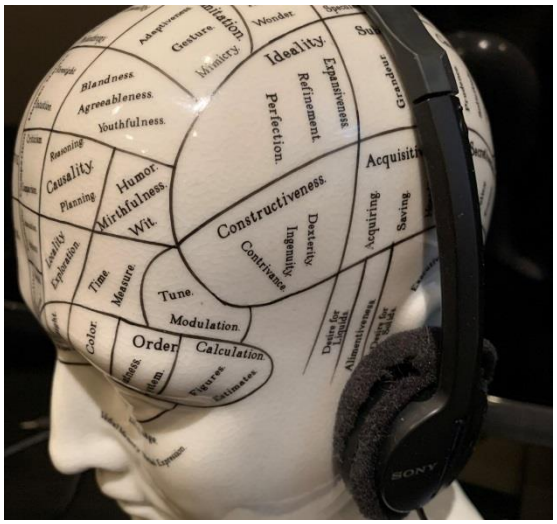
SoundScience to reduce stress and improve sleep.

Dr Stan Rodski, Peak Performance Neuroscientist.



Sound can make a difference to our stress and sleep. Most of us already know how we can more easily fall asleep when listening to relaxing music. We seem to find it really helps us to let go of our active thoughts and quiet our mind—which, for many of us, tends to race from one thing to the next all day long and more often than not when we don't want it to. We find it difficult to 'Turn Off'.

The link between sound(music) and behaviour(relaxation and sleep) has lead to the development of 'binaural beats' technology we call SoundScience. This technology has been created by Dr Stan Rodski, Peak Performance Neuroscientist, to help us turn off our brain, relax and sleep better. Sleep and relaxation are so important to our overall wellbeing but increasingly difficult to achieve in our fast paced, time poor and stressful digital world.

SoundScience provides a fascinating and exciting technology that harnesses the brain's responsiveness to sound to move the brain and you into a state of deeper relaxation, less anxiety and better sleep.

How does SoundScience binaural beats achieve this?

Binaural beats are a technique of combining two slightly different sound frequencies to create the perception of a single new frequency tone.

Soundscience technology exposes the individual to two different frequencies at the same time, one in each ear, the brain actually perceives a single tone that is the difference between the two separate frequencies. Your brain, in a sense, “tunes” to this new frequency.

You listen to binaural beats using headphones plugged into your phone. In each ear, you receive sound at a slightly different frequency (often accompanied by some relaxing background sounds). If your left ear receives a 300-hertz tone and your right ear receives a 280-hertz tone, your brain will process and absorb a 10-hertz tone. That’s a very low-frequency soundwave—one you can’t actually hear. But you don’t need to hear the sound for your brain to be affected by it.

Why is exposure to these soundwaves helpful to sleep and relaxation? Science shows that exposure to binaural beats can create changes in the brain’s degree of arousal. Listening to these sounds that create a low-frequency tone, research indicates, triggers a slow-down to brainwave activity—and that may help you relax, lower your anxiety, and make it easier for you to fall asleep and sleep more soundly.

How do brain waves work with binaural beats?

To understand how binaural beats help relaxation, mood, mental performance, and sleep, we need to know a little bit about brain waves and what they indicate about our state of consciousness, emotion, and mental activity. Brainwaves are created from the pulses of electrical activity our neurons exhibit as they communicate with each other. Our thoughts, feelings, and actions are all expressed through this constant neural communication—so our brainwaves are associated with how we feel and what we can do at any given moment.

We will focus on four major types of brainwaves:

Beta. These brainwaves are associated with high levels of alertness and arousal. When beta brainwave patterns dominate, we’re primed to focus and concentrate, to make decisions and think analytically. When you’re analyzing an issue at work, you’re probably in a beta-dominant state. Beta waves are fast, with a higher frequency (between 15-40 hertz). At the higher levels of this range, beta waves are associated with anxiety.

Alpha. Alpha brainwave patterns are associated with a state of wakeful relaxation. Slower and lower in frequency (between 9-14 hertz), alpha waves are dominant when we’re calm and relaxed, but still alert. Alpha

waves are associated with states of meditation —mindfulness, meditation and yoga help us achieve an alpha state— it is also good for creativity.

Theta. This brainwave pattern is associated with deep relaxation and with some stages of sleep, including the lighter stages of non-REM (NREM) sleep. REM sleep itself is mostly composed of beta wave and other activity that's similar to an alert, waking brain. Deep meditation produces theta waves, which are slower and of lower frequency (between 5-8 hertz) than Alpha waves. That murky barrier between sleep and wakefulness, when you're drifting in and out of sleep, and your thoughts feel dreamlike and difficult to remember? That's a theta-dominant state of consciousness.

Delta. Is a slow-wave, delta sleep. Delta waves are slow, low-frequency brainwaves (between 1.5-4 hertz) that are the dominant brainwave pattern of deep (stage 3 and 4), NREM sleep.

The faster (and higher frequency) the brainwave pattern, the greater your state of arousal. The slower and lower frequency brainwaves are, the deeper your state of relaxation—or sleep.

Research scientists have observed that exposure to sound waves can affect brainwave patterns. In a process called entrainment "tuning the brain", when exposed to sound waves at certain frequencies, brainwave patterns adjust to align with those frequencies.

Binaural beats work by exposing the brain to beats that create low-frequency tones in the brain, these sound waves create shifts in brainwaves themselves, generating slower frequency brainwaves that promote deeper states of relaxation.

How does SoundScience improve sleep?

Brainwave activity during sleep is largely distinct from brain activity when you're awake. (REM sleep is an exception: During REM, your brain is active in ways very much like when you're awake.) During non-REM sleep, the slower, lower frequency theta and delta waves dominate, compared to the alpha and beta waves that are prominent when you're alert and active.

SoundScience slows brainwave activity, helping to produce low-frequency waves, to aid relaxation and sleep. But it's not only lowering brainwave frequency that binaural beats may offer to sleep and relaxation. A small study (19 people) has found that exposure to binaural beats is associated with changes to three hormones important to sleep and well-being:

- DHEA. DHEA functions as a kind of master hormone, helping to produce other hormones in the body on an as-needed basis. DHEA is critical to immune function and disease protection. Particularly significant for sleep is that DHEA works to suppress cortisol, a hormone that stimulates alertness and provokes stress at elevated levels. The study found that 68 percent of participants had increases to DHEA after using binaural beats.
- Cortisol. Cortisol is an arousal hormone, stimulating alertness and attention. Cortisol levels rise and fall in connection to circadian rhythms—cortisol levels rise to their peak levels first thing in the morning, just in time for you to be active for the day. Too-high cortisol levels are associated with insomnia, as well as more time spent in light sleep, rather than deep sleep. The study found that 70 percent of participants experienced a reduction in cortisol after exposure to binaural beats.
- Melatonin. Melatonin promotes and regulates sleep. Melatonin levels rise dramatically in the evening, and the hormone works to relax your body and mind, preparing you to fall asleep. The study found 73 percent of participants had higher levels of melatonin after using binaural beats. The average increase was more than 97 percent.

How does SoundScience binaural beats increase relaxation and reduce anxiety?

A growing body of research suggests that binaural beats can reduce different forms of anxiety, from mild to chronic. One especially interesting study looked at the effects of binaural beats on anxiety among patients preparing to undergo surgery—a life circumstance that is pretty anxiety provoking for most anyone. Over a period of six months, patients spent 30 minutes on the day of their surgery listening to binaural beats. Compared to patients who listened to a soundtrack that did not include binaural beats—and patients who received no “beats” therapy at all—the binaural beat listeners experienced significantly greater reductions in anxiety levels.

Another study looked at whether binaural beats helped anxiety in patients preparing for cataract surgery, and found that binaural beats led to reduced anxiety levels and lower blood pressure levels before surgery.

SoundScience is low impact and non-invasive. It doesn't rely on chemical drugs and, for most people, more likely and easier to adopt and maintain. In this way, it significantly compliments other behavioral therapies for sleep such as mindfulness, meditation and relaxation techniques, and other mind-body therapies including colouring.

Soundscience uses binaural beat technology to create an easy short cut to a meditative state.

All you have to do is put on a set of headphones or ear buds, relax and listen to achieve meditation quickly.

Combine with colouring-in if you prefer to not close your eyes and to be doing something.

In as little as 10 minutes you will feel calm and stress free.