

FOR NON-ORAL HEALTH PROFESSIONALS

# Relationship Between Oral and Systemic Diseases

## Background

The link between oral diseases and some of the most common systemic diseases such as diabetes<sup>1</sup> and cardiovascular disease<sup>2</sup> has been established in scientific literature. Shared underlying pathways and common risk factors between oral diseases and systemic conditions have been identified.

This factsheet explains the oral-systemic association and ways in which other healthcare professionals can collaborate with dental teams in the interests of their patients.



### **The oral-systemic connection**

The FDI Whole Body Health Project is a dynamic platform where research on the association between oral diseases and the most common noncommunicable diseases (NCDs) is kept updated. Click on the following link to learn how oral health relates to twelve different systemic conditions: <https://whole-body-health.fdiworlddental.org/>

## **Underlying mechanisms and inflammation**

In the presence of gingival and periodontal inflammation, pathogenic microorganisms from the periodontal tissues enter the blood circulation during normal daily functions through microscopic ulcers under the gum margin.<sup>3</sup> This can activate certain white blood cells in the blood stream to release damaging oxygen radicals and inflammatory mediators. It can also activate an acute-phase response in the liver, resulting in the release of C-reactive protein, which also causes inflammation in the body.<sup>3</sup> Research suggests that the inflammatory mediators produced during periodontitis can 'spill over' into the blood stream and increase the systemic inflammatory burden.<sup>4</sup>

In addition, periodontal inflammation can change proteins in the periodontal tissues to make them autoantigenic and to predispose to diseases like rheumatoid arthritis.

## **Oral diseases share common risk factors with non-communicable diseases (NCDs)**

NCDs are the leading cause of premature deaths in the world. They include oral diseases and systemic NCDs, such as cardiovascular diseases (CVD), cancer, chronic respiratory diseases, type 2 diabetes, cancers, chronic obstructive pulmonary disease (COPD) and asthma, share modifiable risk factors.

Most of the common risk factors for oral diseases and other NCDs are modifiable and include <sup>5</sup>:

- Tobacco use
- An unhealthy diet-high in free sugars
- Alcohol use<sup>6</sup>
- Physical inactivity.
- Air pollution<sup>7</sup>

## **Collaboration between dentists and dental teams and medical practitioners**

Examples of common areas of collaboration between dentists and dental teams and medical practitioners include:<sup>8</sup>

- Referrals for routine and emergency care
- Pain management
- Medically complex patients
- Anticoagulation
- Antibiotic prophylaxis
- Gastroesophageal reflux disease.

# Oral healthcare delivery framework for Medical Practitioners<sup>8</sup>

## Ask

Obtain detailed medical, dental and social history and lab tests, if needed, to investigate underlying causes of potential oral and systemic diseases. Ask about common risk factors, such as tobacco, cannabis and alcohol use in a standardized risk assessment protocol. For specific questions, consult the following resources:

- <https://www.safetynetmedicalhome.org/sites/default/files/Oral-Health-Screening-Questions.pdf>
- <https://www.safetynetmedicalhome.org/sites/default/files/Rapid-Oral-Health-Screening-Risk-Assessment.pdf>

## Look

Medical practitioners should look for signs and symptoms of oral and systemic disease by conducting both physical and basic oral examinations. During the oral examination, they should look at the:

- Labial mucosa and labial sulcus (upper and lower)
- Labial part of the commissures and buccal mucosa (right and left)
- Tongue (dorsal, lateral and ventral surfaces)
- Floor of the mouth
- Hard and soft palate
- Alveolar ridges/gingiva (upper and lower)
- Tonsillar beds
- Gums
- Teeth mobility

## Decide

Decide what conditions require immediate attention, examples include:

- Oral abscess
- Cellulitis
- Ludwig's angina (a type of bacterial infection that occurs in the tissues under the tongue)
- Acute necrotizing ulcerative gingivitis
- Life-threatening conditions like oral cancer or precancerous lesions or oral manifestations of systemic diseases
- Advanced dental caries and chronic alveolar abscesses
- Difficulty swallowing or speaking

Decide whether it is appropriate to provide brief advice on behaviours that can have an impact on your patient's health, such as on tobacco and alcohol use, their diet and level of physical activity, and whether a specialist referral is required.<sup>10</sup>

Decide what other investigations or tests you may need to confirm oral or systemic conditions.

## Act

- Evaluate and initially manage oral urgencies/emergencies.
- Screen for oral diseases and facilitate appropriate referrals.
- Encourage favourable and healthy behaviours that promote oral and general health and arrange for the patient's follow-up with oral and general specialists based on data obtained from the initial screening.
- All patients with the comorbidities listed in oral-systemic conditions on the FDI Whole Body Health Project platform should be referred to a dentist or a member of the dental team for an examination and periodontal screening.
- In areas where Noma is endemic, non-oral healthcare professional should carry out the basic principles of oral examination and be able to distinguish the reversible (necrotizing ulcerative gingivitis and edema) from the irreversible (gangrenous, scarring and sequalae) stages of Noma.<sup>9</sup>
- Examples of specific interventions that can be carried out by other healthcare professionals can be found here: <https://www.safetynetmedicalhome.org/sites/default/files/Primary-Care-Clinical-Interventions.pdf>.
- Medical practitioners should monitor conditions such as diabetes, which affect both oral and systemic health, both directly and indirectly, via ensuring the patient has access to optimal management.

## Document

Document the patient's history, diagnosis, and management of oral and systemic diseases.

## Role-Specific Considerations

### Pharmacists

- Educate patients about the effects of medications on oral health, such as dry mouth or gum overgrowth.
- Review medications that may affect dental treatments or conditions.
- Provide guidance on managing medication side effects that impact oral health.

### Nutritionists/Dietitians

- Advise on diets that support oral and systemic health.
- Educate patients on the impact of nutrition on oral health conditions, such as the role of sugar in dental caries or the impact of eating disorders on oral health.

Collaborate with dental teams to develop comprehensive dietary plans for patients with specific oral health needs.

## This factsheet is supported by:



## References

1. Stöhr J, Barbaresko J, Neuenschwander M, et al. Bidirectional association between periodontal disease and diabetes mellitus: a systematic review and meta-analysis of cohort studies. *Sci Rep* 11, 13686 (2021) <https://doi.org/10.1038/s41598-021-93062-6> [Accessed on 13 March 2024].
2. Xu, S., Song, M., Xiong, Y. et al. The association between periodontal disease and the risk of myocardial infarction: a pooled analysis of observational studies. *BMC Cardiovasc Disord* 17, 50 (2017). <https://doi.org/10.1186/s12872-017-0480-y> [Accessed on 13 March 2024].
3. Cekici A, Kantarci A, Hasturk H, Van Dyke TE. Inflammatory and immune pathways in the pathogenesis of periodontal disease. *Periodontol* 2000. 2014 Feb;64(1):57-80. doi: 10.1111/prd.12002. PMID: 24320956; PMCID: PMC4500791.
4. Martínez-García M, Hernández-Lemus E. Periodontal Inflammation and Systemic Diseases: An Overview. *Front Physiol.* 2021 Oct 27;12:709438. doi: 10.3389/fphys.2021.709438. PMID: 34776994; PMCID: PMC8578868.
5. <https://www.who.int/news-room/fact-sheets/detail/oral-health#:~:text=Most%20oral%20diseases%20and%20conditions,chronic%20respiratory%20disease%20and%20diabetes> [Accessed on 13 March 2024].
6. Anderson BO, Berdzuli N, Ilbawi A, Kestel D, Kluge HP, Krech R, Mikkelsen B, Neufeld M, Poznyak V, Rekve D, Slama S, Tello J, Ferreira-Borges C. Health and cancer risks associated with low levels of alcohol consumption. *Lancet Public Health.* 2023 Jan;8(1):e6-e7. doi: 10.1016/S2468-2667(22)00317-6. PMID: 36603913; PMCID: PMC9831798.
7. Air pollution exposure may be linked to higher risk of mouth cancer. *Br Dent J* 225, 800 (2018). <https://doi.org/10.1038/sj.bdj.2018.994> [Accessed on 13 March 2024]
8. Phillips KE, Hummel J. Oral Health in Primary Care: A Framework for Action. *JDR Clin Trans Res.* 2016 Apr;1(1):6-9. doi: 10.1177/2380084415625634. PMID: 30931696.
9. WHO. Information brochure for early detection and management of NOMA. NOMA is a severe disease. It is treatable if detected and managed early! Available from: [https://www.afro.who.int/sites/default/files/2017-07/Information\\_brochure\\_EN.pdf](https://www.afro.who.int/sites/default/files/2017-07/Information_brochure_EN.pdf) [Accessed on 13 March 2024].
10. Strengthening health systems for treating tobacco dependence in primary care. <https://www.who.int/publications/i/item/strengthening-health-systems-for-treating-tobacco-dependence-in-primary-care> [Accessed on 13 March 2024].

## Other Resources

FDI Whole Body Health Project. Available from: <https://www.fdiworlddental.org/whole-body-health> [Accessed on 13 March 2024].

FDI World Dental Federation. Policy brief: ACCELERATING ACTION ON ORAL HEALTH AND NCDS Achieving an integrated response. Available from: [http://www.fdiworlddental.org/sites/default/files/2020-11/ncda\\_fdi-policy\\_brief\\_oral\\_health\\_ncds.pdf](http://www.fdiworlddental.org/sites/default/files/2020-11/ncda_fdi-policy_brief_oral_health_ncds.pdf) [Accessed on 13 March 2024].

FDI World Dental Federation. Educational module for other healthcare professionals. Available from: [Educational Module for Other Healthcare Professionals | FDI \(fdiworlddental.org\)](#) [Accessed on 13 March 2024].

World Health Organisation (WHO). An online learning module on the oral-systemic connection: Promoting oral health in primary health care settings. Available from: <https://openwho.org/courses/oral-health-promotion-PHC/items/5jbasr9EHgyEnyOLLM26Vyhttps://www.efp.org/news-events/news/efp-highlights-perio-diabetes-link-on-world-diabetes-day-30381/> [Accessed on 13 March 2024].

European Federation of Periodontology; The Oral Health and Gum Hub. Look after your gums. Available from: <https://www.efp.org/for-patients/> [Accessed on 13 March 2024].

Smiles For Life. A module: The Relationship of Oral and Systemic Health. Available from: <https://www.smilesforlifeoralhealth.org/courses/the-relationship-of-oral-and-systemic-health/> [Accessed on 13 March 2024].

A list of comprehensive references on this topic can be found here: [https://s3.xopic.de/openwho-public/courses/276klvITWOfKXg5giHHujh/rfiles/3UL20433leKUy9jpfGAR9N/Module\\_3\\_Further\\_Reading.pdf](https://s3.xopic.de/openwho-public/courses/276klvITWOfKXg5giHHujh/rfiles/3UL20433leKUy9jpfGAR9N/Module_3_Further_Reading.pdf) [Accessed on 13 March 2024].

### Disclaimer:

The provided fact sheet offers general information and may require adaptation to suit the unique scope of work and regulations governing other healthcare professionals in each country.

The Educational Module for Other Healthcare Professionals Project is supported by **HALÉON**