Indications and Usage:+ FAQ

In carefully conducted randomized controlled trials CES has repeatedly shown efficacy in treating mild to moderate primary or secondary anxiety and depressive conditions, normalization of central hemodynamics (systolic and diastolic blood pressure but not peripheral vascular tension) in Stage I hypertension, relieving headache pain (85%) and other types of pain conditions including pain resulting from dental surgery and cancer (35%), and especially in potentiating through centrally-mediated action the effect of analgesic drugs (fentanyl 176% -306%, morphine 174% -306%, alfentanil 60% -2 15% and dextromoramide 267% -392%), or replacing them altogether and increasing the depth of anesthesia (In one study fentanyl use decreased by 31%). and increasing attention and the ability to learn new tasks. To a lesser degree CES has been shown effective in relieving primary insomnia (particularly sleep-onset insomnia), mild depression, post-axonic spasticity, minimal brain dysfunction and mood changes subsequent to closed head injury (with corresponding decrease in the need to neuroleptic drugs). Efficacy of CES has been researched in regards to substance abuse recovery (including nicotine and opiate addiction) with mixed results.

Frequently Asked Questions about Cranial Electrotherapy Stimulation (CES)

What is Cranial Electrotherapy Stimulation (CES)?
What does CES feel like?
Can I use it while I sleep?
How does CES work?
What is CES used for?
Is CES dangerous?
Bibliography

What is Cranial Electrotherapy Stimulation?

CES (Cranial Electrotherapy Stimulation) is a process which utilizes minute electrical stimulation for therapeutic treatment of anxiety, depression, and insomnia.

What does CES feel like?

Applied through electrodes to the area between the mastoids and the jaw, the sensation felt by the individual is normally one of relaxation.

Can I use it while I sleep? If there is high stress or anxiety just prior to treatment, the individual may go to sleep while using CES, particularly if in a reclining chair or bed. Sleep at the time of application is not required to benefit from CES, although individuals frequently report an improvement in the quality of their night time sleep.

How does CES work?

http://www.altered-states.net
As with a number of medicines, the mechanism of action (how it works) of CES is not fully understood. Research has led to the hypothesis that it has a mild effect on the hypothalamic area of the brain. Researchers also have noticed rapid increases in serotonin, also associated with relaxation and calmness, and decreases in cortisol, one of the primary stress-related biochemicals. Interestingly, CES also increases levels of norepinephrine and dopamine, both associated with alertness and feelings of pleasure. This may be why so many CES users report feeling both relaxed and alert.

What is CES used for?

CES was originally developed in the Soviet Union in 1949, it's primary focus being the treatment of sleep disorders, hence it's initial designation as "electrosleep." Treatment of insomnia, however, has been overshadowed by psychiatric application for depression and anxiety.

Is CES dangerous?

No negative effects or major contraindications have been found from the use of CES to date, either in the US or other parts of the world.

PRECAUTIONS: Optimally CES treatment should be applied in early hours after awakening and while in relaxed and quiet environment. Do not use CES within three hours of bedtime. Exercise caution when driving or operating machinery for one hour after treatment. Do not apply electrodes directly over the eyes or the carotid sinus area (upper side of the neck below the ear and behind the jaw). Do not sleep during CES treatment.

FREQUENCY AND DURATION: Optimal CES treatments are 30 minutes two times daily for the first three weeks but one 60 minute session may be substituted. In some studies 40 minutes I time per day, five days per week has been found to be adequate. After first two weeks of daily treatment application may be reduced to maintenance level ranging from one 20-minute application every other day to one 20-minute application every three days. Treatment should not be discontinued as ineffective until 2 weeks of twice daily applications have been completed.

FOLLOWING CES TREATMENT: Use caution in operating a motor vehicle or other potentially dangerous mercenary until you get used to how you feel after CES treatment. We suggest you take it easy and avoid stressful situation for at least an hour after CES treatment. Try and move slowly, taking your time and breathing calmly and deeply into your abdomen. We also suggest you drink at least 2 full glasses of water in the first hour after CES treatment. Make a note of any unusual or interesting phenomena you experience and discuss these with your doctor at your next session or before is necessary.

COMBINED USE WITH MEDICATIONS: Cranial Electric Stimulation can be used in conjunction with analgesic, psychoactive and vascular medications. In general CES tends to potentiate, or cause an increase in, the effectiveness of these medications. Medication dosage should thus be closely monitored and reduced is necessary. Medication for high blood pressure should be monitored carefully as it may need to be reduced.

Insomnia: Reduced frequency of treatment needed (20 minutes once daily tapering after two weeks to 3 treatments weekly). Optimal treatment time during circadian rise immediately preceding sleep (e.g. 4-7 p.m. if bedtime 10:00 p.m.) Primary treatment affect is in Stage 4 (delta) sleep. Ambiguous REM occasionally occurs during treatment Headache Treat headache as soon as possible after first warning signs and not later than one hour after onset. Patch electrodes should be placed on alternate sides of temple. Can be used in conjunction with analgesic and vascular medications.

http://www.altered-states.net
Clinical Effect In: Response to CES treatment is very individual. Treatment effects tend to be cumulative. Relief for anxiety conditions, insomnia and attentional problem is normally experienced by the second treatment with stable recovery by the seventh treatment. Mild depression and mild chronic pain conditions generally remit by the end of the tenth day of treatment. When brain neurotransmitters are back in balance no further improvement will be noticed. Maintenance treatments are sometimes needed at 2 to 3 twenty-minute sessions per week.

Adverse Reactions: Generally well tolerated. Some persons may experience initial anxiety related to novelty of the CES procedure and, or pulsating feeling generated by electrodes against the skin. Other adverse reactions: Dizziness (0.15%), skin irritation (0.12%), headaches (0.22%). Rare paradoxical reactions such as hyperexcited states, increased anxiety, and sleep disturbance have occurred. Some CES studies have demonstrated a exacerbation of preexisting depression in some individuals. No impairment of consciousness or reaction time has been reported in clinical studies. No studies have been conducted on long-term use of this product. If you suspect that an herb or other supplement is making you sick, call the FDA’s MedWatch hotline at 800-332-1088 or contact the agency via it’s website at www.fda.gov/medwatch.

Known Interactive Effects: CES treatment may interact with over-the-counter, herbal, hormonal, or enzymatic medications prescribed for the treatment of psychological conditions including anxiety, depression, or insomnia including drugs which affect brain serotonin levels or for pain and other neurologic conditions. In such situations close supervision by psychological or medical personnel is recommended.

Warnings: The information above is provided for educational purposes and may not be construed as a medical prescription or as a substitute for the advice of your physician. Do not use this product without first consulting your physician especially if you are pregnant or lactating. You should regularly consult your physician in matters regarding your health and particularly in respect to symptoms and conditions which may require diagnosis or medical attention. Reevaluate use of this product after 6 months.

A. What is the history of CES?

East European nations soon picked up CES as a treatment modality and its use spread worldwide. By the late 1960's, animal studies of CES had begun in the United States at the University of Tennessee and what is now the University of Wisconsin Medical school.

These were soon followed by human clinical trials at the University of Texas Medical school in San Antonio and the University of Wisconsin Medical School. More studies have followed. At present, the number of human studies stands at 103. In addition, there are 18 experimental animal studies, all of which attest to the safety of CES.

CES has been an international treatment modality for more than 50 years. Thousands of people worldwide continue to receive its benefits. The most extensive work on CES

http://www.altered-states.net
continues in Russia at the Pavlov Institute in St. Petersburg. But by no means is its use restricted to that part of the world. Current estimates are that there are between 50-100,000 units in use globally. From a broad reading of published literature, no negative effects or major contraindications have been found from the use of CES to date, either in the U.S. or other parts of the world.

Q. Who could benefit most from the use of CES?

A. First and foremost, those suffering from stress in the form of depression, anxiety, and insomnia who seek an effective non-pharmacologic alternative. Secondly, those suffering from illnesses where stress constitutes a prime symptom.

According to the American Academy of Family Physicians, stress-related problems account for 80-85% of all visits to medical offices. Research indicates that 80-85% of all diseases are caused by stress which plays a major role in aggravating up to 90% of all illnesses and some part in the development of every disease, from cancer to the common cold.

It has been estimated that 80% of the populace of the United States react to life adjustment problems with the "flight" or "fight" anxiety reaction. And that a similar percentage of our hospitals are filled with persons who have channeled anxiety released energies into their bodies resulting in psychogenic illnesses.

Among those illnesses are: substance abuse withdrawal syndrome (alcohol, street drugs, nicotine, prescription drugs), chronic fatigue syndrome including fibromyalgia, pre-menstrual syndrome, attention deficit disorder and hyperactivity, migraine and tension headaches, TMJ dysfunction, chronic pain, pre-competitive and performance anxiety, panic disorders, tic dolereaux, bruxism, stress induced asthma, hives, gastrointestinal disorders, ulcers or gastritis, and irritable bowel syndrome, to name a few.

We would underscore, however, that CES is not a cure for these illnesses and does not represent itself as such. But by successfully addressing the anxiety, depression, and insomnia underlying these disorders, it can play a major role in the healing process.

Q. Is CES then only for the "sick" and the "stressed-out ?"

A. You don't have to be "sick" or "stressed-out" to use CES and realize its benefits. CES is a life-enhancing instrument of potential value to everyone. Its uses are wide ranging. Some people use it as an adjunct to meditation practice each morning. Others during peak stressor moments that hit unexpectedly in the course of a day. Who hasn't experienced those times when we are about to "lose it?" Putting the unit on in these situations even just briefly--perhaps for as little as ten minutes-- can help curb that anxiety and serve as a reminder that one needs to be with ones self in a different way.

CES also represents a significant affirmation that you have the power within to change your mental state and that you are willing to take active steps to create the time and the space to do so.

Many use CES as an assist to their creative work or in high stress situations. CES quiets the mind, making it especially helpful in preparing for examinations or as an accelerated learning tool, such as when memorizing blocks of material. For the athlete readying for competition, it helps create the state of relaxed awareness helping them enter the zone of maximum performance. Each person finds for themselves how to best incorporate CES into their daily routine.

http://www.altered-states.net
Q. Can CES be used as a sleep aid?

A. The 100 Hz CES unit can be used at bedtime. But the .5 Hz CES needs to be employed differently.

Because of the increased alertness resulting almost immediately from its use, some patients may find it difficult to fall asleep immediately after a treatment. Accordingly it is recommended that the .5 Hz CES application be done at least three hours before going to bed. But by no means does that mean that it is contraindicated for insomnia.

One thing CES users often report is an increase in vivid dreaming. This results from compensation for lost REM sleep. As your sleep pattern begins to normalize--within the next two or three nights--it should become less frequent.

Q. Does CES work for everyone?

A. No. But it is known to be significantly effective for about 95% of the people who use it.

Q. What can I expect?

A. Most people will experience a relaxation response almost immediately after treatment begins with a CES unit. Immediately after a CES treatment, patients usually report feeling relaxed and sometimes inebriated for the first few minutes. This is a pleasant and very comfortable sensation. After several minutes to hours, the light-headed feelings usually disappear, the relaxed state remains and a profound sense of alertness is achieved.

This relaxed/alert state will usually remain for an average of 12 to 72 hours after the first few treatments. With regular use it is possible for the patient to habituate to this preferred state of consciousness. Some patients describe the CES experience as analogous to having a type A mind in a type B body.

During the treatment some people will notice a subjective change in their body weight. You might feel heavier at first and then lighter, or you may simply feel lighter initially. You could feel slightly worse during the heavy cycle, and this feeling could last for days unless extra treatment time is given. Therefore it is important to continue the treatment for a few extra minutes if you should feel heavier at the end of the allotted time, even if it has already been twenty minutes or more. Continue for at least two minutes after you feel lighter. Although this is quite common, not everyone will be aware of these weight perception changes.

Q. What long range changes should I expect?

A. Sleep patterns should begin to normalize within the first day or two, with less and shorter periods of awakening during the night, faster onset of sleep after going to bed, and a greater feeling of being rested upon awakening the following morning. Depression and mood swings become less, as does irrational anger, irritability, and poor impulse control. By the second week, cognitive processing is visibly enhanced. Mental confusion due to stress begins to subside as the ability to focus and concentrate on work becomes easier and more efficient. The ability to recall information and accelerate learning also begins to return to normal pre-stress levels as concentration and memory improve.

Q. What is the suggested length and frequency of treatment?

A. For the 100Hz unit the recommended usage is 30-45 minutes once or twice daily for the
first month after which the frequency may be reduced to two or three times weekly once symptoms are reduced or eliminated entirely. The 0.5 Hz unit recommended usage is three times a week for twenty to forty minutes, although there are some who will benefit from a more frequent daily treatment. There are also some who will achieve the full benefits within ten minutes. Some dentists use it instead of nitrous oxide during dental procedures that last for hours. You yourself determine how to best incorporate CES into your daily routine. It can be used on waking in the morning and/or on going to bed at night and/or in response to stress situations. Individuals undergoing psychiatric treatment or rehabilitation for substance abuse often benefit from more frequent and prolonged application.

Those suffering from severe anxiety and extremes of compulsive or addictive behavior may find it necessary to use it more frequently, perhaps several times daily. When symptoms of depression or anxiety have lessened or disappeared, it is still important to have access to the unit as a tool for relapse prevention on an as-needed basis. It is helpful to work in close conjunction with your physician/healthcare professional to determine the role CES plays in your overall treatment program.

Q. Can you overuse the unit? / Are there any adverse effects from doing so?

A. You can't really overuse it. There have been no reported adverse effects from more frequent use. The objective of CES is to return neurotransmitter activity to pre-stress homeostasis. Once attained, CES has no additional effect. Serving as a training wheel of sorts, CES helps you reprogram yourself. Rather than learning to rely on the unit, you learn instead how to refine and expand the art of self-regulation. CES teaches you to become more sensitively attuned to yourself and better understand your body and its needs.

Along the way, you will intuitively come to know when CES is needed and when it is to be put aside. You alone will become the determinant of use, as regards both frequency and duration.

During its usage, you will experience periods of relative calm and a sense of control. You may even succumb to a bit of self-congratulations. Seemingly, your CES unit appears destined for the bottom of a drawer. Life being what it is, however, just as you are ready to celebrate for successfully negotiating your personal terrain with skill and dignity---Voila! New challenges appear from nowhere.--a veritable curveball from Hell. CES can help move you through those difficult transitions. Keep it handy. Incorporate it into your daily regimen.

The continuing use of the unit allows for further refinement of stress management skills at newer and higher levels of complexity.

Q. Is CES difficult to use? / How much technical skill does it take?

A. Most CES units are user friendly. After having put on either the electrodes or the earclips and inserted the leadwire into the jack, it's all very simple. CES units either feature an on-off knob that also controls the amplitude (turning it to the right increases the amount of current) as in the 100 Hz devices. They use a button that turns the unit on and a side wheel that increases the amplitude (The Alpha Stim in addition displays the amount of micro-current being used from 1-6, each numeral representing one hundred microamperes). Start with a low current and gradually increase it. If the current is too high, the patient may experience a stinging at the electrodes, dizziness or nausea. If any of these symptoms occur, simply reduce the current and the symptoms will immediately subside. After a minute or two, try increasing the current again, but always keep it at a comfortable level. It's ok to feel the current providing it is not uncomfortable.
Q. How does CES work?

A. As is the case with numerous medications, including aspirin, the exact physiological mechanism by which CES works is not fully understood and is still the subject of research study. It is hypothesized that CES acts by direct stimulation of the brain in the hypothalamic area with specific electronic frequencies. Such stimulation causes the brain to manufacture various neurohormones that effect ones moods and emotions as well as ones cognitive capabilities back to a level of pre-stress homeostasis. For a more detailed hypothesis see "The Bioelectrical Mechanism" under Research.

Q. How does electromedicine such as CES differ from Western drug medicine?

A. Western drug medicine relies primarily on chemistry to heal and control pain. Microcurrent electrical therapy (MET) is based on the concept that the biophysics underlying the chemistry also plays a significant role in regulating bodily processes. Using waveforms at a level of current similar to the body's own, MET bridges cellular communications helping reestablish the normal electrical flow.

The concept of a bioelectrical control system is common to every form of healing ever developed in recorded history, except for drug medicine. The Chinese named bioelectricity chi; the Japanese called it ki, the Indians referred to it as prana, and the Russians, bioplasm. There are 75 trillion cells in the human body, each one having an electrical potential across its cell membrane, just like a battery. Though acknowledging this fact, Western medicine does not yet fully appreciate the natural healing powers of the body or the bioelectrical systems that control them.

Q. How is the current transmitted?

A. The traditional 100Hz unit utilizes pre-gelled electrodes that snap on or attach to the end of leadwire that plugs into jack of the unit. The Brain Tuner (BT-5 and 6) employs a stethoscope shaped device that sits beneath the ears.

The 0.5 Hz unit (Alpha Stim) uses "ear clips" with felt electrodes that adhere to the clips. Saturate the felt electrodes with saline solution and then apply them to the superior aspect of the earlobes as close to the jaw as possible.

Q. Under what circumstances is CES best used?

A. CES units generally come with a built-in belt-clip allowing you full freedom of movement. This allows you to use it just about anywhere and under a variety of circumstances, except those noted under the contraindications. You can do it at home while watching TV or at the office while doing your paperwork. Though of course you might not care to go out jogging with it on, but then again you might. But CES is more than an aside. It is also a reminder of the need to create inner quiet and reroute your mental traffic. You don't want to contribute to it further by treating CES as yet one more thing to do, squeezed in between other frenetic events in your life. Though you need not interrupt your usual activity for CES, its results are generally enhanced by setting aside a special time for its use alone.

Q. How safe is CES?

A. CES has an unblemished safety record. For a more detailed analysis of that record see "safety" under the research section.

http://www.altered-states.net
Cranial electrotherapy stimulators are generally limited to less than one milliampere (mA) of current. The Alpha-Stim 100 is an example of a CES device that employs very low intensity electrical current pulses (up to 600 microamperes). To put this into perspective, it takes one-half of an ampere to light an ordinary 60 watt light bulb. To truly compare the work done per second by these two different currents, we must multiply the currents by the respective voltages that drive them. The product current x voltage is a measure of the rate of generation of energy, and is referred to as the power output. By definition, when a device outputs 1 ampere of current with a 1 volt driving force, the power output of the device is 1 watt. Therefore for the Alpha-Stim 100, the maximum output is $(600/1,000,000)$ amperes x 9 volts = 0.0054 watts, or about 11,000 times less power than the light bulb. Many people do not even feel this amount of current.

This is current amplitude similar to that in the human body. The sole source of the current is a nine volt battery. Because the current is alternating, it sends bipolar current between the electrodes instead of unidirectionally, as would be the case with direct current. Hence there is a net cellular polarization of zero to the user. This is a safety factor of major importance.

The Alpha-Stim in particular uses a very broad band of frequencies collectively known as harmonic resonance. This insures that the right frequency will be delivered to reestablish homeostasis within the bioelectrical system. The other frequencies pass harmlessly.

Q. Is CES discomforting?

A. CES is not to be confused with either ECT (electroconvulsive therapy) which uses a much greater amount of electricity to induce traumatic shock, or aversion therapy both of which are based on discomfort. With CES you should experience no discomfort whatsoever. The most that will ever be felt is a mild tingling sensation. If at any time the sensation proves too strong, the amplitude should immediately be reduced by a simple turnoff the knob or twist of the dial.

Research shows CES to operate effectively at both lower and higher levels of stimulation as well as below the sensate threshold. accordingly, the patients may turn the amplitude to the point of sensation; then turn it down slightly below that point leaving it there during the session. You may also increase or decrease the amplitude at will without impairing the efficacy of the treatment. Your own comfort always dictates the setting of the treatment.

Q. What is the relationship between CES and nutrition?

A. There is a synergistic relationship between nutrients and CES. Think of the brain as a car battery, some cells of which may not be fully functioning. To achieve that end one needs both water and the trickle charge--This is analogous to the brain, amino acids and the CES. The brain uses amino acids as the raw materials, the building blocks or precursors with which to build its neurotransmitters. It is necessary for these amino acids to be present in the bloodstream in adequate amounts for the maximum impact/benefit of CES to be realized. These precursors, if present will be taken up and synthesized into neurohormones much more effectively when CES is added. These neurotransmitter precursor amino acids can be taken orally as food supplements.

To experience an even more dramatic impact of CES, it should be done in conjunction with amino acid supplements, especially in those areas in which one is deficient. Ideally, you might first test to determine the nature of the neurotransmitter deficiency and then develop a regimen supplementing your diet with specific amino acids known to be precursors to them.

http://www.altered-states.net
Q. Are there any contraindications?

A. There are no known contraindications for use of CES. However, there are circumstances in which its safety has not been tested. Accordingly, CES should not be used without on-going clinical supervision by severe depressives and those known to be epileptic, pregnant, or those using implanted electronic devices such as cardiac pacemakers or insulin pumps.

There have, however, been instances where under such supervision CES has been employed successfully and where CES has been shown to reduce both the frequency and severity of seizures.

Because of the feeling of induced relaxation that results while using CES, though, this relaxation response does not in any way impair reaction time, it is recommended that CES not be used while operating dangerous or complex equipment or while driving.

CES treatment may result indirectly in increased blood flow to the brain. Hence its possible contraindication in recent hemorrhagic stroke patients. This same effect can cause brief increased blood flow beneath the electrodes behind the ears. This redness should not be cause for concern. This is an extremely rare occurrence. It is not a burn response and will go away shortly after the CES treatment is finished if it occurs at all.

Perhaps three persons out of one hundred report a slight headache when using CES. This is usually alleviated by simply turning the current down. If the headache should recur during ordinary use, cease using the unit and consult with your health care professional.

As with the use of any medical device, the physician/licensed practitioner should be informed of any medication or neurotransmitter blockers the patient is taking as well as the employment of cardiac pacemakers or other electronic devices as mentioned above.

Q. What research is there as to the safety and effectiveness of CES?

A. There are approximately 1,000 articles on CES therapy many of which are listed in four reviews put out by the Foreign Service Bulletin of the United States Library of Congress. This is in addition to the wealth of physiological and bio-engineering data on electrosleep and electroanesthesia in animals. As of this writing there are more than 100 research studies on CES in humans and 18 experimental animal studies. The efficacy of CES has been clinically confirmed through the use of 28 different psychometric tests. The significance of CES research for treating anxiety has also been reconfirmed through meta-analyses conducted at the University of Tulsa and at the Department of Health Policy and Management, Harvard University School of Public Health. The full body of research can be accessed at this website.

Bibliography


Cranial Electrical Stimulation - CES Reduces Anxiety and Depression, Focus on Alcohol and Drug Issues, Vol. 6, No.1, 1983.

Low Intensity Transcranial Electrostimulation Improves Human Learning of a Psychomotor Task, Richard E. Madden, Ph.D., M.S.W.; & Daniel L. Kirsch, Ph.D.,

http://www.altered-states.net


Changes in Urinary Free Catecholamines and 17-Ketosteroids with Cerebral Electrotherapy (Electrosleep), David F. Briones, M.D., Saul H. Rosenthal, M.D., University of Texas Medical School at San Antonio, Texas, 57-58, 1973.


http://www.altered-states.net
