Results from Scientific Studies:

- **Vagus Nerve Activity**:
    - 61% increase in 5 minutes
    - 86% increase after 2 months of daily use
- **Post-Viral Symptoms (including fatigue, brain fog, GI symptoms, pain)**:
    - 61% improvement
- **Fatigue**:
    - 48% improvement
- **Sleep**:
    - 19% improvement
- **Inflammation**:
    - 78% improvement
- **Postural Heart Rate Change (POTS)**:
    - 40% reduction
- **Heart Rate Variability**:
    - 18% increase
- **Depressive Symptoms**:
    - 45% improvement
- **Oxidative Stress**:
    - 28% reduction
- **Memory**:
    - 32% improvement
- **Reading & Learning**:
    - 29% improvement
- **Macrocirculation**:
    - 50% improvement
- **Microcirculation**:
    - 39% improvement
- **Attention Deficiency**:
    - 11% improvement
- **Anxious States**:

    - 35% improvement
- **Palpitations**:
    - 85% reduction
- **Heart Muscle Function**:
    - 19% improvement
- **GI Symptoms**:
    - 80% improvement
- **Blood Pressure**:
    - 10% reduction

Simplified

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	Cardiovascular Nurosym Research	**Highlights**	**Link**	**Condition**	**Improvement [%]**
1	Autonomic neuromodulation acutely ameliorates left ventricular strain in humans	The patient showed a decrease in deformation of heart muscle (Global Longitudinal Strain) from -19.3% to -23.1% after 1 hour of active Nurosym neuromodulation, which is a favourable change indicating improved cardiac function.	https://link.springer.com/article/10.1007/s12265-018-9853-6	Heart failure with preserved ejection fraction (HFpEF)	~19% GLS; FMD; LSCI; HRV; quality of life questionnaires (PROMs)
2	The role of low-level vagus nerve stimulation in cardiac therapy	**Review:** Nurosym neuromodulation, taking advantage of neural plasticity without destroying the targeted neural tissue. Nurosym has emerged as a novel non pharmacological adjuvant therapy and offers protective effects for the heart, including hypertension.	**https://www.tandfonline.com/doi/abs/10.1080/17434440.2019.1643234**	Cardiovascular diseases (atrial arrhythmia, ventricular arrhythmia, ischemia/reperfusion injury, heart failure, and hypertension)	

3.	TREAT AF (Transcutaneous Electrical Vagus Nerve Stimulation to Suppress Atrial Fibrillation): A Randomized Clinical Trial	The positive impact was observed in paroxysmal atrial fibrillation **(median AF burden was 85% lower in the active arm compared with the control arm, 6 months treatment)**, which includes the effective slowing of heart rate and enhanced sympathovagal balance, can be attributed, in part, to neural remodelling achieved through Nurosym neuromodulation.	https://www.sciencedirect.com/science/article/pii/S2405500X19309260?via%3Dihub	Paroxysmal atrial fibrillation	~85% AF burden reduction
4.	Low-Level Tragus Stimulation for Atrial Fibrillation: A Glimpse of Hope for Neuromodulation	**Editorial Comment:** The study (on Nurosym neuromodulation) offers hope for the potential role of neuromodulation in managing atrial fibrillation and other cardiac conditions influenced by the vagus nerve impairment. The study indicated that an implantable device will provide the systematic treatment.	**https://www.sciencedirect.com/science/article/pii/S2405500X20300773?via%3Dihub**	Atrial fibrillation	comment: 23% TNF-a decrease & 116% LF/HF increase; 72% compliance after 6 months
5.	Circulating neuropeptide Y as a biomarker for neuromodulation in atrial fibrillation	Nurosym neuromodulation helps lower neuropeptide Y (NPY) levels by about 38% in atrial fibrillation progression. This means that it can effectively slow down the heart rate during atrial fibrillation episodes and reduce the risk of rapid heart rate, showing how it can be a valuable treatment option.	https://www.sciencedirect.com/science/article/pii/S2405500X20308094?via%3Dihub	Paroxysmal atrial fibrillation	~38% Neuropeptide Y (NPY) levels lower
6.	Non-invasive Low-level Tragus Stimulation in Cardiovascular Diseases	**Review:** Neuromodulation with Nurosym has the potential to enhance the quality of life for patients dealing with conditions such as atrial fibrillation, post-acute myocardial infarction, and heart failure.	**https://www.aerjournal.com/articles/non-invasive-low-level-tragus-stimulation-cardiovascular-diseases**	**Review:** quality of life, atrial fibrillation, post-acute myocardial infarction, and heart failure.	animal and human
7.	Autonomic Modulation of Cardiac Arrhythmias: Methods to Assess Treatment and Outcomes	**Review:** Nurosym neuromodulation holds potential in correcting the sympathovagal imbalance in this cardiovascular disease by improving Heart Rate Variability (HRV). The group using the active treatment had significantly lower levels of atrial fibrillation (AF) burden and tumour necrosis factor (TNF)-α (a marker of inflammation) compared to the sham group.	**https://www.sciencedirect.com/science/article/pii/S2405500X20301729?via%3Dihub**	**Review:** Atrial fibrillation, inflammatory response	tragus stim. has activated central vagal projections; decrease sympathetic output

8.	Effects of low-level tragus stimulation on endothelial function in heart failure with reduced ejection fraction	Blood vessels flow-mediated dilatation was increased by the percent change in the brachial artery diameter by ~50% after one day of Nurosym therapy. This might be a helpful way to address endothelial (cells' layer in blood vessels) problems in patients, without the need for invasive procedures.	https://www.sciencedirect.com/science/article/abs/pii/S107191642031589X	Endothelial disease (cells' layer in blood vessels)	~50% Brachial artery diameter increased
9.	Low-level transcutaneous vagus nerve stimulation reverses cardiac dysfunction and changes left ventricular gene expression in a rat model of heart failure with preserved ejection fraction	Nurosym neuromodulation showed promise in improving cardiac function, reducing fibrosis, and mitigating diastolic dysfunction in a rat model of heart failure with preserved ejection fraction (HFpEF). These results indicate that vagal neuromodulation, with its anti-inflammatory effects, has the potential to be a non-invasive neuromodulation therapy for HFpEF.	https://academic.oup.com/eurheartj/article/42/Supplement_1/ehab724.0736/6393733?login=false	Heart failure with preserved ejection fraction (HFpEF) (rat model), inflammatory response	animal model: antifibrotic effect
10.	Low-Level Tragus Stimulation Modulates Atrial Alternans and Fibrillation Burden in Patients With Paroxysmal Atrial Fibrillation	The reduction in phase width change (PWA) serves as a valuable biomarker showing the positive effect of Nurosym therapy in patients with paroxysmal AF **(62% reduction in AF burden, 6 months treatment, sham vs active group)**, paving the way for innovative therapy.	https://www.ahajournals.org/doi/10.1161/JAHA.120.020865	Paroxysmal atrial fibrillation	~62% AF burden reduction
11.	Microvolt T-Wave Alternans Is Modulated by Acute Low-Level Tragus Stimulation in Patients With Ischemic Cardiomyopathy and Heart Failure	Patients with conditions such as ischemic cardiomyopathy and heart failure reported improved (T-wave alternans) results in their electrocardiogram (ECG) tests after undergoing Nurosym therapy.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8343129/	Cardiomyopathy Heart Failure	n.s.
12.	Neuromodulation of Inflammation to Treat Heart Failure With Preserved Ejection Fraction: A Pilot Randomized Clinical Trial	Nurosym therapy led to a significant improvement in global longitudinal strain by approximately ~11% to control group, a notable **reduction in inflammatory cytokines by about ~23% TNF-α and ~61.3% IL-8 with the enhancement in the quality of life for patients with heart failure with preserved ejection fraction (~35% MLHFQ score).**	https://www.ahajournals.org/doi/10.1161/JAHA.121.023582	Heart failure with preserved ejection fraction	~11% GLS, ~23% TNF-α, ~61.3% IL-8 lower, ~35% MLHFQ score increase,

13.	Neuromodulation reduces inflammation in HFpEF		https://www.nature.com/articles/s41569-022-00672-2		
14.	Case report: SGLT2i, transcutaneous vagus nerve stimulation, and their effects on intrarenal venous flow pattern in HFpEF	Nurosym neuromodulation reveals renal congestion and offers a potential approach to managing heart failure with preserved ejection fraction, underlining their positive impact.	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9523255/	Heart failure with preserved ejection fraction	
15.	Effects Of Low Level Tragus Stimulation On Inflammation In Acute Decompensated Heart Failure	Following Nurosym neuromodulation, patients with pre-existing inflammation experienced notable improvements in left ventricular strain and a **significant decrease in inflammatory biomarkers, particularly a remarkable ~78% reduction in IL-6.**	https://onlinejcf.com/article/S1071-9164(22)01010-7/fulltext	Inflammation (heart failure patients)	~78% IL-6 lower, H_2O_2 reduction
16.	Review: Denervation or stimulation? Role of sympatho-vagal imbalance in HFpEF with hypertension		https://www.nature.com/articles/s41440-023-01272-4		
17.	Noninvasive Vagus Nerve Stimulation in Postural Tachycardia Syndrome: A randomized clinical trial	After two months of active Nurosym therapy, there was a substantial decrease in orthostatic tachycardia (POTS) compared to the sham group, according to **HR analyses that revealed an ~40% improvement during Nurosym neuromodulation.** Furthermore, levels of anti-autonomic autoantibodies (α1-AR and β1-AR) were significantly lower ($p<0.05$) in the active group, indicating a potentially beneficial effect on autonomic function. Importantly, no adverse effects related to the device were observed.	https://pubmed.ncbi.nlm.nih.gov/37999672/	POTS	~40% decrease in postural tachycardia; reduction in antiadrenergic antoantibodies and inflammatory cytokines, improvement in HRV

18.	Afterload reduction after non-invasive vagus nerve stimulation in acute heart failure	Nurosym impact on central blood pressure (BP) in acute heart failure (AHF) patients. Patients receiving active stimulation showed significant reductions in central aortic systolic pressure (CASP), brachial systolic BP (SBP), diastolic BP (DBP), and heart rate (HR), while those in the sham group experienced increases. Nurosym acutely reduces afterload in elderly AHF patients, therefore preventing heart failure decompensation.	https://www.frontiersin.org/articles/10.3389/fnhum.2023.1149449/full	Heart Failure	Reduction on central blood pressure and parameters SBP, CASP, DBP, and HR
19.	Low-Level Transcutaneous Electrical Vagus Nerve Stimulation Suppresses Atrial Fibrillation	Effects of Nurosym on electrophysiological parameters and inflammatory markers in patients with AF. Pacing-induced AF, changes in atrial effective refractory period (AERP), and inflammatory cytokines (TNF-α and CRP) were assessed. Nurosym significantly shortened the duration of stimulation-induced AF and prolonged the AF cycle length, and also inhibited systemic TNF-α and CRP levels, while no significant changes were observed in the control group. Two patients suffered minor burns.	https://www.sciencedirect.com/science/article/pii/S0735109714075810?via%3Dihub	Atrial Fibrillation	Pacing-induced AF duration decreased; suppressed systemic levels of tumour necrosis factor-alpha (TNF-α) and C-reactive protein (CRP)
20.	Insights into the effects of low-level vagus nerve stimulation on atrial electrophysiology	Nurosym in the prevention and treatment of atrial fibrillation (AF). Study of atrial electrophysiology by intraoperative epicardial mapping during both acute and chronic use of Nurosym. In acute and chronic Nurosym, a shift of the exit point of the sinoatrial node towards a more cranial direction was observed in 50% of patients. Unipolar potential voltage increases significantly during both acute and chronic Nurosym, which produces an antiarrhythmic effect.		Atrial Fibrillation	50% reduction in arrhythmias; Epicardial mapping showed increased parasympathetic activity

21.	Low level transcutaneous vagus nerve stimulation acutely ameliorates diastolic function in humans	A prospective, randomized, double-blind, crossover study examined the acute effects of low-level Nurosym on diastolic dysfunction and autonomic tone in patients with normal left ventricular ejection fraction and evidence of diastolic dysfunction. Echocardiography and a 5-minute ECG assessment were performed before and after the stimulation sessions. **Results showed that Nurosym led to a significant reduction in global longitudinal strain, indicating improvement in diastolic dysfunction, along with favourable modulation of sympathovagal balance, as indicated by a reduced LF/HF ratio.**	https://academic.oup.com/eurheartj/article/38/suppl_1/ehx502.P2437/4089157	heart failure with preserved ejection fraction (HFpEF)	LF/HF at 1 hour decreased; GLS decrease; diastolic dysfunction treatment
22.	Autonomic Afferent Dysregulation in Atrial Fibrillation	The aim of this study was to evaluate the role of cardiac afferent reflexes in atrial fibrillation (AF) in terms of efferent autonomic tone in atrial remodelling. Study measurements included beat-to-beat mean arterial pressure (MAP) and heart rate (HR). LBNP-induced reflex vasoconstriction was assessed using forearm blood flow obtained from venous occlusion plethysmography. Reversibility was assessed by repeated LBNP after Nurosym stimulation. **Studies have shown that cardiac afferent reflexes are abnormal in patients with AF.**	https://pubmed.ncbi.nlm.nih.gov/35210071/		Improved local blood flow and vascular function (blood vessel tone)

23	Blood Pressure Variability After Non-invasive Low-level Tragus Stimulation in Acute Heart Failure	Participants in the active AVNT group saw VAS scores improve from 52.5 to 62.5 (p=0.02), while the placebo group showed no significant change (52.5 to 50.0, p=1.0). Active patients reported relief from shortness of breath. AVNT stabilises blood pressure more effectively than sham stimulation, likely through enhanced autonomic regulation and improved viscerosensory perception. the active AVNT group showed significant reductions in blood pressure variability (BPV) metrics. Systolic blood pressure (SBP) variability decreased significantly (6.63 to 3.15 mmHg, p=0.012). Conversely, the sham group experienced increases in SBP (3.82 to 5.71 mm;Hg, p=0.049) and all DBP variability metrics increased in the sham group.	Blood Pressure Variability After Non-invasive Low-level Tragus Stimulation in Acute Heart Failure - PubMed	Hypertension	VAS score improvement; BPV improvement SBP improvement
24.	Transcutaneous vagus nerve stimulation restores the cardiac phenotype in heart failure with preserved ejection fraction by modulating the immune cell profile	Heart failure with preserved ejection fraction (HFpEF) is characterized by a pro-inflammatory state. The study demonstrated that Nurosym modulates the immune response through the cholinergic anti-inflammatory pathway, which involves acetylcholine-dependent activation of α7 nicotinic acetylcholine receptors (α7nAchR) on macrophages. Treatment with tVNS restored these parameters to control values, and sham-stimulated mice developed hypertension, diastolic dysfunction, increased normalized heart weight, and left ventricular fibrosis.	https://www.ahajournals.org/doi/10.1161/circ.146.suppl_1.13645	Heart Failure (mice model)	immune responses -> CAP -> α7nAchR on macrophages; improved cardiac phenotype (mice)

25	Impact of optimized transcutaneous auricular vagus nerve stimulation on cardiac autonomic profile in healthy subjects and heart failure patients	The stimulation protocol that yielded the greatest autonomic modulation was 25 Hz applied to the left tragus. In HF patients, the autonomic response was negligible - likely due to reduced vagal sensitivity and beta-blocker use. Left AVNT at 25 Hz: HR reduction of −1.1 ± 1.2 bpm ($p < 0.01$); RMSSD increase of +2.55 ± 4.55 ms ($p < 0.01$); HF power increase of +42.1 ± 78.4 ms² ($p < 0.05$); RR interval increase of +15 ± 19 ms ($p < 0.001$); 10 Hz, right tragus, and sham stimulation showed minimal or no significant effects.	https://iopscience.iop.org/article/10.1088/1361-6579/ad5ef6	Electrophysiology	One stimulation effect; Left AVNT HR reduction; RMSSD increase; HR power increase
26.	Noninvasive low-level tragus stimulation attenuates inflammation and oxidative stress in acute heart failure	**Acute decompensated heart failure (ADHF) is characterised by inflammation, oxidative stress, and increased sympathetic nervous system activity.** Study of the effect of Nurosym on inflammation and oxidative stress in patients with ADHF. Compared with sham stimulation, neuromodulation led to a significant reduction in circulating serum interleukin-6 levels (-78% vs. -9%; $p = 0.012$). Similarly, neuromodulation resulted in reduced oxidative stress on endothelial cells in the neuromodulation group ($p = 0.003$) compared to sham stimulation ($p = 0.094$). There were no significant differences in heart rate, blood pressure, or kidney function between the two groups.	**https://link.springer.com/article/10.1007/s10286-023-00997-z**	Heart Failure Chronic Inflammation	~24% ROS (oxidative stress) ~87% IL-6 reduction (compared to placebo)
27	**Low-Level Tragus Stimulation Attenuates Blood Pressure in Young Individuals With Hypertension: Results From a Small-Scale Single-Blind Controlled Randomized Clinical Trial**	Low-level tragus stimulation (LL-TS) improved blood pressure management in young adults with Grade 1**. Systolic Blood Pressure (SBP): Intervention group (IG): 13.81 mm Hg; Control group (CG): 6.49 mm Hg, difference within groups (P=0.003); Diastolic Blood Pressure (DBP): IG 9.15 mm; CG: 4.24 mm Hg; difference within groups (P=0.001).hypertension.**	**https://www.ahajournals.org/doi/10.1161/JAHA.123.032269**	Hypertension	Reduced systolic blood pressure (SBP) by 9.7% Diastolic blood pressure (DBP) by 10.2% over three months in young adults with Grade 1 higher blood pressure

28	Acute right-sided AVNT improves cardio-vagal baroreflex gain in patients with chronic heart failure	AVNT shown a significant increase in baroreflex (Mean difference = 1.9 ± 1.6 ms/mmHg from baseline); HRV no significant changes towards vagal predominance. AVNT as a noninvasive alternative to improve sympathovagal balance. Right-sided is more effective than left-sided in improving cardio-vagal baroreflex gain in CHF patients without affecting heart rate, blood pressure, or HRV parameters significantly	**https://link.springer.com/article/10.1007/s10286-024-01074-9**	Chronic Heart Failure	33% relative improvement in baroreflex gain
29	TraNscutaneOus Electrical VAgus Nerve Stimulation to Suppress Premature Ventricular Contractions: a cross-over, randomized clinical trial (NOVA-PVC)	Minor side effects (e.g. headache, local irritation) reported in a few cases; Most participants tolerated LLTS well; no serious adverse events; No symptoms scale used; Blinding preserved through stimulation site masking (tragus vs earlobe). PVC burden reduction: 23% reduction with LLTS vs sham; ≥50% in 15%, ≥80% in 11%; HR/HRV: no significant change; PVC origin: Consistent effect across RVOT (71.9%), LVOT (12.5%), and epicardial (15.6%); QRS duration: PVC QRS 145 ms; sinus QRS 120 ms; no LLTS-specific difference; Coupling interval: 366 ms (±170.5); no treatment interaction; Time-dependent effect: Strongest at 6h post-stimulation (β = −1.23, p = 0.042); cumulative over days; HR–PVC interaction: Greatest effect in S-HR PVCs (p = 0.05)	**https://www.sciencedirect.com/science/article/abs/pii/S2405500X25002646**	Premature Ventricular Contractions	23% PVC burden reduction

	Cognition Nurosym Research	**Highlights**		**Condition**	**Improvement [%]**
1	The effect of transcutaneous auricular vagus nerve stimulation on reading comprehension	**Poster:** A positive effect on memory-based aspects of reading comprehension was observed using Nurosym neuromodulation. This suggests that Nurosym Therapy may improve memory and reading comprehension skills.	**https://www.sciencedirect.com/science/article/abs/pii/S0166432822004326**	Reading comprehension	

2	The Effect of Transcutaneous Auricular Vagus Nerve Stimulation on Reading Comprehension (tcu.edu)	The study revealed a trend in the main effect of neuromodulation, suggesting that the Nurosym device may have a positive influence on reading comprehension and remove the existing deficit between readers with dyslexia and typically developing individuals.	https://repository.tcu.edu/handle/116099117/40265	Reading comprehension	n.s
3.	Transcutaneous auricular vagus nerve stimulation enhances learning of novel letter-sound relationships in adults	Participants who received Nurosym neuromodulation showed a significant improvement in their performance on the automaticity task compared to the control group, completing it in less time (Nurosym group: 33.14 seconds vs. control group: 46.27 seconds). Additionally, the Nurosym group **achieved a higher accuracy rate of ~16% on decoding tasks, compared to the control group.**	https://linkinghub.elsevier.com/retrieve/pii/S1935861X20302795	Cognition improvement (task)	~29% less time on automaticity tasks ~16% accuracy on decoding tasks
4.	The effect of transcutaneous auricular vagus nerve stimulation on novel language learning	The results indicate that there was no significant benefit of 5 Hz Nurosym Neuromodulation on novel language learning.	https://repository.tcu.edu/handle/116099117/44322	language learning	no benefit of 5 Hz AVNT on novel language learning (Palau)
5.	Improvement of memory-based reading recall using transcutaneous auricular vagus nerve stimulation	Participants who received active neuromodulation showed a **significant ~26% improvement in their performance on all test questions, with a remarkable ~32% boost specifically in answering memory-based questions.**	https://osf.io/preprints/psyarxiv/wvsrc/	Cognition improvement (memory)	~26% better performance ~32% increase memory-based question
6.	A two-week course of transcutaneous vagal nerve stimulation improves global sleep: Findings from a randomised trial in community-dwelling adults	In the group with an active neuromodulation program, **there was a ~13% improvement in global sleep scores, and participants exposed to late stimulation also showed ~15% improvement in answering memory-based questions.**	https://www.autonomicneuroscience.com/article/S1566-0702(22)00031-5/fulltext	Insomnia, memory	~13% global sleep score improvement ~15% memory-based questions

7.	The effect of long-term non-invasive vagus nerve stimulation on cognitive performance: results from a randomized placebo controlled trial	Nurosym neuromodulation applied daily showed a potential beneficial effect on the memory recall but without satistically significant difference.	https://www.brainstimjrnl.com/article/S1935-861X(23)01728-X/fulltext	memory recall	significant improvement in recall (early and late tVNS phase)
8.	The effect of non-invasive vagus nerve stimulation on memory recall in reading	In a pilot study, improvements in memory recall of previously read material were observed, representing higher levels of reading skills in participants who received active Nurosym neuromodulation.	https://linkinghub.elsevier.com/retrieve/pii/S0166432822004326	memory recall	
9.	The effects of transcutaneous auricular vagus nerve stimulation on language retention in college-aged students	The Nurosym effect in memory-based reading comprehension and associative memory, and examining the effects on long-term language retention. During this training, participants received sham stimulation, 5 Hz stimulation, or 25 Hz stimulation towards the posterior aspect of the left tragus. There was no significant difference in performance between the sham and 5 Hz taVNS groups. Those receiving 25 Hz stimulation significantly improved retention of learned words after one week.	https://repository.tcu.edu/bitstream/handle/116099117/59369/Crupper__Jordan-Honors_Project.pdf?sequence=1	memory recall	improved verbal and visual working memory

	Cancer Nurosym Research	**Highlights**	**Link**		
1	Effects of non-invasive vagal nerve stimulation on radiation-induced inflammation and cancer prognosis	The preliminary findings of the study suggest that vagal neuromodulation has the potential to improve the body's ability to fight tumours by reducing the presence of Myeloid-Derived Suppressor Cells (MDSC), which can support tumour growth. Vagal neuromodulation encourages the growth of beneficial cells like conventional dendritic cells, natural killer cells, and CD8+ T cells, while decreasing harmful MDSC populations.	https://researchportal.vub.be/en/publications/effects-of-non-invasive-vagal-nerve-stimulation-on-radiation-indu-2		

2	Transcutaneous Vagal Nerve Stimulation Alone or in Combination With Radiotherapy Stimulates Lung Tumor Infiltrating Lymphocytes But Fails to Suppress Tumor Growth	Vagal neuromodulation may modulate the immune response in the context of lung cancer treatment, both in preclinical mouse models and in a small cohort of non-small cell lung cancer patients. In a clinical trial in lung cancer patients, Nurosym neuromodulation led to increases in NK cells and dendritic cells (DCs), which are associated with anti-tumor immunity.	https://www.frontiersin.org/articles/10.3389/fimmu.2021.772555/full	Non-small cell lung cancer, anti-tumor factors	~25% NK cells i(NSCLC patients, non-significant)

	Post-Viral Autonomic Dysfunction Nurosym Research	**Highlights**		**Condition**	**Improvement [%]**
1	Transcutaneous auricular vagus nerve stimulation (tVNS) can reverse the manifestations of the Long-COVID syndrome: a pilot study	The study observed a significant reduction in long-term Covid-19 symptoms among all participants who took part in ten days Nurosym therapy.These improvements were evident not only through self-reported enhancements in patient well-being, including reduced fatigue (**~48% on Pitchot Fatigue Scale)** and improved mood **(~45% on Beck depression score)**, but also in objective physiological indicators. **These objective improvements encompassed increased muscle strength (~7%), elevated blood oxygen saturation levels (~1%), and a noteworthy 1.9-fold increase in the inhibitor of the proinflammatory effect (specifically, IL-1ra)**.	https://emrespublisher.com/open-access-pdf/transcutaneous-auricular-vagus-nerve-stimulation-can-reverse-the-manifestations-of-the-long-covid-syndrome-a-pilot-study-100011.pdf	Chronic fatigue, Depression, inflammatory response	~48% on Pitchot Fatigue Scale ~45% on Beck depression score ~185% IL-1ra improvement (compared to median baseline vs. median 3rd visit)
2	Transcutaneous vagus nerve stimulation in the treatment of long covid-chronic fatigue syndrome	In a study of patients experiencing chronic fatigue symptoms after Covid-19 infection, **approximately 40% of the participants showed positive responses to treatment involving Nurosym neuromodulation, as evidenced by improvements in fatigue, brain fog, and widespread pain.**	https://www.medrxiv.org/content/10.1101/2022.11.08.22281807v1	Fatigue, Brain Fog	~60% patients has shown improvement; 57% improvement VAS rate

3	Transcutaneous vagus nerve stimulation improves Long COVID symptoms in a female cohort: a pilot study	Neuroimaging studies have detected damages in various limbic and associative brain regions following COVID-19 infection, likely indicative of neuroinflammation and possible neurodegeneration. Participants likely experienced perceived improvements in cognitive functions, mood stabilisation. Reductions in anxiety, sleep disturbancess, fatigue, depression. Fluid cognition, processing speed, episodic memory, inhibitory control and attention improved significantly from baseline to post-intervention and follow-up.	https://www.frontiersin.org/journals/neurology/articles/10.3389/fneur.2024.1393371/full	Long-Covid	~35% Anxious States improvement ~19% PROMIS sleep disturbances improvement ~19% improvement in Attention Deficiency Symptom

	Neurological Nurosym Research	**Highlights**	**Link**	**Condition**	**Improvement [%]**
1	Feasibility, safety and efficacy of transauricular vagus nerve stimulation in a cohort of patients with disorders of consciousness	Preliminary results indicate that Nurosym neuromodulation is a safe and effective method for aiding consciousness recovery in patients with impaired consciousness, especially in those in a minimally conscious state. The study showed improvements in Coma Recovery Scale-Revised (CRS-R) scores, primarily in the motor subscale.	https://linkinghub.elsevier.com/retrieve/pii/S1935861X19304760	Coma	Improvement in CRS-R (Coma) (Parameters: EKG, blood pressure, heart rate)

	Optimization Nurosym Studies	**Highlights**	**Link**	**Condition**	**Improvement [%]**
1	The effect of transcutaneous auricular vagus nerve stimulation on HRV in healthy young people	The Nurosym neuromodulation group was associated with **significantly higher measures of cardiac vagal activity (~61% HF, ~18% RMSSD, ~25% pRR50 and ~14% SDRR parameters improvement, compared to control group), and thus activation of the parasympathetic system responsible for regeneration and rest**.	https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0263833	Parasympathetic activity	~61% HF, ~18% RMSSD, ~25% pRR50, ~14% SDRR improvement

2	Circadian stage-dependent and stimulation duration effects of transcutaneous auricular vagus nerve stimulation on heart rate variability	Nurosym neuromodulation, particularly in the morning, resulted in **substantial increases in HRV parameters (~39% HF, ~16% RMSSD parameters improvement, compared to baseline) associated with vagal activity, and sympathetic-parasympathetic balance.** Individuals who responded better to therapy showed lower baseline measures of indices representing vagal activity and higher baseline measures of sympathetic activity. Quoting other research: **fMRI showed NTS activation**	https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0277090	Parasympathetic activity	~39% HF, ~16% RMSSD improvement

	Sensory Nurosym Research	**Highlights**		**Condition**	**Improvement [%]**
1	Effectiveness of transcutaneous vagus nerve stimulation for the treatment of tinnitus: an interventional prospective controlled study	A neuromodulation study of Nurosym with chronic tinnitus did not result in significant improvement in tinnitus measures compared to controls. The study showed a significant increase in theta band activity in quantitative electroencephalography (qEEG) in the study group compared to the control group, which proves the influence of neuromodulation on brain activity.	https://www.tandfonline.com/doi/full/10.1080/14992027.2023.2177894?scroll=top&needAccess=true&role=tab	Chronic tinnitus	n.s.
2.	Non-invasive vagus nerve stimulation reduces sympathetic preponderance in patients with tinnitus	Nurosym for autonomic nervous system (ANS) imbalance in patients with tinnitus-induced stress.The results showed that approximately three-quarters of 97 patients had sympathetic predominance or reduced parasympathetic activity before treatment. Nurosym caused a significant increase in R-R interval variability in 75% of patients and a decrease in HRV age in 70% of patients (15 - 60 min). **90% of patients either had increased R-R interval variability or decreased HRV age, indicating a shift in ANS function from a sympathetic to a parasympathetic predominance.**	https://www.tandfonline.com/doi/full/10.1080/00016489.2016.1269197	Chronic tinnitus	90% of patient had increased R-R interval variability or decreased HRV age; stress index reduction (graphical representation)

3.	Transcutaneous vagus nerve stimulation via tragus or cymba conchae: Are its psychophysiological effects dependent on the stimulation area?	The aim of this study was to compare the cognitive and neurophysiological effects of tVNS applied to different areas of the ear, namely the tragus, conchae cymbae, and earlobe. Previous studies have demonstrated tVNS to influence cognitive function and autonomic regulation. The study found that stimulating different ear regions did not lead to differences in post-error slowing or pupillary responses. However, **they observed an increase in norepinephrine activity after stimulation, suggesting the involvement of neurological processes.** Moreover, cardiac vagal activity increased over the study period, regardless of stimulation area, indicating a nonspecific effect of tVNS on autonomic activity.	https://pubmed.ncbi.nlm.nih.gov/33444689/	Targeted stimulation	No difference between concha cymbae and tragus stimulation and physiological effect

	Pain Nurosym Research	**Highlights**			
1	Use of tVNS as a new therapeutic option in a cohort of patients with Fibromyalgia Syndrome: Pilot Study	Dysfunctions in the Autonomic Nervous System (ANS) are implicated in fibromyalgia (FMS). Nurosym improved disease activity and sleep quality in FMS patients. Within 2 weeks of tVNS, reductions were seen in Wide Pain Index (WPI) and Fibromyalgia Impact Questionnaire Total (FIQR). After 4 weeks, FIQR scores, physical function, general health, symptoms, Symptom Severity Score (SSS), and WPI significantly decreased. Sleep quality improved according to PSQI. However, perceived diffuse pain, measured by visual analogue scale (VAS), remained unchanged after 2 or 4 weeks of treatment. **Future studies should explore disease biomarkers like brain-derived neurotrophic factor (BDNF).**		Fibromyalgia	31% PSQI; 27% FIQ; 22% SSS; 36% WPI n.s. VAS