiotherapy. Radiother Oncol. 2009;91(3):288-95
3. Burnett SS, Sixel KE, Cheung PC, Hoisak JD. A study of tumor motion management in the conformal radiotherapy of lung cancer. Radiother Oncol. 2008;86(1):77-85.
4. Radiotherapy: Developing a world class service for England. Report to Ministers from National Radiotherapy Advisory Group. 2007

**Editor's comments:**

This Audit is aimed at assessing the introduction of therapeutic radiographer led verification for SBRT.

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**Published Date:**

Monday 8 April 2013

**Last Reviewed:**

Tuesday 17 April 2018