

NATIONAL INSTITUTE FOR HEALTH AND CARE EXCELLENCE

Medical technology consultation document

Alpha-Stim AID for anxiety disorders

The National Institute for Health and Care Excellence (NICE) is producing guidance on using Alpha-Stim AID for anxiety disorders in the NHS in England. The medical technologies advisory committee has considered the evidence submitted by the company and the views of expert advisers.

This document has been prepared for public consultation. It summarises the evidence and views that have been considered, and sets out the recommendations made by the committee. NICE invites comments from the public. This document should be read along with the evidence (see the [committee papers](#)).

The advisory committee is interested in receiving comments on the following:

- Has all of the relevant evidence been taken into account?
- Are the summaries of clinical and resource savings reasonable interpretations of the evidence?
- Are the recommendations sound and a suitable basis for guidance to the NHS?
- Are there any equality issues that need special consideration and are not covered in the medical technology consultation document?

Note that this document is not NICE's final guidance on Alpha-Stim AID for anxiety disorders. The recommendations in section 1 may change after consultation.

After consultation the committee will meet again to consider the evidence, this document and comments from the public consultation. After considering the comments, the committee will prepare its final recommendations which will be the basis for NICE's guidance on the use of the technology in the NHS in England. For further details, see the [medical technologies evaluation programme process and methods guides](#).

The key dates for this guidance topic are: 9 October 2020

Closing date for comments: 6 November 2020

Second committee meeting: 11 December 2020

[Details of the advisory committee](#) are given in section 5.

NICE medical technologies guidance addresses specific technologies notified to NICE by companies. The 'case for adoption' is based on the claimed advantages of introducing the specific technology compared with current management of the condition. This case is reviewed against the evidence submitted and expert advice.

If the case for adopting the technology is supported, the specific recommendations are not intended to limit use of other relevant technologies that may offer similar advantages. If the technology is recommended for use in research, the recommendations are not intended to preclude the use of the technology in the NHS but to identify further evidence which, after evaluation, could support a recommendation for wider adoption.

1 Recommendations

1.1 Alpha-Stim AID shows promise for managing anxiety disorders. However, there is not enough good quality evidence to support the case for routine adoption in the NHS.

1.2 Research is recommended to address uncertainties about

- the short- and long-term efficacy of Alpha-Stim AID,
- its position in the care pathway for treating anxiety disorders and
- its resource impact.

This research should include a randomised controlled trial that compares Alpha-Stim AID with current treatment options such as individual cognitive behavioural therapy, or medication, or both. Find out details of the research recommended in [section 4](#).

Why the committee made these recommendations

Anxiety disorders are treated using a range of interventions including cognitive behavioural therapy, or medication, or both. Alpha-Stim AID uses an electric current intended to generate calming brain waves, which may relieve anxiety symptoms.

Clinical trial evidence shows that Alpha-Stim AID can relieve anxiety symptoms in people with anxiety disorders. But it is not clear how this happens and how much

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benefit people get. Also, the evidence is of low quality. How long any benefit lasts is unclear because most of the trials lasted for only 5 or 6 weeks. There is also no evidence comparing Alpha-Stim AID with individual cognitive behavioural therapy or medication.

The effect of adopting Alpha-Stim AID on costs and resources is unclear because its clinical effectiveness and its position in the care pathway are uncertain. Alpha-Stim AID is not recommended for routine adoption and further research is needed.

2 The technology

Technology

- 2.1 Alpha-Stim AID is an electrotherapy device that uses a variable electric microcurrent to stimulate brain alpha wave electrical activity. It uses a current with a repetition rate of 0.5 hertz, with bipolar asymmetric rectangular waves in a cycle that repeats at 10-second intervals.
- 2.2 Alpha-Stim AID is compact, about the size of a mobile phone, and delivers an electric current through a pair of small clips attached to the ear lobes. The clips have removable soft pads that are moistened to ensure electricity conduction. The strength of the current can be adjusted. Alpha-Stim AID is recommended to be used for between 20 and 60 minutes every day, every other day, or as needed to treat symptoms of anxiety. Alpha-Stim AID is battery powered and portable. The company has 7 previous versions of the Alpha-Stim device and states that all versions are based on the same mechanism of action.

Innovative aspects

- 2.3 Alpha-Stim AID differs from other anxiety disorder treatments because it uses a patented electrical wave pattern that is transmitted to the brain to stimulate the production of alpha waves.

Intended use

- 2.4 Alpha-Stim AID is intended to be used to treat anxiety, insomnia and depression. This guidance focuses on the use of Alpha-Stim AID for treating anxiety disorders. The device can be self-administered at home, or by a healthcare professional in a hospital or clinic. Some people may feel their ability to do potentially hazardous tasks (for example, drive a car) is impaired after treatment, and this may last several hours. Alpha-Stim AID may affect the functioning of implanted cardiac pacemakers and defibrillators. The safety of cranial electrotherapy has not been established during pregnancy. The device has a 5-year warranty.

Relevant pathway

- 2.5 [NICE's guideline on generalised anxiety disorder and panic disorder in adults](#) provides principles of care for people with generalised anxiety disorder. It recommends a stepped-care model to organise service provision and to help people with generalised anxiety disorder, their families, carers and practitioners choose the most effective intervention.
- 2.6 Improving Access to Psychological Therapies (IAPT) services provide evidence-based psychological therapies to people with anxiety disorders and depression. A clinical expert noted that IAPT teams are the standard structure of service provision for people with anxiety and depression in most regions of England. IAPT teams deliver the NICE-recommended stepped-care model for generalised anxiety disorder.
- 2.7 [NICE's guideline on social anxiety disorder: recognition, assessment and treatment](#) provides treatment principles for adults with social anxiety disorder. It recommends the use of individual cognitive behavioural therapy. If a person wants to have drug treatment, a selective serotonin reuptake inhibitor (escitalopram or sertraline) should be offered. For adults who decline cognitive behavioural therapy and drug treatment, short-term psychodynamic psychotherapy that has been specifically developed to treat social anxiety disorder should be considered.

Costs

- 2.8 The cost of Alpha-Stim AID is £450 (excluding VAT) per device. The device can be reused by multiple people. A per person treatment cost of £70 is used in the cost modelling, which is based on a treatment time of 10 weeks and includes £40 to cover other costs such as staff time, postage and consumables.

For more details, see the [website for Alpha-Stim AID for anxiety disorders](#).

3 Evidence

Clinical evidence

The clinical evidence comprises 6 studies, of which 3 are randomised controlled trials

- 3.1 Six studies provided evidence relevant to the decision problem in the scope, including 2 published randomised controlled trials, 1 unpublished randomised controlled trial and 3 non-comparative observational studies. The studies included between 12 and 197 people. Only 1 study used the current model of the device, the others used older models. One study was done in the UK.

Evidence shows that using Alpha-Stim AID relieves anxiety symptoms

- 3.2 The 3 randomised controlled trials showed a statistically significant improvement in patient-reported anxiety scores with Alpha-Stim AID compared with drugs alone, a sham device, or no treatment in people with anxiety disorders. The benefit of Alpha-Stim AID in relieving anxiety symptoms was also reported consistently in the observational studies.

There is no evidence of the long-term effect of Alpha-Stim AID

- 3.3 The studies were of short duration (usually 5 to 6 weeks) with only 1 observational study reporting longer-term outcomes at 24 weeks.

The published evidence on the effect of Alpha-Stim AID on quality of life is limited

- 3.4 Only 2 of the studies reported improvements in quality of life (Morriss et al. 2019, Lu and Hu 2014) using health questionnaire (EQ-5D-5L and WHOQOL BREF) scores. An improvement in quality of life was also reported with Alpha-Stim AID in a patient survey facilitated by NICE's public involvement programme. For details, see the assessment report overview in the supporting documents for this guidance.

Alpha-Stim AID is considered a safe device

- 3.5 Adverse events reported with Alpha-Stim AID in 2 studies included mild headache, dizziness, nausea and feeling strange. Similar symptoms were reported by people who used Alpha-Stim AID in the patient survey that was done as part of this assessment. Additional symptoms reported in this survey included ear discomfort and worsening of anxiety symptoms. All reported adverse events were mild. The clinical experts did not identify any specific safety concerns with Alpha-Stim AID.

Cost evidence

One UK study is included in the economic modelling

- 3.6 The company identified 1 UK study (Morriss et al. 2019). This reported the cost impact of Alpha-Stim AID as a treatment option for people with anxiety disorders who were waiting for individual cognitive behavioural therapy (iCBT) delivered by Improving Access to Psychological Therapies (IAPT) services. No additional economic analyses were identified by the external assessment centre (EAC).

The company's model shows cost savings in treating anxiety disorders

- 3.7 The company developed a decision tree model with a time horizon of 6 months. The model compared the cost of using Alpha-Stim AID as an option for people waiting for iCBT in IAPT services with that of iCBT alone. The results showed that Alpha-Stim AID was cost saving by £817.68 per person.

The EAC changes the company's model to reflect the evidence and expert opinion

3.8 The EAC agreed with many of the assumptions in the company's model but found some limitations. In the UK observational study, a significant proportion of people who were offered Alpha-Stim AID chose not to use it and preferred to wait for iCBT (Morriss et al. 2019). The EAC therefore revised this parameter in the model to reflect the reduced uptake of Alpha-Stim AID. The EAC also modified the structure of the model to better reflect the current care pathway outlined to it by clinical experts. The EAC's base case included drug treatment as an option at the start of the pathway and also for people whose anxiety symptoms did not respond to Alpha-Stim AID or iCBT. The EAC excluded the second course of iCBT for people whose anxiety symptoms did not respond to an initial course of treatment.

The EAC's updated analysis suggests that cost saving is influenced by response rate and assumptions about the treatment pathway

3.9 The EAC's base case showed that using Alpha-Stim AID saved £80.79 per person compared with iCBT. This was based on a 47.2% response rate with Alpha-Stim AID (Morriss et al. 2019) and a 54.2% response rate with iCBT (Gyani et al. 2013). The reported response rate for Alpha-Stim AID included everyone who used it in the Morriss et al. study. However, many people may also have had iCBT alongside or after Alpha-Stim AID. The reported response rates for treatment combinations were more uncertain and varied. For instance, the response rate was 65% in people using Alpha-Stim AID alone and 13% in people having Alpha-Stim AID followed by iCBT (Morriss et al. 2019). The EAC explored the effect of different response rates and treatment regimens. For details, see the addendum to the EAC's assessment report in the supporting documents for this guidance.

4 Committee discussion

Clinical-effectiveness overview

A better understanding of how Alpha-Stim AID works in people with anxiety disorders is needed

4.1 The committee considered that Alpha-Stim AID's mode of action was uncertain although the clinical experts explained the physiological role of alpha brain waves in mediating feelings of calmness. The clinical experts confirmed that Alpha-Stim AID's mode of action had not been investigated in people with anxiety disorders. The committee was therefore concerned about the plausibility of its therapeutic effect. It proposed that further studies should be done, for example using electroencephalography, to record any acute or longer-term changes in brain waves after using Alpha-Stim AID in people with anxiety disorders.

Alpha-Stim AID is a treatment option for managing anxiety disorders, but the evidence is weak

4.2 The randomised controlled trial evidence showed short-term relief of anxiety symptoms with Alpha-Stim AID in people with anxiety disorders. However, the committee noted that the quality of the evidence was low because of a high risk of bias. The committee was concerned about the possibility of a significant placebo effect with Alpha-Stim AID. But it also acknowledged that reducing anxiety symptoms was the most important outcome regardless of how this was achieved. The committee concluded that well planned and well-conducted trials were needed to be certain about Alpha-Stim AID's clinical benefit.

Evidence on the long-term benefit of using Alpha-Stim AID is needed

4.3 The evidence consisted of relatively short-term studies, mostly with follow-up periods of 6 to 12 weeks. In 1 study follow up was 24 weeks. The clinical experts advised that anxiety disorders are long-term conditions and many people have relapses in symptoms. No convincing evidence

was available on the longer-term benefits of Alpha-Stim AID and the committee concluded that further research was needed to explore this.

More evidence is needed to assess the effect of Alpha-Stim AID compared with other options in the care pathway

4.4 The clinical experts explained that there are several different treatments offered to people with anxiety disorders in the NHS. The committee considered that Morriss et al. (2019) provided information about the use of Alpha-Stim AID in people waiting for iCBT. But aside from this, the evidence about the effect of different treatments or treatment combinations was uncertain. The committee noted, for example, that there was no evidence comparing the effect of Alpha-Stim AID with medication in people with anxiety disorders. It concluded that there was significant uncertainty about the possible role of Alpha-Stim AID in a complex mental health care pathway. The committee proposed that further studies were needed to compare Alpha-Stim AID with established treatments for anxiety disorders, such as iCBT and medication.

Side effects and adverse events

Alpha-Stim AID is a low-risk device with no serious side effects

4.5 The evidence suggested that adverse events with Alpha-Stim AID were mild. The clinical experts explained that people may have vertigo or dizziness when Alpha-Stim AID is first used, particularly at a high electric current, but these symptoms tend to lessen when the current is reduced. Data from the patient survey confirmed that the device is generally well tolerated. The committee concluded that people using Alpha-Stim AID have a low risk of side effects. Also, the device might be a treatment option for some people for whom conventional treatments are unsuitable or who would prefer to avoid them.

NHS considerations overview

Training and ongoing support is important for people using Alpha-Stim AID at home

4.6 The clinical experts advised that training on the correct use of Alpha-Stim AID is important and this is offered to people before treatment starts. This involves explaining technical issues such as ensuring correct connections and setting appropriate currents. The patient expert also noted that people may need ongoing support while using Alpha-Stim AID at home. The committee concluded that providing information and support was essential to ensure that the technology is used correctly.

The position of Alpha-Stim AID in the treatment pathway is not clear

4.7 The clinical experts explained that because of the number of people with anxiety disorders there is huge pressure on iCBT services. They also explained that iCBT is not suitable for everyone and some people may have to wait for quite some time to have it. So, easy access to self-administered treatment such as Alpha-Stim AID that can be used at home is a potentially attractive option for people waiting for iCBT. The committee also considered that a range of different options was needed in the NHS so that treatment for anxiety disorders can be tailored to the needs of individual people. The clinical experts explained that Alpha-Stim AID can be offered early in the care pathway and it may help people engage better with subsequent iCBT if this is still needed. The clinical experts also suggested that Alpha-Stim AID may particularly benefit people who want to avoid taking medication or when medication is unsuitable for them. The committee concluded that although there is demand for a range of treatment options for managing anxiety disorders, the clinical benefits of Alpha-Stim AID in the care pathway remained uncertain (see sections 4.2 to 4.4).

There is potential for Alpha-Stim AID to be used in GP services to help people manage anxiety disorders

4.8 The clinical experts explained about the potential role of Alpha-Stim AID in primary care, where there is an unmet clinical need for people with anxiety disorders. The committee noted that there is an ongoing study exploring the use of Alpha-Stim AID in primary care. It considered that the full results of this study would be valuable to consider in a future assessment.

Cost modelling overview

The EAC's updated model is acceptable but uncertainties remain

4.9 The committee considered that the position of Alpha-Stim AID treatment in the care pathway and how well different treatments work (that is, Alpha-Stim AID alone or with iCBT) was uncertain. So, it was difficult to draw firm conclusions about the cost benefits of using Alpha-Stim AID. The committee concluded that further clinical efficacy evidence was needed to accurately assess whether using Alpha-Stim AID alone or as an add-on treatment would lead to cost savings compared with standard care.

Further information about resource use would be valuable

4.10 In the EAC's base-case analysis, the main drivers in the cost model were the uptake rate and response rates for the different treatments. The clinical experts explained that the uptake rates were likely to vary across services and people's preferences. They considered that the uptake rate of 22% used in the EAC's model did not reflect the much higher rates found in their own clinical practice. The clinical experts also commented that people may stop treatment early with Alpha-Stim AID if their symptoms improved and this may have confounded the calculated response rates. The committee concluded that more robust data were needed to understand the potential resource impact of using Alpha-Stim AID in the NHS.

Further research

Further good quality research is needed to address uncertainties about the clinical efficacy of Alpha-Stim AID

- 4.11 Alpha-Stim AID shows potential for managing anxiety disorders, but further studies are needed to address uncertainties about its clinical efficacy. A fundamental understanding of the effect of Alpha-Stim AID on brain function in people with anxiety disorders, for example using electroencephalography, would be helpful. The committee considered that a well-conducted randomised controlled trial should be done to evaluate the short- and long-term effects of Alpha-Stim AID compared with established treatment options such as medication and iCBT. Such a study should include an assessment of patient-reported outcome measures and resource use to inform a future assessment of the cost consequence of using Alpha-Stim AID in the NHS.

Collecting real-world data is encouraged

- 4.12 The committee considered that collecting real-world data on the use of Alpha-Stim AID would be useful to help understand issues such as patient treatment preferences, the uptake of the device, and the response rates and treatment completion rates in different clinical scenarios.

5 Committee members and NICE project team

Committee members

This topic was considered by [NICE's medical technology advisory committee](#), which is a standing advisory committee of NICE.

Committee members are asked to declare any interests in the technology to be appraised. If it is considered there is a conflict of interest, the member is excluded from participating further in that evaluation.

The [minutes of the medical technology advisory committee](#), which include the names of the members who attended and their declarations of interests, are posted on the NICE website.

NICE project team

Each medical technologies guidance topic is assigned to a team consisting of 1 or more technical analysts (who act as technical leads for the topic), a technical adviser and a project manager.

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ISBN: [\[to be added at publication\]](#)