# Gastric Electrical Stimulation

## *Potential Applications*

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## A potential alternative to treat obesity or stomach motor disorders

Similar to the heart, the stomach has electrical activity that orchestrates muscle contractions. Modifying stomach contractions through gastric electrical stimulation (GES) – the equivalent of a gut pacemaker – holds potential for treating not only gastric motor disorders, but also eating disorders, such as morbid obesity.

The stimulation is applied by an implantable device that functions in a fashion similar to a pacemaker, altering the stomach's muscle contractions by modifying its electrical activity. Depending on device settings, GES may enhance or inhibit stomach muscle contractions or pressure, and therefore may alter how quickly the stomach empties.

### Potential to Treat Chronic Indigestion and Gastroparesis

Indigestion that leads to the pain of dyspepsia is a common chronic stomach complaint caused by a motor disorder, as is gastroparesis (delayed stomach emptying). Together, functional dyspepsia and gastroparesis affect about 20% of the population.

Currently there are only a few partially effective medications. Symptoms include chronic nausea, vomiting, abdominal discomfort and feeling full before the stomach is full.

The main causes are lack of stomach contractions, delayed stomach emptying, increased sensitivity to stretching of the stomach, and reduced ability to accommodate a normal volume of food. Appropriately programmed, GES can improve stomach contractions, stomach emptying, and the ability to accommodate food. It is believed GES has therapeutic potential to treat functional dyspepsia and gastroparesis.

Obesity is a major worldwide health problem. In the United States, about one-third of the population is obese and more than 15 million patients face such serious health risks from morbid obesity that they need medical or surgical treatment.

### Therapeutic Potential to Treat Obesity with Gastric Electrical Stimulation

Obesity and related illness claim more than 400,000 lives and account for $150 billion in annual spending on health care in the U.S.

The only effective, long-term therapy is surgery, such as gastric bypass or gastric banding.

Due to risks associated with surgery, these digestive system procedures are carried out on only a very small portion of patients who have morbid obesity.

By comparison, the procedure to implant a gastric electrical stimulator is less invasive. Programmed appropriately, GES can reduce stomach contractions and slow the pace at which food empties from the stomach, thereby creating a sensation of fullness and reducing the amount of food consumed.

Extensive experimental studies have shown GES has therapeutic potential for treating obesity. New implantable gastric stimulation devices are being developed, and clinical trails are on the horizon.

**Please note:** *This information should not be used as a substitute for medical treatment and advice. Always consult a medical professional about any health-related questions or concerns.*

For further information see:
WIKISTIM at http://www.wikistim.org – This free-to-use collaborative, searchable wiki of published primary neuromodulation therapy research was created in 2013 as a resource for the global neuromodulation community to extend the utility of published clinical research. The goals of WIKISTIM are to improve patient care and the quality of research reports, foster education and communication, reveal research needs, and support the practice of evidence–based medicine.

### Further reading

1. Abell TL, Minocha A, Abidi N. Looking to the future: electrical stimulation for obesity. *Am J Med Sci*. 2006 Apr; 331(4): 226-32.
2. McCallum RW, Lin Z, Forster J, Roeser K, Hou Q, Sarosiek I. Gastric electrical stimulation improves outcomes of patients with gastroparesis for up to 10 years. *Clin Gastroenterol Hepatol*. 2011 Apr;9(4):314-319.e1. Epub 2010 Dec 23.