Technoleg Iechyd Cymru
Health Technology Wales

Topic Exploration Report

This report summarises the results of a brief exploration to establish the quantity and quality of existing high-level evidence on the procedure of interest.

Topic:	Stereotactic Ablative Body Radiotherapy (SABR) for people with central non-small-cell lung carcinoma (NSCLC)
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Purpose

On behalf of Health Technology Wales, Cedar researchers conducted a rapid review of evidence on the implementation and use of SABR for people with central non-small-cell lung carcinoma (NSCLC). This exploratory summary will inform the prioritisation of radiotherapy procedures to be introduced at Velindre Cancer Centre (VCC), alongside expert opinion and other considerations. It could also be used to clarify the scope of an evidence appraisal. Some of the background information and resource impact considerations was submitted by clinical teams at VCC.

Background

Stereotactic ablative radiotherapy (SABR) is a method of delivering radiotherapy to a very precise area of the body, while limiting the rest of the body's exposure. SABR uses small beams of radiation directed from different angles that meet at the tumour. This means that the tumour receives a high dose of radiation, while the surrounding healthy tissues receive a low dose (Macmillan website). It is normally used for small early- stage cancers.

Use is proposed for patients with non-small cell lung cancer whose tumours are very close important areas such as the heart, oesophagus, spinal cord, central airways. This are known as central NSCLC, as opposed to peripheral NSCLC. Across Wales in 2015 there were 2,467 patients diagnosed with lung cancer (WCISU). 87% of lung cancers in UK and NSCLC (Cancer Research UK accessed 30 Nov 2018, however information was not identified on how many were central or inoperable.

Proposed PICO	
Population	Patients with central NSCLC *Clarification: would be useful to define if patients have to be early stage, and if they are not suitable for surgery.*
Intervention	Stereotactic ablative radiotherapy (SABR)
Comparator	Standard fractionation (55Gy/20#)
Outcome measures	Progression free survival, overall survival, recurrence, cost

Summary of findings

There are guidelines from NICE, Health Care Improvement Scotland and NHS England commissioning guidance that early stage, inoperable NSCLC is suitable for SABR. These guidelines do not distinguish between peripheral and central tumours. The UK SABR consortium guidance (2016) includes the use of SABR for early stage, inoperable peripheral NSCLC, but not central NSCLC.

The guidance for operable NSCLC tumours tends towards surgery in most cases, although again, there is no distinction between peripheral and central tumours.

A forthcoming update of the NICE CG has the evidence reviews (Oct 2018) available on the website, however none of the selected, or excluded papers on central NSCLC. Google and Medline searches identified papers that included a small number of observational single arm studies and retrospective studies.

Economic impact

The proposal states that no additional equipment is required, which is plausible. The proposal also appears to estimate a 2 week WTE set up period initially, to develop the protocol. There is an ongoing additional staffing requirement per patient for treatment delivery.

The conventional treatment delivery is 20 treatments at 15 minutes each (total of 5 hours per patient). SABR is calculated at 8 treatments of 30 minutes (total of 4 hours). The proposal appears to include 2 staff members in the delivery of treatment, in which case SABR would save 2 hours in treatment time per patient. The planning and delivery together result in an additional requirement for 2 hours staff time per patient. For the estimated 18 patients, this would be 36 staff hours per year (after protocol development)

The costs estimated for staff are very low, and full staff costs are expected to be approximately double this rate. The estimated costs do not consider the patient outcomes. This could include the cost of any complications such as toxicity, and also any costs or savings from changes in progression free survival and associated treatments. There may be a service impact, as although time required with the LINAC machines is reduced, overall staff requirements are higher.

The UK SABR Consortium recommend quality assurance measures that include staff training, and an audit of patients, with follow- up of 2-5 years. These will have cost and staff time implications.

Prioritisation criteria

Clinical impact (Potential for the technology to have an impact on patient-related health outcomes):
Initial scan of the evidence does not seem to give a clear indication of agreed benefit.

Budget impact (Impact of the technology on health care spending):
Based on submitted model. It is uncertain if possible complications or benefits would be a net cost or saving. The estimated total cost for year 1 (including training and protocol development is £2,597.76).

Population impact (The size of the population that would be affected by the technology):
Proposal estimates 18 patients only or 0.73% of all lung cancer patients in Wales in 2015 (based on WCISU; (18/2467)*100%).

Equity (The technology has the potential to introduce, increase, or decrease equity in health status):
For patients not suitable for surgery, this may offer an alternative treatment.

Questions for researcher

Based on the sources you have identified, is your impression that the evidence is likely to:

- favour implementation of the procedure?
- favour standard care?
- be inconclusive?

There seems to still be considerable debate and evidence is largely non-comparative.

Questions for topic proposer

- Is this intended to be for patients with NSCLC who are not suitable for surgery?
- Is this intended to also include patients with central NSCLC who are suitable for surgery?
- Is required equipment and training already in place?
- Is the equipment optimal for this type of procedure?
- Concerns about higher toxicity for patients with central NSCLC
- What is the definition of central that is being considered?
- The cost of a medical physicist at £23.41 per hour is very low. State the source of information.

Sources of evidence

See the following documents

Appendix – Brief literature search results

Most of the available guidelines do not specifically discuss central NSCLC, they are more likely to consider the stage and if the patient is considered appropriate for surgical intervention.

Resource	Results
UK guidelines and guidance	
e.g. NICE; Healthcare Improvement Scotland; Guidelines International Network; SIGN	• NICE CG121 Lung cancer: diagnosis and management (April 2011) Update expected March 2019, draft update (Oct 2018) available online, including a systematic literature review. 2011 guidance has very little information on SABR. It does state that "Patients receiving radiotherapy with curative intent should be part of a national quality assurance programme[5]." • NHS England commissioning guide –recommends use of SABR for early stage, non-operable tumours. No specific recommendation for central NSCLC • SIGN 2014: No specific recommendation for central NSCLC. Patients with early-stage peripheral lung cancers who are not suitable for surgery should be considered for stereotactic ablative radiotherapy. It states that there is observational evidence, treatment should be 3-5 stages, is well tolerated, and that larger or more centrally located tumours require more fractionated radiotherapy. It also states that SABR is a technically demanding treatment and centres should have 4-D CT scans for planning, image guided radiation therapy and appropriate treatment planning algorithms, and be involved in external audit and quality assurance programmes. • UK SABR Consortium Guidelines(2016). States that the current evidence is too weak to support use of SABR in groups including central NSCLC except within a controlled clinical trial. Includes a list of quality assurance measures for introducing SABR • Executive Summary of an ASTRO Evidence-Based Guideline (Sep 2017) Considers SABR (or SBRT) for inoperable early stage central NSCLC. They conclude that it is an appropriate treatment but that the risk of toxicity depends on the regimen chosen, and is different from risks for peripheral tumours. The guideline identified 13 single arm studies, 9 of which were only for patients with central tumours.
Secondary literature and economic evaluations	
e.g.Cochrane library; Medline *systematic reviews, meta-analyses, economic evaluations*	• **Cochrane review:** Radical radiotherapy for stage I/II non-small cell lung cancer in patients not sufficiently fit for or declining surgery (medically inoperable) – has been withdrawn as requiring update and authors not available. • Evidence reviews for NICE guidance update (2018): 13 RCTs were identified:1 SABR vs surgery, 2 SABR vs different SABR regimen. The committee agreed that there was insufficient evidence to judge the effectiveness of SABR based on the randomised controlled trials alone. Three systematic reviews covering 23 observational studies and 7 further individual observational studies not included in the systematic reviews were included after full text screening. None of the paper titles included "central".
Primary studies	
Medline *RCTs; observational studies*	150 results, 39 were apparently relevant from a rapid sift based primarily on title. None were identified as containing "RCT" or "Random". No comparative papers were identified during rapid sifting. No individual paper is selected, due to the variation in study types and conclusions.

Ongoing secondary research	
Clinicaltrials.gov	• SUNSET: SBRT for ultra-central NSCLC https://clinicaltrials.gov/ct2/show/NCT03306680 Phase I dose-escalation study, prospective, single arm. Primary outcome is maximum tolerated dose. Secondary outcomes are times to local progression, overall survival and patient reported outcomes. • LungTech SBRT of inoperable centrally located NSCLC a phase II study. Single arm, 150 patients https://www.eortc.org/research_field/clinical-detail/22113/
Other sources	
	Reference list is available on request from HTW.

Date of search:	30th November 2018
Concepts searched:	SABR, NSCLC, Lung, stereotactic, SBRT, radiotherapy, ablative. NOTE: also included in "radiotherapy with curative intent", particularly in NICE guidance. Database: Ovid MEDLINE(R) ALL <1946 to December 05, 2018> Search Strategy: --- 1 nsclc.mp. or exp Carcinoma, Non-Small-Cell Lung/ (56555) 2 SABR.mp. (612) 3 stereotactic.mp. (22492) 4 2 or 3 (22568) 5 1 and 4 (1526) 6 central.tw. (708510) 7 5 and 6 (150) 8 RCT.mp. (18424) 9 7 and 8 (0) 10 from 7 keep 1,4,6-8,10,12-14,16,35-36,41,43,59,66,68-69,71-72,74,76,78-80,83,87,92,100,107,112,121,134-135,137-141 (39)