Gastric Pacemaker for Managing Gastrointestinal Motility

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Background

Obesity is considered to be one of the most pressing health problems of modern society. Its prevalence continues to increase significantly and it is associated with many life-threatening disorders. Controlled electrical stimulation of the stomach is a promising technique to treat obesity that could provide reliable long-term results without side effects of pharmacotherapy or from the postoperative complications related to anatomy-modifying bariatric surgery.

Researchers at the University of Calgary have developed a method and device that uses neural gastric electrical stimulation (NGES) to control movement of fluids and solids in the gastrointestinal tract. NGES utilizes multi-channel, high energy, high-frequency stimulating waveforms to generate microprocessor controlled synchronized contractions that can move gastric content both in antegrade or retrograde directions. The method overrides the spontaneously existing slow waves and has been designed to overcome tissue exhaustion. When used in the vicinity of the pylorus the technique produces timed, circumferential contractions that work to keep food in the stomach – providing a feeling of satiety and reducing overall food intake. The technique has also demonstrated success for controlling antegrade movement of fluids and solids in the stomach for treating gastroparesis, and in the colon for treating chronic constipation and other debilitating diseases.

Areas of Application

• Gastroparesis, delayed gastric emptying, chronic constipation, obesity

Competitive Advantages

• Ability to control the magnitude and propagation pattern based on particular requirements of the patient
• Implantable microelectronic unit similar to cardiac pacemakers
• Applicable to other smooth muscle sphincters and organs along the entire gastrointestinal tract, e.g., the esophagus, pylorus, small and large intestines and anal sphincter

Intellectual Property Status

• Issued: US 6,243,607; US 6,449,511; US 7,343,201; US 7,720,539;
CA 2,264,831
• Pending: US 12/032,601; CA 2,588,727; CA 2,327,640; PCT/CA2008/001751

Publications