I believe that engineering can offer a lot to reduce healthcare costs by implementing some comfortable and convenient ways to monitor the patient or to treat the patient or to let the patient control their own management of illness.

People suffering from gastroesophageal reflux disease do not feel well. "Basically, what we do is we develop a pacemaker to jump start the stomach," Chiao said.

The small stimulator Chiao and his team came up with forces the stomach to contract and move food properly. It can be implanted during a 30-minute outpatient procedure, using an endoscope, and without surgery, he said.

The device does need to undergo FDA testing, so it will be four to five years before it's ready for clinical application, he said.

The closest competition for treatment of gastroesophageal reflux disease is a much larger neurostimulator device that requires a three-hour surgery under general anesthesia and hospitalization afterward, he said. Chiao's device is smaller than half a postage stamp. It is small controller on a necklace or belt wirelessly activates the implant to set off weak electrical impulses that stimulate the stomach tissues, making the stomach move to properly digest food.

The device also has applications for obesity control, Chiao said. After a patient eats, the stimulator can make the stomach move in an out-of-synch way to make the patient feel full, he said.

About 175 million people had gastrointestinal problems in 2000 and 365 million are expected to have the condition by 2020, according to the World Health Organization.

Chiao is working with a team of clinical interventionalists from the University of Mississippi Medical Center and the University of Texas Southwestern Medical Center. His research achievements are multidisciplinary, covering electrical and electronic engineering, optics, nanotechnology, wireless technologies, biotechnology and medicine.

"I believe that engineering can offer a lot to reduce healthcare costs by implementing some comfortable and convenient ways to monitor the patient or to treat the patient or to let the patient control their own management of illness," he said.

Chiao encourages his students to explore a similar career path.

"The medical market is an area of growth," he said. "We're all getting older. I believe if a student has a good talent across engineering and medicine, they are better off for the future."
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