

# Brain stimulation aims to speed up tinnitus treatment

June 12 2013

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(Medical Xpress)—A combination of brain stimulation and video games may be the key to speeding up treatment for tinnitus sufferers.

Studies led by Head of Department for The University of Auckland's Audiology section, Dr Grant Searchfield, have shown that these treatments were effective in a shorter time than traditional [tinnitus](#) treatment.

Tinnitus (often associated with a ringing in the ears) is the 'perception of a sound in the absence of an auditory stimulus' that affects about 20 per cent of the population to an annoying level, and about 3 per cent to a level that has an impact on their quality of life.

Traditional treatment involves counselling and non-invasive hearing sound therapy using [hearing aids](#) to reduce the tinnitus signal, says Dr Searchfield. Sufferers can get benefits from this treatment, but it takes a long time and is ineffective for some people.

Tinnitus is one of several [brain disorders](#) (such as [amblyopia](#) or [lazy eye](#)), where the function of the organ is not the source of the problem, but rather the way the brain interprets information is at fault.

Hearing loss normally results in a reduction in activity within the [auditory nerve](#), but in tinnitus while this happens at the nerve, the nerve pathways in the brain show increases in activity or new connections.

The department's latest study looked at a technique called 'trans-cranial direct current stimulation' (or tDCS) and its intensity and duration effects on tinnitus suppression. The study concluded that specifically, an anodal current of two milliamps for 20 minutes of tDCS was the best stimulus and had potential as a clinical tool for reducing tinnitus.

"While at an early stage of development for tinnitus this technique enables us to alter the balance of excitation and inhibition in particular regions of the [human brain](#)", says Dr Searchfield. "The key to this is [brain plasticity](#), or the natural ability of the brain to change."

"Other new treatment concepts include sound intensive games, varying the frequency and intensity of sounds in the game depending on the individual's level of tinnitus, " he says. "These studies showed that a task that involves listening is more likely to get a response and a change."

"The idea is that there may be many different sub-types of Tinnitus and we may be able to train individuals differently depending on their complaints."

Each day before the individual plays a particular game they calibrate it for their own level of tinnitus, customising game play to respond at the right level.

"Perceptual training using computer games is in its infancy, but showing promise." says Dr Searchfield. "The use of games may be an important alternative to passive listening management for tinnitus treatment."

"As there is proven connectivity between the senses, such as sight usually used to confirm what you can hear, we are starting to use that in new trials with tinnitus sufferers using integration and attention-diversion approaches."

"These sensory changes are strongly dependent on the brain and the management of these problems are also strongly dependent on the brain," says Dr Searchfield. "For example, in tinnitus you could cut the [auditory nerve](#) and the person would still have tinnitus, it would have no effect."

"Through collaborations in the Centre for [Brain](#) Research we are now taking our understanding of hearing and combining this with groups who have expertise in [brain stimulation](#), vision and the pharmacology of the [brain](#) to develop world-first treatments for tinnitus".

"Visual and auditory problems tended to affect the aging population more, so we will be faced with an increasing burden of sensory problems and need a means to tackle those, hopefully within shorter periods of time", he says. "Treatments that take 12 months are too long and take up clinical resources. Our new concepts could possibly be delivered over the internet, increasing access and reducing the burden on clinicians and cost to patients."

Next year, The University of Auckland will be hosting the 8th International TRI [Tinnitus](#) Conference from the 10th to the 13th of March looking at the themes of neuroplasticity, multi-sensory integration, multi-disciplinary collaboration and innovation.

Provided by University of Auckland

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