Digestive Disease Institute
Patients First
Outcomes 2007

Quality counts when referring patients to hospitals and physicians, so Cleveland Clinic has created a series of Outcomes books similar to this one for many of its institutes. Designed for a healthcare provider audience, the Outcomes books contain a summary of our surgical and medical trends and approaches, data on patient volume and outcomes, and a review of new technologies and innovations.

Although we are unable to report all outcomes for all treatments provided at Cleveland Clinic — omission of outcomes for a particular treatment does not mean we necessarily do not offer that treatment — our goal is to increase outcomes reporting each year. When outcomes for a specific treatment are unavailable, we often report process measures that have documented relationships with improved outcomes. When process measures are unavailable, we report volume measures; a volume/outcome relationship has been demonstrated for many treatments, particularly those involving surgical technique.

Cleveland Clinic also supports transparent public reporting of healthcare quality data and participates in the following public reporting initiatives:

- Joint Commission Performance Measurement Initiative (www.qualitycheck.org)
- Centers for Medicare and Medicaid (CMS) Hospital Compare (www.hospitalcompare.hhs.gov)
- Leapfrog Group (www.leapfroggroup.org)
- Ohio Department of Health Service Reporting (www.odh.state.oh.us)

Our commitment to providing accurate, timely information about patient care is designed to help patients and referring physicians make informed healthcare decisions. We hope you find these data valuable. To view all our Outcomes books, visit Cleveland Clinic's Quality and Patient Safety website at clevelandclinic.org/quality/outcomes.
Dear Colleague:

I am proud to present the 2007 Cleveland Clinic Outcomes books. These books provide information on results, volumes and innovations related to Cleveland Clinic care. The books are designed to help you and your patients make informed decisions about treatments and referrals.

Over the past year, we enhanced our ability to measure outcomes by reorganizing our clinical services into patient-centered institutes. Each institute combines all the specialties and support services associated with a specific disease or organ system under a single leadership at a single site. Institutes promote collaboration, encourage innovation and improve patient experience. They make it easier to benchmark and collect outcomes, as well as implement data-driven changes.

Measuring and reporting outcomes reinforces our commitment to enhancing care and achieving excellence for our patients and referring physicians. With the institutes model in place, we anticipate greater transparency and more comprehensive outcomes reporting.

Thank you for your interest in Cleveland Clinic's Outcomes books. I hope you will continue to find them useful.

Sincerely,

Delos M. Cosgrove, MD
CEO and President
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Chairman’s Letter

Physicians and surgeons within the Cleveland Clinic Digestive Disease Institute treat a high volume of patients, many with serious or complex medical problems, from across the United States and from around the world. The institute is the largest national referral center for repairing failed pelvic pouches, and the first living related donor liver transplantation was performed here.

The institute also houses one of the world’s leading collections of medical data: the David G. Jagelman Inherited Colorectal Cancer Registries. This is the largest registry for inherited forms of colorectal cancer in the U.S. and the second largest in the world, providing vital information on the implications of a family history of colorectal cancer. Our cure rates for colorectal cancer are well above the national average, and our morbidity and mortality rates for many digestive diseases are as low or lower than national averages.

The outcomes found in this booklet, as well as our innovations, research and patient satisfaction results, not only contribute to our status as a national and international tertiary referral center, but they also are instrumental in our ranking as one of the top five digestive diseases centers in the nation according to U.S. News & World Report.

On behalf of my colleagues, I hope you find this edition of Outcomes useful as a reference for the quality care and commitment to patients found at Cleveland Clinic, as well as the devotion to research and innovation that drives quality outcomes.

Victor Fazio, MD
Chairman, Digestive Disease Institute
Institute Overview

The Cleveland Clinic Digestive Diseases Institute builds on the successful model of the Digestive Disease Center by bringing under its banner all medical and surgical subspecialties primarily focused on the gastrointestinal tract. To this end, we now include the liver transplant team, the nutrition support team, and upper gastrointestinal surgery with colorectal surgery and gastroenterology in a close-knit group of healthcare providers, able to draw on each other’s strengths and experience. As a result of this integration, we can offer patients the most advanced, safest and proven treatments performed in the most effective and convenient way. Our enthusiasm for research and our devotion to the expansion of knowledge provide unmatched opportunities for access to cutting-edge technology and drug therapy, while the advances that such drive guarantee the Institute will remain at the forefront of digestive disease medicine throughout the world.

2007 Digestive Disease Institute Statistics

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
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<td>Total Patient Visits</td>
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<td>Total New Patients</td>
<td>3,899</td>
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<tr>
<td>Admissions</td>
<td>3,829</td>
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<td>Patient Days</td>
<td>28,179</td>
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<td>ALOS</td>
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<td>Total Endoscopic Procedures</td>
<td>24,853</td>
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<td>Total MIS Cases</td>
<td>425</td>
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<tr>
<td>Total Inpatient Surgical Cases</td>
<td>3,689</td>
</tr>
<tr>
<td>Total Outpatient Surgical Cases</td>
<td>1,579</td>
</tr>
</tbody>
</table>
Anorectal Disease

Fistulas
Up-to-date treatments are available for all anal problems, including anal fistulas, hemorrhoids, anorectal abscesses and cancer.

Annual Fistula Patient Volume

For most people, an anal fistula only requires unroofing or opening the tract. Complex fistulas may require other treatments if the amount of anal sphincter muscle to be cut in the unroofing would compromise sphincter continence. Advancement rectal flaps are used in this situation. A flap of rectal wall is elevated and sutured down over the opening in the anal area. This allows closure of the fistula without division of the sphincter, practically assuring continence or control of rectal evacuation.
Episioproctotomy

Episioproctotomy is a procedure to repair a rectovaginal fistula in patients who have an anterior defect of the external sphincter. Patients with a cloacal deformity can be similarly treated.

A 75-percent success rate was achieved in our series. None of the patients who had a cloaca experienced a recurrence. Of those patients who did have a recurrence, 72 percent had a history of an unsuccessful repair.

Patients with no recurrence showed improved quality-of-life and continence scores postoperatively.

Healing: Rectovaginal Fistulae

Hemorrhoids

Patients with prolapsing hemorrhoids not suitable for banding may be advised to undergo surgical hemorrhoidectomy, performed as a day procedure in more than 95 percent of cases. Thirty-eight percent of patients had an operative procedure.

Annual Hemorrhoid Patient Volume
**Anorectal Abscesses**

Perianal abscesses and acute septic complications of the anorectum are complex issues that require expert treatment to minimize recurrent symptoms and reduce future complications. Abscesses in this area are commonly treated by surgeons in the department.

**Annual Volume of Anorectal Abscess Patients**

![Annual Volume of Anorectal Abscess Patients](chart)

**Anal Cancer**

Anal cancer is treated with a multidisciplinary approach. Department surgeons work with Cleveland Clinic's Taussig Cancer Institute oncology team for access to the latest radiotherapy and chemotherapy treatments with acceptable morbidity.

**Annual Volume of Anal Cancer Patients**

![Annual Volume of Anal Cancer Patients](chart)
**Stapled Hemorrhoidectomy**

The Department of Colorectal Surgery led a national study that investigated the circular stapled technique for prolapsing hemorrhoids. This technique produces significantly less pain, reduces the need for analgesics and results in less pain at first bowel movement than the traditional excisional treatment. Additionally, it provides similar symptom control and need for additional hemorrhoidal treatment at one year.

The technique is performed using a circular purse-string suture positioned above the enlarged internal hemorrhoids. A stapler is placed transanally to perform a circumferential excision of the anorectal prolapsing tissue, restoring the anoderm to its proper location in the anal canal. Positive short-term results using the circular stapler are well-documented. Patients also experience a quicker return to work than patients undergoing a traditional excision. More than 80 stapled hemorrhoidectomies were performed in 2007.
Turnbull-Cutait Abdominoanal Pull-through Procedure

The Turnbull-Cutait abdominoanal pull-through procedure is used to salvage patients with nonmalignant problems (such as complications of a low colorectal anastomosis, radiation-induced fistulas or complex anorectal Crohn disease) who might otherwise require permanent fecal diversion. In this technique, an initial abdominoanal pull-through operation is followed by a second-stage perineal procedure, where a handsewn coloanal anastomosis is done five to seven days after the initial procedure.

Turnbull-Cutait Procedure

In a review of all patients undergoing Turnbull-Cutait procedures, 76 percent were able to avoid permanent stoma. Functional outcome was comparable to the outcome of patients with primary handsewn coloanal anastomosis.

Turnbull-Cutait Procedure Compared with Primary Handsewn Incontinence

Results show that the Turnbull-Cutait abdominoanal pull-through procedure safely salvages patients with low anastomotic complications and complex anorectal Crohn disease who might otherwise require permanent fecal diversion. Long-term functional results and quality of life were comparable to that of patients with primary handsewn coloanal anastomosis.
Doppler-guided Hemorrhoid Ligation

Doppler-guided hemorrhoid ligation is a new technique for treating second- and third-degree hemorrhoids. This procedure uses ultrasound to detect the artery supplying the hemorrhoid pedicle, which is ligated through a specially designed proctoscope. A mucopexy fixes the hemorrhoid pedicle to prevent a prolapse. This procedure has been popular in Europe and received FDA clearance in August 2006.

## Quality of Life Results for Turnbull-Cutait Procedure

<table>
<thead>
<tr>
<th>Variable</th>
<th>Turnbull-Cutait</th>
<th>Coloanal Anastomosis</th>
<th>P Value</th>
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<tbody>
<tr>
<td>SF36 Physical Component Scale</td>
<td>45.45 +/- 9.86</td>
<td>47.68 +/- 8.46</td>
<td>0.2</td>
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<tr>
<td>SF36 Social Function</td>
<td>61.65 +/- 18.95</td>
<td>69.46 +/- 25.60</td>
<td>0.08</td>
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<tr>
<td>SF36 Mental Component Scale</td>
<td>47.08 +/- 7.77</td>
<td>47.75 +/- 9.40</td>
<td>0.6</td>
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</table>

Anal Fistula Plug to Repair a Perianal Fistula

The anal fistula plug technique utilizes the anal fistula plug to close fistulas with long or multiple tracts. The plug is made of a biodegradable material, which helps in the healing of the fistulous tract. The procedure is done after a draining seton has been placed to drain any infectious material. This procedure is performed on an outpatient basis.

Doppler-guided Hemorrhoid Ligation

Doppler-guided hemorrhoid ligation is a new technique for treating second- and third-degree hemorrhoids. This procedure uses ultrasound to detect the artery supplying the hemorrhoid pedicle, which is ligated through a specially designed proctoscope. A mucopexy fixes the hemorrhoid pedicle to prevent a prolapse. This procedure has been popular in Europe and received FDA clearance in August 2006.
Cleveland Clinic's Digestive Disease Institute is at the forefront of colon polyp and cancer prevention through patient screening, education, detection and treatment. Prevention of colorectal neoplasms is one major research interest. The institute is a study site for many large national and international trials of various chemopreventive agents for sporadic adenomas and for inherited colorectal cancer syndromes such as familial adenomatous polyposis.

The five-year survival rate for patients with stage I colon cancer is 92.7 percent.

### Annual Volume of Colon Cancer Patients

<table>
<thead>
<tr>
<th>Year</th>
<th>Distinct Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
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</tr>
<tr>
<td>2004</td>
<td>500</td>
</tr>
<tr>
<td>2005</td>
<td>400</td>
</tr>
<tr>
<td>2006</td>
<td>300</td>
</tr>
<tr>
<td>2007</td>
<td>200</td>
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</table>

### Colon Cancer 5-Year Survival Rates

Outcomes 2007
In most cases, patients with colon cancer require a colectomy to remove the segment of bowel in which the tumor lies. In more advanced cases, the procedure may include removal of a contiguous organ to maximize the chance of cure. Cleveland Clinic surgeons, experienced in the complexities of these major surgeries, collaborate with surgeons in other specialties when necessary. Many referred patients are seen for recurrent cancer after treatment elsewhere. These patients are expeditiously assessed by the gastrointestinal imaging staff for strategic planning of complex reoperative surgeries. Intraoperative radiotherapy is given in selected cases after resecting recurrent rectal cancer. Five-year survival data for each stage of colon cancer are among the best published. Recurrence is unlikely for patients who are disease-free for five years or more. Patients who require surgery are frequently recruited into trials to evaluate methods of improving recovery after surgery. This has been an increasing focus of the Institute in recent years.

### Annual Volume of Rectal Cancer Patients

**Distinct Patients**

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<td>2007</td>
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<td></td>
<td>500</td>
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<td>450</td>
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</table>

### Rectal Cancer 5-Year Survival Rates

<table>
<thead>
<tr>
<th>Stage</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>92.7%</td>
</tr>
<tr>
<td>Stage II</td>
<td>79.2%</td>
</tr>
<tr>
<td>Stage III</td>
<td>61.4%</td>
</tr>
<tr>
<td>Stage IV</td>
<td>7.2%</td>
</tr>
</tbody>
</table>

Intraoperative radiotherapy is given in selected cases after resecting recurrent rectal cancer. Five-year survival data for each stage of colon cancer are among the best published. Recurrence is unlikely for patients who are disease-free for five years or more. Patients who require surgery are frequently recruited into trials to evaluate methods of improving recovery after surgery. This has been an increasing focus of the Institute in recent years.
Our extensive experience treating rectal cancer comes from having one of the highest volumes of patients in the world with this condition. One factor that sets us apart is the number of treatment options available to save the sphincter and avoid colostomy. These options include transanal excision and radical surgery with anastomosis of the colon to the anus, incorporating a J-pouch or coloplasty. Colorectal surgeons avoid a permanent colostomy in approximately 80 percent of cases and achieve some of the lowest recurrence rates in the world. Detailed tumor assessments required to make these decisions involve a comprehensive array of tests. Endoanal ultrasound and anal manometry are immediately available at the office visit, avoiding a prolonged wait and subsequent visits for treatment decisions. Each year on average, 27 patients with early tumors can have them removed through the anal canal, eliminating the need for abdominal surgery.

Complications are carefully monitored. Surgeons may use temporary defunctioning ileostomies for patients with low rectal cancer, particularly those with preoperative radiation. Immediate consultation with the enterostomal nurses can be obtained at the time of the initial office visit so that patients are fully aware of the outcomes and treatment plans.
Operative Morbidity and Mortality in Colorectal Cancer

- N = 5,034
- Operative mortality: 2.3% (with no significant variability between surgeons or through time)
- Multivariate analysis
- Primary end point = 30-day operative mortality

Risk Factors for Increased Morbidity and Mortality

- Increased age
- Increased grade (American Society of Anesthesiologists)
- TNM staging
- Urgent surgery
- Anemia

This model has important implications in everyday practice, as it can be used in the process of informed consent and for monitoring surgical performance.
Jagelman Registries

In 2007, the David G. Jagelman Inherited Colorectal Cancers Registries have continued to show growth. The registries have not only been very involved in the community but have also been extremely productive academically. This year, 55 new familial adenomatous polyposis (FAP) families, one new juvenile polyposis (JP) family, two Peutz-Jeghers syndrome (PJS) families and 14 MYH-associated polyposis/other polyposis families consented to the registries. Registry coordinators are also responsible for coordinating the high-risk clinic (HRC), which now takes place twice a month (due to a growing demand, we increased the days the HRC was held and added Jon Vogel, MD, to our staff). This clinic is designed for anyone with a strong family history of colorectal cancer. Individuals can see specialists from the Digestive Disease Institute, the departments of Medical Genetics, General Surgery and Nutrition, and the Jagelman Registries. In 2007, HRC specialists saw 104 patients and performed 12 colonoscopies, 49 flexible sigmoidoscopies and 45 esophagogastroduodenoscopies (EGDs). With the collaboration of genetic counselors, 20 patients were also seen by our Medical Genetics department.

Research

The Jagelman Registries continue to enroll patients in a registry-based observation study that is assessing clinical outcomes in FAP patients receiving celecoxib compared with control patients. To date, 32 patients have been enrolled in this study.

Patient enrollment also continues in a study involving the prospective analysis of computed tomographic (CT) colonography in the evaluation of FAP. To date, 10 patients are enrolled in this study.

In August 2007, we began enrolling patients in a prospective study of the correlation between FAP and intellectual performance. Currently, 30 patients are enrolled in this study.

2007 Jagelman Registry Numbers

- **77%** FAP
- **19%** MYH/Other
- **3%** JP
- **1%** PJS

FAP = Familial Adenomatous Polyposis
JP = Juvenile Polyposis
PJS = Peutz-Jeghers Syndrome
MYH = Associated Polyposis
Jagelman Registry: Number of FAP Families

![Graph showing the number of FAP families from 2003 to 2007.]

Jagelman Registry: Number of PJS and JP Families

![Graph showing the number of PJS and JP families from 2003 to 2007.]

Cleveland Clinic is home to the largest institutional registries for inherited colon cancer in the United States and the second largest in the world.
Center for Colon Polyp and Cancer Prevention

Many trials are under way to study the effectiveness of different strategies to prevent colorectal neoplasia, including precancerous polyps and cancer. Many studies are cosponsored by the National Cancer Institute. These include assessing the safety of celecoxib in children with FAP, the effectiveness of celecoxib and difluoromethylornithine (DFMO) in adults with FAP, the effectiveness of black raspberries to prevent rectal polyps in adults with FAP and a colorectal adenoma chemoprevention study to evaluate calcium and vitamin D. The Center for Colon Polyp and Cancer Prevention completed a study assessing the proper intervals for postpolypectomy colonoscopy. In collaboration with the departments of Colorectal Surgery and Radiology, the accuracy of CT colonography vs. endoscopic colonoscopy for the detection of colorectal neoplasia is being studied.

High-Risk Hereditary Colon Cancer Clinic

A multidisciplinary inherited colon cancer high-risk clinic was established in 2001. Patients with a dominantly inherited colon cancer syndrome who require multispecialty care are encouraged to participate. The clinic is held one Tuesday morning per month in the Digestive Disease Institute. Patients have the opportunity to consult with physicians, genetic counselors and the Jagelman Registries’ registrar. Additionally, any necessary procedures or genetic testing may be conducted on the day of their consultation.

High-Risk Clinic Visits

Referral to our high-risk clinic provides multidisciplinary evaluation, counseling and prospective procedures in the hope that early diagnosis will increase a patient’s chance of cure.

While cancer treatment remains paramount, a number of techniques developed over the years were aimed at preserving anal sphincter function through the construction of a coloanal anastomosis. Variations of the straight coloanal anastomosis to further improve anal function are the creation of a colonic J-pouch and, more recently, a coloplasty.
Colonic J-pouch

Cleveland Clinic surgeons have extensive experience with colonic J-pouch for reanastomosis of the colon to the anus in patients with very low rectal cancers. The technique permits improved function for patients and may reduce the risk of complications, such as anastomotic leak.

Coloplasty

The coloplasty pouch is a technique pioneered and studied extensively by Cleveland Clinic surgeons. It is a new option following reconstruction of an ultra-low rectal anastomosis that improves the function of patients who might otherwise have undergone a straight colorectal anastomosis due to an anatomically narrow pelvis, which is frequently seen in male patients.
In 2005, the Department of Colorectal Surgery published study results of 162 patients with coloanal or low colorectal anastomosis. Patients underwent straight coloanal anastomosis (50 cases), colonic J-pouch construction (43 cases) or coloplasty (69 cases). Postoperatively, patients who had a colonic J-pouch or coloplasty had significantly fewer bowel movements both during the day and at night, used less antidiarrheal medications and, ultimately, had a better quality of life.

**Functional Outcome Comparison**

<table>
<thead>
<tr>
<th>Procedure Type</th>
<th>Bowel Movements</th>
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<tbody>
<tr>
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<td>Coloplasty</td>
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<tr>
<td>J-Pouch</td>
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<tr>
<td>Straight</td>
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**Contact Radiotherapy**

Cleveland Clinic is one of only five centers in the world that offers contact radiotherapy. This therapy can be very effective for patients who are infirm or have other major medical comorbidities. Contact radiotherapy is administered through the anal canal without requiring surgery.

**Intraoperative Radiotherapy**

Intraoperative radiation therapy (IORT) has the advantage of irradiating the tumor bed while protecting surrounding healthy organs from radiation. This approach is especially useful when the required radiation dose exceeds the tolerance dose of surrounding normal tissues. Available only in a limited number of institutions, the technique is delivered in conjunction with radiotherapists who come to Cleveland Clinic’s operating rooms to deliver the radiation.

A review was conducted of recurrent and locally advanced rectal cancer patients treated with IORT after tumor resection. Twenty-four patients with recurrent (18) or locally advanced (6) rectal cancer received IORT. One-year overall survival was 94 percent. Better survival outcomes were seen in patients with negative resection margins and primary locally advanced cancer compared with recurrent cancer. IORT appears to be a safe technique for improving local control in this complex and difficult-to-manage treatment group.
Overall Survival after IORT by Tumor Fixation

Overall Survival after IORT by Disease Status
Transanal Endoscopic Microsurgery

In 2007, our institution introduced a new procedure called transanal endoscopic microsurgery (TEM). This involves the use of stereoscopic endoscopes to fully resect lesions of the rectum and distal colon without making any abdominal incisions or splitting the sphincter. TEM is used for treatment of benign lesions up to the 20-cm level as well as for early rectal cancers. Cleveland Clinic is one of the few centers in the Midwest that has this technology.

TEM is the least invasive method to remove all polyps and select cancers of the rectum and distal colon.

Benefits of the procedure include:
- no abdominal incision
- no stoma
- use of a closed airtight system that provides constant rectal distension, improved visibility and longer reach than conventional instrumentation
- the ability to remove virtually any rectal adenoma and select rectal cancers (all polyp types, select T1 cancers, select T2 cancers with neoadjuvant therapy and T3 cancers in medically compromised patients)
- good safety record and minimal complications
- outpatient or single-night hospital stay
- lower recurrence rates than with conventional methods
- all polyps
- select T1 cancers
- select T2 cancers with neoadjuvant therapy
- T3 cancers in medically compromised patients
- superior exposure of tumors higher in the rectum
- greater precision of excision
- allows for total excisional biopsy
- short operative time
- negligible blood loss
- relatively pain-free procedure
Diverticular Disease

Most patients are referred for elective management of recurrent diverticulitis. Surgery is recommended based on American Society of Colorectal Surgery guidelines. Some patients present with an acute complication and require emergency surgery. A further cohort is referred for reconstructive surgery, having had an emergency procedure performed elsewhere. The Hartmann procedure is still one of the more common types of emergency resections done universally. It is associated with significant morbidity.

Annual Volume of Diverticulitis Patients

![Annual Volume of Diverticulitis Patients](image)

 Distinct Patients

<table>
<thead>
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<th>2006</th>
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<td>950</td>
<td>1000</td>
<td>850</td>
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</tbody>
</table>

Diverticulitis/Hartmann Resection for Urgent Presentation
We recently published our results comparing surgical outcomes of primary resection and anastomosis vs. Hartmann reversal procedure. The results showed Hartmann reversal was associated with a higher prevalence of surgical or medical complications compared with primary resection and anastomosis. Patients who underwent Hartmann reversal were 2.1 times more likely to have adverse surgical events during their postoperative period.

### Complications of Primary Resection and Anastomosis vs. Hartmann Reversal Procedure

<table>
<thead>
<tr>
<th></th>
<th>Primary Resection/Anastomosis n(%)</th>
<th>Hartmann Reversal n(%)</th>
<th>P value</th>
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</thead>
<tbody>
<tr>
<td>All complications</td>
<td>212 (29%)</td>
<td>59 (48.8%)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Surgical complications</td>
<td>190 (26%)</td>
<td>53 (43.8%)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Postoperative ileus</td>
<td>72 (9.8%)</td>
<td>28 (23.1%)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Medical complications</td>
<td>35 (4.8%)</td>
<td>11 (9.0%)</td>
<td>0.052</td>
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<tr>
<td>Respiratory failure</td>
<td>6 (0.8%)</td>
<td>5 (4.1%)</td>
<td>0.012</td>
</tr>
<tr>
<td>Renal failure</td>
<td>6 (0.8%)</td>
<td>5 (4.1%)</td>
<td>0.012</td>
</tr>
<tr>
<td>Reoperation rate</td>
<td>79 (10.8%)</td>
<td>23 (19%)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Every effort is made to re-establish the anastomosis, even in urgent conditions, to avoid further associated morbidity with Hartmann procedure. Cleveland Clinic surgeons are proficient at selecting appropriate candidates for primary anastomosis, with or without defunctioning ileostomy. Elective surgery for diverticulitis is increasingly performed using minimally invasive laparoscopic techniques. This results in less postoperative pain, shorter length of stay and earlier return to work and other activities. Almost all patients requiring surgery for diverticulitis are candidates for the laparoscopic technique.
Endoscopy and Pancreatic-Biliary Disorders

A high volume of standard gastroenterologic procedures is performed, including esophagastroduodenoscopy (EGD), colonoscopy and sigmoidoscopy. Endoscopic retrograde cholangiopancreatography (ERCP), endoscopic ultrasound (EUS) and percutaneous endoscopic gastrostomy (PEG) are some of the advanced procedures performed. In most cases, these procedures may be performed on an outpatient basis. With the experience of our physicians and nurses, these procedures are performed efficiently and safely, with complication rates at or below national averages.

Annual EGD Procedure Volumes

![Annual EGD Procedure Volumes Chart]

Annual ERCP Procedure Volumes

![Annual ERCP Procedure Volumes Chart]
The Department of Gastroenterology has maintained a high-volume practice while attaining low complication rates.

The complication rate for endoscopic procedures was 0.44 percent in 2007.
In addition, the department has attained high cecal intubation rates when compared with its peers.

Colonscopy: Cecal Intubation Rate

A recent study conducted by the Colorectal Surgery Endoscopy Section reviewed outcomes for colonoscopy completion and adenoma detection for different indications. Results showed a > 90-percent completion rate and comparable excellent adenoma detection rates for staff members.
Endoscopic Ultrasound

Endoscopic ultrasound (EUS) is one of the most important breakthroughs in digestive diseases over the past few years. Passage of an ultrasound probe on the tip of an endoscope allows a more efficient staging of esophageal, gastric, pancreatic and rectal cancers. Fine-needle aspiration of benign and malignant tumors can be performed safely.

EUS Upper Tract Procedure Volume

EUS Rectal Procedure Volume

Small or early growths are being found in the gastrointestinal tract through the widespread use of endoscopy. Some lesions are significant and are occasionally found in patients unable to withstand traditional surgery due to other medical problems. Options for these patients include endoscopic mucosal resection (EMR) or ablation techniques that cause the tissue to blister and slough off over time. When surgery is not an option, a new protocol is testing cryotherapy in patients with Barrett esophagus with high-grade dysplasia or intramucosal cancer. Cryotherapy uses super-cooled liquid nitrogen spray to treat lesions.
Capsule Endoscopy and Enteroscopy

Cleveland Clinic endoscopists are among the most active in the country in utilizing capsule endoscopy. A special GI bleeding clinic allows patients to be evaluated by experienced capsule endoscopists. This technique has proven invaluable in the evaluation of patients with occult gastrointestinal bleeding, polyps of the small intestine, tumors of the small intestine and inflammatory bowel disease. A capsule specially designed to examine the esophagus for conditions such as Barrett esophagus and esophageal varices is also available. In specialized situations where narrowing of the small intestine is a concern for a patient who is otherwise a candidate for capsule endoscopy, a specialized patency capsule can be used. The patency capsule determines whether narrowing is present, which would make placement of a conventional capsule problematic. The patency capsule essentially dissolves in the GI tract after a certain period to remove any risk of causing an obstruction at a site of narrowing.

Balloon-assisted enteroscopy (BAE) is also available. BAE involves the use of an ultra-long endoscope coupled to a balloon-tipped overtube to achieve a more comprehensive examination of the small intestine. BAE complements capsule endoscopy by allowing the examination and treatment of segments of the small bowel previously out of reach of traditional endoscopy.

Capsule Endoscopy Procedure Volume

In addition to endoscopic procedures, our Imaging Institute performs CT colonography as an alternative to colonoscopy.
• Thirteen percent of patients had a reported polyp of $\geq 6$ mm. Of patients with follow-up, 50 of 67 (75 percent) were confirmed.
• Seven percent of patients had a reported polyp $\geq 10$ mm. Of patients with follow-up, 31 of 41 (76 percent) were confirmed.
• Seven of the 31 confirmed polyps $\geq 10$ mm were cancer (22.6 percent).

CT Cryotherapy

Cryotherapy involves the application of liquid nitrogen through an endoscope for the treatment of precancerous lesions of the esophagus and for superficial cancers in selected patients. The Digestive Disease Institute is one of only a few institutions in the country to offer this therapy.
**Pancreatic Cancer**

Cleveland Clinic's Pancreas Clinic and the departments of Gastroenterology and Hepatology and Hepato-Biliary Surgery see a high volume of patients with pancreatic cancer. Endoscopic ultrasound offers close-up images of the mass and adjacent vascular structures to help the gastroenterologist and surgeon determine resectability. Furthermore, fine-needle aspiration can be performed to confirm the diagnosis. Endoscopic ultrasound can also be used to treat the debilitating pain in selected patients with chronic pancreatitis or pancreatic cancer through a procedure known as celiac plexus neurolysis.

![Fine-needle Aspiration of a Pancreatic Mass](image)

**Annual Pancreatic Cancer Volume**

![Annual Pancreatic Cancer Volume Chart](chart)
**Esophageal Cancer**

Accurate staging of esophageal cancer is critical for optimal treatment. Endoscopic ultrasound provides staging information more accurately than other staging modalities because it allows assessment of the tumor’s depth in the esophageal wall and allows the examination of surrounding lymph nodes.

**Annual Esophageal Cancer Volume**

![Annual Esophageal Cancer Volume Chart](image)

*Fine-needle Aspiration of a Malignant Lymph Node*
Rectal Cancer

Accurate staging of rectal cancer is critical to optimizing patient survival. A high volume of rectal cancer patients is seen. Surgical expertise combined with a multidisciplinary approach offers patients excellent outcomes.

Pancreatic-Biliary Disorders

The Department of Gastroenterology and Hepatology treats patients with a wide variety of disorders of the biliary tree, including bile duct injuries after surgery, complications of liver transplantation, choledocholithiasis and sclerosing cholangitis.

Pancreas Clinic

More than 1.2 million cases of pancreatic disease are diagnosed in the United States annually, contributing to $2.1 billion of healthcare expenditures. Our Pancreas Clinic is one of a few designated clinics in the nation for the study of pancreatic disease. Pancreatic specialists see patients with complicated acute recurrent pancreatitis and chronic pancreatitis as well as a multitude of other diseases, including pancreatic cancer. Gastroenterologists, surgeons, radiologists, anesthesiologists and psychologists continue to develop new protocols for managing pancreatitis that may decrease morbidity. Patients with all forms of pancreatic disease are offered cutting-edge techniques and treatments. Our staff is equipped with the latest technologies and provides patients with the most appropriate evaluation and treatment options.

Acute Pancreatitis

Acute pancreatitis occurs when the pancreas becomes inflamed for a variety of reasons, most commonly due to alcohol consumption or gallstone disease. Ten to 15 percent of cases are idiopathic in nature. Our Institute offers the latest in endoscopic, minimally invasive and radiographic imaging to diagnose and treat acute pancreatic inflammation.
Chronic Pancreatitis

Chronic pancreatitis is caused by continued insult to the pancreas from alcohol or metabolic/genetic disorders, resulting in scar formation. This causes chronic abdominal pain, steatorrhea and weight loss. The Pancreas Clinic, in collaboration with our Pain Management Center, offers a multidisciplinary approach to chronic pancreatic pain management. Medical management of chronic pancreatitis may include pancreatic enzymes, narcotic maintenance, antidepressants, antioxidants and subcutaneous injections of octreotide.

Endoscopic Pancreatic Function Test

When compared with the traditional Dreiling tube method, the endoscopic pancreatic function test eliminates the need for fluoroscopy, is shorter in duration (30 minutes vs. 80 minutes) and costs 30 percent less. It is safe, highly accurate and eliminates radiation exposure. The patient is sedated during the procedure; the physician passes the endoscope down to the duodenum to aspirate the pancreatic fluid.
Aspirating Cystic Neoplasm
Conventional imaging of pancreatic cysts with CT scan does not always provide a definitive answer. Endoscopists perform fine-needle aspiration of these cysts under endoscopic ultrasound guidance. This allows fluid to be taken from the cyst so that cancer cells may be sought. Patients with precancerous or cancerous conditions can undergo timely surgery in the hopes of cure, while patients with nonthreatening conditions will avoid unnecessary surgery.

Treatment Protocol for Chronic Pain Management
Pain associated with chronic pancreatitis is difficult to manage. We believe a multidisciplinary approach is best for evaluating this complex syndrome. The Department of Gastroenterology and Hepatology has been developing a chronic pancreatic pain protocol in collaboration with the departments of General Surgery, Pain Management, and Psychiatry and Psychology.

Optical Biopsy and Other Imaging Modalities
Detection of cancer in the digestive tract may not occur until there is visible growth in the intestine and related symptoms. Unfortunately, it is often too late at this point to cure the patient. Optical biopsy techniques utilize special computers and technology to allow a close-up image of the intestinal tract. Ongoing research at Cleveland Clinic is establishing the role of optical biopsy techniques for such conditions as Barrett esophagus, polyps and inflammatory bowel disease.

Examples of Narrow-Band Imaging and Autofluorescence Spectroscopy
Other imaging modalities being studied use different types of light to identify small precancerous and early cancerous lesions that may go undetected by conventional endoscopy. Examples of these are narrow-band imaging and autofluorescence spectroscopy.
Enterostomal Therapy

Enterostomal therapy, commonly known as wound, ostomy and continence nursing, was founded at Cleveland Clinic in 1958. Pioneering colorectal surgeons Rupert B. Turnbull, MD, and Norma Gill, RN, an ostomate herself, began a specialty now practiced around the world.

This specialty program has educated nearly 1,500 nurses around the United States and world. It continues to teach nurses the theoretical and clinical care of people with ostomies, fistulae, wounds and incontinence. Cleveland Clinic boasts one of the largest, most experienced and highly skilled staff of board-certified ET/WOC nurses in the world, who care for people with these very special needs.

Fecal Incontinence and Pelvic Floor Dysfunction

In the Colorectal Center for Functional Bowel Disorders (CCFD) at the Cleveland Clinic Digestive Disease Institute, we treat adults with fecal incontinence, severe constipation, pelvic pain, pelvic floor dysfunction, rectovaginal fistulas and anorectal disorders. A comprehensive evaluation is performed. We work with physical therapists, psychologists and pain specialists for a multimodality approach to treatment. This involves a combination of diet modification, medical therapy, exercises (physical therapy) and surgery.

In 2007, 3,820 patients were seen by the CCFD. Of these patients, 80 percent were treated by a multimodal plan that included medication, enema therapy and exercise. Twenty percent of these patients underwent surgery. For patients with urinary dysfunction and pelvic organ prolapse, surgery was carried out in conjunction with our urology and urogynecology colleagues.
Distribution of patients seen in the Colorectal Center for Functional Bowel Disorders

Breakdown of patients seen in 2007 and their treatment modalities. Procedures for rectal pain were mostly colonoscopies.

Treatment modalities
CCFD Ancillary Service Utilization

**Percent of Patients Referred**

<table>
<thead>
<tr>
<th>Ancillary Service</th>
<th>Physical Therapy</th>
<th>Defecography</th>
<th>Psychology</th>
<th>Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of Patients Referred</td>
<td>25%</td>
<td>10%</td>
<td>5%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Percentage of patients referred to other services or diagnostic procedures. Acupuncture, which was < 1%, is not included.

**Outcome of rectovaginal fistulae treated in 2007**

**Number of Patients**

- **Overall**: 38 treated patients, 20 patients healed
- **IBD**: 20 treated patients, 10 patients healed
- **Diverticulitis**: 10 treated patients, 5 patients healed
- **Obstetric**: 5 treated patients, 3 patients healed
- **Idiopathic**: 5 treated patients, 2 patients healed
- **Cancer**: 3 treated patients, 2 patients healed

Outcome of rectovaginal fistulae treated in 2007 based on etiology of the fistulae.
Innovative Treatments

Bowel Management Program
Bowel Management is an intensive one-week program for patients with severe constipation or fecal incontinence. Patients are taught to cleanse themselves once daily with enemas or laxatives. At the end of the week, each patient will have an individualized regimen with the goal of a daily BM without soiling or loss of stool.

The Bowel Management program also can serve as an adjunct to surgical procedures for benign or malignant diseases.

For those patients who achieve success with enema therapy, a surgical procedure will be offered called antegrade colonic enema.

Newer Treatments for Fecal Incontinence
New therapies are constantly becoming available for patients suffering from fecal incontinence. These are often performed used under the guidance of a research protocol. Some of the newer treatments are injectable agents, sacral neuromodulation and radiofrequency treatment (SECCA).

The artificial bowel sphincter continues to be offered to selected patients.

Management of Pelvic Pain
A comprehensive management plan for pelvic pain is offered based on patient symptoms and previous therapy. This plan may include medical management, electrogalvanic stimulation, physiotherapy or acupuncture. This approach has resulted in a higher percentage of patients whose pain is relieved or controlled.

Anorectal Surgery
Hemorrhoidal Arterial Ligation
Doppler-guided hemorrhoidal arterial ligation is a relatively painless procedure that is done as an outpatient surgery.

Other procedures offered are banding and the stapled hemorrhoidectomy.

Rectovaginal Plug
This is a new device to treat specific rectovaginal fistulae. We are currently studying this noninvasive procedure and its outcomes.

Rectal Prolapse
Surgical repair for rectal prolapse is usually advised. This repair can be achieved via an abdominal operation or anal operation, with the exact approach being tailored to each patient. When possible, these procedures are performed laparoscopically.
Inflammatory Bowel Disease

Crohn Disease and Ulcerative Colitis

Crohn disease and ulcerative colitis are chronic inflammatory bowel diseases (IBDs) that can present with a myriad of manifestations. The Digestive Disease Institute’s gastroenterologists and colorectal surgeons work collaboratively to identify the optimal approach to managing these disorders.

Innovative therapies, many pioneered at Cleveland Clinic, allow patients with IBD to lead higher quality lives. Due to our participation in clinical trials and the excellent outcome of surgical cases, we have received increased worldwide referrals, particularly for complex cases and severely affected patients.

Proper treatment often hinges on close cooperation among the patient, gastroenterologist and colorectal surgeon. The Digestive Disease Institute is ideally suited for such consultation because gastroenterologists and colorectal surgeons share space in a common IBD Center. Patients are commonly seen by consultants from each department on the same day. Immediate consultation offers patients two expert opinions, depending on the clinical situation.
**Medical Therapy**

Gastroenterologists in the IBD Center have extensive experience with immunosuppressive agents and biological therapies; therefore, they can offer patients the most effective medications for their conditions.

IBD gastroenterologists participate in most national trials of experimental agents developed by pharmaceutical companies. Not everyone is eligible or able to participate, but many patients are grateful for the opportunity to try something new after approved agents have failed. A complete list of open trials can be found at our website: clevelandclinic.org/digestivedisease.

A database has also been compiled of all patients with Crohn disease who are seen in the departments of Gastroenterology and Colorectal Surgery and who consent to participate. This allows regular review of disease complications, functional outcome following surgery, quality-of-life and complications associated with different treatments, so patients’ quality of care can continually improve. Our Crohn disease DNA bank is linked to this database.

**Surgical Procedures for Crohn Disease**

Surgical management of Crohn disease is an area of special interest to the Department of Colorectal Surgery. Our comprehensive and prospective database, research in basic and clinical science, therapeutic trials and outcomes analyses help maintain our position at the forefront of Crohn disease management. An average of 260 operations is performed each year for Crohn disease. A broad-based and multidisciplinary team approach to the care of these patients enables us to maintain a considerable level of treatment success.

**Total Morbidity for Crohn Disease**

<table>
<thead>
<tr>
<th>Year</th>
<th>Volume</th>
<th>30 Day Mortality (%)</th>
<th>30 Day Readmission (%)</th>
<th>Wound Infection (%)</th>
<th>Abdominal Abscess (%)</th>
<th>Obstruction or Ileus (%)</th>
<th>Anast. Leak (%)</th>
<th>Bleed (%)</th>
<th>Gen. Peritonitis (%)</th>
<th>Total Morbidity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>275</td>
<td>1 (.4)</td>
<td>25 (9)</td>
<td>14 (5)</td>
<td>8 (3)</td>
<td>4 (1.4)</td>
<td>6 (3)</td>
<td>7 (3)</td>
<td>3 (1)</td>
<td>49 (20.1)</td>
</tr>
<tr>
<td>2002</td>
<td>291</td>
<td>2 (.6)</td>
<td>27 (9.3)</td>
<td>26 (9)</td>
<td>9 (3)</td>
<td>6 (2)</td>
<td>3 (1)</td>
<td>6 (2)</td>
<td>1 (.3)</td>
<td>20 (10.7)</td>
</tr>
<tr>
<td>2003</td>
<td>314</td>
<td>1(.4)</td>
<td>33 (10.5)</td>
<td>20 (6)</td>
<td>3 (1)</td>
<td>3 (1)</td>
<td>5 (2)</td>
<td>6 (1.9)</td>
<td>4 (1.3)</td>
<td>42 (15)</td>
</tr>
<tr>
<td>2004</td>
<td>233</td>
<td>2 (.9)</td>
<td>33 (14)</td>
<td>17 (7)</td>
<td>8 (3)</td>
<td>5 (2)</td>
<td>4 (2)</td>
<td>3(1.3)</td>
<td>2 (.9)</td>
<td>51 (17)</td>
</tr>
<tr>
<td>2005</td>
<td>243</td>
<td>0(0)</td>
<td>35 (14.4)</td>
<td>21 (8.6)</td>
<td>7 (2.8)</td>
<td>7 (2.8)</td>
<td>4 (1.6)</td>
<td>7 (2.8)</td>
<td>3 (1.2)</td>
<td>52 (17)</td>
</tr>
<tr>
<td>2006</td>
<td>186</td>
<td>1(0.5)</td>
<td>15 (8.06)</td>
<td>12 (6.45)</td>
<td>1 (0.5)</td>
<td>2 (1.07)</td>
<td>0 (0)</td>
<td>5 (2.68)</td>
<td>0 (0)</td>
<td>46 (20)</td>
</tr>
<tr>
<td>2007</td>
<td>260</td>
<td>0 0)</td>
<td>26 (10)</td>
<td>5 (1.9)</td>
<td>8 (3)</td>
<td>18 (6.9)</td>
<td>4 (1.5)</td>
<td>6 (2.3)</td>
<td>0 (0)</td>
<td>67 (25)</td>
</tr>
</tbody>
</table>
**Strictureplasty**

Preservation of bowel length is critical for patients with Crohn disease because multiple operations for recurrent disease are often required. Strictureplasty is a technique used to treat Crohn disease-related small bowel obstruction without resection of the diseased segment. We are pleased to report highly favorable results with this bowel-sparing surgical technique.

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**Surgical Outcomes for Strictureplasty in Patients with Crohn Disease**

Two recent Cleveland Clinic studies included more than 300 patients with Crohn disease who underwent strictureplasty. There were no postoperative deaths. An interesting finding reported in a prior study revealed that nearly 80 percent of operative recurrences were actually new areas of disease, distant from the strictureplasty site.

<table>
<thead>
<tr>
<th>Study</th>
<th>Patients</th>
<th>Stricture</th>
<th>Strictureplasties per Patient</th>
<th>Complications</th>
<th>Septic Complications</th>
<th>Follow-up Year</th>
<th>Operative Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td>123</td>
<td>Diffuse</td>
<td>5</td>
<td>20%</td>
<td>6%</td>
<td>6.7</td>
<td>29%</td>
</tr>
<tr>
<td>Study 2</td>
<td>219</td>
<td>Limited</td>
<td>2</td>
<td>18%</td>
<td>5%</td>
<td>7.8</td>
<td>34%</td>
</tr>
</tbody>
</table>
Surgical Procedures for Ulcerative Colitis

Ileoanal Pouch Surgery
One of the many techniques perfected at Cleveland Clinic is the pelvic pouch or the ileal pouch-anal anastomosis (IPAA). The Department of Colorectal Surgery is an established referral destination for any patient with mucosal ulcerative colitis who requires surgical treatment and wishes to avoid a permanent stoma. Colorectal surgeons have a very high success rate with this specialized surgery.

Approximately 170 IPAA surgeries are performed each year. Data accumulated on these patients show that quality-of-life and health ratings are very high from one to 15 years after surgery, with no decline in the vast majority of patients. Most patients do so well after this surgery that they rarely require regular medical treatment for disorders associated with their pouch.

Ileal Pouch Failure Model
We recently reported outcomes for all patients who underwent primary IPAA at Cleveland Clinic between 1983 and 2007. After excluding patients who underwent the procedure at a different center before being referred to us, there were 3,080 patients. A large proportion of patients were able to undergo single-stage proctocolectomy and IPAA with good results.
The early (30-day postoperative) and long-term complication rates, outcomes and quality-of-life data were very favorable for the 3,080 patients.

### 30-Day Complication Rate (%)

<table>
<thead>
<tr>
<th>Complication</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound infection</td>
<td>5</td>
</tr>
<tr>
<td>Sepsis</td>
<td>3.7</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>3.2</td>
</tr>
<tr>
<td>Obstruction</td>
<td>3.7</td>
</tr>
<tr>
<td>Fistula</td>
<td>1.1</td>
</tr>
<tr>
<td>Anastomotic stricture</td>
<td>0.2</td>
</tr>
<tr>
<td>Anastomotic separation</td>
<td>2.5</td>
</tr>
<tr>
<td>Pouch Failure</td>
<td>0.07</td>
</tr>
</tbody>
</table>

### Incontinence

#### Rare or No Incontinence (%)

![Graph showing incontinence rates over time]

Patients achieved excellent continence scores in both the short term and the long term.
Bowel Movements: Frequency

<table>
<thead>
<tr>
<th>Follow-up duration</th>
<th>3 Mo</th>
<th>6 Mo</th>
<th>1 Yr</th>
<th>3 Yr</th>
<th>5 Yr</th>
<th>15 Yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bowel movements: Day</td>
<td>6.9 ± 3</td>
<td>6.3 ± 2.9</td>
<td>5.8 ± 2.8</td>
<td>5.6 ± 2.3</td>
<td>5.7 ± 3.3</td>
<td>5.7 ± 3.9</td>
</tr>
<tr>
<td>(n=180)</td>
<td>(n=900)</td>
<td>(n=1204)</td>
<td>(n=1230)</td>
<td>(n=1348)</td>
<td>(n=483)</td>
<td></td>
</tr>
<tr>
<td>Bowel movements: Night</td>
<td>1.8 ± 1.8</td>
<td>1.8 ± 1.8</td>
<td>1.9 ± 1.8</td>
<td>1.7 ± 1.5</td>
<td>1.7 ± 2.3</td>
<td>1.7 ± 1.4</td>
</tr>
<tr>
<td>(n=178)</td>
<td>(n=874)</td>
<td>(n=1186)</td>
<td>(n=1222)</td>
<td>(n=1377)</td>
<td>(n=480)</td>
<td></td>
</tr>
</tbody>
</table>

Patients’ bowel movement frequencies averaged five to six times a day and about one to two at night. These results were much better than prior to surgery.

Cleveland Clinic Quality of Life Score

When we compared patients' quality of life prior to (baseline) and after surgery, we found that there was significant improvement post-surgery. This improvement persisted in both the short term and the long term.

Patient Satisfaction with Surgical Results

We also asked patients to score their satisfaction with the surgery on a zero-to-10 scale. Results were excellent and persisted in both the short term and long term. Lastly, in patients polled, 97 percent of the population said they would undergo the procedure again and 97.4 percent said they would recommend the procedure to others in the same condition.
IPAA with Omission Diverting Stoma

Cleveland Clinic surgeons reported the outcomes in selected patients with no diverting ileostomy and compared these results to patients who had diverting stoma. A recent study indicated no differences between the two groups in pouchitis rates and septic complications, such as pelvic abscess, anastomotic leak and fistula. This was one of the lowest-reported complication rates in IPAA surgery in the world.

Complications Compared between Ileostomy and No-ileostomy Groups

<table>
<thead>
<tr>
<th></th>
<th>Ileostomy n = 1,725 (%)</th>
<th>No Ileostomy n = 277 (%)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pouchitis</td>
<td>513 (30)</td>
<td>93 (33.6)</td>
<td>0.7</td>
</tr>
<tr>
<td>Pelvic sepsis</td>
<td>113 (6.5)</td>
<td>15 (5.4)</td>
<td>0.51</td>
</tr>
<tr>
<td>Anastomotic leak</td>
<td>94 (5.5)</td>
<td>12 (4.3)</td>
<td>0.57</td>
</tr>
<tr>
<td>Fistula</td>
<td>139 (8.1)</td>
<td>18 (6.5)</td>
<td>0.36</td>
</tr>
<tr>
<td>Pouch vaginal fistula</td>
<td>52/712 (7.3)</td>
<td>4/154 (2.6)</td>
<td>0.049</td>
</tr>
<tr>
<td>Postoperative ileus</td>
<td>195 (11.3)</td>
<td>56 (20.2)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Small bowel obstruction</td>
<td>324 (18.8)</td>
<td>28 (10.1)</td>
<td>0.012</td>
</tr>
<tr>
<td>Operation for SBO</td>
<td>127 (39)</td>
<td>8 (29)</td>
<td></td>
</tr>
<tr>
<td>Perioperative fever (&gt;38ºC)</td>
<td>194 (11.3)</td>
<td>56 (20.3)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>63 (3.7)</td>
<td>3 (1.1)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Anastomotic stricture*</td>
<td>352 (20.4)</td>
<td>26 (9.4)</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Pouch failure</td>
<td>77 (4.5)</td>
<td>5 (1.8)</td>
<td>0.022</td>
</tr>
</tbody>
</table>

*Includes symptomatic and asymptomatic strictures
There were no differences between the groups in quality of life (as assessed by Cleveland Clinic’s quality-of-life questionnaire) at intervals of three months and at one, three, five and 10 years. Functional outcome results were also similar between the groups at the same follow-up intervals after adjusting for age in the patients with the same anastomosis type. Cleveland Clinic surgeons believe omitting temporary diverting ileostomy is a safe procedure in carefully selected patients undergoing IPAA surgery.

** Continent Ileostomy**

Continent ileostomy is an option in patients in whom an ileal pouch surgery is not possible or in whom the initial and subsequent repeat ileoanal pouch surgery failed and the patient is reluctant to accept a permanent ileostomy. Continent ileostomy, or Kock pouch, is constructed by three loops of small bowel and a one-way valve, which allows patients to avoid wearing an outer appliance. One has to cannulate the Kock pouch three or four times a day to empty itself. Cleveland Clinic surgeons are very experienced in this technique. We are one of a few centers where this procedure is done.

We recently reviewed our experience in patients with a failed IPAA who received a continent ileostomy to avoid wearing a permanent external appliance. Our results in this group of patients (n = 64) between 1982 and 2007 revealed acceptable outcomes and showed that patients were very satisfied. The overall survival rate of continent ileostomy was 95.3 percent (61/64). Mean pouch survival time was 4.2 years (range, one to 19 years). About 75 percent of patients had a recent follow-up. The median follow-up was 3.6 years. The median quality-of-life score was 0.85 (0 = worst, 1 = best).
Genetics of IBD

IBD runs in families, suggesting a genetic component to the cause of these diseases. Researchers from our IBD Center were involved with studies that led to discovery of the first gene associated with Crohn disease — NOD2/CARD15. The second IBD gene was discovered this year as the interleukin-2 receptor (IL-2R) gene. An ongoing NIH-funded study is allowing us to create a DNA bank of our IBD patients. To date, more than 700 Crohn disease patients and controls have contributed to this effort.

In 2006, Jean-Paul Achkar, MD was the first author of a study in which 904 IBD patients from a multicenter collaboration were stratified by phenotypic information (Achkar JP, et al. *Am J Gastroenterol*. 2006;101:572–580). This phenotype-stratified genetic linkage study demonstrates that IBD2 is an extensive ulcerative colitis locus. While there was no genetic linkage signal when all ulcerative colitis patients were studied (blue line in graph at right), there was a strong linkage signal when only patients with extensive ulcerative colitis were studied (purple line). This finding has potential implications for better localizing a gene for ulcerative colitis on chromosome 12.

### Long-term Outcomes after Conversion of Pelvic Pouch to Continent Ileostomy

<table>
<thead>
<tr>
<th>Complications (n=64)</th>
<th># of Patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve slippage</td>
<td>19</td>
<td>29.7</td>
</tr>
<tr>
<td>Peristomal hernia</td>
<td>10</td>
<td>15.6</td>
</tr>
<tr>
<td>Fistula</td>
<td>9</td>
<td>14.1</td>
</tr>
<tr>
<td>Ileostomy stricture</td>
<td>3</td>
<td>4.7</td>
</tr>
<tr>
<td>Delayed perineal wound healing</td>
<td>10</td>
<td>15.6</td>
</tr>
<tr>
<td>Pouchitis</td>
<td>7</td>
<td>10.9</td>
</tr>
<tr>
<td>Pelvic abscess</td>
<td>3</td>
<td>4.7</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Kock pouch status</th>
<th># of Patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doing well</td>
<td>58</td>
<td>90.6</td>
</tr>
<tr>
<td>Gas leakage</td>
<td>2</td>
<td>3.1</td>
</tr>
<tr>
<td>Converted to end ileostomy</td>
<td>4</td>
<td>6.2</td>
</tr>
</tbody>
</table>

In 2006, Jean-Paul Achkar, MD was the first author of a study in which 904 IBD patients from a multicenter collaboration were stratified by phenotypic information (Achkar JP, et al. *Am J Gastroenterol*. 2006;101:572–580). This phenotype-stratified genetic linkage study demonstrates that IBD2 is an extensive ulcerative colitis locus. While there was no genetic linkage signal when all ulcerative colitis patients were studied (blue line in graph at right), there was a strong linkage signal when only patients with extensive ulcerative colitis were studied (purple line). This finding has potential implications for better localizing a gene for ulcerative colitis on chromosome 12.
Optical Coherence Tomography
Optical coherence tomography (OCT) is a new imaging technique for evaluation of the various layers of the intestinal wall. Investigators at the IBD Center were the first in the world to apply the use of OCT to IBD. Major grants have been received from the American College of Gastroenterology to study how OCT can be used in the management of IBD patients. As the resolution of this technique improves, we will be able to better identify which areas of intestinal mucosa are likely to have lesions on biopsy. In coming years, OCT will be considered an optical biopsy technique.
**Pouchitis**

Cleveland Clinic has long been a leader in the life-saving surgical remodeling of the lower digestive tract to form an internal pouch to receive wastes. Victor Fazio, MD, Feza Remzi, MD, and Bo Shen, MD, of the Digestive Disease Institute have now established the nation's first pouchitis clinic. The program sees an average of 20 patients per week from around the United States and other countries. It enables researchers to advance their knowledge of pathogenesis, risk stratification, diagnosis and treatment of a variety of pouch disorders. For the first time, Dr. Fazio, Dr. Remzi and Dr. Shen have published the Cleveland Clinic classification of pouch disorders. Their clinical research has been supported by NIH, the American College of Gastroenterology and the Broad Foundation.

Patients with ulcerative colitis can be treated by surgery to remove the colon and create an ileal pouch. While some patients have an excellent long-term outcome, some develop complications such as acute pouchitis, chronic pouchitis, cuffitis, irritable pouch syndrome and even Crohn disease. Recent research in the IBD Center concentrates on risk factors for the development of complications of the ileal pouch, accurate diagnostic criteria, cost-effective evaluation of a symptomatic patient, and physiology of the pouch with barostat measurements. Treatment options being studied include balloon dilation of inlet and outlet strictures, 5-aminosalicylic acid suppositories for cuffitis, innovative antibiotic regimens for pouchitis and, in an NIH-funded study, amitriptyline for irritable pouch syndrome. More recently, investigators showed toll-like receptor 2 (TLR2) is involved with the earliest pathogenetic events of acute pouchitis, chronic pouchitis and Crohn disease of the pouch.
Cancer Biology

Patients with IBD are at increased risk of developing cancer. Current methods of cancer surveillance lack sufficient sensitivity to reassure patients with a negative test that cancer will not develop. The IBD Center is looking at ways to improve sensitivity of testing with chromoendoscopy. Also, in an NIH-funded study, research is under way to find biomarkers that may predict which patients are more likely to develop dysplasia and which patients are more likely to progress to advanced neoplasia. Promising results have been obtained. Using genomic hybridization (Figure, right), patients who progress to dysplasia or cancer have been shown to have marked genetic instability with multiple gene mutations (green and red dots on the left panel) whereas patients who do not progress have very few gene mutations (right panel).

Laparoscopy

Traditional surgical treatment for many intestinal disorders required a long midline abdominal incision and a lengthy recovery period of between four and eight weeks. Today, colorectal surgeons are highly experienced in minimally invasive laparoscopic techniques for intestinal surgery.
Benefits of laparoscopic surgery include less pain, shorter hospitalization time, quicker return to full health and less scarring. Experience with more than 1,500 laparoscopic intestinal resections and an average of eight laparoscopic cases each week shows that the approach can be at least as safe as traditional surgical methods when performed by a surgical team with special training and extensive experience.

A registry of all patients undergoing laparoscopic colorectal surgery is maintained prospectively. Recent literature continues to suggest that laparoscopic cancer surgery offers an equally good outcome to open surgery when performed by experienced surgeons.

The laparoscopic approach is now offered to almost 95 percent of patients requiring an elective index resective procedure, while conversion rates and a need for a larger incision are needed in less than 10 percent of patients.

We recently evaluated outcomes for patients undergoing IPAA by the laparoscopic approach and found that we were able to perform the procedure with comparable morbidity and early and long-term outcomes to patients undergoing conventional IPAA surgery with an open technique.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>LAP-IPAA (n=109)</th>
<th>Open IPAA (n=218)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>35.5 ± 14.2</td>
<td>35.8 ± 13.5</td>
<td>0.76</td>
</tr>
<tr>
<td>Gender (male)</td>
<td>54 (49.5%)</td>
<td>110 (50.5%)</td>
<td>0.88</td>
</tr>
<tr>
<td>BMI (Kg/m2)</td>
<td>24.7 ± 5.0</td>
<td>25.2 ± 4.6</td>
<td>0.35</td>
</tr>
<tr>
<td>Time to stoma closure (days)</td>
<td>84 (Iqr 26,428)</td>
<td>95 (Iqr 23,275)</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Length of stay (days)</td>
<td>6.5 ± 4.4</td>
<td>7.5 ± 4.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Estimated blood loss (ml)</td>
<td>265.9 ± 73.1</td>
<td>352 ± 207.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Median follow up (years)</td>
<td>2.9 (Iqr 0.7, 8.5)</td>
<td>3.4 (Iqr 1.5, 7.8)</td>
<td>0.06</td>
</tr>
</tbody>
</table>

Patients who underwent laparoscopic surgery had less blood loss, a shorter length of stay and a better cosmetic result than those who had the conventional open procedure.

While the oncologic ramifications of a laparoscopic approach have been proved at least equal to the open operation, the possibility that a laparoscopic approach may actually help protect colorectal cancer patients against recurrence is now being evaluated.
Liver Disease

With an expertise in treating a wide range of common and uncommon hepatobiliary diseases, our liver specialists treat patients from around the world. The Hepatology Section offers a full range of diagnostic testing and treatment of patients with liver diseases, including viral hepatitis, nonalcoholic fatty liver disease, cholestatic liver disease and other less common liver disorders. A comprehensive approach is utilized for patients with liver failure, including management of ascites, variceal bleeding and hepatocellular carcinoma. Hepatologists are an integral part of the liver transplant program. In 2007, hepatologists had more than 1,700 new patient visits and more than 5,500 total clinic visits.

Cleveland Clinic surgeons have extensive experience with relatively uncommon hepatobiliary procedures, including resection of benign and malignant liver tumors, laparoscopic radiofrequency ablation for inoperable liver tumors and portal hypertension surgery. Our liver transplant program is an essential component of a broad medical and surgical strategy to manage all patients with liver disease with the therapy most appropriate to that patient. Experts in all areas of liver disease participate in the evaluation, management, treatment and follow-up of these patients.

Liver Transplant Program

In 2007, 148 liver transplants were performed with ever-improving outcomes.

In addition to adult transplantation, the Transplant Center offers pediatric liver transplantation. The living donor transplant program for both children and adults was restarted in the second half of 2005. Our commitment to clinical and basic science research in liver transplantation is growing. Ongoing clinical trials are assessing the induction of immune suppression in the hope of reducing the need for immunosuppressive drugs. Additional research studies include examining the role of novel immune suppressive medications to protect renal function after transplant and exploring the role of liver transplant in patients with stable HIV infection.
# Cleveland Clinic
## 1 Year Survival Rates

<table>
<thead>
<tr>
<th>Patient</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult (Actual)</td>
<td>90.62</td>
</tr>
<tr>
<td>Adult (Expected)</td>
<td>86.75</td>
</tr>
<tr>
<td>Pediatric (Actual)</td>
<td>88.89</td>
</tr>
<tr>
<td>Pediatric (Expected)</td>
<td>95.21</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Graft</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult (Actual)</td>
<td>84.13</td>
</tr>
<tr>
<td>Adult (Expected)</td>
<td>81.62</td>
</tr>
<tr>
<td>Pediatric (Actual)</td>
<td>88.89</td>
</tr>
<tr>
<td>Pediatric (Expected)</td>
<td>93.09</td>
</tr>
</tbody>
</table>

Actual = Cleveland Clinic actual survival  
Expected = UNOS computer expected survival

For patient receiving their first transplant from 7/1/04-12/31/06  
Differences between actual and expected rates are not statistically significant.  
Source: United Network for Organ Sharing
Variceal Bleeding

Variceal bleeding is a common life-threatening complication of cirrhosis. The preferred treatment method is variceal banding.

Endoscopic photo of a band placed on an esophageal varix

Annual Variceal Volume

Annual Esophageal Variceal Banding
Annual Paracentesis Volume

Annual Transjugular Intrahepatic Portosystemic Shunts
Procedure Volumes
Treatment of Liver Tumors
A multidisciplinary approach is used to treat liver tumors, including surgical resection, tumor ablation, chemoembolism and liver transplant. Combined modalities, such as liver ablation followed by transplant, are often used.

Drug Trials for Hepatitis C
Since the early 1990s, Cleveland Clinic hepatologists have been engaged in a series of multicentered clinical trials of antiviral therapy. Since that time, trial results indicate that the success rate of therapy has risen from about 10 percent to more than 85 percent in certain subgroups of infected individuals. Additionally, a major effort was initiated to understand the mechanism of failure of therapy in obese patients with hepatitis and in those with insulin resistance. Novel therapies are being tested as adjuncts to care for these specific populations.

New Approach to Hepatitis C Treatment with TNF Inhibitor
A Cleveland Clinic hepatologist showed that viral eradication might be enhanced significantly by adding an inhibitor of tumor necrosis factor-alpha (TNF-alpha) to standard therapy. This modification is thought to enhance specific aspects of the immune response, leading to successful viral eradication. The concept was tested through a randomized placebo-controlled study that included patients with chronic hepatitis C. Our hepatologists are leading a large multicenter trial in 10 sites throughout the United States to validate the potential of this novel therapy.

Novel Diagnostic Tools for Nonalcoholic Fatty Liver Disease
Potential novel markers to distinguish steatosis from nonalcoholic steatohepatitis are being explored. In addition, noninvasive methods of assessing degree of liver injury in nonalcoholic fatty liver disease are being tested on a national level. These methods potentially could eliminate the need for biopsy in patients with nonalcoholic fatty liver disease.
Motility Disorders

Diagnostic procedures required for assessment of motility disorders outside the esophagus are provided to patients, including gastroduodenal manometry, anorectal manometry and anal ultrasound. Radiologic and nuclear medicine tests are performed by the appropriate departments.

Constipation and Evacuatory Disorders

Patients are usually initially managed by a gastroenterologist and referred to a surgeon for laparoscopic subtotal colectomy with ileorectal anastomosis.

Endosonography

Endosonography is also known as rectal ultrasound endoscopy. This is a new diagnostic tool that uses sound waves to produce images and precisely identify abnormalities, making it possible to visualize the sphincter muscles.
**Clinical Nutrition**

**Malnutrition and Maldigestion**

More than 500 patients with maldigestion and malabsorption are seen each year. Some patients have unusual conditions such as refractory celiac disease, intestinal lymphangiectasia and Whipple disease, while others have radiation enteritis or intestinal failure. These conditions often lead to weight loss, dehydration, electrolyte abnormalities and anemia. The Digestive Disease Institute can also provide specialized treatment to patients with severe malnutrition through the Cleveland Clinic Nutrition Support Team and the Intestinal Rehabilitation Program.

![Annual Malnutrition and Maldigestion](image)

**Home Parenteral Nutrition**

The Nutrition Support Team (NST) provides comprehensive care for one of the largest cohorts of home parenteral nutrition patients in the nation. Established more than 25 years ago, the team provides expertise for management of these complex cases, avoiding many of the associated complications of parenteral nutrition. A careful assessment of patient outcomes showed that tunneled central venous catheters are less likely to be associated with complications than peripherally inserted catheters (Am J Gastroenterol 2006; 101:S401).

![Annual Patient Volume of Home Parenteral Nutrition](image)

NST is a multidisciplinary team of professionals trained to provide state-of-the-art care to patients who have intestinal failure or severe GI dysfunction. The NST also participates in clinical research and is involved in the education of other healthcare providers.
Clinical care was provided to 1,214 hospitalized patients who required parenteral nutrition, resulting in 10,653 parenteral nutrition orders.

Enteral nutrition is provided to patients with a functioning GI tract but who require placement of a feeding tube. Critically ill patients particularly benefit from early feeding and small bowel feeding tube placement. A newly dedicated enteral access RN position established in 2007 resulted in the placement of 894 bedside electromagnetic tubes. The electromagnetic tube system avoids inadvertent placement of tubes into the respiratory tract. It also has been shown to decrease costs by avoiding the use of multiple X-rays associated with blind placement of feeding tubes.

Research in home parenteral nutrition patients has shown that improper catheter tip placement (tip not within the middle third of the SVC to right atrium) is associated with severe complications, including catheter thrombosis, septic thrombophlebitis, loss of vascular access and pulmonary embolism (DeChicco, et al. JPEN 2007;31:382-387). The NST studied the incidence of improper catheter tip placement in all home parenteral nutrition patients admitted with previously placed catheters. The results in 124 patients indicated that 16 percent of catheters were malpositioned, which was significantly associated with shorter catheter duration, greater number of lumens, arm venous access entry site and catheters not placed at the Cleveland Clinic. These findings suggest the importance of confirming catheter tip placement prior to infusing parenteral nutrition. The NST confirms all catheter tip placements to avoid associated severe complications.

**Intestinal Rehabilitation Program**

The Intestinal Rehabilitation Program was established in 2001 to optimally manage patients with intestinal failure. This ambulatory-based program seeks to restore nutritional status and maximize the patient’s quality of life through the safest and most cost-effective techniques. An initial diagnostic evaluation of the patient’s nutrition, vitamin, and trace element status as well as gastrointestinal anatomy is conducted. This is followed by intensive preliminary and follow-up dietary counseling, including the possible use of vitamins, minerals, trace elements, oral rehydration solutions and soluble fiber. Preliminary research suggests a predigested liquid supplement with a prebiotic may promote transition from parenteral to enteral nutrition. Medical management modalities may include the use of antidiarrheal and antisecretory agents, pancreatic enzyme replacement therapy and nonabsorbable oral antibiotics. In addition, evaluation for restorative surgical procedures can lead to enhanced intestinal absorption by increasing intestinal absorptive capability. Recombinant human growth hormone was recently approved for use in parenteral nutrition-dependent short bowel syndrome patients to promote intestinal adaptation and enhance function of the residual bowel for possible reduction or elimination of parenteral nutrition. The Intestinal Rehabilitation Program provides comprehensive evaluation, education, and monitoring of patients undergoing therapy with this and other trophic substances to safely and effectively transition patients from intravenous nutrition to oral or enteral feedings.

**Nutrition Therapy Program**

The scope of service for the Department of Nutrition Therapy is to meet the clinical nutrition needs of patients across the continuum of care as an active, collaborative partner in support of primary and specialized medical care. Services provided by registered dietitians and dietetic technicians utilize evidence-based care to treat patients who are at risk for malnutrition and who require special oversight as a result of food allergies and intolerances, medical conditions, surgical recovery and cultural differences. Medical nutrition therapy includes initial and reassessments, identification of a nutrition diagnosis and development of a care plan with goals, interventions and monitoring.
Preventing and Treating Malnutrition

Malnutrition frequently accompanies prolonged hospital stays, frequent readmissions and complications following surgery. Registered dietitians work in tandem with physicians to identify and treat patients at high risk for malnutrition as early as possible during their hospital admission. Aggressive treatment through enteral and parenteral feeding, oral supplements and diet consistency alterations work to strengthen patients’ immune systems and reduce length of stay, morbidity and mortality. Registered dietitians see more than 33,000 patients in the hospital and center for rehabilitation each year.

Nutrition Counseling to Support Management of Chronic Disease

With the escalating incidence of such chronic diseases as diabetes mellitus, cancer, hypertension, kidney disease, vascular and heart disease, eating and digestive disorders and obesity, the need to guide patients in self-management and prevention strategies becomes an essential component of medical care. Registered dietitians counsel patients through individualized nutritional strategies to better control blood glucose levels, blood pressure, blood urea nitrogen, lipid levels and weight as well as manage symptoms such as nausea and vomiting, diarrhea and constipation. Referrals for ambulatory nutrition counseling come from all primary care and specialty medicine areas. As a result, more than 44,000 patients receive nutrition education and counseling from registered dietitians each year.

Training Future Nutrition Practitioners

Providing the experiential component for students to become dietitians since 1989, the Cleveland Clinic’s Nutrition Therapy Dietetic Internship program received a full 10-year reaccreditation from the American Dietetic Association Commission on Accreditation for Dietetics Education in 2007. Since its inception, program graduates have had a 100-percent pass rate when taking the registration exam to become certified as registered dietitians.
Innovations in Practical Nutrition Applications during 2007

- Registered dietitians gave more than 50 presentations to medical students, physicians, nurses, allied health disciplines, nutrition colleagues and community groups.
- Registered dietitians gave more than 70 media interviews with national and local televised, print and Web-based media.
- Registered dietitians wrote more than 20 articles for professional and lay publications.
- Registered dietitians conducted outcomes research for a variety of nutrition interventions:
  - Published abstract: A. Escuro. Utilizing the revised amyotrophic lateral sclerosis functional rating scale (ALSFRS-R) as a tool in nutrition assessment of patients with ALS. *J Am Diet Assoc, 2007*
  - Catch-up weight gain in children diagnosed with failure to thrive following initiation of enteral nutrition
  - Enteral feeding holds in the MICU, including incidence and reasons for holds, effect on residual volumes and nosocomial pneumonia incidence
  - Effects of consistent carbohydrate meals on glycemic control
  - A prospective randomized controlled trial comparing advanced practice medical management versus advanced practice medical management plus bariatric surgery in the treatment of type 2 diabetes mellitus (STAMPEDE)
  - High school weight and weight at entry to a Cardiac Disease Risk Prevention Clinic as predictors of all cause mortality and coronary heart disease: A PreCIS Data Base Study
Swallowing and Esophageal Disorders

The Center for Swallowing and Esophageal Disorders is one of only a few such academic centers in the United States. The center’s multidisciplinary team includes gastroenterologists, radiologists, general and thoracic surgeons, neurologists, lung specialists, swallowing therapists and ear, nose and throat specialists.

Gastroesophageal Reflux Disease

Broad treatment modalities are offered for all forms of gastroesophageal reflux disease (GERD), from typical heartburn and regurgitation to atypical presentations including acid-induced asthma, chest pain, and cough, hoarseness and sore throat.

Anti-reflux surgery can be done through one of a variety of approaches best suited to the patient. For the initial surgery, a minimally invasive laparoscopic approach is preferred. Our surgeons now have the largest referral practice in the region for complicated GERD and redo operations. Seventy percent of procedures for complicated reflux disease involve a technically more complex Collis-Belsey or Collis-Nissen procedure to lengthen the esophagus to prevent reoccurrence. There have been no operative deaths since 1998.

GERD Case Distribution
Barrett Esophagus

Barrett esophagus is a complication of chronic GERD that may increase the risk of esophageal cancer in a small subset of patients. Current strategies for improved survival in patients with esophageal adenocarcinoma focus on cancer detection at an early and potentially curable stage. This can be accomplished by screening for Barrett esophagus and endoscopic surveillance of patients with known Barrett esophagus. Expert pathology evaluation is key to the diagnosis.

Acid suppression with proton pump inhibitors is the cornerstone of medical therapy for Barrett’s esophagus because it provides consistent symptom relief. The result is either no regression of the Barrett segment or modest clinically insignificant regression.
Achalasia

Cleveland Clinic has a long history of treating patients with achalasia. Available treatments include endoscopic botulinum toxin injection into the esophagus (especially for elderly patients), surgical Heller myotomy and pneumatic (balloon) dilation. Nearly 100 pneumatic dilations a year are performed, with an overall success rate of 85 percent and a very low perforation rate (< 2 percent). Cleveland Clinic is also one of the only centers in the world researching the cause of achalasia.

The use of surgical myotomy as a treatment for achalasia continues to increase due, in part, to recent advances in endoscopic surgery. No surgery-related deaths have occurred during the past four years in this group of patients.

Achalasia Procedure Volume

Surgery offers the best chance for long-term survival for esophageal cancer. Radiation therapy offers tumor control; however, it is most effective on small tumors. Sometimes chemotherapy is added to radiation therapy. If a tumor blocks the esophagus, laser therapy, photodynamic therapy or stenting may be used to create an opening so that swallowing is easier. Nutritional support with all of these procedures is necessary. Recent studies combining radiation and chemotherapy prior to surgery demonstrate longer survival for patients diagnosed with esophageal cancer.
**Esophagectomy**

Esophagectomy remains one of the most challenging of general thoracic operations. These procedures are performed as part of a trimodality approach to the disease, with surgery following an intensive course of concurrent chemoradiotherapy. Keys to success are experience from a high surgical volume, careful patient selection and excellent postoperative care. Overall surgical mortality is only 2 percent.

**Eosinophilic Esophagitis**

Eosinophilic esophagitis is an increasingly recognized cause of many esophageal symptoms. Cleveland Clinic investigators are involved in novel translational research examining the link between eosinophilic inflammation and clinical symptoms in subjects with eosinophilic esophagitis.

**Barrett Esophagus Registry**

Cleveland Clinic has the largest non-VA hospital registry for Barrett Esophagus in the United States, following more than 800 patients. Nearly 25 percent of these are women. Doctors at Cleveland Clinic’s Center for Swallowing & Esophageal Disorders are using the registry in studies to assess the possible inheritance pattern for Barrett esophagus, the role of new biomarkers to better risk-stratify these patients and new treatments, including high-dose acid suppression (with or without aspirin or NSAIDs), radiofrequency ablation and cryotherapy to promote regression of metaplasia and decrease the risk of cancer.

**Intraluminal Impedance Monitor**

We are one of five centers in the world studying the utility of impedance in assessing bolus movement and nonacid reflux. When combined with traditional esophageal manometry, impedance allows for simultaneous correlation of motility with the movement of liquid and solid bolus. This test may be particularly useful prior to antireflux surgery in patients with dysphagia after fundoplication and in patients with motility disorders.

**High-resolution Manometry**

High-resolution manometry allows more accurate assessment of esophageal motor function. Cleveland Clinic is a pioneer in the development of combined impedance/high-resolution manometry for optimal esophageal testing.
**Alternative Imaging in Barrett Esophagus**

Investigators are examining the role of novel imaging technologies including narrow-band imaging and autofluorescence endoscopy in an effort to facilitate the detection of precancerous changes in Barrett esophagus.

**Digestive Diseases Surgery Anesthesiology**

The Section of Anesthesia for Colorectal Surgery and the Section of Anesthesia for Liver Transplantation within the Department of General Anesthesiology continue their emphasis on the management of perioperative normothermia (\(\geq 36.0^\circ C\)). Although the trend in 2007 was upward, the addition of this measure in early 2008 to the Anesthesiologist Dashboard clinical practice reporting tool for staff anesthesiologists will provide data for continuous improvement.

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**Perioperative Normothermia**

![Bar graph showing percentage of normothermia over quarters](image)
Surgical Quality Improvement

Surgical Care Improvement Program (SCIP)

SCIP is a national campaign aimed at reducing surgical complications by 25 percent by the year 2010. SCIP is sponsored by the Centers for Medicare and Medicaid Services (CMS) in collaboration with a number of other national partners serving on the steering committee, including the American Hospital Association (AHA), Centers for Disease Control and Prevention (CDC), Institute for Healthcare Improvement (IHI), The Joint Commission and others. Cleveland Clinic is committed to improving the care of surgical patients and participates in SCIP. A multidisciplinary team including the Surgery Institute, Anesthesiology Institute, Infectious Disease Department, Nursing Institute, and Quality and Patient Safety Institute works together to ensure that our surgical patients receive appropriate care.

Appropriate Preoperative Prophylactic Antibiotic Timing 2007

* Source: United States Department of Health and Human Services, Hospital Compare
Most current reported discharges July 2006 to June 2007.
“Top Hospitals” represent the top 10 percent of reporting hospitals nationwide.
National average of all reporting hospitals in the United States.

Appropriate Prophylactic Antibiotic Selection 2007

* Source: United States Department of Health and Human Services, Hospital Compare
Most current reported discharges July 2006 to June 2007.
“Top Hospitals” represent the top 10 percent of reporting hospitals nationwide.
National average of all reporting hospitals in the United States.
Prophylactic Antibiotics Discontinued within 24 Hours After Surgery 2007

Recommended Venous Thromboembolism Prophylaxis Received by Patient 2007

* Source: United States Department of Health and Human Services, Hospital Compare
Most current reported discharges July 2006 to June 2007.
“Top Hospitals” represent the top 10 percent of reporting hospitals nationwide.
National average of all reporting hospitals in the United States.

* Source: United States Department of Health and Human Services, Hospital Compare
Most current reported discharges January 2007 to June 2007.
“Top Hospitals” represent the top 10 percent of reporting hospitals nationwide.
National average of all reporting hospitals in the United States.
 Recommended Venous Thromboembolism Prophylaxis Ordered 2007

* Source: United States Department of Health and Human Services, Hospital Compare
  Most current reported discharges January 2007 to June 2007.
  “Top Hospitals” represent the top 10 percent of reporting hospitals nationwide.
  National average of all reporting hospitals in the United States.

Surgery Patients Who Received their Beta Blocker Perioperatively 2007

* No national benchmark data available at this time
National Surgical Quality Improvement Program (NSQIP)

The American College of Surgeons’ National Surgical Quality Improvement Program is a national program that objectively measures surgical outcomes. It reports risk-adjusted 30-day mortality and morbidity outcomes. Currently, the program includes Cleveland Clinic’s surgical cases from colorectal surgery, general surgery and vascular surgery. As this program continues to grow at a national level, Cleveland Clinic is committed to expanding it to all surgical areas. We view NSQIP as a valid, independent way to document our surgical outcomes and provide a basis for ongoing performance improvement. Our NSQIP scores are comparable despite doing more colorectal surgery than the average NSQIP participant. Our scores are excellent given the number of re-operative and immunosuppressed cases we perform at Cleveland Clinic. The fact that a case is re-operative or immunosuppressed is not recognized by NSQIP.
Patient Experience

Outpatient - Digestive Disease Institute

We ask our patients about their experiences and satisfaction with the services provided by our staff. Although our patients are already indicating we provide excellent care, we are committed to continuous improvement.

Overall Rating of Care 2007

![Graph showing overall rating of care with percentages for Excellent, Very Good, Good, Fair, and Poor. N=2,397.]

Overall Rating of Provider Care 2007

![Graph showing overall rating of provider care with percentages for Excellent, Very Good, Good, Fair, and Poor. N=2,398.]

Would Recommend Provider 2007

![Graph showing would recommend provider with percentages for Extremely Likely, Very Likely, Somewhat Likely, Somewhat Unlikely, and Very Unlikely. N=2,350.]

Digestive Disease Institute
**Inpatient - Cleveland Clinic**

With the support of the Center for Medicare and Medicaid Services (CMS) and its partner organizations, the first national standard patient experience survey was implemented in late 2006. Adult medical, surgical, and obstetrics and gynecology patients treated at acute care hospitals across the country are included in the survey. Results collected for initial public reporting, published on www.hospitalcompare.gov in March 2008, are shown here.

**Overall Rating of Care (0 worst - 10 best scale)**
**October 2006 - June 2007**

![Percent “9” or “10” graph]

Total Cleveland Clinic Survey Respondents = 4,725

**Would Recommend Facility**
**October 2006 - June 2007**

![Percent “Yes, definitely” graph]

Total Cleveland Clinic Survey Respondents = 4,725
A Shocking Therapy for Pancreatic Stones

Having pancreatic stones was the most horrible ordeal of Patricia Holland’s life.

“Everyone talks how bad kidney stones are – and I’ve had plenty of those – but having pancreatic stones doesn’t even compare,” says Holland of Corry, Pa. “It was worse than kidney stones 100 times over.”

Holland’s recurrent attacks of acute pancreatitis began after she had her gallbladder removed at a Pennsylvania hospital. Over the next two and half years, she was in and out of hospitals for treatment an estimated 30 times. Because she couldn’t eat, Holland got her nutrition intravenously. Her weight plummeted more than 30 pounds and no amount of medication eased her agonizing pain.

She then decided to come to Cleveland Clinic where gastroenterologist Mansour Parsi, MD, was motivated to try shock wave treatment – lithotripsy – to remove the pancreatic stones.

Although hospitals routinely use lithotripsy to break up stones in the kidney and ureter, very few use it for the pancreas. After treating Holland in 2007, Dr. Parsi established a center to help other patients suffering with pancreatic stones. In fact, Cleveland Clinic is the only major medical center in Ohio that applies lithotripsy for patients with this condition.

Holland underwent lithotripsy twice. In addition to abating her pain, the treatment allowed her to regain weight and strength in about five months. “This is the best I’ve done so far and the longest I’ve gone without being in the hospital,” says Holland. “If it wasn’t for Dr. Parsi I don’t know what I would have done.”

Coming of Age, Battling Cancer

To most people, a 21st birthday is a celebration of life, of adulthood’s tender beginnings. Yet just a month after her 21st birthday, Maureen O’Leary discovered she had developed a rare form of rectal cancer.

Initially, hemorrhoids or a fissure seemed to be likely explanations for her symptoms. “I thought it was no big deal,” she says. “But after I woke up from the colonoscopy, my mother and sister looked teary-eyed, and I wondered what was going on.”

At her age, O’Leary was not a typical colorectal cancer candidate. For those beyond age 50, colonoscopy screening for colon cancer is critical.

O’Leary developed familial adenomatous polyposis (FAP), a rare condition that can cause hundreds of mushroom-shaped growths of tissue, or polyps, to form in the colon, rectum and large intestine. In FAP patients, unless the affected part of the colon is removed, the polyps will develop into cancer.

“It was overwhelming,” she says. “I’m thinking, ‘OK, I have this weird, freaky disease. It’s OK as long as it is not cancer.’ And then I found out it was cancer, all within a couple of months.”

So began a search for the right surgeon, which brought O’Leary to Cleveland Clinic Digestive Disease Institute and James Church, MD. “Many doctors I saw told me Cleveland Clinic has a great colorectal department and that Dr. Church knows a lot about FAP. His name kept coming out of other doctors’ mouths and kept surfacing in all the research we did. I could tell I was in the best hands.”

The weekend before the surgery, O’Leary’s family and friends held a party to support her. “We laughed, we stayed up late, and my mom was still grilling hot dogs at 4 a.m.,” she says.

O’Leary describes Dr. Church as being calm, knowledgeable and compassionate. “I could spend as much time as I needed with him,” she says. “I never felt rushed.” In July 2003, he performed a J-pouch procedure (sewing or stapling the end of the small intestine to form a pouch) with a temporary ileostomy (attachment of the bottom of the small intestine to an opening in the abdomen to remove waste). A second surgery was performed in December 2003. Since these surgeries, O’Leary has been cancer-free.

O’Leary, who majored in history at Marquette University, now works for an advertising agency in San Diego.
Innovations

Center for Endoscopy first in Ohio to SpyGlass Direct Visualization System
Diseases of the biliary system are frequently encountered in clinical practice. An examination of the bile ducts is often required for the appropriate diagnosis and management of patients with biliary diseases. Over the last three decades, endoscopic retrograde cholangiography (ERC) has been the primary method of diagnosing and treating many biliary diseases. ERC can demonstrate the anatomy of the biliary tract and reveal anatomical abnormalities, strictures and intraductal filling defects. However this technique can frequently not differentiate the biological nature of bile duct lesions and may fail in determination of their intraluminal extension. Furthermore, it is unable to provide information about biliary mucosal lesions that do not project into the biliary lumen.

Cholangioscopy is a promising procedure that provides direct visualization of the biliary tree. SpyGlass™ Direct Visualization System is a single operator per-oral cholangioscope that recently became commercially available. Our Center for Endoscopy and Pancreatobiliary Disorders was the first center in Ohio and one of the first centers in the country using this new technology for diagnosis and treatment of patients with biliary disorders. Our center has also been involved in international multicenter studies to better assess the utility of cholangioscopy for diagnosis of indeterminate biliary lesions and difficult to remove stones. Initial results of these studies have been very promising. Further research is ongoing.

TNFerade is on trial at Cleveland Clinic for treatment of pancreatic cancer.
TNFerade is a new “gene therapy” agent designed to be injected directly into solid tumors to produce tumor-cell death. It is a replication-deficient adenovirus which contains the tumor necrosis factor alpha (TNF) gene. The TNF gene is linked to a radiation-inducible promoter gene so that it produces synergistic expression of TNF in the presence of radiation. The initial phase II study in pancreatic cancer suggested a dose-dependent improvement over expected outcomes (progression and survival). There were even some patients whose tumors were downstaged to allow surgical resection. One patient had a complete pathological response. This initial encouraging data requires further validation in a phase III randomized trial.

The Cleveland Clinic departments of Gastroenterology, Medical Oncology, and Radiation Oncology are now involved in the phase III multi-center study of TNFerade injection for treatment of locally advanced (Stage III) pancreatic cancer. A multidisciplinary approach is necessary for patients to receive the new treatment (5 weekly EUS-guided TNFerade injections) and the standard care treatments (5-FU/external beam radiation induction, Gemcytobine maintenance). In 2007, three patients were enrolled in the study. It is hoped that this and other EUS-delivered anti-tumor treatments may hold promise in improving the outcome of this deadly disease.

Colon Cancer Research
The colorectal cancer research laboratory at Cleveland Clinic is working toward understanding the behavior and response to treatment for individual cancers through studying the genetics of colorectal tumors. Using advanced scientific laboratory technology and statistical models, individual genes as well as groups of genes associated with a particular biologic process, have been identified to help predict disease prognosis. The ultimate goal of this work is to be able to more accurately identify and deliver the most effective treatments for each individual patient with colorectal cancer.

Initiation of islet auto-transplantation
Patients with intractable pain due to chronic pancreatitis, who are refractory to medical and alternative surgical management, who are candidates for total or sub-total pancreatectomy and were not previously diabetic, can be considered for islet auto-transplantation, in which the resected native pancreas is processed for islets and then infused into the liver. This potentially allows these patients to have some islet function, to minimize the amount of exogenous insulin needed. In 2007, this program was initiated by Matthew Walsh, MD, in collaboration with Massimo Trucco, MD, at the Children’s Hospital of Pittsburgh.

Use of the vascular stapler for venous anastomosis in liver transplantation: The performance of a liver transplant is a demanding operation lasting six to 12 hours. Five to six vascular and other structures must be reconnected during the operation. The use of the vascular stapler was first conceived of in the management of vascular complications after liver transplantation and then extended to the performance of primary liver transplantations. This procedure has demonstrated effectiveness in treating particular types of complications after liver transplantation and can reduce the operative times by 30 to 45 minutes.

Initiation of combined liver and pancreas transplantation
In certain patients suffering from liver failure in combination with pancreas insufficiency, manifest by absence of insulin and digestive enzyme secretion, the use of a combined liver and pancreas transplant can be considered to treat both conditions. This operation should be considered as one of the spectrum of abdominal organ replacements, including intestinal transplantation. In 2007, this program was initiated by John Fung, MD, and Bijan Eghtesad, MD.
Nutrition Section Helping our Communities Schools

Registered Dietitians developed nutrition parameters for healthy meals and vending choices, which were implemented throughout the Cleveland Clinic. These parameters were introduced and adapted for Hawken School through a community partnership to take wellness initiatives into school feeding programs.

First Pouchitis/Pouch Disorder Clinic

Cleveland Clinic has long been a leader in the life-saving surgical remodeling of the lower digestive tract to form a pouch to receive wastes. Victor Fazio, MD, Feza Remzi, MD, and Bo Shen, MD, of the Digestive Disease Institute, have now established America’s first clinic for the treatment of some diseases that can affect the pouch. In 2007, 359 pouch evaluations were performed. The program sees 15 patients per week, on average, from around the U.S. or from other countries, and enables researchers to advance their knowledge of pathogenesis, risk stratification, diagnosis and treatment of pouch disease.

Innovations - Digestive Diseases Institute Anesthesiology

Under the leadership of Brenda Lewis, DO, the Section of Colorectal Anesthesia is helping to investigate how bowel tissue oxygenation can best be assessed and improved perioperatively through clinical trials. Several of these techniques are now being incorporated into routine practice. We offer an expanded option of central access for patients with poor IV access or those who but do not want neck lines. The section has developed a new ultrasound-guided PICC line placement program with the enthusiastic initiative of Tatyana Kopyeva, MD.

Transplant Center: The Surgical Intensive Care Unit (SICU) Team, composed of medical staff (critical care physicians), nurses and house staff, is a proud partner with the Cleveland Clinic Transplant Center, now the fifth largest liver transplantation program in the U.S. Our team has accommodated a tripling of transplant cases during the past 48 months and increasing complexity with the same number of available ICU resources while maintaining patient survival above the national average. This was accomplished by improving critical care efficiency and through growth of our multidisciplinary framework, which now includes more critical care physicians, nurse practitioners and dedicated clinical pharmacists. We have also worked to develop relationships with the regional Long-Term Care Facilities to facilitate ongoing communication and two-way plan of care to facilitate transfer from acute care to long-term care and smooth ICU re-admission, if necessary.

Single Port Laparoscopic Colectomy

Laparoscopy has become the treatment of choice for the majority of colorectal disorders that require an abdominal operation. As the emphasis focuses on minimizing the technique utilized to access the pathology, natural orifice surgery is quickly evolving. While endoscopic approaches are being viewed with much skepticism, the Cleveland Clinic’s surgeons continued to explore the realm of utilizing an embryologic natural orifice, the umbilicus, as sole access to the abdomen to perform a colorectal procedure.

Feza Remzi, MD, and Daniel Geisler, MD, surgeons at Cleveland Clinic and pioneers of a Single-Port Laparoscopic (SPL) method in the field of Colo-Rectal Surgery, recently performed the world’s first colon resection (partial removal of the colon) entirely through a single incision in the navel.

The conventional laparoscopic approach to colon resection for polyp or cancer utilizes three to five abdominal wall incisions. The conventional laparotomy may vary in incision size (8 to 15 inches). The SPL trans-umbilical approach employed by Dr. Remzi and Dr. Geisler is a variant of the laparoscopic operation that uses only a single umbilical incision through which a single specially-designed port is placed. There is no utilization of any other accessory ports inside or outside the umbilicus.

Antegrade Colonic Enema

Patients who achieve success with enema therapy will be offered a surgical procedure Antegrade Colonic Enema (ACE). Either the appendix or the small bowels are brought up to the abdominal wall to allow for catheter axis and irrigation of the colon. Five patients have received the antegrade colonic enema procedure for varied indications. Four of the five patients have achieved good results but long-term efficacy is unknown.
New Knowledge

Journal Articles


**Book Chapters**


**Digestive Diseases Institute Anesthesiology**


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Some physicians may practice in multiple locations. For a detailed list including staff photos, please visit clevelandclinic.org/staff.
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800.553.5056

**Colorectal Surgery Appointments/Referrals**
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**Gastroenterology & Hepatology Appointments/Referrals**
216.444.6536 or 800.223.2273 ext. 46536

**Hepatobiliary Surgery Appointments/Referrals**
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On the Web at clevelandclinic.org/digestivedisease

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216.444.2200

**Hospital Patient Information**
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**Patient Appointments**
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**Special Assistance for Out-of-State Patients**
Complimentary assistance for out-of-state patients and families
800.223.2273, ext. 55580, or email medicalconcierge@ccf.org

**International Center**
Complimentary assistance for international patients and families
800.884.9551 or 001.216.444.6404 or visit clevelandclinic.org/ic

**Cleveland Clinic in Florida**
866.293.7866

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Cleveland, OH 44195

**Beachwood Family Health and Surgery Center**
26900 Cedar Road
Beachwood, OH 44122
Colorectal Surgery: 216.839.3333
Gastroenterology: 216.839.3850

**Hillcrest Hospital Atrium**
6780 Mayfield Road, Suite 325
Mayfield Heights, OH 44124
Colorectal Surgery: 440.312.7111

**Independence Family Health Center**
5001 Rockside Road
Crown Center II
Independence, OH 44131
Colorectal Surgery and Gastroenterology: 216.986.4000

**Solon Family Health Center**
29800 Bainbridge Road
Solon, OH 44139
Colorectal Surgery and Gastroenterology: 440.519.6800

**Strongsville Family Health and Surgery Center**
16761 SouthPark Center
Strongsville, OH 44136
Colorectal Surgery and Gastroenterology: 440.878.2500

**Westlake Family Health Center**
30033 Clemens Road
Westlake, OH 44145
Colorectal Surgery and Gastroenterology: 440.899.5555

**Willoughby Hills Family Health Center**
2570 SOM Center Road
Willoughby Hills, OH 44094
Colorectal Surgery and Gastroenterology: 440.943.2500
Cleveland Clinic Overview

Cleveland Clinic, founded in 1921, is a nonprofit multispecialty academic medical center that integrates clinical and hospital care with research and education. Today, 1,800 Cleveland Clinic physicians and scientists practice in 120 medical specialties and subspecialties, annually recording more than 3 million patient visits and more than 70,000 surgeries.

In 2007, Cleveland Clinic restructured its practice, bundling all clinical specialties into integrated practice units called institutes. An institute combines all the specialties surrounding a specific organ or disease system under a single roof. Each institute has a single leader and focuses the energies of multiple professionals onto the patient. From access and communication to point-of-care service, institutes will improve the patient experience at Cleveland Clinic.

Cleveland Clinic’s main campus, with 37 buildings on 140 acres in Cleveland, Ohio, includes a 1,000-bed hospital, outpatient clinic, specialty institutes and supporting labs and facilities. Cleveland Clinic also operates 14 family health centers; eight community hospitals; two affiliate hospitals; a 150-bed hospital and clinic in Weston, Fla.; and health and wellness centers in Palm Beach, Fla., and Toronto, Canada. Cleveland Clinic Abu Dhabi (United Arab Emirates), a multispecialty care hospital and clinic, is scheduled to open in 2011.

At the Cleveland Clinic Lerner Research Institute, hundreds of principal investigators, project scientists, research associates and postdoctoral fellows are involved in laboratory-based research. Total annual research expenditures exceed $150 million from federal agencies, non-federal societies and associations, and endowment funds. In an effort to bring research from bench to bedside, Cleveland Clinic physicians are involved in more than 2,400 clinical studies at any given time.

In September 2004, Cleveland Clinic Lerner College of Medicine of Case Western Reserve University opened and will graduate its first 32 students as physician-scientists in 2009.

Cleveland Clinic is consistently ranked among the top hospitals in America by U.S. News & World Report, and our heart and heart surgery program has been ranked No. 1 since 1995.

For more information about Cleveland Clinic, visit clevelandclinic.org.

Online Services

eCleveland Clinic

eCleveland Clinic uses state-of-the-art digital information systems to offer several services, including remote second medical opinions to patients around the world; personalized medical record access for patients; patient treatment progress for referring physicians (see below); and imaging interpretations by our subspecialty trained radiologists. For more information, please visit eclevelandclinic.org.

DrConnect

Online Access to Your Patient’s Treatment Progress

Whether you are referring from near or far, DrConnect can streamline communication from Cleveland Clinic physicians to your office. This online tool offers you secure access to your patient’s treatment progress at Cleveland Clinic. With one-click convenience, you can track your patient’s care using the secure DrConnect website. To establish a DrConnect account, visit eclevelandclinic.org or email drconnect@ccf.org.

MyConsult

MyConsult Remote Second Medical Opinion is a secure online service providing specialist consultations and remote second opinions for more than 600 life-threatening and life-altering diagnoses. The MyConsult service is particularly valuable for people who wish to avoid the time and expense of travel. For more information, visit eclevelandclinic.org/myconsult, email eclevelandclinic@ccf.org or call 800.223.2273, ext 43223.

For more information about Cleveland Clinic, visit clevelandclinic.org.
Cleveland Clinic

9500 Euclid Avenue, Cleveland, OH, 44195

Cleveland Clinic is a nonprofit multispecialty academic medical center. Founded in 1921, it is dedicated to providing quality specialized care and includes an outpatient clinic, a hospital with more than 1,000 staffed beds, an education institute and a research institute.

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