

# MAYO CLINIC HEALTH LETTER

Reliable Information for a Healthier Life

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## Implanted pacemakers

### Ticking away at progress

For more than 50 years, pacemakers have been used to maintain a steady heart rhythm in hearts that beat too slowly. Just as steadily, progress in pacemaker technology has advanced through the years, as the devices have gotten smaller, more durable and loaded with more helpful features.

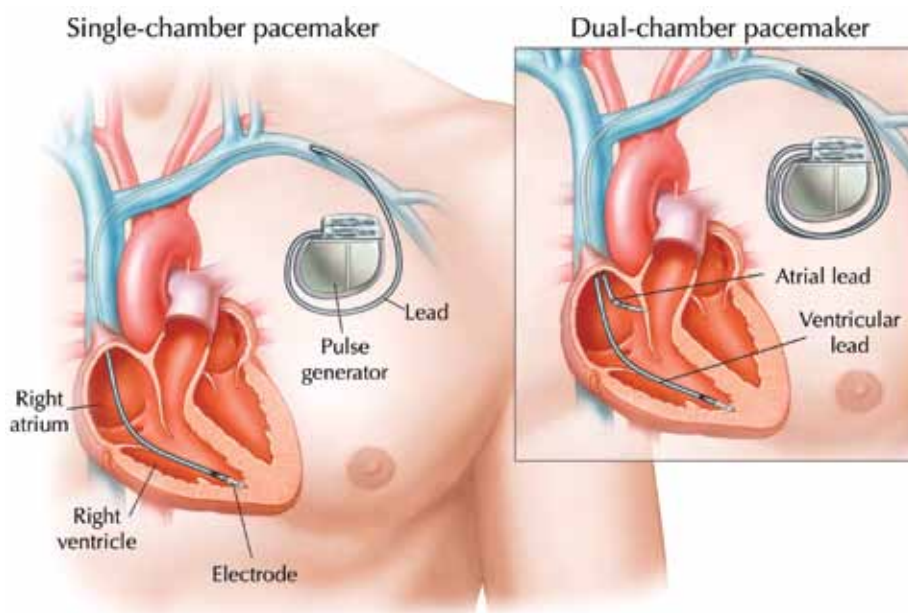
In many ways, pacemakers have become such a routine part of medical care that they sometimes seem like yesterday's technology. In fact, pacemakers are incredibly high-tech, and they

maintain an important role in prolonging life and improving quality of life.

### Can't beat it

A heartbeat starts with an electric signal from the heart's natural pacemaker, the sinoatrial (SA) node. This specialized group of cells acts like a spark plug and is located in the right, upper chamber (atrium) of the heart. The electric signal from the SA node passes through the right and left atria, causing the atria to contract. This squeezes blood into the heart's two lower chambers (ventricles).

After activating the atria, the electrical signals converge at another group of cells called the atrioventricular (AV) node — the heart's junction box. The AV node stalls the electrical signal for



Pacemakers for a slow heartbeat have one or two insulated wires (leads) that run from the pulse generator to the inside of the heart. A pacemaker monitors your heartbeat. If it's too slow or beating in an uncoordinated way, the pacemaker starts sending electrical impulses to get your heartbeats back on track.

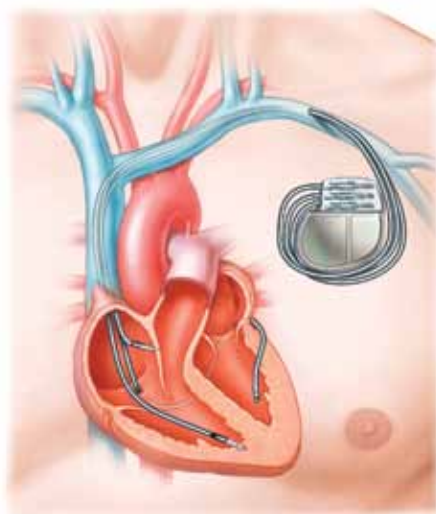
a split second, which allows time for the ventricles to fill with blood. It then sends the signal through pathways called bundle branches to the ventricles, causing them to contract and pump blood to the body.

For your heart to function properly, the heart's chambers must work in the coordinated fashion described above. Your heart must also beat at an appropriate rate — normally from 60 to 100 beats a minute at rest.

### Problems arise

Many factors can disrupt the heart's electrical system, leading to a heart rhythm problem (arrhythmia). Normal aging of heart muscle is one factor. Another is damage to heart muscle, which may occur as the result of a heart attack, heart failure or diseases of heart muscle tissue such as cardiomyopathy.

Medications can cause arrhythmias, which may be reversible if the drug can be discontinued, changed or adjusted. Other potentially reversible causes may include electrolyte problems, thyroid dysfunction, infections such as Lyme disease, sleep apnea and others. There are many types of arrhythmias. Pacemakers are most commonly used for arrhythmias that result in a slow heart rate. These include:



**Pacemakers with three wires, used for advanced heart failure, can help restore the normal balance between or coordination of the right and left ventricles.**

■ *Sinoatrial node dysfunction* — If your SA node isn't sending electrical signals properly, your heart rate may be too slow or it may speed up and slow down intermittently. Sometimes, because of disease in the atrium near the SA node, there can be a block in the signal, which inappropriately slows the heart rate.

■ *Conduction blocks* — These occur at the AV node or along the bundle branches that conduct signals to the ventricles. They may sometimes completely block a normal signal, but they may also slow it down or partially block it.

If the heart beats too slowly, the brain and body don't get enough blood flow. A slow heartbeat doesn't always cause signs or symptoms, but when it does, they may include dizziness, confusion, fainting, extreme fatigue and shortness of breath. Exercise or exertion also may be difficult to tolerate.

Pacemakers are sometimes used to manage difficult-to-control rapid arrhythmias such as atrial fibrillation. In atrial fibrillation, the heart's upper chambers (atria) quiver (fibrillate) and race. Many of the racing signals pass through the AV node, causing the main pumps (ventricles) to beat too rapidly, resulting in symptoms. In this case, an ablation (cautery) of the AV node can be performed to slow all impulses from the atria. Since the main pumps are electrically disconnected from the atria, they no longer race, but usually beat too slowly. A pacemaker is then used to restore a normal heart rate.

Pacemakers can also improve heart efficiency with advanced heart failure. With heart failure, a lack of precise coordination of the ventricle contractions may worsen already diminished heart function. A pacemaker can be used to restore the normal balance between or coordination of the right and left ventricles. This doesn't cure heart failure, but it may help a diseased heart work better. In people who have a blocked bundle and heart failure, a special type of pacing, called biventricular pacing or cardiac resynchronization pacing often improves heart pump function

and symptoms. With this type of pacing, an extra wire is advanced to the left ventricle to coordinate the timing of the heart's main pumps and improve their efficiency.

### Making the decision

Doctors look at a number of factors in deciding whether a pacemaker would be of benefit. If you have symptoms related to slow heart rhythms, especially if there's a block in the pathways, it's usually a strong indicator that a pacemaker would be of benefit. Even without symptoms, some blocks in conduction are serious enough to require a pacemaker. Other factors such as having heart failure, a heart attack or previous fainting spells also are considerations.

Implanted pacemakers consist of a pulse generator and one or more insulated wires. The pulse generator is a

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small, thin metal container and may be as small as a silver dollar, although most are somewhat larger. It contains a battery and the electrical circuitry necessary for pacing and other features. Pacemakers for a slow heartbeat have one or two insulated wires (leads) that run from the pulse generator to the inside of the heart. When used for heart failure, pacemakers typically have three leads, one to the atrium and two to the ventricles.

A pacemaker monitors your heartbeat. If it's too slow or beating in an uncoordinated way, the pacemaker starts sending electrical impulses to get your heartbeats back on track. Pacemakers also have sensors to detect physical activity and exertion and will raise or lower your heart rate to meet your needs. They also can monitor heart rhythms — which can help diagnose other heart rhythm problems over time — as well as battery life, pacemaker function and other factors. This information is stored and can be wirelessly retrieved at your doctor's office — or it can be sent to your doctor automatically over the phone.

### Under your skin

Surgery to implant a pacemaker usually requires only sedatives and numbing of the skin at the site of placement, not general anesthesia.

During surgery, the lead or leads are inserted into a major vein under or near

your collarbone and guided to your heart with the help of X-ray images. One end of each wire is secured to the appropriate position in your heart. The leads are also attached to the pulse generator, which is usually implanted under the skin beneath your collarbone.

You'll usually stay in the hospital overnight after having a pacemaker implanted. It takes about a month for scar tissue to form and anchor the tip of the lead within the heart. During that time, avoid vigorous upper body exercise such as golf or tennis, lifting the arm on your pacemaker side above your head, or heavy lifting.

### Living with it

The pacemaker will be programmed to match your needs before you leave the hospital. You'll need periodic checks to make sure your pacemaker is functioning properly. You'll also need to take precautions to avoid certain sources of electromagnetic interference as discussed in the article at right, "Precautions with pacemakers."

Items that are unlikely to interfere with your pacemaker include microwave ovens, televisions and remote controls, radios, toasters, electric blankets, electric shavers, and electric drills. If you feel dizzy, lightheaded or have sudden fatigue while using or being near an electrical or magnetic device, move away from the device as soon as possible. If you continue to feel unwell, contact your pacemaker care team.

After healing from surgery, most people can return to normal activity levels. Your pacemaker shouldn't prevent you from physical activity such as golf, walking, cycling, tennis or travel.

Battery life of a pacemaker is usually about eight to 10 years. When a pacemaker's battery wears out, the pulse generator is replaced but the leads are typically left in place. The pulse generator detects when the battery is low and may change how it functions to conserve the battery. The medical personnel that check your device can easily determine the battery status. □

## Health tips

### Precautions with pacemakers

It's unlikely that your pacemaker would stop working properly because of electrical or magnetic interference, but it's still wise to take precautions with:

- *Cellphones* — When your cell phone is on, keep it at least 6 inches away from your pacemaker. When talking, use the ear opposite your implantation site.

- *Certain tests and procedures* — Before any test or procedure, tell your health care provider that you have a pacemaker. Magnetic resonance imaging (MRI) scans are generally not recommended for those with pacemakers, although there are exceptions. Caution also is warranted with radiation therapy, shock wave lithotripsy, surgical procedures and transcutaneous electrical nerve stimulation.

- *Store anti-theft devices and airport metal detectors* — It's unlikely that these would interfere with pacemaker function if you walk through them at a normal pace. Avoid lingering around them or leaning on them. A pacemaker could set off a security alarm. If security personnel want to check you with a hand-held metal detector, ask for an alternative form of search. To avoid potential problems, obtain an ID card from your doctor stating that you have a pacemaker.

- *Power-generating equipment* — Industrial settings such as those with welding equipment, generators or high-voltage transformers can interfere with pacemakers. Your doctor can arrange a test in your workplace to determine if it affects your pacemaker. □

### Pacemaker plus

A close relative to the pacemaker is the implantable cardioverter-defibrillator (ICD).

These devices are pacemakers but have the extra ability to shock (defibrillate) the heart back to a normal rhythm if a life-threatening arrhythmia develops.

People who have arrhythmias or are at risk of them may benefit from this extra feature, but many with an arrhythmia that causes a slow heartbeat don't require it.

## News and our views

### Bacterial infection and chronic low back pain

Chronic low back pain affects millions of people, and often there's no clear cause. However, a recent study from Denmark suggests that a small percentage of such cases may be related to bacterial infection.

The study appeared in the April 2013 issue of *European Spine Journal* and involved adults who had a recent history of herniated disk in the lower back and chronic low back pain for more than six months. All participants had a very specific type of bone change in a lower back bone (vertebra) that can only be detected with magnetic resonance imaging (MRI). Previous studies have found that this particular type of bone change can be associated with low-grade bacterial infection in an adjacent herniated or damaged disk.

Study participants were divided into two groups. One group took a placebo for 100 days and the other group took the antibiotic drug amoxicillin and clavulanate (Augmentin, others). Those in the antibiotic group improved significantly in all areas measured, compared with the placebo group. In addition to back pain improvement, those taking antibiotics reported significant reductions in constant pain, fewer days of sick leave and considerably less disrupted sleep due to pain.

Mayo Clinic experts say these findings are of great interest but that this is also the first and only study of its type. As such, it needs to be verified through repeated studies. They also note that less than 10 percent of people with chronic low back pain would be candidates for the antibiotic treatment offered in this study. Until more research is available, antibiotics won't be considered as part of recommended treatment options. □

### Diabetes drug may delay prostate cancer progression

Among older men, prostate cancer is the most common form of cancer. Type 2 diabetes is a common condition as well — and it's not uncommon for older men to have both diseases.

This information set the stage for a recent analysis of men who had prostate cancer and diabetes and who frequently used a diabetes drug called metformin (Glucophage, Glumetza, Fortamet). About half the men in the study took metformin. Men taking metformin for their diabetes had a 24 percent lower chance of dying of prostate cancer in the first six months of metformin use than did men taking other diabetes medications.

The research, published in the *Journal of Clinical Oncology*, was based on past medical records. In addition to a significantly reduced risk of dying of prostate cancer, men taking metformin for diabetes also experienced a 7 percent reduction in risk of death by any cause over two years, compared with men who didn't take the drug.

Mayo Clinic doctors say that this intriguing analysis suggests the possibility that a relatively safe and inexpensive drug may be helpful in treating prostate cancer. However, the link in this study is merely an association. More robust research is necessary to determine true cause and effect. In addition, other questions remain, such as whether metformin may be helpful in those with prostate cancer who don't have diabetes. It's too early to recommend metformin for anyone with prostate cancer, but for those with prostate cancer and type 2 diabetes, metformin may be a treatment choice. □

## Stool leakage

### With help, often treatable

If you experience unexpected leakage of stool from the rectum (fecal incontinence), you're not alone.

Fecal incontinence — which can range from occasional leakage of stool while passing gas to a complete loss of bowel control — affects millions of people in the U.S. and is slightly more common in women. Determining exactly how common the problem is remains difficult, since many people are reluctant to talk about it, even with their doctor. But an estimated 8 percent of the general population and 15 percent of people age 70 and older are affected.

Although fecal incontinence is more common in middle-aged and older adults, it isn't an inevitable part of aging. It's often the result of other treatable medical issues, or it can be a warning sign of other more-serious problems. Don't shy away from talking to your doctor. Better understanding of the disorder, awareness, and improvements in diagnosis and treatment make it possible for many people to be helped.

### Various causes

Your rectum and anus are at the end of your large intestine. Normally, the muscles and nerves in and around these two structures sense the presence of waste, allow storage in the rectum, propel stool and eliminate it. The pelvic floor muscles also support the organs in your pelvis and lower abdomen.

Changes in the function of this complex system can interfere with normal stool elimination. Among the common causes of fecal incontinence are:

- **Muscle damage** — It may be difficult to hold stool back if muscle rings at the end of the rectum (internal and external anal sphincters) are damaged by factors such as childbirth, or hemorrhoid or cancer surgery. Weak or improperly functioning pelvic floor muscles also can contribute to fecal incontinence.

■ *Nerve damage* — Injury to nerves that sense stool in the rectum or that control the anal sphincters can lead to fecal incontinence. Damage may be related to childbirth, a habit of straining to pass stool, a spinal cord injury, a stroke and even certain diseases — such as diabetes and multiple sclerosis — that may affect these nerves.

■ *Chronic constipation* — Ongoing constipation can lead to a mass of hard, dry stool in the rectum (impacted stool) that's too hard to pass. As a result, muscles in the rectum and intestines stretch, eventually weakening and allowing watery stool from farther up to leak out around the hard mass. Nerves in the anus and rectum may become less responsive to the presence of stool when there's chronic constipation.

■ *Diarrhea* — It's easier to retain solid stool in the rectum than loose stool, so diarrhea can cause or make fecal incontinence worse. A recent review of studies found that among women older than 40, diarrhea was a bigger risk factor for fecal incontinence than was anal sphincter injury during childbirth.

■ *Loss of storage capacity in the rectum* — Changes in the rectum wall that cause the rectum to stiffen — such as may occur from radiation treatment, rectal surgery or inflammatory bowel disease — reducing its capacity to hold stool.

### Treatments vary

Once fecal incontinence is diagnosed and the likely cause is identified, your doctor can discuss treatment options that may be best suited to your situation. It's not unusual to use multiple approaches to treat fecal incontinence. Among the conservative options are:

■ *Dietary changes* — What you eat and drink affects stool consistency and how fast it passes through your digestive system. If constipation is causing fecal incontinence, your doctor may recommend drinking plenty of fluids and gradually increasing your intake of fiber-rich foods. Getting adequate fiber can help with diarrhea, too, as it bulks up stool, making it less watery. Avoid

beverages with caffeine, alcohol, milk and carbonation if they trigger diarrhea. Artificial sweeteners and excesses in high fructose corn syrup also can produce diarrhea.

■ *Medications* — Your doctor may recommend anti-diarrheal drugs or laxatives, depending on what's causing the incontinence. Sometimes, medications you're taking for other conditions can contribute to fecal incontinence. If that's the case, your doctor can work with you to make appropriate medication changes to help reduce aggravation of fecal incontinence. With this in mind, it's important that your doctor is aware of all prescription and nonprescription drugs and supplements you're taking.

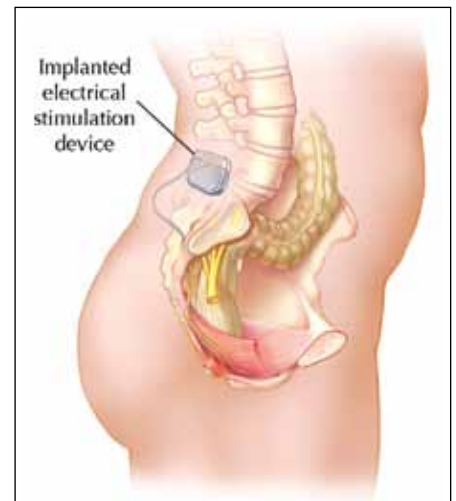
■ *Biofeedback and pelvic floor exercises* — Restoring pelvic floor muscle strength can improve anal sphincter muscle control and awareness of the need to have a bowel movement. Biofeedback may be used to help you learn how to properly squeeze and relax pelvic floor muscles. During biofeedback, a trained physiotherapist uses special sensors to measure bodily functions that help teach you what it feels like when you actively squeeze and relax your pelvic floor muscles.

■ *Bowel training* — Establishing a specific time of day to have a bowel movement and allowing adequate time to relax may help. For example, you might try 20 to 30 minutes after a meal because eating stimulates the bowel.

Surgical treatments for fecal incontinence may be considered when the cause is related to pelvic floor damage or muscle injuries that affect the anal sphincter. In certain cases, overlapping sphincter repair (sphincteroplasty) may be done to reconnect the separated ends of a torn sphincter muscle. Essentially, the ends are sewn together in an overlapping fashion. Surgery may be done to repair protrusion of the rectum through the anus (rectal prolapse) or through the vagina (rectocele) or for hemorrhoids that interfere with bowel function.

If structural damage to the anal sphincter is severe, a new sphincter

may be constructed using one of two major surgical options. One method involves taking a strip of muscle from the inner thigh and wrapping it around the sphincter to help restore muscle tone. The other approach is to insert an artificial sphincter around the sphincter muscle. Long-term effectiveness with artificial sphincters is still unknown and the rate of complications after surgery is high, with infection being the most serious and common problem. □



### Sacral nerve stimulation

A relatively new treatment option is electrical stimulation of the sacral nerves. This option may be considered if more-conservative measures aren't successful.

Your sacral nerves run from your spinal cord to muscles in your pelvis. These nerves regulate the sensation and strength of your rectal and anal sphincter muscles. The device is implanted in the upper buttock under the skin and delivers continuous small electrical impulses to the sacral nerves to help strengthen muscles in the bowel.

Sacral nerve stimulation is much less invasive than are other surgical approaches, and it carries low risk of serious complications. Although long-term results are unknown at this point, multicenter studies of sacral nerve stimulation have reported marked and sustained improvement in bowel control.

# Belching and gas

## Reducing air in the system

It's certainly not the most dignified or polite topic, but belching and passing gas comes up on a frequent basis in anyone who eats and breathes.

The buildup of air and gas in your digestive tract is a natural part of the digestive process. Belching and passing gas are natural and normal ways to relieve built-up air or gas pressure. However, some people — or their partners or loved ones — may wish this pressure release didn't happen quite so often. While you can't expect total elimination of excess air and gas within your digestive tract, you can take steps to keep it under better control.

## Swallowed air

When you swallow food, you often swallow air with it that remains in your stomach. Belching is a way for your body to expel that excess air. An occasional belch to relieve stomach fullness is normal, but if you belch frequently, it may be that you're swallowing too much air.

Air buildup can happen from eating too fast, talking while you eat or drinking carbonated beverages. Some people who belch repeatedly, even when they're not eating or drinking, are swallowing air as a nervous habit. Belching also can result from the reflux of stomach acid into your esophagus. You may swallow frequently to clear the acid, which leads to more air intake and further belching. Naturally, the best way to reduce belching is to swallow less air.

These suggestions may help.

- *Eat and drink slowly* — Typically, the more time you take to eat and drink, the less air you swallow. It may also help to avoid talking while eating.
- *Drink fewer carbonated beverages* — Soft drinks and beer release carbon dioxide gas, increasing the volume of

air in your digestive system.

- *Avoid gum and hard candy* — When you suck on hard candy or chew gum, you swallow more often than you normally would. Part of what you're swallowing is air.

- *Don't use a straw* — You swallow more air sucking on a straw than you do sipping from a glass.

- *Don't smoke* — When you inhale the smoke from tobacco products, you also inhale and swallow air.

- *Check your dentures* — Loosefitting dentures can cause you to swallow excess air while you're drinking or eating.

## Get past gas

Occasionally, some of the air that you swallow will make it all the way to your colon, where it's passed as gas. But most often, intestinal gas (flatulence) results from the fermentation of undigested food, such as plant fiber, after it reaches your colon. Constipation can contribute to intestinal gas, since the longer food waste remains in your colon, the more time it has to ferment.

Gas also forms when your intestines have difficulty breaking down certain components in foods. These may include fructose — which is found in fruit and many processed foods — gluten if you have celiac disease and dairy products if you have lactose intolerance.

Passing gas occurs between about 10 and 20 times a day in normal adults, and the expectation of avoiding it altogether isn't realistic. Still, you may be able to keep it to a minimum by:

- *Limiting foods that produce gas* — Discovering what foods cause gas for you is a step-by-step process of elimination. It involves coming up with a list of possible causes, then adding or eliminating one type of food at a time.

Certain foods that produce gas for one person may not produce gas for another. However, common culprits include beans, lentils and legumes; dairy products; whole grains; and vegetables such as broccoli, cabbage, cauliflower, cucumbers, kohlrabi, onions, radishes, rutabagas and potatoes. In

excessive amounts, fruits or fruit juices also may cause gas. The artificial sweeteners sorbitol and mannitol — found in sugar-free candies and gums — also can produce gas.

In attempting to relieve your problem, don't do a wholesale elimination of nutritious foods just because they might cause gas. You may be able to narrow down the problem to just a culprit or two. Even then, you may still be able to eat the food if you consume it in smaller amounts or prepare it in a certain way — such as eating steamed broccoli versus raw.

- *Using gas-reducing food additives* — You may try nonprescription products such as alpha-galactosidase (Beano), which works primarily with beans and similar foods, but won't stop all gas. Lactase supplements help digest dairy products, if dairy appears to be a cause of gas. Products containing simethicone (Gas-X, Mylanta Gas, Mylicon, others) or activated charcoal tablets are commonly used, but research hasn't found consistent benefit from these.

- *Adding fiber gradually* — High-fiber foods are excellent for digestion. But eating too much fiber too quickly can cause gas. Increase the fiber in your diet gradually over several weeks.

- *Preventing constipation* — Regular exercise reduces intestinal gas by helping to prevent constipation, as can eating fewer fatty foods, such as fried meats, cream sauces, gravies and rich pastries.

## Seeing your doctor

If steps to reduce excessive belching or passing gas don't help, talk to your doctor about ruling out more-serious conditions. Belching may sometimes be caused by gastroesophageal reflux disease (GERD) or stomach inflammation (gastritis). Excess gas — particularly if coupled with other symptoms such as weight loss, diarrhea or abdominal pain — can sometimes be caused by bowel conditions including diverticulitis, irritable bowel syndrome (IBS) or an inflammatory bowel disease, such as ulcerative colitis or Crohn's disease. □

# The mystery of health

## Salutogenesis

You've changed into the exam gown for your annual checkup. You feel kind of dreary as you consider the likely discussion — aching joints, blood pressure, and probably medication changes to treat this, that or whatever else has cropped up. Why not focus on building health instead of just fighting disease?

That's a good question, and it points to a theory about health that centers on how you perceive your life and the factors that have shaped your perception. Salutogenesis — from the Latin word *salus* meaning “health,” and the Greek word *genesis* meaning “origin” — literally means “the origin of health.” Salutogenesis is an important concept in the study of healthy aging. It shifts attention to what supports health and well-being — what creates health — rather than what causes disease.

### Seeing health differently

The World Health Organization (WHO) was created in the post-World War II years. The WHO defined health a new way: “Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.”

Aaron Antonovsky, a medical sociologist who studied the narratives of Holocaust survivors, founded the salutogenesis theory. Antonovsky began looking at health from a new perspective when he found out 29 percent of women survivors of concentration camps weren't emotionally damaged. Rather than focus on risks and disease, he began exploring what factors keep people healthy, especially people who find themselves in difficult circumstances.

You probably know people who have faced more than their share of stressful situations and hardships — be they health-related, extreme family challenges, natural disasters or what

have you — yet somehow they've managed to remain well. Others in those same situations fare far worse.

***‘Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.’***

— World Health Organization

What accounts for the difference? Antonovsky reasoned that a person's ability to successfully weather life's bumps and bruises — or worse — depended on two key factors:

- *Having resources that help you understand and structure your life (generalized resistance resources)* — These resources may be tangible, such as money and housing, but they're also the knowledge and skills you develop in life. Examples of these resources include life experience, intelligence, social support and traditions.

- *Being able to make sense of the world (sense of coherence)* — This allows you to use your resources to manage stresses that you encounter in life.

Antonovsky also identified three life experiences that occur during childhood and contribute to shaping an individual's sense of coherence. These include recognizing that:

- Life has a certain predictability — it can be understood

- You have sufficient resources to manage personal challenges

- It's worth your energy to address life's challenges because your life makes sense and has meaning

A fourth — emotional closeness — was added later by others. Having a sense of connection to others is critical to feeling part of a community.

### Aging is a process

Maybe you've said that getting older isn't for sissies. It can be discouraging to focus on imagined snapshots of what may lie ahead in later decades. However, those imaginings aren't reality.

Aging is an ongoing and ever-changing process, and it's generally not helpful to dwell only on possible future pitfalls.

Instead, life lived in the present moment — bringing a mindful approach to all aspects of your life — can be very helpful in navigating through the storm of a sudden health crisis or in coming to terms and living well with a chronic condition. (See our October 2013 Special Report, “Mindfulness.”)

Moving forward despite a new or ongoing challenge also can be helped by your social supports — such as family, friends, caregivers or religious community — and shaped by your experiences. Social supports and life experiences can be protective factors. To a certain degree, they help predict how you'll do in life. Antonovsky suggested that older adults are more likely to have a greater capacity to make sense of the world due to previous experiences managing stressful situations.

So, does your ability to make sense of the world influence the way you view yourself as you age? Despite the growing number of older adults, relatively few studies have asked older adults to rate themselves for successful aging. One study of 205 older adults with physical illnesses or disabilities found that most considered themselves to be aging successfully.

The same type of discrepancy has been noted in several other studies. In one, more than 1,900 women older than 60 were asked to rate how successfully they had aged — 1 being not successful to 10 being very successful. The vast majority rated themselves as 7 or higher. Again, most of those who considered themselves successful in aging didn't meet the objective criteria for having good physical health. Their perception of how they had aged differed from the reality of their own health.

Multiple things help support health. Multigenerational relationships, study, counseling and support groups can all make a difference, and each has the potential to add perspective and depth to your understanding of health. □

# Second opinion

**Q** I recently had a lactose breath test to check for lactose intolerance. I'm not lactose intolerant, but now my doctor has ordered a lactulose breath test. Why do I need two tests?

**A** In many ways, the tests you're referring to are virtually the same. In fact, they're often referred to by the same name — hydrogen breath tests.

The main difference is that one tests your ability to digest lactose, which is found in many dairy products. The other tests your ability to digest lactulose or glucose and is used to screen for a condition known as small intestine bacterial overgrowth.

After an overnight fast, a hydrogen breath test starts by taking several measurements of hydrogen and other gases in your ordinary breath. Normally, you exhale very little hydrogen and very little is detectable.

You will then be asked to drink a liquid containing lactose, lactulose or glucose. Your breath is analyzed for hydrogen at regular intervals for the next two to three hours.

If your body doesn't digest lactose, it will pass undigested to the colon where it ferments. This releases hydrogen and other gases, which are absorbed by your intestines and eventually exhaled.

Lactulose or glucose normally passes through the small intestine undigested. However, if you have bacterial overgrowth, those excess bacteria may digest lactulose or glucose, causing a rise in hydrogen in the breath at a point when there shouldn't be one.

Typically, hydrogen breath testing is done when your doctor suspects a problem based on your health history and symptoms. It's also usually done in conjunction with other tests in order to arrive at or rule out a diagnosis. This is especially true in the case of small intestine bacterial overgrowth. □

**Q** I've heard that hibiscus tea is helpful for high blood pressure. Is that true?

**A** Some studies have suggested that it may have a mild blood pressure lowering effect. However, studies evaluating the influence of hibiscus tea on high blood pressure (hypertension) have generally been short. The longest was only about three months, which isn't long enough to determine the usefulness of hibiscus for a chronic condition such as high blood pressure.

Preliminary clinical research indicates hibiscus tea may be of modest help in the early stages of high blood pressure. One small study involved 65 men and women who were prehypertensive or mildly hypertensive and not taking blood pressure medication. For six weeks, half the participants drank 3 cups of brewed hibiscus tea daily and the other half drank a placebo. Systolic blood pressure was reduced by about 7 millimeters of mercury (mm Hg) in hibiscus tea drinkers. Placebo drinkers had a reduction of about 1 mm Hg in systolic blood pressure.

There isn't sufficient evidence to support the use of hibiscus tea to help control or lower blood pressure if you have hypertension. However, if you enjoy hibiscus tea, there's no reason not to drink it, especially if the initial research is borne out in larger controlled trials. Hibiscus tea itself is generally considered safe. □

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## Have a question or comment?

We appreciate every letter sent to Second Opinion but cannot publish an answer to each question or respond to requests for consultation on individual medical conditions. Editorial comments can be directed to:

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200 First St. SW, Rochester, MN 55905, or  
send email to [HealthLetter@Mayo.edu](mailto:HealthLetter@Mayo.edu)

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**Check out Mayo Clinic's consumer health website, at [www.MayoClinic.org](http://www.MayoClinic.org)**



Measuring for excess hydrogen in your breath using a collection device such as the one illustrated above helps diagnose certain digestive problems.



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