



Infographic



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## Effects and parameters of taVNS in individuals with atrial fibrillation: an infographic

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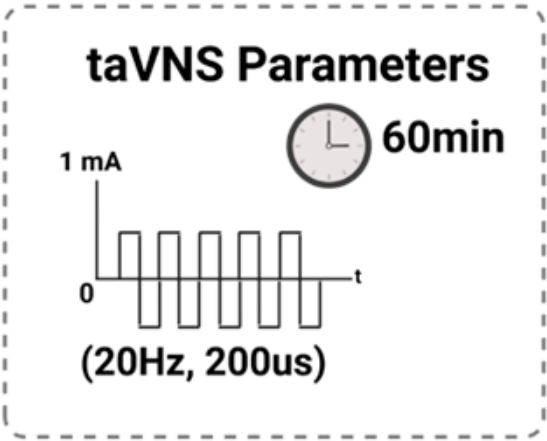
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**ABSTRACT | BACKGROUND:** Transcutaneous auricular vagus nerve stimulation (taVNS) is a non-invasive neuromodulatory technique used to modulate autonomic excitability through the electrical stimulus of the vagus nerve. Studies have shown that taVNS can be used as a therapeutic strategy for arterial fibrillation (AF) management. This infographic aims to highlight the evidence about the effect and parameters of taVNS in individuals with AF. **METHOD:** We conducted a review using the PubMed mesh combination (Transcutaneous Electric Nerve Stimulation)AND(Nerve Stimulation, Vagal)OR(Nerve Stimulation, Vagus)OR(Nerve Stimulation, Vagal)AND(Atrial Fibrillation) that included six taVNS clinical trials with human adults over the age of 18. **RESULTS:** taVNS can promote an increase in the PQ interval on the electrocardiogram by increasing the parasympathetic tone. Moreover, the taVNS can prevent AF progression through antiarrhythmic effects, such as antiadrenergic mechanisms of neural remodeling, and a decrease of pro-inflammatory cytokines and AF of burden. **DISCUSSION:** The acute effect of taVNS can increase the P - wave alternans (PWA), which is believed to be related to AF. However, the chronic effect of taVNS for six months promotes a decrease in PWA and AF burden. In addition, the taVNS can alter the heart variability ratio parameters through the increase of the HF/LF relation in individuals with AF, which can be a signal of sympathovagal rebalance. However, the taVNS can improve the autonomic balance through the decrease in HF/LH relation in healthy individuals. **CONCLUSION:** The taVNS can be a useful therapeutic tool in the management of individuals with AF due to its antiarrhythmic effects.

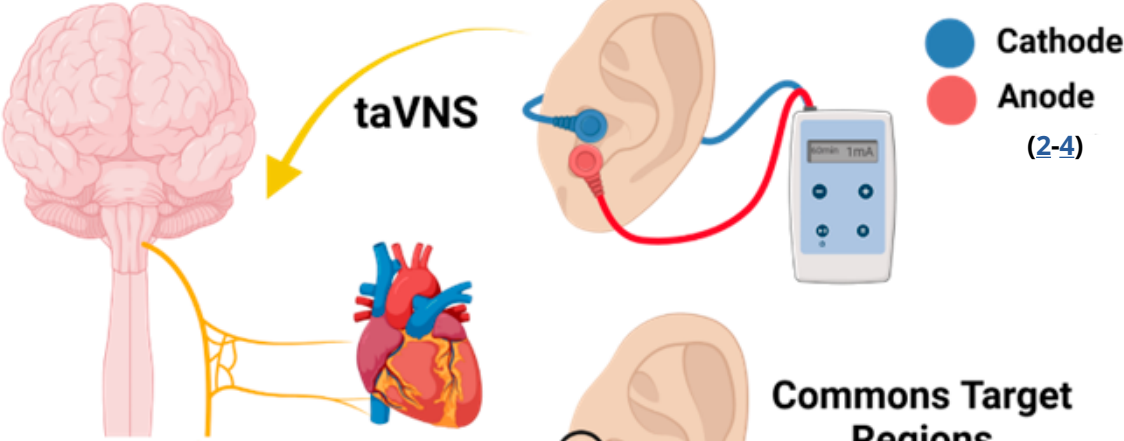
**KEYWORDS:** taVNS. NIBS. Neuromodulation. Persistent Atrial Fibrillation.



# Effects and Parameters of taVNS in Atrial Fibrillation

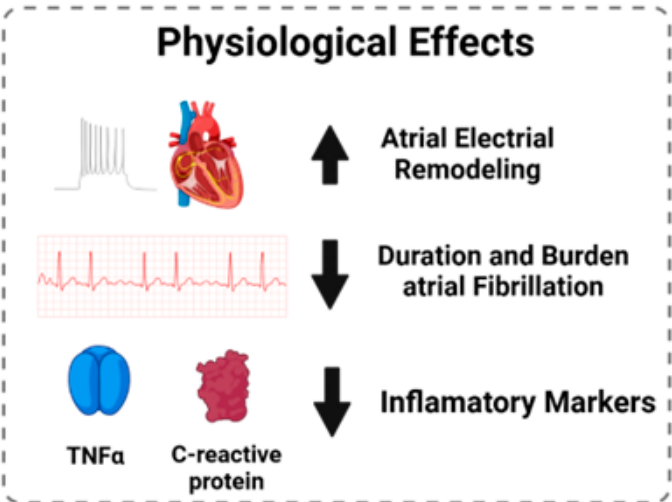


(1)

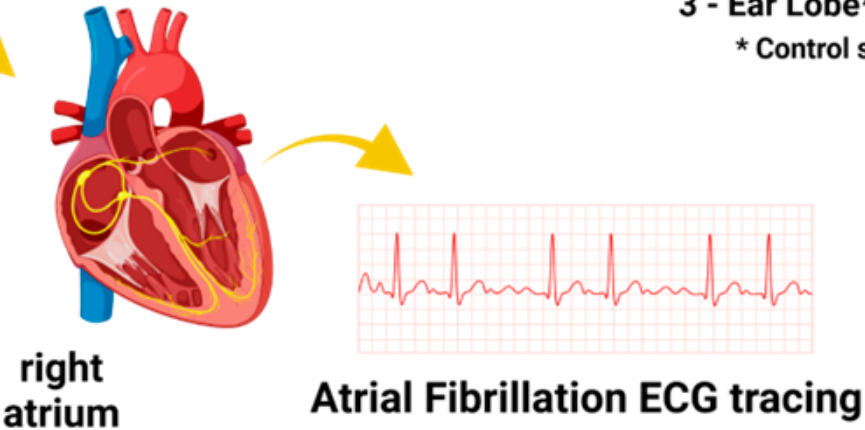


### Commons Target Regions

- 1 - Cymba Conchae
  - 2 - Tragus
  - 3 - Ear Lobe\*
- \* Control stimulations
- (2-4)



(1,5,6)



## Infographic Legend

taVNS can be applied on the ear tragus or cymba concha using two electrodes, a cathode, and an anode. Some studies<sup>5,7</sup> have been using electrodes in the ear lobule as the control condition due to the lack of vagus innervation in this region.<sup>4</sup> The antiarrhythmogenic effects of taVNS include the antiadrenergic mechanisms of neural remodeling and a decrease of pro-inflammatory cytokines and AF of burden.<sup>8-10</sup> This infographic layout was built using Biorender.com in agreement with G.R.A.P.H.I.C guidelines.<sup>11</sup>

### Authors' contributions

All authors were involved in all aspects of infographic conception. Ribeiro MWS drafted the layout infographic and wrote the abstract text, while Lopes TS, Lopes LCD, Estevam FLDD and Miranda NBN critically reviewed it.

### Conflicts of interest

No financial, legal, or political conflicts involving third parties (government, companies, and private foundations, etc.) were declared for any aspect of the submitted work (including, but not limited to grants and funding, participation in an advisory board, study design, preparation manuscript, statistical analysis, etc.).

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