

# Module 3: The Oral Microbiome

Second largest microbial community — and its links to systemic disease.

Tracks: Core, Clinical, Advanced | Duration: 50 min

## KEY TAKEAWAYS

- The oral microbiome is not just about cavities — it has systemic implications.
- *P. gingivalis* can restructure the entire subgingival community at low abundance — a keystone pathogen.
- Oral-cardiovascular links are association-heavy; causation is still being tested.

## EVIDENCE-GRADED CLAIMS

Periodontal disease is associated with cardiovascular disease	<b>B — Supported, context-specific</b>	Strong epidemiological association; causal proof from intervention trials is still building.
Treating periodontitis improves glycemic control in T2DM	<b>B — Supported, context-specific</b>	Meta-analyses show modest HbA1c reduction (~0.3%) after periodontal treatment.
Mouthwash disrupts beneficial oral bacteria involved in NO production	<b>C — Promising, preliminary</b>	Emerging evidence; small studies show chlorhexidine reduces oral nitrate reduction and may raise BP.
<i>P. gingivalis</i> causes Alzheimer's disease	<b>D — Plausible, unproven</b>	Detected in AD brain tissue; causal link is speculative. Cortexyme trial failed.

## SUMMARIES

### For Patients

Your mouth hosts over 700 species of bacteria — the second largest microbial community in your body after your gut. Most are harmless or helpful, but some can cause gum disease. Increasingly, researchers are finding links between oral bacteria and heart disease, diabetes, and even Alzheimer's, though we're still proving cause vs correlation.

### For Clinicians

Periodontitis is independently associated with CVD, T2DM, and adverse pregnancy outcomes in large cohorts. *P. gingivalis* acts as a keystone pathogen — at low abundance, it dysregulates the host immune response and restructures the subgingival community. The clinical question is whether treating periodontitis improves systemic outcomes — intervention trials are mixed but trending positive for glycemic control.

## REFERENCES

- The keystone-pathogen hypothesis — Hajishengallis G et al., Nat Rev Microbiol 2012 [\[Link\]](#)