View results

Respondent

7 Anonymous

24:30
Time to complete

1. Project Number and Name - (Can be found on email) *

IP1314

Your information

2. Name: *

Dr Brian Stedman

3. Job title: *

Consultant Interventional Radiologist

4. Organisation: *

University Hospital Southampton

5. Email address: *

[redacted]

6. Professional organisation or society membership/affiliation: *

GMC

7. Nominated/ratified by (if applicable):

8. Registration number (e.g. GMC, NMC, HCPC) *

4129567

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice: https://www.nice.org.uk/privacy-notice

9. I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. *

- (●) I agree
- ( ) I disagree

The procedure/technology

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

10. Please describe your level of experience with the procedure/technology, for example:

Are you familiar with the procedure/technology?

Over 10 years regular experience.

11. Have you used it or are you currently using it?

- Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake?

- Is this procedure/technology performed/used by clinicians in specialities other than your own?

- If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.

Currrently used regularly - approx twice a month at UHS.

12. Please indicate your research experience relating to this procedure (please choose one or more if relevant):

- [ ] I have done bibliographic research on this procedure.
- [ ] I have done research on this procedure in laboratory settings (e.g. device-related research).
- [ ] I have done clinical research on this procedure involving patients or healthy volunteers.
- [ ] I have published this research.
- [x] I have had no involvement in research on this procedure.
- [ ] Other

13. Does the title adequately reflect the procedure?

- (•) Yes
- ( ) Other

14. Is the proposed indication appropriate? If not, please explain

Yes

15. How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design?

Its a routine technology in other metastatic cancer types.

16. Which of the following best describes the procedure:

- (•) Established practice and no longer new.
- ( ) A minor variation on an existing procedure, which is unlikely to alter the procedure's safety and efficacy.
- ( ) Definitely novel and of uncertain safety and efficacy.
- ( ) The first in a new class of procedure.

17. Does this procedure/technology have the potential to replace current standard care or would it be used as an addition to existing standard care?

In specific subpopulations it could replace the current standard of care.

Current management

18. Please describe the current standard of care that is used in the NHS.

Liver directed therapies used in this group - would include TAE and TACE to allow control of liver metastatic disease.

19. Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this?

    If so, how do these differ from the procedure/technology described in the briefing?

    No

Potential patient benefits and impact on the health system

20. What do you consider to be the potential benefits to patients from using this procedure/technology?

    Improved outcomes with a less morbid treatment.
    Improved QOL.

21. Are there any groups of patients who would particularly benefit from using this procedure/technology?

    Patients with highter proliferation tumours (high G2 +G3) - those with biliary enteric anastamosis (post Whipples) and those with carcinoid heart disease.

22. Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system?

    Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?

    Yes - SIRT is better tolerated and can be performed as a day case. It also will peplace multiple cycles of TAE or TACE treatment (median 4 cycles) with a single treatment.

23. What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?

    Interventional radiology theatre. Nuclear medicine department with gamma camera and radiation pharmacy to calibrate dose. Medical physics support.

24. Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?

    Yes - IR training in work up and delivery of SIRT.
    Nuclear medicine - training in dosimetry and interpretation of scans.

Safety and efficacy of the procedure/technology

25. What are the potential harms of the procedure/technology?

    Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:

    - Adverse events reported in the literature (if possible, please cite literature)
    - Anecdotal adverse events (known from experience)
    - Theoretical adverse events

    Theoretical damage to background liver from radiation (not seen clinically).
    Potential non target treatment (gastric / lung etc) - not seen in experienced centres.

26. Please list the key efficacy outcomes for this procedure/technology?

Overall survival
Disease control to allow cardiac surgery.
Symptom control for symptomatic patients (octreotide requirement)

27. Please list any uncertainties or concerns about the efficacy and safety of this procedure/technology?

Ongoing discusion about dosimetry and splitting dose between 2 cycles.

28. Is there controversy, or important uncertainty, about any aspect of the procedure/technology?

From trial data it would appear patients with large volume disease benefit fron liver directed Rx prior to PRRT but htis needs clarification.

29. If it is safe and efficacious, in your opinion, will this procedure be carried out in:

- ○ Most or all district general hospitals.
- ○ A minority of hospitals, but at least 10 in the UK.
- ◉ Fewer than 10 specialist centres in the UK.
- ○ Cannot predict at present.

Abstracts and ongoing studies

30. Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work).

Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature searches. You do not need to supply a comprehensive reference list but it will help us if you list any that you think are particularly important.

31. Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.

32. Please list any other data (published and/or unpublished) that you would like to share.

Other considerations

33. Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an estimated number, or a proportion of the target population)?

As a specialist NET MDT (ENET centre of excellence) - I would envisage one to two patients per month would be appropriate for SIRT Rx

34. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Beneficial outcome measures.

These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured.

5HIAA serial assesment.
Octreotide requirements
Symptoms for carcinoid syndrome
Serial Technecium / gallium scans to quantify active disease burden

35. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Adverse outcome measures.

These should include early and late complications. Please state the post procedure timescales over which these should be measured:

Further comments

36. If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe *

My interpretation of the PRRT data (NETTER updates) would imply patients with large volume disease do not see any significant disease response in the early to medium term. This has a major significance with patients with borderline operability (unstable) prior to cardiac valve surgery. Our experience has been that SIRT allows rapid control of syndrome and disease burden and allows patients to benefit from cardiac surgery.

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

37. Type of interest: *

- [ ] Direct: financial
- [ ] Non-financial: professional
- [ ] Non-financial: personal
- [ ] Indirect
- [x] No interests to declare

38. Description of interests, including relevant dates of when the interest arose and ceased. *

Co-founder and trustee of a South Coast Neuroendocrine patient support group Planets Cancer charity

39. I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website. *

- (●) I agree
- ( ) I disagree

Signature

40. Name: *

Brian Stedman

41. Date: *

05/07/2023

NICE National Institute for Health and Care Excellence

Professional Expert Questionnaire

Technology/Procedure name & indication: **IP1314 Selective internal radiation therapy (SIRT) for neuroendocrine tumours metastatic to the liver**

Your information

Name:	Damian Mullan
Job title:	Consultant Interventional Radiologist and Neuroendocrine MDT Lead
Organisation:	The Christie NHS Foundation Trust Manchester
Email address:	
Professional organisation or society membership/affiliation:	FCIRSE. BSIR, FRCR
Nominated/ratified by (if applicable):	Click here to enter text.
Registration number (e.g. GMC, NMC, HCPC)	GMC6026287

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

x☐ Please tick this box if you would like to receive information about other NICE topics.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public

consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice.

x ☐ I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. If consent is NOT given, please state reasons below:

Click here to enter text.

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

1	Please describe your level of experience with the procedure/technology, for example: Are you familiar with the procedure/technology?	My hospital performed the first UK SIRT in 2007. I joined in 2009. We are the most experienced UK SIRT centre. We have treated a number of neuroendocrine patients with SIRT and also with the comparator of bland particle embolization and have performed audits comparing outcomes. Bland embolization is quite hostile and morbid. In our experience SIRt is a more benign process with significantly less inpatient stay due to a reduced morbidity profile. Although more expensive as a one off procedure, there are reduced inpatient stays and reduced hepatorenal syndromes which may make it cost equivalent and with a reduce morbidity.
	Have you used it or are you currently using it? – Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake? – Is this procedure/technology performed/used by clinicians in specialities other than your own?	Yes Yes Purely Radiological

	− If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.	No. But we consider PRRT for systemic disease. Perfromed at neuroendocrine centres of excellence
2	− Please indicate your research experience relating to this procedure (please choose one or more if relevant):	I have done bibliographic research on this procedure.Yes I have done research on this procedure in laboratory settings (e.g. device-related research). I have done clinical research on this procedure involving patients or healthy volunteers. Yes I have published this research. Awaiting I have had no involvement in research on this procedure. Other (please comment)
3	Does the title adequately reflect the procedure? How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design? Which of the following best describes the procedure (please choose one):	Yes. It needs to be specific for the liver as systemic disease has other systemic treatment options. If liver dominant with carcinoid symptoms, SIRT (radioembolization) can be very effective with a significantly reduced morbidity profile in comparison to ‘bland’ embolization. Established practice and no longer new.
4	Does this procedure/technology have the potential to replace current standard care or	It could replace bland embolization in terms of cost efficiency and reduced side effect profile

	would it be used as an addition to existing standard care?	
5	Have there been any substantial modifications to the procedure technique or, if applicable, to devices involved in the procedure? Has the evidence base on the efficacy and safety of this procedure changed substantially since publication of the guidance?	Minor only. Non contributary

Current management

6	Please describe the current standard of care that is used in the NHS.	Bland embolization with significant embolization syndrome and potential for protracted inpatient stays, or PRRT if multisite disease.
7	Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this? If so, how do these differ from the procedure/technology described in the briefing?	Not liver specific.

Potential patient benefits and impact on the health system

8	What do you consider to be the potential benefits to patients from using this procedure/technology?	Reduced morbidity and potential for cost effectiveness in comparison to current standard of care bland embolization
9	Are there any groups of patients who would particularly benefit from using this procedure/technology?	Liver dominant with carcinoid syndrome.
10	Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system? Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?	Yes. Clearly.
11	What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?	There are many established centres of excellence for SIRT and NET in the UK. No specific uplift would be required.
12	Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?	No

Safety and efficacy of the procedure/technology

13	What are the potential harms of the procedure/technology? Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:	Well recognised and understood. RILD. Extra hepatic uptake. Less than 4% worldwide. Less than 0.5% in expert centres.

	Adverse events reported in the literature (if possible, please cite literature) Anecdotal adverse events (known from experience) Theoretical adverse events	
14	Please list the key efficacy outcomes for this procedure/technology?	Reduction of carcinoid syndrome. Plus minus bulk.
15	Please list any uncertainties or concerns about the efficacy and safety of this procedure/?	None in comparison to standard of care aside from rare risk of RILD and extrahepatic radiation
16	Is there controversy, or important uncertainty, about any aspect of the procedure/technology?	No
17	If it is safe and efficacious, in your opinion, will this procedure be carried out in (please choose one):	A minority of hospitals, but at least 10 in the UK.

Abstracts and ongoing studies

18	Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work). Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature searches. You do not need to supply a comprehensive reference list but it will help	Too many to list

	us if you list any that you think are particularly important.	
19	Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.	Not at present in the UK. Case series and retrospective and limited trials at present.
20	Please list any other data (published and/or unpublished) that you would like to share.	

Other considerations

21	Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an estimated number, or a proportion of the target population)?	In greater Manchester we treat 10-15 patients per year with balnd embolization with the understanding we will make them ill due to embolization syndrome with a protracted patient stay. If we have the confidene to undertake a benign procedure, the numbers might be higher.
22	Please suggest potential audit criteria for this procedure/technology. If known, please describe: − Beneficial outcome measures. These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured. − Adverse outcome measures. These should include early and late complications. Please state the post procedure timescales over which these should be measured:	Beneficial outcome measures: Cost of inpatient stay vs Bland Morbidity vs Bland Adverse outcome measures: NTE, RILD (NTE can occur with Bland)

Further comments

23	If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe.	

NICE National Institute for Health and Care Excellence

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

Type of interest *	Description of interest	Relevant dates	
		Interest arose	Interest ceased
Indirect	I am a proctor for SIRT and also for bland embolization.	**2015**	
Choose an item.			
Choose an item.			

x ☐ I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website.

Print name:	**Damian Mullan**
Dated:	**4/7/2023**

NICE National Institute for Health and Care Excellence

Professional Expert Questionnaire

Technology/Procedure name & indication: IP1314 Selective internal radiation therapy (SIRT) for neuroendocrine tumours metastatic to the liver

Your information

Name:	Dr Prakash Manoharan
Job title:	Consultant Radiologist and Nuclear Medicine Physician
Organisation:	The Christie NHS Foundation Trust
Email address:	[redacted]
Professional organisation or society membership/affiliation:	RCR
Nominated/ratified by (if applicable):	BNMS
Registration number (e.g. GMC, NMC, HCPC)	GMC 4183257

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

☐ Please tick this box if you would like to receive information about other NICE topics.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public

consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice.

☒ I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. If consent is NOT given, please state reasons below:

Click here to enter text.

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

1	Please describe your level of experience with the procedure/technology, for example: Are you familiar with the procedure/technology?	I am very familiar with the SIRT procedure including but not exclusive to NET. I helped set up the service at The Christie and successfully applied for The Christie to become an NHS centre for SIRT. I have over a decade of experience in this technology. I am also a subject matter expert in NET and HPB diseases. I am dually accredited in radiology and nuclear medicine with expertise in MRI, molecular radiotherapy (which SIRT falls into) and molecular imaging. I used to be a chairperson in ARSAC for research group 1 and I am currently the clinical Molecular Imaging Group lead at the Christie. I am also the research lead for imaging at The Christie and nationally I lead the NHSE NC1 PET CT clinical service which covers 70% of the population of England. I am also a founding member of The Christie ENETS centre of excellence which was one of the first 3 centres of excellence in the UK.
	Have you used it or are you currently using it? – Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake? – Is this procedure/technology performed/used by clinicians in specialities other than your own?	I am fully versed in this technology and was one of the authors of a paper published by the RCP, BNMS, IPEM and RCR with regards to the provision of molecular radiotherapy in the UK (rcr214-review-molecular-radiotherapy-services-uk.pdf). I am involved in the patient selection process as an expert in radiology, nuclear medicine and molecular radiotherapy. Currently NHSE only funds SIRT for HCC and selected CRC patients.

	– If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.	
2	– Please indicate your research experience relating to this procedure (please choose one or more if relevant):	I have done clinical research on this procedure involving patients or healthy volunteers. I have published this research.
3	Does the title adequately reflect the procedure? Is the proposed indication appropriate? If not, please explain. How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design? Which of the following best describes the procedure (please choose one):	Yes it does. It is a therapy that is widely available in other advanced/developing healthcare systems even though phase 3 clinical trial evidence is lacking. In NET, this might be difficult due to the nature of the disease if overall survival is utilised as an end point. The UK lags in the research and development of this technology. As an integrated healthcare system, we can answer some of the outstanding questions in SIRT in NET. Established practice and no longer new in other healthcare systems. A variation on an existing vascular interventional procedure (TAE/TACE), but it is a 2 step procedure and needs to be performed by a specialist unit to ensure the procedure's safety and efficacy. The duality of an embolic agent coupled with delivery of brachy radiotherapy requires precise dose planning and vascular radiology/nuclear medicine expertise in the department. Novel and of uncertain safety and efficacy as phase 3 trials between TACE (transarterial chemoembolization), TAE (transarterial embolization), or SIRT (selective internal radiation therapy) has not been performed. The first in a new class of procedure.

4	Does this procedure/technology have the potential to replace current standard care or would it be used as an addition to existing standard care?	Possibly in addition to. It will potentially add to the phased delivery of therapy to metastatic NET patients and increase our ability to manage their symptoms and improve NET patient survival.
5	Have there been any substantial modifications to the procedure technique or, if applicable, to devices involved in the procedure? Has the evidence base on the efficacy and safety of this procedure changed substantially since publication of the guidance?	Ideally requires phase 3 clinical trials, however treatment options for NET are limited.

Current management

6	Please describe the current standard of care that is used in the NHS.	This depends on many factors including the patient's age, clinical status, extent of disease, site of disease and histological grade of the disease. In grade 1 and 2 patients as an example, we have access to somatostatin injections for predominantly symptom control with some tumour control effects. When patients progress we then have access to PRRT. Once they progress through this we have access to everolimus, sunitinib, chemotherapy (in selected patients) and clinical trials. The systemic options depend on a few factors and not all patients would be suitable for these options. These patients have a longer survival than most other cancer patients. We therefore require more treatment options/modalities to manage their disease.

7	Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this? If so, how do these differ from the procedure/technology described in the briefing?	Potentially TAE/TACE in NET. Potentially SIRT could be an ideal treatment modality for liver dominant metastatic NET patients as these tumours are radiosensitive (SIRT has embolic and brachytherapy dual effect) and as most NETs are hypervascular, SIRT could be an ideal addition.

Potential patient benefits and impact on the health system

8	What do you consider to be the potential benefits to patients from using this procedure/technology?	SIRT in NET could help significantly with the symptom control and survival in this patient group (single arm and phase 2 trial evidence is available). The symptoms are very debilitating and a great concern to the patients restricting their ability to live a normal life with cancer (severe loose stool, abdominal pains, flushing and flatulence). By targeting the liver for liver dominant metastatic disease (which is the source of the majority of the symptoms due to release of 5HIAA), we can phase the more systemic therapy options later in the patients pathway. Also SIRT has a potential additive effect when it is followed through with PRRT (please see trial listed below) and in a small proportion of patients this might allow them access to liver transplantation, hence potentially curing them- yet to be determined.
9	Are there any groups of patients who would particularly benefit from using this procedure/technology?	Liver dominant metastatic disease patients with progression, syndromic/symptomatic and potential patients for liver resection/ transplantation.
10	Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system? Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?	Yes, it could, however, we need better clinical trials/long term audits which is the current issue. From our experience, it does manage symptoms well and 'buys' us time to phase our other therapies later in the patients' pathway. This therapy is available for our self-paying patients, and we utilise it to manage their disease. Due to its dual effect, it has the potential to reduce hospital visits and manage the debilitating NET symptoms.
11	What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?	SIRT requires an expert NET MDT, nuclear medicine department expert at therapeutics, medical physicist, radiologist, nuclear physicians, and interventional radiologists. MRI, PET CT and SPECT CT facilities. Therefore, it can only be delivered in specialist centres.
12	Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?	As above. It is a highly specialised process/procedure, and The Christie is a specialist training centre for SIRT.

Safety and efficacy of the procedure/technology

13	What are the potential harms of the procedure/technology? Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence: Adverse events reported in the literature (if possible, please cite literature) Anecdotal adverse events (known from experience) Theoretical adverse events	Pain, gastritis and if the dose is delivered to a site external to the liver it could cause severe ulceration and perforation of the bowel.
14	Please list the key efficacy outcomes for this procedure/technology?	Symptom control, reduction in size of the tumours enabling liver resections to better control the disease (limited study evidence with patient selection bias).
15	Please list any uncertainties or concerns about the efficacy and safety of this procedure/?	Requires more and larger multi-centre clinical trials especially in comparison to bland/chemoembolization.
16	Is there controversy, or important uncertainty, about any aspect of the procedure/technology?	As above.
17	If it is safe and efficacious, in your opinion, will this procedure be carried out in (please choose one):	A minority of specialist hospitals, but at least 10 in the UK.

Abstracts and ongoing studies

18	Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work).	Not many recent published literatures especially in the UK as NHSE does not fund this therapy for NET patients.

	Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature searches. You do not need to supply a comprehensive reference list but it will help us if you list any that you think are particularly important.	
19	Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.	1. Ongoing study, yet to report: Additional hepatic ^{166}Ho-radioembolization in patients with neuroendocrine tumours treated with ^{177}Lu-DOTATATE; a single center, interventional, non-randomized, non-comparative, open label, phase II study (HEPAR PLUS trial) Arthur J. A. T. Braat,[1] Dik J. Kwekkeboom,[2] Boen L. R. Kam,[2] Jaap J. M. Teunissen,[2] Wouter W. de Herder,[3] Koen M. A. Dreijerink,[4] Rob van Rooij,[1] Gerard C. Krijger,[1] Hugo W. A. M. de Jong,[1] Maurice A. A. J. van den Bosch,[1] and Marnix G. E. H. Lam[1] 2. Potential industry sponsored study: **SIRT vs SSA**. This is not the best study as it excludes TAE/TACE. However, they would be in line with the NETTER-1 study which was PRRT+SSA versus double dose SSA.
20	Please list any other data (published and/or unpublished) that you would like to share.	

Other considerations

21	Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an	Could be between 200 to 300 patients per year depending on the eligibility criteria (would assume most patients eligible for PRRT would at some time point be eligible for SIRT)

	estimated number, or a proportion of the target population)?	
22	Please suggest potential audit criteria for this procedure/technology. If known, please describe: − Beneficial outcome measures. These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured. − Adverse outcome measures. These should include early and late complications. Please state the post procedure timescales over which these should be measured:	Beneficial outcome measures: Symptom control- patient reported outcome, time to treatment failure, changes to blood biomarkers for patients who excrete these and reduction in size of the tumour, potentially not utilising current RECIST 1.1 criteria as highlighted by our recent publication: (J Neuroendocrinol. 2023 Jun;35(6):e13311. doi: 10.1111/jne.13311. Epub 2023 Jun 21. Proposal of early CT morphological criteria for response of liver metastases to systemic treatments in gastroenteropancreatic neuroendocrine tumors: Alternatives to RECIST Louis de Mestier 1, Matthieu Resche-Rigon 2, Clarisse Dromain 3, Angela Lamarca 4, Anna La Salvia 5, Lesley de Baker 6, Uli Fehrenbach 7, Sara Pusceddu 8, Annamaria Colao 9 10, Ivan Borbath 11, Robbert de Haas 12, Maria Rinzivillo 13, Alessandro Zerbi 14, Luigi Funicelli 15, Wouter W de Herder 16, Andreas Selberherr 17 18, Anna Dorothea Wagner 19, Prakash Manoharan 20, Andrea De Cima 21, Willem Lybaert 22, Henning Jann 23, Natalie Prinzi 8, Antongiulio Faggiano 9, Laurence Annet 24, Annemiek Walenkamp 25, Francesco Panzuto 13 26, Vittorio Pedicini 27, Maria Giovanna Pitoni 28, Alexander Siebenhuener 29, Marius E Mayerhoefer 30 31, Philippe Ruszniewski 1, Marie-Pierre Vullierme 32) Adverse outcome measures: Pain, gastritis, liver failure, portal hypertension, ascites, bowel perforation, ischaemic effects of the embolization and vascular intervention related comlications including dissection/ bleeding.

Further comments

23	If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe.	Specialised procedure. Requires continuous auditing to assess efficacy and safety if clinical trials are not forth coming due to difficulties with recruitment in a relatively rare disease group.

NICE National Institute for Health and Care Excellence

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

Type of interest *	Description of interest	Relevant dates	
		Interest arose	Interest ceased
Choose an item.			
Choose an item.			
Choose an item.			

☒ I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website.

Print name:	**Dr Prakash Manoharan**
Dated:	**29/06/2023**

NICE National Institute for Health and Care Excellence

Professional Expert Questionnaire

Technology/Procedure name & indication: IP1314 Selective internal radiation therapy (SIRT) for neuroendocrine tumours metastatic to the liver

Your information

Name:	Matthew Seager
Job title:	Consultant Interventional Radiologist
Organisation:	King's College Hospital NHS Trust
Email address:	[redacted]
Professional organisation or society membership/affiliation:	GMC
Nominated/ratified by (if applicable):	Click here to enter text.
Registration number (e.g. GMC, NMC, HCPC)	7412079

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

☒ Please tick this box if you would like to receive information about other NICE topics.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public

consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice.

☒ I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. If consent is NOT given, please state reasons below:

Click here to enter text.

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

1	Please describe your level of experience with the procedure/technology, for example: Are you familiar with the procedure/technology?	I have been a consultant interventional radiologist for 3 months and specialise in hepatobiliary interventions. I regularly perform SIRT for other liver tumours (HCC and colorectal liver metastases) and last year completed a post CCT fellowship at an Australian centre (Sir Charles Gairdner Hospital) which is a leading centre for SIRT. In Australia I performed SIRT for neuroendocrine tumour (NET) metastases.
	Have you used it or are you currently using it? – Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake? – Is this procedure/technology performed/used by clinicians in specialities other than your own?	SIRT is used widely in specialist centre to treat other types of liver tumours, predominantly HCC. It is not licensed by NICE to treat NET metastases. If licensed for use in NET metastases, there would be reasonable uptake of the technology at centres looking after these patients like my own (King's College Hospital). No.

	− If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.	We would be involved in selecting patients through our MDT, but the procedure can only be performed by interventional radiologists and we would not therefore refer to someone else.
2	− Please indicate your research experience relating to this procedure (please choose one or more if relevant):	I have done bibliographic research on this procedure. I have done research on this procedure in laboratory settings (e.g. device-related research). I have done clinical research on this procedure involving patients or healthy volunteers. I have published this research. I have had no involvement in research on this procedure. X Other (please comment)
3	Does the title adequately reflect the procedure? Is the proposed indication appropriate? If not, please explain. How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design? Which of the following best describes the procedure (please choose one):	Yes. The technology itself is not novel and is widely used to treat other liver tumours. At the moment, the options for liver directed therapy in the NHS for patients metastatic NET to the liver are bland or chemoembolisation. SIRT would be an excellent addition to this armamentarium. Established practice and no longer new.

4	Does this procedure/technology have the potential to replace current standard care or would it be used as an addition to existing standard care?	In addition to bland and chemoembolisation initially. I suspect SIRT would prove to be safe for treating large volume, irresectable disease compared to bland/chemoembolisation as it is less toxic to the biliary tree.
5	Have there been any substantial modifications to the procedure technique or, if applicable, to devices involved in the procedure? Has the evidence base on the efficacy and safety of this procedure changed substantially since publication of the guidance?	Dosimetry has advanced significantly in the last few years. This means we can be more certain we are delivering tumoricidal doses and remaining safe as well as knowing when we should not take on a case because the dose to background liver will be too great. There is a new SIRT product produced by Terumo that uses a different radioisotope (Holmium 166), that may prove effective, but the evidence base is still being developed. The evidence base in HCC has improved significantly, likely due to the improved dosimetry techniques. With regards to NET, we are limited to case series/retrospective studies. The NETTER study in 2021 showed survival benefit of peptide receptor radionuclude therapy (PRRT) comparted to analogs and this has proven to be an effective and widely used therapy. However, it is less effective for liver tumours > 3 cm and takes around 8 months to have an effect on symptoms of carcinoid. There is therefore a potential role for SIRT in patients with large volume liver dominant disease and those who are symptomatic (where it works much more quickly). The HEPAR PLuS study from 2020 showed holmium SIRT can be performed safely after PRRT (this study performed it within 20 weeks of PRRT).

Current management

6	Please describe the current standard of care that is used in the NHS.	This depends on NET grade, the origin of the primary, pattern of liver disease and presence of extrahepatic disease. In patients with liver dominant disease who are symptomatic with carcinoid syndrome, bland or chemoembolisation may be offered, but as mentioned, these are likely more toxic to the bile ducts than SIRT and are less well tolerated. Otherwise the (in inoperable cases) systemic therapy would be offered – analogs +/- chemotherapy, the latter of which have systemic

		side effects. PRRT can also be considered for well differentiated disease.
7	Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this? If so, how do these differ from the procedure/technology described in the briefing?	Bland or chemoembolisation. These are intra-arterial therapies that rely on blocking off the arterial blood supply to the tumours. Whilst likely cheaper than SIRT, these procedures typically result in a worse post-embolisation syndrome and have the ability to cause biliary injury. The latter is particularly problematic in patients who have colonised bile ducts (e.g. post Whipples following pancreatic NET) and may even preclude embolic therapy, wheras SIRT can be performed more safely in this scenario.

Potential patient benefits and impact on the health system

8	What do you consider to be the potential benefits to patients from using this procedure/technology?	To treat symptomatic carcinoid effectively. To prolong survival in liver dominant NET metastatic disease. Potentially to facilitate curative surgery in unilobar disease. Rarely to perform curative SIRT in liver disease isolated to one or two liver segments by delivering a very high focal dose (radiation segmentectomy).
9	Are there any groups of patients who would particularly benefit from using this procedure/technology?	Patients with metastatic NET and bulky liver dominant disease (PRRT is less effective). Patients appropriate for liver directed therapy but with colonised bile ducts. Patients with carcinoid syndrome who are appropriate for SIRT.
10	Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system? Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?	It could prolong survival liver dominant NET metastatic disease, reducing the reliance on expensive chemotherapy and expensive PRRT. It may facilitate some patients to have curative surgery, but because it takes month for the maximum response, you obtain a “test of time” to highlight some patients who would have progressed elsewhere had they been offered up front surgery.
11	What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?	No changes to facilities needed for centres that already perform SIRT for other liver tumours. May need investment to help support the expected (small) number of increased cases that would be performed across the country. Metastatic NET is rarer than HCC, so the number of SIRTs performed would be smaller than in HCC.
12	Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?	Operators who perform SIRT for other liver tumours just need to be familiar with when SIRT is appropriate in metastatic NET and be aware of the dosimetry recommendations (published in international guidelines).

Safety and efficacy of the procedure/technology

13	What are the potential harms of the procedure/technology? Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence: Adverse events reported in the literature (if possible, please cite literature) Anecdotal adverse events (known from experience) Theoretical adverse events	Post embolisation syndrome (typically less severe then with bland embolisation/chemoembolisation), non-target treatment (rare with modern angiography machines/cone beam CT) and radiation induced liver injury. RILD should be rare < 5% with modern dosimetry. A long-term fibrosis can be seen in around 20% of patients treated with bilobar SIRT, so caution must be undertaken in this scenario https://pubmed.ncbi.nlm.nih.gov/29724520/
14	Please list the key efficacy outcomes for this procedure/technology?	A heterogenous mix of results. The following table from https://pubmed.ncbi.nlm.nih.gov/35918431/ in CVIR 2022 nicely summarises them:

Table 1 Studies assessing effectiveness of Radioembolization for NELMs

First Author	Device	Number of Patients	Extrahepatic disease	Prior chemotherapy	Site of primary	Tumor grade	Tumor burden	Radiologic response (CR + PR), criteria used	Survival[a] (months)
Kennedy [67]	Resin	148	NR	NR	67% small bowel; 19% pancreas	NR	NR	63% RECIST	70
Fan [68]	Glass	38	39%	39%	29% bowel; 37% pancreas	45% G1; 16% G2/G3; 39% Unknown	11% with greater than 66%	26% RECIST	29.2
King [69]	Resin	34	59%	16%	32% small bowel; 25% pancreas	NR	NR	50% RECIST	27.6
Memon [16]	Glass	40	35%	8%	25% small bowel; 23% pancreas	NR	5% with greater than 50%	64% WHO; 64% EASL	34.4
Cao [26]	Resin	58	43%	33%	36% small bowel; 26% pancreas	52% G1; 24% G2; 24% G3	10% with greater than 50%	50% RECIST	36.0
Saxena [28]	Resin	48	48%	52%	31% small bowel; 31% pancreas	63% G1; 21% G2; 17% G3	32% of total liver volume	55% RECIST	35.0
Paprottka [70]	Resin	42	NR	43%	55% small bowel; 21% pancreas	NR	14% with greater than 50%	23% RECIST	NR
Schaarschmidt [29]	Resin or glass	297	41%	91%	31% small bowel; 25% pancreas	26% G1; 51% G2; 7% G3	16% with greater than 50%	NR	38.9
Wong [30]	Resin	170	48%	85%	36% midgut; 26% foregut; 24% pancreas	70% G1; 15% G2; 15% G3	26% of total liver volume	36% RECIST	33
Braat [22]	Resin	244	66%	67%	35% small bowel; 31% pancreas	39% G1; 36% G2; 10% G3	47% with greater than 50%	16% RECIST	37

CR, complete response; PR, partial response; NR, not reported

[a]Survival measured from time of radioembolization

15	Please list any uncertainties or concerns about the efficacy and safety of this procedure/?	Because of the heterogeneity, it is unclear exactly what clinical outcome to expect in different scenarios e.g. different grades, primaries. If the procedure is approved, then registry data will be vital to collect.
16	Is there controversy, or important uncertainty, about any aspect of the procedure/technology?	Working out exactly when to offer the procedure, but there is little doubt in my mind, that it is an excellent tool and a great option for patients.
17	If it is safe and efficacious, in your opinion, will this procedure be carried out in (please choose one):	Fewer than 10 specialist centres in the UK – it should be limited to centres with high volume experience of SIRT and in treating patients with NET e.g. Southampton, Newcastle, King's.

Abstracts and ongoing studies

18	Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work). Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature searches. You do not need to supply a comprehensive reference list but it will help us if you list any that you think are particularly important.	Other than stated above, I'm not aware of recent publications (in the last year).
19	Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.	https://classic.clinicaltrials.gov/ct2/show/NCT04362436

20	Please list any other data (published and/or unpublished) that you would like to share.	-

Other considerations

21	Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an estimated number, or a proportion of the target population)?	Difficult to know. I suspect around 200 per year across the country, but I'm not sure about this.
22	Please suggest potential audit criteria for this procedure/technology. If known, please describe: – Beneficial outcome measures. These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured. – Adverse outcome measures. These should include early and late complications. Please state the post procedure timescales over which these should be measured:	Beneficial outcome measures: Imaging progression – over 2 years Quality of life scores – over 2 years Time to use of another therapy including systemics. Adverse outcome measures: Liver function tests – over 2 years. Radiation induced liver injury presence – over 6 months. Radiation hepatic fibrosis – over 2 years.

Further comments

23	If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe.	It is vital to co-ordinate data acquisition in the NHS if this procedure is approved.

NICE National Institute for Health and Care Excellence

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

Type of interest *	Description of interest	Relevant dates	
		Interest arose	Interest ceased
Direct - financial	I am a proctor for Sirtex, one of the 3 companies offering a SIRT product.	**26/6/23**	
Choose an item.			
Choose an item.			

☒ I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website.

Print name:	**Matthew Seager**
Dated:	**27/6/23**

View results

Respondent

11 Anonymous

23:06
Time to complete

1. Project Number and Name - (Can be found on email) *

IP1314

Your information

2. Name: *

Nadeem Shaida

3. Job title: *

Consultant Interventional radiologist

4. Organisation: *

Cambridge University NHS Foundation Trust

5. Email address: *

[redacted]

6. Professional organisation or society membership/affiliation: *

GMC

7. Nominated/ratified by (if applicable):

BSIR

8. Registration number (e.g. GMC, NMC, HCPC) *

4715052

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice: https://www.nice.org.uk/privacy-notice

9. I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. *

- (●) I agree
- ( ) I disagree

The procedure/technology

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

10. Please describe your level of experience with the procedure/technology, for example:

Are you familiar with the procedure/technology?

Yes

11. Have you used it or are you currently using it?

- Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake?

- Is this procedure/technology performed/used by clinicians in specialities other than your own?

- If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.

Yes have performed this procedure - limited numbers of procedures as not funded at present.
Nuclear medicine physicians are also involved in dosing and delivery of treatment

12. Please indicate your research experience relating to this procedure (please choose one or more if relevant):

- [x] I have done bibliographic research on this procedure.
- [ ] I have done research on this procedure in laboratory settings (e.g. device-related research).
- [ ] I have done clinical research on this procedure involving patients or healthy volunteers.
- [ ] I have published this research.
- [ ] I have had no involvement in research on this procedure.
- [ ] Other

13. Does the title adequately reflect the procedure?

- (•) Yes
- ( ) Other

14. Is the proposed indication appropriate? If not, please explain

yes

15. How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design?

Different to existing therapies for NET.
Approved by NICE and in use in different settings ie. CRC mets and HCC

16. Which of the following best describes the procedure:

- ( ) Established practice and no longer new.
- (•) A minor variation on an existing procedure, which is unlikely to alter the procedure's safety and efficacy.
- ( ) Definitely novel and of uncertain safety and efficacy.
- ( ) The first in a new class of procedure.

17. Does this procedure/technology have the potential to replace current standard care or would it be used as an addition to existing standard care?

Additional

Current management

18. Please describe the current standard of care that is used in the NHS.

Hormone therapy if widespread - sometimes surgical resection or ablation within the liver

19. Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this?

    If so, how do these differ from the procedure/technology described in the briefing?

    No

Potential patient benefits and impact on the health system

20. What do you consider to be the potential benefits to patients from using this procedure/technology?

    Locoregional control in liver only metastatic net patients

21. Are there any groups of patients who would particularly benefit from using this procedure/technology?

    As above

22. Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system?

    Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?

    Could lead to downstaging of tumour to resection or ablation

23. What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?

    Existing facilities for SIRT - Angio suite, radiopharmacy, IR and nuc med capabilities

24. Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?

    Standard SIRT training

Safety and efficacy of the procedure/technology

25. What are the potential harms of the procedure/technology?

    Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:

    - Adverse events reported in the literature (if possible, please cite literature)
    - Anecdotal adverse events (known from experience)
    - Theoretical adverse events

    Low to rare:
    Bleeding (arterial injury)/Bruising
    Infection
    Non-target treatment
    Liver failure (Radiation induced)
    Blood pressure shifts during procedure (specifically in symptomatic carcinoid syndrome patients)

26. Please list the key efficacy outcomes for this procedure/technology?

Time to local progression in liver
Overall survival

27. Please list any uncertainties or concerns about the efficacy and safety of this procedure/technology?

Nil specific

28. Is there controversy, or important uncertainty, about any aspect of the procedure/technology?

No

29. If it is safe and efficacious, in your opinion, will this procedure be carried out in:

- ○ Most or all district general hospitals.
- ◉ A minority of hospitals, but at least 10 in the UK.
- ○ Fewer than 10 specialist centres in the UK.
- ○ Cannot predict at present.

Abstracts and ongoing studies

30. Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work).

Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature searches. You do not need to supply a comprehensive reference list but it will help us if you list any that you think are particularly important.

RESIN registry
Long-term outcomes following 90Y Radioembolization of neuroendocrine liver metastases: evaluation of the radiation-emitting SIR-spheres in non-resectable liver tumor (RESiN) registr

31. Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.

ARTISAN trial - Single centre upcoming phase 2 trial with Theraspheres

32. Please list any other data (published and/or unpublished) that you would like to share.

N/a

Other considerations

33. Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an estimated number, or a proportion of the target population)?

Difficult for me to answer this - I would guess nationally less than 30-50.

34. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Beneficial outcome measures.

These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured.

Safety - Side effect profile - 30 days
Time to progression - 1 year and 3 years
Overall survival 1 year, 3years and 5 years

35. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Adverse outcome measures.

These should include early and late complications. Please state the post procedure timescales over which these should be measured:

30 days for immediate procedural issues - 6/12 for liver failure

Further comments

36. If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe *

n/a

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

37. Type of interest: *

- [x] Direct: financial
- [ ] Non-financial: professional
- [ ] Non-financial: personal
- [ ] Indirect
- [ ] No interests to declare

38. Description of interests, including relevant dates of when the interest arose and ceased. *

Paid invitation to medical advisory board meeting by Theraspeheres in 2019 - this pertained to HCC treatment and not neuroendocrine tumours

39. I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website. *

- (●) I agree
- ( ) I disagree

Signature

40. Name: *

Nadeem Shaida

41. Date: *

18/07/2023

View results

Respondent

27 Anonymous

900:22
Time to complete

1. Project Number and Name - (Can be found on email) *

IP1314

Your information

2. Name: *

Peter Littler

3. Job title: *

Consultant Interventional Radiologist

4. Organisation: *

Newcastle Upon Tyne NHS Trust

5. Email address: *

6. Professional organisation or society membership/affiliation: *

BSIR

7. Nominated/ratified by (if applicable):

BSIR

8. Registration number (e.g. GMC, NMC, HCPC) *

4638953

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice: https://www.nice.org.uk/privacy-notice

9. I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. *

- (●) I agree
- ( ) I disagree

The procedure/technology

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

10. Please describe your level of experience with the procedure/technology, for example:

Are you familiar with the procedure/technology?

As an Interventional Radiologist with a special interest in Interventional Oncology treatments, I have treated patients with NET metastases to the liver with SIRT for apx 12 years.

11. Have you used it or are you currently using it?

- Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake?

- Is this procedure/technology performed/used by clinicians in specialities other than your own?

- If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.

Yes, for approximately 12 years. Numbers are increasing recently in our practice. I would anticipate that, if commissioned, SIRT would be used for patients with bulky disease in the liver mainly as a means of controlling symptoms. This procedure will only be carried out in tertiary liver centres commisioned to use SIRT for other tumour types (HCC and CRLM) preferably who are also ENETS centres of excellence. The procedure is only carried out by Interventional Radiologists.

12. Please indicate your research experience relating to this procedure (please choose one or more if relevant):

- [ ] I have done bibliographic research on this procedure.
- [ ] I have done research on this procedure in laboratory settings (e.g. device-related research).
- [ ] I have done clinical research on this procedure involving patients or healthy volunteers.
- [ ] I have published this research.
- [x] I have had no involvement in research on this procedure.
- [ ] Other

13. Does the title adequately reflect the procedure?

- (•) Yes
- ( ) Other

14. Is the proposed indication appropriate? If not, please explain

I cannot see an indication documented aside from to treat NET mets to the liver. I agree with this indication.

15. How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design?

SIRT is a very useful treatment for hypervascular liver tumours (HCC) with an increasing level of evidence demonstrating its use as a well tolerated and effective treatment with prolonged OS and potential to downstage to resection previously inoperable tumours.

SIRT is also used in treating CRLM in the salvage situation.

SIRT with Y90 is not a novel treatment (although Holmium SIRT is new).

SIRT in the treatment of NET mets is a novel application of an established therapy although has been used in the treatmnet of these patients in small numbers for over 10 years.

16. Which of the following best describes the procedure:

- ( ) Established practice and no longer new.
- (•) A minor variation on an existing procedure, which is unlikely to alter the procedure's safety and efficacy.
- ( ) Definitely novel and of uncertain safety and efficacy.
- ( ) The first in a new class of procedure.

17. Does this procedure/technology have the potential to replace current standard care or would it be used as an addition to existing standard care?

I think that SIRT should replace bland embolisation in larger more bulky unilobar or bilobar liver metastases. Most commonly this would be to control symptoms. SIRT could be used to treat a solitary growing liver metastasis in patients unsuitable for resection.

Current management

18. Please describe the current standard of care that is used in the NHS.

As per ENETS guidance.

19. Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this?

    If so, how do these differ from the procedure/technology described in the briefing?

Bland embolisation or TACE is commonly used to treat NET Liver metastases. SIRT is better tolerated and more effective on larger or multifocal tumours in my opinion. SIRT is one of the recommended locoregional treatmnet options in the ENETS guidelines 2022.

Potential patient benefits and impact on the health system

20. What do you consider to be the potential benefits to patients from using this procedure/technology?

SIRT is well tolerated and is generally a single treatment episode. It is a preferable option to bland embolisation and TACE in bulky disease / larger lesions.

21. Are there any groups of patients who would particularly benefit from using this procedure/technology?

Symptomatic NET patients with bulky unilobar or biobar tumours. Lesions 6 cm and over is a size threshold used in HCC treatment that do less well with TACE.

22. Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system?

    Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?

Yes. Fewer treatments and better tolerated than bland embolisation/ TACE. The effects are SIRT are over a longer period of time (6 months) compared with embolisation that causes immediate necrosis explaining the improved patient experience. SIRT will also preserve vasculature compared with bland embolisation/TACE.

23. What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?

No changes to facilities needed as I would envisage this would be carried out in tertiary liver SIRT centres already experienced in the technology and in the treatment of NET metastases. Patients would be given an octreotide infusion

24. Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?

Not if only commissioned in existing SIRT tertiary centres.

Safety and efficacy of the procedure/technology

25. What are the potential harms of the procedure/technology?

Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:

- Adverse events reported in the literature (if possible, please cite literature)
- Anecdotal adverse events (known from experience)
- Theoretical adverse events

Radiation induced liver disease - very uncommon due to personalised dosimetry and non cirrhotic livers. Non target radioembolisation - very uncommon. Fatigue for a few weeks - quite common post SIRT and variable from patient to patient. Groin bruise - common.

26. Please list the key efficacy outcomes for this procedure/technology?

As for symptom control patient reported outcomes would be important. Biochemical markers. Response and progression free survival.

27. Please list any uncertainties or concerns about the efficacy and safety of this procedure/technology?

There is limited available data but our experience using SIRT for this indication is very positive and published literature is supportive.

28. Is there controversy, or important uncertainty, about any aspect of the procedure/technology?

Limited data available although SIRT is an locoregional therapy option recommended in guidlines for locoregionla treatmnet of NET liver mets (ENETS 2022).

29. If it is safe and efficacious, in your opinion, will this procedure be carried out in:

- ○ Most or all district general hospitals.
- ◉ A minority of hospitals, but at least 10 in the UK.
- ○ Fewer than 10 specialist centres in the UK.
- ○ Cannot predict at present.

Abstracts and ongoing studies

30. Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work).

Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature searches. You do not need to supply a comprehensive reference list but it will help us if you list any that you think are particularly important.

31. Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.

ARTISAN phase 2 at Imperial.

32. Please list any other data (published and/or unpublished) that you would like to share.

Other considerations

33. Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an estimated number, or a proportion of the target population)?

Unknown. I would think 50 - 100 per year in the UK.

34. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Beneficial outcome measures.

These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured.

Biochemical markers. QoL. Measured pre and over 1 year post SIRT.
Response and survival - ORR. pFS. mOS.

35. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Adverse outcome measures.

These should include early and late complications. Please state the post procedure timescales over which these should be measured:

Early complications would be over 30 days. Late apx 4 months.

Further comments

36. If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe *

A registry for data collection if commisioned would be beneficial. Dosimetry should be personalised where possible and documented in any data collection.

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

37. Type of interest: *

- [x] Direct: financial
- [ ] Non-financial: professional
- [ ] Non-financial: personal
- [ ] Indirect
- [ ] No interests to declare

38. Description of interests, including relevant dates of when the interest arose and ceased. *

Provide workshops and proctoring for Boston Scientific - ongoing.
Consultancy for Terumo on TACE beads Feb 23 (unrelated to Quiremspheres).

39. I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website. *

- (•) I agree
- ( ) I disagree

Signature

40. Name: *

Peter Littler

41. Date: *

10/08/2023

View results

Respondent

8 Anonymous

25:20
Time to complete

1. Project Number and Name - (Can be found on email) *

IP1314 Selective Internal Radiation Therapy (SIRT) For neuroendocrine tumours metastatic to the liver

Your information

2. Name: *

Sachin Modi

3. Job title: *

Consultant Interventional Radiologist

4. Organisation: *

University Hospital Southampton

5. Email address: *

[redacted]

6. Professional organisation or society membership/affiliation: *

GMC

7. Nominated/ratified by (if applicable):

N/A

8. Registration number (e.g. GMC, NMC, HCPC) *

6162251

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice: https://www.nice.org.uk/privacy-notice

9. I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. *

- (●) I agree
- ( ) I disagree

The procedure/technology

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

10. Please describe your level of experience with the procedure/technology, for example:

Are you familiar with the procedure/technology?

I have 10 years experience in delivering SIRT for primary and metastatic cancer to the liver. I was involved in the NICE appraisal process for SIRT in HCC. I have large experience in liver directed treatments for primary and metastatic liver cancer

11. Have you used it or are you currently using it?

- Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake?

- Is this procedure/technology performed/used by clinicians in specialities other than your own?

- If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.

Yes I am aware of the current use which is on clinical trials, compassionate or self funded / insured patients

No this procedure is performed by interventional radiologists

Yes, we are involved in MDT decisions with these patients along with liver surgeons, oncologists and nuclear medicine physicians. We have a weekly net mdt at Uhs and am regularly involved in the discussion of these patients.

12. Please indicate your research experience relating to this procedure (please choose one or more if relevant):

- [x] I have done bibliographic research on this procedure.
- [x] I have done research on this procedure in laboratory settings (e.g. device-related research).
- [x] I have done clinical research on this procedure involving patients or healthy volunteers.
- [ ] I have published this research.
- [ ] I have had no involvement in research on this procedure.
- [ ] Other

13. Does the title adequately reflect the procedure?

- (•) Yes
- ( ) Other

14. Is the proposed indication appropriate? If not, please explain

Yes. There is a strong rationale to control the burden of liver metastatic disease in these patients. Most of these patients have normal non cirrhotic livers and hence a less embolic therapy which can achieve excellent responses is appropriate

15. How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design?

It is not a new technology and has been being used for over 10 years. This is a new indication

16. Which of the following best describes the procedure:

- ( ) Established practice and no longer new.
- (•) A minor variation on an existing procedure, which is unlikely to alter the procedure's safety and efficacy.
- ( ) Definitely novel and of uncertain safety and efficacy.
- ( ) The first in a new class of procedure.

17. Does this procedure/technology have the potential to replace current standard care or would it be used as an addition to existing standard care?

Yes potentially to replace TAE (trans arterial embolisation)

Current management

18. Please describe the current standard of care that is used in the NHS.

Not used currently in an nhs setting for mNET

19. Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this?

    If so, how do these differ from the procedure/technology described in the briefing?

    No

Potential patient benefits and impact on the health system

20. What do you consider to be the potential benefits to patients from using this procedure/technology?

    Control liver disease leading to improved outcomes of progression free survival and overall survival. Improved QOL compared to other treatments

21. Are there any groups of patients who would particularly benefit from using this procedure/technology?

    Large burden of disease
    Single lobe or segment
    Single large tumour

22. Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system?

    Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?

    Yes. Reduction in number of traditional embolisation procedures which will result in fewer visits

23. What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?

    None. Already in place

24. Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?

    No, already in place in 10 hospitals in uk

Safety and efficacy of the procedure/technology

25. What are the potential harms of the procedure/technology?

    Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:

    - Adverse events reported in the literature (if possible, please cite literature)
    - Anecdotal adverse events (known from experience)
    - Theoretical adverse events

    Small risks of radiation hepatitis but very low with new advances in dosimetry (1-2%)

26. Please list the key efficacy outcomes for this procedure/technology?

Improved progression free survival, overall survival, response to tumours in liver

27. Please list any uncertainties or concerns about the efficacy and safety of this procedure/technology?

None

28. Is there controversy, or important uncertainty, about any aspect of the procedure/technology?

No

29. If it is safe and efficacious, in your opinion, will this procedure be carried out in:

- ○ Most or all district general hospitals.
- ◉ A minority of hospitals, but at least 10 in the UK.
- ○ Fewer than 10 specialist centres in the UK.
- ○ Cannot predict at present.

Abstracts and ongoing studies

30. Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work).

Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature searches. You do not need to supply a comprehensive reference list but it will help us if you list any that you think are particularly important.

N/A

31. Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.

N/A

32. Please list any other data (published and/or unpublished) that you would like to share.

No

Other considerations

33. Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an estimated number, or a proportion of the target population)?

250

34. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Beneficial outcome measures.

These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured.

Response in liver
Reduction in metanephrines
Improved progression free survival
Improved overall survival
Improved QOL compared to other liver directed treatments

35. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Adverse outcome measures.

These should include early and late complications. Please state the post procedure timescales over which these should be measured:

Mortality and mobility within 30 days
Procedural adverse events

Further comments

36. If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe *

None

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

37. Type of interest: *

- [x] Direct: financial
- [ ] Non-financial: professional
- [ ] Non-financial: personal
- [ ] Indirect
- [ ] No interests to declare

38. Description of interests, including relevant dates of when the interest arose and ceased. *

Consultant for Boston Scientific

39. I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website. *

- (●) I agree
- ( ) I disagree

Signature

40. Name: *

Sachin Modi

41. Date: *

09/07/2023

View results

Respondent

10 Anonymous

34:33
Time to complete

1. Project Number and Name - (Can be found on email) *

IP1314

Your information

2. Name: *

Tahir Shah

3. Job title: *

Consultant Hepatologist

4. Organisation: *

Queen Elizabeth Hospital Birmingham

5. Email address: *

[redacted]

6. Professional organisation or society membership/affiliation: *

UKINETS Treasurer

7. Nominated/ratified by (if applicable):

NA

8. Registration number (e.g. GMC, NMC, HCPC) *

GMC 4213426

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice: https://www.nice.org.uk/privacy-notice

9. I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. *

- (●) I agree
- ( ) I disagree

The procedure/technology

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

10. Please describe your level of experience with the procedure/technology, for example:

Are you familiar with the procedure/technology?

Yes

11. Have you used it or are you currently using it?

- Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake?

- Is this procedure/technology performed/used by clinicians in specialities other than your own?

- If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.

Presently only used in less than a dozen patients a year in England - free agent supplied by pharma.
Uptake is likely to be slow as only a few centres have experience of SiRT and neuroendocrine tumours.
It may replace some trans-arterial embolisation treatments (TAE). It is better tolerated than TAE and less resource using with overnight stay rather than hospital admission for 5-10 days on a specialist ward.
Total number of cases in England is likely to be less than 50 a year and will likely take a few years to get to these numbers.

12. Please indicate your research experience relating to this procedure (please choose one or more if relevant):

- [ ] I have done bibliographic research on this procedure.
- [ ] I have done research on this procedure in laboratory settings (e.g. device-related research).
- [ ] I have done clinical research on this procedure involving patients or healthy volunteers.
- [ ] I have published this research.
- [ ] I have had no involvement in research on this procedure.
- [x] I have some experience of this treatment and have written a proposal for a clinical trial also.

13. Does the title adequately reflect the procedure?

- (•) Yes
- ( ) Other

14. Is the proposed indication appropriate? If not, please explain

Yes

15. How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design?

It is a significant improvement in terms of venerability and effectiveness when comparing to trans-arterial embolisation.
It requires greater expertise that for TAE in terms of additional support from Nuclear Medicine.
SiRT is becoming increasingly used in UK and expertise is growing.

16. Which of the following best describes the procedure:

- (•) Established practice and no longer new.
- ( ) A minor variation on an existing procedure, which is unlikely to alter the procedure's safety and efficacy.
- ( ) Definitely novel and of uncertain safety and efficacy.
- ( ) The first in a new class of procedure.

17. Does this procedure/technology have the potential to replace current standard care or would it be used as an addition to existing standard care?

SiRT itself is now an established therapy.
Limited number of Centres in England are licensed for certain indications such as hepatocellular cancer.

Current management

18. Please describe the current standard of care that is used in the NHS.

Trans-arterial embolisation, though this is going out of fashion due to poor tolerability and poor outcomes.
SiRT is better tolerated and more effective [personal experience and some published data] and a good option for patients running out of other choices.

19. Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this?

    If so, how do these differ from the procedure/technology described in the briefing?

Trans-arterial embolisation is presently used but is a major drain on NHS resources as patients can be very unwell after, requiring prolonged hospital admission and a 6-12 week recovery.

Potential patient benefits and impact on the health system

20. What do you consider to be the potential benefits to patients from using this procedure/technology?

Better tolerated
More effective than alternatives

21. Are there any groups of patients who would particularly benefit from using this procedure/technology?

liver predominant progressive disease
liver disease with severe hormone related symptoms

22. Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system?

    Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?

yes:
can be given as day case, saving 5-10 hospital days of admission to usually a specialist liver ward.
Well tolerated without the need for prolonged recovery with significant input from healthcare professionals - physiotherapist, district nurses etc.
fewer outpatient visits as more effective treatment than alternative.

23. What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?

Expansion of SiRT capacity

24. Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?

Can only be used in centres with expertise in SiRT; limited number in UK.

Safety and efficacy of the procedure/technology

25. What are the potential harms of the procedure/technology?

Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:

- Adverse events reported in the literature (if possible, please cite literature)
- Anecdotal adverse events (known from experience)
- Theoretical adverse events

transient fatigue is commonest
small risk of liver failure
small risk of gastrointestinal ulceration

26. Please list the key efficacy outcomes for this procedure/technology?

progression free survival
improvement in hormone related symptoms
overall survival

27. Please list any uncertainties or concerns about the efficacy and safety of this procedure/technology?

Lack of randomised trial data in NETs

28. Is there controversy, or important uncertainty, about any aspect of the procedure/technology?

No

29. If it is safe and efficacious, in your opinion, will this procedure be carried out in:

- ○ Most or all district general hospitals.
- ○ A minority of hospitals, but at least 10 in the UK.
- ◉ Fewer than 10 specialist centres in the UK.
- ○ Cannot predict at present.

Abstracts and ongoing studies

30. Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work).

Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature searches. You do not need to supply a comprehensive reference list but it will help us if you list any that you think are particularly important.

31. Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.

32. Please list any other data (published and/or unpublished) that you would like to share.

Other considerations

33. Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an estimated number, or a proportion of the target population)?

NA

34. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Beneficial outcome measures.

These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured.

NA

35. Please suggest potential audit criteria for this procedure/technology. If known, please describe:

Adverse outcome measures.

These should include early and late complications. Please state the post procedure timescales over which these should be measured:

NA

Further comments

36. If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe *

Presently SiRT hasa limited but very useful role in NETs.
This may expand if randomised trials show efficacy in expanded cohort, but these are a decade away

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

37. Type of interest: *

- [ ] Direct: financial
- [x] Non-financial: professional
- [ ] Non-financial: personal
- [ ] Indirect
- [ ] No interests to declare

38. Description of interests, including relevant dates of when the interest arose and ceased. *

Have worked with the 2 main companies to discuss the role of the therapy in HCC and NET patients.
Have developed a design for a clinical trial of SiRT in NETs.

39. I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website. *

- (●) I agree
- ( ) I disagree

Signature

40. Name: *

Tahir Shah

41. Date: *

14/07/2023

NICE National Institute for Health and Care Excellence

Professional Expert Questionnaire

Technology/Procedure name & indication: IP1314 Selective internal radiation therapy (SIRT) for neuroendocrine tumours metastatic to the liver

Your information

Name:	Teik Choon SEE
Job title:	Consultant Interventional Radiologist
Organisation:	Cambridge University Hospitals NHS Foundation Trust
Email address:	[redacted]
Professional organisation or society membership/affiliation:	Royal College of Radiologist; British Society of Interventional Radiologists, British Institute of Radiology, HCC UK
Nominated/ratified by (if applicable):	HCC UK/ BASL (British Association of the Study of the Liver)
Registration number (e.g. GMC, NMC, HCPC)	4591247

How NICE will use this information:

The information that you provide on this form will be used to develop guidance on this procedure.

☐ Please tick this box if you would like to receive information about other NICE topics.

Your advice and views represent your individual opinion and not that of your employer, professional society or a consensus view. Your name, job title, organisation and your responses, along with your declared interests will also be published online on the NICE website as part of public

consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.

For more information about how we process your data please see our privacy notice.

√☐ I give my consent for the information in this questionnaire to be used and may be published on the NICE website as outlined above. If consent is NOT given, please state reasons below:

Click here to enter text.

Please answer the following questions as fully as possible to provide further information about the procedure/technology and/or your experience.

1	Please describe your level of experience with the procedure/technology, for example: Are you familiar with the procedure/technology? Have you used it or are you currently using it? – Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake? – Is this procedure/technology performed/used by clinicians in specialities other than your own?	I am familiar with SIRT (>10 years) in treating hepatocellular carcinoma and in colorectal liver metastases. We are one of the 10 centres that was involved in the commissioning through evaluation programme for SIRT in colorectal liver metastases and I was the professional expert when NICE was evaluating SIRT in HCC. I have not used SIRT in neuroendocrine tumours (NET) metastatic to the liver. My experience in treating this type of liver tumours is mainly with trans-arterial embolisation. Currently SIRT in NET liver metastases is probably only available in the private sector. As far as i am aware this is also very limited. SIRT procedure is performed by Interventional Radiologists, in conjunction with support from the Nuclear Medicine team. Patient selection is always a multidisciplinary approach.

	– If your specialty is involved in patient selection or referral to another specialty for this procedure/technology, please indicate your experience with it.	
	– Please indicate your research experience relating to this procedure (please choose one or more if relevant):	I have done bibliographic research on this procedure. Other (please comment) I had contributed to the national registry for SIRT. I was part of the steering group in evaluating the role / outcome of SIRT in cholangiocarcinoma and colorectal liver metastases from the national registry. Both analyses were published.
3	Does the title adequately reflect the procedure? Is the proposed indication appropriate? If not, please explain. How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design? Which of the following best describes the procedure (please choose one):	Yes. Perhaps shorten it to: Selective internal radiation therapy (SIRT) for neuroendocrine liver metastases Yes. SIRT has not been universally or formally adopted in the treatment of NET liver mets. Established practice and no longer new (in terms of the SIRT procedure). However, it is not an established practice in NET liver mets.
4	Does this procedure/technology have the potential to replace current standard care or	It has the potential to add to existing standard of care

	would it be used as an addition to existing standard care?	
5	Have there been any substantial modifications to the procedure technique or, if applicable, to devices involved in the procedure? Has the evidence base on the efficacy and safety of this procedure changed substantially since publication of the guidance?	Refinement of techniques and dosimetry is ongoing. Evidence is primarily from HCC and colorectal liver mets data.

Current management

6	Please describe the current standard of care that is used in the NHS.	Clinical management is mainly focused on two aspects: tumour control and hormonal excel control. Current available treatments in the NHS include: - Tumour burden reduction but surgery, ablation, bland embolisation (TAE), or chemoembolization (TACE) - somatostatin analogues to manage carcinoid syndrome - Systemic therapy - Combination of the above
7	Are you aware of any other competing or alternative procedure/technology available to the NHS which have a similar function/mode of action to this? If so, how do these differ from the procedure/technology described in the briefing?	Stereotactic ablative radiotherapy (SABR) could potentially be another radiation technology. However, I am not aware of it being used in the NHS for this indication.

Potential patient benefits and impact on the health system

8	What do you consider to be the potential benefits to patients from using this procedure/technology?	Data is limited but potentially tumour control and symptomatic control related to NET liver mets.
9	Are there any groups of patients who would particularly benefit from using this procedure/technology?	Potentially hypervascular (which NETs tend to be) large size symptomatic groups
10	Does this procedure/technology have the potential to change the current pathway or clinical outcomes to benefit the healthcare system? Could it lead, for example, to improved outcomes, fewer hospital visits or less invasive treatment?	It has the potential to improve outcomes compared to TAE/TACE e.g: - Less post embolisation syndrome - One off/less frequent treatment sessions - Better tumour control?
11	What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?	The provision will be similar to SIRT in HCC and colorectal liver mets. The prophylactic prevention of carcinoid crisis will be similar to TAE/TACE in NETS liver mets.
12	Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?	Similar requirement as per SIRT in HCC and colorectal liver mets

Safety and efficacy of the procedure/technology

13	What are the potential harms of the procedure/technology? Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:	Expected potential harm will be similar to SIRT in HCC (more at risk in HCC if there is underlying liver cirrhosis) and colorectal liver mets including radiation injury to stomach, duodenum, lungs, and liver. However, majority of this could be avoided or minimised during SIRT work up prior to the actual treatment.

	Adverse events reported in the literature (if possible, please cite literature) Anecdotal adverse events (known from experience) Theoretical adverse events	
14	Please list the key efficacy outcomes for this procedure/technology?	- Tumour control - Symptom control - Survival
15	Please list any uncertainties or concerns about the efficacy and safety of this procedure/?	- Fairly limited evidence to date
16	Is there controversy, or important uncertainty, about any aspect of the procedure/technology?	- Fairly limited evidence to date
17	If it is safe and efficacious, in your opinion, will this procedure be carried out in (please choose one):	Fewer than 10 specialist centres in the UK.

Abstracts and ongoing studies

18	Please list any abstracts or conference proceedings that you are aware of that have been recently presented / published on this procedure/technology (this can include your own work). Please note that NICE will do a comprehensive literature search; we are only asking you for any very recent abstracts or conference proceedings which might not be found using standard literature	NA

	searches. You do not need to supply a comprehensive reference list but it will help us if you list any that you think are particularly important.	
19	Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.	- TheraSphere Selective Internal Radiation Therapy (SIRT) as Treatment for Neuroendocrine Tumours With Liver Mets (ArTisaN)
20	Please list any other data (published and/or unpublished) that you would like to share.	NA

Other considerations

21	Approximately how many people each year would be eligible for an intervention with this procedure/technology, (give either as an estimated number, or a proportion of the target population)?	Unable to predict at this point.
22	Please suggest potential audit criteria for this procedure/technology. If known, please describe: – Beneficial outcome measures. These should include short- and long-term clinical outcomes, quality-of-life measures and patient-related outcomes. Please suggest the most appropriate method of measurement for each and the timescales over which these should be measured. – Adverse outcome measures. These should include early and late complications. Please state the post procedure timescales over which these should be measured:	Beneficial outcome measures: -Objective response (SIRT response may not be evident until 6 months or so) - Improvement of hormonal related measures - QoL assessment Adverse outcome measures: -Carcinoid crisis - Liver impairment

Further comments

23	If you have any further comments (e.g. issues with usability or implementation, the need for further research), please describe.	NA

NICE National Institute for Health and Care Excellence

Declarations of interests

Please state any potential conflicts of interest relevant to the procedure/technology (or competitor technologies) on which you are providing advice, or any involvements in disputes or complaints, in the previous **12 months** or likely to exist in the future. Please use the NICE policy on declaring and managing interests as a guide when declaring any interests. Further advice can be obtained from the NICE team.

Type of interest *	Description of interest	Relevant dates	
		Interest arose	Interest ceased
Direct - financial	Speaker fees from SIRTEX (x 2) and Boston Scientific (x 2) in SIRT for HCC	**2022 and 2023**	
Choose an item.			
Choose an item.			

√☐ I confirm that the information provided above is complete and correct. I acknowledge that any changes in these declarations during the course of my work with NICE, must be notified to NICE as soon as practicable and no later than 28 days after the interest arises. I am aware that if I do not make full, accurate and timely declarations then my advice may be excluded from being considered by the NICE committee.

Please note, all declarations of interest will be made publicly available on the NICE website.

Print name:	**Teik Choon SEE**
Dated:	**26/6/23**