# Re-Audit of Radical Radiotherapy outcomes for Medically Inoperable early Non Small Cell Lung Cancer (NSCLC).

**Descriptor:**

This audit will measure local management of medically inoperable NSCLC against national guidelines from 2004 to 2007.It will also compare current survival outcomes against two previous audits carried out in 1986-1992 and more recently in 2001 to 2003 in a similar population.Also moving towards the delivery of Stereotactic Ablative Body Radiotherapy (SABR) in our region, we wanted to estimate the number of patients who may be suitable for this treatment per year.

**Background:**

Lung cancer is one of the most common cancers and has high mortality rates across all stages of disease. (1)In comparison to Sweden and Canada the UK has lower cure rates; reasons for this are thought to be that the UK lung cancer population is frailer, and has more advanced stage at diagnosis. However, wide disparities in stage specific survival suggest differences in treatment and some of this may be due to access to specific advanced radiotherapy treatments (2).The management of NSCLC has changed dramatically over the past 5-10 years due to advances in surgery, radiological staging, combined modality therapies, and advances in radiation technology. In particular the use of [F18]-2’-fluoro-2’-deoxy-D-glucose (FDG) Positron Emission Tomography Computed Tomography ( PETCT) used for staging.For Stage I & II NSCLC (6th Edition of AJCC staging), surgical resection is considered the standard of care in patients medically fit for surgery.However, many patients are unable to have surgery due to medical co-morbidities. These patients tend to be older and frailer with poor World Health Organization Performance Status (WHO PS). These factors preclude them from surgery due to high anaesthetic risk. Biopsy is difficult due to poor pulmonary function tests (PFT’s) with low Forced Expiratory Volumes in one second (FEV1). This makes the risk of pnemothorax associated with computed tomography (CT) biopsy, greater for these patients.Radical radiotherapy (RT) is an option for treatment for medically or technically inoperable Stage I/II NSCLC. A number of regimes exist around the United Kingdom (UK) for management of these patients including:• CHART (Continuous Hyperfractionated Accelerated Radiotherapy),• 52.5 - 55Gy/20#/OD/4weeks or• 64-66Gy/32-33#/OD/6.5 weeks.These are endorsed within national guidelines i.e. National Institute for Clinical Excellence and Royal College of Radiologists guidelines i.e. CHART (54Gy/36#/12days/TID) or 55Gy/20#/4weeks/OD or 64-66Gy/32-33#/6.5 weeks/OD (3-4).A large number of UK centres do not use CHART routinely due to the logistic requirements of delivering radiotherapy treatment three times daily in a radiotherapy department.However, in the past 10 years, Stereotactic ablative radiotherapy (SABR) has become a standard of care for Stage I peripheral NSCLC who are medically unfit or inoperable and there has been increasing implementation in Europe over the past 5 years.There is expanding prospective and retrospective data from USA, Japan and Netherlands which support the role of SABR. These studies consistently show local control rates of 80–98 % at 3yrs, overall survival (OS) 50–70 % at 3 yrs, but distant metastasis of up to 30% at 3 years (5).

## The Cycle

**The standard:**

NICE CG121•Offer CT- or ultrasound-guided Trans thoracic needle biopsy to patients with peripheral lung lesions.•Offer PET-CT as the preferred first test after CT showing a low probability of mediastinal malignancy (lymph nodes < 10 mm maximum short axis on CT) for patients who are potentially suitable for treatment with curative intent.•Radical RT is indicated for patients with stage I, II or III NSCLC who have good PS (0,1) and whose disease can be encompassed in a radiotherapy treatment volume without undue risk of normal tissue damage.•All patients should undergo PFT’s before having radical RT for NSCLC.•Patients with stage I or II NSCLC who are medically inoperable but suitable for radical RT should be offered the CHART regimen.•If CHART is not available, offer conventionally fractionated radiotherapy to a dose of 64–66 Gy in 32–33 fractions over 6 1/2 weeks or 55 Gy in 20 fractions over 4 weeks.CHART•2 year OS 30%•3 year OS 20%

**Target:**

70% of patients should have biopsy of the lesion pre treatment with radical radiotherapy.100% of patients should have PETCT for staging if disease.100% of patients should have pulmonary function tests pre radical radiotherapy treatment.2 year and 3 year overall survival (OS) should be = 30% and 20% respectively.

## Assess local practice

**Indicators:**

1. Proportion of patients having biopsy of the lesion pre treatment with radical radiotherapy.2. Proportion of patients having PETCT for staging.3. Proportion of patients who were WHO PS 0–1.4. Proportion of patients who had pulmonary function tests pre radical radiotherapy.5. Proportion of patients who received 64 – 66 Gy in 32–33 fractions over 6 ½ weeks or 55 Gy in 20 fractions over 4 weeks. (Note CHART is not available in this cancer centre).6. 2 and 3 year OS.

**Data items to be collected:**

1.Age2.Pre-treatment WHO PS3.Co-morbidities4.Type of biopsy – CT or US Guided biopsy.5.Pathology6.Staging PET CT7.Pulmonary Function Tests – FEV1, DLCO and KCO8.Disease Stage – T N M AJCC 6th Edition9.Thoracic radiotherapyoStart dateoCompletion dateoTreatment GapsoTotal radiation dose administeredoFractionationoTreatment timeoTreatment intentoReasons if palliative10.Treatment-related toxicity (Common Terminology Criteria version 3)oEarly (= 3 months)oLate (> 3 months)11.Treatment responseoRecist Criteria12.Treatment outcomeoOverall survivalo2- and 3-year survival rate13.Patients suitable for SABR as per SABR UK Consortia Guidelines (6):oMDT confirmed diagnosis of NSCLC based on findings of positive histology, positive PET scan or growth on serial CT scanoClinical stages of T1 N0 M0 or T2 (=5cm) N0 M0 or T3 (=5cm) N0 M0oWHO PS 0-2oPeripheral lesions outside a 2cm radius of main airways and proximal bronchial tree.

**Suggested number:**

Patients diagnosed with Stage I and II Non Small Cell Lung Cancer over a period of 4 years.

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

• Identify problems in the diagnostic pathway to ensure patients are having pulmonary function tests and being assessed appropriately for biopsy by the multidisciplinary team. Discuss with radiology department capacity for all radical NSCLC patients to have PET CT for staging• Develop departmental protocol to guide management if one not available• Review departmental protocol against current national guidelines and identify reasons for non-concordance• Review adherence to departmental protocol• Re-audit in 12 months

**Resources:**

Data collection methods: Password protected Microsoft Excel Spreadsheet to collect data which can be transferred into SPSS (Statistical Product and Service Solutions) Statistics package for analysis.Personnel: Audit lead, audit facilitator, consultant respiratory oncologist, therapy radiographer, statistician, junior medical staff – specialist trainee and core traineeTime: 3 months to collect and analyse data and prepare report for audit committee. Presentation to be made to the audit meeting and Action Plan decided. Implementation date set and agreed date for re-audit.

**References:**

1. (1)Coleman MP, Forman D, Bryant H, Butler J, Rachet B, Maringe C, et al. Cancer survival in Australia, Canada, Denmark, Norway, Sweden, and the UK, 1995–2007 (the International Cancer Benchmarking Partnership): an analysis of population-based cancer registry data. The Lancet 2011;377(9760):127-138.(2) Walters S et al “Lung cancer: Original article: Lung cancer survival and stage at diagnosis in Australia, Canada, Denmark, Norway, Sweden and the UK: a population-based study, 2004–2007” The ICBP Module 1 Working Group. Thorax 2013;68:6 551-564 Published Online First: 11 February 2013 doi:10.1136/thoraxjnl-2012-202297(3) National Institute for Health and Clinical Excellence. “The diagnosis and treatment of lung cancer (update)”. NICE 2011. <http://guidance.nice.org.uk/cg121>(4) Saunders M, Dische S, Barrett A, Harvey A, Griffiths G, Parmar M. Continuous, hyperfractionated, accelerated radiotherapy (CHART) versus conventional radiotherapy in non-small cell lung cancer: mature data from the randomised multicentre trial. Radiotherapy and Oncology 1999;52(2):137-148.(5) Senan S, Lagerwaard F. Stereotactic radiotherapy for stage I lung cancer: Current results and new developments. Cancer/Radiothérapie 2010;14(2):115-118.(6) Stereotactic Ablative Body Radiation Therapy (SABR): A Resource. SABR Consortium April 2011.

**Editor's comments:**

The results of a national RCR audit of radical lung radiotherapy will be available in 2014 which should allow centres to compare practice

**Submitted by:**

Dr Paula Hunt (nee McCloskey)

**Published Date:**

Tuesday 10 September 2013

**Last Reviewed:**

Tuesday 1 March 2022