MAYO CLINIC

Clinical Update

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Endoscopic Management of Large, Flat Colorectal Polyps

Large sessile polyps and flat colorectal lesions greater than 3 cm may occur in as many as 5% of adults undergoing colonoscopy. Historically difficult to detect and remove, such lesions are of particular concern because they pose a high risk of malignancy, especially on the right side of the colon.

As recently as 5 years ago, most large polyps were managed surgically. But according to gastroenterologists at Mayo Clinic in Jacksonville, Florida, many of these lesions are now successfully treated using endoscopic methods (Figure 1). Advances in both imaging technology and treatment methods have paved the way for endoscopic management of difficult polyps.

Chromoendoscopy allows for better identification of lesions as well as better endoscopic characterization. And the variety of endoscopes and snares available today make it possible to treat polyps in any part of the gastrointestinal tract accessible to endoscopy, including the esophagus, stomach, and duodenum.

Points to Remember

- Once surgically managed, large, flat colorectal polyps are now safely and effectively treated endoscopically—most commonly with endoscopic mucosal resection.
- Various endoscopes and snares enable treatment of polyps in any part of the gastrointestinal tract accessible to endoscopy, including the esophagus, stomach, and duodenum.
- Endoscopic submucosal dissection, a technically demanding procedure that allows for en bloc resection, is gaining acceptance in a few large US centers.

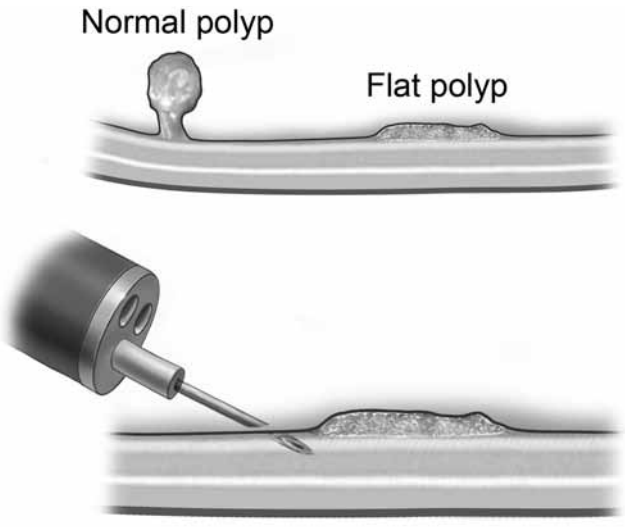


Figure 1. *Normal polyps traditionally have been removed endoscopically. Large, flat polyps have not.*

Endoscopic Mucosal Resection

Today, endoscopic mucosal resection (EMR) is the treatment of choice for large, flat, and sessile colorectal lesions (Figure 2). It may be performed using electrocautery or cold snare excision, with or without lifting agents such as saline and hydroxypropyl methylcellulose.

Lifting agents create a cushion between the base of the polyp and healthy tissue, making removal easier and reducing the risk of perforation. Mayo Clinic researchers are currently doing studies comparing snares and injectates to see

whether a particular combination facilitates better removal.

Bleeding is the most common complication of EMR, occurring in about 6% to 8% of cases in the colon and in 11% to 17% in the duodenum. Generally, bleeding can be well controlled with forceps and coagulation grasping, argon plasma coagulation, or endoscopic clipping. Perforation is a second major complication but, in experienced hands, tends to occur in less than 5% of patients. Follow-up to check for recurrence and residual disease is recommended 3 to 5 months after the procedure. Residual disease, which can occur in 8% to 17% of patients, is often successfully treated with repeat EMR.

Endoscopic Submucosal Dissection

Endoscopic submucosal dissection (ESD) is another recent advance in endoscopic therapy. Used in Japan and, increasingly, in a few large centers in the United States, ESD was developed to aid en bloc resection, which both reduces residual disease and allows for precise pathologic evaluation. ESD requires great technical skill and is much more arduous and time-consuming than EMR. After injection of fluid into the submucosal layer, the lesion is slowly and carefully removed from the base with an endosurgical knife.

The rate of complications such as bleeding and perforation also may be higher with ESD than with EMR. At Mayo Clinic in Florida,

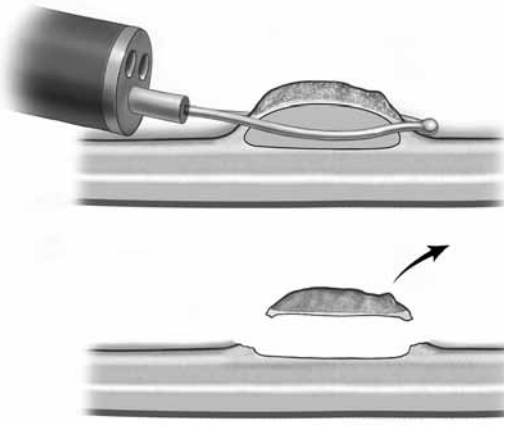


Figure 2. *Endoscopic mucosal resection is a safe and definitive technique for removing large, flat polyps in the gastrointestinal tract.*

ESD is performed by physicians well trained in the procedure. In Japan, ESD is used to remove nearly half of early gastrointestinal cancers. Mayo Clinic endoscopists sometimes provide close and meticulous observation in cases where incidental findings are well contained and not penetrating. But patients whose lesions appear cancerous are typically referred to surgeons.

The widespread use of EMR and, to a much lesser extent, ESD has greatly reduced the number of colorectal lesions requiring surgery. EMR, in particular, has proved to be a safe and often definitive therapy for large, flat polyps in the gastrointestinal tract.

Treatment Options for Benign Uterine Fibroids

Uterine fibroids affect up to 70% to 80% of women, and about 30% of women are symptomatic. Up to 75% of African American women have fibroids. More than 200,000 hysterectomies are performed each year for uterine fibroids in the United States. The direct health care costs attributable to this condition exceed $2.1 billion annually.

Many fibroids can be felt on pelvic examination. Ultrasound can detect those that are silent. Not all fibroids require treatment, but many do. Symptoms include heavy or prolonged menstrual bleeding, anemia, pelvic pressure, pain with menses, and bowel and bladder dysfunction. Asking patients about the severity of their symptoms, whether their symptoms interfere with work or daily activities, or if they have new symptoms can help determine if fibroid treatment is necessary.

Points to Remember

- Multiple treatment options are available for women who seek relief from heavy bleeding and other symptoms related to uterine fibroids.
- Hysterectomy offers permanent symptom relief for women who are not interested in future pregnancies.
- Less invasive treatment options can offer symptom relief and speedier recovery. These include medications, myomectomy, uterine artery embolization, and magnetic resonance–guided focused ultrasound therapy

Hysterectomy

Hysterectomy is a proven option for women who are not interested in future pregnancy and want to eliminate fibroid-related problems permanently. Hysterectomy is also a good choice for women with concerns such as abnormal Pap tests that require intensive follow-up, adenomyosis, or endometriosis. In addition, surgery may have an impact on physical and emotional well-being, fertility, and sexual function.

Other Treatment Options

Today, multiple medical therapies and less invasive surgical approaches provide symptom relief, shorter hospital stays, and speedier recovery than hysterectomy. And some options preserve fertility for women who want to become pregnant in the future. Listed below are some of the more commonly prescribed treatments.

Medications

Various medications are now available to treat fibroid symptoms such as heavy menstrual bleeding and pelvic pressure. These include oral contraceptives, gonadotropin-releasing hormone agonists, a progesterone-releasing intrauterine device, and a new nonhormonal drug product called tranexamic acid. These medications offer some symptom relief, but they do not eliminate fibroids.

Myomectomy

Myomectomy is an effective surgical option for the removal of fibroids with preservation of the uterus. This approach can relieve symptoms related to fibroid bulk and bleeding without sacrificing fertility. Although an abdominal incision is sometimes required for very large or numerous fibroids, many fibroids can be removed hysteroscopically or through just a few small incisions using a laparoscope or robot-assisted approach to speed patients' recovery and return to work.

Abdominal myomectomy usually requires a hospital stay of 2 or 3 days, and postoperative recovery takes 4 to 6 weeks. Laparoscopic or robot-assisted myomectomy is often performed with no hospital stay, and recovery typically takes a few days to 2 weeks. Hysteroscopic myomectomy is usually performed with no hospital stay, and recovery typically takes less than a week. The majority of women experience symptom relief, but new fibroids can develop that may or may not require treatment.

Uterine Artery Embolization

Larger fibroids can also be effectively treated with uterine artery embolization fibroids (Figure 1).

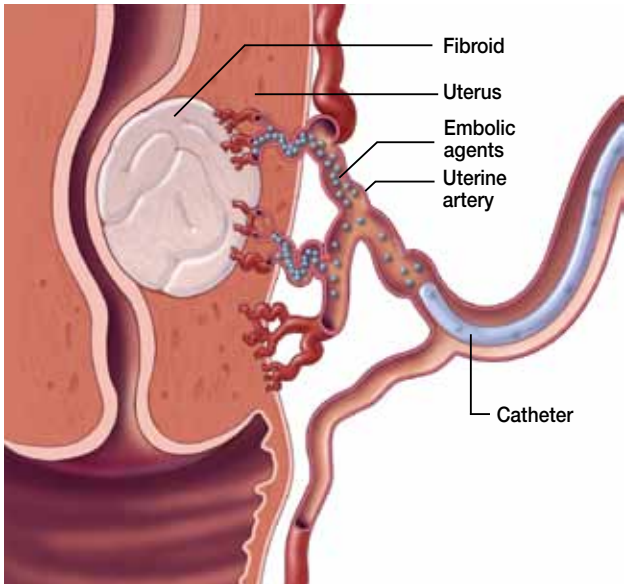


Figure 1. *During UAE, a catheter emits embolic agents into the uterine artery. The embolic agents then lodge in the uterine arteries and block the blood supply to the fibroids.*

Mayo Clinic Recruiting Participants for Research Comparing UAE and MRgFUS

Mayo Clinic researchers in Rochester, Minnesota, are conducting a randomized clinical trial funded by the National Institutes of Health (NIH) called the FIRSTT (Fibroid Interventions Reducing Symptoms Today and Tomorrow) study. FIRSTT is the first large-scale randomized study designed to compare the effectiveness of UAE and MRgFUS in treating fibroids. The study will follow participants for a total of 3 years after treatment to observe and compare symptom relief, length of recovery, and any problems associated with each of these treatments. Mayo Clinic researchers are still recruiting study participants and are hopeful that the results will help in the development of evidence-based guidelines for each of the available treatment options.

Participants must be at least 25 years old and not actively trying to become pregnant. Their uterus should be less than the size of a 5-month pregnancy, and they must be able to undergo MRI. Women are not eligible if they have had a major surgical procedure for their fibroids or prior UAE or FUS. Most importantly, women must feel both UAE and FUS are good treatment options.

For more information or to refer a patient to participate in the FIRSTT study, contact Lisa G. Peterson, RN, at 507-266-4813.

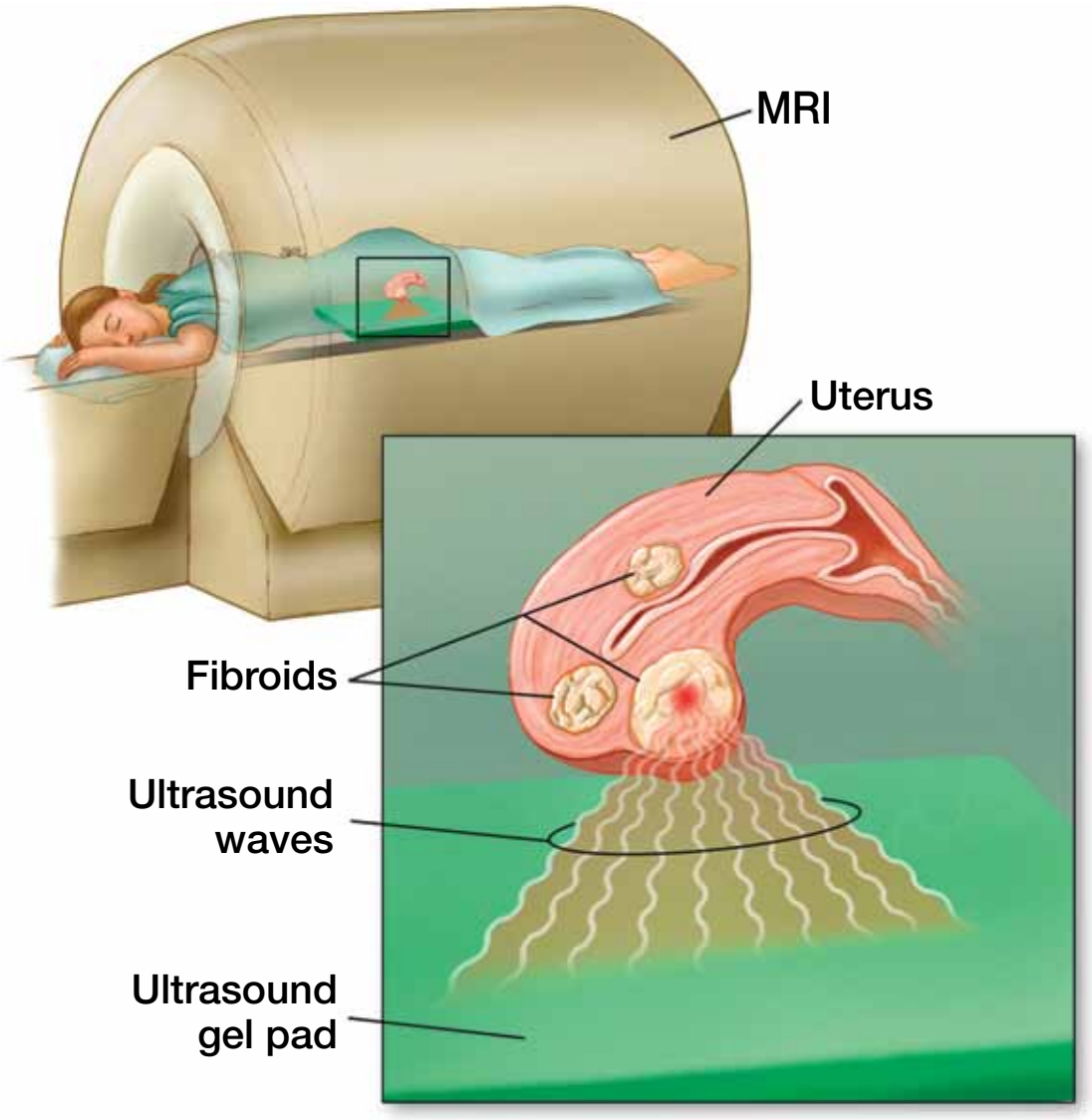


Figure 2. *In MRgFUS, treatment is conducted within a specialized MRI scanner. High-frequency, high-energy sound waves are directed through a source (gel pad) to destroy uterine fibroids.*

UAE is often appropriate for patients who want to return to work and normal activities quickly after treatment. Because UAE has the potential to affect ovarian function, it is not recommended for women who are pursuing pregnancy.

During this procedure, a physician threads a catheter through a small incision in the groin and injects small embolic particles into the uterine arteries to block the blood supply to the fibroids. Patients typically spend 1 night in the hospital after the procedure, and they return to work between 4 and 14 days later. As with myomectomy, the majority of women experience symptom relief, but new fibroids can develop that may or may not require treatment.

Magnetic Resonance–Guided Focused Ultrasound

Also approved by the US Food and Drug Administration for fibroid treatment, magnetic resonance–guided focused ultrasound (MRgFUS) is the first noninvasive treatment for uterine fibroids (Figure 2). Although some patients have reported successful pregnancies following MRgFUS, more research is needed before determining this treatment's impact on fertility. Thus, women must be counseled regarding options before pursuing MRgFUS when their goal is pregnancy in the future.

MRgFUS takes place in an MRI machine, and no incision is required. After MR images map the fibroid locations, the ultrasound transducer sends waves through the abdominal wall and into the fibroid, destroying the tissue. Patients typically go home the same day the procedure is performed, and they can return to work and other activities within a day or 2.

Pituitary Tumors: Team Approach Advantages

The pituitary gland controls endocrine function and straddles a region between the nose and the brain. Pituitary tumors are best managed through the coordinated approach by an interdisciplinary surgical and medical team. Mayo Clinic's team of pituitary experts is anchored by an endocrinologist and includes, as needed, physicians in neuroradiology, neurosurgery, neurology, otorhinolaryngology (ENT), ophthalmology, radiation oncology, and laboratory medicine. Performing more than 120 pituitary surgical procedures annually, Mayo Clinic in Rochester, Minnesota, has a large practice devoted to the treatment of pituitary tumors.

Pituitary tumors are usually benign and noncancerous. Sometimes extremely small, they can be either functioning (hormone-producing clinical syndrome) or nonfunctioning (non–hormone-producing or no clinical syndrome). Patients with functioning tumors producing an excess of such hormones as prolactin, corticotropin (ACTH), thyrotropin, or growth hormone typically experience symptoms and seek medical care. However, not all functioning tumors have clinical sequelae, and like nonfunctioning tumors, they may be undetected. Some become large enough to compress the optic nerves or the pituitary gland, causing symptoms of visual loss or pituitary failure.

Points to Remember

- Pituitary tumors are usually benign and can be either functioning (hormone-producing clinical syndrome) or nonfunctioning (non–hormone-producing or no clinical syndrome).
- Diagnostic tests may include MRI, biochemical testing, ophthalmologic examination, and petrosal sinus sampling.
- Surgery is usually the primary treatment. A transnasal approach eliminates the need for an external incision and minimizes interference with other brain structures.

Comprehensive Diagnosis

When a pituitary tumor is suspected, additional tests may include biochemical testing, MRI, ophthalmologic examination, and petrosal sinus sampling. Since it opened in 1976, Mayo's Endocrine Testing Center has conducted more than 145,000 tests and procedures.

MRI is a standard diagnostic technique for pituitary tumors. Mayo has advanced 3-Tesla MRI scanning, which generates the high-resolution images necessary for detecting what are sometimes very small tumors. However, some pituitary tumors, such as those secreting excess ACTH in Cushing disease, may be too small to detect with MRI. When laboratory tests indicate excess ACTH production, patients are referred to radiology for petrosal sinus sampling, conducted by injecting corticotropin-releasing hormone through a catheter and measuring the pituitary response. The test may determine if a tumor is present and can also help identify its location.

Surgical Management

Surgery is usually the primary means of treating pituitary tumors and is a collaborative effort. Surgeons at Mayo Clinic use an endoscopic transnasal approach rather than a sublabial transseptal approach. An ENT surgeon advances a nasal endoscope through the nostril to the anterior wall of the sphenoid sinus. The neurosurgeon then uses either an endoscope or an endoscopic-microscopic combination to enter the sella turcica and resect the tumor (Figure). Because the surgery is minimally

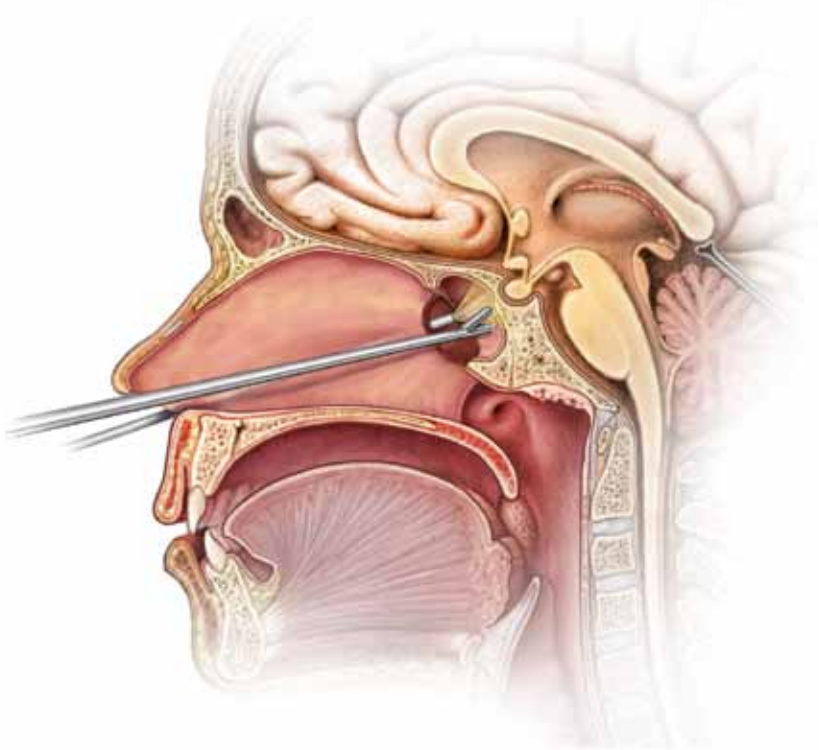


Figure. *Endoscopic approach through the nose to the sella, which harbors the pituitary gland. The procedure for tumor resection may then be performed as an endoscopic technique or an endoscopic-microscopic combination.*

invasive, the duration of the surgery, postsurgical recovery time, and patient postoperative pain are reduced.

Unless there are complications, most patients leave the hospital the day after surgery. Expected complications may include a spinal fluid leak, which occurs in about 30% of patients, and increased urine output from transient diabetes insipidus, for which there are medications. Serious complications such as blindness, stroke, and death are very rare.

After discharge, patients are typically seen the same day by the endocrinologist for medical follow-up. If a patient remains in the hospital longer than overnight, the endocrinologist does an inpatient consultation. Preoperative and postoperative patient evaluations are very important because the function of the gland is so diverse and regulates so many other endocrine organs.

Postoperative management of remaining tumor, depending on its size, location, and other features, may be amenable to radiosurgery with a single-day dosing gamma knife procedure. Other residual or recurrent tumor, depending on size or configuration, may be treated with radiation therapy, observation, or medical therapy, if appropriate.

At Mayo Clinic, patients benefit not only from a coordinated care plan, but also from state-of-the-art advances, including improved radiologic and imaging techniques, new endocrine laboratory tests and verification methods, the latest medications, advanced surgical techniques, and innovations in radiation delivery, such as the heavy particle proton beam, soon to be acquired.

Titanium Plates Stabilize Broken Ribs

The effort to relieve pain from broken ribs has historically been frustrating for both physicians and patients. Good pain control is vital, not only for patients' comfort but also to ensure they cough and breathe deeply to prevent pneumonia. Yet most methods for managing pain do not provide lasting relief and can inhibit breathing.

Rib taping, for instance, makes breathing more difficult. And oral narcotics, the mainstay treatment for rib fractures, depress respiration and carry a considerable risk of addiction when taken long term. Epidural anesthesia, which numbs the nerves that supply the ribs, helps prevent pneumonia but can be used for only 5 days.

According to trauma and critical care surgeons at Mayo Clinic in Rochester, Minnesota, better alternatives exist, such as lidocaine patches placed over the ribs and local anesthetic administered using a continuous infusion pump. Still, these options are not without drawbacks.

Continuous infusion has several advantages over an epidural, including portability, which allows people to go home rather than remain in the hospital. Patients also have a longer pain-free interval—2 weeks—before the catheter must be removed. But most patients require an additional 10 weeks before the injury is fully healed.

Points to Remember

- Many available methods for managing pain following rib fracture do not provide lasting relief and can inhibit breathing.
- A surgical procedure called rib stabilization offers drug-free pain relief and a quick return to normal life for select patients with broken ribs, including older adults with fragile bones.
- During this procedure, titanium plates are attached to the broken ribs to stabilize them. Some plates are attached to rib bones with screws. Others, designed for fragile, osteoporotic bones, encircle the ribs from front to back.

Fixing Fractures

Ultimately, the ideal treatment for rib pain is nonnarcotic, provides lasting relief, and helps people return to normal activities soon. For the past 3 years, Mayo Clinic in Rochester has

selectively used a surgical procedure called rib fracture stabilization or flail chest stabilization that seems to satisfy all these requirements.

During this procedure, titanium plates are attached to the broken ribs to stabilize them. Some of the plates fit over the bone and attach to it with screws. Other plates, which encircle the ribs from front to back, are better for fragile, osteoporotic bones. This option is especially important because older adults are at greatly increased risk of morbidity and mortality from broken ribs. The plates are durable and generally remain in place after the fractures heal. To date, no Mayo Clinic patient has had a problem with infection after placement of the titanium plates. Any discomfort is easily treated with over-the-counter pain relievers.

Because this procedure is expensive and requires a thoracotomy, Mayo Clinic surgeons are still evaluating which patients are appropriate candidates. Patients who cannot cough or breathe deeply due to pain or those with worsening radiographs are likely to benefit from this option.

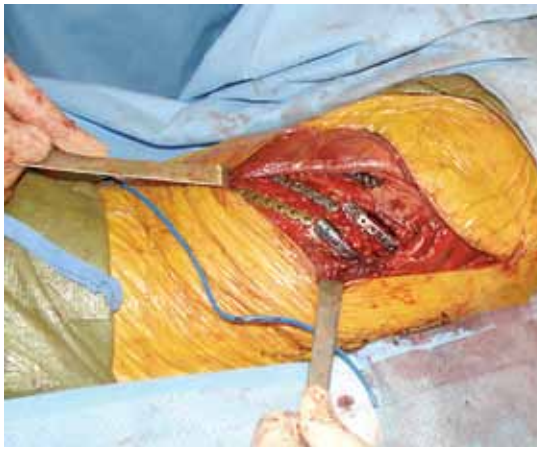
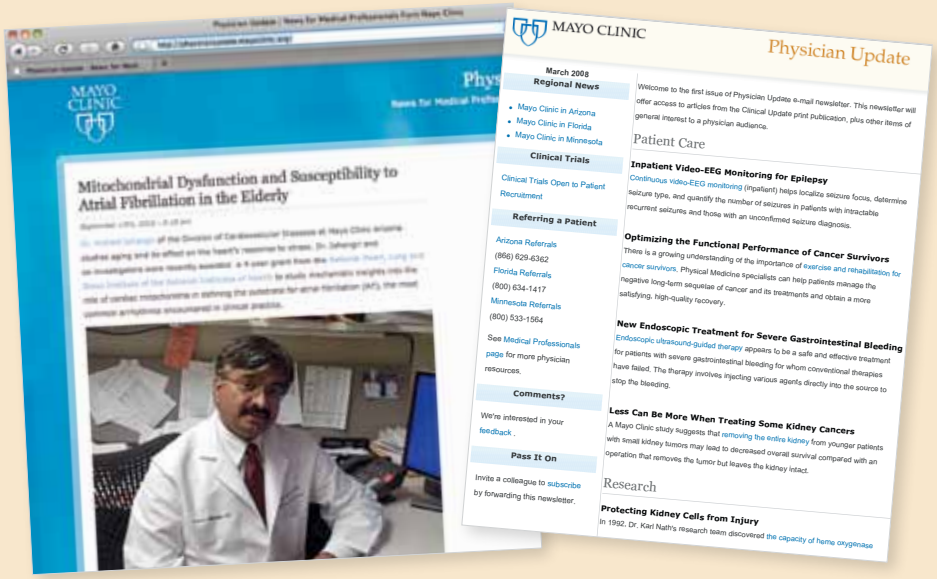


Figure. *Titanium plates hold broken ribs in the proper alignment, allowing people with fractures to breathe normally and heal with minimal pain.*

Physician Update



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Education Opportunities

Pain Medicine for the Non-Pain Specialist
March 8-10, 2012, Marriott, Marco Island, Florida
There is an increasing need for primary care physicians to have more understanding of pain management and to be able to work in collaboration with pain management specialists and better understand how, when, and why to refer their patients for specialized pain care. This course will provide an update on critical issues in the management of chronic pain to address the national and international movement toward improved pain control in chronic noncancer and cancer pain. For additional information phone 800-323-2688 or e-mail cme@mayo.edu.

8th Annual Mayo Clinic Women's Health Update
March 8-10, 2012, Firesky Resort and Spa, Scottsdale, Arizona
This annual course addresses the unique needs of female patients and their health care providers. Participants will gain a comprehensive insight into relevant medical problems uniquely found in women, as well as a basic approach to addressing and improving their common health concerns. The Mayo residency program will be submitting presentations on women's health for a poster competition, and participants will be involved in selecting the best poster presentation. An optional session featuring the latest on bioidenticals will also be offered. For additional information phone 480-301-4580 or e-mail mca.cme@mayo.edu.

Clinical Reviews 2012: 23rd Annual Family Medicine and Internal Medicine Update
March 21-24, 2012, Westin Kierland Resort and Spa, Scottsdale, Arizona
The 2012 course offers an updated comprehensive review of the most important advances that have recently been made in internal and family medicine. The course, directed to family medicine and internal medicine providers, includes lectures, Q&A sessions, an interactive format that allows for immediate audience participation, "Meet the Preceptor" luncheon sessions, and various afternoon workshops. For additional information phone 480-301-4580 or e-mail mca .cme@mayo.edu.

33rd Annual Practice of Internal Medicine
April 30-May 4, 2012, Siebens Building, Mayo Clinic, Rochester, Minnesota
This course will focus on the management of a variety of medical issues seen in areas of gastroenterology, infectious diseases, general internal medicine, rheumatology, geriatrics, emergency medicine, pulmonary, endocrinology, cardiology, neurology and women's health. For additional information phone 800-323-2688 or e-mail cme@mayo.edu.

ENT for the Primary Care Provider 2012
May 18, 2012, Siebens Building, Mayo Clinic, Rochester, Minnesota
This symposium is designed to update primary care providers in the diagnosis and treatment of common ears, nose, and throat problems. This year's symposium features a choice between 2 breakout sessions: "Hands-on training in the diagnosis and treatment of benign paroxysmal positional vertigo" or "Pediatric ENT emergencies: what needs action now or later?" For additional information phone 800-323-2688 or e-mail cme@mayo.edu.

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