

# **Auricular Interventions in Neurology: the Vascular Autonomic Signal challenge**

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## ***ABSTRACT***

The Auricular approach to diagnostics and therapeutics has gained momentum over the last 15 years. Battlefield Acupuncture has taken on a life of its own and has been adopted into NATO and even been introduced into neonatal intensive care. It is time to take on the challenge of Auricular Medicine - the application of the neurophysiological phenomenon referred to as the Vascular Autonomic Signal or VAS to identify active ear sites in Auricular interventions. It is time to utilize the VAS in therapeutics, recognizing its potential for recording the healing process.

## ***KEY WORDS***

Auricular Medicine, Neurology, Public Health

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## ***BACKGROUND***

The escalating costs of health care delivery has become a major issue for many countries and there is an urgent need to seek new approaches which can be taught to clinicians world wide and applied to patient care effectively and more economically. This is our challenge as a world community. Currently of major concern is the opioid crisis. The devastation to the affected individuals and their communities as well the cost to society in general has now reached critical status. In 2017, the opioid crisis has been declared a

health emergency in the United States. In Australia medications containing opioids are no longer available over the counter as of February 2018. There is no doubt many more countries will adopt stricter policies in the future. Let us all rise to the challenge and work together to implementing affordable health strategies. In this article, Auriculotherapy and its more physiologically tuned sister intervention, Auriculomedicine are explored.

## EAR ACUPUNCTURE, AURICULOTHERAPY, AURICULOMEDICINE

Acupuncture has been gradually explored and introduced in recent years and its place in clinical care has gain relevance, more recently for its role in tackling the opioid crisis.[[Fan 1](#)] In Europe clinicians refer to auricular interventions not as ear acupuncture but as Auriculotherapy and also as auricular medicine.[[Nogier 2](#)]

Auriculomedicine is the more challenging auricular intervention as it utilizes the neurophysiological phenomenon commonly referred to as the Vasculo-Autonomic Signal or VAS in auricular diagnostics and therapeutics. [[Strittmater 3](#)]. The VAS is underutilized today. Documented half a century ago by a French physician Dr Paul Nogier, it has been neglected or ignored by many clinicians. Today the time has come for more clinicians to explore the VAS and seek its relevance in diagnostics and therapeutics. The changes in the VAS (best located at the radial pulse as amplitude changes) is linked to changes in the body's autonomic status and also the integrity of the body's interior and exterior functionality. It can be used to identify auricular (and body acupuncture) sites requiring attention or treatment. Currently the VAS is located using one's thumb or other digit at the radial pulse seeking an increased pulse amplitude when the auricular site being screened or tested is dysfunctional. It is a sign indicating that auricular site requires intervention.[[Nogier 2](#)] Many clinicians use a pressure device to induce pressure pain to identify these auricular dysfunctional sites. *It has to be considered that a non- pain inducing approach in identifying these dysfunctional sites may be advantageous as it avoids stimulation or over activation of the pain pathways.* The VAS is also known as the Nogier Reflex in some countries such as Germany. Currently, new methods are under development for identification and utilization of the VAS.[[Litscher 4](#)]

## NEUROIMAGING EVIDENCE

Auricular point specificity has been studied [[Romoli 5](#)] as has the anatomical and functional aspects of stimulating auricular knee points [[Alimi 6](#)]. The central pain control regions of the anterior cingulate and the thalamus were also shown to be involved in BFA [[Niemtzow 7](#)] More neuroimaging studies especially functional magnetic resonance imaging are required to better document the dynamic relationships between auricular stimulation, cranial nerves activation and access to relevant brain regions and their feedback responses or their top down effects.

Low level laser acupuncture to depression specific acupuncture points regulates at the default mode network as part of its central mechanisms. [Quah-Smith 8, Kong 9]. This may be part of the central mechanisms for all auricular interventions.

## AURICULAR NEUROLOGICAL ACCESS TO THE BRAIN

The foundation of auricular interventions has been its innervation and access to the central nervous system. [Oleson 10] Clinically Auriculotherapy and Auriculomedicine has been used world wide for many decades due to its empirical effectiveness without strong biological evidence. Their ease of application, cost effectiveness, usefulness in large population health management and low side effect profile has been discussed and offered as an alternative medicine [Stanton 11]. It is offered as a graduate course in Paris [Stanton 12]

It has only been in recent years that the central mechanisms have finally been identified. The connectivity of the auricular branches of the trigeminal (Cranial Nerve 5 or CN5) and the vagus nerve (Cranial Nerve 10 or CN10) to the cortical, subcortical brain regions and the rest of the nervous system networks has finally been revealed. [Mercante 13, Grimonprez 14, Kong 9, Bliss 15] The auricular branch of the superior cervical ganglion has direct access to the sleep control or circadian rhythm brain regions at the supra-chiasma centre for melatonin regulation. [Bernard 16, Benarroch 17] With this recent knowledge in hand, the role of AT and AM in the brain to body's psycho-neuro-bio-immunological regulation has finally been made clearer.

## CLINICAL APPLICATIONS

Leading the advance has been the remarkable growth in interest and subsequent increase internationally in the clinical application of an auricular intervention referred to as Battlefield Acupuncture or BFA. [Niemtzow 18] Although its architect, retired United States Air Force Colonel Richard Niemtzw developed it for acute pain management in the battlefield, its principals and mechanisms for controlling central pain has been implemented in other clinical settings including in neonatal intensive care units to reduce pain and suffering and preserve the cellular integrity of the developing cortex and sub-cortex [ Walker 19, Kesavan 20, de Graaf 21, van den Bosch 22, Quah-Smith 23, Chen 24, Chen 25]. Acupuncture in paediatrics has long been established [Raith 26, Tsai 27] and it is of even greater interest to implement AT and AM at the neonatal stage at the start of the individual's life. It may well be protective of good health to start at this neonatal stage and much remains to be done with further investigations.

The National Acupuncture Detoxification Association (NADA) has also developed an auricular protocol for the treatment of addictions and related psychological change [Stuyt 28].

Low intensity laser as a modality for auricular acupuncture in patient care has also been helpful. [ Round 29]. Auricular intervention for cancer pain has been found to be effective [Alimi 30].

At the 9<sup>th</sup> International Symposium on Auriculotherapy in 2017 [Quah-Smith et al. 31], it was clear that auricular interventions now have an overwhelming evidence base for successful implementation clinically in many fields of medicine. The most outstanding current research projects studied how auricular stimulation helped reduce amyloid deposits in the dementia brain by improving lymphatic clearance rates, how auricular stimulation reregulated functional connectivity at the brain to successfully treat depression and by identifying active ear foci in neonates one is able to predict the illness rate or negative health events rate by the number of active foci at the ear.

Dosage : How much is enough?

Currently, when applying auricular needles, ear pressure seeds or magnets, there is no quantifiable measure for how long they need to be left in place nor how frequently the intervention has to be repeated and at what intervals. Moving forward, the challenge is to use modalities such as low level laser as the intervention of choice. Using the VAS to detect how much is enough laser, it will be possible to, at each time point, upload the correct quantity of laser energy to effect a positive shift in neurophysiological change for each patient. These energy uploads can be recorded and has been shown to reduce (as the patient condition requires less energy as it gets better) over time with patient recovery.[Quah-Smith 32]

## Conclusion

As health care systems approach overload, the realization that there has to be better solutions to rein in dollar costs and still deliver effective and affordable care is high on the list of priorities for every government. Auricular interventions now have strong biological and clinical evidence for its application within health care delivery. The next challenge is to validate the Vascular Autonomic Signal within auricular medicine to better predict durations of treatments and restoration of good health.

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