GUESTEditorial

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The Past and Future in Gastroenterology

This is the sixth of a 12-part series: This year we're focusing on the phenomenal progress that the medical community has made in the 30 years of Federal Practitioner's *existence. Each month we'll feature an editorial written by one of our Editorial Advisory Association members, reminding us how much has changed in their particular medical field over the past 30 years. This month's focus is gastroenterology.*

A mere 30 years ago I was just beginning my residency in internal medicine, and in 2009, I completed my gastroenterology fellowship training. Looking back, I am truly astounded by the advances in knowledge and practice that have occurred in gastroenterology. I am reminded of these advances every day when seeing patients, because virtually every medication I prescribe was developed over this period. Reviewing where we came from also provides a temptation for looking toward what the next 30 years will bring.

Clinicians have seen remarkable improvements in gastrointestinal (GI) diagnostic abilities over these years. Gastrointestinal endoscopy was largely developed in the 1970s and 1980s, whereas more recent developments have centered on refinements, including the development and expansion of the endoscopic ultrasound, development of high-definition video technology, refinement of endoscopic therapies for GI bleeding and mucosal resection, and the expansion of endoscopic practice to screening for colorectal cancer (CRC).[1]

Fortunately, improvements in diagnostic abilities have been accompanied by incredible improvements in treatments. This is especially true in the areas of viral hepatitis (interferon alfa and direct-acting antivirals), inflammatory bowel disease (infliximab [1998]), peptic ulcer disease (*Helicobacter pylori* [1984]), gastroesophageal reflux disease (omeprazole [1989]), and in some GI cancers (imatinib [2002]). Importantly, with these new treatments there has been a marked improvement in outcomes. For example, in the early 1990s, every Wednesday morning found me working in an esophageal dilation clinic in which would come patients with esophageal strictures from chronic reflux. Here dilations were performed, once monthly for most patients. Very soon after the first proton pump inhibitor medication, omeprazole, was approved, these patients were able to be treated more effectively, and ultimately, the dilation clinic was disbanded.

Another striking example is the progress in the ability to eradicate and essentially cure chronic viral hepatitis B and C, which together affect 500 million people worldwide.[2] Lamivudine, approved in 1994, was the first oral antiviral treatment for hepatitis B and represented a major improvement over the standard treatment of interferon alfa. Lamivudine led to a marked reduction in active hepatitis B infection but was ultimately susceptible to the development of viral resistance. Since then, a total of 7 hepatitis B antiviral medications have been approved and are generally given once daily with minimal adverse effects (AEs). These agents provide long-term suppression, but not eradication, of the virus, and are associated with markedly reduced inflammation, reduced cancer risk, and regression of cirrhosis.

In 1989, the hepatitis C virus was described, and incremental steps have continuously been made to study the virus and develop specific antiviral inhibitors. Progress in treatment began with the use of interferon alfa monotherapy (1991); followed by combination therapy with ribavirin and interferon alfa (1998); ribavirin with once weekly pegylated interferon alfa (2001); and more recently with the triple therapy combinations including the direct-acting antiviral protease inhibitors, boceprevir or telaprevir (2011). Recent data of new direct-acting antivirals that can be combined without interferon indicate an almost 100% viral eradication within 12 to 24 weeks of therapy without significant AEs.[3,4] These breakthroughs heralded the possibility of completely curing hepatitis C in the great majority of patients. From 1997 through 2009, I helped to treat more than 500 patients with chronic hepatitis C and have since followed their progress. In these patients, a sustained virologic response (SVR) of 41% was seen. Overall mortality was 7.7% in

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patients with SVR compared with 24.2% in those patients without SVR ($P < .0001$).[5] These results are highly rewarding, on par with reports from other centers, and demonstrate that viral eradication results in reduced mortality. Further challenges remain to deliver hepatitis C antiviral medications at an affordable cost to those in need.

In the last 30 years, gastroenterology has been significantly impacted by the development and practice of CRC screening. From the 1980s and early 1990s, randomized trials of fecal occult blood testing (FOBT) and case control trials of sigmoidoscopy led professional organizations to begin recommending routine screening for CRC in healthy individuals, which has evolved over time.[6-11] In 2001, Congress approved Medicare reimbursement for CRC screening. The current U.S. Preventive Services Task Force update has recommended using FOBT, sigmoidoscopy, or colonoscopy in adults, beginning at age 50 years and continuing until age 75 years.[12]

Between 1996 and 2005, there was a decline in the incidence of CRC in the U.S. in all racial and ethnic groups. Mortality also decreased in most groups.[13] This has been very encouraging, although the observed reduction in CRC incidence and mortality may be due to underlying population changes in cancer susceptibility in addition to expanded screening efforts.

Improvements in diagnostics and technology have also led to wrong turns and continuing concerns related to costs of medical care. Problems with over diagnosis and lead-time bias have caused clinicians to question the current recommendations for prostate, breast, and other cancer screenings.[14-16] Endoscopic and radiologic procedures can be overused, and controversies related to CRC screening continue, such as the proper role of colonoscopy.[17] Caution is needed when considering screening healthy populations, while clinicians look forward to the technological advances in screening methods to improve the cost/benefit balance. Efforts to work within the medical system to more carefully use diagnostic tests must continue (see www.choosingwisely.org).

Looking to the future, growth will be seen in the areas of informatics, and there should be an improved implementation of best practices. In the U.S., increasing proportions of the population will have access to routine medical care, and there should be continued incremental improvements in cost controls as well. Chronic viral hepatitis will be eradicated worldwide. There will be continued refinements in the understanding of cancer genetics and targeted therapies, and a great expansion of knowledge related to host genetic and microbiome factors that influence later disease or disease risk, as well as interventions that could reduce these risks. These improvements will enable clinicians to create personalized screening and multifactorial treatment strategies suitable for each individual. Needless to say, the future is difficult to predict, but it is certain that gastroenterology will continue to be an exciting and fast-paced specialty that will continue to significantly impact morbidity and mortality. ●

Author disclosure

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