

About AAT Medical, a Neurotech International company

Our mission is to improve the lives of people with neurological conditions. Our vision is to become a global leader in home-use and clinical solutions which are accessible and affordable. We are focused on development and commercialization of technological solutions for diagnosis and treatment of such conditions, starting with autism.

To this aim, we are committed to conducting research both internally and in collaboration with international companies, universities and research centres. Our team comprises a number of talented individuals, ranging from neuroscientists and bio-medical engineers to app developers.

Unique Features

Key features include:

Safe and easy home use

Mente Autism has been designed for home use. Safe and simple to activate, it requires little to no direct supervision and does not restrict users and data collection to a clinical setting.

Portable

Light and portable, Mente Autism can be used outdoors as long as the noise levels in the area will not hinder the child from hearing the sounds emitted by Mente Autism through the earphones.

Personalised therapy

Mente Autism's unique patented technology creates a personalised neurofeedback therapy that is specific to each user.

Comfortable headband

The headband is ergonomically designed and hypoallergenic for greater comfort and ease.

Daily session reports

Mente Autism creates a report per daily session. These reports record each session and provide graphs that track progress. Users can authorise healthcare professionals to access them.

Scientifically certified

Mente Autism holds Class IIa CE Medical certification. AAT Medical is ISO 13485 certified and is registered with FDA under registration number 3010806606. Mente Autism is undergoing FDA review.

Clinical-quality EEG device

Mente Autism provides a clinical-quality 4-channel EEG using state-of-the-art circuitry and sensors. Coherence levels ensure excellent source localization.

Constant system checks

Throughout the session, the device constantly checks that each sensor is correctly positioned with optimal connection with the head. On the app, the parent or carer can view the status of each sensor. A warning is issued via the app if there is an issue and the session is paused until the sensors' position is fixed. If Mente Autism is not



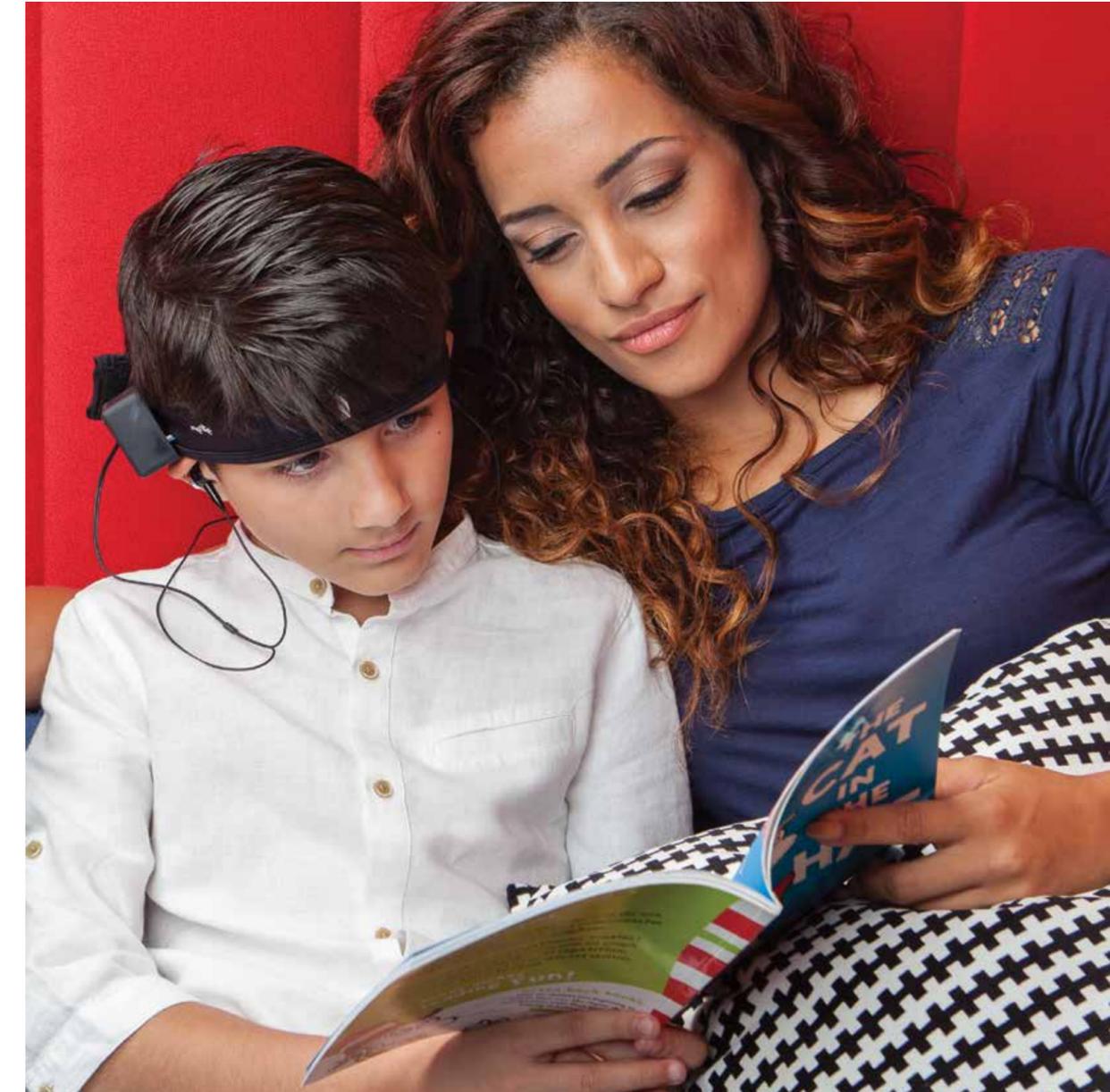
"My son, 12 years of age, has been using Mente for the past four years. The changes we have seen in him since he started using Mente have been staggering. Once a highly non-verbal boy, our son's language and communication skills have improved enormously. Not only does he understand what others are saying, but at times he initiates the conversation. He is more independent in that he has started taking decisions himself, as many boys his age tend to do. Hearing my son talk and engage in discussion was, and still is, the ultimate gift I could have ever hoped for. The change in him over the past four years has been remarkable. His speech therapist has also remarked that his communication abilities have greatly improved. Mente continues to positively change my family's dynamics and for that, I do recommend it."

Parent of 12-year-old with Autism Spectrum Disorder (ASD)

connected to a tablet or phone and a sensor is out of place, the session will stop and the LED light on the headband will turn orange. If this happens, parents / carers can reconnect to the app to check that all sensors are properly positioned.

Advanced sensory and chip technology

Mente Autism's sophisticated sensors and top-of-the-line built-in circuitry pick up highly detailed and minute electrical signals from the scalp that are key for the ground-breaking therapy sessions and report generation.



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AAT Medical Ltd - a wholly owned subsidiary of Neurotech International Ltd.
Block LS3, Life Sciences Park, San Gwann Industrial Estate,
San Gwann, SGN3000, Malta.

Tel: +356 2133 0588 Email: info@mentetech.com

CE 0426

www.mentetech.com

Helping children
on the Autism Spectrum

What is Mente Autism?

Mente Autism is a clinical-quality EEG device that uses patented neurofeedback technology to help children with autism. Designed for home use, Mente Autism helps relax the minds of children on the spectrum which in turns helps them to focus better and engage positively with their environment.

Mente Autism is an easy-to-use, effective neurofeedback system for safe home use by children with autism. It consists of a headband, an application (app) and a cloud component. Its unique patented technology creates "tailor-made" sonified neurofeedback for the children who use it. After each 40-minute morning therapy session, the system



uploads the data registered during the session to the Cloud service via the Mente Autism App (using a Wi-Fi or 3G connection). Using this data, the Mente Autism cloud service generates a report that records and measures the child's progress. Each session report can be viewed online or within the app. The headband has five (4 channel) ultra-sensitive EEG electrodes that pick up minute waves (Alpha, Beta, Delta and Theta waves) emitted by the brain. They are specially located on the band to provide accurate readings of the brain waves and they use the latest technology to lower impedance and artefact generation. One type of sensor is to be worn on the forehead and another type is purpose built to penetrate hair and reach the scalp at the back of the head.



To start a session, the headband must be connected to the user's Android/iOS smartphone/tablet via a Wi-Fi or 3G

connection. Once the session begins, the connection between the headband and the PC or tablet can be disconnected, giving the child total freedom to move around while completing the session (without needing to remain within range of a Wi-Fi or 3G connection). All data registered during the session is stored on the headband and can be uploaded via the app at a later stage. Medical professionals chosen by the parents or guardians can remotely monitor patients' progress by accessing the daily generated reports or downloading the raw EEG from the Mente Autism online dashboard.



Using state-of-the-art technology, these brainwaves are interpreted, processed and converted into auditory stimulation that the child will hear through custom earphones that come with the product.



How does it help children with autism?

Mente Autism reads four brain waves but focuses on those patterns of excess Delta and Theta waves. Delta brain waves are associated with sleep and closed eyes and people on the autism spectrum have abnormally high Delta and Theta brainwaves, which peak constantly, even when they are awake. The result is that people on the autism spectrum are often isolated, in their own world.

Mente Autism uses an auditory system to reduce these Delta brain waves. It does this by creating personalised auditory stimulation to reduce unwanted brain waves. The child listens to these sounds via the Mente Autism

earphones and this forms the basis of the therapy. The device uses state-of-the-art circuitry and noise-cancelling technology to remove unwanted brain waves.

Feedback from current Mente Autism users has been positive and parents find the system easy to operate from home. To determine the Delta and Theta wave levels and suitability of the therapy, it is recommended that a quantitative EEG (QEEG) is carried out by a medical professional prior to initial Mente Autism usage to define whether Mente Autism is indicated for the child's use. It is recommended that Mente Autism use starts between the ages of

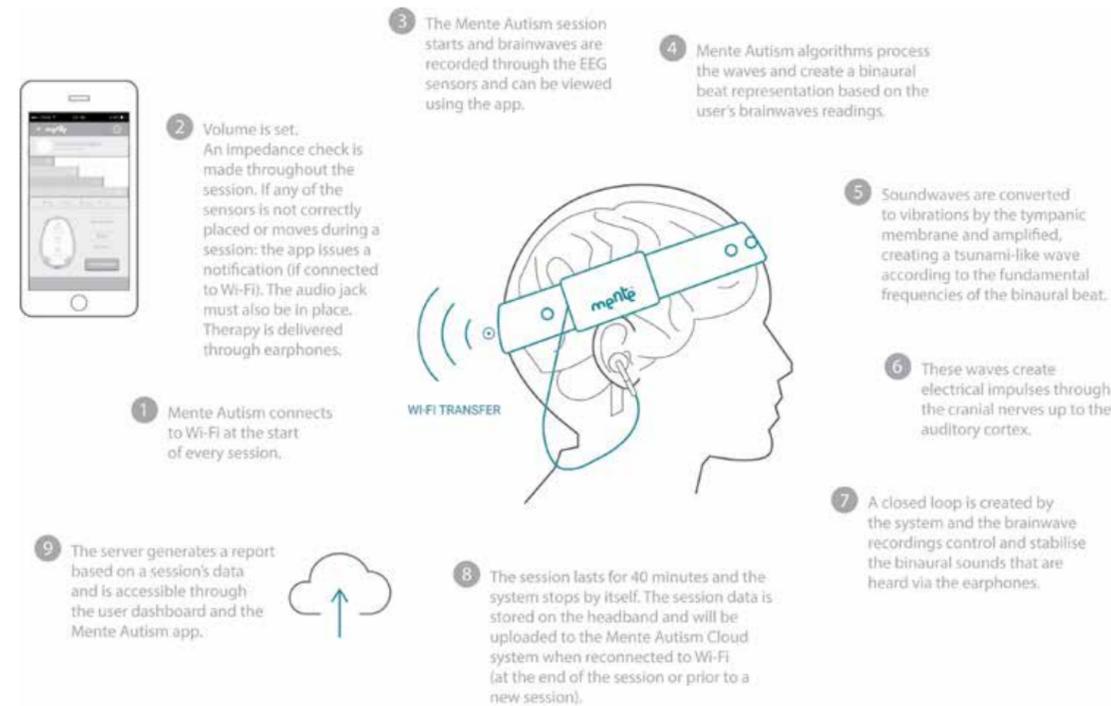
3 and 12 years of age. Mente Autism is not suitable for children who have a history of hearing impairment. It may not be suitable for children on certain medications or if comorbid conditions are present.

It also includes a sound check for volume control, battery monitoring, LED notifications. It will also be possible to update the device's software remotely. Mente Autism holds CE Medical certification. AAT Medical is ISO 13485 certified and is registered with FDA with Establishment Registration number 3010806606. Mente Autism is undergoing FDA review.

How it works

The Mente Autism headset records brainwave levels in real time

Session data is stored on the headset device and this is processed on board in real time. The Mente Autism app, if connected to the device using Wi-Fi or a 3G connection, provides a graphical representation of the brainwaves before, during and after the 40-minute session. A report can be viewed using the user dashboards on the website.

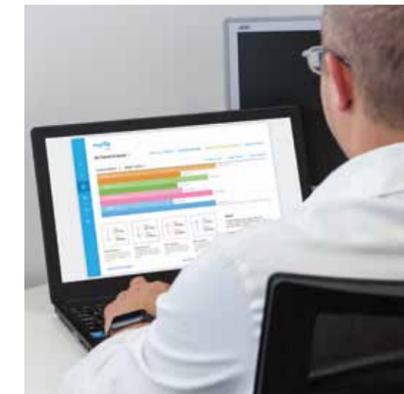


For Medical Professionals

A frontrunner in its field, Mente Autism is a clinical-quality EEG device using state-of-the-art hardware and software to provide an effective neurofeedback system that is designed for home use. Comprising a headset, an application (app) and a cloud component, the technology creates individual, "tailor-made" auditory stimulation which is therapeutic for the children who use it.

How is it therapeutic for children with autism?

Mente Autism is a portable system. Its 4-channel EEG headband houses five highly sensitive electrodes which record electroencephalographic (EEG) potentials from the scalp in real time. This EEG signal is amplified, filtered and processed to create a therapeutic, auditory stimulation in real time. Changes in potentials are graphically displayed via the Mente Autism app (if connected via a Wi-Fi connection).



Five top-of-the-line sensors are used to ensure optimum quality EEG recordings. The positioning and type of the sensor on the headband (one type to be worn on the forehead, one to penetrate hair and reach the scalp) are such that readings of the four brain waves are accurate, the signal is more stable and resolution is much better. The sensors use the latest lower impedance electrodes and generate far less noise.

Front sensor:

- Dry surface to user's skin
- Consists of a conductive membrane behind which is electrode gel typically used in clinical EEG systems
- Cushioned sensor surface conforms to irregular body surfaces better than metal discs
- Low-noise conduction between body and sensor
- Stable Ag/AgCl Interface
- Impedance 10 - 100 KΩ on unprepared skin



suppress excessive Delta and Theta activity while promoting and stabilizing Alpha and Beta rhythms.

Mente Autism also uses coherence, which describes the linearity of the relationship between two EEG signals, as a biomarker. Mente Autism records and analyses the coherence in the Delta and Theta bands for monitoring purposes. Through the medical professional dashboard accessible online, medical professionals can view pre and post session coherence assessments. This will help in analysing the effectiveness and potential future benefits of Mente Autism for the particular patient.

Back sensor:

- Novel shape optimized for hair penetration and scalp contact
- Special silver coating imparts optimal conductivity to the sensor's surface for the best possible signal transduction
- Flexible material safely flattens under pressure – no hard metal pins
- Flexible legs slide under hair strands for scalp contact
- Impedance 100 - 2000 KΩ on unprepared skin



Artefact Reduction Algorithms

Electroencephalography (EEG) is a proven technique to record brain activities in natural settings. A problem often encountered is that EEG signals may be contaminated by ocular artefacts such as eye blink activities. To achieve satisfactory cleaning of the raw EEG signal from eye-blink artefacts, Mente Autism uses a series of algorithms that are applied in real-time, are window-based and conform with already-established methods of sampling and filtering.

Both sensors have passed the ISO 10993-1 biocompatibility test.

Connecting patients and medical professionals

Through accurate EEG recordings, with high coherence levels for better source localization, Mente Autism analyses abnormal brainwave activity in children with autism. This abnormality is characterized by excessively high Theta and Delta wave levels in the fronto-temporal areas of the brain. Using this neurological information, Mente Autism creates an inverse feedback signal to the brain through the patient's auditory system. Mente Autism uses the auditory cortex within the brain to target surrounding areas, such as the thalamus and the superior temporal gyrus. These areas are accessible through the system's innovative auditory stimulation techniques, using the specificity provided by neurofeedback. The auditory stimulation created aims to

Medical professionals authorised by parents or guardians have remote access to a dashboard from where they can observe the users' daily performance and overall progress. Medical professionals can download high-definition EEG results. Info-graphical statistics about Alpha, Beta, Delta and Theta brainwave levels are presented in a report generated after each therapy session. Medical professionals can also download raw neurological data. Furthermore, medical professionals can remotely upload routine clinical data into the system to fine-tune the home-based therapy. Mente Autism is currently undergoing an independent trial in the US by Carrick Institute for Graduate Studies (NCT02773303).