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For people with diabetes, having too much glucose (sugar) in their blood for a long time can cause some serious complications, including foot and skin problems, as well as heart disease, stroke, kidney disease, eye damage and others.

How can diabetes affect my feet?

Diabetes can cause two problems that can affect your feet:

Diabetic neuropathy — Uncontrolled diabetes can damage your nerves. If you have damaged nerves in your legs and feet, you might not feel heat, cold or pain. This lack of feeling is called diabetic neuropathy. If you do not feel a cut or sore on your foot because of neuropathy, the cut could get worse and become infected.

Peripheral vascular disease — Diabetes also affects the flow of blood. Without good blood flow, it takes longer for a sore or cut to heal. Poor blood flow in the arms and legs is called peripheral vascular disease. (The word “peripheral” means “located away from a central point,” and the word “vascular” refers to the blood vessels. Peripheral vascular disease is a circulation disorder that affects blood vessels away from the heart.)

If you have an infection that will not heal because of poor blood flow, you are at risk for developing gangrene, which is the death of tissue due to a lack of blood. To keep gangrene from spreading, the doctor may have to remove a toe, foot or part of a leg. This procedure is called amputation. Diabetes is the most common, non-traumatic cause of leg amputations. Each year, more than 56,000 people with diabetes have amputations. However, research suggests that more than half of these amputations can be prevented through proper foot care.

What are some common foot problems of people with diabetes?

Anyone can get the foot problems listed below. For people with diabetes, however, these common foot problems can possibly lead to infection and serious complications, such as amputation.

Athlete’s foot — Athlete’s foot is a fungus that causes itching, redness and cracking. Germs can enter through the cracks in your skin and cause an infection. Medicines that kill the fungus are used to treat athlete’s foot. These medicines may be pills and/or creams applied directly to the problem area. Ask your health care provider to recommend a medication for athlete’s foot.

Fungal infection of nails — Nails that are infected with a fungus may become discolored (yellowish-brown or opaque), thick and brittle, and may separate from the bed of the nail. In some cases, the nail may crumble. The dark, moist and warm environment of shoes can promote fungal growth. In addition, an injury to the nail can put you at risk for a fungal infection. Fungal nail infections are difficult to treat. Topical medications are available, but they only help a small number of fungal nail problems. Oral medications may be prescribed by your health care provider. Treatment also may include periodic removal of the damaged nail tissue.

Calluses — A callus is a build-up of hard skin, usually on the underside of the foot. Calluses are caused by an uneven distribution of weight, generally on the bottom of the forefoot or heel. Calluses also can be caused by improperly fitting shoes or by a skin abnormality. Keep in mind that some degree of callus formation on the sole of the foot is normal. Proper care is necessary if you have a callus. After your bath or shower, use a pumice stone to gently remove the build-up of tissue. Use cushioned pads and insoles. Medications also may be prescribed to soften calluses. DO NOT try to cut the callus or remove it with a sharp object.

Corns — A corn is a build-up of hard skin near a bony area of a toe or between toes. Corns may be the result of pressure from shoes that rub against the toes or cause friction between the toes. Proper care is necessary if you have a corn. After your bath or shower, use a pumice stone to gently remove the build-up of tissue. Do not use over-the-counter remedies to dissolve corns. DO NOT try to cut the corn or remove it with a sharp object.

Blisters — Blisters can form when your shoes keep rubbing the same spot on your foot. Wearing shoes that do not fit properly or wearing shoes without socks can cause blisters, which can become infected. When treating blisters, it's important not to "pop" them. The skin covering the blister helps protect it from infection. You also may use an antibacterial cream and clean, soft bandages to help protect the skin and prevent infection.

Bunion — A bunion forms when your big toe angles in toward the second toe. Often, the spot where your big toe joins the rest of the foot becomes red and callused. This area also may begin to stick out and become hard. Bunions can form on one or both feet. Bunions may run in the family, but most often they are caused by wearing high-heeled shoes with narrow toes. These shoes put pressure on the big toe, pushing it toward the second toe. The use of felt or foam padding on the foot may help protect the bunion from irritation. A device also may be used to separate the big and second toes. If the bunion causes severe pain and/or deformity, surgery to realign the toes may be necessary.

Dry skin — Dry skin can result if the nerves in your legs and feet do not get the message from your brain (because of diabetic neuropathy) to sweat, which keeps your skin soft and moist. Dry skin can crack, which can allow germs to enter. Use moisturizing soaps and lotions to help keep your skin moist and soft.

Foot ulcers — A foot ulcer is a break in the skin or a deep sore, which can become infected. Foot ulcers can result from minor scrapes, cuts that heal slowly or from the rubbing of shoes that do not fit well. Early intervention is important in treating foot ulcers. Ask your health care provider for advice on how to best care for your wound.

Hammertoes — A hammertoe is a toe that is bent because of a weakened muscle. The weakened muscle makes the tendons (tissues that connect muscles to bone) shorter, causing the toes to curl under the feet. Hammertoes can run in families. They also may be caused by wearing shoes that do not fit properly (are too short). Hammertoes can cause problems with walking, and can lead to other foot problems, such as blisters, calluses and sores. Splinting and corrective footwear can help in treating hammertoes. In severe cases, surgery to straighten the toe may be necessary.

Ingrown toenails — Ingrown toenails occur when the edges of the nail grow into the skin. Ingrown nails cause pressure and pain along the nail edges. The edge of the nail may cut into the skin, causing redness, swelling, pain, drainage and infection. The most common cause of ingrown toenails is pressure from shoes. Other causes of ingrown toenails include improperly trimmed nails, crowding of the toes, and repeated trauma to the feet from activities such as running, walking or doing aerobics. Keeping your toenails properly trimmed is the best way to prevent ingrown toenails. If you have a persistent problem or if you have a nail infection, you may need a health care provider's care. Severe problems with ingrown nails may be corrected with surgery to remove part of the toenail and growth plate.

Plantar warts — Plantar warts look like calluses on the ball of the foot or on the heel. They may appear to have small pinholes or tiny black spots in the center. They are usually painful and may develop singly or in clusters. Plantar warts are caused by a virus that infects the outer layer of skin on the soles of the feet. DO NOT use over-the-counter medications to dissolve the wart. If you are not sure if you have a plantar wart or a callus, let your health care provider decide.

Can these foot problems be prevented?

Proper foot care can help prevent these common foot problems and/or treat them before they cause serious complications. Here are some tips for good foot care:

1. Take care of yourself and your diabetes. Follow your health care provider's advice regarding nutrition, exercise and medication. Keep your blood glucose level within the range recommended by your health care provider.
2. Wash your feet in warm water every day, using a mild soap. Do not soak your feet. Dry your feet well, especially between the toes.
3. Check your feet every day for sores, blisters, redness, calluses or any of the other problems listed above. If you have poor blood flow, it is especially important to do a daily foot check.
4. If the skin on your feet is dry, keep it moist by applying lotion after you wash and dry your feet. Do not put lotion between your toes. Your health care provider can tell you which type of lotion is best to use.
5. Gently smooth corns and calluses with an emery board or pumice stone. Do this after your bath or shower, when your skin is soft. Move the emery board in only one direction.
6. Check your toenails once a week. Trim your toenails with a nail clipper straight across. Do not round off the corners of toenails or cut down on the sides of the nails. After clipping, smooth the toenails with an emery board.
7. Always wear closed-toed shoes or slippers. Do not wear sandals. Do not walk barefoot, even around the house.
8. Always wear socks or stockings. Wear socks or stockings that fit your feet well and have soft elastic.
9. Wear shoes that fit well. Buy shoes made of canvas or leather, and break them in slowly.

10. Protect your feet from heat and cold. Wear shoes at the beach or on hot pavement. Wear socks at night if your feet get cold.
11. Keep the blood flowing to your feet. Put your feet up when sitting, wiggle your toes and move your ankles several times a day, and don't cross your legs for long periods of time.
12. Stop smoking. Smoking can make blood flow problems worse.
13. If you have a foot problem that gets worse or won't heal, contact your health care provider for advice and treatment.
14. Make sure your diabetes doctor examines your feet during each check-up.
15. See your podiatrist (foot doctor) every two to three months for check-ups, even if you don't have any foot problems.

When should I contact my health care provider?

- Contact your health care provider if you experience any of the following problems:
- Changes in skin color
- Changes in skin temperature
- Swelling in the foot or ankle
- Pain in the legs
- Open sores on the feet that are slow to heal or are draining
- Ingrown toenails or toenails infected with fungus
- Corns or calluses
- Dry cracks in the skin, especially around the heel
- Unusual and/or persistent foot odor

How can diabetes affect my skin?

If your blood glucose is high, your body loses fluid, causing your skin to become dry. This occurs because the body is turning the water into urine to remove excess glucose from the blood. Your skin also can get dry if the nerves, especially those in your legs and feet, do not get the message to sweat (because of diabetic neuropathy). Sweating helps keep your skin soft and moist.

Dry skin can become red and sore, and can crack and peel. Germs can enter through the cracks in your skin and cause an infection. In addition, dry skin usually is itchy, and scratching can lead to breaks in the skin and infection.

Skin problems are common in people with diabetes. Blood glucose provides an excellent breeding ground for bacteria and fungi, and can reduce the body's ability to heal itself. These factors put people with diabetes at greater risk for skin problems. In fact, as many as a third of people with diabetes will have a skin disorder related to their disease at some time in their lives. Fortunately, most skin conditions can be prevented and successfully treated if caught early. But if not cared for properly, a minor skin condition can turn into a serious problem with potentially severe consequences.

What are some common skin problems in people with diabetes?

Some of the problems listed below—such as bacterial infections, fungal infections and itching—are skin conditions that can affect anyone. However, people with diabetes are more prone to getting these conditions, which can lead to serious complications. Some of the conditions listed—such as diabetic dermopathy, necrobiosis lipoidica diabetorum and eruptive xanthomatosis—occur only in people with diabetes. (Remember, people with diabetes also can develop skin conditions that affect people who do not have diabetes.) Some common skin conditions include:

Acanthosis nigricans — This is a condition that results in the darkening and thickening of the skin. Often, areas of tan or brown skin, sometimes slightly raised, appear on the sides of the neck, the armpits and groin. Occasionally, these darkened areas may appear on the hands, elbows and knees. Acanthosis nigricans usually strikes people who are very overweight. There is no cure for acanthosis nigricans, but losing weight may improve the condition. Acanthosis nigricans usually precedes diabetes.

Allergic reactions — Allergic reactions to foods, bug bites and medicines can cause rashes, depressions or bumps on the skin. If you think you may be having an allergic reaction to a medicine, contact your health care provider. Severe allergic reactions may require emergency treatment. It is especially important for people with diabetes to check for rashes or bumps in the areas where they inject their insulin.

Atherosclerosis — Atherosclerosis is the narrowing of blood vessels from a thickening of the vessel walls. While atherosclerosis most often is associated with blood vessels in or near the heart, it can affect blood vessels throughout the body, including those that supply the skin. When the blood vessels supplying the skin become narrow, changes occur due to a lack of oxygen. Loss of hair, thinning and shiny skin, thickened and discolored toenails, and cold skin are symptoms of atherosclerosis. Because blood carries the white blood cells that help fight infection, legs and feet affected by atherosclerosis heal slowly when they are injured.

Bacterial infections — There are different kinds of bacterial infections affecting the skin. These include styes, which are infections of the glands of the eyelids; boils, which are infections of the hair follicles; and carbuncles, which are deep infections of the skin and the underlying tissue. There also are bacterial infections that affect the nails. With a bacterial infection, the areas involved generally are hot, swollen, red and painful. Most bacterial infections require treatment with antibiotics in the form of pills and/or creams.

Bullosis diabetorum (diabetic blisters) — In rare cases, people with diabetes develop blisters that resemble burn blisters. These blisters—called bullosis diabetorum—can occur on the fingers, hands, toes, feet, legs or forearms. Diabetic blisters usually are painless and heal on their own. They often occur in people who have diabetic neuropathy. Bringing your blood glucose level under control is the treatment for this condition.

Diabetic dermopathy — Diabetes can affect the small blood vessels of the body that supply the skin with blood. Changes to the blood vessels because of diabetes can cause a skin condition called diabetic dermopathy. Dermopathy appears as scaly patches that are light brown or red, often on the front of the legs. The patches do not hurt, blister or itch, and treatment generally is not necessary. The patches are sometimes called skin spots.

Digital sclerosis — The word “digital” refers to your fingers and toes, and “sclerosis” means hardening. Digital sclerosis, therefore, is a condition in which the skin on your toes, fingers and hands become thick, waxy and tight. Stiffness of the finger joints also may occur. The treatment is to bring your blood glucose level under control. Lotions and moisturizers may help soften the skin.

Disseminated granuloma annulare — This condition causes sharply defined, ring- or arc-shaped areas on the skin. These rashes most often occur on the fingers and ears, but they can occur on the trunk. The rash can be red, red-brown or skin colored. Treatment usually is not required, but some cases may benefit from a topical steroid medication, such as hydrocortisone.

Eruptive xanthomatosis — Eruptive xanthomatosis can occur in some individuals when blood glucose levels are not well controlled and when triglycerides in the blood rise to extremely high levels. This condition appears as firm, yellow, pea-like bumps on the skin. The bumps—which are surrounded by red halos and are itchy—usually are found on the feet, arms, legs, buttocks and backs of the hands. Treatment for eruptive xanthomatosis consists of controlling your blood glucose level. Lipid-lowering drugs also may be needed.

Fungal infections — A yeast-like fungus called *Candida albicans* is responsible for many of the fungal infections affecting people with diabetes. This fungus creates itchy red rashes, often surrounded by tiny blisters and scales. These infections most often occur in warm, moist folds of the skin. Three common fungal infections are jock itch, which appears as a red, itchy area on the genitals and the inside of the thighs; athlete’s foot, which affects the skin between the toes; and ringworm, which causes ring-shaped, scaly patches that can itch or blister. Ringworm can appear on the feet, groin, trunk, scalp or nails. Medicines that kill the fungus may be needed to treat these infections.

Itching — Itching skin, also called pruritus, can have many causes, such as a yeast infection, dry skin or poor blood flow. When itching is caused by poor blood flow, the lower legs and feet are most often affected. Using lotion can help to keep your skin soft and moist, and prevent itching due to dry skin.

Necrobiosis lipoidica diabetorum — Necrobiosis lipoidica diabetorum (NLD) is caused by changes in the blood vessels and generally affects the lower legs. With NLD, the affected skin becomes raised, yellow and waxy in appearance, often with a purple border. Sometimes, NLD is itchy and painful. As long as the sores do not break open, treatment is not necessary. If the sores do break open, see your health care provider for treatment.

Scleroderma diabetorum — Like digital sclerosis, this condition causes a thickening of the skin; but scleroderma diabetorum affects the skin on the back of the neck and upper back. This condition, which is rare, most often affects people with diabetes who are overweight. The treatment is to bring your blood glucose level under control. Lotions and moisturizers may help soften the skin.

Vitiligo — Vitiligo is a condition that affects skin coloration. With vitiligo, the special cells that make pigment (the substance that controls skin color) are destroyed, resulting in patches of discolored skin. Vitiligo often affects the trunk, but may be found on the face around the mouth, nostrils and eyes. This condition usually occurs in people with type 1 diabetes. There is no specific treatment for vitiligo. You should use sunscreen with a SPF of 15 or higher to prevent sunburn on the discolored skin. Assessing skin turgor (fullness) is a way for health care workers to assess the amount of fluid loss that may occur from various conditions, such as diarrhea or vomiting. Loss of body fluid through frequent urination also is a concern for people with diabetes. Skin turgor refers to the skin’s elasticity (its ability to change shape and return to normal). An assessment of skin turgor is used to help determine the effects of diabetes on skin health.

Can these skin problems be prevented?

Keeping your diabetes under control is the most important factor in preventing the skin-related complications of diabetes. Follow your health care provider's advice regarding nutrition, exercise and medication. Keep your blood glucose level within the range recommended by your health care provider. Proper skin care [[link to skin care article](#)] also can help reduce your risk of skin-related problems.