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ALL THE POSSIBILITIES OF MODERN MEDICINE



COLUMBIA UNIVERSITY  
MEDICAL CENTER

Department of Surgery  
In affiliation with  
NewYork-Presbyterian Hospital

## Pancreatic Cancer: Prevention and Genetics

Muzzi Mirza Pancreatic Program uses imaging and genetic testing to prevent pancreatic cancer.

Understanding how cancers grow has made it possible to prevent many types of cancer. Tests such as mammograms, colonoscopy, and PSA tests can detect precancerous cells, which can be surgically removed before they progress to more harmful stages – thereby preventing thousands of people from developing more dangerous forms of breast, colon, and prostate cancer every year.

In the same way that colon cancer progresses through various stages of polyp formation, pancreatic cancer also includes stages of premalignant growth. If physicians can detect precancerous lesions and remove them, pancreatic cancer can sometimes be averted.

Yet unlike the breast, colon, or prostate, the pancreas is much more difficult to access, making testing more invasive and expensive. For that reason, screening for pancreatic cancer has never become routine. Instead, the disease has traditionally been detected only in its latest stages, when it is almost uniformly fatal.

But advances in understanding cell biology and genetics have led to the development of alternative methods of screening at The Muzzi Mirza Pancreatic Cancer Prevention & Genetics Program, a specialized center dedicated entirely to detecting and preventing pancreatic cancer. As described in a study of the center's results to date, screening with genetics and imaging can be highly effective in finding and curing premalignant and malignant pancreatic lesions.

According to **Harold Frucht, MD**, Program Director, "Research in the last few years has allowed us to better understand the progression of pancreatic cancer, so we better know who is at risk and what to look for. This allows us to carefully choose who to screen so that we don't do unnecessary testing or surgery."

In particular, recent research has shed light on multi-organ cancer syndromes that increase the risk of developing pancreatic cancer. These syndromes include:

- FAMMM, or Familial Atypical Multiple Mole Melanoma, which can be marked by the presence of moles on the body;
- Peutz-Jeghers syndrome, which is associated with gastrointestinal tumors;



*PurpleStride Manhattan is a 1-, 2-, or 3-mile walk at Riverside Park to create awareness, raise funds and meet others who share the same goal: to find a cure for pancreatic cancer! The November 2009 walk included over 2000 participants and raised over \$300,000 for pancreatic cancer research.*



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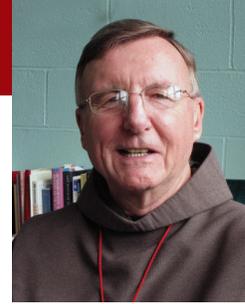
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Father Robert Warren underwent surgery at the NYP/Columbia Hernia Center, where he says, "The care was superb, just amazing."

# Complex Hernias

Specialists in hernia repair can now correct many hernias that until recently were considered inoperable.

In October 2009, Father Robert Warren underwent surgery at NewYork-Presbyterian Hospital to remove a benign mass in his colon. In February 2006 he had undergone a similar operation (at his community hospital), which was later complicated by the formation of a hernia in his abdominal incision. The hernia was repaired at the community hospital by two surgeons who used prosthetic mesh to reinforce the hernia repair. Following his 2009 colon surgery at NewYork-Presbyterian, a small area of the wound near his belly button failed to heal. But the 71-year-old Franciscan priest focused instead on his work running a HIV/AIDS program and raising funds for the friars' many ministries in upstate New York. Eventually, he returned to his doctor and learned that the mesh, which had been implanted in 2006, was now infected. His colorectal surgeon referred him to **Peter L. Geller, MD, Director, NewYork-Presbyterian/Columbia University Department of Surgery Hernia Center.**

Infected incisional hernias usually require two surgeries: one to remove the infected mesh and a second to repair the hernia after the infection clears. In this case, Dr. Geller was able to perform a single procedure in which he removed the infected mesh, mobilized the overlapping muscular layers of the abdominal wall, and sutured the abdominal wall back together without mesh. Relieved that he was able to avoid another surgery, Father Warren has recovered very well.

Like Father Warren, many people develop complex hernias after surgery. *Complex abdominal hernias* may include recurrent hernias following mesh placement, infected mesh grafts, hernias characterized by loss of abdominal domain (in which the abdominal organs protrude through the hernia, the abdominal cavity shrinks, and it becomes difficult to replace the abdominal organs), and others.

Complex hernias present unique challenges and require specialized treatment. According to Dr. Geller, until recently

many patients with complex hernias were discouraged from having surgery, and instead wore external support devices or underwent unsuccessful procedures that resulted in further serious complications.

In the last five to ten years, the advent of new prosthetic materials and the development of new surgical techniques have led to a revolution in hernia repair. As a result, the practice of hernia repair has become a specialty rather than one of many areas within mainstream general surgery. "We have become more adept at repairing hernias that were formerly considered unfixable," says Dr. Geller. These include extremely large hernias, hernias that have recurred many times with increasing loss of abdominal integrity, as well as patients with complex wounds including hernias with intestinal fistulas. "These hernias are no longer inoperable, but are often successfully repaired using new techniques and materials." Moreover, the repetitive practice that comes with specialization has enabled surgeons such as Dr. Geller to perform simple hernia repairs with less post-operative pain and fewer recurrences.

In Father Warren's case, Dr. Geller used a technique called *laparoscopic component separation*. Using laparoscopic instruments, he freed the muscle layers of the abdominal wall after removing the infected mesh and successfully closed the wound without implanting a new mesh graft. According to Dr. Geller, "This technique is very useful in difficult situations, especially in patients with wounds or infections where we cannot use mesh."

The NYP/Columbia Hernia Center treats approximately 600 patients each year at three locations. The Center plans to conduct studies to track recurrence rates, pain, and patient satisfaction after hernia operations. ■

**For more information, visit: [www.columbiaherniacenter.org](http://www.columbiaherniacenter.org) or call 212.326.5547.**

## What is a Hernia?

A hernia is the protrusion of an organ or tissue through the wall of the cavity that normally contains it. Hernias can occur in many parts of the body. The most common, inguinal hernias, account for 75% of abdominal hernias. Higher in the abdomen, a diaphragmatic hernia occurs when part of the stomach or intestine protrudes through a defect in the diaphragm. Incisional hernias, which may develop when a surgical wound

fails to heal completely, often contain trapped intestine and can be more hazardous to treat. Causes of hernias include congenital weaknesses and collagenopathies, prior surgery or other trauma to the abdomen, increased pressure in the abdomen, and weakening of the abdominal wall due to age, obesity, smoking, poor nutrition, and other causes. Symptoms such as pain or a visible bulge may or may not be present.

# Sleeve Gastrectomy for Gastroparesis

Novel use of weight loss surgery may help patients debilitated by gastroparesis.

As advanced as modern medicine has become, in some cases, it still falls short. Patients who develop a condition called gastroparesis are among those who may exhaust the limits of available therapies. It is for patients such as these that physicians at NewYork-Presbyterian/Columbia have once again stepped up and found new avenues of treatment – and hope.

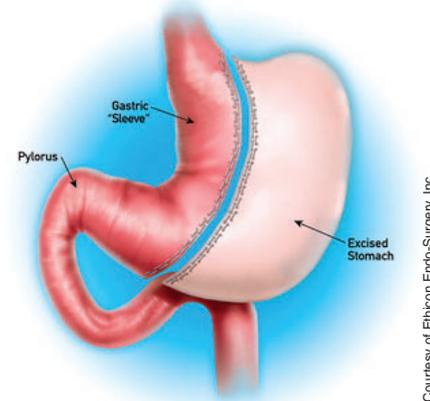
Gastroparesis is a disorder in which the stomach cannot contract and empty its contents into the intestines. Because patients with gastroparesis cannot move food properly through their digestive system, they may experience symptoms including pain, nausea, vomiting, abdominal bloating, malnutrition, and more. Although a number of conditions may cause gastroparesis, by far the most common is diabetes, in which continued high blood sugar levels damage the vagus nerve, which controls the movement of food through the digestive tract. Gastroparesis can develop as a consequence of either type 1 or type 2 diabetes that is poorly controlled.

Conventional treatments may include medical therapies, dietary changes, and implantation of a gastric electrical stimulator, or 'gastric pacemaker,' an implanted device that helps to control nausea and vomiting. If all of these fail to help, however, patients may have no choice but to receive nutrients through feeding tubes – not an attractive option for anyone, but especially younger patients. According to **Melissa Bagloo, MD, Assistant Professor of Clinical Surgery, Division of Minimal Access/Bariatric Surgery**, "There are many patients who do not improve with current treatments and whose quality of life continues to deteriorate. This is a debilitating condition that can be very frustrating for both patients and physicians."

At the Center for Metabolic and Weight Loss Surgery, NewYork-Presbyterian Hospital/Columbia University Medical Center, Dr. Bagloo and colleagues are now testing a procedure that has shown excellent initial results in this difficult-to-treat population. Based on their long-term experience, **Marc Bessler, MD, Director, Center for Metabolic and Weight Loss Surgery**, and colleagues believed that a laparoscopic procedure called sleeve gastrectomy just might help patients with severe gastroparesis. When four patients with gastroparesis were unable to receive gastric pacemakers early this year, the surgeons performed sleeve gastrectomy, normally used to help patients lose weight, to see if it might help.

According to Dr. Bagloo, "We had previously observed that after sleeve gastrectomy, patients who had difficulty emptying their stomachs showed significant improvement in their digestion. We do not know precisely why this is: Sleeve gastrectomy may have the effect of 'resetting' the natural gastric pacemaker, or it may be that the smaller size of the stomach increases intragastric pressure so that it helps facilitate gastric emptying. There could also be other reasons why the surgery helps."

The four patients who underwent sleeve gastrectomy at the center in 2010 were all diabetics with severe gastroparesis. For various reasons, they were not eligible to receive a gastric pacemaker. After surgery, two of the patients did very well right away, and the other two needed nutritional support for several months. "At six months after surgery, all four were eating, drinking, and were no longer experiencing nausea or vomiting. For patients who faced the prospect of life-long feeding tubes, the benefits of such a successful outcome cannot be overstated," says Dr. Bagloo.



Courtesy of Ethicon Endo-Surgery, Inc

*Sleeve gastrectomy, also called vertical sleeve gastrectomy or gastric sleeve, has been long used as the first stage of weight loss surgery in patients with very high body mass index (BMI). In this laparoscopic procedure, the size of the stomach is reduced to about 15% of its size. Over many years, physicians observed that patients lost weight very effectively after sleeve gastrectomy without undergoing biliopancreatic diversion, the second and more invasive stage. As a result, bariatric surgeons frequently perform sleeve gastrectomy as a standalone procedure today.*

The risks associated with laparoscopic sleeve gastrectomy are minimal, and include leakage in the staple line (2-3%), wound infection, and post-operative pain. Unlike implantation of a gastric pacemaker, sleeve gastrectomy leaves no foreign object, which can erode, get infected, or require subsequent procedures to replace batteries, in the body. Although other surgeries have been attempted in patients with gastroparesis, they are larger operations with significant risks, says Dr. Bagloo. "We believe that laparoscopic sleeve gastrectomy may be a less invasive option that allows patients to eat normally and regain their quality of life."

No other group has reported using sleeve gastrectomy to treat gastroparesis. Based on the success in the initial four patients, NYP/Columbia is conducting further study. The Center for Metabolic and Weight Loss Surgery is concurrently developing a program that will offer all treatments, including gastric pacemakers and sleeve gastrectomy, for patients with gastroparesis. ■

**For more information, please call 212.305.4000 or visit [www.ObesityMD.org](http://www.ObesityMD.org)**

- HNPCC, or hereditary nonpolyposis colorectal cancer (also called Lynch syndrome), which is associated with colorectal, endometrial, biliary, brain, and pancreatic cancers;
- Breast and ovarian cancer in association with the BRCA 1 or BRCA 2 genes; and
- Hereditary pancreatitis.

Even if a patient does not fit into one of the syndromes above, he or she may still have a family history of cancer that suggests higher risk for pancreatic cancer. Important signs of increased risk include early onset of cancers and multiple cancers (of any type) in the family. Ideally, people should seek screening at least ten years prior to the age at which their youngest relative with cancer was diagnosed.

### How the Muzzi Mirza Pancreatic Cancer Prevention & Genetics Program Works

Anyone may request an appointment at the Muzzi Mirza center, including relatives of patients who have been diagnosed with pancreatic or other cancers. At the first appointment, the center takes a detailed family history and performs a physical exam. The family history is used to determine whether the patient's risk of developing pancreatic cancer is average, moderate, or high.

Blood tests may be administered to check for tumor markers, glucose levels (because many people predisposed to pancreatic cancer develop diabetes), and to assess liver function, pancreatic function, and other measures of health.

Some patients will undergo imaging tests such as CT scan, MRI, and endoscopic ultrasound of the pancreas. "Some

patients have just blood work, others may have blood work and endoscopic ultrasound, others may have blood work and MRI, and still others may have all three," says **Joanna Martinez-Gomez**, Program Coordinator. "The higher the risk, the closer the look we need to take at the pancreas and the pancreatic ducts."

Genetic testing may also be recommended. "We are looking for any patterns of cancer, including breast, ovarian, colon, or others," says Dr. Frucht. "Certain syndromes predispose people to certain kinds of cancers. If we suspect that a syndrome may be present, we recommend genetic testing."

Depending on the results of these tests, the patient's risk level may be reclassified. The team then determines how often to monitor the patient. If an abnormality is found on imaging, the team decides whether to continue to monitor or to surgically remove it. Patients at high risk may return to the center at six or twelve month intervals for ongoing evaluation.

"For anyone with a family history of cancer, early screening is very important," says **Kristin Engelstad**, Genetics Counseling Intern in the Muzzi Mirza Program. "If there is cancer in your family – not just pancreatic, but any type of cancer – you can now be proactive rather than simply wait around to get cancer. If you wait until symptoms appear, often that is too late." She particularly encourages younger adults, who may resist the idea, to seek screening earlier rather than later. "Not only can it help in treating yourself, but if you have children, knowledge about a genetic mutation or syndrome can potentially help your children." ■

For information or to inquire about screening, visit [www.pancreasmd.org](http://www.pancreasmd.org) or call 212.305.9337.

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