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What's Happening in There?

YOUR GASTROINTESTINAL (GI) TRACT IS THE ENGINE FOR YOUR ENTIRE body. Your cells depend on the nutrients extracted there from the food you eat for energy and on other essential ingredients like oxygen and minerals they need to survive. It's an incredibly complex and specialized system, and every part plays a crucial role.

There are multiple points along this thirty-foot digestive superhighway where things can go awry. Bloating is one of the earliest and most common indications that there may be a problem. In this chapter I'll give you a quick overview of the digestive system and some of the things that can go wrong along the route. The more familiar you are with your GI tract, the easier it is to determine whether you've taken a wrong turn somewhere along the way.

A Trip Down Your Digestive Superhighway

GI discomfort can start at any point in the digestive tract, from the mouth to the anus and everywhere in between. The upper GI tract includes the mouth, esophagus, stomach, and the first part of the small intestine called the duodenum. Digestion actually begins in the mouth, where enzymes in

saliva start to break down food. Gravity and muscular contractions help propel things down the long tubular esophagus into the stomach, where hydrochloric acid provides the optimum pH for digestive enzymes such as pepsin to break down protein and other food molecules.

Alcohol, caffeine, nicotine, fatty foods, and a too-full stomach can all send acid back up into the esophagus where it doesn't belong and leave you reaching for antacids—which, it turns out, may not be such a great idea. Stomach acid is a crucial part of the digestive process. Decreasing acid production with medications can lead to major problems, including poor absorption of nutrients and overgrowth of harmful bacteria, which is a major cause of bloating. Delayed emptying of the stomach, called gastroparesis, can bloat you, too. It's an underdiagnosed condition associated with nausea and abdominal pain that can lead to vomiting and weight loss in severe cases.

Once semi-digested food known as chyme has passed through the stomach, digestion continues in the small intestine. This is where our bodies start to extract the nutrients from food. Coming out of the stomach, chyme is very acidic, but the small intestine secretes a hormone called cholecystokinin (CCK), which stimulates the gallbladder to release alkali bile into the intestines, changing the acid content. Bile helps with the digestion of fats by providing a detergent-like effect, which emulsifies the fats so that they can dissolve in liquid and be more easily absorbed through the lining of the GI tract. Too much fat in the diet can cause gallstones, a problem that's frequently blamed on the gallbladder and leads to surgery. Although we can live without our gallbladder, digestion is never the same without it.

As the food breaks down into smaller and smaller molecules, it's absorbed across the surface area of the small intestine by tiny fingerlike projections called villi. Conditions like celiac disease flatten your villi and can lead to bloating, malabsorption, and lots of other problems. The absorbed nutrients are transported via the bloodstream to the liver, the main detoxification organ in the body. In addition to removing toxins from the blood, the liver synthesizes hormones, proteins, and bile.

Your pancreas is a gland that also makes and secretes important hormones like insulin and pancreatic juice that contains enzymes crucial to the digestive process. Insulin helps glucose get from the bloodstream into

Bloating: Getting the Story Behind the Symptom

Symptoms like bloating are very nonspecific, and that can pose a real problem in pinning down a diagnosis. Any number of conditions can cause it, from garden-variety constipation to cancer. Look up “bloating” on the Internet and you’re as likely to come up with a worrisome but unlikely diagnosis like pancreatic cancer as you are to find a probable explanation like lactose intolerance, leaving you confused and scared as to what might really be going on. With bloating, the symptom itself may not be as helpful as the story behind the symptom. That’s why you have to make sure that the information you give your doctor is complete, with all the details, and that it’s heard, that key questions are asked, and, most of all, that the person you’re telling your story to believes that you know when something is not quite right with your body, even if you don’t know exactly what it is. That’s ultimately what will help you turn your bloating into a meaningful diagnosis that you can do something about.

the cells of your body to be used for energy. Insufficient amounts of insulin lead to diabetes, a serious illness characterized by high levels of glucose in the blood and not enough in the cells. The main digestive enzymes are proteases, amylases, and lipases; they digest protein, carbohydrates, and fat, respectively. Enzyme levels decrease with age, and chemicals in the food we eat and medications can decrease them even further, leading to maldigestion and bloating.

Wavelike contractions called peristalsis transport the products of digestion through the small intestine into the colon. One of the main functions of the colon is to absorb water from the stool into the bloodstream as it transports things to the finish line. When it’s working well, water is extracted as the products of digestion move through the colon in a clockwise direction from right to left, and as a result the stool that comes out of the anus is solid. The colon is also the site of bacterial fermentation of unabsorbed materials. Lots of factors can affect the transit time and consistency of the stool and result in bloating and a change in bowel habits.

The things you can’t see in the digestive tract may be more important

than those you can. The trillions of bacteria and other organisms that live there play a crucial role in digestive health, as do the levels of digestive enzymes and hormones. That's why knowing which foods and habits upset the ratio of helpful to undesirable species and how to boost enzyme activity and optimize hormonal secretion is essential information.

Mechanical blockages, out-of-control hormones, bacterial imbalance, low enzyme levels, active inflammation, structural abnormalities, and a host of other issues can disrupt the smooth functioning of your digestive engine and lead to bloating and abdominal distress. It's vitally important to pay attention to the feedback your GI system gives you—what makes it feel good and what aggravates it. You'll be learning about this in later chapters. Over time, as you're able to read your digestive road map, you'll be able to figure out the changes and adjustments you need to keep your GI tract functioning like the miraculously efficient system it's meant to be.