

## Professional Expert Questionnaire

Technology/Procedure name & indication:

### Your information

<b>Name:</b>	<input type="text" value="Andrew McQueen"/>
<b>Job title:</b>	<input type="text" value="Consultant Radiologist"/>
<b>Organisation:</b>	<input type="text" value="Newcastle upon Tyne Hospitals NHS Foundation Trust"/>
<b>Email address:</b>	<input type="text" value="[REDACTED]"/>
<b>Professional organisation or society membership/affiliation:</b>	<input type="text" value="Royal College of Radiologists, British Society of Head &amp; Neck Imaging"/>
<b>Nominated/ratified by (if applicable):</b>	<input type="text" value="Dr P Haslam, President British Society of Interventional Radiology"/>
<b>Registration number (e.g. GMC, NMC, HCPC)</b>	<input type="text" value="6026798"/>

**How NICE will use this information:** the advice and views given in this questionnaire will form part of the information used by NICE and its advisory committees to develop guidance or a medtech innovation briefing on this procedure/technology. Information may be disclosed to third parties in accordance with the Freedom of Information Act 2000 and the Data Protection Act 2018, complying with data sharing guidance issued by the Information Commissioner's Office. 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interests will also be published online on the NICE website as part of the process of public consultation on the draft guidance, except in circumstances but not limited to, where comments are considered voluminous, or publication would be unlawful or inappropriate.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:

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

**Please note that questions 10 and 11 are applicable to the Medical Technologies Evaluation Programme (MTEP). We are requesting you to complete these sections as future guidance may also be produced under their work programme.**

<p><b>1</b> Please describe your level of experience with the procedure/technology, for example:</p> <p>Are you familiar with the procedure/technology?</p> <p>Have you used it or are you currently using it?</p> <ul style="list-style-type: none"><li>- Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake?</li><li>- Is this procedure/technology performed/used by clinicians in specialities other than your own?</li><li>- If your specialty is involved in patient selection or referral to another specialty for this</li></ul>	<p>I have recently started to perform a very similar procedure (Ultrasound guided Radiofrequency Ablation of Benign Thyroid nodules). Microwave Ablation (MWA) is a similar, more recently developed procedure for the same clinical indication and I am familiar with the literature and technical aspect of the procedure from peer reviewed journal articles and specialist educational webinars.</p> <p>This procedure is not presently offered in the UK/NHS (to the best of my knowledge).</p> <p>Procedure performed by interventional radiologists in European centres (I am a head &amp; neck radiologists)</p> <p>I am involved with patient selection (same group) for Radiofrequency Ablation. I can provide the selection criteria used in Newcastle, if helpful.</p>
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	procedure/technology, please indicate your experience with it.	
2	<p>- Please indicate your research experience relating to this procedure (please choose one or more if relevant):</p>	<p>I have done bibliographic research on this procedure.</p> <p>I have done research on this procedure in laboratory settings (e.g. device-related research).</p> <p>I have done clinical research on this procedure involving patients or healthy volunteers.</p> <p>I have published this research.</p> <p><b>I have had no involvement in research on this procedure.</b></p> <p>Other (please comment) I have reviewed literature on all benign thyroid ablation techniques as part of our own service development.</p>
3	<p>How innovative is this procedure/technology, compared to the current standard of care? Is it a minor variation or a novel approach/concept/design?</p> <p>Which of the following best describes the procedure (please choose one):</p>	<p>Established practice and no longer new.</p> <p><b>A minor variation on an existing procedure, which is unlikely to alter the procedure's safety and efficacy.</b></p> <p>Definitely novel and of uncertain safety and efficacy.</p> <p>The first in a new class of procedure.</p>
4	Does this procedure/technology have the potential to replace current standard care or	Addition to existing standard of care (benign nodule ablation with RFA already NICE approved)

would it be used as an addition to existing standard care?	
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### Current management

5	Please describe the current standard of care that is used in the NHS.	Surgery (hemithyroidectomy) or radiofrequency ablation (BENIGN NODULES).  Surgery or radioactive iodine (AUTONOMOUSLY FUNCTIONING NODULES)
6	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?	RFA (as above) – both performed under local anaesthesia  RFA differs in the method of tissue ablation. RFA is heating of tissue to achieve ablation by thermal injury and is generally slower and susceptible to heat sink (loss of heat through adjacent blood vessels). Microwave ablation offers a faster ablative technique but with the potential greater risk of injury to adjacent anatomy due to more rapid ablation of tissue. Some European and Asian centres perform both and there is a large volume of literature on RFA and smaller, but growing research on MWA.

## Potential patient benefits and impact on the health system

7	What do you consider to be the potential benefits to patients from using this procedure/technology?	Faster ablation procedure for common (benign thyroid nodule) condition, avoiding surgery. Avoiding surgery or radioactive iodine in autonomously functioning nodules.
8	Are there any groups of patients who would particularly benefit from using this procedure/technology?	Patients with symptomatic thyroid nodules who do not wish to undergo/consider surgery
9	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?	No - Most patients who do not wish to have surgery are presently managed conservatively. Introduction of MWA would add to non surgical options.
<b>10 - MTEP</b>	Considering the care pathway as a whole, including initial capital and possible future costs avoided, is the procedure/technology likely to cost more or less than current standard care, or about the same? (in terms of staff, equipment, care setting etc)	More than standard of care (conservative treatment)  Less than standard of care for those who opt for surgery.  Overall, I would expect additional capital spend than current standard of care.
<b>11 - MTEP</b>	What do you consider to be the resource impact from adopting this procedure/technology (is it likely to cost more or less than standard care, or about same-in terms of staff, equipment, and care setting)?	As above. MWA would likely be performed using a generator loaned from the company (or already owned by NHS Trust performing liver, pancreatic, renal MWA). Each MWA antennae (needle) is procured from vendor (Terumo are the only company I am aware of ).
12	What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?	An Interventional Radiology environment with pre procedure space, nurse assistance for procedure and patient monitoring, good quality neck ultrasound machine, sterile procedure with microwave generator and antennae. Aftercare in recovery area. IR or day case surgical setting is likely to be most suitable (not diagnostic radiology environment)

13	<p>Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?</p>	<p>Yes – currently thyroid RFA is being commenced by Head &amp; Neck and Interventional radiologists in the UK with specific training and observation provided by the 2 main RFA vendors. Proctorship of a new service is undertaken with site visit and direct supervision &amp; support for first procedure(s).</p> <p>There is not (currently) a standard criteria or description for who should perform thyroid ablation. British Society of Head &amp; Neck Imaging has raised this issue and the potential to create a document of expected training &amp; standards for those performing.</p>
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### Safety and efficacy of the procedure/technology

14	<p>What are the potential harms of the procedure/technology?</p> <p>Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:</p> <p>Adverse events reported in the literature (if possible, please cite literature)</p> <p>Anecdotal adverse events (known from experience)</p> <p>Theoretical adverse events</p>	<p>Damage to recurrent laryngeal nerve – causing temporary or permanent vocal cord palsy.</p> <p>Burns to skin</p> <p>Tracheal/oesophageal injury</p> <p>Local haematoma or infection – requiring surgical evacuation or drainage.</p>
15	<p>Please list the key efficacy outcomes for this procedure/technology?</p>	<ol style="list-style-type: none"> <li>1. Symptom improvement (THY PROMS is often used as patient reported outcomes.).</li> <li>2. Cosmetic improvement – PROMS and medical photography can help.</li> <li>3. Size reduction on follow up ultrasound.</li> <li>4. Complication rate (compared with other ablation techniques and surgery)</li> </ol>
16	<p>Please list any uncertainties or concerns about the efficacy and safety of this procedure/?</p>	<p>Small number of centres have used it so far. MWA is faster but has more potential to cause morbidity, therefore requires high skill and knowledge of Ultrasound guided neck intervention &amp; anatomy.</p>
17	<p>Is there controversy, or important uncertainty, about any aspect of the procedure/technology?</p>	<p>Patient safety with MWA due to the faster ablation process (described above)</p>

18	If it is safe and efficacious, in your opinion, will this procedure be carried out in (please choose one):	<p>Most or all district general hospitals.</p> <p>A minority of hospitals, but at least 10 in the UK.</p> <p><b>Fewer than 10 specialist centres in the UK.</b></p> <p>Cannot predict at present.</p>
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### Abstracts and ongoing studies

19	<p>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).</p> <p>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.</p>	<p><b>1. Papini E, Monpeyssen H, Frasoldati A and Hegedüs L (2020). European Thyroid Association Clinical Practice Guideline for the Use of Image-Guided Ablation in Benign Thyroid Nodules. European Thyroid Journal. 9:172–185</b></p> <p><i>Abstract</i></p> <p>Standard therapeutic approaches for benign thyroid lesions that warrant intervention are surgery for cold and either surgery or radioiodine for autonomously functioning thyroid nodules (AFTN). Image-guided thermal ablation (TA) procedures are increasingly proposed as therapy options for selected clinical conditions. Due to mounting scientific evidence and widening availability, ETA considered it appropriate to develop guidelines for the use of TA in adult patients. TA procedures are well tolerated, but a dedicated training of the operators is required and information on possible complications needs to be shared with the patients. The following factors should be considered when weighing between observation, surgery, and TA for benign thyroid nodules. In solid non-hyperfunctioning nodules, TA induces a decrease in thyroid nodule volume, paralleled by improvement in symptoms. Nodule re-growth is possible over time and may necessitate repeat treatment, or surgery, in a dialogue with the patient. In AFTN, radioactive iodine is the first-line treatment, but TA may be considered in young patients with small AFTN due to higher probability of restoring normal thyroid function and avoidance</p>
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of irradiation. In cystic nodules, ethanol ablation (EA) is the most effective and least expensive treatment. TA may be considered for cystic lesions that relapse after EA or have a significant residual solid component following drainage and EA. TA should be restricted to benign lesions that cause symptoms or cosmetic concern. Presently, laser and radiofrequency ablation are the most thoroughly assessed techniques, with similar satisfactory clinical results. Microwaves and high-intensity focused ultrasound therapy options remain to be fully evaluated

2. Cui T, Jin C, Jiao D, Teng D, Sui G (2019). Safety and efficacy of microwave ablation for benign thyroid nodules and papillary thyroid microcarcinomas: A systematic review and meta-analysis. *European Journal of Radiology*. 118: 58-64
3. Dong P, Wu X, Sui G, Luo Q, Du J, Wang H and Teng D (2021). The efficacy and safety of microwave ablation versus lobectomy for the treatment of benign thyroid nodules greater than 4 cm. *Endocrine*. 71(1):113-121
4. Yue W, Wang S, Lu F, Sun L, Guo L, Zhang Y, Li X and Xu H, (2017). Radiofrequency ablation vs. microwave ablation for patients with benign thyroid nodules: a propensity score matching study. *Endocrine*. 55:485–95
5. Wang B, Han Z, Yu J, Cheng Z, Liu F, Yu X, Chen C, Liu J and Liang P (2017). Factors related to recurrence of the benign non-functioning thyroid nodules after percutaneous microwave ablation. *International Journal of Hyperthermia*. 33:459–64
6. Korkusuz Y, Gröner G, Raczynski N, Relin O, Kingeter Y, Grünwald F and Happel C (2018). Thermal ablation of thyroid nodules. Are radiofrequency ablation, microwave ablation and high intensity focused ultrasound equally safe and effective methods *European Radiology*. 28:929–35.
7. Wu W, Gong X, Zhou Q, Chen X and Chen X (2017). Ultrasound-Guided Percutaneous Microwave Ablation for Solid Benign Thyroid Nodules: Comparison of MWA versus Control Group. *International Journal of Endocrinology*. 9724090

		<ol style="list-style-type: none"> <li>8. Honglei G, Shahbaz M, Farhaj Z, Ijaz M, Kai S, Davrieux C and Cheng S (2021). Ultrasound guided microwave ablation of thyroid nodular goiter and cystadenoma. A single center, large cohort study. <i>Medicine</i>. 100:34(e26943).</li> <li>9. Korkusuz H; Happel C; Heck K; Ackermann H and Grünwald F (2014). Percutaneous thermal microwave ablation of thyroid nodules Preparation, feasibility, efficiency. <i>Nuklearmedizin</i>. 53(4):123-30.</li> <li>10. Liu Y, Qian L, Liu D and Zhao J (2017). Ultrasound-guided microwave ablation in the treatment of benign thyroid nodules in 435 patients. <i>Experimental Biology and Medicine</i> 2017; 242: 1515–1523.</li> <li>11. Wu W, Gong X, Zhou Q, Chen X, Chen X and Shi B (2017). US-guided percutaneous microwave ablation for the treatment of benign thyroid nodules. <i>Endocrine Journal</i>. 64 (11): 1079-1085</li> <li>12. Heck K, Happel C, Grünwald F and Korkusuz H (2015). Percutaneous microwave ablation of thyroid nodules: effects on thyroid function and antibodies. <i>International Journal of Hyperthermia</i>, (31)5: 560-567</li> <li>13. Zhi X, Zhao N, Liu Y, Liu J, Teng C and Qian L (2018). Microwave ablation compared to thyroidectomy to treat benign thyroid nodules. <i>International Journal of Hyperthermia</i>. 34(5): 644–652</li> <li>14. Jin H, Fan J, Liao K, He Z, Li W and Cui M (2018). A propensity score matching study between ultrasound-guided percutaneous microwave ablation and conventional thyroidectomy for benign thyroid nodules treatment. <i>International Journal of Hyperthermia</i>. (35)1: 232-238</li> <li>15. Liu S, Guo W, Yang B, Li Y, Huang X, Wang X, Chen J, D and Zhou X (2019). Comparison of stress response following microwave ablation and surgical resection of benign thyroid nodules. <i>Endocrine</i>. 65:138–143.</li> <li>16. Gharib H, Hegedüs L, Pacella C, Baek J, and Papini E (2013). Nonsurgical, Image-Guided, Minimally Invasive Therapy for Thyroid Nodules. <i>Journal of Clinical Endocrinology and Metabolism</i>. 98(10):3949 –3957</li> </ol>
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20	Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.	There are likely to be trials but I am not aware of these
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### 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 Newcastle, we currently have 2 patients per month eligible for thyroid ablation for benign nodules. However, the target population is many times larger as the treatment is new. Colleagues in UCH London have a lengthy waiting list and receive referrals from across UK. Functioning nodules are a smaller but regular group – endocrinology colleagues would be able to specify the potential numbers
22	Are there any issues with the usability or practical aspects of the procedure/technology?	The main issue is to standardise training and the definition of who can/should be able to perform this procedure. Many different clinician groups have performed in Europe and east Asia and there is a need to clarify standard practice.
23	Are you aware of any issues which would prevent (or have prevented) this procedure/technology being adopted in your organisation or across the wider NHS?	No
24	Is there any research that you feel would be needed to address uncertainties in the evidence base?	No
25	Please suggest potential audit criteria for this procedure/technology. If known, please describe: <ul style="list-style-type: none"> <li>- 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.</li> </ul>	Beneficial outcome measures: BENIGN NODULES – THY PROMS questionnaire of symptoms, medical photography, US follow up of nodule size AFTNs – thyroid function profile  Adverse outcome measures

	<ul style="list-style-type: none"> <li>- Adverse outcome measures. These should include early and late complications. Please state the post procedure timescales over which these should be measured:</li> </ul>	<p>BOTH: side effects, repeat treatment rate</p> <p>AFTNs: Need for standard treatment (surgery, radioactive iodine) for treatment failure, need for thyroxine replacement</p>
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**Further comments**

<p><b>26</b></p>	<p>Please add any further comments on your particular experiences or knowledge of the procedure/technology,</p>	
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**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.	A vendor of microwave ablation (Terumo) has offered me attendance at a 2 day workshop of thyroid MWA in Spain in October 2022. I am yet to accept but would be interested in seeing the technique. There are no plans to purchase Terumo equipment or commence MWA within Newcastle within the next 3 years (we have only just started RFA) and I have no commercial interest in the company	1/2/22	
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:	<input type="text" value="ANDREW MCQUEEN"/>
Dated:	<input type="text" value="6/2/22"/>

## Professional Expert Questionnaire

Technology/Procedure name & indication:

### Your information

<b>Name:</b>	<input type="text" value="Dr Gibran Timothy Yusuf"/>
<b>Job title:</b>	<input type="text" value="Consultant Interventional Radiologist"/>
<b>Organisation:</b>	<input type="text" value="King's College Hospital"/>
<b>Email address:</b>	<input type="text" value="[REDACTED]"/>
<b>Professional organisation or society membership/affiliation:</b>	<input type="text" value="GMC, RCR, BSIR, BSHNI, BMUS, EFSUMB, CIRSE"/>
<b>Nominated/ratified by (if applicable):</b>	<input type="text" value="ENT UK"/>
<b>Registration number (e.g. GMC, NMC, HCPC)</b>	<input type="text" value="7014347"/>

**How NICE will use this information:** the advice and views given in this questionnaire will form part of the information used by NICE and its advisory committees to develop guidance or a medtech innovation briefing on this procedure/technology. Information may be disclosed to third parties in accordance with the Freedom of Information Act 2000 and the Data Protection Act 2018, complying with data sharing guidance issued by the Information Commissioner's Office. 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 the process 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.**

**Please note that questions 10 and 11 are applicable to the Medical Technologies Evaluation Programme (MTEP). We are requesting you to complete these sections as future guidance may also be produced under their work programme.**

<p><b>1</b> Please describe your level of experience with the procedure/technology, for example:</p> <p>Are you familiar with the procedure/technology?</p> <p>Have you used it or are you currently using it?</p> <ul style="list-style-type: none"> <li>- Do you know how widely this procedure/technology is used in the NHS or what is the likely speed of uptake?</li> <li>- Is this procedure/technology performed/used by clinicians in specialities other than your own?</li> <li>- If your specialty is involved in patient selection or referral to another specialty for this</li> </ul>	<p>I am an interventional radiologist and have experience of visceral ablation using microwave and cryoablation. I also am highly skilled in ultrasound, with an interest in advanced techniques and small parts imaging (including thyroid ultrasound). I am a regular invited speaker and publish regularly in ultrasound. I am familiar with microwave ablation but have not performed it within the thyroid specifically.</p> <p>Currently thyroid ablation is performed very little in the NHS at only 1-2 centres. Ablation is only done with radiofrequency ablation in the UK and as far as I am aware no centres have yet commenced microwave ablation of thyroid nodules. The natural progression of radiofrequency ablation to microwave in other organs suggests that microwave ablation of the thyroid will become favourable over radiofrequency ablation.</p> <p>In some places (as far as I know, not within the UK) some ENT surgeons also perform microwave thyroid ablation, but again radiofrequency ablation is the dominant method.</p> <p>As an interventional radiologist, I would advise on suitability for microwave thyroid ablation in conjunction with the referring surgical and/or endocrine team. Currently I do not undertake this procedure but would be expected to be part of MDT discussion initially.</p>
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	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 had no involvement in research on this procedure.
3	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):	The type of energy used for ablation is the main difference to current NICE recommendation for radiofrequency ablation of thyroid nodules. Microwave mainly represents a preferable option to radiofrequency ablation in most organs partially due to shorter procedure times. I would consider this a minor variation on a theme with the overarching concept remaining of thermal ablation of benign thyroid nodules.  A minor variation on an existing procedure, which is unlikely to alter the procedure's safety and efficacy.
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?	Yes

### Current management

5	Please describe the current standard of care that is used in the NHS.	Thyroidectomy/hemi thyroidectomy or rarely radiofrequency ablation
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<p><b>6</b> 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?</p> <p>If so, how do these differ from the procedure/technology described in the briefing?</p>	<p>Radiofrequency ablation is the current alternative, but is slower, less controllable and potential for greater variation.</p>
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## Potential patient benefits and impact on the health system

7	What do you consider to be the potential benefits to patients from using this procedure/technology?	Less variable degree of treatment as well as shorter and easier procedures. In comparison to thyroidectomy/hemi thyroidectomy the procedure has lower risk rate, recovery time, cost and complexity. This procedure is also minimally invasive and performed as a daycase.
8	Are there any groups of patients who would particularly benefit from using this procedure/technology?	Patients who are unsuitable for a general anaesthetic, those wishing to preserve maximal thyroid function, desire to avoid a cosmetic scar
9	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?	There would be fewer post procedure follow up clinics, less likely to have inpatient admission from procedure and less likely to require endocrine follow up for decreased thyroid function.  The procedure itself is also minimally invasive so is performed as a daycase without general anaesthetic requirement.
<b>10 - MTEP</b>	Considering the care pathway as a whole, including initial capital and possible future costs avoided, is the procedure/technology likely to cost more or less than current standard care, or about the same? (in terms of staff, equipment, care setting etc)	Given the current standard of care is hemithyroidectomy/thyroidectomy and when accounting for complications, thyroid replacement and bed stay, microwave ablation is likely to be more cost effective.
<b>11 - MTEP</b>	What do you consider to be the resource impact from adopting this procedure/technology (is it likely to cost more or less than standard care, or about same-in terms of staff, equipment, and care setting)?	There is an expected initial capital expense to outlay but will be less costly than current standard of care.
12	What clinical facilities (or changes to existing facilities) are needed to do this procedure/technology safely?	A procedural room, ultrasound equipment, nursing staff, interventional staffing and consumables. Access to thyroid surgery/theatre is a must have as well as difficult airway anaesthetic equipment.

<b>13</b>	Is any specific training needed in order to use the procedure/technology with respect to efficacy or safety?	Proctoring of cases is advisable.
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### Safety and efficacy of the procedure/technology

<b>14</b>	<p>What are the potential harms of the procedure/technology?</p> <p>Please list any adverse events and potential risks (even if uncommon) and, if possible, estimate their incidence:</p> <p>Adverse events reported in the literature (if possible, please cite literature)</p> <p>Anecdotal adverse events (known from experience)</p> <p>Theoretical adverse events</p>	<p>The risk profile is the same as radiofrequency ablation of thyroid nodules</p> <p>Bleeding, infection, pain (2-3%), thyroid nodule rupture, permanent/temporary voice disturbance, Horner's syndrome, vasovagal response, local injury, airway compromise – based on data available all complications less than or equal to 1% unless otherwise stated</p> <p>Multiple publications including of note Radiofrequency Ablation of Benign Thyroid Nodules and Recurrent Thyroid Cancers: Consensus Statement and Recommendations and Ultrasound-guided radiofrequency ablation (RFA) of benign symptomatic thyroid nodules - initial UK experience. <i>Br J Radiol.</i> 2019;92(1098):20190026. doi:10.1259/bjr.20190026</p>
<b>15</b>	Please list the key efficacy outcomes for this procedure/technology?	Relief of mass effect symptoms, cosmetic appearance, objective nodule size on imaging, safety profile, cost
<b>16</b>	Please list any uncertainties or concerns about the efficacy and safety of this procedure/?	No specific concerns
<b>17</b>	Is there controversy, or important uncertainty, about any aspect of the procedure/technology?	No

18	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.
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### Abstracts and ongoing studies

19	<p>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).</p> <p>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.</p>	Several webinars and congresses have mentioned microwave but not as dedicated topics.
20	Are there any major trials or registries of this procedure/technology currently in progress? If so, please list.	Not currently aware of any

### 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 estimate as a benign procedure and can be offered at intervals but population base would be the same as previous NICE advice for RFA ablation of thyroid nodules.
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22	Are there any issues with the usability or practical aspects of the procedure/technology?	No
23	Are you aware of any issues which would prevent (or have prevented) this procedure/technology being adopted in your organisation or across the wider NHS?	No
24	Is there any research that you feel would be needed to address uncertainties in the evidence base?	Further accumulated data will add to the strength but this will be acquired with acceptance
25	<p>Please suggest potential audit criteria for this procedure/technology. If known, please describe:</p> <ul style="list-style-type: none"> <li>- 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.</li> <li>- Adverse outcome measures. These should include early and late complications. Please state the post procedure timescales over which these should be measured:</li> </ul>	<p>Beneficial outcome measures:</p> <p>Symptomatic improvement (QOL scores e.g. THYpro or patient satisfaction), cosmetic appearances (patient satisfaction), objective nodule size (ultrasound based).</p> <p>Results should not be expected to be immediate and should be assessed at a minimum of 6 months but 12 months is a more appropriate time.</p> <p>Adverse outcome measures:</p> <p>Major and minor complications described above, including voice change, nodule rupture, bleeding, haematoma, local structure injury. Admission rate, further treatment needed at 12 months, thyroid function</p>

## Further comments

26	Please add any further comments on your particular experiences or knowledge of the procedure/technology,	NA
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**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.**

<b>Print name:</b>	<input type="text" value="Click here to enter text."/> Gibran Timothy Yusuf
<b>Dated:</b>	<input type="text" value="Click here to enter text."/> 27/03/2022