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High Tech Intestines

With all the advancements in picture taking, microsurgery, and genetic engineering, now is an exciting time to review the latest high-tech tools for the health of your gastrointestinal tract.

In stomach and intestinal medicine, we have always relied heavily on some type of imaging, such as x-rays or scopes, to diagnose disease. Many of us have swallowed x-ray dye while pictures were taken to diagnose an ulcer, or had scopes placed in unmentionable places to find polyps. Straight out of the spy world comes a new technology, which allows you to swallow a standard-size capsule that contains a small camera chip and a transmitter. The **Given Capsule** takes about 50,000 pictures of the fifteen feet of your small intestine, frequently discovering the source of bleeding which you can't see by any other means. Although we still have to use conventional tools to stop the bleeding, such as scopes or surgery, one can easily envision a future in which the capsule contains a small laser the can be directed the "seal" the leak.

Some tests of the stomach don't use images, but instead measure amount of acid in the intestinal tract. In the past, if you had chest pain or severe heartburn which didn't go away with standard treatment, we might send you home with a small wire placed through your nose and positioned in your esophagus, or swallowing pipe. The device worn on your belt would connect to this sensor and measure the amount of acid moving into your chest, called a pH probe. With new technology, we temporarily attach a small transmitter the size of a pill, called the **Bravo** device, to the lower part of your esophagus during a sedated scope procedure. The device sends a signal, like a radio channel, to a small sensor worn on your belt, and records two days of acid exposure, with a wire hanging out your nose. Neat stuff!

On the horizon in a few years is an easier way to examine the colon and prevent polyps from silently growing into Colon Cancer, the nation's second leading cause of cancer death. **Virtual Colonoscopy** uses a CAT Scan or an MRI to produce a holographic image (like Star Trek) of your intestine to find polyps, or pre-cancerous growths, so people with these silent killers can be scheduled to remove them. This procedure promises to be somewhat easier, and does not require sedation or as much bowel cleansing.

In addition to diagnosis, new technology has aided development of new treatment as well. For years we gave steroids to patients with Crohn's disease and Ulcerative Colitis, diseases in which the immune defense systems stays turned on a damages the intestines. Then we discovered the treatment caused other, severe side effects, such as osteoporosis. Thanks to mapping of DNA and other high-tech tools, we have newer drugs such as **Remicade**. This is a newer "designer" drug that blocks one of the inflammatory "middlemen" with these diseases, effectively eliminating any further damage in many patients.

Another designer medication is **Pegalated Interferon**, which attaches a large polyethylene glycol, or PEG, molecule to interferon, to make it stay in the bloodstream longer. By doing so, and in combination with another medication, about fifty percent of people with Hepatitis C virus can be permanently cured, instead of the twenty percent just a few years ago. Science is good!

Aside from medications, new technologies have given birth to new procedures. If you have regular heartburn and don't get good results from medications, you have choices shy of surgery. The **Stretta** procedure delivers high frequency radio waves, or microwaves, to the sphincter valve in the lower esophagus, causing it to stay tighter. This reduces the amount of acid regurgitating into the chest and throat, usually allowing you to stop medications. The **EndoCinch** device uses internal sutures to achieve similar results. These procedures do not require an operating room, and you go home the same day!

We live in an era in which a surgeon on one side of the world uses a robot to perform surgery on a person on the other side of the globe. Technology advances in the last decade now offer better and safer care of your stomach and intestine. Do we dare imagine the future?