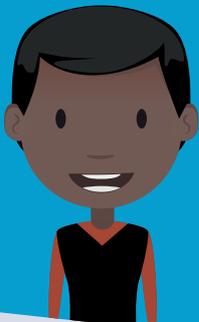


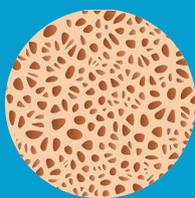
PATIENT INFORMATION

Diabetes and osteoporosis

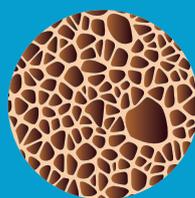


What is osteoporosis?

Osteoporosis is a condition in which bones become thinner and more fragile, making them more likely to break (fracture).



Normal bone



Osteoporotic bone



Broken bone

What is diabetes?

Diabetes mellitus is a group of metabolic diseases that occurs when the pancreas is no longer able to make insulin, or when the body cannot make good use of the insulin it produces. Not being able to produce insulin or use it effectively leads to raised glucose levels in the blood. Over the long-term high glucose levels are associated with damage to the body and failure of various organs and tissues. With the incidence of type 2 diabetes rising at alarming rates, osteoporosis management in people with diabetes is a topic of growing concern. The International Diabetes Federation estimates that there are more than 415 million people with diabetes worldwide, and this number is likely to increase by 55% by 2040.



- **Type 1 diabetes** caused by an auto-immune reaction where the body's defense system attacks the cells that produce insulin. People with this form of diabetes need daily injections of insulin to control their glucose levels.
- **Type 2 diabetes** this accounts for at least 90% of all cases of diabetes. It is characterized by insulin resistance and relative insulin deficiency, either or both of which may be present at the time diabetes is diagnosed.
- **Gestational diabetes** is a form of diabetes consisting of high blood glucose levels during pregnancy. It affects one in 7 births worldwide and is associated with increased risk of complications to both mother and baby.



Why are people with diabetes at increased risk of osteoporosis and fractures?

Although more research is needed to clarify the complex relationship between these two diseases, researchers have shown that bone health is compromised by diabetes. The interplay between bone and insulin is a key link between osteoporosis and diabetes and the use of some antidiabetic drugs has also been associated with an increased risk of fractures. The risk also increases with the development of diabetes complications. Here are some facts:

- People with type 1 diabetes have lower bone mineral density and a higher risk of fractures. Evidence is accumulating that people with type 2 diabetes who have complications, particularly microvascular disease (such as diabetic eye disease or kidney disease), are also at increased risk of certain types of osteoporotic fractures despite having a higher BMD when compared to people with type 1 diabetes.
- The longer average life expectancy of people with diabetes that has accompanied improvements in medical care has increased the significance of osteoporosis. In addition to the usual causes of osteoporosis associated with ageing, bone health is also compromised by diabetes.
- Women with type 1 and 2 diabetes also have an increased fracture risk because vision problems and nerve damage associated with the disease have been linked to an increased risk of falls. Hypoglycemia, or low blood sugar reactions, may also contribute to falls and fractures.
- Sedentary lifestyle habits common in many people with type 2 diabetes may also interfere with bone health.



Am I at risk?

There are no specific recommendations on osteoporosis screening for people with diabetes, but people with diabetes should talk to their doctors about whether they might be candidates for a bone density test. FRAX[®] calculations may also be used to predict 10-year risk of fracture based on individual risk factors and FRAX[®] accounts for increased fracture risk ("secondary causes of osteoporosis") in patients with type 1 diabetes. Although FRAX[®] does predict fracture risk in older patients with Type 2 diabetes, it has been shown to underestimate the risk in these patients. Doctors must therefore consider a possible further increase in risk due to diabetes when interpreting the FRAX[®] scores.



Diabetes-related risk factors for osteoporotic fractures

The following diabetes-related factors have been identified in relation to osteoporosis-related fractures:

- Suboptimal glucose control and diabetes management
- Poor vision due to eye damage increasing fracture risk
- Poor balance due to foot ulcers and nerve damage
- Poor mobility due to excessive weight through sedentary lifestyle and limited joint mobility
- Hypoglycaemia



Top Tips for bone health

The strategies to prevent and treat osteoporosis in people with diabetes are similar to those for people without diabetes. Recommendations include:

- **A healthy diet rich in calcium and vitamin D**

Calcium is contained in various foods, and especially in dairy products. Although guidelines vary worldwide and according to age, adequate intake of around 1000 mg/day is often advised. Vitamin D is produced in the skin upon exposure to sunlight. Although many people are able to obtain enough vitamin D naturally via sunlight, older people are often deficient in this vitamin due, in part, to limited time spent outdoors. They may require vitamin D supplements to ensure an adequate daily intake, particularly in obese subjects at higher risk of hypovitaminosis D.

- **Regular bone strengthening exercise**

Regular weight-bearing and muscle-strengthening exercise can also help prevent bone loss and, by enhancing balance and flexibility, reduce the likelihood of falling and breaking a bone. Exercise is especially important for people with diabetes since exercise helps insulin lower blood glucose levels.

- **Healthy lifestyle**

Avoiding smoking and excessive alcohol intake, while maintaining a healthy body weight, not only helps with the management of diabetes, it is also important for bone health.

- **Medication**

Drug treatments approved for the prevention and treatment of osteoporosis in postmenopausal women and men are commonly prescribed, although more research is needed to determine how effective these treatments are in older patients with diabetes.

- **Minimizing the risk of falling**

Two main steps to avoiding falls is wearing slip-proof shoes and fall-proofing the home. The latter may include installing hand rails on stairs and in bathrooms as well as ensuring that walkways are free of hazards (such as loose rugs).



I do not have bone pain. Does it mean that I don't have osteoporosis?

Osteoporosis is a painless disease until a fracture occurs. So if you do not have pain, it does not necessarily mean that you do not have osteoporosis. Individuals could definitely be osteoporotic even if they have not had a fracture at all.

Will taking calcium and vitamin D protect my bones?

Calcium and vitamin D are important for bone health. An adequate intake of calcium can be achieved through dietary intake or, if this is not possible, by taking supplements. Most of our vitamin D is obtained by exposure of the skin to sunlight and supplements are sometimes necessary, particularly in people who do not go out of doors much or do not expose their skin to sunlight. Vitamin D is also available in some foods (www.iofbonehealth.org). IOF recommends vitamin D supplementation in adults aged 60 and over for falls and fracture protection.

Although it is important to ensure that you have enough calcium and vitamin D, your doctor may consider that you also need drug treatment to prevent or treat osteoporosis.

