National Institute for Health and Care Excellence

Medical technologies evaluation programme

MT443 Sleepio to treat insomnia symptoms

Consultation comments table

Final guidance MTAC date: 18th February 2022

There were 47 consultation comments from 4 consultees:

- 12 comments from a company representative
- 17 comments from a healthcare professional
- 14 comments from a healthcare researcher
- 4 comments from a professional organisation

A total of 15 comments responding to the 4 consultation questions are presented in Table 1. The other 32 comments are presented in Table 2, arranged in the following themes:

- Recommendations (comments 1 to 6)
- Sleepio comparators (comments 7 to 12)
- Clinical evidence – new meta-analysis (comments 13 to 17)
- Technology (comments 18 to 21)
- Drop-out rate (comment 22 to 23)
- Health inequalities (comments 24 to 25)
- Impact of COVID-19 (comments 26 to 28)
- Clarification and factual inaccuracies (comments 29 to 32)

The EAC also provided an updated cost comparison analysis in a separate document (see Appendix 1).

Table 1. Comments on 4 consultation questions (n=15)

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#	Consultee ID	Role	Comments
Question 1: Has all of the relevant evidence been taken into account?			
1	1	Company	Additional studies could be taken into account: - Digital cognitive behavioural therapy for insomnia promotes later health resilience during the coronavirus disease 19 (COVID-19) pandemic https://pubmed.ncbi.nlm.nih.gov/33249492/ Comparative efficacy of digital cognitive behavioural therapy for insomnia: A systematic review and network meta-analysis https://www.sciencedirect.com/science/article/abs/pii/S1087079221001520
2	2	Healthcare professional	No, there is recent evidence outstanding. There is a recent meta-analytic review by Hasan et al. 2021 (Sleep Medicine Reviews), which directly compares web based CBTI with face-to-face CBTI. It shows that digital CBTI, with either a guided or a virtual therapist (including Sleepio studies) can deliver a similar (insomnia symptoms) or better (sleep parameters) treatment effect as face-to-face CBTI.
3	3	Healthcare researcher	Yes.
4	4	Professional organisation	Yes, it would appear that all the relevant evidence has been taken into account for this product.
Question 2: Are the summaries of clinical and cost-effectiveness reasonable interpretations of the evidence?			
5	1	Company	In consideration of the economic evidence, Big Health would like to propose a change to the pricing model to ensure Sleepio is cost saving in-year. The proposed model prices Sleepio at a licence price of £45, covering one year of access per patient.
6	2	Healthcare professional	Suggestion of clarification and amendment. Please see comments below.
7	3	Healthcare researcher	Yes.
8	4	Professional organisation	Yes, they appear robust and reasonable summaries.
Question 3: Are the recommendations sound and a suitable basis for guidance to the NHS?			
9	2	Healthcare professional	Suggestion of clarification and amendment. Please see comments below.
10	3	Healthcare researcher	Yes.
11	4	Professional organisation	Yes, we feel the recommendations are sound and a suitable basis for guidance to the NHS. However, we would also add that we welcome a range of interventions and support for those with anxiety and initiatives that target factors known to impact anxiety including poor sleep.
Question 4: Are there any equality issues that need special consideration and are not covered in the medical technology consultation document?			
12	1	Company	Sleepio is effective in pregnant women, whereas some hypnotic drugs are not indicated. Using Sleepio increases equity of access for pregnant women who have trouble sleeping but cannot take drugs, and have no access to f2f CBT-I.

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13	2	Healthcare professional	CBTI is the first line, recommended treatment for insomnia disorder in both national (e.g., NICE Insomnia CKS, 2021) and international clinical guidelines (e.g., Qaseem et al., 2014; Riemann et al., 2017). Despite this, CBTI is routinely unavailable to NHS patients across the UK. There are no long-term plans for widespread training of therapists in CBT-I, a hugely costly endeavour, and no plans for provision of CBT-I in areas where it cannot presently be accessed face-to-face. This leaves a very real and widespread problem of a lack of access to evidence-based, first-line treatment, which is particularly problematic in areas already subject to significant health provision inequalities. Web-based CBTI directly addresses health inequality when it comes to CBTI provision. It is conceivable that in such areas, without adequate provision for CBTI, there will be a protracted over-reliance on off-license pharmacotherapy (e.g., benzodiazepine receptor agonists, sedative antidepressants), use which has been highlighted as problematic and in need of addressing by Public Health England (2019).
14	3	Healthcare researcher	Potential to exacerbate health inequalities - covered in equality impact assessment
15	4	Professional organisation	As has already been identified within the review of the technology not everyone has equitable access to digital healthcare products and solutions.

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Table 2. Individual comments from the consultees (n=32)

#	Consultee ID	Role	Section	Comments	Response
Recommendations (n=7)					

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1	1	Company	1.2	We would like to propose a change to the pricing model to ensure Sleepio is cost saving in-year. As a summary, the proposed licence price per patient is £45.	Thank you for your comment. The EAC conducted an updated cost comparison analysis of Sleepio using the updated license fee of £45 (see Appendix 1). With the new price, Sleepio was cost saving compared with treatment as usual after 1 year. The committee decided that despite the limitations in the economic modelling, the technology was likely to be at least cost neutral and very likely cost saving compared to usual care. Therefore, the committee recommended Sleepio as an option for people with insomnia symptoms who would receive treatment as usual.
2	1	Company	1.4	However, there is inequity of access for face-to-face CBT-I, which prevents access for some patients who may be eligible**.**	Thank you for your comment. The committee discussed the accessibility issues of face-to-face CBT-I with the clinical experts. This is referred to in sections 4.2 and 4.3 of the guidance. The committee also acknowledges the challenges of carrying out comparative research in this group of patients in section 4.18.
3	2	Healthcare professional	1.4	Eligibility' (i.e. appropriateness) for accessing face-to-face CBT-I would currently include any adult patient presenting in primary care with insomnia symptoms. Eligibility for Sleepio would be the same. The comparability between face-to-face CBTI and Sleepio needs further elucidation in the context of a recently published meta-analytic review (Hasan et al., 2021; Sleep Medicine Reviews) showing that digital CBT-I with either a guided or a virtual therapist (including Sleepio studies) can deliver similar (insomnia symptoms) or better (sleep parameters) treatment effects as face-to-face CBTI. Face-to-face CBT-I is very rarely available in primary or secondary care and so, by and large, in the few places where it is available, waiting times for accessing treatment (e.g. via IAPT) are lengthy. Additionally, in the few services able to provide CBT-I, (e.g. some IAPT services), there is often active screening out of patients who are otherwise ineligible for the service (e.g. not meeting anxiety or depression criteria), given current commissioning	Thank you for your comment. Please see the response to comment 2. Thank you for identifying the Hasan et al. 2021 review. The EAC reviewed this study (section 3.5 and the addendum to the assessment report) and the committee discussed it and the other evidence available relating to face-to-face CBT-I (see section 4.5). The committee decided the evidence is limited and further research is needed for this patient group.

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				criteria. There are very few services actively commissioned to treat insomnia disorder and no long-term plans for widespread training of therapists in CBT-I, a hugely costly endeavour. There are no plans for provision of CBT-I in areas where it cannot presently be accessed face-to-face. This leaves a very real and widespread problem of a lack of access to evidence-based, first-line treatment, particularly in areas already subject to significant health provision inequalities.	
4	2	Healthcare professional	1.4	This is a cost associated with the provision of an evidence-based treatment where there is currently no evidence-based treatment being routinely employed, e.g. reliance on non-treatments (sleep hygiene) and on off-license use of medications (e.g. zopiclone, mirtazepine). CBT-I, the NICE recommended first-line treatment for the disorder, whether web-based or face-to-face is not routinely available to patients in the NHS and should be being made accessible to all patients throughout the UK. Sleepio provides access to the indicated treatment for the disorder at a population scale.	Thank you for your comment. Please see the response to comment 2.
5	2	Healthcare professional	1.4	As a general point, this is incorrect. This only applies in the very few areas where there is face-to-face CBT-I provision. Even in those areas, the lack of appropriately trained clinicians means significant waiting times and over-reliance on non-evidence-based approaches to symptom management (e.g. benzodiazepine receptor agonists). There is a widespread lack of provision of CBT-I across the UK with most patients being unable to access this treatment approach even after presenting in primary care.	Thank you for your comment. Please see the response to comment 2.
6	3	Healthcare researcher	1.4	Some patients may be eligible for face to face CBT-I but may prefer digital CBT-I due various reasons (pandemic, sustainability, convenience etc).	Thank you for your comment. The committee considered your comment carefully and discussed the different forms of CBT-I that are currently available. The

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					committee concluded that Sleepio has the potential to provide another option for people who would benefit from access to CBT-I.
Sleepio comparators (n=5)					
7	2	Healthcare professional	1.1	Regardless of the cost implications, usual treatment is, unfortunately, not evidence-based in this case. Neither sleep hygiene, nor hypnotic medication is indicated as a first-line treatment for insomnia disorder (NICE CKS, 2021; Qaseem et al., 2016; Riemann et al., 2017; Wilson et al., 2020; Schutte-Rodin et al., 2008) despite widespread use. Cognitive Behavioural Therapy for Insomnia (CBT-I), which is the recommended first-line treatment for the disorder (see above), is not routinely provided in either primary or secondary care mental health services and so is largely unavailable via conventional clinical channels across the UK.	Thank you for your comment. The population for this evaluation is adults with difficulty sleeping. This includes people with insomnia symptoms as well as those with insomnia disorder. The committee considered your comment and asked the clinical experts for input on the clinical pathway for people with insomnia and insomnia symptoms in the NHS. Clinical experts explained that the gold standard treatment for insomnia is face-to-face CBT-I, but its availability is very limited in the NHS. Although eligibility for face-to-face CBT-I is broad, referral in clinical practice is limited to people who have severe insomnia or present with other comorbidities such as depression and anxiety. In current practice, people who present to their GP with insomnia symptoms would receive sleep hygiene advice and hypnotic medication. The committee concluded that the appropriate comparator for people with insomnia symptoms is treatment as usual, which consists of sleep hygiene advice and short-term medication.
8	2	Healthcare professional	1.4	Neither of these are evidence-based approaches for insomnia disorder (see e.g. NICE Insomnia CKS, 2021).	Thank you for your comment. Please see the response to comment 7.
9	1	Company	1.4	How would eligibility for face-to-face CBT for insomnia differ to the eligibility criteria for Sleepio? It would be helpful to understand the proposed clinical pathway.	Thank you for your comment. Please see the response to comment 7.
10	1	Company	3.5	That's not necessarily true. It's not feasible to compare with f2f CBT due to lack of provision, and it would be unethical to compare with non-evidence based digital CBT-I programmes	Thank you for your comment. The committee understood the challenges of doing a comparative study versus face-to-face CBT-I in the UK and suggested a real-world study in people eligible for CBT-I in section 4.18 of the guidance.

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11	1	Company	4.2	As NICE recently shared in a draft guideline, therapy should be offered first line instead of drugs	Thank you for your comment. Please see the response to comment 7.
12	2	Healthcare professional	4.2	Worth clarifying that these treatment approaches (sleep hygiene and hypnotic medication) are not indicated in the treatment of insomnia disorder.	Thank you for your comment. Please see the response to comment 7.
Clinical evidence – new meta-analysis (n=5)					
13	2	Healthcare professional	1.4	This needs clarification. A recently published meta-analytic review (Hasan et al., 2021; Sleep Medicine Reviews) shows that digital CBT-I with either a guided or a virtual therapist (including Sleepio studies) can deliver similar (insomnia symptoms) or better (sleep parameters) treatment effects as face-to-face CBTI. The authors note: “interaction may play a crucial role in the success of digital CBTi as we noted that web-based CBTi with a virtual or real therapist yielded promising treatment results or had efficacy equivalent to that of face-to-face CBTi ... In consideration of the need to deliver cost-effective treatments, web-based CBTi combined with a virtual therapist is preferred, offering promising scalability and a solution to the problem of a lack of real therapists.” For clarification, the Sleepio programme utilises a virtual therapist, known as ‘The Prof’.	Thank you for your comment. The committee carefully considered your comment and the EAC carried out a review of the Hasan et al. meta-analysis. The meta-analysis reported different CBT-I approaches, including face-to-face CBT-I. Although, Sleepio was one of the CBT-I approaches included, there was no direct comparison with face-to-face CBT-I. The EAC noted that although the statistical methodology of the meta-analysis was appropriate, there was significant heterogeneity amongst the studies. The dataset included only a few studies assessing face-to-face CBT-I. The committee understood that digital CBT-I with a therapist is superior to other forms of digital CBT-I. However, it considered the evidence is limited for Sleepio in the group of patients who would be eligible for CBT-I. The committee concluded that more research or data collection is recommended on Sleepio for people who are eligible for face-to-face CBT-I in primary care.
14	2	Healthcare professional	1.4	See previous comment. A recently published meta-analytic review (Hasan et al., 2021; Sleep Medicine Reviews) shows that digital CBT-I with either a guided or a virtual therapist (including Sleepio studies) can deliver similar (insomnia symptoms) or better (sleep parameters) treatment effects compared to face-to-face CBTI.	Thank you for your comment. Please see the response to comment 13.
15	2	Healthcare professional	3.4	There is now a recently published meta-analytic review (Hasan et al., 2021; Sleep Medicine Reviews) showing that digital CBT-I with either a guided or a virtual therapist (including Sleepio studies) can deliver similar (insomnia symptoms) or	Thank you for your comment. Please see the response to comment 13.

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				better (sleep parameters) treatment effects as face-to-face CBTI.	
16	2	Healthcare professional	4.3	This has now been confirmed and further elucidated by the recent meta-analytic review by Hasan et al., 2021 (Sleep Medicine Reviews).	Thank you for your comment. Please see the response to comment 13.
17	2	Healthcare professional	4.4	There is now direct evidence comparing Sleepio with face-to-face CBT-I, in the recent meta-analytic review by Hasan et al., 2021 (Sleep Medicine Reviews). The review shows that "web-based CBTi yields a comparable effect on sleep outcomes regardless of whether a real or virtual therapist is used" (as is the case with Sleepio's virtual therapist).	Thank you for your comment. Please see the response to comment 13.
Technology (n=4)					
18	3	Healthcare researcher	2.2	Will prolonging access beyond 12 months be beneficial to the population group who require it?	Thank you for your comment. The committee carefully considered your comment and asked the clinical experts to provide input on whether prolonged access beyond 12 months would be beneficial for people with insomnia. One of the clinical experts commented that the techniques which people are introduced to through Sleepio can be internalised and applied in the future whenever a person has difficulty sleeping. Therefore, the clinical expert considered it to be unlikely that people would return to the Sleepio app after 12 months of first use. The company stated that users can contact Sleepio directly to request access to their account after the initial 12 month access period.
19	3	Healthcare researcher	2.7	Can patients engage with the Sleepio community (other people with insomnia) anonymously for data protection purposes?	Thank you for your comment. The committee carefully considered your comment and asked the company to clarify whether users can engage with the Sleepio community anonymously. The company representative explained that users can create a username to communicate with other users. This username does not have to contain the individual's name or any other personal details.
20	3	Healthcare researcher	4.9	Resource (time) implication for NHS staff during implementation but may reduce resource requirements in the long run if patients have fewer consultations/ prescription or non-prescription	Thank you for your comment. The committee carefully considered your comment and discussed how different implementation models have been used across GP practices during the rollout of Sleepio. The committee agreed that

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				medication for insomnia in the future as a result of the app.	the training and support for referrers has an important effect on patient uptake and engagement.
21	3	Healthcare researcher	4.10	Is there an easy, simple way for patients/clinicians to report adverse events for a digital app similar to the Yellow Card Report?	Thank you for your comment. The committee carefully considered your comment and asked the company for clarification on the process for reporting adverse events. The company representative stated that the company can be contacted directly by either clinicians or patients to report adverse events. The committee also noted that all technologies that have received a CE or UKCA mark and that are registered with MHRA can receive adverse event reports using the Yellow Card Report.
Drop-out rate (n=2)					
22	2	Healthcare professional	4.6	Sessions 2 and 3 contain active treatment (vs. sleep hygiene, which is not considered an active treatment). These evidence-based, active treatments include Stimulus Control Therapy and Sleep Restriction Therapy, both of which form the mainstay of the CBTI therapeutic modality. Improvements at these points are likely the results of these treatments and not of sleep hygiene advice. People may find that sleep has improved significantly enough shortly after starting these active treatments and therefore may discontinue using Sleepio.	Thank you for your comment. The committee carefully considered your comment and asked the clinical experts for input on the content of each Sleepio session. The clinical expert stated that although sessions 2 and 3 may contain active components of CBT-I, there are different factors that could influence the drop out rate for face-to-face CBT-I. The EAC clarified that the reason for drop out was not included in the data available on Sleepio users. The committee decided to amend section 4.6 and remove the reference to specific Sleepio sessions.
23	1	Company	4.6	Would be helpful to have drop-out rate defined	Thank you for your comment. The committee carefully considered your comment and asked the EAC about the definition of drop-out used in the Sleepio studies. In the Soh et al. (2020) paper, a drop out was defined as any participant who did not complete all 6 sessions of the intervention but the EAC noted the definition of a drop-out varied. The committee considered it is important to highlight the fact that the drop-out rate in terms of the number of people completing the Sleepio program is high, but consistent with other forms of CBT-I. It decided to keep section 4.6.
Health inequalities (n=2)					
24	3	Healthcare researcher	2.1	Does approving Sleepio inadvertently increase health inequalities?	Thank you for your comment.

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				It is restricted to iOS devices - does this reduce the market and patient population who would benefit from it's use, can it be extended to include all digital devices? Does connecting it to a wearable fitness tracker make it more successful because it doesn't rely on manual entry? Does it therefore rely on the accuracy of the wearable device? How can the variability of accuracy between wearable trackers be accounted for? Does it disadvantage those patients who do not wear a tracker? Does it inadvertently discriminate against a population group who cannot afford wearable trackers? Noted that this population can enter data manually.	The committee carefully considered your comment and asked the company to explain how Sleepio users access the technology. The company explained that Sleepio is usually accessed through the technology website using any device connected to the internet. The company advised that Sleepio is available as an app for iOS users and is likely to become available on Android devices later this year. The technology can also be linked to a compatible wearable fitness tracker to monitor sleep (currently Fitbit and any other device that uses Apple's HealthKit). The company clarified that users to do not benefit more by using Sleepio on a mobile device or wearable fitness tracker.
25	3	Healthcare researcher	4.8	This may increase health inequalities in certain patient groups.	Thank you for your comment. The committee carefully considered your comment and accepted that Sleepio would be harder to use for some people with access and language restrictions.
Impact of COVID-19 (n=3)					
26	3	Healthcare researcher	4.3	Given current system pressures in dealing with COVID backlog, would Sleepio be a less resource heavy option and therefore more beneficial to the system needs?	Thank you for your comment. The committee carefully considered your comment and the impact of COVID-19 on the potential adoption of Sleepio, The committee concluded that this discussion was outside the remit of the scope for this topic.
27	3	Healthcare researcher	4.5	Changes and fears due to COVID may make patients more reluctant to have face to face CBT-I and so may prefer digital CBT-I. Digital methods may be preferred by patients/practitioners with a high interest in environmental sustainability.	Thank you for your comment. Please see the response to comment 26.
28	3	Healthcare researcher	4.6	In the current situation, drop-out rates for face to face CBT-I may be influenced by fears about the pandemic so Sleepio might be more advantageous in this regard.	Thank you for your comment. Please see the response to comment 26.

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Clarification and factual inaccuracies (n=4)					
29	1	Company	3.5	This meta-analysis included Sleepio studies, do you mean indirect comparison?	Thank you for your comment. The committee carefully considered your comment and amended section 3.5 for clarity. The authors of the Soh et al. study describe the study as a meta-analysis. Section 3.5 has been amended to state that the study is a meta-analysis rather than an indirect meta-analysis.
30	1	Company	4.3	typo	Thank you for your comment. The typing inaccuracy referenced has been amended.
31	2	Healthcare professional	4.7	Clarification: There is a weekly Q&A session on the Sleepio user forum, facilitated by a Clinical Psychologist with specialism in insomnia disorder. This session is open to all Sleepio users.	Thank you for your comment. The committee carefully considered your comment and also requested input from the company to clarify the format of the weekly session on the Sleepio forum. Section 4.8 has been amended to state, 'Sleepio users can access a weekly question and answer session on the Sleepio forum, facilitated by a clinical psychologist who specialises in insomnia.'
32	1	Company	4.16	for the population-based cost model, but not a main cost driver for the Scotland model	Thank you for your comment. The committee carefully considered your comment and asked for the EAC's input on the influence of uptake rate for the different pricing models. The committee heard that both of the previous pricing models relied on uptake, although the uptake rate was more of a cost driver for the population-based model than the Scotland model. The committee concluded that uptake rate is no longer a cost driver for the economic model with the proposed license fee. This section of the guidance has been removed.

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