PURDUE INNOVATES | Office of Technology Commercialization

# Non-Invasive Measurement of Vagal Nerve Action Potentials for Bioelectronic Control of Gastroparesis Symptoms

**Skin-surface sensor system that tracks vagal markers to optimize bioelectronic therapy.**

Gastric electrical stimulation (GES) is an invasive process for patients with diabetic and idiopathic gastroparesis. Researchers at Purdue University have developed a way to measure the precise severity and frequency of hallmark symptoms on the surface of skin in a non-invasive manner, and thereafter offer suggestions for treatment. The system developed by Purdue University detects vagal nerve activation, prepares data-driven diagnostic tests for determining the best patient benefits, and identify nerve response for off-target effects. In addition, the system continuously measures GES parameters, providing new tools for bioelectronic intervention. Compatible with software and firmware for immediate data interpretation, the system was found to increase Compound Nerve Action Potential (CNAP) fiber volleys while decreasing negative symptoms in sixty patients. This advanced mechanism effectively treats autoimmune inflammatory disorders.

**Advantages**:

-Non-Invasive

-Measures Symptom Severity

-Better Patient Care

-Connection of Neural Signals to Neuromodulation

Potential Applications:

-Reducing Symptoms of Idiopathic and Diabetic Gastroparesis

-Treatment of Autoimmune Inflammatory Disorders

-Patient Pain Management

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**Category**

Medtech & Digital Health/Remote Patient Monitoring & Telehealth

Medtech & Digital Health/Wearable Health Tech & Biosensors

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**Technology Validation:**

This technology was validated in a clinical study with sixty-six adults receiving GES therapy (Medtronic/Enterra I/II) to treat refractory nausea and vomiting secondary to diabetic, idiopathic, or postoperative gastroparesis. Participants filled out a symptom score following charged pulses which varied in timed volleys. In conclusion, researchers found that stimulating the vagus nerve can improve GES therapy.

Recent Publication:

"An emerging method to noninvasively measure and identify vagal response markers to enable bioelectronic control of gastroparesis symptoms with gastric electrical stimulation"

Journal of Neuroscience Methods

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**TRL:** 3

**Intellectual Property:**

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