Technoleg Iechyd Cymru
Health Technology Wales

Topic Exploration Report

Topic explorations are designed to provide a high-level briefing on new topics submitted for consideration by Health Technology Wales. The main objectives of this report are to:

1. Determine the quantity and quality of evidence available for a technology of interest.
2. Identify any gaps in the evidence/ongoing evidence collection.
3. Inform decisions on topics that warrant fuller assessment by Health Technology Wales.

Topic:	Stereotactic ablative radiotherapy (SABR) for renal cell carcinoma (RCC)
Topic exploration report number:	TER286

Introduction and aims

Kidney cancer is the 7th most common cancer in the UK, with around 13,100 kidney cancers diagnosed in the UK each year (CRUK, 2020). Renal cell carcinoma is the most common type of kidney cancer.

Stereotactic ablative radiotherapy (SABR), also known as stereotactic body radiation therapy (SBRT), is a type of external radiotherapy that uses narrow radiation beams at different angles that are targeted more precisely at the tumour area. It is often used on small, well-defined tumours. SABR is currently used in Wales for some other cancer types, including lung cancer.

Health Technology Wales researchers searched for evidence on SABR to treat renal cell carcinoma.

Summary of evidence

Systematic reviews

We identified four systematic reviews that included use of SABR in kidney cancer, although two of these focused on metastases.

Primary renal cell carcinoma

Rohann et al. 2019 assessed efficacy and safety of SABR for primary renal cell carcinoma (SABR targeting metastases were excluded). Rohann et al. (2019) identified 26 relevant studies, including 383 tumours and 372 patients; most participants had inoperable cancer. Pooled results for local control was 97.2% and grade 3-4 toxicity was 1.5%. Post-SABR eGFR (estimated glomerular filtration rate, used to assess renal function) was -7.7 ml/min. Authors did not report quality assessment within the abstract but noted that heterogeneity was minimal.

The oldest review was a technical brief prepared by the ECRI Institute of Evidence-based practice (Tipton et al. 2011), which performed a systematic scan for evidence on SABR for

multiple cancer types. The review identified six studies for kidney cancer covering a total of 88 patients; it is not clear at this stage what kidney cancer types are included in the study populations. None of the studies compared SABR to another form of therapy.

Renal cell carcinoma metastases

Two reviews assessed SABR for the treatment of metastatic renal cell carcinoma. The second review assessed SABR for oligometastatic renal cell carcinoma (Zaorsky et al. 2019). It included 28 studies which included 1,602 patients (679 extracranial/923 intracranial). Pooled local control at one year was 89.1% for extracranial disease and 90.1% for intracranial disease, and one-year survival rates were 86.8% and 49.7%, respectively; both of these outcomes had considerable heterogeneity. Grade 3-4 toxicity was 0.7% for extracranial disease and 1.1% for intracranial disease. Authors did not report quality assessment in the abstract. They concluded that SABR is safe and efficacious for oligometastatic renal cell carcinoma, but further prospective studies are needed.

Smith et al. (2018) systematically reviewed evidence on SABR to treat renal cell carcinoma spine metastases; nine studies were identified. Local control at one year ranged between 71.2% and 85.7% and toxicity ranged between 23% and 38.5%. Pain improvements was seen in 41-95% of patients.

Primary evidence

HTW looked for additional primary evidence published subsequent to the systematic review by Rohann et al. (2019). Three potential studies were identified: one study evaluated SABR to treat larger renal cell carcinoma not suitable for surgery (95 participants; Shankar et al. 2020), one evaluated SABR for oligometastatic renal cell carcinoma (47 participants; Yuanyuan et al. 2019) and one evaluated robotic SABR in people with renal cell carcinoma who had impaired renal function (10 participants; Senger et al. 2019). All concluded that SABR (or robotic SABR) is a viable treatment option.

Ongoing evidence

We identified four ongoing studies evaluating SABR to treat renal cancer; details can be found in the brief literature search results below. One ongoing study is the only study we identified that compares SABR and another therapy, in this case radiofrequency ablation. Estimated primary completion date is 30 June 2021.

Areas of uncertainty

- The initial topic submission focused on SABR to treat renal cell carcinoma. Some of the evidence identified by this exploration refers to kidney cancer and fuller evaluation of the evidence is required to determine applicability. Should this topic proceed to appraisal and be focused on renal cell carcinoma, it is uncertain whether this will limit the available evidence.
- During exploration searches, we noted primary studies that assessed SABR in combination with other therapies, such as immunological checkpoint inhibitors. Input is required to determine whether this would be a relevant subgroup to consider in the context of NHS Wales, or whether such evidence should be excluded.
- Evidence identified included SABR targeting primary renal cell carcinoma, and metastatic renal cell carcinoma. Fuller evaluation of the texts is required to establish whether the metastatic evidence also includes treatment of primary sites.

Conclusions

Evidence exists that evaluates SABR to treat renal cell carcinoma. However, with the exception of one ongoing study, the evidence is limited to single-group evaluations. A lot of the individual studies enrolled a relatively low number of patients (10 to 50), which may limit the reliability of the findings. Fuller evaluation is needed to determine the full quantity and quality of the evidence.

We did not identify any economic evidence.

Brief literature search results

Resource	Results
HTA organisations	
Healthcare Improvement Scotland	We did not identify any relevant evidence from this source.
Health Technology Assessment Group	We did not identify any relevant evidence from this source.
Health Information and Quality Authority	We did not identify any relevant evidence from this source.
EUnetHTA	We did not identify relevant evidence from this source.
International HTA Database	Stereotactic Body Radiation Therapy (SBRT) - Roleau G, Larochelle M, Pineau G, Moqadem K, Institut national d'excellence en santé et services sociaux (2014) https://database.inahta.org/article/15413 [Only English summary available, references evidence that include "kidney" in the title] Review of the indications of stereotactic body radiation therapy (SBRT) in patients with primary tumours and oligometastases - Maceira-Rozas MC, Salvador Garrido N (2014) https://database.inahta.org/article/14431 [Only English summary available, references NHS paper that includes "kidney"]
UK guidelines and guidance	
SIGN	We did not identify any relevant evidence from this source.
NICE	We did not identify any relevant evidence from this source.
Secondary literature and economic evaluations	
https://www.epistemonikos.org/en/	Smith BW, Joseph JR, Saadeh YS, et al. (2018). Radiosurgery for Treatment of Renal Cell Metastases to Spine: A Systematic Review of the Literature. World neurosurgery. 109: e502-e9. doi: 10.1016/j.wneu.2017.10.011 Tipton KN, Sullivan N, Bruening W, et al. (2011). Stereotactic Body Radiation Therapy.
https://www.tripdatabase.com/	Nicholas GZ, Eric JL, Gargi K, et al. (2019). Stereotactic ablative radiation therapy for oligometastatic renal cell carcinoma (SABR ORCA): a meta-analysis of 28 studies. European Urology Oncology. 2(5): 515-23. doi: 10.1016/j.euo.2019.05.007 Rohann JMC, Alexander VL, Nicholas GZ, et al. (2019). The Emerging Role of Stereotactic Ablative Radiotherapy for Primary Renal Cell Carcinoma: A Systematic Review and Meta-Analysis. European urology focus. 5(6): 958-69. doi: 10.1016/j.euf.2019.06.002
Cochrane library	We did not identify any additional relevant evidence from this source.
Medline (via Ovid or Pubmed)	We did not identify any additional relevant evidence from this source.
Primary studies	
https://www.epistemonikos.org/en/	We did not identify any additional relevant evidence from this source.
https://www.tripdatabase.com/	We did not identify any additional relevant evidence from this source.

Cochrane library	Senger C, Conti A, Kluge A, et al. (2019). Robotic stereotactic ablative radiotherapy for renal cell carcinoma in patients with impaired renal function. BMC Urology. 19(1): 96. doi: 10.1186/s12894-019-0531-z Shankar S, Rohann JMC, Andrew W, et al. (2020). Stereotactic Ablative Radiotherapy for ≥T1b Primary Renal Cell Carcinoma: A Report From the International Radiosurgery Oncology Consortium for Kidney (IROCK). Biology and Physics. doi: 10.1016/j.ijrobp.2020.06.014 Yuanyuan Z, Jonathan S, Alana C, et al. (2019). Stereotactic Ablative Radiation Therapy (SAbR) Used to Defer Systemic Therapy in Oligometastatic Renal Cell Cancer. Biology and Physics. 105(2): 367-75. doi: 10.1016/j.ijrobp.2019.07.023
Ongoing primary or secondary research	
Clinicaltrials.gov	A Prospective Randomized Pilot Trial of Stereotactive Body Radiation Therapy Versus Radiofrequency Ablation for the Management of Small Renal Masses. ClinicalTrials.gov Identifier: NCT03811665. https://clinicaltrials.gov/ct2/show/NCT03811665 Currently recruiting (estimated 24 participants). Estimated primary completion date June 30 2021. A Phase II Trial of Stereotactic Ablative Body Radiation Therapy (SABR) for Patients With Primary Renal Cancer (RCC). ClinicalTrials.gov Identifier: NCT02141919. https://clinicaltrials.gov/ct2/show/NCT02141919 Active, not recruiting. 16 participants. Estimated primary completion date November 2021. A Pilot Study of Stereotactic Body Radiotherapy (SBRT) in Oligometastatic Renal Cell Carcinoma. ClinicalTrials.gov Identifier: NCT02542202 https://clinicaltrials.gov/ct2/show/NCT02542202 Currently recruiting (estimated 25 participants). Estimated primary completion date January 2022. Feasibility Study of Stereotactic Body Radiation Therapy for Oligometastatic Renal Cell Carcinoma. ClinicalTrials.gov Identifier: NCT03575611 https://clinicaltrials.gov/ct2/show/NCT03575611 Currently recruiting (estimated 30 participants). Estimated primary completion date was September 2020.
Other	
CADTH	Implementation of Stereotactic Ablative Radiotherapy in Canada – Currently in consultation Included kidney but does not evaluate evidence. “The respondent from Nova Scotia reported that their jurisdiction is looking to obtain more linear accelerators or upgrade current linear accelerators so that their program can be expanded to treat more oligometastatic sites such as prostate, head and neck, kidney, and pancreas.”

Date of search:	May 2021
Concepts used:	stereotactic ablative radiotherapy (SABR), stereotactic body radiation therapy (SBRT), kidney cancer, renal cancer, renal cell carcinoma, renal cell adenocarcinoma.