A stiff heart

A type of heart failure

You received a diagnosis of heart failure a few months back. Since then, you’ve been exercising more, eating less salt and taking your medications. Recently, you heard news of a new medication for heart failure. Interested, you inquire about it at your next checkup, but your doctor says it’s not effective for the kind of heart failure that you have. It turns out not all heart failure is the same.

In the past, heart failure was largely thought to be the result of a heart too weak to pump out the right amount of blood. But in a large and growing group of people, heart failure develops even when the pumping ability of the heart muscle remains relatively intact.

Both types of heart failure result in a reduced amount of blood being distributed to the rest of the body and consequently lead to similar symptoms, such as feeling weak, tired and short of breath. However, scientists are discovering that these two types of heart failure are actually quite different in their mechanisms and in how they respond to treatment.

Pumping problems

One way doctors measure how well your heart is pumping is by checking your ejection fraction — the percentage of blood pumped out of your left ventricle with each heartbeat. Since the...
heart doesn’t empty completely, the ejection fraction is never 100 percent. Instead, it’s normally somewhere between 50 and 70 percent. The remaining 50 to 30 percent stays in the ventricle. This contraction phase where blood is pumped out of the heart is called systole.

If your heart muscle weakens, it can’t pump out as much blood with each beat. That forces the heart to beat faster. Over time, the heart usually tries to compensate by enlarging to fill with more blood. The result is an enlarged, weakened heart ejecting a reduced amount of blood with each beat. This is called heart failure with reduced ejection fraction (HFrEF), also sometimes referred to as systolic heart failure.

However, in about half the people with heart failure, the ejection fraction remains normal. This is known as heart failure with preserved ejection fraction (HFpEF). It’s also been called diastolic heart failure. In these cases, trouble typically develops during the heart’s relaxation phase (diastole) with the left ventricle of the heart having difficulty actively relaxing to allow blood in. In addition, the heart muscle of the left ventricle becomes stiff over time. So even though the percentage of blood ejected with each heartbeat might be considered normal, the total amount of blood being pumped out isn’t enough to supply your needs.

These factors create a situation in which pressure on the heart is elevated during the cardiac relaxation phase and tends to rise further during physical activity, resulting in shortness of breath. Increased heart pressure then increases the back pressure on the blood vessels in the lungs, making people with HFpEF short of breath during activity.

How does it happen?

HFpEF becomes much more common with age. This is partly explained by the fact that the heart’s ability to relax naturally declines over time, increasing the risk of HFpEF. The average age at which the disease is recognized is often about 80, but many people first notice symptoms in their 60s. HFpEF is also more common among women, although the reason for this isn’t entirely clear.

Chronic high blood pressure is a major contributor — between 80 and 90 percent of people with HFpEF have high blood pressure. Untreated high blood pressure makes your heart work harder. Over time, the muscle of the left ventricle may become thicker to compensate for the extra work it must perform. Eventually, it becomes too stiff to relax and fill effectively.

Excess weight also is a factor. When your body’s carrying too much fat, it speeds up the age-related decline in your left ventricle’s diastolic function, even when blood pressure is well-controlled. Obesity is tied to other conditions associated with HFpEF, such as diabetes, metabolic syndrome and sleep apnea, which can all contribute to a decline in heart function. Atrial fibrillation, a type of irregular heart beat, is exceptionally common among people who have HFpEF.

In contrast with HFrEF, previous heart attack is less common among those with HFpEF. However, a recent Mayo Clinic study showed that coronary artery disease is quite common in HFpEF, and that treating it may be helpful. In addition, it’s believed that conditions such as obesity, diabetes, lung disease, kidney disease and high cholesterol cause inflammation of the blood vessels and eventually the heart, and that this inflammatory process may contribute to stiffening of the heart.

There are some specific diseases that produce symptoms of HFpEF, but are actually related to specific forms of proteins depositing in the heart, making it stiff. These conditions are called amyloidosis. There are several forms of amyloidosis, with differing treatments, so it’s important that your doctor consider amyloidosis as an explanation for symptoms of HFpEF.
Detecting HFpEF

It’s not always easy to tell if you have HFpEF based on symptoms alone. Most people with HFpEF have symptoms common to heart failure in general. But these symptoms can also be caused by other underlying problems, such as obesity, lack of physical conditioning and lung disease.

To determine whether you have HFpEF, your doctor typically relies on three key findings:

- **Symptoms of heart failure**—Breathing difficulty, fatigue or inability to tolerate physical exertion.
- **Normal ejection fraction**—An ejection fraction of 50 percent or greater. This is usually measured with an echocardiogram, a test that uses electrodes and ultrasound imaging of the heart to gauge how well the heart is pumping.
- **Evidence of a heart that’s not working as it should**—A blood test that shows elevated levels of B-type natriuretic peptide—a biomarker of heart pumping function—suggests the possibility of heart failure.

In addition, your doctor may use special imaging tests, including echocardiogram assessment, to look for signs of diastolic dysfunction, as well as structural changes in the heart’s left ventricle consistent with HFpEF. Sometimes, a more invasive procedure such as a heart catheterization is required to get the answer.

Signs and symptoms of HFpEF often aren’t evident at rest, so your doctor may recommend checking your heart function while you walk on a treadmill or pedal a stationary bicycle. Or you may receive a drug intravenously to stimulate your heart in a way that’s similar to exercise. This is called a stress test. It helps your doctor determine how your heart responds to exertion. Performing exercise in a cardiac catheterization laboratory may be done at some centers.

Treatment

A strong indication that HFpEF is unlike HFrEF is the fact that many of the medications and devices used to treat HFrEF simply don’t work for HFpEF. Research is ongoing to discover exactly why this is, but it may have to do with the different pathways to heart failure within each type.

By clarifying the mechanisms by which HFpEF develops, scientists hope to develop more effective—and likely, more individualized—ways to treat it. Doctors at Mayo Clinic are investigating several types of medicines and devices that may help with HFpEF. In the meantime, treatment is aimed at:

- **Controlling your blood pressure**—This is usually done with medications, such as angiotensin-converting enzyme (ACE) inhibitors, angiotensin II receptor blockers and beta blockers.
- **Decreasing high blood pressure**—May improve your heart’s ability to relax and fill more effectively, or keep it from getting worse.
- **Preventing fluid overload in your body**—Diuretics, often called water pills, make you urinate more frequently and get rid of extra salt. This prevents fluid from collecting in your body, including in your lungs, which helps you breathe easier.
- **Treating other medical conditions you might have**—Your doctor will also want to treat any underlying issues that may be contributing to your heart failure, such as atrial fibrillation or coronary artery disease.
- **Making healthy lifestyle changes**—Reducing the amount of salt in your diet can help minimize your body’s retention of fluid and the swelling that accompanies it. Evidence suggests that sticking with a sodium-restricted eating plan such as the Dietary Approaches to Stop Hypertension (DASH) diet improves left ventricular diastolic function, as well. Research also shows that exercise can improve your quality of life and increase your exercise capacity when you have HFpEF.
- **Research to find an effective treatment for HFpEF**—research is continuing. Clinical studies are underway at Mayo Clinic and elsewhere that may offer options to people struggling with HFpEF.

Health tips

Pick your protein

Protein helps maintain muscle mass, fight off infection and enhance metabolism. For most Americans, about 45 to 55 grams a day is recommended. Meat and poultry are full of protein, but the nonlean types can also be loaded with saturated fat and cholesterol. Swap in other protein-rich foods instead, such as:

- **Seafood**—Consider substituting seafood for meat twice a week. Canned fish and frozen fillets are great to have on hand for everyday meals. For special occasions, try salmon or shrimp.
- **Eggs**—Eggs contain all the protein components you need. Put a poached egg over salad, wild rice or whole-grain toast and you have a meal. Hard-boiled eggs make great snacks. Eggs contain saturated fat, so aim for no more than one a day, on average.
- **Dairy**—Fat-free milk and milk products provide calcium and vitamin D, but also pack a nice protein punch. Try Greek yogurt with honey or fresh fruit. Spread ricotta on toast and top with fruit. If you don’t like cow’s milk, try soy milk.
- **Beans, peas and tofu**—Dried, canned or frozen beans are an inexpensive protein option and have the added bonus of fiber and high levels of antioxidants. Add to salads, pastas, soups and casseroles. Tofu is a soy-based source of protein you can add to soups, stir-fries and even scrambled eggs.
- **Nuts and seeds**—A handful of unsalted, roasted nuts is a healthy serving of protein. Spread nut butters over crackers or toast for a protein-filled snack.
Central sensitization

Chronic pain connection

For many who have chronic pain — such as from migraines, fibromyalgia or irritable bowel syndrome — modern medicine often comes up short. It’s not uncommon for diagnostic tests to reveal that there’s nothing physically wrong.

Without a rational explanation for the ongoing, often debilitating pain, attempted therapy is at best an educated guess. At worst, it’s more like a stab in the dark.

This may be changing. Thanks to decades of research, it’s been recognized in recent years that several forms of chronic pain have a common link — the excessive sensitization of nerves and nerve connections in the spinal cord and brain (central sensitization syndrome). With it, nerves are rewired so that ordinary sensations are misinterpreted as being harmful or painful.

Scientific understanding of central sensitization syndrome is helping doctors, therapists, those with chronic pain and their loved ones break down barriers of misunderstanding, such as thinking the pain isn’t real or hoping for cures — or searching for causes — that probably don’t exist.

Central sensitization may only be one part of a larger picture for those with certain types of chronic pain. Still, a rational explanation for a key element of what’s happening provides a foundation to better understand the scope and source of pain, and perhaps a chance to buy into rehabilitation therapies.

A natural arc

Normally, pain is caused by some type of harmful stimulus to the body. The pain signal travels from the nerve endings to the central spinal cord and on through various parts of the brain. It seems like a straightforward route to follow, much like a phone line. How-

News and our views

Mayo improves detection of returning prostate cancer

Men who have been successfully treated for prostate cancer typically have their prostate-specific antigen (PSA) levels measured periodically. If PSA levels rise, it’s an indication that cancer may be back. If so, the next step is to determine where in the body the cancer is located.

Mayo Clinic experts have developed a test to better answer that question. It’s called a C-11 choline positron emission tomography (PET) scan. Due to the difficulty of performing the test, Mayo Clinic in Rochester, Minnesota, is the only medical center in the U.S. that does it. Currently, this test is appropriate only for highly select prostate cancer patients.

Locating recurring prostate cancer can be difficult using standard techniques such as bone scans, computerized tomography (CT) scans and magnetic resonance imaging (MRI) scans. Elevated PSA levels can occur long before anything can be detected with those techniques.

The Mayo test uses a radioactive form of the B vitamin precursor choline, which is readily absorbed by prostate cancer cells. The radioactive choline is injected, and a PET scan of the entire body is performed immediately after. Radioactive choline that’s soaked up by cancer cells shows up as a hot spot on the PET scan.

Locating recurrent prostate cancer sooner may allow your doctor to identify small, isolated deposits of cancer — within the prostate and outside of the prostate — that can be targeted for more-effective treatment. C-11 choline PET scanning detects cancer that leads to different treatment in about 32 percent of men. In addition, testing after treatment is initiated can indicate whether the cancer is responding to therapy. C-11 choline PET testing isn’t suitable for all patients with prostate cancer. And for patients with known widespread metastases, the test will not provide any additional information.

Mayo doctors involved in the development of the C-11 choline PET scan see it as a major step forward in taking the guesswork out of treatment for recurrent prostate cancer.

In the MRI scan at left, arrows point to two normal-sized lymph nodes and one enlarged lymph node. With the normal-sized lymph nodes, there’s no indication of cancer. In the C-11 choline PET scan at right, the normal-sized lymph nodes are clearly positive for cancer, in addition to the enlarged lymph node.
ever, there are multiple types of nerve cells involved in this transmission, junctions along the way with chemically activated and deactivated receptors — and a certain amount of room for misinterpretation of those pain signals by parts of the brain.

Ordinary pain usually follows an arc. There’s the initial sharp, immediate pain of an injury that activates certain nerve cells and produces an immediate response, such as pulling your hand away from a burning hot object. This pain is followed by a longer lasting, less sharp pain that motivates you to care for the injury. The initial pain also may be dull, such as with a headache. Eventually, the nerves and nerve pathways that are in a state of excitement from the pain stimulus calm down to a normal state as healing occurs.

Growing pain

Central sensitization occurs when the pain process fails to follow the normal downward part of the pain arc. Pain nerves of the spinal cord reconfigure themselves to be in a more constant state of excitement and sensitivity. Sensations that shouldn’t be painful may be perceived as such. Life stresses that would ordinarily be manageable set off a cascade of pain. Noises, smells, bright light, or ordinary aches and pains may become exaggerated by supersensitivity.

In short, normal messages from nerve endings are magnified and blown out of proportion by the time they reach the brain. The brain concludes something major is happening, even though the trigger is minor. In fact, research using functional magnetic resonance imaging (fMRI) of the brain has demonstrated that there are observable changes in how the brain routes and processes pain messages in central sensitization.

Typically, diagnostic testing related to the pain shows that everything is physically normal — or if something is found to be wrong, the pain level is far out of proportion to the problem. Since there’s often nothing to “fix” medically, options for therapy dwindle.

Many people with chronic pain begin a downward spiral of pain, resulting in reduced activity, isolation, loss of fitness and sleep, increased stress and tension, depression, and worsened pain. A new doctor, drug or therapy may spark hope, but pain lingers or returns, and the destructive cycle deepens.

Triggering causes

Central sensitization has been strongly linked to several types of chronic pain. These include nerve pain such as with peripheral neuropathy and pain from other conditions such as arthritis, migraine, fibromyalgia, irritable bowel syndrome and temporomandibular joint disorder. Other forms of chronic pain — such as interstitial cystitis or atypical facial pain — have a more modest link. There’s also suspicion that conditions such as restless legs syndrome and post-traumatic stress disorder may involve central sensitization.

The causes of central sensitization appear to involve a mix of factors. There may be a genetic component that increases susceptibility. Adverse experiences in childhood may increase the susceptibility of nerves becoming rewired — or of having higher levels of stress hormones — as a youth or later.

There’s often a cause or event that seems to get the sensitization started. Many who have chronic pain recall a physically or emotionally stressful event such as a car accident, abuse, a serious infection or a disease. They may not have associated the event with their pain. Making the connection can help them recognize how stress can worsen pain and pain can worsen stress.

Pain rehabilitation

Research is focused on better identification of the processes involved in sensitization. It’s likely that research will one day identify better treatments. Until then, a comprehensive plan for rehabilitation is typically the best way to gain better control over pain. This can sometimes be done with the help of a primary care doctor. However, a specialized pain rehabilitation center may be worth considering if you and your doctor have struggled to manage your pain.

Therapeutic approaches vary depending on the problem and individual, but they often include focusing on medication management, improving overall health and managing stress. Other therapies include counseling, lifestyle management, acupuncture, yoga, massage and hypnosis. 

In central sensitization syndrome, pain nerves of the spinal cord reconfigure themselves to be in a more constant state of excitement and sensitivity. Because of this, mildly painful sensations — such as bumping your head — may be perceived as extremely painful.
Food poisoning

Prevention is best

It could be the nearly raw pink spot in your just-off-the-grill hamburger. Or perhaps the leftovers that weren’t properly refrigerated. These are just some of the many ways in which bacteria, viruses and parasites — or their toxins — have a chance to contaminate food.

An estimated 1 in 6 Americans gets food or beverage poisoning each year. Food contamination can occur at any point, including during growing, picking, processing, storing and shipping. In addition, there’s plenty of opportunity for food poisoning to occur at home. Taking basic precautions can help minimize that risk.

Can be severe

Food poisoning symptoms can start within hours of eating contaminated food, or they may begin a few days later. Signs and symptoms often include nausea, vomiting, abdominal pain, fever or diarrhea. They may last for a few hours to several days.

Most people can weather food poisoning with rest and by drinking fluids such as fruit juice, sports drinks or oral rehydration fluids as able — followed by a gradual reintroduction of food.

However, foodborne illness can become severe or even life-threatening. Older adults, infants, pregnant women and those living with chronic diseases or with suppressed immune systems are at higher risk of severe illnesses or of developing complications such as dehydration. Seek medical attention for signs that are severe or persistent, particularly with diarrhea and frequent episodes of vomiting, including the inability to keep fluids down. A key risk is dehydration, which can cause excessive thirst, dry mouth, little or no urination, severe weakness, dizziness, or lightheadedness.

Additional signs and symptoms that warrant medical attention include having bloody vomit or stools, an oral temperature higher than 101.5 F or neurological symptoms such as blurry vision, muscle weakness and tingling in the arms. Typically, medical care is supportive in nature, treating signs and symptoms such as diarrhea or dehydration as the body recovers. Sometimes, an antibiotic may be prescribed if the cause of the infection is bacterial.

Preventing poisoning

Practice these food safety habits to prevent food poisoning at home:

- Wash your hands well with warm, soapy water before and after handling or preparing food. Use hot, soapy water to wash utensils, cutting boards and other surfaces you use, particularly if used with raw meats.
- Wash fruits and vegetables that can’t be peeled and are consumed raw, such as berries and leafy greens.
- Keep raw meat, poultry, fish and shellfish and their juices away from other foods at all times. Make sure juices from raw or undercooked meat don’t come in contact with fully cooked meat or other foods.
- Use a food thermometer to make sure ground beef is cooked to 160 F and steaks, roasts and chops to at least 145 F. Cook poultry to 165 F. Make sure fish and shellfish are cooked thoroughly.
- Avoid having perishable foods at room temperature for more than two hours or above 90 F for more than one hour. Promptly refrigerate or freeze foods to minimize the time the temperature of the food is between 40 and 140 F.
- Thaw food in the refrigerator. If you thaw food in the microwave or in water, be sure to cook it immediately.
- Use cooked leftovers within four days, or freeze them for longer storage. Reheat leftovers so that the internal temperature reaches 165 F. Reheat sauces, soups and gravies to boiling.
- If you aren’t sure if a food has been prepared, served or stored safely, discard it. Don’t taste food that you’re not sure about.

Main actors

There are more than 200 microbes known to cause food poisoning, and that list is constantly changing as microbes spread around the world, as food habits change and as microbes evolve. Some of the most common microbes include:

<table>
<thead>
<tr>
<th>Microbe</th>
<th>Method of contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Campylobacter</td>
<td>Spreads through undercooked poultry and contaminated poultry juices. Has also been associated with unpasteurized dairy products.</td>
</tr>
<tr>
<td>Norovirus</td>
<td>Often spread by food handlers and can be in unwashed produce.</td>
</tr>
<tr>
<td>Salmonella</td>
<td>Can be present in undercooked meat, poultry, eggs and seafood and in the juices of these foods.</td>
</tr>
<tr>
<td>Shigella</td>
<td>This family of bacteria is passed by food handlers, particularly when hands aren’t thoroughly washed after using the bathroom.</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>Can be found in undercooked meat, fresh produce, and unpasteurized dairy products and fruit juice — and can be passed through fecal contamination.</td>
</tr>
<tr>
<td>Listeria</td>
<td>Found in unwashed produce and in unpasteurized or contaminated milk, soft cheeses, deli meats, hot dogs and smoked seafood.</td>
</tr>
</tbody>
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Chronic hives

Bothersome but usually manageable

Not again. You woke up this morning with itchy, red welts covering your arms and legs. You thought they’d gone away after showing up every now and again over the past few months. But now they’re back with a vengeance. You know it’s not poison ivy, and you can’t think of anything you ate or touched that might have caused such a reaction. What’s going on?

An itchy problem

Hives (urticaria) are raised, red or white itchy welts on your skin. A sudden onset of hives (acute hives) usually has an identifiable cause or trigger — such as insect stings or bites, medications, certain foods, allergens, or infections. Acute hives go away within a few weeks and are usually effectively treated with antihistamines.

Chronic hives are different in that they persist for more than six weeks. The hives seem to come and go with no clear pattern — fading over the course of a day or two and then reappearing in a different location a few days later.

Anyone can develop chronic hives, but they’re more common in middle-aged women. Chronic hives can go on for months and even years. They can interfere with sleep, work and other activities. Itching can be severe and may be accompanied by painful swelling. Signs and symptoms tend to flare up with heat, exercise or stress.

One of the biggest sources of frustration with chronic hives is wondering what’s causing them. The truth is that it’s hard to know. Up to 90 percent of cases remain unexplained — no external factor or contributing disease can be pinpointed as the cause.

People with chronic hives often are anxious that the hives may be a sign of a serious problem. While it’s possible for chronic hives to be associated with an underlying illness, such as an infection, autoimmune disorder or certain cancers, this is pretty rare. Most doctors don’t recommend extensive testing for such conditions unless there are additional related symptoms.

Although you may never know the cause of your hives, you can rest assured that chronic hives are:

- Often temporary — Investigators followed more than 200 people with chronic hives for up to five years. They found that about half the people with unexplained chronic hives were free of symptoms within a year.
- Rarely life-threatening — A sudden onset of hives can be part of a serious allergic reaction (anaphylaxis). Signs and symptoms may also include swelling of your tongue or throat, breathing problems, and vomiting. Anaphylaxis requires emergency care. But chronic hives don’t put you at any sudden risk.
- Effectively managed — In the majority of cases, chronic hives can be successfully controlled with medications and possibly a few lifestyle changes.

What your doctor can do

To conduct a thorough evaluation, your doctor will want to examine your hives. This may mean seeing your doctor when the hives show up. Your doctor will also want to know how often they appear, how long they last, whether you have any painful swelling, and if you have any other signs and symptoms, such as fever, unintentional weight loss, sensitivity to cold or heat, or pain in your abdomen, bones or joints.

If the pattern of your symptoms is consistent with chronic hives, your doctor will want to know if you’ve started any new medications, traveled recently, or had any infections or other illnesses that might be contributing to the hives.

Providing your hives aren’t complicated by any additional signs and symptoms and they can’t be explained by any recent changes in your life, your doctor may recommend starting treatment with an over-the-counter non-drowsy antihistamine every day.

Common examples include loratadine (Claritin, Alavert), fexofenadine (Allegra) or cetirizine (Zyrtec). If this doesn’t work for you, be sure to tell your doctor. Your doctor may increase your dose or try a different kind of antihistamine. Medications such as corticosteroids or histamine (H-2) blockers also are possibilities. If antihistamines don’t control hives, your doctor may prescribe treatment with omalizumab (Xolair). This is an injectable medicine that’s usually given once a month. In most cases, an effective treatment can be found.

If your physical exam and medical history suggest there might be an underlying problem causing the hives, your doctor may recommend additional testing, such as blood tests or skin tests.

What you can do

Evidence suggests that certain factors — such as heat, tight clothing and nonsteroidal anti-inflammatory drugs (NSAIDs) — can worsen chronic hives. Try to keep cool, avoid hot showers and wear loose, comfortable clothing. If you take NSAIDs regularly for pain relief, talk to your doctor about switching to a different form of pain reliever, at least while you continue to have hives.

People often wonder if something in their diets might be causing their hives. There’s very little evidence that certain foods or food additives are responsible for chronic hives. But it may give you peace of mind to keep a food journal alongside a record of your symptoms so that you can detect a pattern, if any. Most doctors don’t recommend any specific diet or dietary elimination. In other words, don’t stress about it.
Q My heels get very dry and cracked, and are sometimes painful. What can I do to help make them better?

A There are several things you can do to help heal the skin on your heels. Cracked heels usually develop when the skin around the rim of the heel is dry and thickened and increased pressure applied to the fat pad under the heel causes the skin to split. To prevent this, moisturize often. Moisturizers provide a seal over your skin to keep water from escaping and your skin from drying out. Try rubbing your heels with a thick moisturizer, such as Eucerin or Cetaphil, several times a day. Some moisturizers contain keratolytic agents — such as urea, salicylic acid or alpha hydroxy acid — that help soften and exfoliate the skin, but they may cause slight stinging or irritation.

Foot soaks — in warm, plain or soapy water for about 20 minutes — may be helpful. Follow up with a loofah or foot scrubber, then coat your heels with a petrolatum-based ointment, such as Vaseline or Aquaphor. You might want to use petrolatum-based moisturizers before you go to bed, as they can feel a bit greasy. Slipping on a pair of socks over your moisturized feet may help lock in moisture overnight.

If these measures don’t help or if your heels become swollen or inflamed, talk to your doctor or a dermatologist. You may need a prescription ointment with stronger moisturizers or a steroid cream to relieve inflammation. Bandages or a special tissue glue can protect and hold the edges of the cracks together so that they can heal. Wearing supportive shoes and losing extra weight also may help relieve pressure on your feet.

If you have other skin conditions, such as psoriasis or eczema, you’ll want to consult with your doctor as well, as this may affect treatment. If you have diabetes, it’s especially important to take good care of your feet. Cracked heels that are left untreated may lead to infection and ulcers.

Q I’ve been taking my blood pressure medication faithfully, and now my blood pressure is within the normal range. Will I ever be able to stop taking the medication?

A Probably not. Most people who begin taking a blood pressure medication will need to continue taking some type of blood pressure medication for the rest of their lives.

Natural, age-related changes that affect your heart, blood vessels and hormones often lead to eventual high blood pressure. And these changes can be coupled with other risk factors that you have more control over, such as your weight, diet and level of physical activity. Research has found that the lifetime risk of developing high blood pressure in adults older than 55 is 90 percent.

Research has also found that when people with drug-controlled high blood pressure eliminate the drug, blood pressure levels usually go back up eventually. Blood pressure drugs help ensure that your blood pressure stays at healthy levels so that you avoid complications such as stroke, heart attack, heart failure, kidney failure and dementia.

If unpleasant side effects are the main reason you want to discontinue your medication, there are usually many adjustments you and your doctor can make to reduce or eliminate them.