Chris Kresser

HEALTH *for the* 21ST CENTURY

EBOOK

Heartburn/ GERD

by CHRIS KRESSER

Heartburn/GERD

The mainstream medical approach to treating heartburn and GERD involves taking acid stopping drugs for as long as symptoms are present. Unfortunately, not only do these drugs fail to address the underlying cause of heartburn and GERD, they make it worse. This means that people who start taking acid stopping medications end up taking them for the rest of their lives.

This is a serious issue because acid stopping drugs promote bacterial overgrowth, weaken our resistance to infection, reduce absorption of essential nutrients, and increase the likelihood of developing IBS, other digestive disorders, and cancer. The pharmaceutical companies have always been aware of these risks. When acid-stopping drugs were first introduced, it was recommended that they not be taken for more than six weeks. Clearly this prudent advice has been discarded, as it is not uncommon today to encounter people who have been on these drugs for decades – not weeks.

The sad truth is that the corruption of our "disease-care" system by the financial interests of the pharmaceutical companies virtually guarantees that this crucial information will remain obscure. Drug companies make more than $7 billion a year selling acid suppressing medications. The last thing they want is for doctors and their patients to learn how to treat heartburn and GERD without these drugs. And since 2/3 of all medical research is sponsored by drug companies, it's virtually guaranteed that we won't see any large studies on the effects of a low-carb diet on acid reflux and GERD.

What is especially disturbing about this is that heartburn and GERD are easily prevented and cured by making simple dietary and lifestyle changes.

What Everybody Ought To Know (But Doesn't) About Heartburn & GERD

According to the National Institute of Diabetes and Kidney Digestive Diseases, sixty million people experience heartburn at least once a month and twenty five million experience symptoms daily. Gastroesophageal Reflux Disease (GERD), a more serious form of acid reflux, is the **most common digestive disorder** in the United States. **Studies**

show that 10-20% of individuals experience symptoms at least once a week, and prevalence of GERD is increasing steadily.

Drugs for acid reflux and GERD are cash cows for the pharmaceutical companies. More than **60 million** prescriptions for GERD were filled in 2004. Americans spent **$13 billion** on acid stopping medications in 2006. Nexium, the most popular, brought in $5.1 billion alone – making it the second highest selling drug behind Lipitor.

As sobering as those statistics are, it's likely that the prevalence of GERD is underestimated because of the availability of antacids over-the-counter. This permits patients to self-medicate without reporting their condition to a doctor.

Up until fairly recently heartburn wasn't taken too seriously. It's primarily been the butt of bad jokes about Grandma's cooking. But we now know that heartburn and GERD can have serious and even life-threatening complications, including scarring, constriction, ulceration, and ultimately, cancer of the esophagus.

Recent studies also show that the damage from poor stomach function and GERD not only extends upward to the sensitive esophageal lining, but also downward through the digestive tract, contributing to Irritable Bowel Syndrome (IBS) and other gastrointestinal problems. IBS is now the second-leading cause of missed work, behind only the common cold.

If you ask the average Joe on the street what causes heartburn, he'll tell you "too much stomach acid." That's what most of the ads seem to suggest too. I'm sure you've seen pictures for acid suppressing drugs on TV and in magazines. But there's a big problem with this theory: the incidence of heartburn and GERD increases with age, while stomach acid levels generally decline with age (Fig 1).

Numerous studies have shown that stomach acid secretion declines with age. In **one study** researchers found that over 30 percent of men and women past the age of 60 suffer from atrophic gastritis, a condition marked by little to no acid secretion. **Another study** found that 40% of women over the age of 80 produce no stomach acid at all.

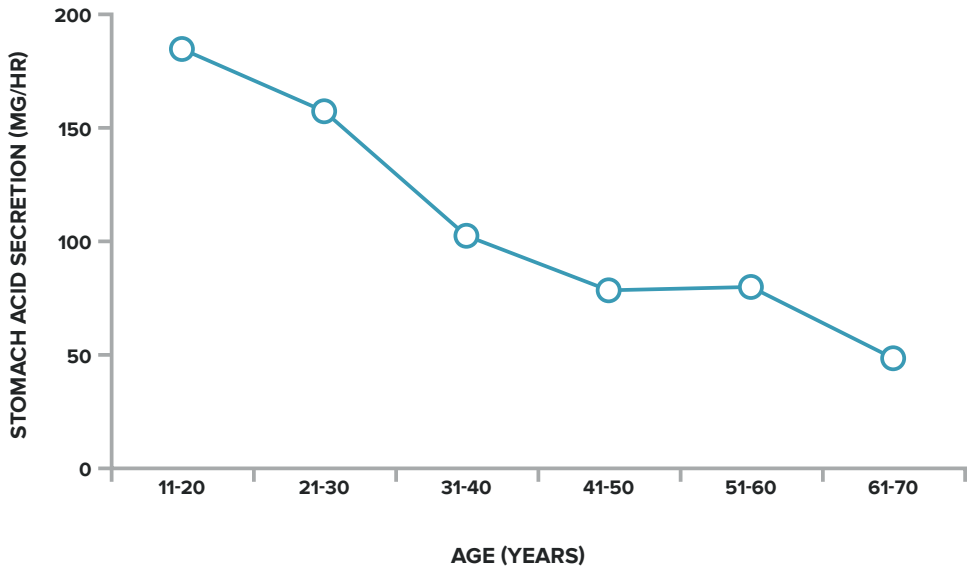


Figure 1. Mean stomach acid secretion from the second to the eighth decade. (from **Wright**, 2001 p.20)

Just as studies show acid secretion declines with age, it is also **well established** in the scientific literature that the risk of GERD increases with age. If heartburn were caused by too much stomach acid, we'd have a bunch of teenagers popping Rolaids instead of elderly folks. But of course that's the opposite of what we see.

In fact, according to Jonathan Wright, MD of the Tahoma Clinic in Washington state, when stomach acid is measured in people suffering from heartburn and GERD it is almost always low, not high. In his book **Why Stomach Acid is Good For You**, Wright explains:

> *When we carefully test people over age forty who're having heartburn, indigestion and gas, over 90 percent of the time we find inadequate acid production by the stomach.*

In Wright's 25 years of conducting these tests, he found very few people with excess stomach acid. Excess stomach acid is only found in a few rare conditions like **Zollinger-Ellison syndrome**), and GERD is hardly ever associated with too much stomach acid.

What's more, Wright and other clinicians have found that giving hydrochloric acid supplements to patients with heartburn and GERD often cures their problem:

In 24 years of nutritionally oriented practice, I've worked with thousands of individuals who've found the cause of their heartburn and indigestion to be low stomach acidity. In nearly all these folks, symptoms have been relieved and digestion improved when they've taken supplemental hydrochloric acid and pepsin capsules.

My own clinical experience confirms this. So far every patient I've had with heartburn or GERD has responded well to hydrochloric acid supplementation. We'd expect just the opposite to be true if these conditions were caused by too much stomach acid.

A SYMPTOM IS NOT A CAUSE

When I explain to patients that GERD is caused by not enough stomach acid, rather than too much, they are initially doubtful. "If that's true", they say, "then why do my antacid drugs provide relief?"

I'm not denying that the symptoms of heartburn and GERD are caused by stomach acid refluxing into the esophagus. Nor am I arguing that reducing or eliminating stomach acid with drugs doesn't relieve those symptoms.

What's crucial to understand is that any amount of acid in the esophagus is going to cause problems. That's because its delicate lining isn't protected against acid like the stomach lining is. You don't have to have excess acid in your stomach to have heartburn.

Also, symptom relief doesn't imply that the underlying cause of the problem is being addressed. Too often western medicine focuses on suppressing symptoms without paying attention to what is causing the symptom in the first place. The misguidedness of this approach is clearly demonstrated by the use of acid inhibiting drugs to treat heartburn and GERD – problems which are caused by not enough stomach acid!

As I wrote above, Americans spend more than $13 billion on acid stopping drugs each year. This expense might be justified if antacid drugs were actually curing heartburn and GERD. But just the opposite is true. Not only do these drugs fail to treat GERD, they will make the underlying condition (not enough stomach acid) worse. This virtually necessitates the lifelong use of these medications for anyone who takes them. While this is a nifty sales strategy for the drug companies, it's a bitter pill to swallow (yes, pun intended) for those suffering from heartburn and GERD.

Curing a disease means eliminating its cause. When a disease is cured, the symptoms don't return once the treatment is removed. This of course is not the case with drugs for

heartburn and GERD. As soon as the patient stops taking them, the symptoms return. And often they're worse than they were before the patient started the drug.

Unfortunately, pharmaceutical companies aren't interested in cures because they aren't profitable. It's much more lucrative to sell drugs that people have to take for the rest of their lives than it is to promote dietary or lifestyle changes that would cure the problem.

Therefore, although the drug companies are well aware that GERD isn't caused by too much stomach acid and that low stomach acid causes serious health problems and complications, they continue to sell billions of dollars worth of antacids to an unsuspecting public. Even worse, these powerful drugs are now available over-the-counter with no warnings about the dangers they present.

Note: if you think this sounds strangely like the situation with the #1 selling drug, Lipitor, you're correct. Lipitor arbitrarily lowers cholesterol across the board, even though evidence clearly indicates that high LDL cholesterol is **not the cause of heart disease**. What's more, low cholesterol is associated with **greater risk of death** in the elderly population. (For more on the cholesterol and heart disease, check out my eBook on **The Diet-Heart Myth**.)

Something is definitely wrong with our "healthcare" system when the #1 and #2 medications are actually contributing to the conditions they're supposed to treat. But I guess if you're looking at it from the standpoint of the drug companies, who are in business to make a profit, it's the perfect business model.

The hidden causes of heartburn and GERD

The idea that heartburn is caused by too much stomach acid is still popular in the media and the public. But anyone familiar with the scientific literature could tell you that heartburn and GERD are not considered to be diseases of excess stomach acid. Instead, the prevailing scientific theory is that GERD is caused by a dysfunction of the muscular valve (sphincter) that separates the lower end of the esophagus and the stomach. This is known as the lower esophageal valve, or LES.

The LES normally opens wide to permit swallowed food and liquids to pass easily into the stomach. Except for belching, this is the **only** time the LES should open. If the LES is working properly, it doesn't matter how much acid we have in our stomachs. It's not going to make it back up into the esophagus. But if the LES is malfunctioning, as it is in

GERD, acid from the stomach gets back into the esophagus and damages its delicate lining.

Here's the key point. It doesn't matter how much acid there is in the stomach. Even a small amount can cause serious damage. Unlike the stomach, the lining of the esophagus has no protection against acid.

In a **recent editorial** published in the journal Gastroenterology, the author remarked:

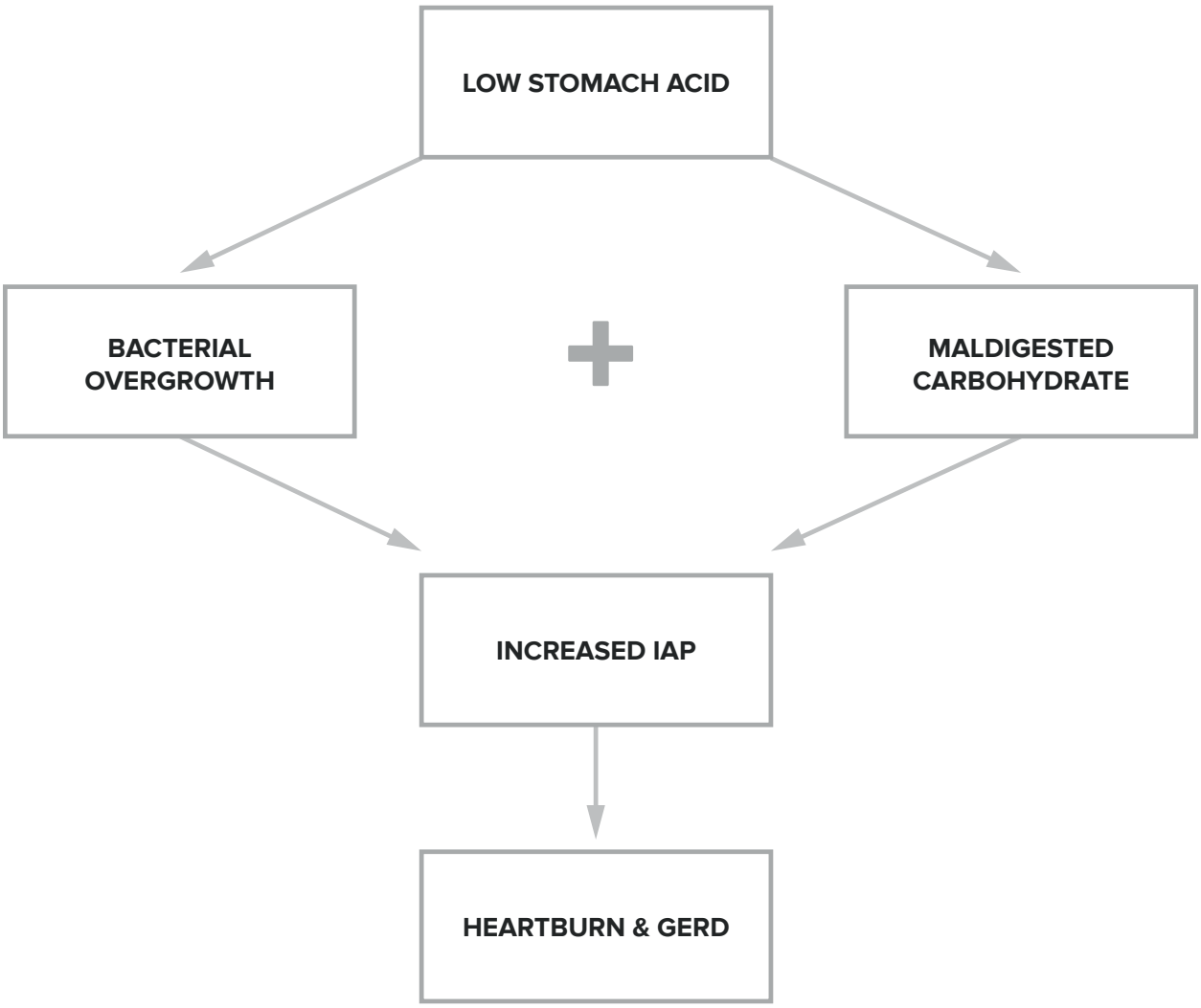
> *Treating gastroesophageal reflux disease with profound acid inhibition will never be ideal because acid secretion is not the primary underlying defect.*

I couldn't agree more. For decades the medical establishment has been directing its attention at how to reduce stomach acid secretion in people suffering from heartburn and GERD, even though it's well-known that these conditions are not caused by excess stomach acid. Instead, the question researchers should have been asking is, **"what is causing the LES to malfunction?"** Since it is universally agreed upon that this is the underlying mechanism producing the symptoms of GERD, wouldn't it make sense to focus our efforts here? That's exactly what we're going to do in this eBook.

It is well accepted in the literature that GERD is caused by an increase in intra-abdominal pressure (IAP). Acid reflux occurs when pressure causes gastric distention (stomach bloating) that pushes the stomach contents, including acid, through the LES into the esophagus. According to current thought, factors contributing to this include overeating, obesity, bending over after eating, lying down after eating, and consuming spicy or fatty foods. For example, several **studies** have indicated an association between obesity and GERD, and **this recent paper** in Gastroenterology concluded that increased intra-abdominal pressure was the causative mechanism. But while I agree that all of the currently accepted factors play a role, I do not think they are the primary causes of the increased IAP seen in GERD.

In his excellent book, **Heartburn Cured**, microbiologist Dr. Norm Robillard argues that carbohydrate malabsorption leads to bacterial overgrowth, resulting in IAP which drives reflux. Dr. Robillard makes a strong case that carbohydrate malabsorption plays a significant role in IAP, and I agree. But as I researched this issue I couldn't help asking: what might be causing the carbohydrate malabsorption in the first place, and are there any other causes of bacterial overgrowth that may precede carbohydrate malabsorption? I believe the one answer to both of those questions is low stomach

acid can contribute to both bacterial overgrowth (independently of carbohydrate intake) and carbohydrate malabsorption, as I describe below. In a nutshell, the process looks like this:



Let's look at each step in turn.

LOW STOMACH ACID CAUSES BACTERIAL OVERGROWTH

One of the chief roles of stomach acid is to inhibit bacterial overgrowth. At a pH of 3 or less (the normal pH of the stomach), most bacteria can't survive for more than 15 minutes. But when stomach acid is insufficient and the pH of the stomach rises above 5, bacteria begin to thrive. The **gastrin knockout mouse**, which is incapable of producing stomach acid, suffers from bacterial overgrowth – as well as inflammation, damage and precancerous polyps in its intestines. It is also well documented that acid-suppressing

drugs promote bacterial overgrowth. Long-term use of Prilosec, one of the most potent acid suppressing drugs, reduces the secretion of hydrochloric acid (HCL) in the stomach to near zero. In **one trial**, 30 people with GERD were treated with a high dose of Prilosec (40g/day) for at least 3 months. 11 of the 30 Prilosec-treated people had developed significant bacterial overgrowth, compared with only one of the ten people in the control group.

LOW STOMACH ACID CAUSES MALDIGESTION OF CARBOHYDRATES

Stomach acid (HCL) supports the digestion and absorption of carbohydrates by stimulating the release of pancreatic enzymes into the small intestine. If the pH of the stomach is too high (due to insufficient stomach acid), the pancreatic enzymes will not be secreted and the carbohydrates will not be broken down properly.

BACTERIAL OVERGROWTH + MALDIGESTED CARBOHYDRATES = GAS!

In **Hearburn Cured**, Dr. Robillard points out that though microbes are able to metabolize proteins and even fats, their preferred energy source is carbohydrate. The fermentation of carbohydrates that haven't been digested properly produces gas. The resulting gas increases intra-abdominal pressure, which is the driving force behind acid reflux and GERD. From Dr. Robillard's **book**:

According to Suarez and Levitt (17), 30 g of carbohydrate that escapes absorption in a day could produce more than 10,000 mL (ten liters) of hydrogen gas. That is a huge amount of gas!

When stomach acid is sufficient and carbohydrates are consumed in moderation, they are properly broken down into glucose and rapidly absorbed in the small intestine before they can be fermented by microbes. However, if stomach acid is insufficient and/or carbohydrates are consumed in excess, some of the carbs will escape absorption and become available for intestinal microbes to ferment.

Dr. Robillard also argues that if gas produced by microbial fermentation of carbohydrates causes acid reflux, we might expect that reflux could be treated by either 1) reducing bacterial overgrowth or 2) reducing carbohydrate intake. He points to two studies which demonstrate this. In a **study** by Pehl, administration of erythromycin (an antibiotic) significantly decreased esophageal reflux. In another **study** by Pennathur, erythromycin strengthened the defective lower esophageal sphincter in patients with acid reflux.

To my knowledge there have only been two small trials performed to test the effects of carbohydrate restriction on GERD. Both had positive results. A **small case series** showed a significant, almost immediate resolution of GERD symptoms in obese individuals initiating a very low-carb diet. A more recent **study** found that a very low-carb diet decreased distal esophagus acid exposure and improved the symptoms of GERD.

Perhaps most importantly, the magnitude of the improvement was similar to what has been reported with treatment with proton-pump inhibitors (acid suppressing drugs). Some researchers **now believe** that Irritable Bowel Syndrome (IBS) is caused by bacterial overgrowth in the small intestine (SIBO). A **study** performed at the GI Motility Center in Los Angeles in 2002 found that 71% of GERD patients tested positive for IBS – double the percentage seen in non-GERD patients being examined. The high prevalence of IBS in GERD patients combined with the recognition that bacterial overgrowth causes IBS is yet another line of evidence suggesting that bacterial overgrowth is also a causative factor in GERD.

To summarize, low stomach acid contributes to bacterial overgrowth in the bowel which in turn can lead to carbohydrate malabsorption (due to decreased pancreatic enzyme secretion). Malabsorption of carbohydrates, as Dr. Robillard has pointed out, increases intra-abdominal pressure and causes GERD. Reducing bacteria loads and limiting carbohydrate intake have both been shown to greatly improve, and in some cases completely cure, acid reflux and GERD.

Where Dr. Robillard and I differ is that I believe low stomach acid is the primary problem with GERD, with carbohydrate malabsorption playing a secondary role. I do think that improper digestion of proteins can, in fact, lead to GERD whereas Dr. Robillard states in his book that putrefaction of proteins is more likely to cause flatulence. This may be so in most cases, but I've seen several patients in my practice on a very low carbohydrate diet that still experience heartburn, which improves upon restoring proper stomach acid secretion.

THE CONNECTION BETWEEN GERD AND IBS

Malekzadeh & Moghaddam performed **a retrospective study** to investigate the prevalence of GERD in patients with IBS and vice versa. The data comes from a very large number of patients (6,476). To my knowledge it's the largest data set that has been reported about the overlap between GERD and IBS.

The authors found that 64% of IBS subjects studied also had GERD, whereas 34% of the GERD patients also had IBS. They also found that the prevalence of all functional symptoms (such as nausea, changes in bowel movement, headache, etc.) was higher in overlapping GERD and IBS subjects than the prevalence in GERD subjects without IBS or IBS subjects without GERD.

What this correspondence suggests, of course, is that IBS and GERD may very well share a common etiology and underlying mechanism. From the conclusion:

> *This finding shows that in overlapping GERD and IBS, other functional abnormalities of the GI tract are also highly prevalent, suggesting a common underlying dysfunction.*

The authors even speculate that the underlying cause may be an overgrowth of bacteria. Specifically, they mention H. pylori as a possible culprit. I think they're on to something!

> *Assessing the role of* H. pylori *infection in GERD and IBS patients could be a target of future research, as in the present study the prevalence of* H. pylori *infection in GERD patients was found to be greater than in non- GERD patients.*

THE ROLE OF H. PYLORI IN GERD

I believe that H. pylori infection plays a significant role in the pathogenesis of GERD and other digestive disorders.

H. pylori is the most common chronic bacterial pathogen in humans. Statistics indicate that **more than 50%** of the world population is infected. Infection rates increase with age. In general, the prevalence of infection raises 1% with every year of life. So we can expect that approximately 80% of 80 year-olds are infected with H. pylori.

Second, we know that H. pylori **suppresses stomach acid secretion**. In fact, this is how it survives in the hostile acidic environment of the stomach, which would ordinarily kill all bacteria. Treating an asymptomatic H. pylori infection with antibiotics **increases stomach acidity** and eradicating H. pylori with antibiotics **improves nearly all patients** suffering from hypochlorhydria.

Although it is commonly assumed that stomach acid production declines with age, recent studies suggest that the secretion of stomach acid doesn't decrease with age and that the trend is actually to increase, especially in men.

However, this tendency for acid secretion to increase with age is completely nullified by the corresponding increase in H. pylori infection. Since the incidence of H. pylori infection increases with age, it follows that hypochlorhydria also increases with age.

Perhaps most importantly for those taking acid suppressing drugs, researchers now believe that the initial infection with H. pylori can only take place when the acidity level in the stomach is decreased (albeit on a temporary basis). In two human inoculation experiments, infection could not be established unless the pH of the stomach was raised by use of histamine agonists. (1, 2)

If low stomach acid is a prerequisite to H. pylori infection, we might expect acid suppressing drugs to worsen current H. pylori infections and increase rates of infection. That's exactly what studies suggest. Prilosec and other acid suppressing drugs increase gastritis (inflammation of the stomach) and epithelial lesions in the corpus of the stomach in people infected with H. pylori.

A 1996 article **published** in the New England Journal of Medicine followed two groups of people who were being treated for reflux esophagitis for a period of five years. One group took Prilosec (20-40 mg/day) and the other underwent surgical repair of the LES. Among those who had documented H. pylori infections at the start of the study and who were treated with Prilosec, the rate of atrophic gastritis increased from 59 percent at the beginning of treatment to 81 percent by the end of the study. Among those who had no atrophic gastritis at the beginning of the study, 30 percent of those who took Prilosec later developed it. By contrast, just 4 percent of the surgically treated group developed atrophic gastritis.

The connection between low stomach acid, H. pylori and acid suppressing drugs kicks off another nasty vicious cycle:

Low stomach acid >>> heartburn >>> acid suppressing drugs >>> H. pylori infection >>> further reduction of stomach acid >>> chronic heartburn & GERD

The increased risk of H. pylori infection caused by acid suppressing drugs is especially significant because H. pylori infection is associated with a small but significant increase in the risk of stomach cancer.

As I mentioned before, fermentation of malabsorbed carbohydrates produces hydrogen gas in the intestines. Hydrogen gas is the preferred energy source for H. pylori. Elevated levels of hydrogen gas are also **associated** with other nasty bugs such as Salmonella, E. coli and Campylobacter jejuni, the leading cause of bacterial human diarrhea illnesses in the world.

Excessive fructose, certain types of fiber and starch, and particularly wheat increase hydrogen production, and thus increase the risk of infection by H. pylori and other pathogenic bacteria. If you'd like to avoid heartburn, GERD and the many other unpleasant symptoms associated with bacterial overgrowth, it follows that you should minimize your intake of sugars, starches and grains.

How Your Antacid Drug is Making You Sick

Believe it or not, stomach acid isn't there just to punish you for eating Indian food. Acid is in the stomach because it's supposed to be there. It is found in all vertebrates. And while it isn't necessary for life, it is certainly required for health.

Most people have no idea how many vital roles stomach acid plays in our bodies. Such misunderstanding is perpetuated by drug companies who continue to insist that stomach acid is not essential. Meanwhile, millions of people around the world are taking acid suppressing drugs that not only fail to address the underlying causes of heartburn and GERD, but put them at risk of serious (and even life-threatening) conditions.

There are four primary consequences of acid stopping drugs:

1. Increased bacterial overgrowth
2. Impaired nutrient absorption
3. Decreased resistance to infection
4. Increased risk of cancer and other diseases

To review, low stomach acid causes bacterial overgrowth in the stomach and other parts of the intestine. Bacterial overgrowth causes maldigestion of carbohydrates, which in turn produces gas. This gas increases the pressure in the stomach, causing the lower esophageal sphincter (LES) to malfunction. The malfunction of the LES allows acid from the stomach to enter the esophagus, thus producing the symptoms of heartburn and GERD.

Bacterial overgrowth has a number of other undesirable effects, including reducing nutrient absorption, increasing inflammation, and raising the risk of stomach cancer. Studies have confirmed that proton-pump inhibitors (PPIs) can profoundly alter the gastrointestinal bacterial population by suppressing stomach acid. Researchers in Italy **detected** small bowel bacterial overgrowth (SIBO) in 50% of patients using PPIs, compared to only 6% of healthy control subjects. The prevalence of SIBO increased after one year of treatment with PPIs.

Stomach acid is a prerequisite to healthy digestion. The breakdown and absorption of nutrients occurs at an optimum rate only within a narrow range of acidity in the stomach. If there isn't enough acid, the normal chemical reactions required to absorb nutrients is impaired. Over time this can lead to diseases such as anemia, osteoporosis, cardiovascular disease, depression, and more.

Stomach acid plays a key role in the digestion of protein, carbohydrates and fat. When food is eaten, the secretion of stomach acid (HCL) triggers the production of pepsin. Pepsin is the enzyme required to digest protein. If HCL levels are depressed, so are pepsin levels. As a result, proteins don't get broken down into their component amino acids and peptides. This can lead to a deficiency of essential amino acids, which in turn may lead to chronic depression, anxiety and insomnia.

At the same time, proteins that escape digestion by pepsin may end up in the bloodstream. Since this is not supposed to happen, the body reacts to these proteins as if they were foreign invaders, causing allergic and autoimmune responses. I'll discuss this more below.

We can eat the most nutritious diet imaginable, packed with vitamins, minerals and other essential nutrients, but if we aren't absorbing those nutrients we won't benefit from them.

As acid declines and the pH of the stomach increases, absorption of nutrients becomes impaired. Decades of research have confirmed that low stomach acid – whether it occurs

on its own or as a result of using antacid drugs – reduces absorption of several key nutrients such as iron, B12, folate, calcium and zinc.

Iron deficiency causes chronic anemia, which means that the body's tissues are literally starving for oxygen. In one **study**, 35 of 40 people (80 percent) with chronic iron-deficiency anemia were found to have below normal acid secretion. Iron-deficiency anemia is a well-known consequence of surgical procedures that remove the regions of the stomach where acid is produced.

Researchers have **found** that inhibition of acid secretion by Tagamet, a popular acid stopping drug, resulted in a significant reduction of iron. At the same time, **studies** have shown that adding acid has improved iron absorption in patients with achlorydia (no stomach acid production).

Vitamin B12 (cobalamin) is needed for normal nerve activity and brain function. B12 enters the body bound to animal-derived proteins. In order for use to absorb it, the vitamin molecules must first be separated from these proteins with the help of – you guessed it – stomach acid.

If stomach acid is low, B12 can't be separated from its carrier proteins and thus won't be absorbed. In one **study** of 359 people aged 69-79 years with serious atrophic gastritis, a disease characterized by low stomach acid, more than 50 percent had low vitamin B12 levels.

A number of studies have examined the negative effect of PPI therapy on B12 absorption. In a **study** on healthy subjects treated with 20 mg and 40 mg of Prilosec per day for two weeks, B12 absorption was reduced by 72% and 88% respectively.

Among other things, folate (folic acid) is vital for keeping the cardiovascular system healthy and for preventing certain birth defects. Low stomach acid levels can interfere with folate absorption by raising the pH in the small intestine. At the same time, when folate is given to achlorydric patients (with no stomach acid) along with an HCL supplement, absorption of the vitamin **increases by 54 percent**.

Both Tagamet and Zantac reduced folate absorption in **another study**, though the reduction in the Zantac group was not statistically significant. The overall reduction of folate absorption was sixteen percent. This modest reduction is probably not enough to

harm a healthy person consuming adequate levels of folate, but it may cause problems in those with folate deficiency (relatively common) or other health problems.

Calcium makes our bones and teeth strong and is responsible for hundreds, if not thousands, of other functions in our body. The importance of stomach acid in the absorption of calcium has been known since the 1960s, when one group of researchers **noted** that some ulcer patients were barely absorbing any calcium at all (just 2 percent). When they investigated they found that these subjects had a high gastric pH (6.5) and very little stomach acid. However, when the researchers gave them HCL supplements, lowering the pH to 1, calcium absorption rose five-fold.

Zinc takes part in several metabolic processes related to keeping cell membranes stable, forming new bone, immune defense, night vision, and tissue growth. In one **controlled trial**, Tagamet treatment reduced zinc absorption by about 50 percent. Another **study** found that Pepcid, which raises intragastric pH to over 5, had the same effect.

Although there is little systemic research on the absorption of other nutrients, there is good reason to believe that low acid levels may also effect levels of vitamin A, vitamin E, thiamine (vitamin B1), riboflavin (vitamin B2), and niacin (vitamin B3). Theoretically, the absorption of any nutrient that is bound to protein will be inhibited (**PDF**).

OUR FIRST LINE OF DEFENSE

The mouth, esophagus and intestines are home to between 400-1,000 species of bacteria. However, a healthy stomach is normally almost completely sterile. Why? Because stomach acid kills bacteria.

In fact, that's one of it's most important roles: to provide a two-way barrier that protects the stomach from pathogenic bacteria. First, stomach acid prevents harmful bacteria that may be present in the food or liquid we consume or the air we breathe from entering the intestine. At the same time, stomach acid also prevents normal bacteria from the intestines to move into the stomach and esophagus, where they could cause problems.

The low pH (high acid) environment of the stomach is one of the major non-specific defense mechanisms of the body. When the pH of the stomach is 3 or lower, the normal between-meal "resting" level, bacteria don't last more than fifteen minutes. But as the pH rises to 5 or more, many bacterial species can avoid the acid treatment and begin to thrive.

Unfortunately, this is exactly what happens when you take acid stopping drugs. Both Tagamet and Zantac **significantly raise** the pH of the stomach from about 1 to 2 before treatment to 5.5 to 6.5 after, respectively.

Prilosec and other PPIs are even worse. Just one of these pills is capable of reducing stomach acid secretion by 90 to 95 percent for the better part of a day. Taking higher or more frequent doses of PPIs, as is often recommended, produces a state of achlorydia (virtually no stomach acid). In a **study** of ten healthy men aged 22 to 55 years, a 20 or 40 mg dose of Prilosec reduced stomach acid levels to near-zero.

A stomach without much acid is in many ways a perfect environment to harbor pathogenic bacteria. It's dark, warm, moist, and full of nutrients. Most of the time these bacteria won't kill us – at least not right away. But some of them can. People who have a gastric pH high enough to promote bacterial overgrowth are more vulnerable to serious bacterial infections.

A recent systematic review of gastric acid-suppressive drugs suggested that they do in fact increase susceptibility to infections (**PDF**). The author found evidence that using acid stopping drugs can increase your chances of contracting the following nasty bugs:

- Salmonella
- Campylobacter
- Cholera
- Listeria
- Giardia
- C. Difficile

Other studies have found that acid stopping drugs also increase the risk for:

- **Pneumonia**
- **Tuberculosis**
- **Typhoid**
- **Dysentery**

Not only do acid stopping drugs increase our susceptibility to infection, they weaken our immune system's ability to fight off infections once we have them. In Vitro **studies** have

shown that PPIs impair neutrophil function, decrease adhesion to endothelial cells, reduce bactericidal killing of microbes, and inhibit neutrophil phagocytosis and phagolysosome acidification.

A GATEWAY TO OTHER SERIOUS DISEASES

A decline in acid secretion with age has been well documented. As recently as 1996, a British physician **noted** that age-related stomach acid decline is due to a loss of the cells that produce the acid. This condition is called atrophic gastritis.

In particular relevance to our discussion here, atrophic gastritis (a condition where stomach acid is very low) is associated with a wide range of serious disorders that go far beyond the stomach and esophagus. These include:

- Stomach cancer
- Allergies
- Bronchial asthma
- Depression, anxiety, mood disorders
- Pernicious anemia
- Skin diseases, including forms of acne, dermatitis, eczema, and urticaria
- Gall bladder disease (gallstones)
- Autoimmune diseases, such as Rheumatoid arthritis and Graves disease
- Irritable bowel syndrome (IBS), Crohn's disease (CD), Ulcerative colitis (UC)
- Chronic hepatitis
- Osteoporosis
- Type 1 diabetes

And let's not forget that low stomach acid can cause heartburn and GERD!

STOMACH CANCER

Atrophic gastritis is a major risk factor for stomach cancer. H. pylori is the leading cause of atrophic gastritis. Acid suppressing drugs worsen H. pylori infections and increase rates of infection.Therefore, it's not a huge leap to suspect that acid suppressing drugs increase the risk of stomach cancer in those infected with H. pylori.

In a recent editorial, Julie Parsonnet, M.D. of Stanford University Medical School writes:

In principle, current [acid suppressing drug] therapies might be advancing the cancer clock by converting relatively benign gastric inflammation into a more destructive, premalignant process.

One way PPIs increase the risk of cancer is by inducing hypergastrinemia, a condition of above-normal secretion of the hormone gastrin. This is a potentially serious condition that has been **linked** to adenocarcinoma – a form of stomach cancer.

Taking a standard 20 mg daily dose of Prilosec typically **results** in up to a three-to-fourfold increase in gastrin levels. In people whose heartburn fails to respond to the standard dose, long-term treatment with doses as high as 40 or 60 mg has **produced** gastrin levels as much as tenfold above normal.

Another theory of what causes stomach cancer involves elevated concentration of nitrites in the gastric fluid. In a healthy stomach, ascorbic acid (vitamin C) removes nitrite from gastric juice by converting it to nitric oxide. However, this process is dependent upon the pH of the stomach being less than 4. As I discussed earlier in this eBook, most common acid stopping medications have no trouble increasing the pH of the stomach to 6 or even higher.

Therefore, it's entirely plausible that acid stopping medications increase the risk of stomach cancer by at least two distinct mechanisms.

GASTRIC AND DUODENAL ULCERS

An **estimated** 90% of duodenal (intestinal) and 65% of gastric ulcers are caused by H. pylori. It is also recognized that the initial H. pylori infection probably only takes place when the acidity of the stomach is decreased. In a human inoculation **experiment**, infection could not be established unless the pH of the stomach was raised (thus lowering the acidity) by use of histamine antagonists.

By lowering stomach acid and increasing stomach pH, acid suppressing drugs increase the risk of H. pylori infection and subsequent development of duodenal or gastric ulcers.

IRRITABLE BOWEL SYNDROME, CROHN'S DISEASE AND ULCERATIVE COLITIS

Adenosine is a **key mediator** of inflammation in the digestive tract, and high extracellular levels of adenosine suppress and resolve chronic inflammation in both Crohn's disease

and ulcerative colitis. Chronic use of PPIs has been **shown** to decrease extracellular concentration of adenosine, resulting in an increase in inflammation in the digestive tract. Therefore, it is possible that long-term use of acid stopping medications may predispose people to developing serious inflammatory bowel disorders.

It has become increasingly **well established** that irritable bowel syndrome (IBS) is caused at least in part by small bowel bacterial overgrowth (SIBO). It is also well known that acid suppressing drugs contribute to bacterial overgrowth, as I explained earlier. It makes perfect sense, then, that chronic use of acid suppressing drugs could contribute to the development of IBS in those that didn't previously have it, and worsen the condition in those already affected.

DEPRESSION, ANXIETY AND MOOD DISORDERS

While there is no specific research (that I am aware of) linking acid suppressing drugs to depression or mood disorders, a basic understanding of the relationship between protein digestion and mental health suggests that there may be a connection.

During the ingestion of food stomach acid secretion triggers the release of pepsin. Pepsin is the enzyme responsible for breaking down protein into its component amino acids and peptides (two or more linked amino acids). Essential amino acids are called "essential" because we cannot manufacture them in our bodies. We must get them from food.

If pepsin is deficient, the proteins we eat won't be broken down into these essential amino acid and peptide components. Since many of these essential amino acids, such as phenylalanine and tryptophan, play a crucial role in mental and behavioral health, low stomach acid may predispose people towards developing depression, anxiety or mood disorders.

AUTOIMMUNE DISEASES

Low stomach acid and consequent bacterial overgrowth cause the intestine to become permeable, allowing undigested proteins to find their way into the bloodstream. This condition is often referred to as "leaky gut syndrome". Salzman and colleagues have **shown** that both transcellular and paracellular intestinal permeability are substantially increased in atrophic gastritis sufferers compared to control patients.

When undigested proteins end up in the bloodstream, they are considered as "foreign" by the immune system. The resulting immune response is similar to what happens when

the body mobilizes its defenses (i.e. T cells, B cells and antibodies) to eradicate a viral or bacterial infection.

This type of immune response against proteins we eat contributes to food allergies. A similar mechanism that is not fully understood predisposes people with a leaky gut to develop more serious autoimmune disorders such as lupus, rheumatoid arthritis, type 1 diabetes, Graves disease, and inflammatory bowel disorders like Crohn's and ulcerative colitis.

The connection between rheumatoid arthritis (RA) and low stomach acid in particular has been well established in the literature. Examining the stomach contents of 45 RA patients, Swedish researchers **found** that 16 (36 percent) had virtually no stomach acid. Those people who had suffered from RA the longest had the least acid. A group of Italian researchers also **found** that people with RA have an extremely high rate of atrophic gastritis associated with low stomach acid when compared with normal individuals.

ASTHMA

In the last ten years, more than four hundred scientific articles concerned with the connection between asthma and gastric acidity have been published. One of the most common features of asthma, in addition to wheezing, is gastroesophageal reflux. It is **estimated** that between up to 80 percent of people with asthma also have GERD. Compared with healthy people, those with asthma also have **significantly more** reflux episodes and more acid-induced irritation of their esophageal lining.

When acid gets into the windpipe, there is a **tenfold drop** in the ability of the lungs to take in and breathe out air. Physicians who are aware of this association have begun prescribing acid stopping drugs to asthma patients suffering from GERD. While these drugs may provide temporary symptomatic relief, they do not address the underlying cause of the LES dysfunction that permitted acid into the esophagus in the first place.

In fact, there is every reason to believe that acid suppressing drugs make the underlying problem (too little stomach acid and overgrowth of bacteria) worse, thus perpetuating and exacerbating the condition.

As I have mentioned, heartburn and GERD are caused by too little – and not too much – stomach acid. Unfortunately, insufficient stomach acid is also associated with bacterial overgrowth, impaired nutrient absorption, decreased resistance to infection, and

increased risk of stomach cancer, ulcers, IBS and other digestive disorders, depression and mood disorders, autoimmune disease, and asthma.

Chronic use of acid stopping medication dramatically reduces stomach acid, thus increasing the risk of all of these conditions. What's more, acid suppressing medications not only do not address the underlying cause of heartburn and GERD, they make it worse. Is the temporary symptom relief these drugs provide worth the risk? That's something only you can decide.

Get Rid of Heartburn and GERD Forever in Three Simple Steps

Now, I'm going to discuss three steps to treating heartburn and GERD without drugs. These same three steps will also prevent these conditions from developing in the first place, and keep them from returning once they're gone.

To review, heartburn and GERD are not caused by too much stomach acid. They are caused by too little stomach acid and bacterial overgrowth in the stomach and intestines. Therefore successful treatment is based on restoring adequate stomach acid production and eliminating bacterial overgrowth.

This can be accomplished by following the "**three Rs**" of treating heartburn and GERD naturally:

1. **Reduce** factors that promote bacterial overgrowth and low stomach acid.
2. **Replace** stomach acid, enzymes and nutrients that aid digestion and are necessary for health.
3. **Restore** beneficial bacteria and a healthy mucosal lining in the gut.

REDUCE FACTORS THAT PROMOTE BACTERIAL OVERGROWTH AND LOW STOMACH ACID

A high carbohydrate diet promotes bacterial overgrowth. Bacterial overgrowth – in particular H. pylori – can suppress stomach acid. This creates a vicious cycle where bacterial overgrowth and low stomach acid reinforce each other in a continuous decline of digestive function.

It follows, then, that a low-carb (LC) diet would reduce bacterial overgrowth. To my knowledge there have only been two small studies done to test this hypothesis. The results in both studies were overwhelmingly positive.

The first **study** was performed by Yancy and colleagues at Duke University. They enrolled five patients with severe GERD that also had a variety of other medical problems, such as diabetes. Each of these patients had failed several conventional GERD treatments before being enrolled in the study. In spite of the fact that some of these patients continued to drink, smoke and engage in other GERD-unfriendly habits, in every case the symptoms of GERD were completely eliminated within one week of adopting a very low carbohydrate (VLC) diet.

The second study (**PDF**) was performed by Yancy and colleagues a few years later. This time they examined the effects of a VLC diet on eight obese subjects with severe GERD. They measured the esophageal pH of the subjects at baseline before the study began using something called the Johnson-DeMeester score. This is a measurement of how much acid is getting back up into the esophagus, and thus an objective marker of how much reflux is occurring. They also used a self-administered questionnaire called the GSAS-ds to evaluate the frequency and severity of 15 GERD-related symptoms within the previous week.

At the beginning of the diet, five of eight subjects had abnormal Johnson-DeMeester scores. All five of these patients showed a substantial decrease in their Johnson-DeMeester score (meaning less acid in the esophagus). Most remarkably, the magnitude of the decrease in Johnson-DeMeester scores is similar to what is reported with PPI treatment. In other words, in these five subjects a very low carbohydrate diet was just as effective as powerful acid suppressing drugs in keeping acid out of the esophagus.

All eight individuals had evident improvement in their GSAS-ds scores. The GSAS-ds scores decreased from 1.28 prior to the diet to 0.72 after initiation of the diet. What these numbers mean is that the patients all reported significant improvement in their GERD related symptoms. Therefore, there was both objective (Johnson-DeMeester) and subjective (GSAS-ds) improvement in this study.

It's important to note that obesity is an independent risk factor for GERD, because it increases intra-abdominal pressure and causes dysfunction of the lower esophageal sphincter (LES). The advantage to a low-carb diet as a treatment for GERD for those who are overweight is that LC diets are also very effective for promoting weight loss.

I don't recommend VLC diets for extended periods of time, as they are unnecessary for most people. Once you have recovered your digestive function, a diet low to moderate in carbohydrates should be adequate to prevent a recurrence of symptoms.

An alternative to a VLC is something called a "**specific carbohydrate diet**" (SCD), or the **GAPS diet**. In these two approaches it is not the amount of carbohydrates that is important, but the type of carbohydrates. The theory is that the longer chain carbohydrates (disaccharides and polysacharides) are the ones that feed bad bacteria in our guts, while short chain carbohydrates (monosacharides) don't pose a problem. In practice what this means is that all grains, legumes and starchy vegetables should be eliminated, but fruits and certain non-starchy root vegetables (winter squash, rutabaga, turnips, celery root) can be eaten. These are not "low-carb" diets, per se, but there is reason to believe that they may be just as effective in treating heartburn and GERD.

Another alternative to VLC that I increasingly use in my clinic is the Low FODMAP diet. FODMAPs are certain types of carbohydrates that are poorly absorbed by some people, particularly those with an overgrowth of bacteria in the small intestine (which, as you now know, tends to go hand-in-hand with heartburn). See **this article** and **my book** for more information.

Be careful to avoid the processed low-carb foods sold in supermarkets. These foods contain many additives, preservatives, and other artificial ingredients that can make your digestive symptoms even worse. Instead, I recommend following a whole foods, "paleo" approach to nutrition that I outline extensively in **my book**, as well as throughout **my website**. You can also check out the **Personal Paleo Launchpad** for additional recommendations on using a whole foods diet to help address digestive issues like GERD.

Fructose and artificial sweeteners have been shown to increase bacterial overgrowth. Artificial sweeteners should be completely eliminated, and fructose (in processed form especially) should be reduced.

High fiber diets and bacterial overgrowth are a particularly dangerous mix. Remember, Almost **all of the fiber and approximately 15-20% of the starch** we consume escape absorption. Carbohydrates that escape digestion become food for intestinal bacteria.

Prebiotics, which can be helpful in re-establishing a healthy bacterial balance in some patients, should probably be avoided in patients with heartburn and GERD. Several

studies **show** that fructo-oligosaccharides (prebiotics) increase the amount of gas produced in the gut.

The other problem with fiber is that it can bind with nutrients and remove them from the body before they have a chance to be absorbed. This is particularly problematic in GERD sufferers, who may already be deficient in key nutrients due to long term hypochlorydria (low stomach acid).

We've already discussed the possible relationship between H. pylori and GERD. While I think it's a contributing factor in some cases, the question of whether and how to treat it is less clear. There is some evidence that H. pylori is a normal resident on the human digestive tract, and even plays some protective and health-promoting roles. If this is true, complete eradication of H. pylori may not be desirable. Instead, a LC or specific carbohydrate diet is probably a better choice as it will simply reduce the bacterial load and bring the gut flora back into a state of relative balance.

The exception to this may be in serious or long-standing cases of GERD that aren't responding to a VLC or LC diet. In this situation, it may be worthwhile to get tested for H. pylori and treat it more aggressively.

Dr. Wright, author of **Why Stomach Acid is Good For You**, suggests using mastic (a resin from a Mediterranean and Middle Eastern variety of pistachio tree) to treat H. pylori. A 1998 in vitro **study** in the New England Journal of Medicine showed that mastic killed several strains of H. pylori, including some that were resistant to conventional antibiotics. Studies since then, including in vivo experiments, have shown mixed results. Mastic may be a good first-line therapy for H. pylori, with antibiotics as a second choice if the mastic treatment isn't successful.

REPLACE STOMACH ACID, ENZYMES AND NUTRIENTS THAT AID DIGESTION AND ARE NECESSARY FOR HEALTH

If you have an open-minded doctor, or one that is aware of the connection between low stomach acid and GERD, ask her to test your stomach acid levels. The test is quite simple. A device called a Heidelberg capsule, which consists of a tiny pH sensor and radio transmitter compressed into something resembling a vitamin capsule, is lowered into the stomach. When swallowed, the sensors in the capsule measure the pH of the

stomach contents and relay the findings via radio signal to a receiver located outside the body.

In cases of mild to moderate heartburn, actual testing for stomach acid production at Dr. Wright's Tahoma clinic shows that hypochlorydria occurs in over 90 percent of thousands tested since 1976. In these cases, replacing stomach acid with HCL supplements is almost always successful.

Although testing actual stomach acid levels is preferable, it is not strictly necessary. There is a reasonably reliable, "low-tech" method that can be performed at home to determine whether HCL supplementation will provide a benefit. To do this test, pick up some HCL capsules that contain pepsin or acid-stable protease. HCL should always be taken with pepsin or acid-stable protease because it is likely that if the stomach is not producing enough HCL, it is also not producing enough protein digesting enzymes.

Note: HCL should never be taken (and this test should not be performed) by anyone who is also using any kind of anti-inflammatory medication such as corticosteroids (e.g. predisone), aspirin, Indocin, ibuprofen (e.g. Motrin, Advil, etc.) or other NSAIDS. These drugs can damage the GI lining that supplementary HCL might aggravate, increasing the risk of gastric bleeding or ulcer.

To minimize side effects, start with one 650 mg capsule of HCL w/pepsin in the early part of each meal. If there are no problems after two or three days, increase the dose to two capsules at the beginning of meals. Then after another two days increase to three capsules. Increase the dose gradually in this stepwise fashion until you feel a mild burning sensation. At that point, reduce the dosage to the previous number of capsules you were taking before you experienced burning and stay at that dosage. Over time you may find that you can continue to reduce the dosage, or you may also find that you may need to increase the dosage.

In Dr. Wright's clinic, most patients end up at a dose of 5-7 650 mg capsules. In my experience, this dose is too high for many people. In fact, some have trouble with even a single 650 mg capsule. I've also found that the addition of cholagogues (agents which promote bile flow from the gall bladder into the small intestine) and pancreatic enzymes can help tremendously, especially in the initial stages.

For these reasons, I created by own combination of HCL and enzymes called the **AdaptaGest Duo**. AdaptaGest Core contains acid-stable protease (to support protein

digestion and complement HCL), cholagogues, and enzymes. AdaptaGest Flex contains HCL, but in a lower dose (200 mg per capsule) than is typical for standalone HCL products. This allows better fine-tuning of your HCL dosage. In my clinic, I prescribe AdaptaGest Duo for anyone struggling with heartburn and other digestive issues related to low stomach acid production. If you'd like to try it, you can order it **here**.

Another way to stimulate acid production in the stomach is by taking bitter herbs. "Bitters" have been used in traditional cultures for thousands of years to stimulate and improve digestion. More recently, studies have confirmed the ability of bitters to increase the flow of digestive juices, including HCL, bile, pepsin, gastrin and pancreatic enzymes. 1

Unsurprisingly, there aren't many clinical studies evaluating the therapeutic potential of unpatentable and therefore unprofitable bitters. However, in one uncontrolled study in Germany, where a high percentage of doctors prescribe herbal medicine, gentian root capsules provided dramatic relief of GI symptoms in 205 patients.

The following is a list of bitter herbs commonly used in Western and Chinese herbology:

- Barberry bark
- Caraway
- Dandelion
- Fennel
- Gentian root
- Ginger
- Globe artichoke
- Goldenseal root
- Hops
- Milk thistle
- Peppermint
- Wormwood
- Yellow dock

Bitters are normally taken in very small doses – just enough to evoke a strong taste of bitterness. Kerry Bone, a respected Western herbalist, suggests 5 to 10 drops of a 1:5 tincture of the above herbs taken in 20 mL of water.

An even better option is to see a licensed herbalist who can prescribe a formula containing several of the herbs above as appropriate for your particular condition.

Apple cider vinegar, lemon juice, raw (unpasteurized) sauerkraut and pickles are other time-tested, traditional remedies that often relieve the symptoms of heartburn and GERD. However, although these remedies may resolve symptoms, they do not increase nutrient absorption and assimilation to the extent that HCL supplements do. This may be important for those who have been taking acid suppressing drugs for a long period.

It is also important to avoid consuming liquid during meals. Water is especially problematic, because it literally dilutes the concentration of stomach acid. A few sips of wine is probably fine, and may even be helpful.

Finally, for those who have been taking acid stopping drugs for several years, it may be necessary to replace the nutrients that are not absorbed without sufficient stomach acid. These include B12, folic acid, calcium, iron and zinc. It's best to get your levels tested by a qualified medical practitioner, who can then help you replace them through nutritional changes and/or supplementation.

RESTORE BENEFICIAL BACTERIA AND A HEALTHY MUCOSAL LINING IN THE GUT

Because bacterial overgrowth is a major factor in heartburn and GERD, restoring a healthy balance of intestinal bacteria is an important aspect of treatment. Along with performing several other functions essential to digestive health, beneficial bacteria (probiotics) protect against potential pathogens through "competitive inhibition" (i.e. competing for resources).

Researchers in Australia have **shown** that probiotics are effective in reducing bacterial overgrowth and altering fermentation patterns in the small bowel in patients with IBS. Probiotics have also been **shown** to be effective in treating Crohn's disease, ulcerative colitis, and other digestive conditions.

Probiotics have also been shown to **significantly increase cure rates** of treatment for H. pylori. In my practice I always include a probiotic along with the anti-microbial treatment I do for H. pylori.

I am often asked what type of probiotics I recommend. First, whenever possible I think we should always attempt to get the nutrients we need from food. This is also true for probiotics. Fermented foods have been consumed for their probiotic effects for thousands of years. What's more, contrary to popular belief and the marketing of

commercial probiotic manufacturers, foods like yogurt and kefir generally have a much higher concentration of beneficial microorganisms than probiotic supplements do.

For example, even the most potent commercial probiotics claim to contain somewhere between one and five billion microorganisms per serving. (I say "claim" to contain because independent verification studies have shown that most commercial probiotics do not contain the amount of microorganisms they claim to.) Contrast that with a glass of homemade kefir, a fermented milk product, contains as many as **5 trillion** beneficial microorganisms!

What's more, fermented milk products like kefir and yogurt offer more benefits than beneficial bacteria alone, including minerals, vitamins, protein, amino acids, L-carnitine, fats, CLA, and antimicrobial agents. Studies have even **shown** that fermented milk products can improve the eradication rates of *H. pylori* by 5-15%.

The problem with fermented milk products in the treatment of heartburn and GERD, however, is that milk is relatively high in carbohydrates. This may present a problem for people with severe bacterial overgrowth. However, relatively small amounts of kefir and yogurt are therapeutic and may be well tolerated. It's best to make kefir and yogurt at home, because the microorganism count will be much higher. **Lucy's Kitchen Shop** sells a good home yogurt maker, and **Dom's Kefir site has** exhaustive information on all things kefir. If you do buy the home yogurt maker, I suggest you also buy the glass jar that Lucy's sells to make it in (rather than using the plastic jar it comes with).

If dairy doesn't work for you, but you'd like to get the benefits of kefir, you can try making water kefir. Originating in Mexico, water kefir grains (also known as sugar kefir grains) allow for the fermentation of sugar water or juice to create a carbonated lacto-fermented beverage. You can buy water kefir grains from **Cultures for Health**.

Another option is to eat non-dairy (and thus lower-carb) unpasteurized (raw) sauerkraut and pickles and/or drink a beverage called **kombucha**. Raw sauerkraut can **easily be made at home**, or sometimes found at farmer's markets. Bubbies brand raw pickles are sold at health food stores, as is kombucha, but both of these can also be made quite easily at home.

All of that said, probiotic supplements are sometimes necessary and can play a crucial role in treatment and recovery. But not all probiotics are created alike, and in the case of small intestinal bacterial overgrowth (or SIBO, which is commonly present with GERD),

certain probiotics may make things worse. SIBO often involves an overgrowth of microorganisms that produce a substance called D-lactic acid. Unfortunately, many commercial probiotics contain strains (like Lactobacillus acidophilus) that also produce D-lactic acid. That makes most commercial probiotics a poor choice for people with SIBO.

Soil-based organisms do not produce significant amounts of D-lactic acid, and are a better choice for this reason. In my clinic, I use a product called Prescript Assist when treating SIBO and GERD. You can purchase it **here**. Other popular choices include Gut Pro from Organic 3 and D-Lactate Free Powder from Custom Probiotics. I used these in the past, but have much better success with Prescript Assist so I now use that exclusively.

Restoring a healthy gut lining is another important part of recovering from heartburn and GERD. Chronic stress, bacterial overgrowth, and certain medications such as steroids, NSAIDs and aspirin can damage the lining of the stomach. Since it is the mucosal lining of the stomach that protects it from its own acid, a damaged stomach lining can cause irritation, pain and ultimately, ulcers.

Homemade bone broth soups are effective in restoring a healthy mucosal lining in the stomach. Bone broth is rich in collagen and gelatin, which have been **shown** to benefit people with ulcers. It's also high in proline, a non-essential amino acid that is an important precursor for the formation of collagen. Bone broth also contains glutamine, an important metabolic fuel for intestinal cells that has been **shown** to benefit the gut lining in animal studies. See **this article** and **this one** for more information about the healing power of bone broth, and how to make it.

Although I prefer obtaining nutrients from food whenever possible, , as I explained above, supplements are sometimes necessary – especially for short periods. Deglycyrrhizinated licorice (DGL) has been **shown** to be effective in treating gastric and duodenal ulcers, and works as well in this regard as Tagamet or Zantac, with far fewer side effects and no undesirable acid suppression. In animal studies, DGL has even been **shown** to protect the stomach lining against damage caused by aspirin and other NSAIDs.

DGL works by raising the concentration of compounds called prostaglandins, which promote mucous secretion, stabilize cell membranes, and stimulate new cell growth – all of which contributes to a healthy gut lining. Both chronic stress and use of NSAIDs suppress prostaglandin production, so it is vital for anyone dealing with any type of

digestive problem (including GERD) to find ways to manage their stress and avoid the use of NSAIDs as much as possible.

There may be some cases when an entirely natural approach is not enough. When there is tissue damage in the esophagus, for example, a surgical procedure called "gastroplication" which repairs the LES valve may be necessary. These procedures don't have the potential to create nutrient deficiencies and disease the way acid blockers do. It is advisable for anyone suffering from a severe case of GERD to consult with a knowledgeable physician.

Conclusion

The mainstream medical approach to treating heartburn and GERD involves taking acid stopping drugs for as long as these problems occur. Unfortunately, because these drugs not only don't address the underlying cause of these problems but may make it worse, this means that people who start taking antacid drugs end up taking them for the rest of their lives.

This is a serious problem because acid stopping drugs promote bacterial overgrowth, weaken our resistance to infection, reduce absorption of essential nutrients, and increase the likelihood of developing IBS, other digestive disorders, and cancer. The manufacturers of these drugs have always been aware of these problems. When acid-stopping drugs were first introduced, it was recommended that they not be taken for more than six weeks. Clearly this prudent advice has been discarded, as it is not uncommon today to encounter people who have been on these drugs for decades – not weeks.

What is especially disturbing about this is that heartburn and GERD are easily prevented and cured by making simple dietary and lifestyle changes, as I have outlined in this eBook.

Unfortunately, the corruption of our "disease-care" system by the financial interests of the pharmaceutical companies virtually guarantees that this crucial information will remain obscure. Drug companies make more than $7 billion a year selling acid suppressing medications. The last thing they want is for doctors and their patients to learn how to treat heartburn and GERD without these drugs. And since 2/3 of all medical research is sponsored by drug companies, it's virtually guaranteed that we won't see any large studies on the effects of a low-carb diet on acid reflux and GERD.

So once again it's up to us to discover the truth and be our own advocates. I hope this eBook has served you in that goal.

You can read more about heartburn and GERD in other up-to-date articles on my blog by clicking here.

Recommended Resources

- Your Personal Paleo Code, the book containing my recommendations on diet and lifestyle changes for optimal health
- Why Stomach Acid is Good For You, by Jonathan Wright, M.D. and Lane Lenard, Ph.D. The title says it all. Great book.
- Heartburn Cured – The Low-Carb Miracle, by Norm Robillard, Ph.D. Good information on the connection between bacterial overgrowth and GERD.
- The GAPS Diet Book and The GAPS Diet Guide. Excellent resources for a specific-carbohydrate diet that reduces bacterial overgrowth and repairs the gut lining.
- GAPS support options. Includes a Yahoo Group where you can get advice and help from thousands of other people on the GAPS diet.