Online Education for the Gastroenterologist

At present, the word “gastroenterology” appears over 15 million times on the web-based search engine Google (www.google.com); “gastroenterology education” returns 4.1 million hits. While it takes Google less than one second to find all of these links, more time is consumed by a gastroenterologist searching for specific educational resources on the web. The Laboratory for Educational Technology (http://labedutech.medschool.pitt.edu) at the University of Pittsburgh School of Medicine has been working with the Division of Gastroenterology, Hepatology and Nutrition (http://dom.pitt.edu/gi) and national professional societies to advance the accessibility and quality of online learning.

The same principles of adult education apply to online education as with any other learning medium. Research has shown that lectures and slide presentations are able to disseminate knowledge but do not translate to improved clinical care. Conversely, case-solving, role-playing, and small group discussion are more effective learning styles and improve clinical outcomes. When multimedia is added, the learning is improved further. This article will highlight significant examples of online educational tools for students, trainees and practicing physicians.

Medical students at the University of Pittsburgh use a comprehensive curriculum website called Navigator (http://navigator.medschool.pitt.edu) developed by the Lab. Navigator contains class schedules, course documents, physiology animations, videos of physical findings, interactive case studies, etc. This website is connected to a school-wide portal which integrates all online resources for students into one, searchable, secure location (http://www.zone.medschool.pitt.edu).

The Lab for Educational Technology and Division faculty has developed gastroenterology trainee and CME resources in conjunction with the American Gastroenterological Association (AGA, www.gastro.org). The Online Education section of their website has interactive case studies, self-study multimedia programs, electronic reproductions of live educational sessions and professionally developed PowerPoint slides on major scientific and clinical topics. The American Society for Gastrointestinal Endoscopy website (www.asge.org) has a library of endoscopy video presentations. Massachusetts General Hospital’s DAVE website (http://dave1.mgh.harvard.edu) has over 150 high-quality videos of endoscopic and EUS findings as well as audio slide presentations from grand rounds.

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A fundamental mission of the Division of Gastroenterology, Hepatology and Nutrition at the University of Pittsburgh is to discover new knowledge about digestive diseases and share it with the world. Important to this mission is the role of Continuing Medical Education (CME). Our CME programs educate physicians and other healthcare professionals about key advances in research enabling them to incorporate challenging research breakthroughs into their clinical practices. Delivery of high quality CME programs is changing related to the flexibility and convenience of the Internet. Technologic advances can enhance CME, and our Division has supported the development of Dr. J.B. McGee’s award-winning efforts in educational technology (see cover story).

Each year, our Division sponsors two CME programs in addition to specialized evening meetings. This year’s first major program, to be held on June 23 & 24, will highlight key Digestive Disease Week (DDW) abstracts with a focus on GI cancers. Our annual autumn CME program, GI & Hepatology: What’s New & What to Do, focuses on practical aspects of diverse GI topics with highlights from the ACG and AASLD annual meetings.

Attendee CME evaluations are closely monitored prompting the inclusion of more interactive case studies and small group discussions, moving our programs beyond typical classroom lectures. Additionally, special talks on billing and emerging legal issues have been added.

The Division’s faculty takes great pride in delivering some of the best CME programs available anywhere. We hope that professionals requiring CME credits in digestive diseases, or with an interest in an area in which our faculty excel, will attend our upcoming programs. Each course is designed to deliver CME credit which minimally disrupts clinical practice and provides a high quality educational experience.

In good health,

David C. Whitcomb, MD, PhD
Giant Eagle Foundation Professor of Cancer Genetics
Professor of Medicine, Cell Biology & Physiology and Human Genetics
Chief, Division of Gastroenterology, Hepatology and Nutrition

Online Education continued from page one

The El Salvador Atlas of Gastrointestinal Video Endoscopy (http://www.gastrointestinalatlas.com/) is the largest online collection with 1744 videos.

Virtual Patients is a computer-based simulation of clinical encounters, during which the learner plays the role of a healthcare provider. More sophisticated versions are immersive experiences where you can ask free-form questions, perform a physical exam, order diagnostic tests, recommend therapy and observe the outcome. Examples include Pitt’s GI Rounds Online (http://girounds.pitt.edu) and New York University’s Surgical Interactive Multimedia Modules (http://simms.med.nyu.edu) which includes Hollywood-quality animations of colon surgery displayed next to synchronized videos from the procedure. The cost to create a Virtual Patient program ranges from $30,000 to $250,000. Other national experts and I, through the Consortium on Medical Education Technology, have joined with the American Association of Medical Colleges and MedBiquitous to promote sharing through a database of over 100 virtual patients (http://www.aamc.org/meded/mededportal/vp) and creation of an international technical standard for exchanging virtual patient data.

Having grown up with the Internet and video games, current students and trainees expect high-quality and effective digital learning experiences with technology playing an increasingly important role in their professional lives. To meet this challenge, my lab recently launched online Collaborative Learning Portfolios with NIH funding to document and share research and learning experiences. We are connecting PDA’s to Learning Portfolios and Navigator to push just-in-time learning to the bedside. We are creating Adaptive Virtual Patients, which detect a user’s skill level and change dynamically based on his or her educational needs. Lastly, the Lab is investigating the use of video game technology and virtual worlds to create “serious games” for health education.

Dr. McGee is an Associate Professor of Medicine with the University of Pittsburgh Division of Gastroenterology, Hepatology and Nutrition and is the Assistant Dean for Medical Education Technology for the University of Pittsburgh School of Medicine. Dr. McGee also serves as the Chairman of the Web-based Education Subcommittee for the American Gastroenterological Association and the Chairman of the Consortium on Medical Education Technology for the American Association of Medical Colleges.
Arthralgias in a Patient on Infliximab

by Daniel K. Mullady, MD
Gastroenterology Fellow, Division of Gastroenterology, Hepatology and Nutrition, University of Pittsburgh

Case Presentation

A 20-year-old female with Crohn’s disease presented with diffuse arthralgias several months after starting infliximab. Two years earlier, she was diagnosed with moderate to severe ileocolonic Crohn’s disease with no extraintestinal manifestations and was treated with oral mesalamine and mesalamine enemas without improvement. Intolerant to 6-mercaptopurine (6-MP), she was maintained on oral corticosteroids for the next year. Her disease quickly went into remission on infliximab monotherapy. Shortly after her first maintenance dose, she developed total body arthralgias which recurred approximately six weeks after each infusion. Initially thought to be related to her IBD, her arthralgias recurred despite an increased dose of infliximab. She had no synovitis and had full range of joint motion. Laboratory evaluation revealed a markedly positive antinuclear antibody (ANA) titer at 1:1280 and a markedly positive anti-double-stranded DNA (anti-dsDNA). Because of concern for drug-induced lupus, infliximab was stopped. Repeat laboratory studies several weeks later revealed a persistently positive ANA and a positive anti-histone antibody, but the anti-dsDNA antibody was negative. Though arthralgias resolved, she had recurrence of abdominal pain and diarrhea similar to her initial Crohn’s disease symptoms.

Discussion

Infliximab is a chimeric monoclonal antibody to TNF which is used to treat rheumatoid arthritis and Crohn’s disease and has been approved recently for ulcerative colitis. Because it is 25 percent mouse protein, immunogenicity (antibodies to infliximab or ATI) is common but is of unclear clinical significance. In a recent study, 61 percent of patients had ATI, and those with ATI had an increased risk of infusion reactions and lower antibody titers at four weeks. Those on concomitant immunosuppressants had lower titers of ATI and higher infliximab concentrations. In a separate study, approximately 75 percent of those who lost initial response to infliximab had ATI while no continuous responders had ATI.

Infusion reactions to infliximab are categorized as immediate or delayed and immune- or non-immune-mediated (see Figure 1).

The incidence of positive ANA titers with infliximab is between 25 to 50 percent. Development of anti-dsDNA antibodies is less common. Drug-induced lupus, however, is a very rare complication of infliximab therapy. In a retrospective study of 500 patients treated with infliximab, only three patients developed an antibody profile and symptoms consistent with infliximab-induced lupus. Diagnosis should include autoantibodies as well as myalgias, arthralgias, arthritis, rash and/or fevers. The diagnostic difficulty results from a lack of diagnostic criteria for drug-induced lupus.

The relationship of this patient’s symptoms to infliximab dosing, positive serologies (especially anti-histone antibodies) and the resolution of symptoms with infliximab withdrawal suggest infliximab-induced lupus. This patient was not on an immunomodulator, predisposing her to an immune-mediated reaction. Treatment options include methotrexate and adalimumab, an entirely humanized anti-TNF which seems to be less immunogenic.

References available upon request.
Preparation for Wireless Capsule Endoscopy – Is It Necessary?

by Benjamin Siemanowski, MD
Gastroenterology Fellow, Division of Gastroenterology, Hepatology and Nutrition, University of Pittsburgh

Case Presentation

A 79-year-old white female with multiple medical problems presented with a three-day history of melena and increasing fatigue. During the prior six months, she had two similar episodes, after which upper endoscopy, colonoscopy and small bowel series did not reveal a source of gastrointestinal bleeding. Physical examination was unremarkable, with the exception of black stool found on digital rectal exam. The patient’s hemoglobin was 8.5 g/dL (baseline 10.5 g/dL). Repeat upper endoscopy and colonoscopy revealed mild gastritis and scattered diverticuli, but no source of recent bleeding. Wireless capsule endoscopy (WCE) was ordered to evaluate the small bowel as a bleeding source. Prior to the procedure, the need for bowel prep was questioned.

Preparation for WCE: Since becoming readily available in 2001, WCE has provided the ability to visualize the small intestine and has gained popularity with expanding indications. Conventional preparation requires only eight hours of fasting prior to capsule ingestion, as was used in the original studies comparing WCE to the previous gold standard, push enteroscopy. Over the past 24 months, there have been seven publications in peer reviewed journals addressing the issue of optimal preparation for WCE. The cost of preparation (Fleet’s PhosphoSoda $2, GoLytely $22) seems negligible compared to the overall cost of the procedure (WCE $728 to $1,250). Many practitioners argue that preparation for WCE subjects patients to unnecessary discomfort. However, a lack of preparation and suboptimal WCE results may subject patients to repeated invasive testing.

More importantly, does preparation improve the quality of WCE? The literature reports a 75 percent overall success rate of the capsule reaching the cecum with adequate visualization. Two retrospective studies, one using phosphosoda and one using polyethylene glycol (PEG) 4L, suggest that preparation improves the overall quality of WCE. A small, nonrandomized study showed no benefit of using 2L of PEG 16 hours prior to WCE. A randomized, prospective, controlled trial compared 40 patients prepped with 2L of PEG and 40 control patients prepped with clear liquids and NPO. Patients in the PEG arm had a statistically significant improvement in both image quality and diagnosis.

Other medications studied include simethicone and erythromycin. A recent study consecutively enrolled 18 patients to receive 80mg of simethicone 20 minutes prior to capsule ingestion with an additional 18 patients receiving no simethicone. Those receiving simethicone had a statistically significant improvement in the quality of WCE. Low cost, minimal side effect profile and ease of use make simethicone an attractive option for improving WCE quality. Erythromycin 250mg 1 hour prior to ingesting the capsule decreases the gastric emptying time of the capsule, but provided no change in image quality. Erythromycin may lead to improved ability of the capsule to reach the cecum and should be considered in patients with decreased gastric motility.

Summary: Initial data from randomized trials suggests that overall quality of the exam can be improved by using PEG solution 2L, 16 hours prior to the exam and simethicone 80 mg, 20 minutes prior to capsule ingestion.

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Improving the Impact of CME

by Barbara E. Barnes, MD, MS

Although the United States has the world’s largest and best organized system of continuing medical education (CME), common venues such as lectures and formal courses may have little impact on physician performance and patient outcomes. As consumers and payers become increasingly concerned about the quality, cost, and safety of healthcare, there is an emerging expectation that healthcare professionals not only continue to learn about new developments and standards of care but also incorporate this information into their practices.

A variety of regulatory forces are reshaping CME. Because of new American Board of Medical Specialties (ABMS) requirements for maintenance of professional competence, physicians are participating in educational activities to prepare for board examinations and to improve their performance in practice. State licensing boards are also becoming more prescriptive about education through mandates for CME in specific domains such as risk management, HIV and domestic violence. In addition, many hospital medical staffs require skills training for credentialing in certain procedures, and insurance networks are offering economic incentives for education related to quality improvement and cost containment initiatives.

In response to these environmental trends, accreditation bodies are setting expectations for CME providers to demonstrate the impact of their programs and expand CME activities. Credit can now be earned for board recertification, manuscript review, test item writing, performance improvement activities, Internet searching and learning, and committee work containing a professional development component. An innovative program launched by the American Academy of Family Practitioners known as Metric, allows physicians to earn 20 CME credits for comparing their practices to established guidelines and assessing intervention outcomes to improve care.

How can gastroenterologists improve the effectiveness of their CME activities? One strategy involves the determination of specific learning needs. Using electronic health records and data provided by health systems and insurers, it is now possible to define gaps in competency and performance that might be addressed through CME. This information can assist in selecting educational activities and topics that are most relevant to practice and that demonstrate results.

Physicians must also ensure that their CME addresses the full scope of professional competence. The ABMS and Accreditation Council for Graduate Medical Education have identified the following six core competency areas: patient care, medical knowledge, practice-based learning and improvement, systems-based practice, interpersonal and communications skills, and professionalism. Unfortunately, much CME focuses on the first two categories, ignoring many dimensions of care that impact quality, cost-effectiveness and patient satisfaction. New options and venues for CME such as quality improvement activities and team-based simulation training can be used to address the broad range of required competencies.

There is growing concern about the role of commercial interests in CME. According to the Accreditation Council for CME (ACCME), over 60 percent of CME revenue is derived from commercial support or industry-sponsored exhibits. Evidence suggesting that such relationships can affect clinical decision making has prompted calls for elimination of such funding and has spawned more stringent regulatory requirements for management of conflict of interest among CME faculty and course directors. Participants in educational activities must understand the impact of these industry relationships on content development and delivery, by avoiding undue economic incentives for participation in CME programs (such as lavish meals and entertainment) and by critically evaluating content credibility.

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GI's Impact on the Medical School Curriculum
by Patricia K. Eagon, PhD

One of the most critical missions of the Division of Gastroenterology, Hepatology, and Nutrition is each autumn’s production of the Digestion and Nutrition Course for the second year medical students. Digestion and Nutrition, or “Dig and Nut” according to the students, is a team-taught, one-month effort directed by Georgia Duker, PhD, James B. McGee, MD and myself. GI faculty contribute lectures, serve as problem-based learning (PBL) facilitators, design cases for discussion and teach review sessions with contributing faculty from the Departments of Pathology, Pediatrics, Molecular Genetics and Biochemistry, Cell Biology, and Pharmacology.

Using various learning formats including traditional lectures, several histology lectures and laboratories, pathology lectures, student-directed small group learning sessions and online case workshops, lecture notes generate a 600-page syllabus, which serves as the major student reference.

Student course ratings continue to rise each year. One of the most important course quality improvements is the Navigator website, http://navigator.medschool.pitt.edu, developed by Dr. James B. McGee (see cover story). All Navigator course materials can be viewed by both students and faculty, including lecture notes and slides, quizzes and self-teaching case workshops. Overall course success is credited to the faculty team, which contributes its time and expertise to train future physicians and physician-researchers.

Dr. Eagon is an Associate Professor of Medicine with the Division of Gastroenterology, Hepatology and Nutrition and the Department of Molecular Genetics and Biochemistry at the University of Pittsburgh.

What Is This?
Presentation: An 18-year-old woman with a history of Crohn’s disease presented with a two week history of abdominal pain and non-bloody diarrhea. She was treated with steroids for a presumed flare of Crohn’s disease with no improvement. A CT scan and colonoscopy were performed.

Images and explanation provided by Mark Lazarev, MD, a Gastroenterology Fellow with the Division of Gastroenterology, Hepatology and Nutrition at the University of Pittsburgh.

Compare your answer to Dr. Lazarev’s answer on page four.

Figure 1
CT abdomen

Figure 2
Flexible sigmoidoscopy

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