

DIABETES COMPLICATIONS

Cardiovascular

- Cerebral Vascular Disease – disease of or damage to blood vessels in the brain or neck
- Coronary Artery Disease - disease of or damage to the heart and blood vessels that feed it
- Diabetic Vascular Disease - blockages in arteries throughout the body due to diabetes. May cause blindness, severe kidney disease, stroke, heart attack, foot sores, and amputation.
- Heart Attack - an interruption in the blood supply to the heart because of narrowed or blocked blood vessels. Also called *myocardial infarction*.
- Heart Failure - chronic condition in which the heart cannot properly pump blood
- Hypertension - a condition present when blood flows through the blood vessels with a force greater than normal. Generally, above 140/90.
- Peripheral Arterial Disease - a disease of the arteries of the arms, legs, and feet.
- Stroke - caused by blockage or rupture of a blood vessel in the brain or neck
- Transischemic Attack (TIA) - caused by a temporary blockage of a blood vessel in the brain or neck. Signs and symptoms resolve within 24 hours.

Digestive

- Constipation – difficult or infrequent bowel movements
- Diabetic Enteropathy – diarrhea, constipation, or fecal incontinence
- Gastroesophageal Reflex Disease (GERD) -
- Gastroparesis - a form of neuropathy that affects the stomach. Digestion of food may be incomplete or delayed, resulting in nausea, vomiting, or bloating, making blood glucose control difficult
- Gum Disease / Infection
- Tooth loss

Endocrine

- Diabetic Ketoacidosis - A serious condition in which high blood sugar levels and little or no insulin result in the breakdown of fat for energy. The breakdown of fats produces a toxic acid called ketones.
- Hyperglycemia - Higher than normal blood sugar
- Hyperosmolar Hyperglycemic Nonketotic Syndrome - A serious condition that involves very high blood glucose levels, without the presence of ketones, resulting in severe dehydration.
- Hypoglycemia - lower than normal blood sugar

Immune

- Allergic Reaction – food allergies or intolerances may increase insulin resistance. Oral diabetes medications and insulins may cause allergic reactions. Insulin allergies may be identified by rashes, depressions, or bumps at the site of injection.

Integumentary

- Acanthosis Nigricans - tan or brown raised areas appear on the sides of the neck, armpits, and groin. Sometimes they also occur on the hands, elbows, and knees. It usually occurs in people who are very overweight.
- Atherosclerosis - a thickening of the arteries that can affect the skin on the legs. As the blood vessels narrow, the skin changes. It becomes hairless, thin, cool, and shiny. The toes become cold. Toenails thicken and discolor. Exercise causes pain in the calf muscles because the muscles are not getting enough oxygen. Affected legs heal slowly when the skin is injured. Even minor scrapes can result in open sores that heal slowly.
- Diabetic Blisters – sores that look like burn blisters and often occur in people who have diabetic neuropathy. They are sometimes large, but they are painless and have no redness around them. They heal by themselves, usually without scars, in about three weeks. They can occur on the backs of fingers, hands, toes, feet, and sometimes, on legs or forearms
- Diabetic Dermopathy – light brown, scaly, oval or circular patches on the front of both legs. Some people mistake them for age spots. They are harmless and need no treatment.

- Digital Sclerosis - tight, thick, waxy skin on the backs of the hands. Finger joints become stiff and can no longer move the way they should. Sometimes skin on the toes and forehead also becomes thick. Rarely, knees, ankles, or elbows also get stiff.
- Disseminated Granuloma Annulare - sharply defined ring- or arc-shaped raised areas on the skin. They can be red, red-brown, or skin-colored. These rashes occur most often on parts of the body far from the trunk, like fingers or ears. But sometimes the raised areas occur on the trunk.
- Eruptive Xanthomatosis - firm, yellow, pea-like enlargements in the skin. Each bump has a red halo and may itch. It occurs most often on the backs of hands, feet, arms, legs, and buttocks.
- Infections – diabetics are at increased risk of both bacterial and fungal skin infections
 - o Bacterial - Inflamed tissues are usually hot, swollen, red, and painful. The most common are styes (infections of the glands of the eyelid), boils, folliculitis (infections of the hair follicles), carbuncles (deep infections of the skin and the tissue underneath), and infections around the nails. Several different bacteria can cause infections, Staphylococcus, staph, is the most common.
 - o Fungal - can create itchy rashes of moist, red areas surrounded by tiny blisters and scales. These infections often occur in warm, moist folds of the skin. Problem areas are under the breasts, around the nails, between fingers and toes, in the corners of the mouth, under the foreskin (in uncircumcised men), and in the armpits and groin. Candida albicans, a yeast-like fungus, is the most common culprit.
- Itching - caused by a yeast infection, dry skin, or poor circulation. When poor circulation is the cause, the itchiest areas may be the lower parts of the legs.

- Necrobiosis Lipoidica Diabeticorum - causes spots similar to diabetic dermopathy, but they are fewer, larger, and deeper. It often starts as a dull, red, raised area. After a while, it looks like a shiny scar with a violet border. The blood vessels under the skin may become easier to see. It may be itchy and painful, and the spots crack open. If the spots crack open, treatment is needed.

Musculoskeletal

- General
 - o Amputation
 - o Diabetic Hand Syndrome – the skin of the hands becomes thick, tight, and waxy. As the skin tightens the fingers cannot be fully extended. It is painless and does not cause any limitations. Similar to Dupuytren's contracture.
 - o Dupuytren's Contracture – thickening of connective tissue beneath the skin of the finger and palms of the hands causes inward curvature. It is painless.
 - o Forestier's Disease - A form of degenerative arthritis caused by calcification along the sides of the vertebrae and commonly with inflammation and calcification of the tendons at their attachments points to bone.
 - o Frozen Shoulder - progressively worse pain and stiffness in the joint causes immobility of the shoulder. The less the shoulder is moved, the worse the condition gets.
 - o Osteoarthritis - a form of arthritis caused by the breakdown and loss of the cartilage of one or more joints.
 - o Osteoporosis - a decrease in the density of bone, decreasing its strength and resulting in fragile bones.
- Feet
 - o Bunions – a bony hump that forms at the base of the big toe where it attaches to the foot. Often, the big toe deviates toward the other toes. They may become red, sore, and infected.
 - o Calluses – a small area of skin on the foot that has become thick and hard due to pressure or rubbing.
 - o Charcot's Joint/Foot – a form of neuropathy in which the joints and soft tissue of the foot break down secondary to nerve damage.
 - o Corns - a small patch of thickened, dead skin with a packed center. The packed center may press on a nerve, causing pain. They usually form on the

tops, sides, and tips of the toes. Corns that form between the toes are called soft corns and are thinner.

- o Dry, Cracked Skin
- o Hammertoes - a toe that is contracted at the middle joint in the toe, caused by the tightening of ligaments and tendons.
- o Infections
- o Nail Disorders
- o Ulcers – a deep open sore, usually on the ball of the foot. It is usually not painful due to neuropathy.

Nervous

- General
 - o Diabetic Myelopathy – damage to the spinal cord caused by diabetes.
 - o Diabetic Neuropathy – Family of nerve disorders caused by diabetes.
Scientists are not sure exactly how the nerve damage is caused, but there are two theories. One, high blood glucose levels cause chemical changes in the nerves and physically damage the blood vessels that carry O₂ and nutrients to the nerves. Two, physically damaged by advanced glycation end products (AGEs). AGEs are created when high blood glucose levels cause a shift in the body's chemical process, allowing glucose to attach to other molecules, usually proteins. Once the protein is coated with glucose, an AGE is created. The AGE contributes to cell dysfunction and diabetic complications
- Eyes
 - o Cataracts - the eye's clear lens clouds, blocking light.
 - o Diabetic Retinopathy – all disorders of the retina caused by diabetes.
 - o Glaucoma - a group of eye conditions resulting in optic nerve damage, which may cause loss of vision. Abnormally high pressure intraocular pressure usually, but not always, causes this damage.

Reproductive

- Decreased/Absent Sexual Response – The body has little or no sexual response without loss of desire
- Decreased Vaginal Lubrication
- Erectile Dysfunction
- Pregnancy Complications – miscarriage, stillbirth, birth defects, large babies
- Retrograde Ejaculation - at orgasm, the ejaculate is forced back into the bladder rather than through the urethra and out the penis.

Respiratory

- Flu - a contagious respiratory infection caused by a variety of flu viruses. Also called influenza.
- Pneumonia - an inflammation of the lungs caused by infection. Pneumonia can be caused by bacteria, viruses, fungi or parasites.

Urinary

- Diabetic Nephropathy – renal failure caused by high blood sugars
- Neurogenic Bladder – lack of bladder control due to a brain, spinal cord, or nerve condition
- Overactive Bladder – a strong, sudden urge to urinate, which may lead to incontinence. Also includes frequent urination, usually eight or more times in 24 hours, or waking to urinate two or more times a night.
- Renal Failure - a chronic condition in which the body retains fluid and harmful wastes build up because the kidneys no longer work properly
- Urinary Tract Infection – bacterial infection in the urinary tract