



# How is diabetes a risk factor for periodontitis?

If you have uncontrolled diabetes, you are at higher risk of developing periodontitis. Here is a breakdown of the key pathways that diabetes can cause which can impact your gum health.

## How diabetes affects the bacteria in your mouth (oral microbiome)

The oral microbiome is a community of bacteria that naturally lives in your mouth. In a healthy mouth, these bacteria are balanced and help protect your gums. However, diabetes can disrupt this balance, making harmful bacteria more likely to grow. This disruption is called dysbiosis – an imbalance of bacteria that triggers inflammation in the gums. When the gums become inflamed, the immune system may struggle to control harmful bacteria, which can make periodontitis worse.

Although research shows a link between diabetes and changes in oral bacteria, more large-scale studies are needed to fully understand how this works.

## How diabetes increases inflammation in the gums

The strongest connection between diabetes and periodontitis is through inflammation. Both conditions cause high levels of inflammation, which can spread throughout the body and contribute to worse overall health. Inflammation plays a major role in periodontitis progression, and people with poorly controlled diabetes are more likely to experience severe periodontitis. Here's how it happens:

- Cytokines (Inflammatory markers)
  - Cytokines are proteins that the body releases in response to infection or injury.
  - People with diabetes and gum disease tend to have higher levels of cytokines, especially if their blood sugar levels are poorly controlled.
  - This leads to greater gum inflammation and more tissue damage in the mouth.
- Hyperglycaemia and Advanced Glycation End Products (AGEs)
  - Hyperglycaemia means high blood glucose (sugar) levels, which causes the formation of Advanced Glycation End Products (AGEs) – molecules that are made when glucose sticks to proteins or fats in the body.
  - AGEs trigger inflammation and oxidative stress (damage caused by harmful molecules).
  - When AGEs bind to their receptor in the body called RAGE, they worsen inflammation and make it harder for the gums to heal.
- Bone remodelling
  - Bone homeostasis refers to the balance between bone formation and bone breakdown.
  - Poorly controlled diabetes increases the production of a molecule called RANKL, which activates osteoclasts (the cells responsible for breaking down bone).
  - Higher levels of RANKL mean more bone loss around teeth, increasing the risk of tooth loss in people with diabetes.
- MicroRNAs
  - MicroRNAs are tiny molecules that help regulate how genes work in the body.
  - They can influence inflammation, bone health, and the AGE-RAGE pathway

### **What does this mean for your gum health?**

If you have poorly controlled diabetes, your body is more likely to experience:

- Higher levels of inflammation in the gums
- Greater destruction of gum tissues and bone
- Slower healing after gum treatments

This makes it essential to manage your blood sugar levels and get regular dental care to protect your gum health.

### **References**

Polak D, Sanui T, Nishimura F, Shapira L. Diabetes as a risk factor for periodontal disease-plausible mechanisms. *Periodontol* 2000. 2020 Jun;83(1):46-58. doi: 10.1111/prd.12298. PMID: 32385872.

