**Diabetes:** chronic metabolic disorder that remains incurable - hyperglycemia

**Periodontitis:** chronic microbially-induced inflammatory condition of tissues surrounding teeth - loss of alveolar bone and connective tissue attachment

- Pain is rare
- Loosening, shifting of teeth
- Eventual tooth loss
- Hispanic-Americans lead in periodontitis prevalence among US adults
People with diabetes are at higher risk of developing periodontal disease.

Diabetic retinopathy affects over one-third of all people with diabetes and is the leading cause of vision loss in working-age adults.

Pregnant woman with diabetes or at high risk for GDM should manage their glycaemia throughout their pregnancy to avoid long-term consequences for themselves and their children, and trasperational effects (higher risk of obesity, diabetes, hypertension and kidney disease in the offspring).

People with diabetes are 2 to 3 times more likely to have cardiovascular disease (CVD).

The prevalence of end-stage renal disease (ESRD) is up to 10 times higher in people with diabetes.

Every 30 seconds a lower limb or part of a lower limb is lost to amputation somewhere in the world as a consequence of diabetes.
Diabetes adversely affects periodontal health

- Relative risk of periodontitis in patients with diabetes is ~ 3-fold that of patients without diabetes
- Diabetes increases the prevalence, severity and progression of periodontitis
- Severity of periodontitis and response to periodontal therapy depends on level of glycemic control, presence of other complications & duration of diabetes
- Periodontitis can start early in life in patients with diabetes
In longitudinal observational studies, severe periodontitis:

- increases risk of poor glycemic control in type 2 diabetes
- is significantly associated with higher prevalence of proteinuria & CVD complications in type 1 diabetes
- predicts overt nephropathy and stage 5 renal disease in type 2 diabetes
- predicts cardio/renal disease-related mortality in type 2 diabetes
- may predict development of type 2 diabetes in previously healthy individuals
Diabetes and periodontitis: common themes

- Prevalent, chronic diseases that often remain undiagnosed
- Affect similar segments of the population
- Prevention & early identification are key
- Successful outcomes depend heavily on intensive interventions, lifestyle modifications & life-long maintenance

Lalla E & Papapanou PN, Nat Rev Endocrinol 2011
Early identification of individuals at risk for or with type 2 diabetes

- Non-traditional healthcare settings
- 70% of US adults visit a dentist at least once a year & return for multiple, often non-emergent visits
New dental patients who were

• not previously told they had pre/diabetes and
• over 40 yo if white, or over 30 yo if non-white

Those with at least one of the following self-reported risk factors

• family history of diabetes
  • hypertension
• high cholesterol or
• overweight/obesity

continued to receive

• a periodontal examination
• a point-of-care HbA1c

All invited for a blood draw & diagnostic test (either returned for FPG, or on same day for HPLC HbA1c)

Identified with potential diabetes or pre-diabetes

1,263

1,121

1,097

72 (6.6%)  
436 (39.7%)
Detecting **prediabetes and diabetes** (N=1097)

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<thead>
<tr>
<th></th>
<th>Sensitivity</th>
<th>Specificity</th>
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<tbody>
<tr>
<td>≥ 26% teeth with deep pockets*, or ≥ 4 missing teeth</td>
<td>0.75</td>
<td>0.36</td>
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<tr>
<td>≥ 26% teeth with deep pockets*, or ≥ 4 missing teeth, or POC HbA1c ≥ 5.7%</td>
<td>0.90</td>
<td>0.28</td>
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<tr>
<td>POC HbA1c ≥ 5.7%</td>
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Detecting **diabetes** (N=1097)

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* with ≥ 1 pocket ≥ 5 mm

Can we impact patient behavior and improve health outcomes?

• A challenge is the need for follow-up with a physician for a definitive diagnosis and timely initiation of lifestyle management and/or pharmacotherapy

• Pilot RCT assessed the effectiveness of an intervention aiming to modify behavior and glycemic status in patients who present at a dental clinic with diabetes risk factors and previously undiagnosed hyperglycemia
• 84% of subjects identified with potential diabetes or prediabetes visited MD
• 1/3 of MDs failed to re-test; the majority advised on diet, weight/BP control & physical activity
• In those identified with undiagnosed diabetes, HbA1c was reduced by 1.46 ± 0.28 % at 6 months; p<0.01
• 49% of those who returned at 6 months reported at least one positive lifestyle change (effort to control weight, change in diet or physical activity)

Lalla E et al, J Clin Periodontol 2015
• EHR data from the Marshfield Clinic, a health system providing care in rural Wisconsin

• 4,560 individuals

• The best performance was achieved by a model that took advantage of the integrated EHR

• AUC: 0.71 (95% CI, 0.69–0.72); Sensitivity: 0.70, specificity: 0.62

Algorithm can be **embedded as a trigger** within the EHR to flag those who may have/are at risk for diabetes (& remain unrecognized) and provide valuable just-in-time clinical decision support

*Acharya A et al, *JDR Clinical & Translational Research* 2018*
How can medical professionals help?

① Discuss oral health and its importance for overall health and well-being with patients

② Advise patients with diabetes to see a dentist on a regular basis

③ Screen for oral and periodontal changes

④ Communicate with dental professionals
Screening for periodontal changes

- **Ask** about symptoms
  - sore, bleeding gums
  - sensitive or loose teeth
  - bad taste or smell in the mouth

- **Perform** a visual assessment of the mouth for
  - food debris or plaque around teeth
  - red, swollen, receding or bleeding gingiva
  - loose teeth, separation of teeth, missing teeth
Take away messages

- Diabetes and periodontitis are closely linked and can amplify one another
- Programs designed to promote oral health awareness and periodontal disease prevention & treatment must be provided to all patients with diabetes, including children/adolescents and their families
• Diabetes risk assessment, education, and medical referral by oral health professionals of dental patients unaware of their status may promote healthy behaviors and have positive outcomes.

• Physicians can send a powerful message by asking/advising about oral health.

• Patient-centered, team-based approach to care is key.

European Federation of Periodontology

Perio & Diabetes

National Institutes of Health
Colgate Palmolive
Juvenile Diabetes Research Foundation
New York State Health Foundation