**Noninvasive assessment of gastric slow wave pathology for diabetic gastroparesis**

Diabetes mellitus afflicts 366 million people worldwide and gastrointestinal complications from the disease are common. The gastric electrical slow wave mediates neuromuscular interactions in the gastrointestinal system that determine the functional status of peristalsis and digestion. Each year, millions of patients present to gastroenterologists with functional disorders characterized by non-specific symptomology that may or may not correlate to standard diagnostic indicators such as gastric emptying. Many of these disorders have known etiologies corresponding to specific cellular and anatomical abnormalities which are difficult to determine noninvasively. Although structural imaging by CT and ultrasound can identify gross abnormality, functional disorders frequently occur with no evident structural abnormality but with slow wave rhythm disturbances in gastric electrical activity. Our most recent data show that gastroparesis and other functional abnormalities of the stomach fundamentally change slow wave propagation patterns. The multichannel MGG used in conjunction with multichannel EGG characterizes gastric slow waves in terms of frequency, spectral distribution of signal power, spatiotemporal frequency maps and slow wave propagation patterns. Although high-resolution serosal electrode mapping shows that complex slow wave dysrhythmias characterize gastroparesis and chronic unexplained nausea and vomiting, there is no viable clinical method to assess these dysrhythmias, and noninvasive characterization of gastric slow waves provides an avenue forward.