

M2A Swallowable Imaging Capsule
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Researchers at Given Imaging (Yoqneam, Israel), realized the need for imaging the small intestine.

Conventional methods such as Endoscopy, provides very good images but cannot view the entire length of the small intestine. Radiology requires the consumption of Barium and exposure to X-rays. Ultrasound simply produces poor images. CT scans are somewhat effective but the patient is once again exposed to X-rays and it is quite costly for one of these scans.

Arkady Glukhovsky, vice president of R&D at Given Imaging gathered his team of engineers and managed to incorporate a digital camera, battery, radio transmitter, and light source into a pill sized package. It can be swallowed by patients to enable nonsurgical imaging of the gastrointestinal tract. The torpedo-shaped capsule can provide more than five hours of real color images. The disposable capsule, which is 30mm long and 11mm in diameter, is propelled by peristalsis through the gastrointestinal tract. The images are transmitted from the capsule using UHF signals to an antenna array attached to the patient (much like an ECG). The aeriels also record position information. The received images are stored in a recorder worn on a belt around the waist. The data is later downloaded to a computer workstation and processed to produce a 20-minute video clip of the images transmitted by the capsule.



The company's system incorporates several technological breakthroughs that have only recently appeared on the market. The tiny imaging system can only have been made possible with the improvement of the signal to noise ratio in CMOS detectors, development of white LEDs, and development of application-specific integrated circuits (ASICs).

The future for this capsule is the integration of sensors for temperature and pH measurements within the gastrointestinal tract.

Given Imaging's capsule passed preliminary U.S. F.D.A. tests that were given to animals and healthy volunteers. Clinical testing is currently taking place and upon approval it will be available to hospitals.