

# Oral Medicine

Periodontal disease (PD) is a chronic gram-negative oral infection at the junction between teeth and gums and poses a major public health issue. In advanced cases, the local epithelial barrier is compromised and a systemic inflammatory response ensues.



# Oral Medicine



A large number of scientific studies report an association between PD and other medical conditions, such as cardiovascular disease, diabetes mellitus and adverse pregnancy outcomes.

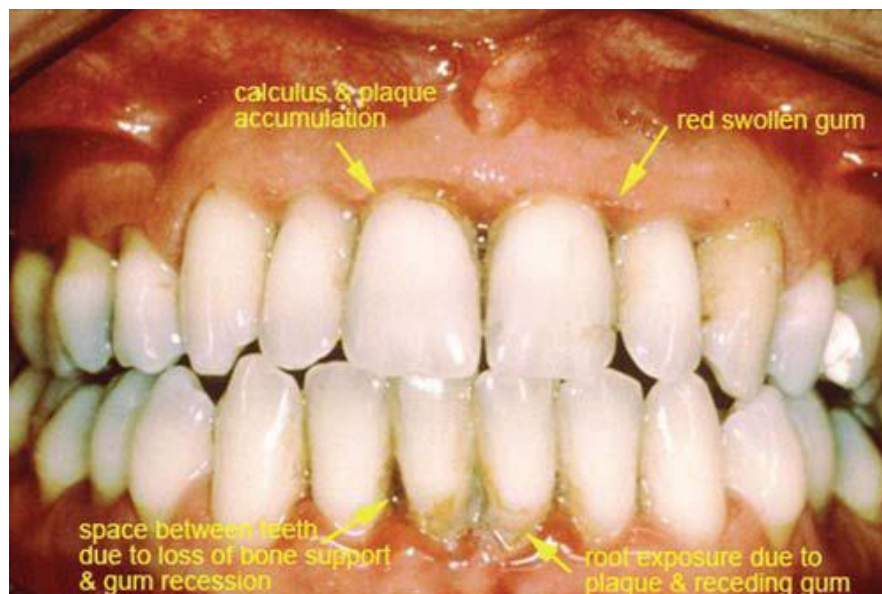
On behalf of the Swiss Society of Periodontology this presentation is intended to enlighten the association between local periodontal infections and systemic diseases.

*Dr. med. dent. Kathrin Lampe Bless, October 2014*

# Oral Medicine



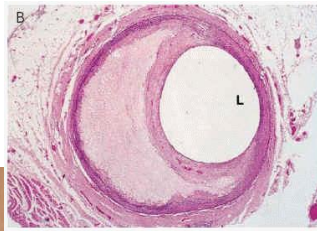
Common signs of PD that may be noted by primary care providers include: tooth loss, gingivitis with gum inflammation and bleeding, excess tartar, infection, decay, tooth mobility, and gum recession with bone loss



*Humphrey et al, J Gen Intern Med 2008*

# Oral Medicine

Two diseases can occur simultaneously because they share risk factors.



Two diseases can also develop sequentially and the progression of one disease may affect the other.

*Van Dyke TE, van Winkelhoff AJ, J Clin Perio 2013; 40 (Suppl. 14)*

# Atherosclerotic cardiovascular Diseases (ACVD)

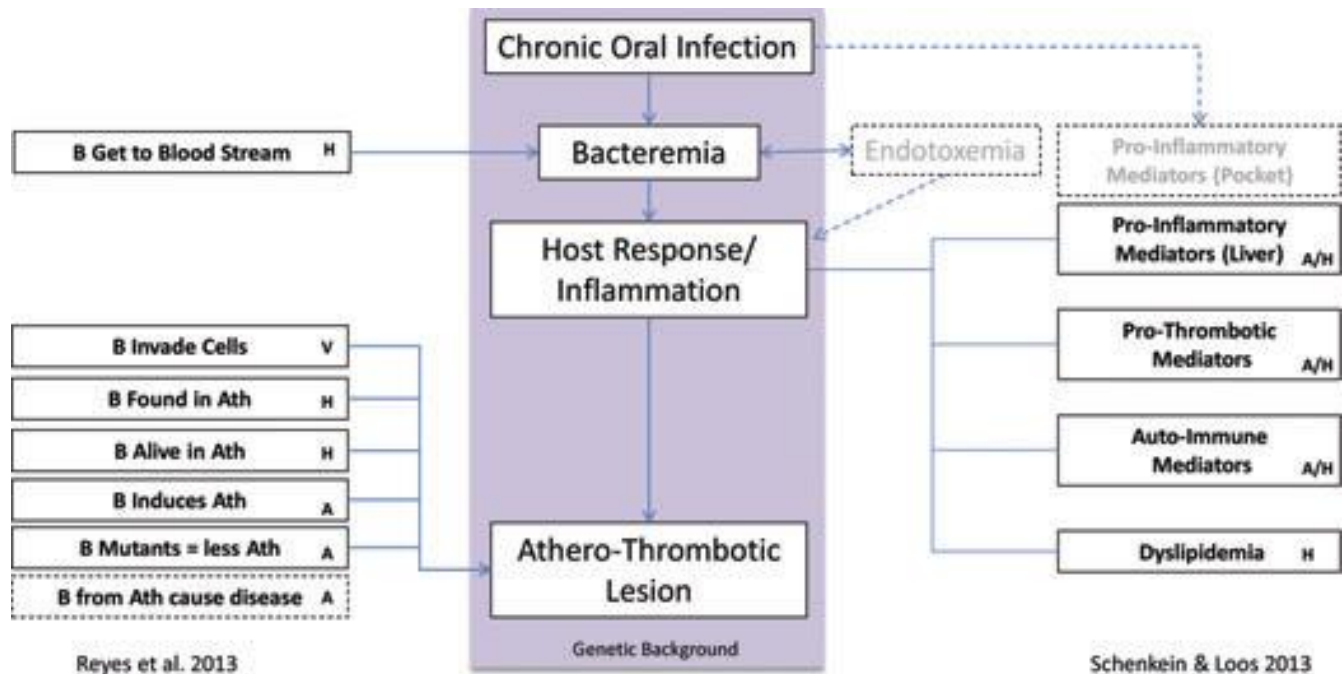


## Biological plausibility

Epidemiol. evidence

Intervention trials

Reasonable recommendations



Reyes L et al, J Clin Perio 2013; 40 (Suppl. 14)

# Atherosclerotic cardiovascular Diseases (ACVD)

Biological  
plausibility

**Epidemiol.  
evidence**

Interven-  
tion trials

Reasonable  
recommen-  
dations

A systematic review showed evidence for an increased risk of ACVD in patients with PD compared to patients without. There is insufficient evidence for an association between PD and secondary CVD.

*Dietrich T et al., J Clin Perio 2013; 40 (Suppl. 14)*

Established cardiovascular risk factors do not completely explain the excess cardiovascular risk in subjects with PD.

*Tonetti , Van Dyke, J Clin Perio 2013; 40 (Suppl. 14)*

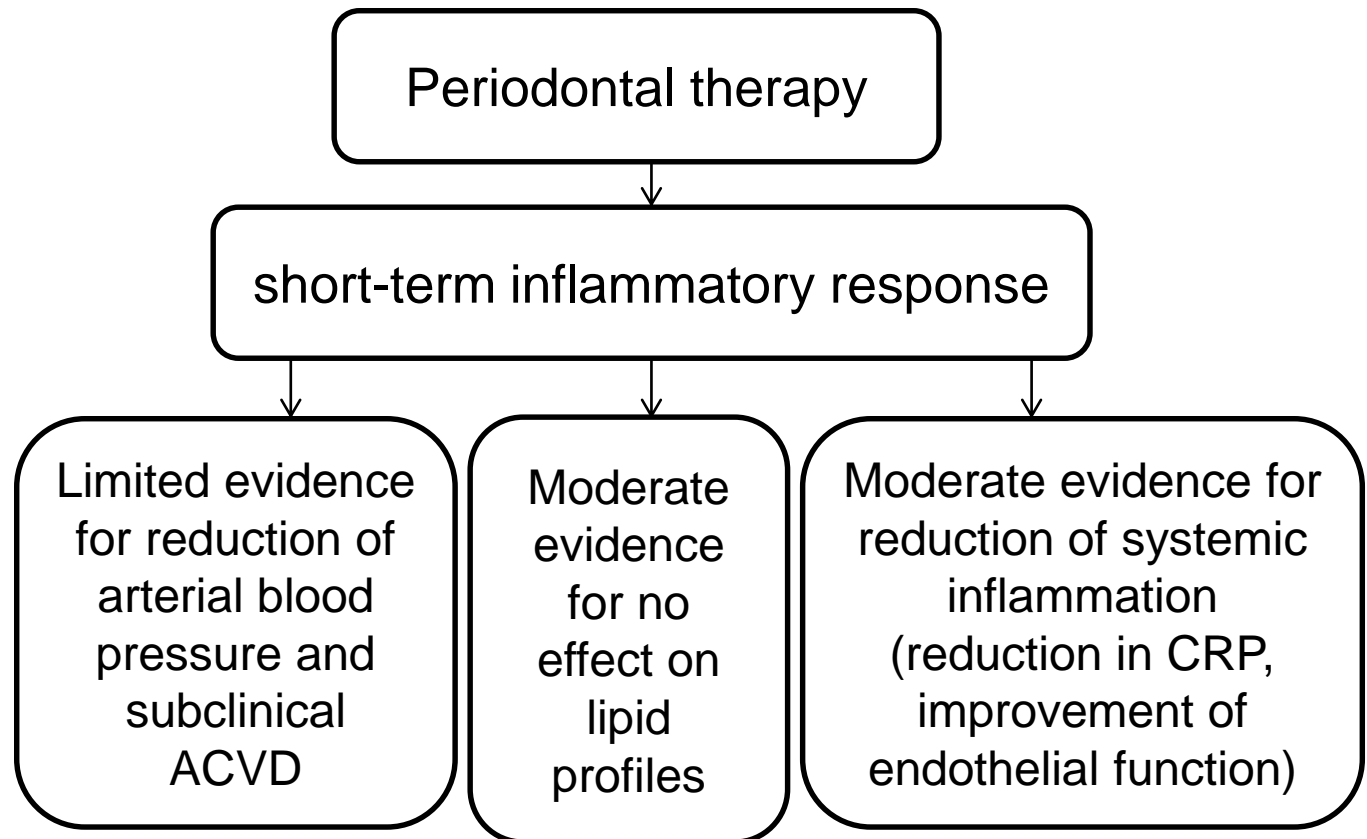
# Atherosclerotic cardiovascular Diseases (ACVD)

Biological  
plausibility

Epidemiol.  
evidence

**Intervention  
trials**

Reasonable  
recommen-  
dations



*D’Aiuto F et al, J Clin Perio 2013; 40 (Suppl. 14)*



# Atherosclerotic cardiovascular Diseases (ACVD)

Biological  
plausibility

Epidemiol.  
evidence

Intervent-  
tion trials

**Reasonable  
recommen-  
dations**

Modifiable lifestyle associated risk factors for periodontitis (and ACVD) should be addressed in the dental office.



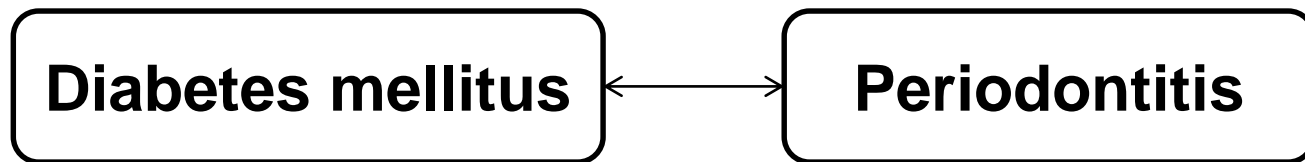
PD patients with other risk factors for ACVD who have not seen a physician within the last year, should be referred for a physical.

*Tonetti , Van Dyke, J Clin Perio 2013; 40 (Suppl. 14)*



# Diabetes mellitus

Diabetes and PD are complex chronic diseases with an established bidirectional relationship. There is long-established evidence that hyperglycemia in diabetes is associated with adverse periodontal outcomes.



*Chapple ILC, Genco R, J Clin Perio 2013; 40 (Suppl. 14)*

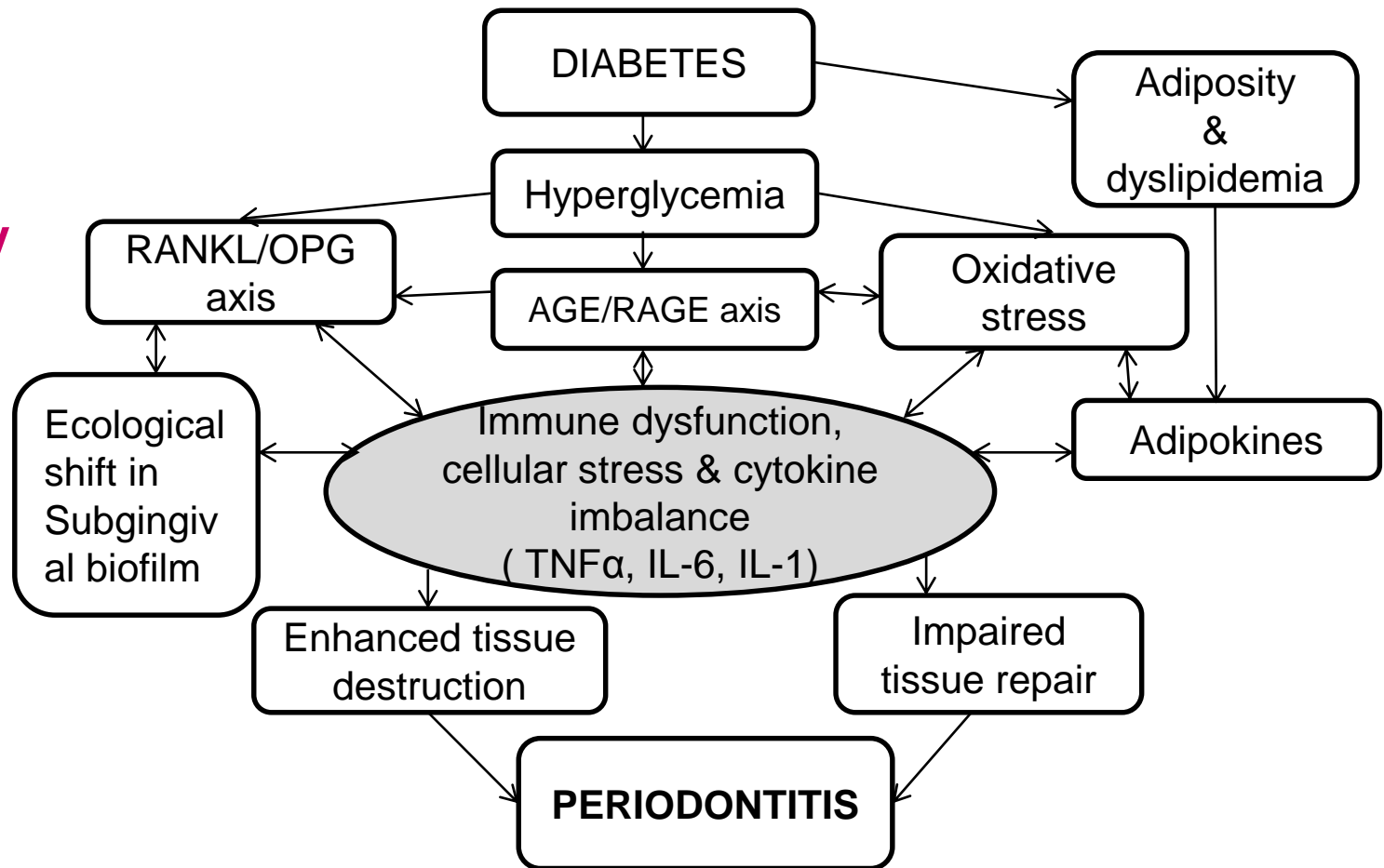
# Diabetes mellitus

**Biological plausibility**

Epidemiol. evidence

Intervention trials

Reasonable recommendations



# Diabetes mellitus

Biological  
plausibility

Severe PD adversely affects glycemic control in diabetes and glycemia in non-diabetes subjects (direct and dose-dependent relationship).

**Epidemiol.  
evidence**

*Chapple ILC, Genco R, J Clin Perio 2013; 40 (Suppl. 14)*

Interven-  
tion trials

Significant adverse effects of PD on glycemic control, diabetes complications, and development of type 2 diabetes.

Reasonable  
recommen-  
dations

*Borgnakke WS et al, J Clin Perio 2013; 40 (Suppl. 14)*

# Diabetes mellitus

Biological  
plausibility

Epidemiol.  
evidence

**Interven-  
tion trials**

Reasonable  
recommen-  
dations

Mechanical periodontal therapy associates with approximately a 0.4% reduction in HbA1C at three months.



No evidence for adjunctive use of antimicrobials.

*Chapple ILC, Genco R, J Clin Perio 2013; 40 (Suppl. 14)*

# Diabetes mellitus

Biological  
plausibility

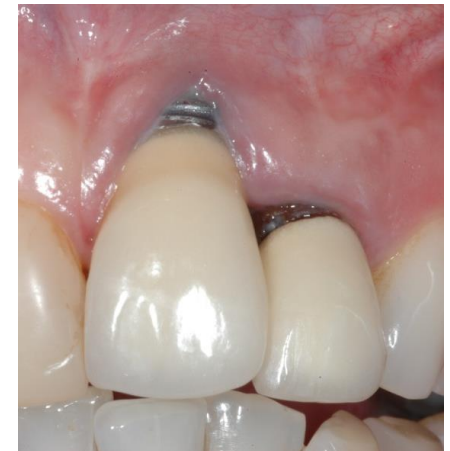
Epidemiol.  
evidence

Interven-  
tion trials

**Reasonable  
recommen-  
dations**

Evidence is lacking to indicate that implant therapy in subjects with diabetes yields long-term outcomes comparable with those of non-diabetic subjects

*Salvi et al, J Clin Perio 2008*

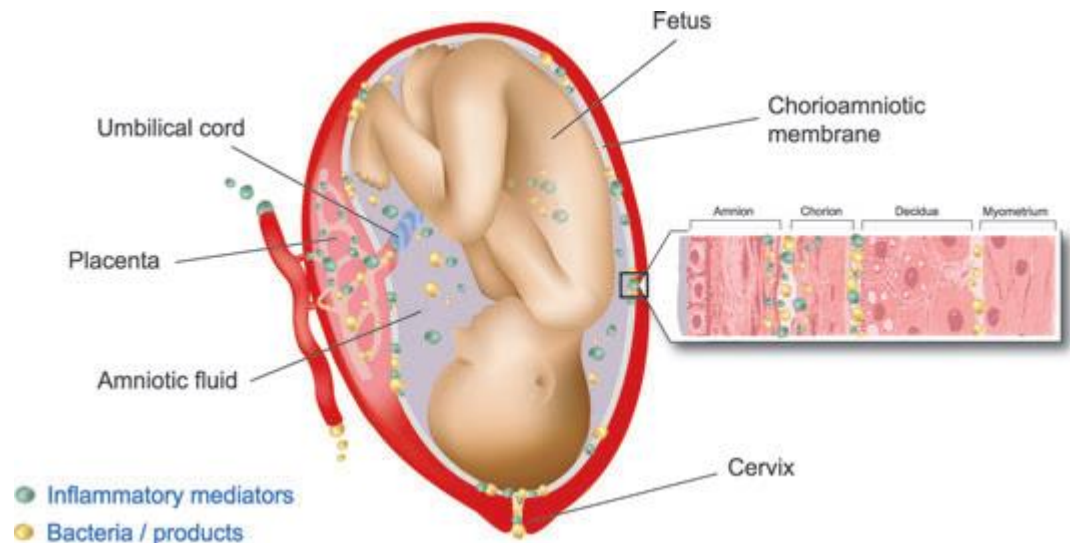


Association of glycemic control with implant failure ? Appropriate accommodations for delays in implant integration based on glycemic control.

*Oates et al, Clin Oral Impl Res 2011*

# Adverse Pregnancy Outcomes

Low birthweight (<2500 g)  
pre-term birth (<37 weeks of gestation)  
pre-eclampsia



*Ide, M. & Papapanou, P., J Clin Perio 40 (Suppl 14)*

# Adverse Pregnancy Outcomes

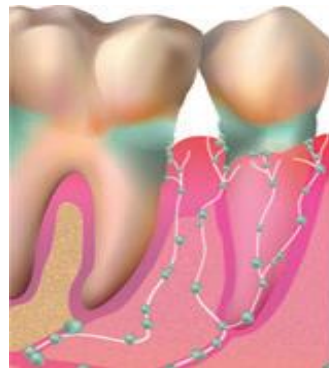


## Biological plausibility

Epidemiol. evidence

Intervention trials

Reasonable recommendations



### Hematogenous dissemination

- Bacteria and/or byproducts
- Pro-inflammatory cytokines

**Direct pathway:** oral microorganisms reach the foetal–placental unit

**Indirect pathway:** Inflammatory mediators circulate and impact the foetal–placental unit

*Madianos PN et al, J Clin Perio 2013; 40 (Suppl. 14)*



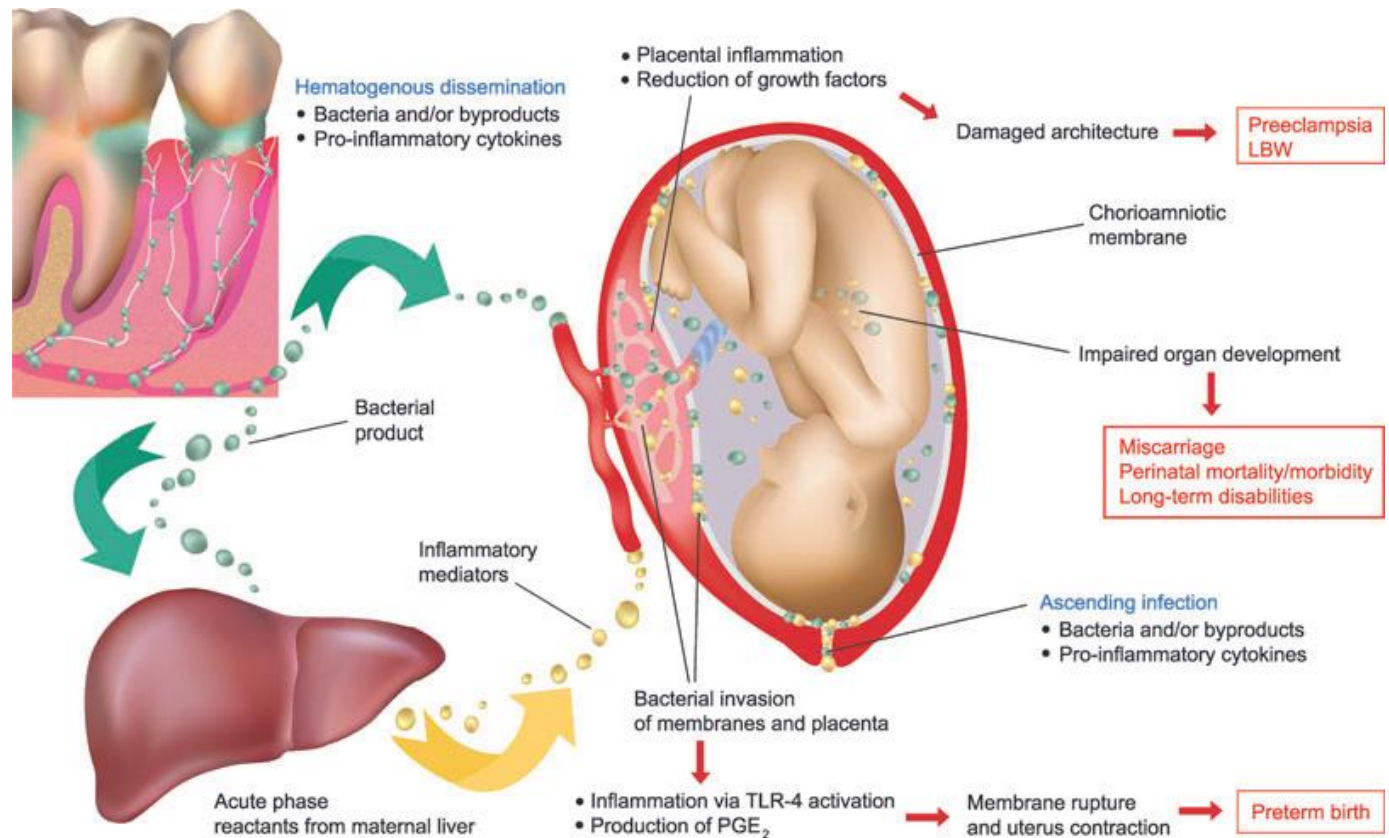
# Adverse Pregnancy Outcomes

**Biological plausibility**

Epidemiol. evidence

Intervention trials

Reasonable recommendations



# Adverse Pregnancy Outcomes



Biological  
plausibility

**Epidemiol.  
evidence**

Interven-  
tion trials

Reasonable  
recommen-  
dations

In PD patients the magnitude of bacteremia was associated with gingival index, plaque index and number of sites with bleeding on probing, but not with pocket depth measurements. Hence, increments of PD clinical parameters, such as probing pocket depth, that determine the severity of the disease do not necessarily correspond to a linear incrementation of bacteremia.

*Forner L et al, J Clin Perio 2006; 33*

# Adverse Pregnancy Outcomes



Biological  
plausibility

Maternal PD is modestly but significantly associated with LBW and preterm birth and was significantly associated with pre-eclampsia.

**Epidemiol.  
evidence**

*Ide M, Papapanou PN, J Clin Perio 2013; 40 (Suppl. 14)*

Interven-  
tion trials

Fusobacterium nucleatum and Anti-F. nucleatum IgM antibodies have been detected in cases of pre-term birth and stillbirth.

Reasonable  
recommen-  
dations

*Sanz M, Kornman K, J Clin Perio 2013; 40 (Suppl. 14)*

# Adverse Pregnancy Outcomes



Biological  
plausibility

Epidemiol.  
evidence

**Interven-  
tion trials**

Reasonable  
recommen-  
dations

Although periodontal therapy has been shown to be safe and leads to improved periodontal conditions in pregnant women, case-related periodontal therapy, with or without systemic antibiotics does not reduce overall rates of pre-term birth and low birthweight.

*Sanz M, Kornman K, J Clin Perio 2013; 40 (Suppl. 14)*

Conclusion: Non-surgical periodontal therapy, scaling and root planing, does not improve birth outcomes in pregnant women with PD.

*Michalowicz BS et al, J Clin Perio 2013; 40 (Suppl. 14)*

# Adverse Pregnancy Outcomes

Biological  
plausibility

Epidemiol.  
evidence

**Interven-  
tion trials**

Reasonable  
recommen-  
dations

Scaling and root surface debridement, with or without adjunctive care including systemic antibiotics, does not reduce overall rates of pre-term birth and low birthweight. Because some trials have shown an overall positive effect, there may be distinct patient populations that benefit from treatment. Previous pre-term birth history and baseline periodontal conditions may be associated with a treatment effect.

*Michalowicz & Gustafsson, J Clin Perio 2013; 40 (Suppl. 14)*

# Adverse Pregnancy Outcomes

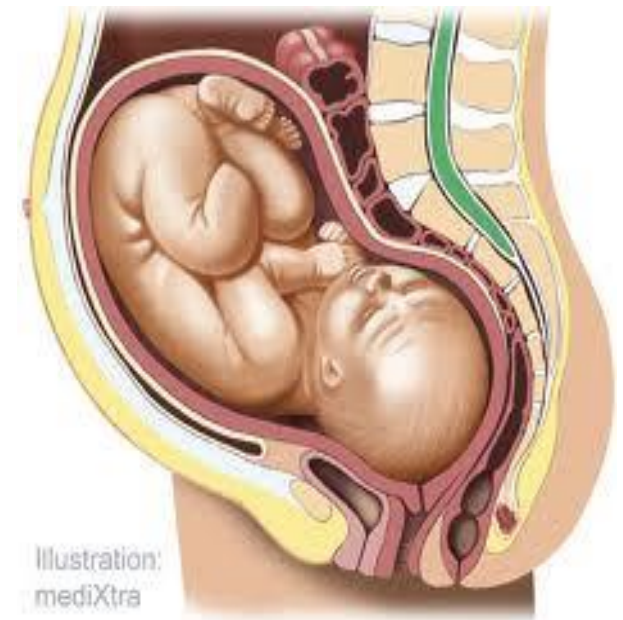
Biological  
plausibility

Epidemiol.  
evidence

Interven-  
tion trials

**Reasonable  
recommen-  
dations**

To reduce the chance for adverse pregnancy outcomes, it may be time to depart from the “one-size-fits-all” therapy and design more targeted therapies.



*Madianos PN et al, J Clin Perio 2013; 40 (Suppl. 14)*

# Adverse Pregnancy Outcomes

Biological  
plausibility

Elective procedures should be avoided in the first trimester and preferably rendered during the second trimester.

Epidemiol.  
evidence

Non-surgical periodontal therapy, delivered during the second trimester of pregnancy, cannot be recommended as a means of improving pregnancy outcomes.

Interven-  
tion trials

**Reasonable  
recommen-  
dations**

*Sanz M, Kornman K, J Clin Perio 2013; 40 (Suppl. 14)*



# Conclusion

The critical and systematic reviews that have been performed to date suggest that PD is an independent predictor of several systemic conditions.

Establishment of causality will require new studies that fulfill the Bradford Hill or equivalent criteria.

*Van Dyke TE, van Winkelhoff AJ,  
J Clin Perio 2013; 40 (Suppl. 14)*

