

“Feeling the burn?”

Edward H. Nessel, R.Ph, M.S., MPH, PharmD.

Have you ever felt the discomfort of heartburn, indigestion, or acid reflux on a recurring basis and realized something's not right? Although many Masters swimmers have experienced “feeling the burn,” many do not know about the possible harmful effects of gastroesophageal reflux disease (GERD), and how to deal with this situation as a swimmer.

How is Gastroesophageal Reflux Disease (GERD) related to Masters swimming?

A majority of the USMS membership is represented by a determined, yet ever-aging group of people seeking the path to a healthy lifestyle. Not only does GERD increase in frequency with age, but swimming forces us into a prone position, which places pressure on the gastrointestinal tract, and allows an easier path for stomach acid to go back up the esophagus.

Who Suffers from GERD?

Up to 15 million Americans experience heartburn and other discomforting symptoms daily. Studies have reported that across the general population 36% to 44% of adults experience heartburn at least once a month, and 67% of those over 65 have symptoms of GERD (though not necessarily heartburn) at least monthly. Just two years ago, the largest selling prescription drug of the year was Prilosec, an acid inhibitor.

What Are The Symptoms of GERD?

The most common symptoms are heartburn (a burning sensation radiating from the stomach to the chest and throat) and regurgitation. Up to half of GERD sufferers experience dyspepsia, seen as heartburn, fullness in the stomach, and nausea after eating. The symptoms are aggravated by bending over, lifting a heavy weight, or lying down (particularly on the back), which may result in nausea and vomiting.

Chest pain can be a common symptom of GERD, and is sometimes difficult to differentiate from angina or an impending heart attack. Since both GERD and angina affect the same populations, you should see your physician if you experience chest pain.

Other symptoms of GERD include:

- (1) difficulty swallowing or choking,
- (2) the feeling of a lump of food trapped behind the sternum, which could be an esophageal spasm or a tumor.
- (3) chronic sore throat
- (4) hiccoughs
- (5) asthma

Diagnosis by an experienced physician should prevent complications from long-term untreated GERD. If symptoms are relieved with a one week trial of any of the stomach acid-inhibitors (Prilosec, Nexium, Protonix, Prevacid), it is probable that the patient is suffering from GERD. However, caution must be used, because underlying cellular changes may have occurred already.

The state-of-the-art method for determining the condition of the patient's esophagus is to perform an upper endoscopy. Biopsies are taken either from the esophagus and/or the stomach to rule out dangerous cellular changes and look for possible infecting organisms. Another diagnostic test examines the acid contents by using a probe called a pH monitor, which is inserted into the esophagus for 24 hours. This test can be especially useful when looking for a cause of nighttime asthmatic symptoms (such as wheezing, coughing, burning throat), while suffering from GERD.

What Causes GERD?

Mild temporary heartburn can happen to anyone. However, persistent gastroesophageal reflux may be due to abnormal factors. The most common scenario involves the band of smooth muscle tissue at the base of the esophagus, the lower esophageal sphincter (LES), which is responsible for closing and opening the lower end of the esophagus. The LES is essential for maintaining a pressure barrier against contents from the stomach. If it loses tone, it cannot close up completely after food empties into the stomach, thereby allowing digestive enzymes and acid to travel back into the esophagus. This situation causes the irritation found in GERD. With aging, the esophageal lining can become less sensitive to this irritation, and may sustain moderate to severe damage. If the esophagus becomes intensely inflamed, it can then lead to strictures, ulcers, and even cancer.

Other physiological factors leading to GERD include defects or injuries in the lining of the esophagus, poor motility of the stomach and duodenum, over-acidic stomach contents, and sensitivity to the other elements of digestion (enzymes, etc).

Various substances can affect the LES, causing it to lose its tone. Examples include:

- Foods such as spearmint, peppermint, onions, garlic, chocolate, acidic citrus and tomato products
- Coffee produces a double whammy. Certain aromatic oils in coffee (whether caffeinated or not) increase stomach acidity, and the caffeine acts to relax the LES.
- Alcohol relaxes the LES muscles and can also irritate the mucous membrane of the esophagus.
- Smoking relaxes LES muscle function, increases acid secretion, reduces the intestinal-lining's protective substances such as prostaglandins and bicarbonate, and decreases mucosal blood flow.
- Medications, such as asthma inhalers, sedatives, common pain relievers, some blood pressure medications, and certain heart medications such as calcium channel blockers, can increase the symptoms of GERD. Adrenaline, or medications that stimulate adrenaline release, such as pseudoephedrine, can also increase the symptoms.
- If used frequently, non-steroidal anti-inflammatories (NSAIDS) can inhibit the

protective prostaglandins and produce ulcerations in mucous membranes lining the stomach and the esophagus.

About half of asthmatic patients also have GERD, although it is not clear why. For most athletes, exercise-induced asthma does not appear to be related to GERD. However, many Masters swimmers do suffer from exercise induced asthma and GERD.

How Can One Treat GERD and Lessen Its Occurrence?

The treatment for GERD includes lifestyle changes and medication. Lifestyle and dietary changes alone can lessen the effects of GERD.

- Avoid food that relaxes the LES: caffeinated foods, chocolate, mint-flavored foods, carbonated drinks, and most spices, condiments and flavorings.
- No alcohol or smoking.
- Chew gum after eating, or when you sense reflux may be about to begin. This action produces more saliva, a known acid-neutralizer and protector of the esophageal lining.
- Avoiding tight-fitting clothing around the waist.
- If recommended by your health care practitioner, lose weight. A large belly puts undue pressure on the stomach.
- Avoid full bending at the waist, especially while lifting or moving heavy weights.
- Avoid ingesting a large amount of food before physical activity, such as swimming.
- Never go to bed right after ingesting large amounts of food and/or drink. The rule of thumb is that three hours must pass between food ingestion and bedtime.
- Elevate the head of the bed at least six inches utilizing a wedge-shaped block. Do not make the mistake of just adding a few pillows to the head, as this can actually worsen the situation.
- Sleep on your *left* side. This positions the opening of the esophagus into the stomach higher than the bulk of the food contents.

There are two main types of medications:

- **H2-blockers** interfere with the receptor sites of histamine in the gut tissue), which indirectly reduces acid production. There are four H2-blockers marketed in the U.S. for over-the-counter purchase: famotidine (Pepcid AC), cimetidine (Tagamet), ranitidine (Zantac), and nizatidine (AXID). These medications do not need to be taken with food, and are appropriate to take for night-time protection against GERD. The acid-suppressing activity lasts from six to 24 hours (Pepcid is the strongest acting), and is very useful for people who need persistent acid suppression. These medications may also prevent heartburn in people who are able to predict its occurrence. With mild symptoms, this class of drugs works in about 70% of patients. With moderate symptoms, the efficacy declines to 50%.
- **Proton-pump** or **acid-pump inhibitors** directly reduce acid by shutting down the enzymatic activation of the acid-forming cells in the lining of the stomach. These medications are stronger than the H2-blockers, and are the major league players that

keep GERD manageable. They work best when there is food in the stomach. Studies have shown that at least 93% of GERD patients are benefited by this class of drugs. The products available are omeprazole (Prilosec), lansoprazole (Prevacid), pantoprazole (Protonix), rabeprazole (Aciphex), and esomeprazole (Nexium). These medications require a prescription from your physician, and several similar new products are presently becoming available. Although these drugs can virtually eliminate many of the distressing symptoms of GERD, they can not fully control regurgitation; that has to be controlled by lifestyle modifications.

Antacids are also very important, because they help lessen the effects of excess acid in the GI tract. Readily available, inexpensive, and mostly without negative side effects, antacids can be utilized to coat the esophagus and stomach a few times per day, and specifically, when trouble may be anticipated. Gaviscon is a drug that can provide a unique beneficial function. This tablet foaming agent must be chewed and taken with water to put a protective barrier between the stomach and the esophagus; it works quite well to temporarily keep the acid in its place.

So, if you're 'feeling the burn' in a bad way, you may wish to make some of the recommended lifestyle changes outlined above. If the symptoms of GERD persist, you may wish to ask your physician about it. Resolving reflux and heartburn symptoms will not only allow you to focus on "feeling the burn" in your muscles, but it will make your swimming experience much more productive and enjoyable.

Ed Nessel is a pharmacist, biochemist, and physiologist. He has been an active member of the USMS Sports Medicine and Coaches Committees, the USMS national librarian, and a recipient of the 1998 USMS Coach of the Year Award. He is also head coach of the Rutgers University Masters Swim Team and a member of Garden State Masters.

References

1. DeVault, KR, Sastell, DO; Practice Guidelines: Updated guidelines for the diagnosis and treatment of gastroesophageal reflux disease. Am J Gastroenterol, 1999; 94: 1434-1442.
2. Pegnini, PL, Katz,PO, Bracy, NA, Castell, DO; Nocturnal recovery of gastric acid secretion with twice-daily dosing of proton pump inhibitors. Am J Gastroenterol, 1998;93: 763-767.
3. Fouad, YM, Katz,PO, Castell, DO; Oesophageal motility defects associated with nocturnal gastro-oesophageal reflux on proton pump inhibitors. Ailment Pharmacol Ther, 1999;13: 1467-1471.
4. Robinson, M, Rodriguez-Stanley, S; H₂-Receptor antagonists revisited: current role in the treatment of gastroesophageal reflux disease. CME Medscape Gastroenterology Treatment Updates.

5. Peghini, PL, Katz, PO, castell, DO; Ranitidine controls nocturnal gastric acid breakthrough on omeprazole: a controlled study in normal subjects. *Gastroenterology*, 1998; 115: 1335-1339.
6. Smith, C. Upper gastrointestinal disorders; *Applied Therapeutics: The Clinical Use of Drugs*, 6th ed. Vancouver, WA: Applied therapeutics, Inc, 1995:23.
7. Khoury, RM, Katz, PO, Hammond, R, Castell, DO; Bedtime ranitidine does not eliminate the need for a second daily dose of omeprazole to suppress nocturnal gastric pH. *Aliment Pharmacol Ther*, 1999;13: 675-678.
8. Shaver, Kay; Nocturnal acid breakthrough in patients with GERD. *Pharmacist's Letter*, detail number 170604, June, 2001.
9. Simon, Harvey, MD; Mass Gen Hosp; Editor-in-Chief, Nidus Information Services, Inc.; Heartburn: Well-Connected Report, March, 1999.
10. Bailey, Marie, MD & Katz, PO, MD; Gastroesophageal reflux disease in the elderly, *Clinical Geriatrics*, July, 2000; 64-69.
11. Weart, Wayne, Pharm.D; Opportunity for Pharmacists in Managing GERD and Peptic-Ulcer Disease, *U.S. Pharmacist (Educational Supplement)*, July, 2001; 3-15.