### STONY BROOK **UNIVERSITY** MEDICAL CENTER

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# Retroflections

DIVISION OF GASTROENTEROLOGY

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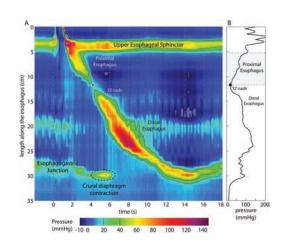
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## CUTTING-EDGE ENDOSCOPY

## Moving Forward on GI Motility

The Division of Gastroenterology has an ambitious plan to enhance the quality of our clinical services and advance scholarship. Dr. Douglas Brand, a pioneer in esophageal motility, and Dr. Gina Sam, a motility expert who recently joined our Division, bring to our Medical Center and our community the latest approaches to the evaluation of not only routine but also challenging motility problems. Technology and clinical scholarship have advanced this formerly obscure field to the stage that motility tracings can actually be translated into immediate clinical benefit to the patient. The two cases presented in this issue highlight this point (see page 3). Future issues of Retroflections will keep readers abreast of these exciting developments. •



High definition manometry.

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## EDITOR'S NOTE

It is almost a cliché to state that gastroenterology is an ever-evolving field. Clinical observation has been the cornerstone of our specialty for centuries, even before it was acknowledged as a separate entity. Hippocrates is credited with figuring out the pathophysiology of ascites in the 4th century BC, based solely on clinical observation. Early in the 20th century, at the heels of the industrial revolution, technology came to the rescue of gastroenterology and helped revolutionize our ability to recognize and treat GI diseases. Fiberoptic endoscopy accounts for much of the progress and explosive growth of gastroenterology.

We are witnessing a proliferation of technological advances that are rapidly becoming part of the evaluation of our patients, as this issue of Retroflections illustrates. These include such things as spiral enteroscopy and esophageal impedance testing that help us with the management of difficult small bowel and esophageal diseases, and endoscopic ultrasound that helps assess and occasionally treat oncologic patients, some with cancers outside the GI tract.

This is not a one-way street, however. Faced with difficult clinical decisions, members of our Division, in collaboration with colleagues from the School of Engineering, are developing nanotechnology-based approaches to the evaluation of pancreatic cysts and GI infections.

Our Division aims to be at the forefront not only of clinical care but also medical innovation. This issue of Retroflections highlights our technological prowess and ceaseless pursuit of superior patient care. •

> Chris E. Lascarides, MD Assistant Professor of Medicine

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## CHIEF'S CORNER

As aptly mentioned by Dr. Lascarides, our Editor-in-Chief, technological innovation plays a critical role both in the diagnosis and management of GI diseases. This is perhaps best exemplified by the group of diseases known as motility disorders. Until modern diagnostic instruments started facilitating clinical research, motility disorders were often (erroneously, as it turns out) relegated to vague psychosomatic categories. Thankfully, the landscape is changing rapidly.

Our Division is fortunate to have among its faculty two motility experts, Dr. Douglas Brand and Dr. Gina Sam. We have acquired state-of-the-art instruments that record every pattern of intestinal contraction from the esophagus to the anorectal region, ablate Barrett's esophagus, and provide biofeedback for anorectal disorders. Drs. Brand and Sam are transforming our approach to motility disorders, and will soon announce the opening of the Stony Brook GI Motility Center, which will address these diseases in a comprehensive manner.

Instrumentation and advances in technology are, however, ineffective if dissociated from human talent. Our Division is proud of its ongoing recruitment of outstanding clinical faculty. Dr. Gina Sam, specializing in motility disorders, Dr. Satish Nagula, an advanced endoscopist of exceptional skill, and Dr. Leah Lieber, specializing in liver diseases, are recent colleagues. Dr. Ellen Li, a world-class physicianscientist, has also joined our Division in the last few months; she leads a major translational research initiative at our University. Their talent and dedication have already made an impact on gastroenterology on Long Island and beyond. We are all grateful to them.



Basil Rigas, MD, DSc Professor and Chief, Division of Gastroenterology and Hepatology

#### FACULTY APPOINTMENTS

## Introducing Our New Physicians

#### Leah Lieber, MD

Dr. Leah Lieber joins the faculty at Stony Brook after completing a Gastroenter-ology fellowship at St. Luke's-Roosevelt Hospital Center in New York City. During her fellowship, she obtained training in hepatology and liver transplantation at Mount Sinai Medical Center. Her major research interest focused on the assessment of nutrition in chronic liver disease patients through estimation of skeletal



Dr. Lieber graduated from MIT with a BS in biology and obtained her MD from the NYU School of Medicine. She did her internal medicine training at University of



Dr. Leah Lieber joined the Division of Gastroenterology in September 2009.

Miami/Jackson Memorial Hospital. During her residency she spent time training in liver disease at the Center for Liver Diseases at the University of Miami School of Medicine, led by hepatology expert Dr. Eugene R. Schiff. Besides her clinical duties, she studied the relationship between liver histology and serum markers of fibrosis in patients with chronic liver disease.

In addition to general gastroen-

terology, her clinical practice at Stony Brook focuses on liver diseases and nutrition. Her research is on the prevention of fibrosis and end-stage liver disease, including therapeutic trials for hepatitis. •

#### Gina Sam, MD, MPH

Dr. Sam obtained her undergraduate degree in chemistry from New York University and her MD and MPH (Community Health) from Tufts University. Following her internship and residency at Lenox Hill Hospital in New York, she did her fellowship in gastroenterology at New York University.

During her fellowship, Dr. Sam focused on esophageal diseases, training with Dr. Morris

Traube. As her interest and experience in esophageal diseases expanded, she pursued dedicated training in the motility of the entire GI tract including anorectal manometry. She was a motility fellow with the American Neurogastroenterology and Motility Society. She pursued clinical training in neurogastroenterology and GI motility at the University of Iowa, where she had the opportunity to work closely with Dr. Satish Rao, one of the leaders in the field. During this time, she acquired highly specialized training in esophageal manometry, pH test-



Dr. Gina Sam joined the Division of Gastroenterology in July 2009.

ing, anorectal manometry, and biofeedback for patients with chronic constipation and fecal incontinence.

Dr. Sam, who is poised to become a national leader in GI motility, brings to our Division rare expertise that will serve the needs of our patients and the broader gastroenterology community. In collaboration with other members of our faculty, she is initiating a comprehensive research program

on Barrett's esophagus that includes, among other things, the formation of an extensive database and a bank of tissue and blood samples for the study of informative biomarkers and genetic changes.

In anticipation of her arrival, our Division has upgraded its motility equipment and is developing a dedicated multidisciplinary GI Motility Center, which will encompass all relevant clinical aspects, from speech therapy, nutrition, psychological and psychiatric support to advanced endoscopy and minimally invasive surgery. •



## Esophageal pH Testing: How to Choose the Right One

The goals of the following two case reports are to demonstrate the usefulness of impedance pH studies and suggest a method for choosing between the three methods of pH testing.

#### PATIENT 1

The patient was a 60-year-old woman with the chief complaint of episodic chest pain. It had begun a year ago and initially responded to PPI therapy. After a few months, she stopped the medication, only to have the chest pain reappear within a month. Cardiac evaluation was negative. Currently, the pain had been troubling her for three months and she also was experiencing regurgitation, belching, and a bad taste in her mouth. Her primary care physician had restarted her PPI, with only partial success in controlling her pain.

#### **Diagnostic Decision**

Since the likelihood of her having reflux was high, she was scheduled for an impedance test on medication. (Her PPI dose was increased before the test, since her response to the current dose had been incomplete.)

#### Impedance Results:

- Normal amounts of acid reflux: 7 episodes (normal up to 50); % time pH <4=0.9% (normal >4.2%)
- Increased amounts of weakly acidic reflux (pH 4-7): 136 episodes (normal up to 26)
- Increased amounts of non-acid reflux (pH > 7): 7 episodes (normal=0-1)
- High Symptom Index scores: % symptom episodes accompanied by reflux: belching 13/15=87%; chest pain 1/2= 50%; regurgitation 1/1=100%

#### Treatment Plan/Response

Since she had experienced some response to PPI therapy and was shown to have excessive amounts of weakly acid reflux, she was advised to continue her twice daily PPI and bedtime H2RA, as well as her anti-reflux precautions. She was also advised to begin a weight reduction program. At her follow-up visit two months later, she described her symptoms as much improved and had lost five pounds.

#### Comment

In this patient, the impedance study pointed out that she was having substantial amounts of weakly acid reflux and that her symptoms were probably reflux related. The results encouraged her and us to continue with her regimen of high-dose acid suppression.

#### PATIENT 2

This patient was a 45-year-old woman with the chief complaint of burning discomfort in her throat, despite PPI therapy. The symptom was of several years' duration and had been treated with a PPI for the past two years. She also complained of mild dysphagia, hoarseness, regurgitation, and episodic throat pain.

#### **Diagnostic Decision**

Because the patient's pre-test probability of having reflux was considered high, we recommended an impedance study be done, on medication.

#### Impedance Results:

- Normal acid reflux: 6 episodes (normal up to 50); % time pH<4.2: 0.1% (normal up to 5.2%)
- Minimally increased weakly acidic reflux: 27 episodes (normal <27)
- Normal non-acid reflux: no episodes (normal=0-1 episode)
- Symptom index score: sore feeling in throat 3/6 (50%) [See Figure 2A.]

#### Treatment Plan/Response

The patient was diagnosed as not having GERD. Thus, she fell into the category of having functional heartburn, probably related to visceral hyperalgesia. Her PPI was discontinued. She began amitriptyline, 10 mg at bedtime. After a few weeks, she reported that the burning discomfort in her throat was less frequent and less severe.

#### Comment

Like those of Patient 1, this woman's symptoms sounded likely to be associated with reflux; i.e., her pre-test probability of reflux was high. Therefore, she too was advised to undergo impedance pH testing on her antireflux medications. However, in contrast to the first patient, her test results showed no significant reflux of any type (acid, weakly acid, or non-acid). Acid suppression medication no longer made sense.

#### Discussion

Any of the three esophageal pH testing methods currently available (traditional 24-hour esophageal pH catheter, 48-hour (BRAVO) esophageal pH capsule, and 24hour esophageal impedance pH catheter) is effective in determining whether acid reflux is occurring in amounts significantly more than is normal and at times that are coincident with the patient's symptoms.

With the patient off all acid-suppressing medication, each of the tests is very effective at answering whether pathological acid reflux is present and causing symptoms. Of the three tests, the 48-hour capsule has the advantage of better patient tolerance. There is also some experience showing it can be used for a 96-hour period, making possible a 48-hour test off medication and a subsequent 48-hour period on medication. [See Figure 1.] Only the pH impedance test can determine whether the patient has abnormal amounts of non-acid reflux, a question that usually arises when a patient with convincing reflux symptoms has failed a course of high-dose proton pump inhibitor therapy. As the two patients described above demonstrate, the results of the test, whether positive or negative for non-acid

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#### Esophageal pH Testing: How to Choose the Right One

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reflux, can significantly affect the treatment decision. [See Figure 2.]

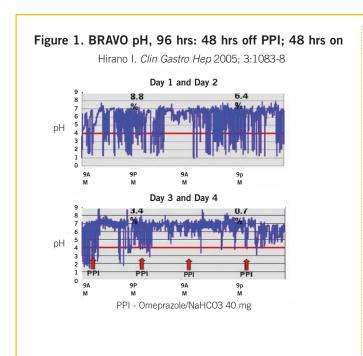
In summary, the pre-test probability of reflux provides a simple way to decide how to carry out esophageal pH testing. If the patient's history of symptoms, previous testing, and medication trials suggest that the probability of acid reflux is low, then pH testing should be done off anti-reflux medication; any of the pH methods will suffice. If the information available leads you to think that the probability of gastroesophageal reflux, acid, weakly acid, or nonacid, is high, then pH testing should be done on high-dose acid suppression, i.e., twice-daily PPI therapy, and pH impedance will provide the most sensitive testing.

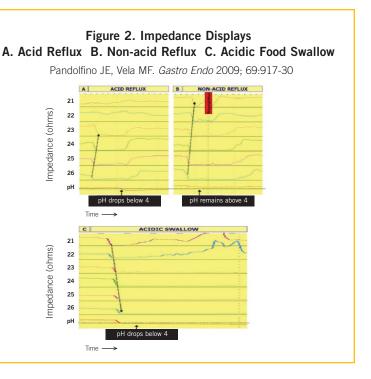
Both cases highlight the importance of the pH testing modalities that we have available right now. In the first patient, obtaining the information that despite being on medication, she is still having reflux episodes was important. The impedance enabled us to tell the first patient that she should continue her acid suppression medication because her symptoms are due to acid reflux.

On the other hand, pH impedance testing in the second patient showed that there were no acid or non-acid reflux events. Therefore. this patient could discontinue medication that is not necessary. Offering esophageal reflux testing to patients is important because it can affect their management. •

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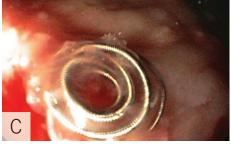
KEY Figure 1: Extended use of the BRAVO pH monitoring system to monitor esophageal acid exposure after a 96-hour period with patients off their therapy on the first two days, followed by intake of omeprazole and sodium bicarbonate 40 mg twice a day for days 3 and 4. Figure 2: Impedance changes in six measuring segments that span the esophagus (Z1 to Z6), and pH changes from a single sensor in the distal esophagus are shown. The dotted horizontal line represents a pH of 4.0, while the dotted arrows show the direction of flow detected by impedance (retrograde or antegrade). A. Acid reflux B. Non-acid reflux C. Acidic food swallow



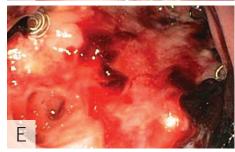
## A Unique Method to Diagnose Obscure-Overt Gastrointestinal Bleeding











A 65-year-old man with a ten-year history of chronic pancreatitis and persistent pancreatic fluid collections presented with five days of nausea, epigastric pain, and black tarry stools. Two months prior he underwent a lateral pancreatico-jejunostomy (Puestow procedure) with surgical resection of the head of the pancreas. That procedure was complicated by bleeding from a 1 cm pseudoaneurysm of his gastroduodenal artery, which required intervention by CT-guided coil embolization for hemostasis.

On physical examination, he was hypotensive and pale with epigastric tenderness to palpation. The percutaneous surgical drain continued to produce moderate amounts of serosanguinous fluid and his digital rectal exam revealed melenic stool. His hemoglobin level was 6.9 grams/dL on admission, and he required 4 units of packed red blood cells.

An emergent push enteroscopy was completely normal. The entero-entero anastomosis was visualized at approximately 150 cm from the incisors [See Image A]. Subsequent colonoscopy with terminal ileoscopy showed melena throughout the entire colon and old blood along a 40 cm segment of terminal ileum [See Image B].

Small bowel "spiral" enteroscopy was then performed using the Discovery SB® overtube device (Spirus Medical Inc., Stoughton, MA). Clotted blood was visualized in the anastomotic Roux-limb leading up towards the distal pancreas. Upon further exploration, suture material was seen at the pancreatico-jejunal anastomosis with metallic embolization coils in the main pancreatic duct as the endoscope was advanced into the pancreatic ductal orifice [See Images C and D]. Distal side branches off the main pancreatic duct could be identified during pancreatoscopy [See Image E].

Repeat angiography was then performed confirming migration of the old embolization coils through the wall of the gastroduodenal artery aneurysm and into the pancreatic parenchyma and ductal tree. This iatrogenic source of bleeding was subsequently treated with four additional coils to occlude the pseudoaneurysm's collateral vessels. The patient clinically improved with no further signs of bleeding.

#### Discussion

Stainless steel coil-embolization is agreed upon as the safest and most effective treatment modality for arterial pseudoaneurysm. However, a handful of isolated complications from coil-embolization in patients with chronic pancreatitis have been identified. In one case, a 65-year-old patient was reported to pass embolization coils per rectum within weeks of an intervention for an 8 cm splenic pseudoaneurysm.1 Nonetheless, the result of gastrointestinal bleeding from this phenomenon in the context of chronic pancreatitis is still extremely rare. The propensity for erosion of these coils through the wall of the pseudoaneurysm has been linked to the presence of digestive enzymes in the surrounding pancreatic fluid.2 In general, the proposed treatment is repeat coil embolization distal and proximal to the arterial defect<sup>1</sup>. Surgical repair is recommended if less invasive approaches fail.3,4 •

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KEY Image A: Entero-entero anastomosis Image B: Blood in the terminal ileum Image C: Embolization coil on spiral enteroscopy-assisted pancreatoscopy Image D: Embolization coil and suture material in pancreatic tissue bed Image E: Pancreatic duct side branches of the main pancreatic duct seen on pancreatoscopy



## Familial Adenomatous Polyposis in a Morbidly Obese Patient: A Management Challenge

A 50-year-old morbidly obese Hispanic man was referred by his primary care physician for occult positive stool and anemia. He reported intermittent lower abdominal pain and loose bowel movements, five to six times a day, with trace blood on occasion for a few months. He had no recent travel history or acute illnesses. Stool studies were negative for infection or parasites. There was no family history of colorectal cancer.

Physical exam revealed a morbidly obese man (BMI=44) with an unremarkable abdominal exam. Laboratory data was normal. Upper endoscopy revealed a small hiatal hernia but otherwise was normal. Colonoscopy was significant for numerous polyps found throughout the entire colon with variable appearances: flat, sessile, and pedunculated, most of which were removed by snare cautery polypectomy, at multiple endoscopic sessions. One polyp revealed adenocarcinoma in situ. Subsequent colonoscopies did not reveal cancer, and the previously marked polypectomy site of the adenocarcinoma was free of residual carcinoma. CT scan of chest/abdomen/pelvis did not show evidence of metastasis. Baseline CEA was within normal limits.

The patient was sent for surgical consultation with a colorectal surgeon and genetic testing for probable polyposis syndrome. Genetic testing revealed an APC mutation. The colorectal surgeon recommended weight reduction to optimize the patient before proceeding to surgery.

#### Discussion

Attenuated familial adenomatous polyposis syndrome (AFAP) is a variant of hereditary polyposis. It is a rare condition found in less than 1% of all colorectal cancer cases. This develops as a result of a mutation in the APC gene or with bi-allelic mutations of the MYH gene. The onset of disease occurs at ages 20 to 30 years. The mean age of diagnosis is at the time of screening of 50 years of age. Tens to hundreds of polyps or colonic adenomas are usually identified on colonoscopy, most commonly affecting the proximal colon. The lifetime colon cancer risk with AFAP by age 80 is 60 to 70% as compared to the general U.S. population of 1 in 19 people, or 5%.1

General screening recommendations for AFAP varies. According to the American College of Gastroenterology, AFAP should be evaluated by both upper endoscopy and colonoscopy.2 Upper endoscopy is recommended at time of diagnosis because of possible extracolonic manifestations of AFAP including duodenal adenomas, gastroduodenal polyps, and periampullary carcinoma. There are no current guidelines for surveillance of the upper GI tract.

Children of the affected individual are recommended to undergo genetic testing and initial endoscopic screening beginning at ages 18 to 20 years. This continues with two-year interval surveillance colonoscopies until adenomas are detected, then yearly colonoscopies until colectomy is planned.3 Otherwise, colonoscopy should be performed five to ten years earlier than the age of diagnosis in the affected family member.4 Surgery is generally recommended due to the high risk of colorectal cancer development. It is also considered in a patient who is diagnosed with colorectal cancer, where clearance of numerous polyps by endoscopy is limited due to size or numbers, or when periodic endoscopic surveillance is not feasible. Surgical options include but are not limited to total colectomy with ileorectal anastamosis, total proctocolectomy with ileal pouch-anal anastamosis, or total proctocolectomy with end ileostomy and stoma.2 If the patient has multiple medical comorbidities and is a high-risk surgical candidate, consultation with both gastroenterology and general surgery is essential. Long term follow-up with interval surveillance endoscopies and medical optimization for future colorectal surgery are strongly recommended. This is individualized depending on the extent and expression of disease. Other studies are being performed on the use of chemoprophylaxis with COX-2 inhibitors in polyp progression and colorectal cancer formation. •

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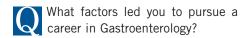


KEY Image A: Large polyp with carcinoma in situ Images B, C, and D: Numerous colonic adenomas

## Satish Nagula, MD



Dr. Nagula is a summa cum laude graduate of the University of Virginia (chemistry) and Yale Medical School. He did his residency at the University of Pennsylvania and completed his fellowship at Memorial Sloan-Kettering Cancer Center. Dr. Nagula joined our Division of Gastroenterology in July 2009.



GI is an exciting field, with multiple organs and varied diseases processes to manage. Each patient presents a unique and interesting challenge. It also has the right blend of patient care and procedures, allowing you to forge patient relationships while also providing therapy through endoscopy.

How has your unique fellowship at Memorial Sloan-Kettering Cancer Center prepared you for your academic practice at Stony Brook?

It certainly was a unique fellowship; I was broadly trained in general gastroenterology during the three-year program. Training at a cancer center has also given me excellent training in advanced endoscopy, with a special niche in the endoscopic management of oncologic diseases. My skills in endoscopic ultrasound (EUS) and endoscopic retrograde cholangiopancreatography (ERCP) will be integral to the mission of our Advanced Endoscopy Center. This center should be in place soon. Led by Dr. Jonathan Buscaglia, the Center will include myself, Dr. Isabelle von Althen-Dagum, and hopefully a new recruit. This will be a cuttingedge service covering all the endoscopic needs of our community.

Patients with cancer are often treated by oncologists, surgeons, and radiation oncologists. What is your role?

It is important to recognize that the optimal care of patients with cancer involves a multidisciplinary approach, so maintaining close communication with the other treating specialists is of paramount importance. Endoscopists can play a critical role in the initial diagnosis and staging of malignancies through EUS and ERCP. Management of pre-malignant conditions (such as Barrett's esophagus) or earlystage malignancies can be readily accomplished with endoscopic mucosal resection (EMR) and ablative therapies. Palliation of intestinal obstruction with endoluminal stents is safe and effective, helping patients maintain their quality of life. EUS-guided therapies are also a new frontier that will be growing in the years to come.

What are your current research interests?

Broadly speaking, I am interested in studying the role of endoscopy in the management of pre-malignant and malignant conditions of the GI tract. This includes examining the role of endoscopic ultrasound in the evaluation of pancreatic cysts, and the impact of endoluminal stents on quality of life in patients. We are initiating a regional long-term study of Barrett's esophagus. In a way, this research is an outgrowth in my interest in the control of Barrett's esophagus by endoscopic methods. As you probably know, our Division is acquiring Barrx Medical's Halo System that eliminates the neoplastic esophageal mucosa. I have been fortunate to obtain significant experience with this technology, and I am pleased to bring this expertise to our Hospital.

What kinds of things do you like to do outside of working here at Stony Brook?

My wife and I really enjoy traveling, and I recently took up SLR photography as a new hobby. In some strange way, this can be seen as another manifestation of our fascination with imaging, which is the essence of endoscopy. Some habits die hard!

■ How are your interactions with community gastroenterologists evolving?

I have been welcomed by our community gastroenterologists in an open way that has been extremely gratifying. As you know, the mission of our Division is to complement the role of our community colleagues and not to act or even be perceived as competition. Our goal is to integrate our respective roles for the benefit of our patients. Due to our volume and advanced instrumentation in our endoscopy unit, we are here to perform these procedures that my colleagues in the community do not provide, such as the aforementioned Barrx Halo esophageal mucosal ablations, or internal drainage of pancreatic cysts via cyst gastrostomies. It is clearly understood that such patients return to the care of the referring gastroenterologist. As far as I know, Dr. Basil Rigas, our Division chief, is making a significant effort to include community gastroenterologists in our teaching and clinical research activities. •





Division of Gastroenterology Stony Brook, NY 11794-8173

## Retro*flections*

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#### IN THE NEWS

## Farewell to Graduating Fellows

Drs. Bucobo and Harris

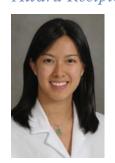


Drs. Michael D. Harris and Juan Carlos Bucobo with Dr. Basil Rigas, Chief, Division of Gastroentereology and Hepatalogy.

We would like to congratulate and wish a warm farewell to our graduating fellows from the GI Class of 2009, Dr. Michael D. Harris and Dr. Juan Carlos Bucobo. Dr. Harris is currently completing a fourth-year GI fellowship at Winthrop-University Hospital in Mineola, specializing in

advanced therapeutic and diagnostic endoscopy. Dr. Bucobo is specializing in advanced therapeutic and diagnostic endoscopy in a fourth-year program at Cedars Sinai Medical Center in Los Angeles. We wish them the best of luck and happiness in their future endeavors. •

# Dr. Lam-Tsai Award Recipient



Dr. Yvette Lam-Tsai has submitted an abstract titled, "The Interaction of GERD and Mental Health Disorders (MHDs) Among World Trade Center (WTC) Workers" to the Americ-

an College of Gastroenterology yearly scientific meeting, which was accepted as one of the 10 best abstracts in the nation. She has been awarded the ACG/Astra Zeneca Senior Fellow award, and was honored with the other recipients of the award on October 24 at the ACG meeting in San Diego. The GI Division would like to take this opportunity to congratulate Dr. Lam-Tsai on all this accomplishment.