

CME Overview

Activity Date

April 2011 through April 2012

Target Audience Statement

This online CME activity is designed for gastroenterologists.

Learning Objectives (Desired Outcomes)

After participating in this activity, physicians should be better able to:

1. Apply new research on gastrointestinal pathophysiology to diagnosing the spectrum of diverticular diseases
2. Recommend appropriate dietary modification for patients with diverticular disease
3. Distinguish irritable bowel syndrome from uncomplicated diverticular disease to treat and manage patients more effectively.
5. Select the best surgical approaches for patients who present with acute diverticulitis and/or recurrent diverticulitis.
6. Select appropriate pharmacotherapy for patients with diverticular disease

Accreditation

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Credit Designation

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Commercial Support

This CME activity is supported by an educational grant from Shire.

Statement of Need/Gap Analysis

Epidemiology / Prevalence of Diverticular Disease

- Studies have reported that the majority of symptomatic patients with diverticular disease under the age of 65 were male, although the same criteria over the age of 65 were mostly women.¹
- The condition is extremely rare in Asia and Africa, especially in sub-Saharan Africa.¹
- Prevalence of diverticulosis — 10% of people over age 40; half of those over age 60; and 2/3 over age 80 have the disease.²
- Acute diverticulitis (complicated and uncomplicated) — 25% of patients diagnosed with diverticulitis for the first time present with complicated diverticulitis and nearly all require surgery; uncomplicated diverticulitis accounts for 75% of cases.²
- According to *The Burden of Digestive Diseases in the United States* (part of the National Commission on Digestive Diseases at the NIH), diverticular disease costs \$4 billion annually.²
- In 2004, diverticular disease was the fifth most common reason for ambulatory care visits, after GERD, constipation, abdominal wall hernia, and hemorrhoids.²
- Among digestive diseases, diverticular disease was also one of the most common reasons for hospitalization, with 313,000 first-listed and 815,000 all-listed diagnoses.²
- Ambulatory care visits with a diagnosis of diverticular disease increased about 18 percent between 1992–1993 and 2003–2005.²
- In 2004, there were an estimated 2.8 million prescriptions at a cost of \$100 million filled at retail pharmacies to treat diverticular disease.²

Pathophysiology of Diverticular Disease

- Research on diverticulitis shows that physicians have gained a better understanding of the pathophysiology of the disease and, as a result, can employ better strategies to diagnose, treat and manage it more effectively.^{1,3} They should be diagnosing diverticulitis earlier via CT scan. If the CT scan shows a positive result, doctors can treat the disease with antibiotics or anticholinergics and suggest dietary changes, according to Martin H. Floch, MD, clinical

professor of medicine, Yale University School of Medicine, and Editor-in-Chief of the *Journal of Clinical Gastroenterology*. Dr. Floch says physicians should use clinical findings from their examination, combined with the CT scan, to better stage the severity of the disease, enabling them to clarify decisions to prescribe more medical or surgical therapy.

Diagnosis

- According to Dr. Floch, physicians should perform CT scans to confirm or rule out extra luminal inflammation to ensure accurate diagnoses in patients who present with symptoms of diverticular disease.⁴ With the correlation of clinical physical findings, lab results and the amount of disease on the CT scan, doctors can make a more accurate evaluation of the status or the severity of disease.
- Irritable bowel syndrome often presents with overlapping symptoms of diverticular disease, adding to the challenge of determining an accurate diagnosis. In addition, the two conditions may coexist in the same patient. Appropriate classification of patients with diverticular disease is critical for selecting the best treatment options currently available.⁵
- Several studies have been done on diverticular disease in the young patient (50 years old and younger). Clinical dilemmas include whether there's a need for surgery after the 1st acute episode of diverticulitis and the fact many young patients are misdiagnosed with other conditions that mimic the symptoms of diverticular disease, which sometimes leads to unnecessary resection surgeries. The estimated incidence of diverticulitis in patients 40 years of age and younger has risen from 2% to 4% of all reported cases of diverticulitis in the 1940s to 1960s, to 4.9% to 26% in the 1980s and 1990s.^{6,7}
- Several studies report there are significantly higher operative rates in young patients with diverticulitis in comparison to older patients. However, this is complicated by the fact that diverticulitis is often initially misdiagnosed preoperatively in young patients, up to 27–88% of the time, in comparison with 14% of the time in older patients.^{6,7} Therefore, young patients may be diagnosed as having appendicitis, small bowel obstruction, or pelvic inflammatory disease.^{6,7}

Treatment

- Research shows that the standard practice of performing an elective resection after two uncomplicated diverticulitis episodes is based on old data and needs to be reevaluated.⁸ Elective resection probably should be reserved for patients who present with acute diverticular disease with perforation, since they're most at risk for high mortality rates. And strategies to identify patients truly at risk for perforation should be developed.^{8,9} Dr. Floch confirms these findings, stating that the extent of disease and comorbidities should be indications for elective resection, not simply having two uncomplicated diverticulitis episodes. Instead of choosing resection surgery, medical management should be considered.
- The role of dietary fiber in diverticular disease has changed the way physicians treat and manage the disease.^{10,11} For patients with diverticulitis, doctors should recommend limiting fiber. For patients who have no evidence of diverticulitis, physicians should recommend they increase fiber intake. But not all fiber is the same, Dr. Floch says. When physicians suspect severe inflammation or obstructive disease, the patient may tolerate some soluble fiber but not large quantities of insoluble fiber. Once the signs and symptoms of acute diverticulitis or obstructive disease have abated, then patients should return to a high intake of both soluble and insoluble fiber. In the past, doctors told patients to just eat fiber, but patients didn't know what that meant. Even dietitians, who suggested patients eat foods containing fiber, didn't fully understand the differences in the types of fiber, Dr. Floch says.
- Preliminary evidence shows that probiotics and mesalazine could play a role in the treatment and management of diverticular disease.^{12,13} Probiotics and mesalazine (theoretically an anti-inflammatory drug) may be helpful in preventing diverticulitis, Dr. Floch says, but more research needs to be done. People are using these therapies off label, but their efficacy is inconclusive. Currently, most doctors are using antibiotics (the main therapy for diverticulitis) when there's evidence of inflammation, Dr. Floch says. There's nothing new physicians should be doing with regard to antibiotics. However, the antibiotic rifaximin, a nonabsorbable antibiotic that remains in the gut, is being evaluated.

Practice guidelines

Although practice guidelines for diagnosing, treating and managing diverticular disease (complicated DD, uncomplicated DD, acute, chronic and recurrent DD, diverticulosis and diverticulitis) have been published,^{14,15} a greater understanding of the pathophysiology of the disease, new advances in diagnostic imaging and greater medical management options suggest these guidelines are outdated and must be reevaluated.^{16,17}

Core Competencies Related to Diverticular Disease

The Subspecialty Board on Gastroenterology (American Board of Internal Medicine, ABIM) considers expertise in the broad domain of gastroenterology, including hepatology, and the diagnosis and treatment of both common and rare conditions that have important consequences to patients a core competency for Board certification.

In addition, the American Board of Medical Specialties (ABMS) and the Institute of Medicine have published core competencies for physicians, including gastroenterologists.

Core Competencies adopted by the ABMS:¹⁸

- 1. Patient care.** Provide care that is compassionate, appropriate and effective treatment for health problems and to promote health.
- 2. Medical knowledge.** Demonstrate knowledge about established and evolving biomedical, clinical and cognate sciences and their application in patient care.
- 3. Practice-based learning.** Able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence and improve their practice of medicine.
- 4. Systems-based practice.** Demonstrate awareness of and responsibility to larger context and systems of healthcare. Be able to call on system resources to provide optimal care (e.g., coordinating care across sites or serving as the primary care manager when care involved multiple specialties, professions or sites).
- 5. Professionalism.** Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to diverse patient populations.
- 6. Interpersonal and communication skills.** Demonstrate skills that result in effective information exchange and teaming with patients, their families and professional associates (e.g., fostering a therapeutic relationship that is ethically sound; uses effective listening skills with nonverbal and verbal communication; working as both a team member and at times a leader).

Institute of Medicine's Core Competencies¹⁹

- 1. Provide patient-centered care** — identify, respect, and care about patients' differences, values, preferences, and expressed needs; relieve pain and suffering; coordinate continuous care; listen to, clearly inform, communicate with, and educate patients; share decision making and management; and continuously advocate disease prevention, wellness, and promotion of healthy lifestyles, including a focus on population health.
- 2. Work in interdisciplinary teams** — cooperate, collaborate, communicate, and integrate care in teams to ensure that care is continuous and reliable.
- 3. Employ evidence-based practice** — integrate best research with clinical expertise and patient values for optimum care, and participate in learning and research activities to the extent feasible.
- 4. Apply quality improvement** — identify errors and hazards in care; understand and implement basic safety design principles, such as standardization and simplification; continually understand and measure quality of care in terms of structure, process, and outcomes in relation to patient and community needs; and design and test interventions to change processes and systems of care, with the objective of improving quality.
- 5. Utilize informatics** — communicate, manage knowledge, mitigate error, and support decision-making using information technology.

Effective Education

Over the past 10 years, there has been a concerted effort to accelerate the application of knowledge to clinical practice, due in part to the rapid advancement of therapeutics. Although CME remains a trusted vehicle by which new scientific information is disseminated to physicians, research is finding that what is "learned" in educational programs is not always "used in practice."²⁰

A comprehensive report published by the Agency for Healthcare Research and Quality in February 2007 systematically reviewed the literature to determine the effectiveness of CME.²¹ According to the results, CME

activities have been shown to have positive short- and long-term effects on practice behavior objectives and are "effective at the acquisition and retention of knowledge, attitudes, skills, behaviors, and clinical outcomes."²¹ The report also found interactive CME to be more effective than non-interactive educational activities.²¹ In addition, results from the 2007 Physicians' Preferences in CME Survey, based on data collected from physician members of the American Medical Association, demonstrated that physicians rate case-based learning and question-and-answer formats more effective in motivating behavior change than other methodologies.²²

Physicians and other members of the care team have a professional responsibility and a commitment to maintain the knowledge and skills necessary to provide high-quality healthcare.²³ To this end, they must take responsibility for participating in CME and conducting periodic evaluations of their performance to demonstrate professional competence. Educational activities that focus on the key issues noted previously may be invaluable for those treating, monitoring, and educating patients with diverticular disease. Such educational activities should encourage reflection on practice as well as clinical application in order to address these issues.

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Method of Participation

To earn CME credit, a participant must read the article and complete the quiz and evaluation questionnaire, answering at least 70% of the quiz questions correctly. Participants must mail or fax a photocopy of the completed answer form (keeping a copy for their own files) to the Office of Continuing Education, Lippincott Continuing Medical Education Institute, Inc., Two Commerce Square, 2001 Market Street, 3rd floor, Philadelphia, PA 19103; fax: (215) 827-5614. Only the first entry will be considered for credit and must be postmarked or faxed by April 31, 2012. Answer sheets will be graded and certificates will be mailed to each participant. Acknowledgement will be sent to the participant within 6 to 8 weeks of receipt of the completed form.

CME Test Questions

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Test Answers. Please circle the correct choice on answer sheet below.

1. A 62-year-old man undergoes colonoscopy and is found to have isolated sigmoid colon inflammation, with mucosal friability and granularity, localized to areas of diverticulosis. The patient has been asymptomatic, aside from reports of occasional bright red rectal bleeding, and recent blood test results, including ESR, are normal. Which of the following is the most likely diagnosis?

- A. Ulcerative colitis
- B. Segmental colitis associated with diverticulosis (SCAD)
- C. Diverticulitis
- D. Ischemic colitis
- E. Symptomatic uncomplicated diverticular disease (SUDD)

2. Based on the currently available data, which of the following patients would benefit most from a trial of 5-aminosalicylic acid?

- A. A 47-year-old man with asymptomatic diverticulosis
- B. A 73-year-old woman with acute diverticulitis who would like to prevent a recurrent episode
- C. A 66-year-old man with a second episode of acute diverticulitis
- D. A 53-year-old woman with left-sided abdominal cramps, diarrhea, and mucous per rectum with recent finding of diverticulosis
- E. An 87-year-old man with acute rectal bleeding in the setting of known diverticulosis

3. In a study attempting to limit recurrent attacks of diverticulitis with probiotics, which organisms seem effective?

- 1. E. coli Nissle 2. LGG 3. L. reuteri 4. L. casei

- A. 1 & 2
- B. 1 & 4
- C. All of the above

4. Which of the following changes in colonic motility are NOT seen in patients with diverticular disease, compared with healthy individuals?

- A. Increased overall colonic motor activity in the diverticulosis-affected segment of the colon
- B. Increased colonic motor activity in response to a physiologic stimulus such as a meal
- C. Abnormal diurnal variation in colonic motor activity
- D. High-amplitude segmental phasic contractions

5. All of the following neurochemical and histopathologic changes have been reported in patients with diverticular disease EXCEPT:

- A. Reduced neuronal density in the enteric nervous system
- B. Increased sensitivity to exogenous acetylcholine, suggestive of cholinergic denervation hypersensitivity
- C. Oligoneuronal hypoganglionosis
- D. Increased numbers of interstitial cells of Cajal

6. A 65-year-old man is seen in the emergency department relating to complaints of abdominal pain. His right lower quadrant pain has worsened over the past 24 hours and initial concern is for appendiceal disease. Cross-sectional imaging reveals a normal appendix, but evidence of localized diverticular inflammation in the right colon. He has no fever, stable vital signs, and slight leukocytosis. Regarding diverticular disease, all of the following statements are true EXCEPT:

- A. Diverticulitis is usually a result of the perforation of a single diverticulum. The degree to which this perforation is contained will determine its clinical behavior and prognosis
- B. Uncomplicated diverticular disease may present with vague, left-sided lower abdominal pain with leukocytosis and fever
- C. Complicated diverticular disease may be associated with symptoms including change in bowel habits and dysuria, and may present with right-sided pain
- D. Asymptomatic diverticular disease does not require follow-up endoscopy.

7. A 60-year-old woman developed diarrhea and abdominal pain while traveling in Mexico 6 months ago. She was diagnosed with salmonella infection by stool studies and treated with antibiotics. Her diarrhea improved but did not go away. She also complained of abdominal cramping that improved with defecation. She did not have fever, chills or weight loss. Stool cultures and Clostridium difficile toxin times 3 were negative. Colonoscopy showed left-sided

diverticulosis but results were otherwise normal. Random colon biopsies were negative. What is the most likely diagnosis?

- A. Subclinical diverticulitis
- B. Recurrent salmonella infection
- C. Postinfectious irritable bowel syndrome
- D. Microscopic colitis

8. A 70-year-old man presented with intermittent diarrhea, rectal bleeding, and abdominal pain for 3 months. Three separate stool samples for culture, ova and parasites and *C. difficile* toxin were negative. Colonoscopy revealed left-sided diverticulosis, with patchy inflammation showing granular and friable mucosa of the interdiverticular mucosa. The peridiverticular mucosa was spared, so were the rectum and the proximal colon. Which of the medications below is most appropriate for the initial treatment?

- A. Mesalamine
- B. Oral steroids
- C. Ciprofloxacin
- D. Infliximab

9. A 70-year-old man presented with left-lower quadrant abdominal pain and mild hematochezia. On endoscopy he was noted to have diverticulosis with prominent mucosal folds and mild mucosal erythema. The endoscopist took 3 biopsies from the sigmoid and submitted them for histology. Which of the following is INCORRECT:

- A. The endoscopist should have sampled the endoscopically normal rectum also
- B. Endoscopic biopsies are not useful in diagnosing diverticulitis
- C. The 3 biopsies, if involved, are sufficient for making a diagnosis of Crohn's disease
- D. Granulomas are not a requirement for diagnosing Crohn's disease.

10. Changes in the bowel wall in diverticular disease include all of the following EXCEPT:

- A. Shortening of the sigmoid
- B. Increased elastin in the circular muscle
- C. Inflammation of the luminal mucosa
- D. Increased cross linking of collagen
- E. Decreased tensile strength

11. After 2 episodes of uncomplicated mild acute diverticulitis that resolved with antibiotics, a 65-year-old healthy man should be advised to have an elective sigmoid colectomy.

- A. True

B. False

12. A 60-year-old woman is admitted on a first episode of complicated diverticulitis with a 7 cm mesocolic abscesses that is treated successfully with a percutaneous drain and antibiotics producing complete resolution when seen at the clinic 3 months after discharge. She should be told that it is necessary to have a sigmoid colectomy to prevent recurrence.

- A. True
- B. False

13. Select the correct response. Current data show that probiotics in diverticular disease:

- A. Are not effective in the treatment of the disease
- B. Are effective in the treatment of the disease
- C. Are promising in preventing recurrence of the disease
- D. Are promising in preventing recurrence of the disease, but this data needs to be reinforced by further studies.

14. Circumferential wall thickening with a thumbprinting morphology involving a long segment of the colon is more consistent with:

- A. Active Crohn's disease
- B. Ischemic colitis
- C. Epiploic appendagitis

Answer Sheet: Circle the appropriate answer below

1. A B C D E

8. A B C D

2. A B C D E

9. A B C D

3. 1 2 3 4 A B C

10. A B C D E

4. A B C D

11. A B

5. A B C D

12. A B

6. A B C D

13. A B C D

7. A B C D

14. A B C

Advances in Diverticular Diseases EVALUATION FORM

Directions

Your successful completion of this activity includes evaluating it. Please indicate your response to each question below.

Please indicate how well the activity: 1 (minimally) to 5 (completely)

1 2 3 4 5

- | | |
|--|-----------|
| Was practical and relevant to my practice | ○ ○ ○ ○ ○ |
| Addressed professional competencies identified by my specialty | ○ ○ ○ ○ ○ |
| Translated evidence to practice | ○ ○ ○ ○ ○ |
| Included fair and balanced content | ○ ○ ○ ○ ○ |
| Encouraged practice enhancement | ○ ○ ○ ○ ○ |

Please rate your your ability to achieve the following objectives, both before this activity and after it: 1 (minimally) to 5 (completely)

	<u>Pre</u>		<u>Post</u>
	<u>1 2 3 4 5</u>		<u>1 2 3 4 5</u>

- | | | |
|--|-----------|-----------|
| Apply new research on gastrointestinal pathophysiology to diagnosing the spectrum of diverticular diseases | ○ ○ ○ ○ ○ | ○ ○ ○ ○ ○ |
| Recommend appropriate dietary modification for patients with diverticular disease | ○ ○ ○ ○ ○ | ○ ○ ○ ○ ○ |
| Distinguish irritable bowel syndrome from uncomplicated diverticular disease to treat and manage patients more effectively | ○ ○ ○ ○ ○ | ○ ○ ○ ○ ○ |
| Select the best surgical approaches for patients who present with acute diverticulitis and/or recurrent diverticulitis | ○ ○ ○ ○ ○ | ○ ○ ○ ○ ○ |
| Select appropriate pharmacotherapy for patients with diverticular disease | ○ ○ ○ ○ ○ | ○ ○ ○ ○ ○ |

How many of your patients with diverticular disease may be impacted by what you learned from this activity?

- <20%
 20-40%
 40-60%
 60-80%
 >80%

Will this activity help you improve your skill or judgment within the next 6 months?

1 2 3 4 5

(1 – Definitely will not improve, 5 – Definitely will improve) ○ ○ ○ ○ ○

How will you apply what you learned from this activity (mark all that apply):

- | | |
|---|--|
| In diagnosing patients <input type="radio"/> | In making treatment decisions <input type="radio"/> |
| In monitoring patients <input type="radio"/> | As a foundation to learn more <input type="radio"/> |
| In educating students and colleagues <input type="radio"/> | In educating patients and their caregivers <input type="radio"/> |
| As part of a quality or performance improvement project <input type="radio"/> | To confirm current practice <input type="radio"/> |
| For maintenance of board certification <input type="radio"/> | For maintenance of licensure <input type="radio"/> |
| In considering enrolling patients in clinical trials <input type="radio"/> | In evaluating published/presented data <input type="radio"/> |
| Other _____ | |

List at least one strategy or tool you learned from this activity that you will apply in practice.

How committed are you to applying this activity to your practice in the ways you indicated above:

1 (minimally) to 5 (completely)

1 2 3 4 5
○ ○ ○ ○ ○

What barriers may slow or prevent the application of this educational activity in your practice (mark all that apply)?

- | | | | |
|---|--|--|--|
| Lack of reimbursement <input type="radio"/> | Lack of time <input type="radio"/> | Lack of guidelines <input type="radio"/> | Lack of confidence <input type="radio"/> |
| Need for more data <input type="radio"/> | Formulary <input type="radio"/> | Patient population <input type="radio"/> | Institutional policy <input type="radio"/> |
| Lack of equipment/other resources <input type="radio"/> | Lack of staff skills <input type="radio"/> | | |
| Other _____ | | | |

