



# 2017 classification system of periodontal diseases and conditions

Assist. Prof. Dr. Ali A Abdulkareem

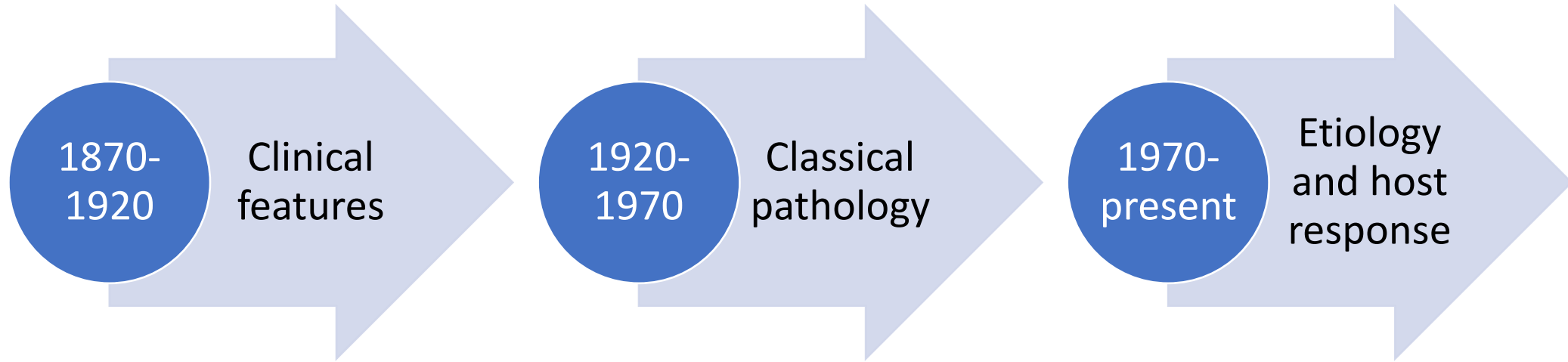
Assist. Prof. Dr. Hayder R Abdulbaqi

Assist. Prof. Dr. Firas B Al-Taweel

Department of Periodontics  
College of Dentistry, University of Baghdad

Why this topic?

# Chronology of classification systems



## **Between 1982-1989, age-distinct types of periodontitis were proposed**

- Early onset
- Prepubertal
- Juvenile
- Rapidly progressive
- Adult
- NUP
- Refractory



# Chronology of classification systems

## **Key features of 1999 classification system**

- Introducing gingival diseases and gingivitis
- Two forms of periodontitis were proposed (chronic and aggressive)
- Periodontal abscess and perio-endo lesions

## **This system did not consider the followings:**

- Overlapping of chronic and aggressive periodontitis
- Non-pathologic loss of attachment
- Successful treatment of periodontitis
- Dental implant-associated conditions
- Healthy state

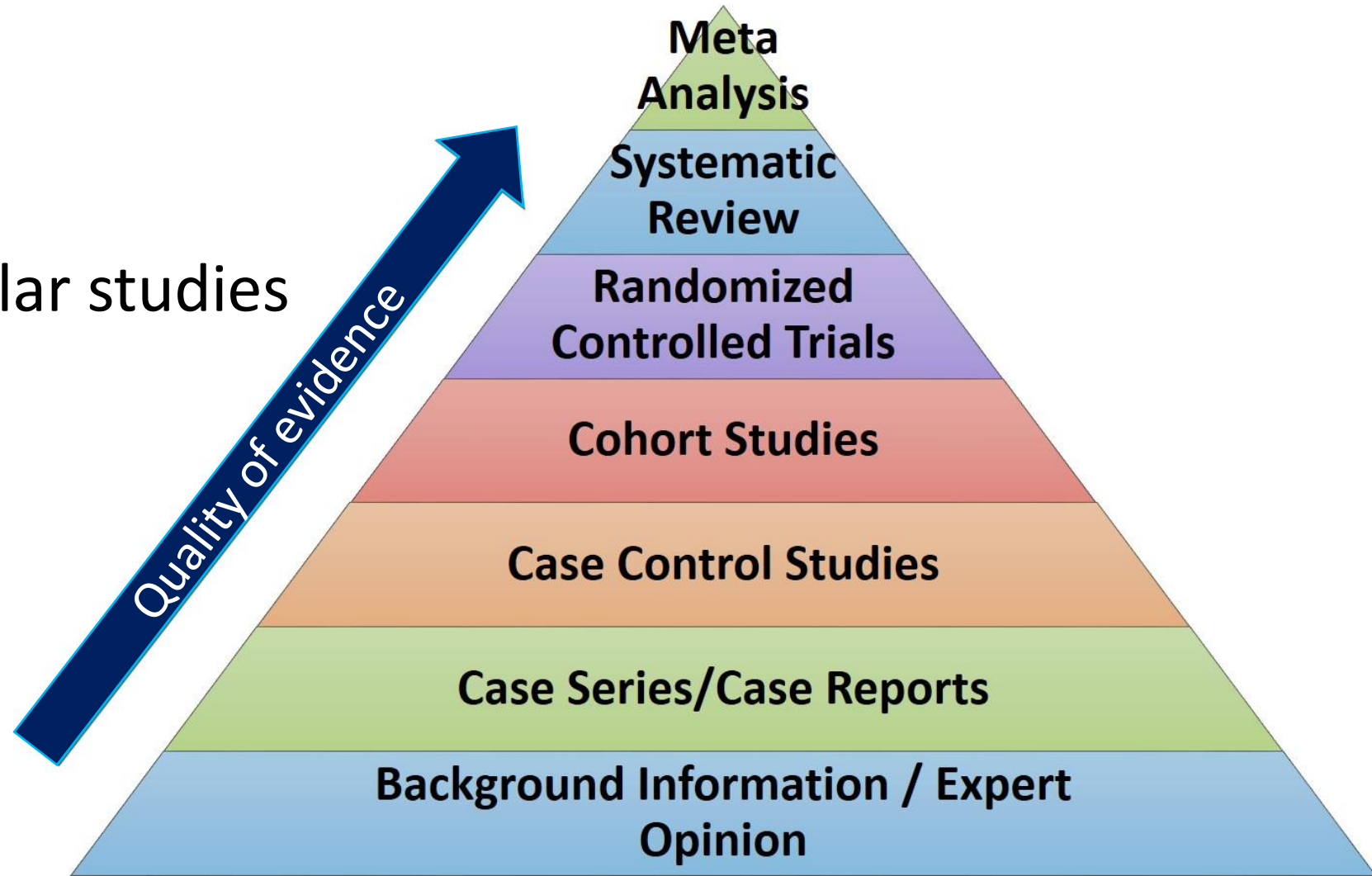
# Chronology of classification systems

## **New classification system**

- Joint work between American Academy of Periodontology (AAP) and the European Federation of Periodontology (EFP)
- The 2015 **Task Force Report** by the AAP added other parameters to the older system (radiographic bone loss in association with clinical attachment loss)
- Announcement in November 9 to 11, 2017

## Evidence from:

- Clinical studies
- Biological and molecular studies
- Expert opinion





## Volume 45, Issue S20

Special Issue: Proceedings of the World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. Co-edited by Kenneth S. Kornman and Maurizio S. Tonetti. The workshop was planned and conducted jointly by the American Academy of Periodontology and the European Federation of Periodontology with financial support from the American Academy of Periodontology Foundation, Colgate, Johnson & Johnson Consumer Inc., Geistlich Biomaterials, SUNSTAR, and Procter & Gamble Professional Oral Health. All manuscripts were fully peer reviewed.



## Volume 89, Issue S1

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# What is “new” in the new classification system?

- **Adding new categories**

Periodontal  
health and  
gingival health

Gingivitis  
dental biofilm-  
induced

Gingival  
disease: non-  
dental biofilm-  
induced



# What is “new” in the new classification system?

- **A new classification of periodontitis**

Necrotizing  
periodontal  
disease

Periodontitis

periodontitis as a  
manifestation of  
systemic disease

~~Chronic periodontitis~~  
~~Aggressive periodontitis~~

What is “new” in the new classification system?

- **Adding new dimensions to periodontitis diagnosis**

Stage

Grade

Status

What is “new” in the new classification system?

- **Evidence-based identification of risk factors**

Smoking

Diabetes  
mellitus

What is “new” in the new classification system?

- **Discriminating loss of attachment reasons**

Intact vs  
reduced

What is “new” in the new classification system?

Periodontal ~~biotype~~  Periodontal phenotype

Biological ~~width~~  Supracrestal attachment

Excessive ~~occlusal force~~  Traumatic occlusal force

## Assessing Periodontal Health and the British Society of Periodontology Implementation of the New Classification of Periodontal Diseases 2017



> J Clin Periodontol. 2018 Jun;45 Suppl 20:S1-S8. doi: 10.1111/jcpe.12935.

### A new classification scheme for periodontal and peri-implant diseases and conditions - Introduction and key changes from the 1999 classification

Jack G Caton <sup>1</sup>, Gary Armitage <sup>2</sup>, Tord Berglundh <sup>3</sup>, Iain L C Chapple <sup>4</sup>, Søren Jepsen <sup>5</sup>, Kenneth S Kornman <sup>6</sup>, Brian L Mealey <sup>7</sup>, Panos N Papapanou <sup>8</sup>, Mariano Sanz <sup>9</sup>, Maurizio S Tonetti <sup>10</sup>

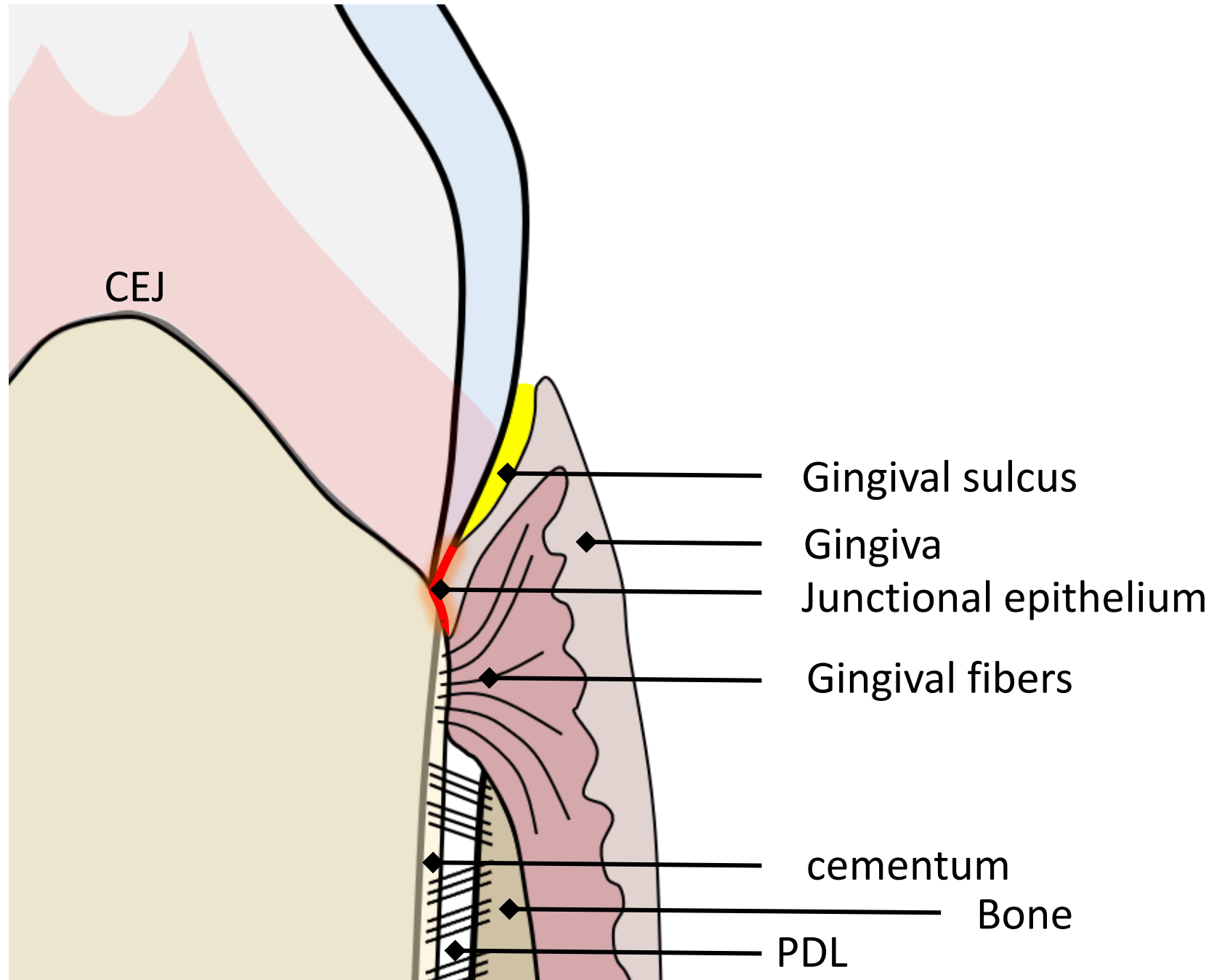
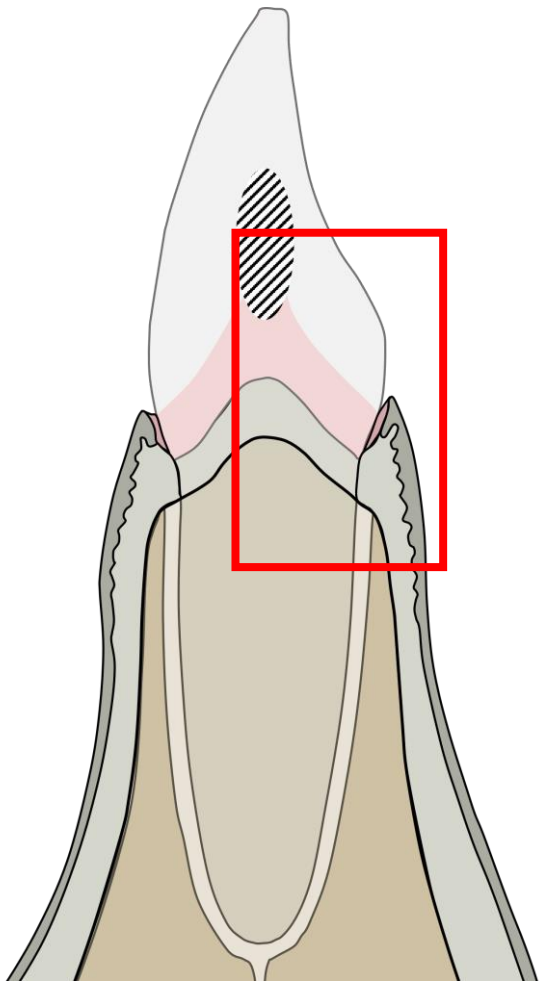
[nature](#) > [british dental journal](#) > [research](#) > article

Research | [Open Access](#) | [Published: 25 November 2022](#)

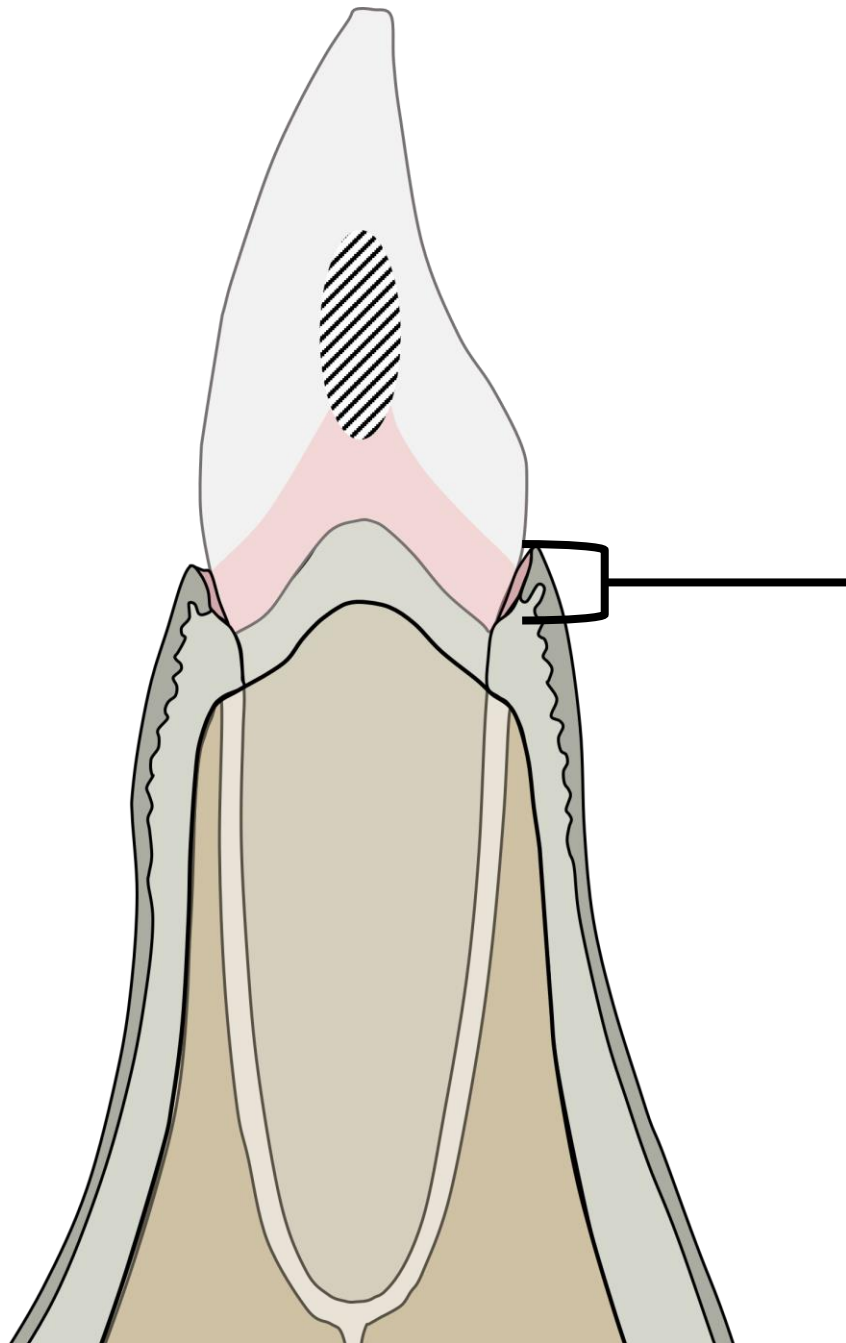
### BSP implementation of the 2017 classification of periodontal diseases: a practice retrospective

[Nicholas Claydon](#), [Dave W. Thomas](#), [Robert J. Adams](#), [Nicola West](#) & [Shaun Hodge](#) 

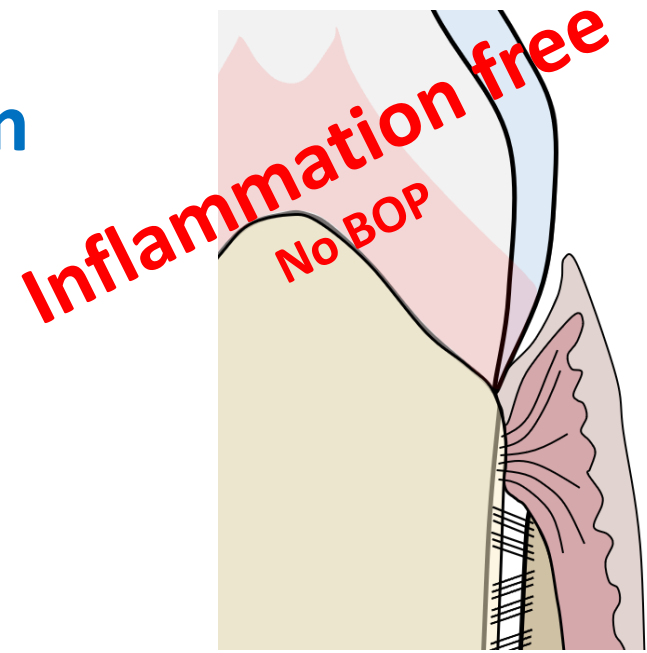




# Healthy Periodontium



- Normal sulcus (0 to 3mm)
- JE attached to CEJ





## Case definition for healthy periodontium

### Health:

BOP: < 10%

PPD:  $\leq$  3 mm

CAL: No (intact)

Yes (reduced)

Radiographic bone loss: No (intact), Possible (reduced)

For reduced: No history of periodontitis

Healthy ; intact , reduced



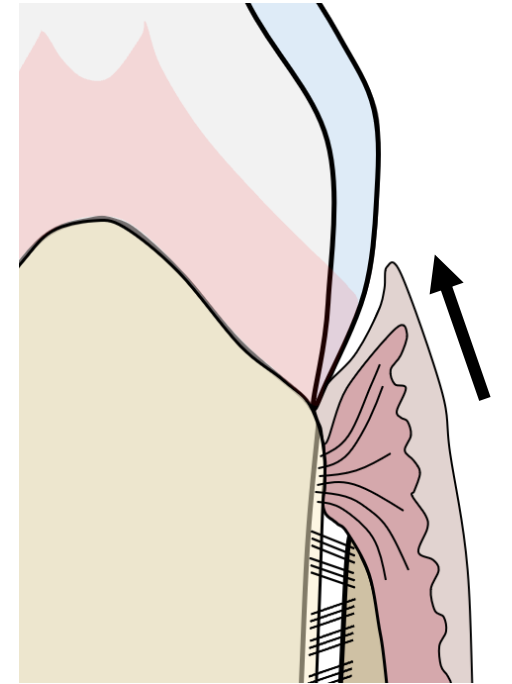
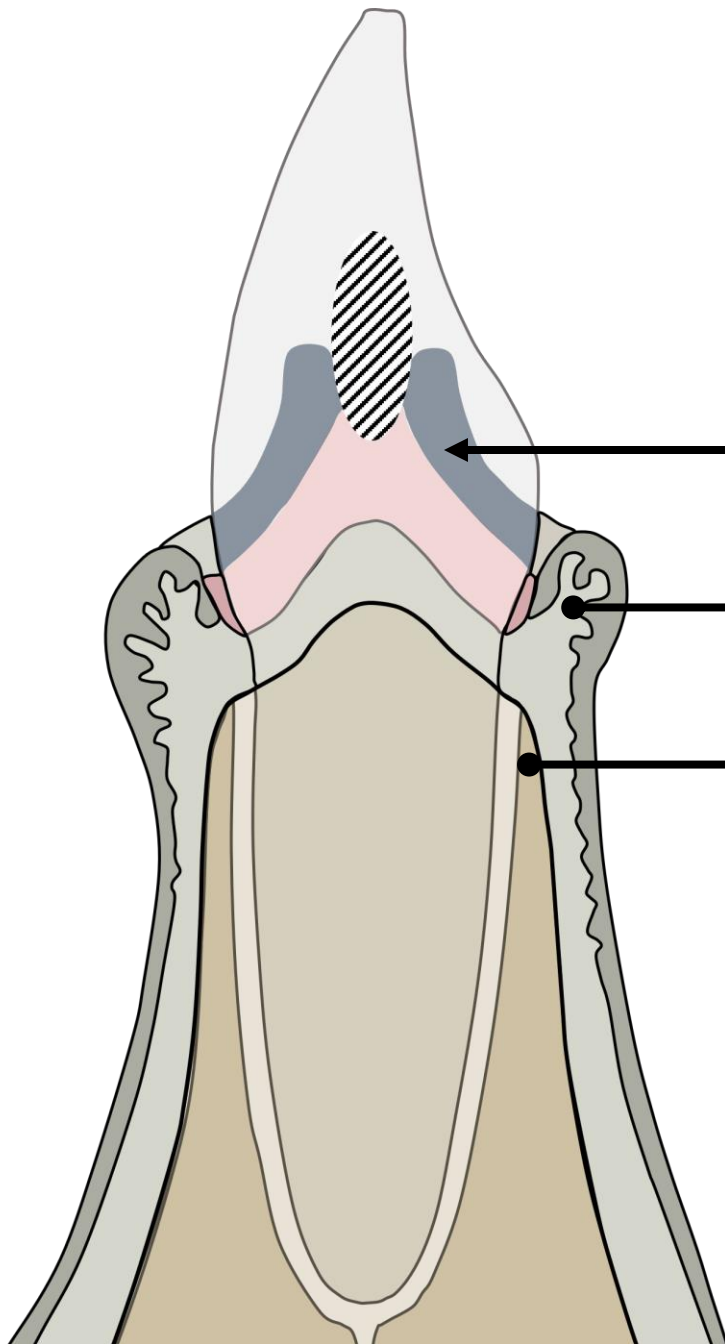
# Biofilm-induced gingivitis

Inflammation confined to gingiva

False pocket (hypertrophied gingiva)

Oedema, redness, loss of architecture

No evidence of bone loss



## Case definition for gingivitis)

### Gingivitis:

BOP  $\geq$  10%-30% (localized),  $>$  30% (generalized)

PPD:  $\leq$  3 mm

CAL: No (intact)

Yes (reduced)

Radiographic bone loss: No (intact), Possible (reduced)

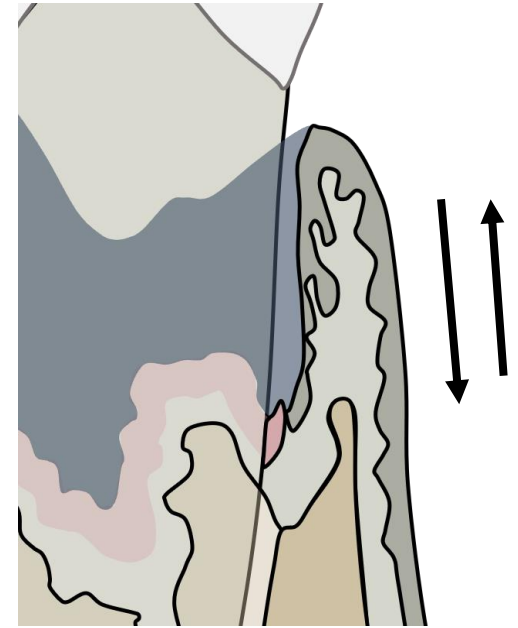
For reduced: No history of periodontitis



Gingivitis ; intact , reduced , localized , generalized



# Periodontitis



Recession could be detected

True pocket formation

Loss of attachment  
and apical migration of JE

Radiographic evidence of bone loss



## Case definition (Periodontitis)

1- Interdental CAL  $\geq 2$  non-adjacent teeth

OR

2- Buccal or oral CAL  $\geq 3$  mm with pocketing

>3 mm is detectable at  $\geq 2$  teeth



**DIAGNOSIS:**

Periodontitis Molar incisor pattern ; Generalised ; Localised

Stage 1 ; Stage 2 ; Stage 3 ; Stage 4

Grade A ; Grade B ; Grade C

Status: Stable  In remission  Unstable

Risk Factors \_\_\_\_\_

## Probing: direction and sites

Distobuccal

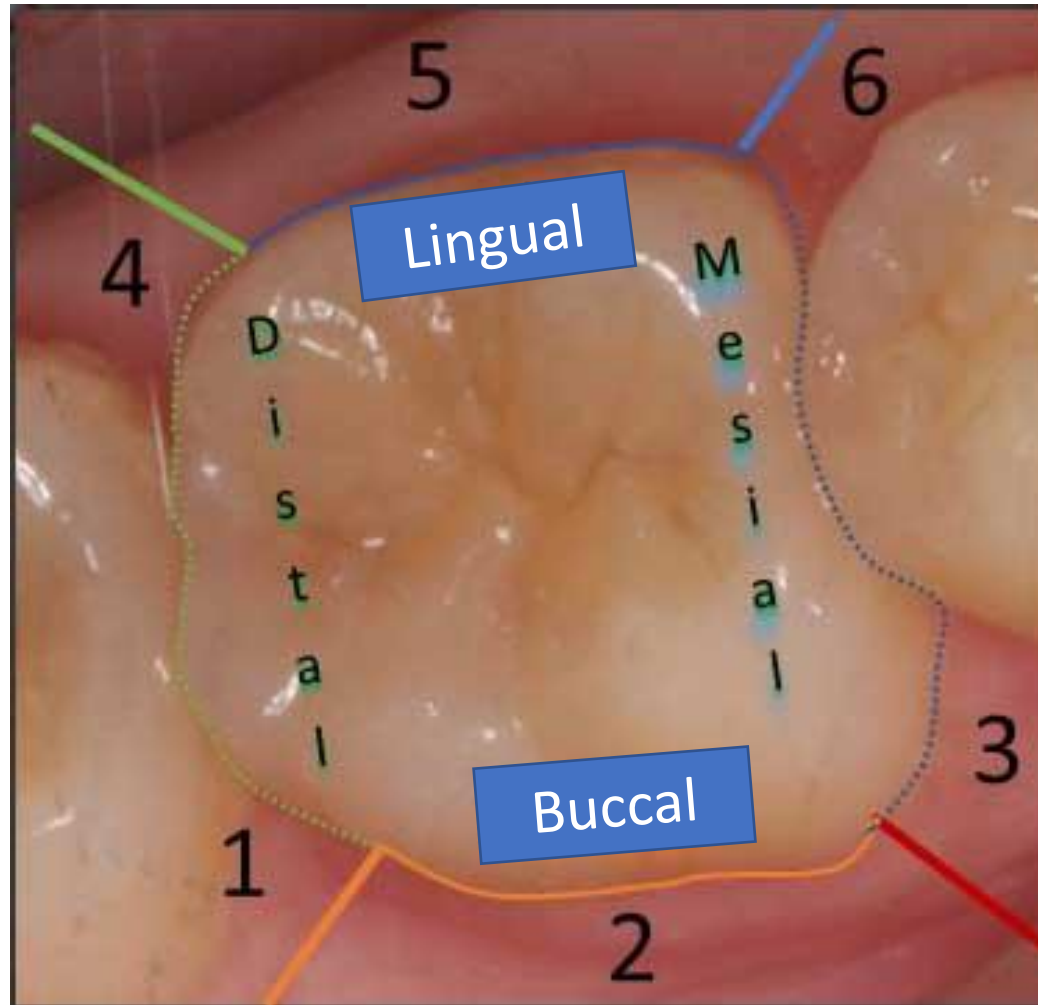
Buccal

Mesiobuccal

Mesiolingual

Lingual

Distolingual



1<sup>st</sup> visit

BOP (%): 20%, 60%, 80%, .....

17	16	15	14	13	12	11	21	22	23	24	25	26	27
1 0 1	1 0 0	1 0 0	1 1 0	1 0 1	0 0 0	0 0 0	1 1 0	0 0 0	0 0 0	1 0 0	0 1 1	<b>X</b>	<b>X</b>
0 0 1	1 0 0	1 0 0	1 1 1	0 0 1	0 0 0	0 0 0	1 0 0	0 1 0	0 0 0	1 0 0	0 1 1	<b>X</b>	<b>X</b>
47	46	45	44	43	42	41	31	32	33	34	35	36	37

### Example probing (BOP) index

Assess each quadrant for the presence (1) or absence (0) of bleeding, and calculate a

Number of teeth = 20  
percentage score for the whole mouth as follows:  
Total number of surfaces = 20 X 6 = 120

Number of bleeding surfaces = 45  
% BOP score = (Number of surfaces with bleeding / Total number of teeth X 6) X 100  
% BOP = 45/120 X 100 = 37.5



**PPD (Baseline)**

17	16	15	14	13	12	11	21	22	23	24	25	26	27
5					5					4			
												6	
	4					4							
47	46	45	44	43	42	41	31	32	33	34	35	36	37

**CAL (Baseline)**

17	16	15	14	13	12	11	21	22	23	24	25	26	27
4					7	3				4			
	3				1	5						4	
47	46	45	44	43	42	41	31	32	33	34	35	36	37



## Diagnosis (periodontitis)

### Extent

Extent: Periodontitis Molar incisor pattern ; Generalised ; Localised

**Periodontitis molar/incisor pattern:** bone loss is isolated to molar and incisor

**Localized periodontitis:** < 30% of teeth have periodontal disease associated bone loss

**Generalized periodontitis:** bone loss exceeds 30% of teeth

Once a periodontitis has been identified, the next step is to 'stage' the patient.

## Disease staging

Stage 1  ; Stage 2  ; Stage 3  ; Stage 4

Staging aims to indicate the severity of disease, which will reflect the complexity of patient management.

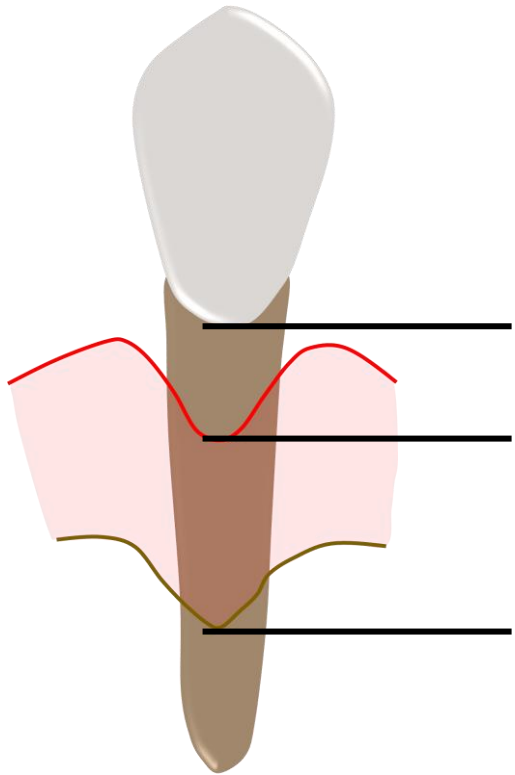
Staging **utilizes the percentage bone loss at the worst site** due to periodontal disease

Assessed either by:

- Radiograph
- Clinically **by measuring CAL + supracrestal attachment (~2 mm) to give an estimate of the distance that the bone crest is from the CEJ.**
- **Do not include teeth involved with perio-endo lesion**

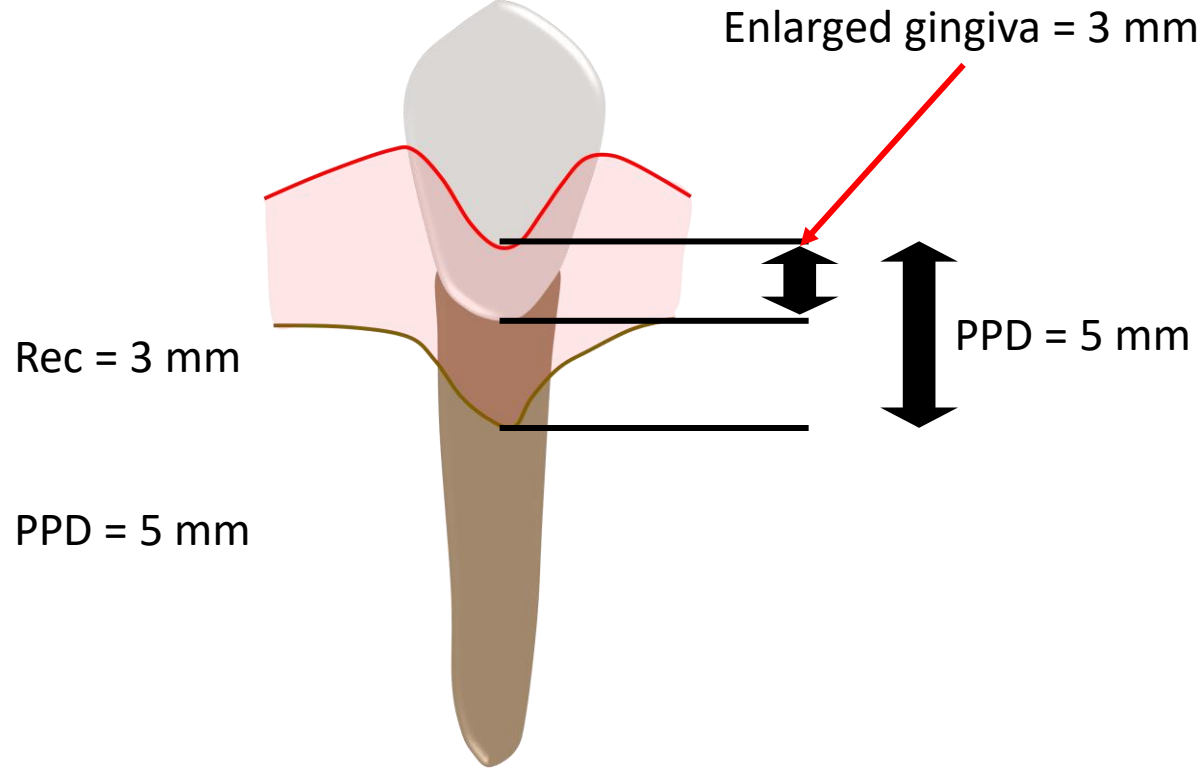
# CAL calculation

## Scenario 1



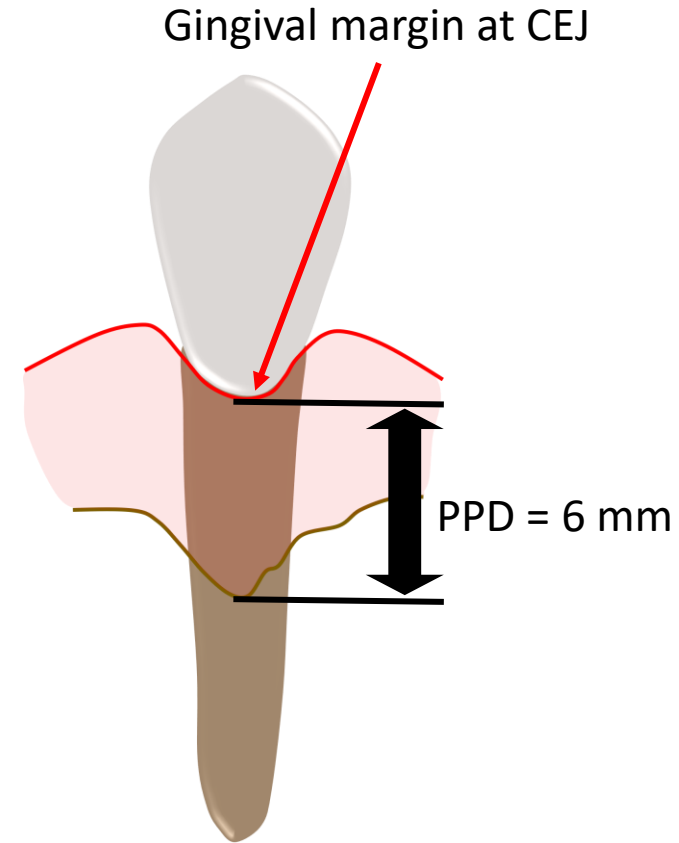
$$\begin{aligned} \text{CAL} &= \text{Rec} + \text{PPD} \\ &= 3 + 5 = 8 \text{ mm} \end{aligned}$$

## Scenario 2



$$\begin{aligned} \text{CAL} &= \text{PPD} - \text{Enlarged gingiva} \\ &= 5 - 3 = 2 \text{ mm} \end{aligned}$$

## Scenario 3

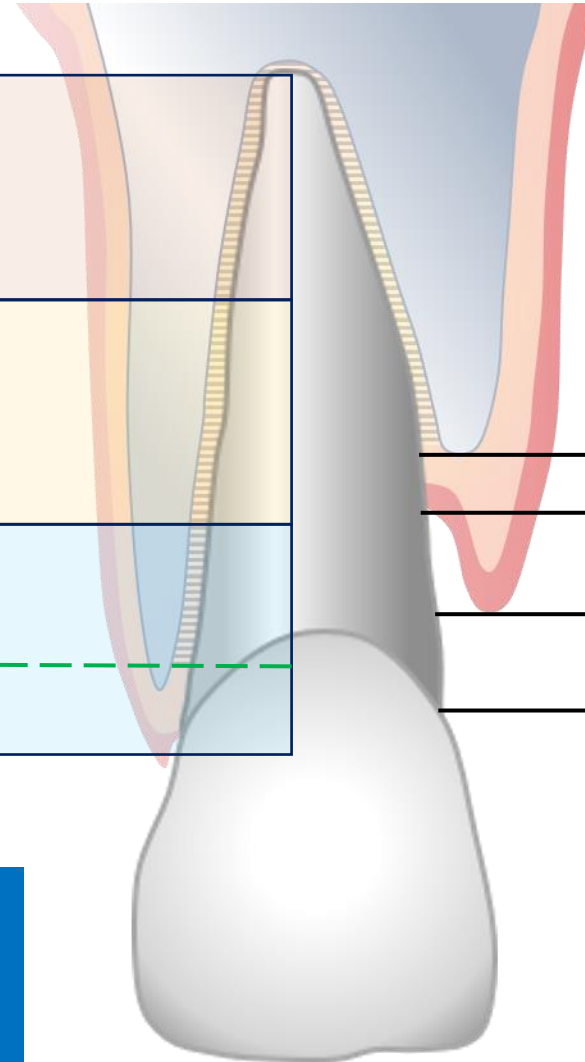


$$\begin{aligned} \text{CAL} &= \text{PPD} \\ &= 6 \text{ mm} \end{aligned}$$

## Measuring the severity of bone loss

In this example, root length is assumed to be **15 mm**

STAGE	Clinical/Radiographic
IV	Apical 1/3
III	Middle 1/3
II	Coronal 1/3
I	1 to 2 mm



% of bone loss is about 50  
This will be used in the next step (Grading)

Supracrestal attachment = 2 mm

PPD = 4 mm

Recession = 2 mm

Bone loss = 8 mm

Roots length (Crown root ratio = 1:2) or radiograph

CAL= 1-2 mm



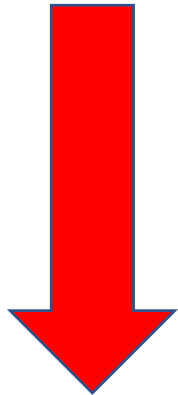
Stage I:  
Initial  
periodontitis

CAL= 3-4 mm



Stage II:  
Moderate  
periodontitis

CAL=  $\geq 5$  mm



Stage III:  
Severe periodontitis  
with potential for  
additional tooth loss



Stage IV:  
Advanced periodontitis  
with extensive tooth  
loss and potential for  
loss of dentition

## Disease grading

Grade A  ; Grade B  ; Grade C

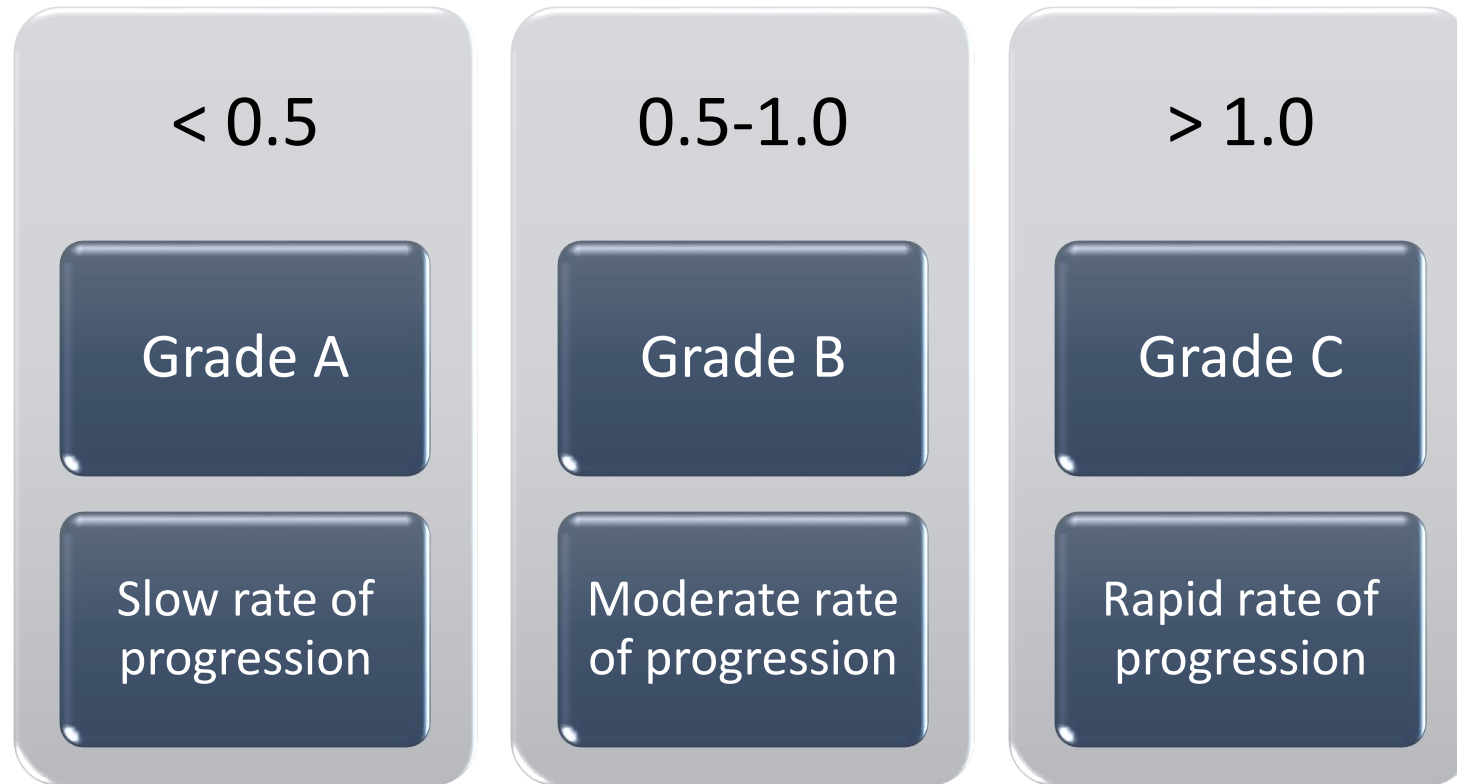
‘Grading’ aims to help identify how susceptible a patient is to periodontal disease

Grading assessed by using **the worst site of bone loss due to periodontal disease along with the patient’s age**. This will give an assessment of the rate of progression.

It is calculated according to the following formula:

$$\frac{\% \text{ Bone loss}}{\text{Patient's age}}$$





In the previous example, the % of bone loss (at worst site)= 50%

Assuming the age was 30 years then the result will be **> 1.0 (Grade C)**

If the age was 60 years then the result will be **0.5-1.0 (Grade B)**

## Disease status

Status: Stable  In remission  Unstable

'Status' aims to determine the patient's current disease status.

Patients who have had a history of periodontal disease are at higher risk of further periodontal disease progression and require long-term maintenance.

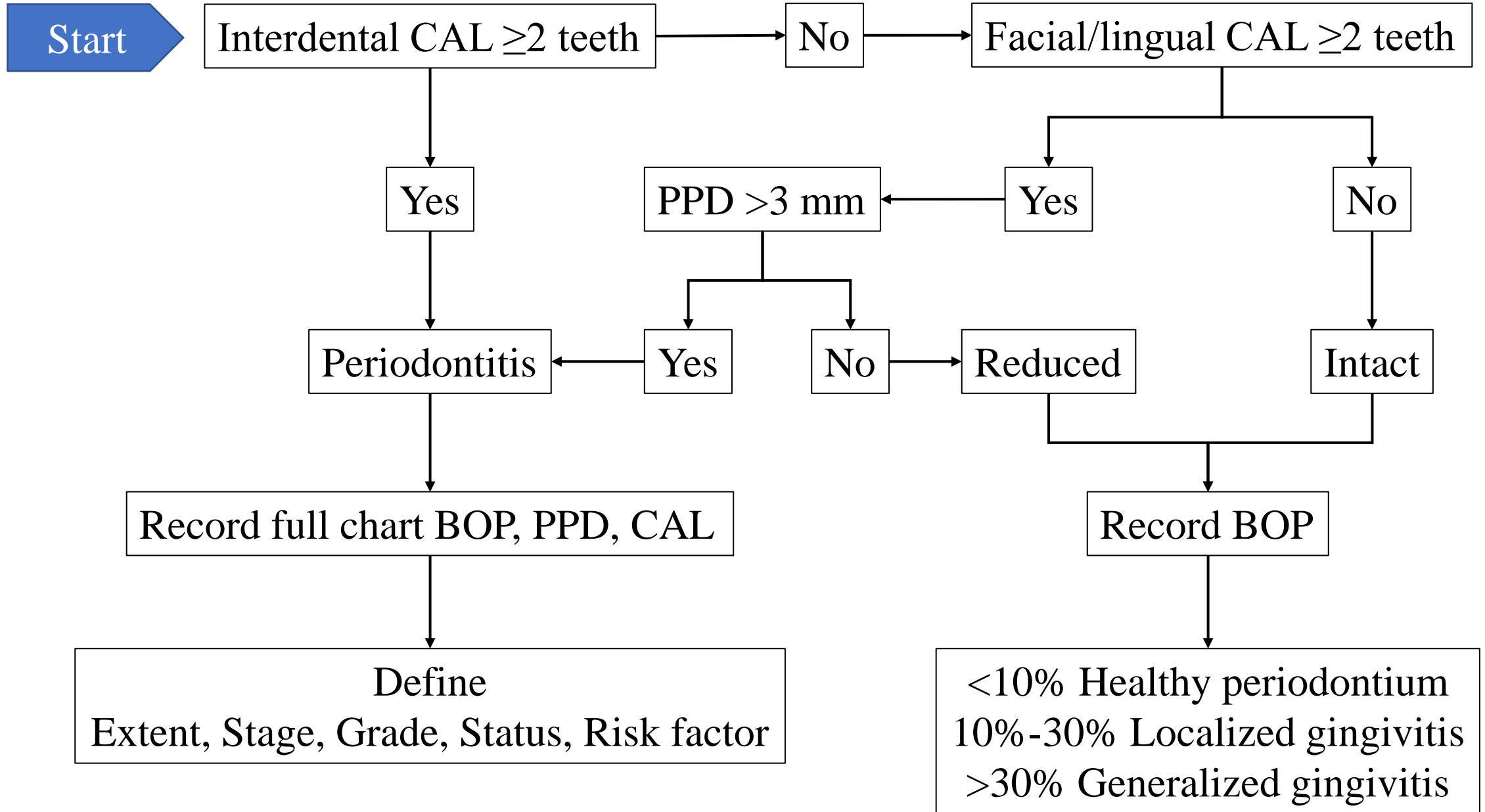
Currently Stable	Currently in Remission	Currently Unstable
<ul style="list-style-type: none"><li>• BOP &lt; 10%</li><li>• PPD ≤ 4mm</li><li>• No BOP at 4mm sites</li></ul>	<ul style="list-style-type: none"><li>• BOP ≥ 10%</li><li>• PPD ≤ 4mm</li><li>• No BOP at 4mm sites</li></ul>	<ul style="list-style-type: none"><li>• PPD ≥ 5mm</li></ul> or <ul style="list-style-type: none"><li>• PPD ≥ 4mm and BOP</li></ul>
Mimic periodontal health	Mimic gingivitis	

## Identification of 'risk factors'

Risk Factors \_\_\_\_\_

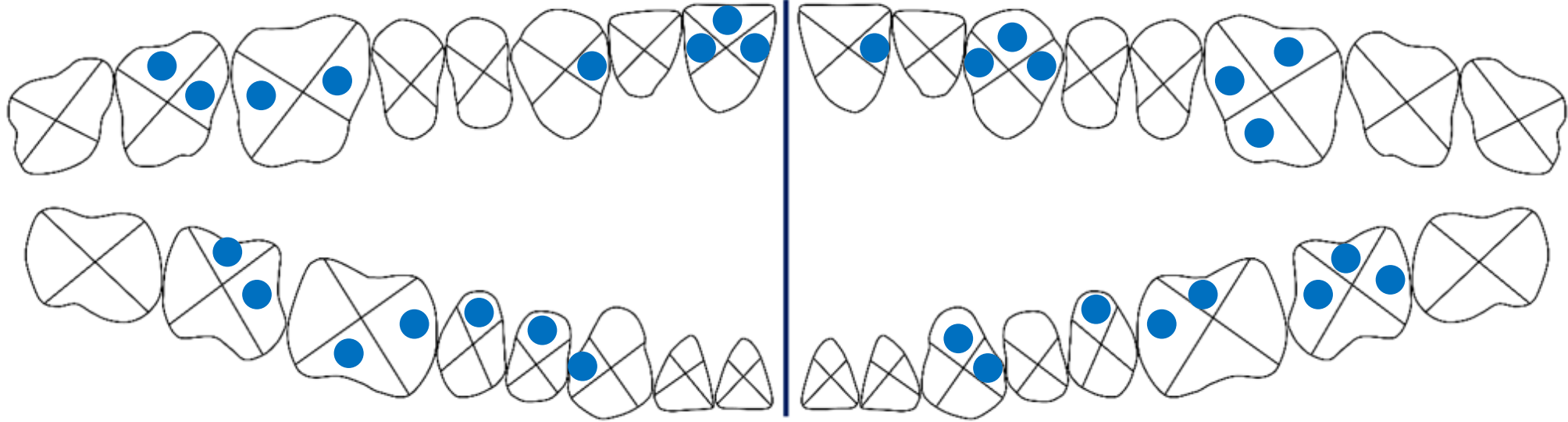
Certain risk factors have the potential to impact development and progression of periodontal disease directly.

- Poorly controlled type 2 diabetes
- Smoking



2<sup>nd</sup> visit

PI (%):



Disclose and allow to rinse.

A probe may be used to confirm the presence of plaque.

Scores recorded on four surfaces; distal, mid and mesial points on the facial (buccal) and lingual (palatal) aspects.

Score as follows:

- 0 = no plaque (left blank)
- 1 = plaque present (recorded ✓)

Calculate the % of plaque as follows:

$$\frac{\text{Number of surfaces with plaque}}{\text{Total number of teeth X 4}} \times 100$$

According to previous example, plaque present on 30 surfaces out of 112

The plaque %= 26.7% (27%)

## Endpoint of periodontal therapy:

- No periodontal pockets  $> 4$  mm with bleeding on probing or no deep periodontal pockets  $\geq 6$  mm

## Follow-up visit:

- 3 months after termination of the treatment
- Repeat measuring all clinical indices

# Sites in concern

## Local factors

- Subgingival caries
- Overhang filling
- Distal of 2nd molar
- Tooth surface anomalies
- Tilted tooth
- Etc.....



# Remember

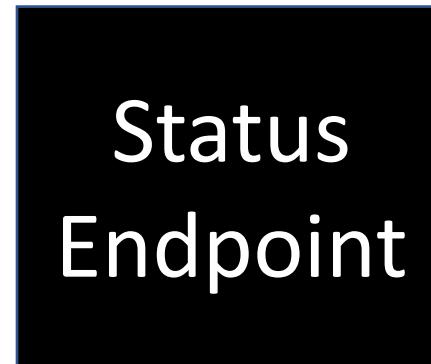
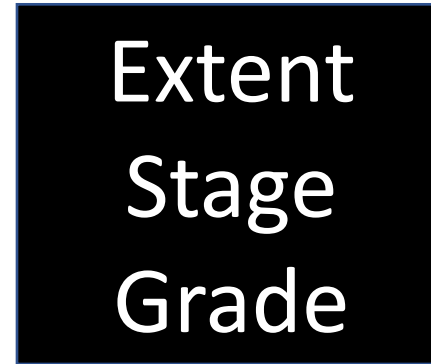
## Diagnosis statement

**Healthy** : intact or reduced

**Gingivitis** : intact or reduced + localized or generalized

**Periodontitis** : localized or generalized + stage + grade + stability + risk factor

# Remember





## History

A 45-year old woman referred by general dentist for a periodontal evaluation.

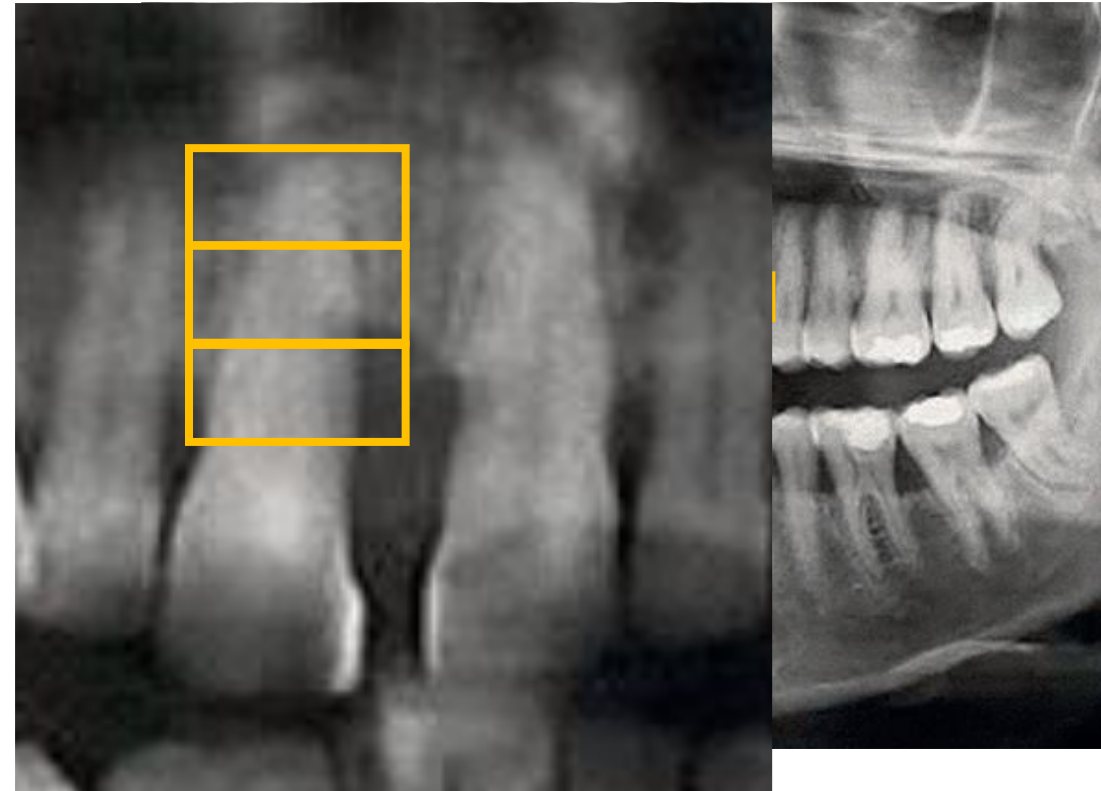
CC: bad breath, bleeding, and flaring of teeth.

MH: chronic autoimmune thyroiditis, she has been an ex-smoker for five years.



## Examination

- The gingiva presents an evident increase in size, change in colour, inflammation as well as loss of the scalloping and texture.
- Panoramic x-ray shows evidence of bone loss
- Interproximal CAL > 4mm at <30% of sites
- Some sites with PPD > 4mm exhibit BOP



**Localized periodontitis, Stage 3, Grade B, currently unstable, No risk factors**

## History

70-year-old male, regular attender, never smoker  
Manual brushes x2/day, no interdental cleaning  
Previous tooth loss due to periodontal disease  
Poorly controlled type 2 diabetic

## Examination

Plaque score 20%

BOP <10% of sites

Obvious interdental recession affecting 80% of teeth

PPD (2 mm for all teeth)

Recession (worst site = 8 mm)



Diagnosis, extent ?

Staging ? (8 mm + 2 mm PPD + 2 mm supracrestal)

Grading ? (80% bone loss)

Status?

Risk factor?

**Generalized periodontitis, Stage 4, Grade c, currently stable, unstable diabetic**

## History

30-year-old female, symptomatic  
Pregnant with no other relevant  
Manual brushes x1/day  
Previous loss of teeth due to ex

## Examination

Plaque score 70%

BOP 80% of sites

Obvious loss of interdental papillae

PPD (> 5 mm for all teeth)

CAL ?



Diagnosis, extent ?

Staging ? (Radiographic bone loss at apical 1/3 and apex)

Grading ? (90% bone loss in some teeth)

Status? (PPD > 5 + 80% BOP)

Risk factor?

**Generalized periodontitis, Stage 4, Grade c, currently unstable, no specific risk factors**

# Please note!

- Antibiotic prescription for periodontitis treatment only indicated in: Periodontitis stage 3 or 4, Grade C, Unstable at a young age (<30%)
- Combination of Amoxillin + Metronidazole





# Classification & case definitions peri-implant conditions

By

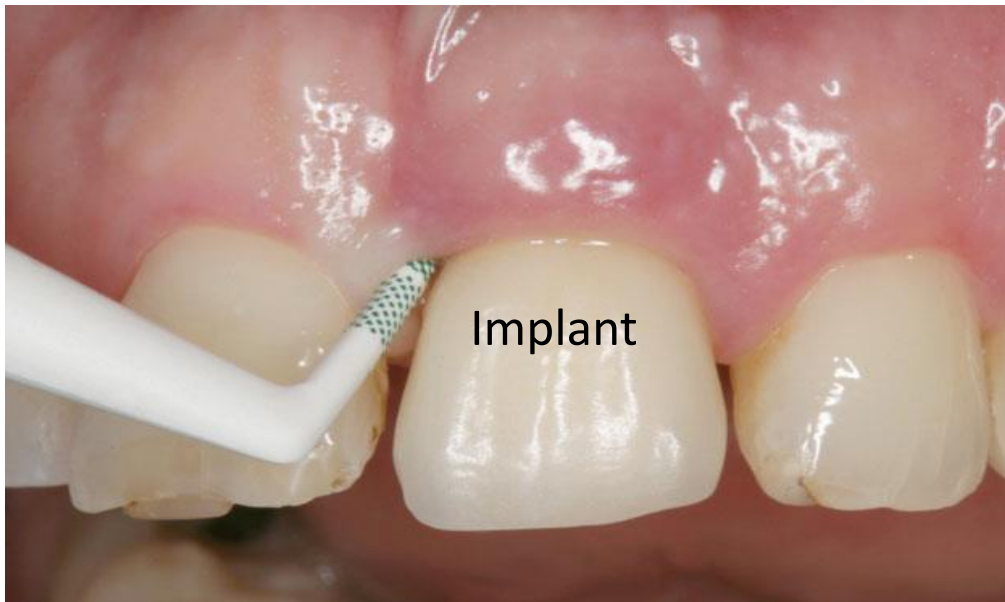
Assist. Prof. Dr. Hayder Raad Abdulbaqi

BDS, MSc, PhD

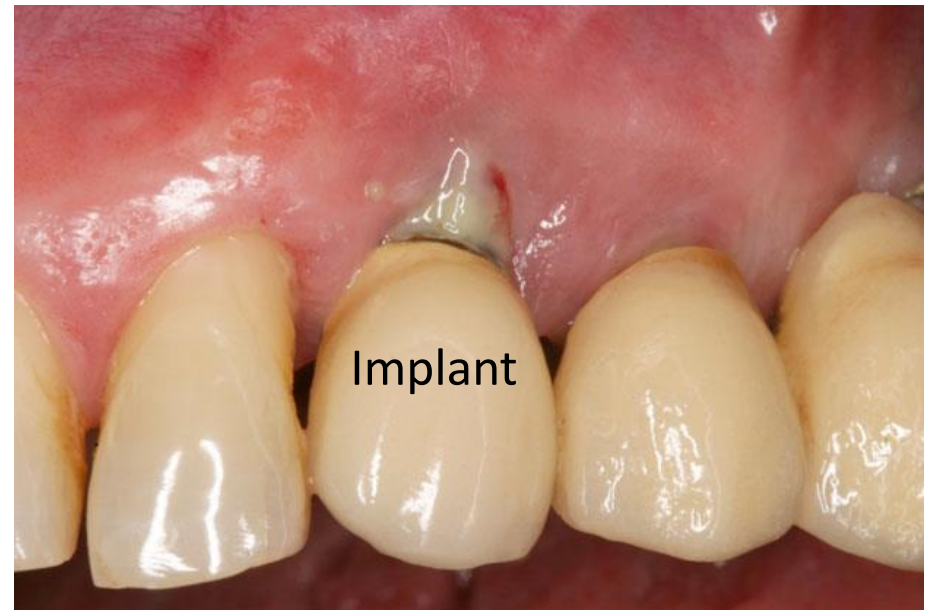
Department of Periodontics

College of Dentistry / University of Baghdad

# Why?

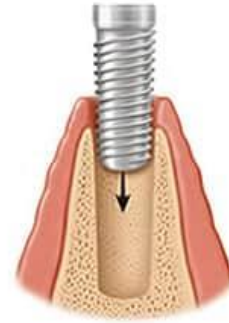


VS





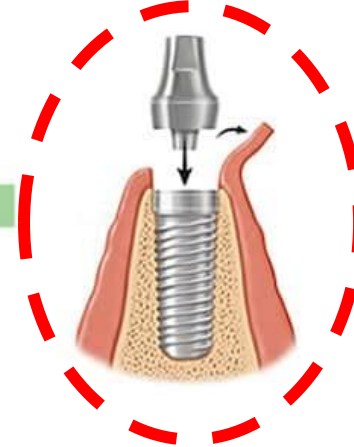
Tooth Extraction



Implant Surgery:  
Fixture Placement



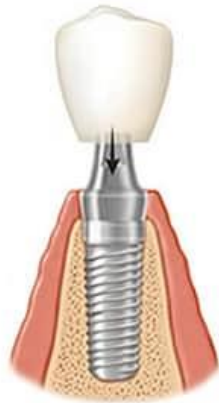
Healing Period  
(minimum 3 months)



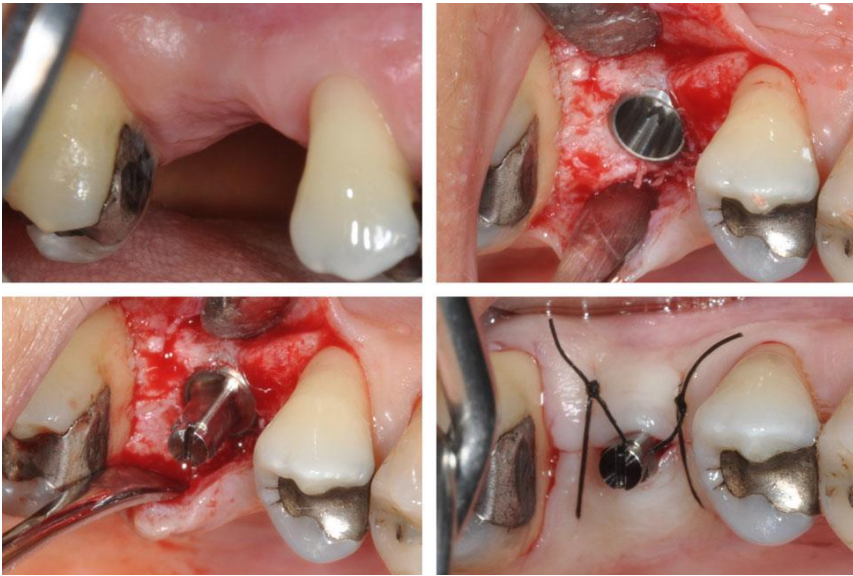
2nd Stage Surgery:  
Replacing Cover  
Screw with  
Healing Abutment



Impression  
Taking



Final  
Restoration  
of Implant



## Morphogenesis (healing)

within 1<sup>st</sup> week

fibrin clot/coagulum with inflammatory cells (mainly neutrophils & less macrophages)

with time

inflammatory cells ↓ & fibroblast ↑

2<sup>nd</sup> - 3<sup>rd</sup> weeks,

fibroblasts ↓

collagen and matrix components increased ↑

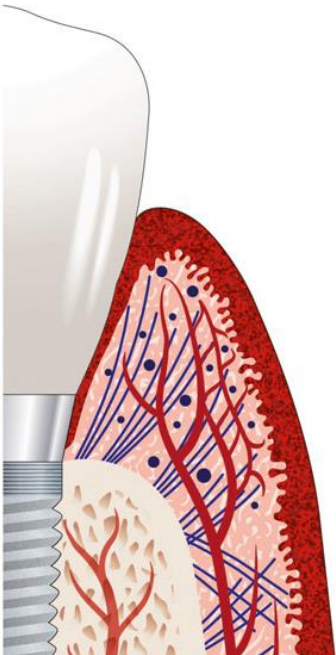
epithelial cells occupy marginal parts of the connective tissue wound

After 4 weeks

collagen fibers became organized in bundles

6<sup>th</sup>-8<sup>th</sup> weeks

mucosal (epithelial and connective tissue) adhesion appeared mature,



# Mucosa seals

# Bone supports

~2 mm

3-4 mm

Sulcus

Sulcus

Junctional epithelium  
BW – “biologic width”

**BW**

Junctional epithelium  
AC – “Abutment connection”

Supracrestal fibers

Supracrestal fiber apparatus

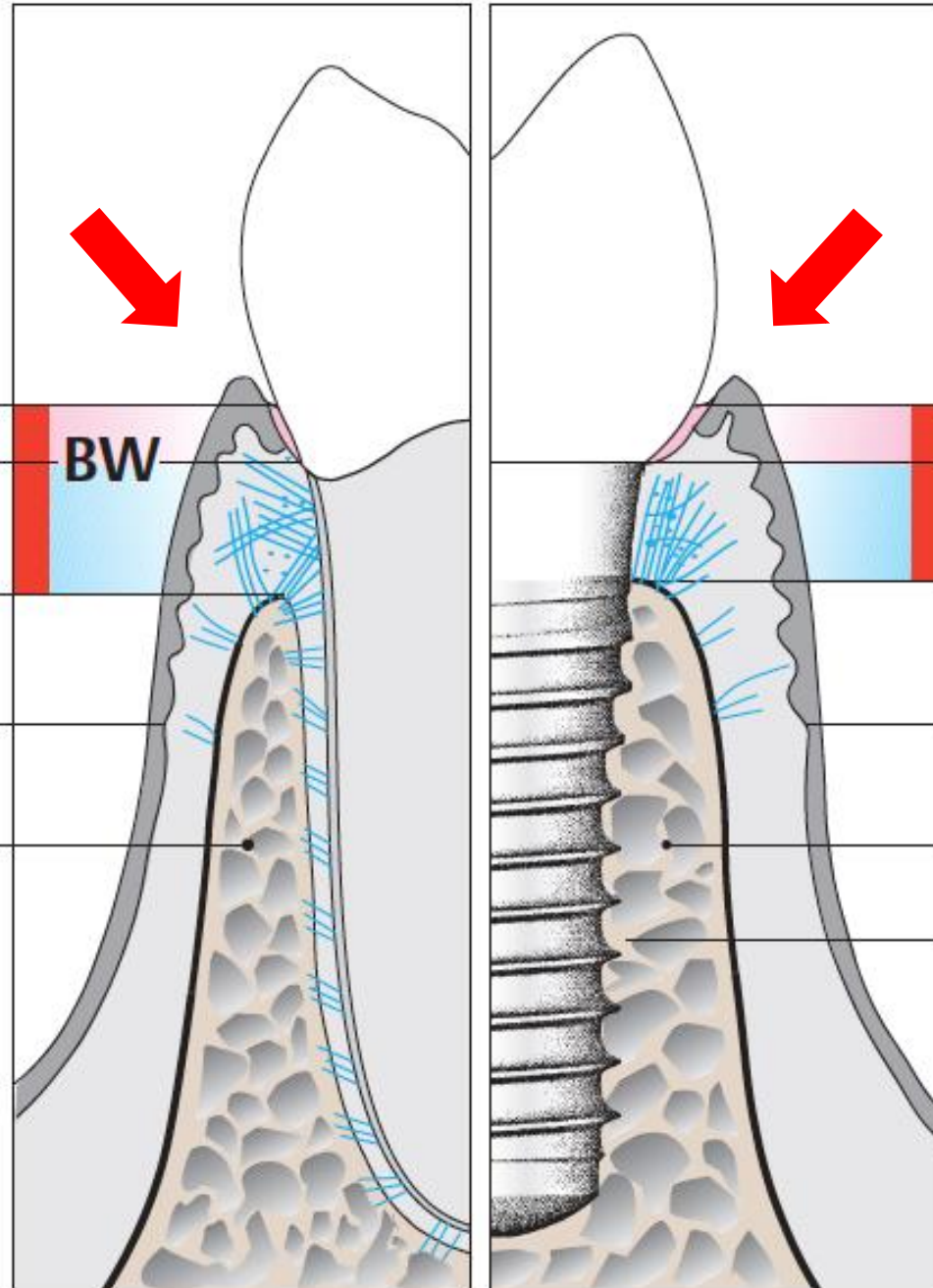
MGL

MGL– mucogingival line

Bone

Bone

Osseointegration  
BIC – “bone implant contact”





Thickness of KM is more at implants?

Width KM is less at implants  
as a rule, about 1 mm less

is a **2mm** KM necessary for optimal gin. health?  
controversy

Papilla height

- Tooth-implant  $\leq 5\text{mm}$
- Implant-implant averaged 3mm



# No PDL around implant

- No cementum, no attached fibers
- Rigid in bone (ankylosed)
- Mucosa follows bone (adjacent implants)
- Mucosa follows CEJ of adjacent tooth

# Classification

Plaque associated diseases by J. G. Caton et al 2017

- Peri-implant health
- Peri-implant mucositis
- Peri-implantitis

Other factors associated with peri-implantitis failure such as

- Periodontal carcinoma
- peripheral giant cell granuloma,
- squamous cell carcinoma,
- metastatic prostatic adenocarcinoma, design etc....
- Malignant melanoma



# Examination

Clinical



Radiographic

## Probing force

A light probing force of 25 g, equivalent to the force required to blanch a fingernail,

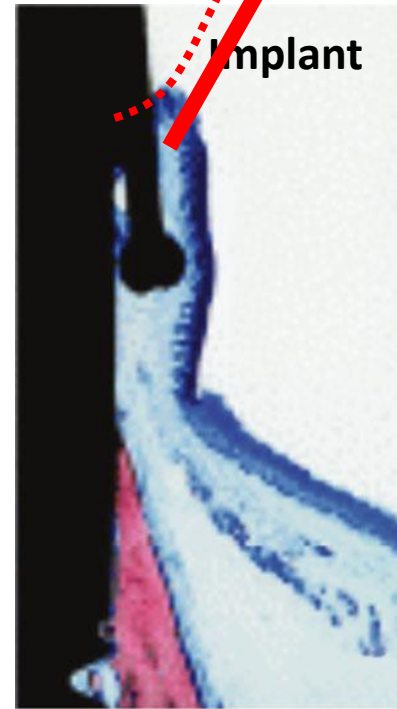


Healthy

Local bleeding dot?  
Mis diagnosis

not inflammation  
forceful probing

Angulation  
implant-restoration  
contours



Within epi.

**NOT**

Healthy

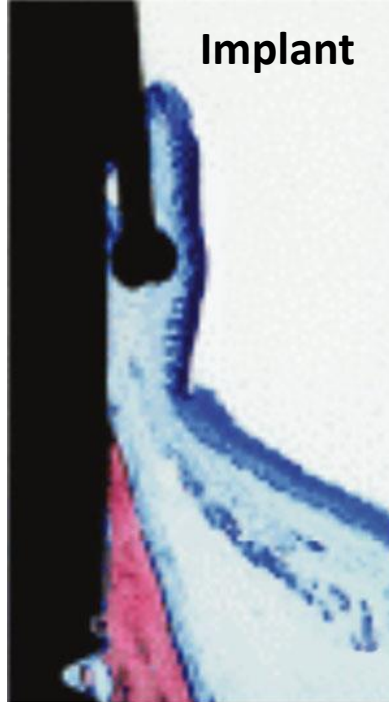
Probe:

- force 25 g
- diameter 0.5mm
- angulation parallel
- degree of inflam.

Probing depth

greater at implants  
greater at proximal

Resistance



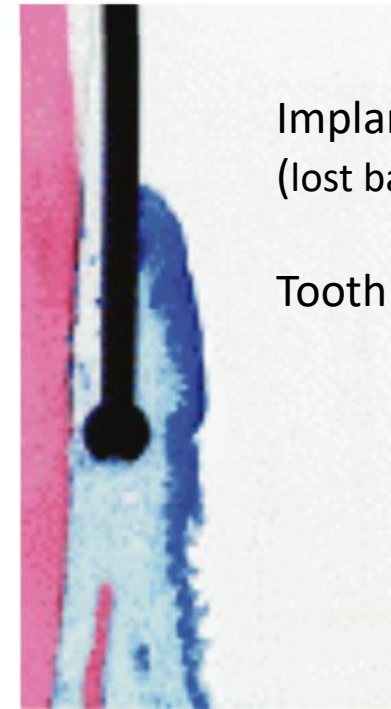
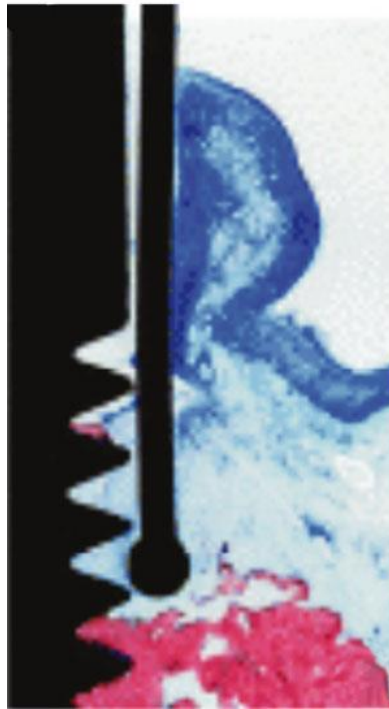
Implant



Tooth

Within epi.

Diseased

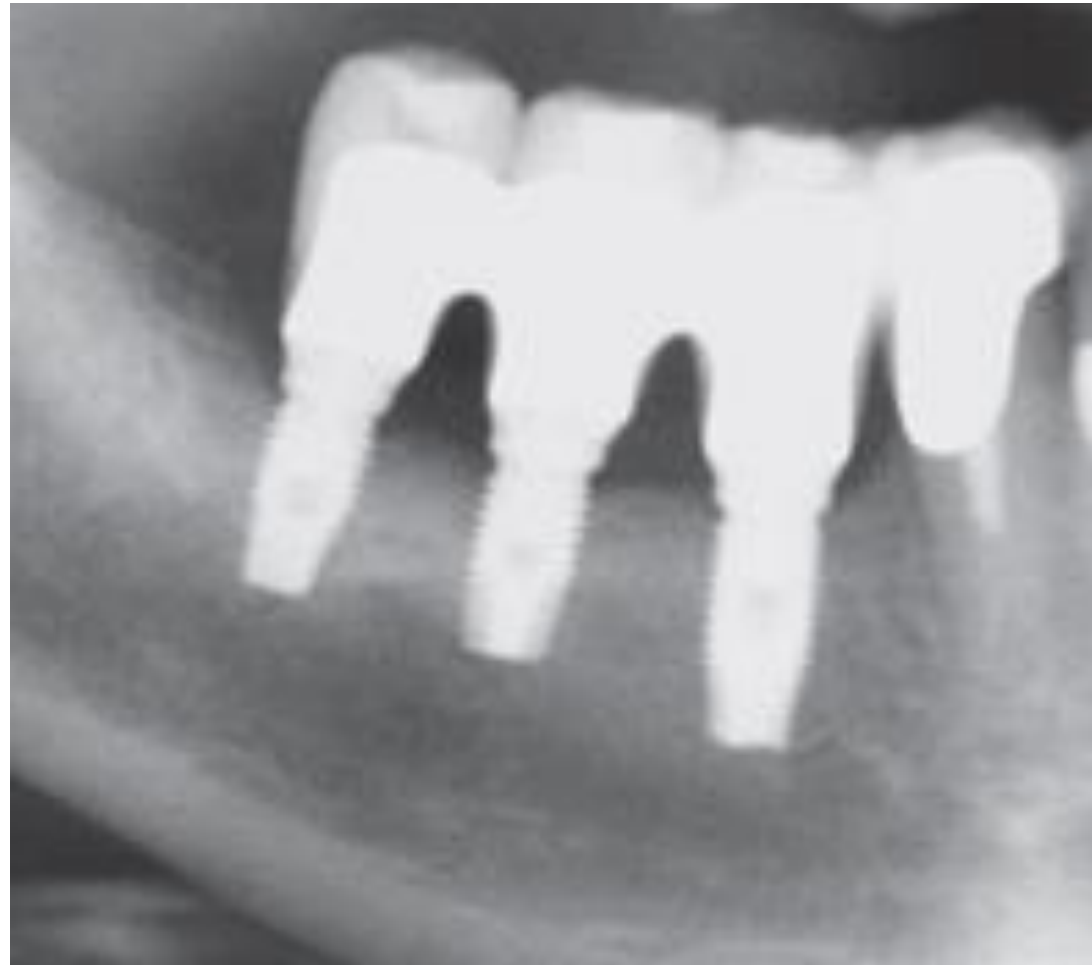


Implant: near bone crest  
(lost barrier function)

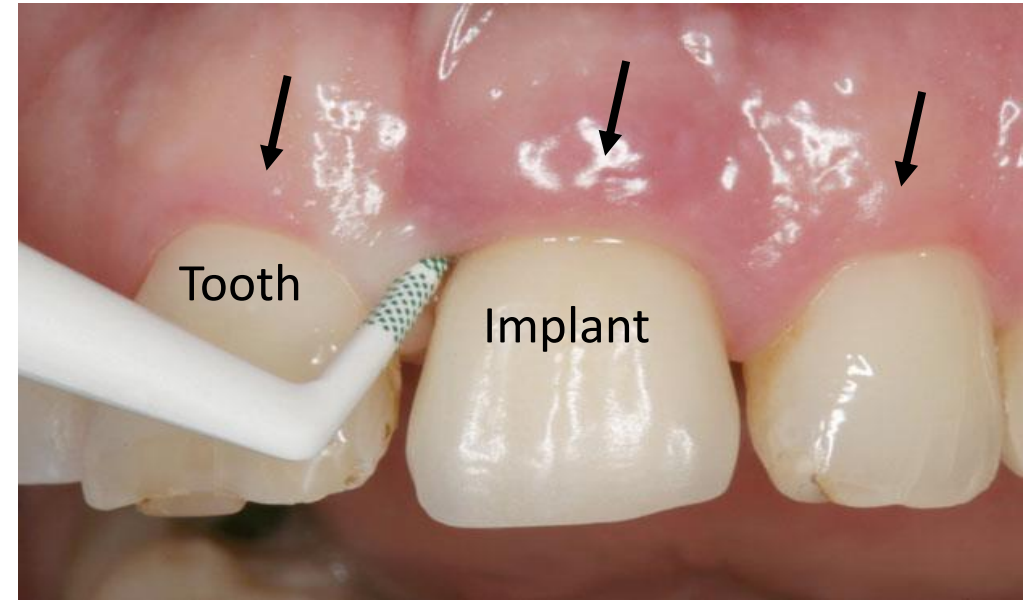
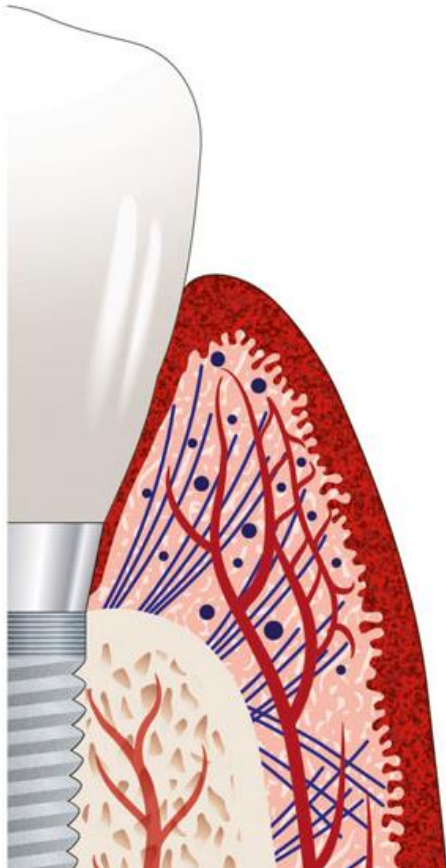
Tooth: within submucosa

# Radiographic

Same angulation  
**Holders**



# Peri-implant health

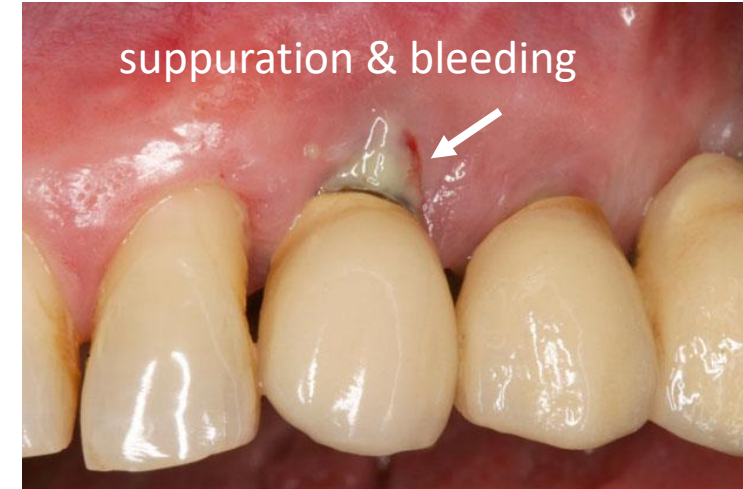
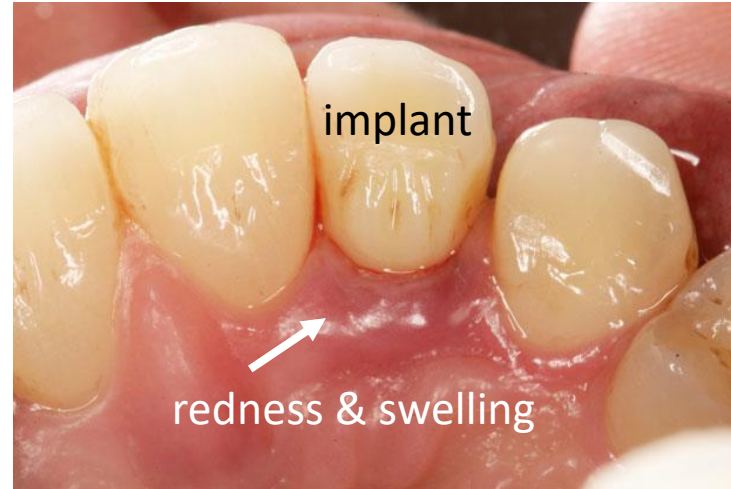
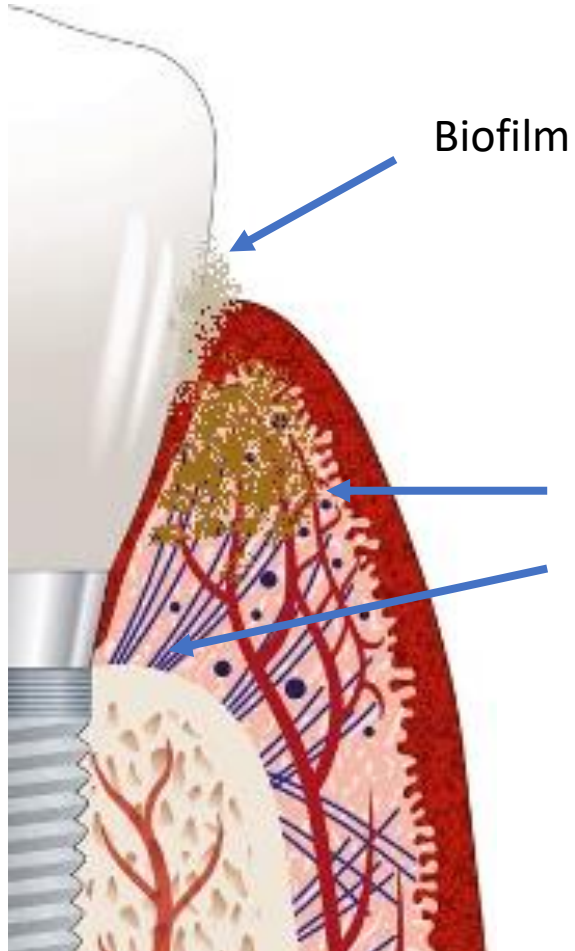


- no visual differences between peri-implant and periodontal tissues.
- **Absence of inflammation:**
- papilla height
  - **Absence of bleeding and/or suppuration**
- not possible to define a range of probing depths ( $\leq 5.0$  mm)
- **No increased in probing depth**
- Peri-implant tissue health can exist around implants with reduced bone
- histologic pic shows a small infiltrate of inflammatory cells
  - **No bone loss beyond remodeling**





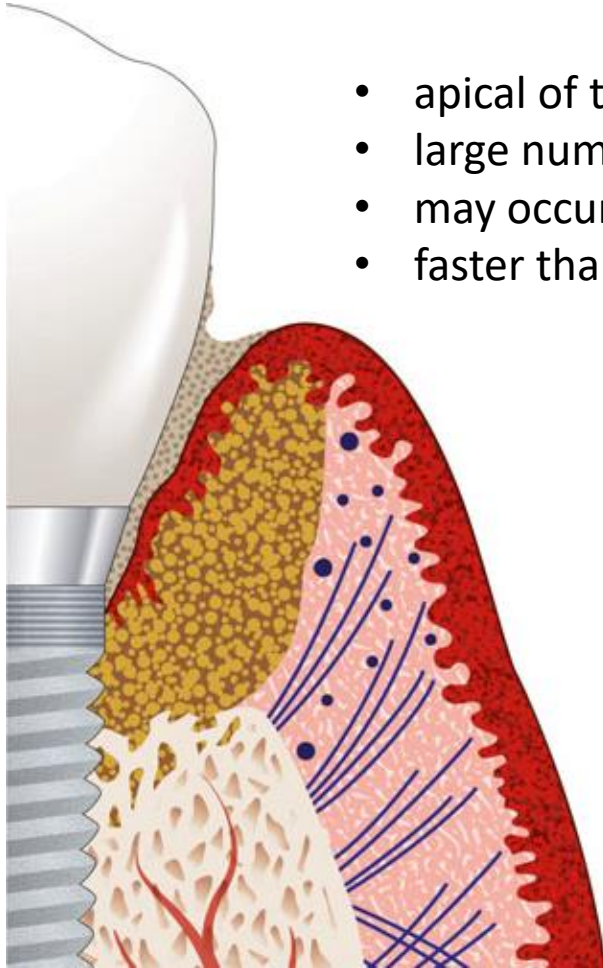
# Peri-implant mucositis



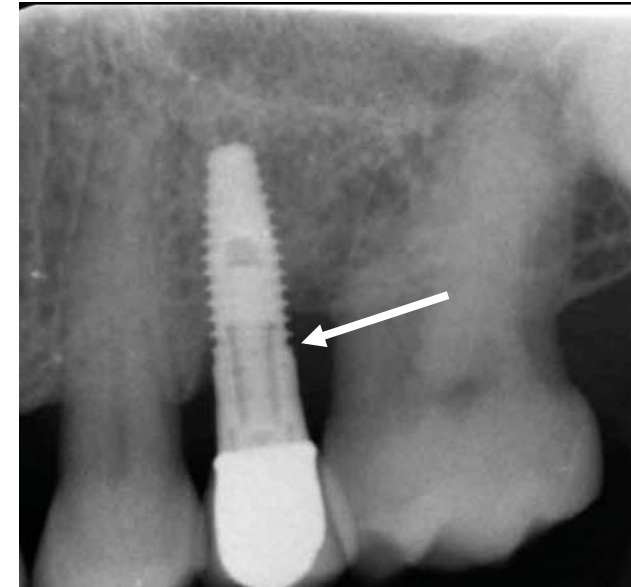
- Resolution may take more than 3 weeks
- infiltrate rich in vascular structures, plasma cells, and lymphocytes
- not apical to junctional epi.
  - erythema and swelling
  - bleeding and/or suppuration on gentle probing
  - may be increased probing depth
  - No bone loss



# Peri-implantitis



- apical of the junctional/pocket epithelium
- large numbers of inflammatory cells
- may occur early during follow-up
- faster than that observed in periodontitis



- redness and swelling
- bleeding and/or suppuration on gentle probing

In the absence of previous increased probing depth or recession

- Presence of bleeding and/or suppuration on gentle probing
- Probing depths of  $\geq 6$  mm.
- Bone levels  $\geq 3$  mm apical to the most coronal portion of the intraosseous part of the implant

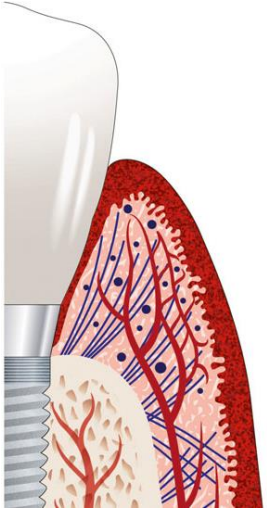


# Peri-implant tissue diseases

	Peri-implant health	Peri-implant mucositis	Peri-implantitis
<b>Dental plaque</b>	No / yes	yes	yes
<b>Gingiva</b>	Pink, no swelling, firm	Red, swelling, soft	Red, swelling, soft
<b>BOP (no dots)</b>	no	yes	yes
<b>PD (&lt;25 N)</b>	Differ, ≤ 5	Increase to baseline	Increase to baseline
<b>X-ray (bone)</b>	< 2 mm, 1 <sup>st</sup> year function	< 2 mm, 1 <sup>st</sup> year function	≥ 2 mm, 1 <sup>st</sup> year function

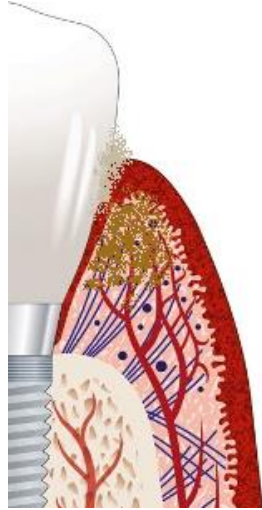
**No baseline**, bone level  $\geq 3$  mm and/or PD  $\geq 6$  mm in conjunction with **profuse BOP** represents peri-implantitis.

# Treatment



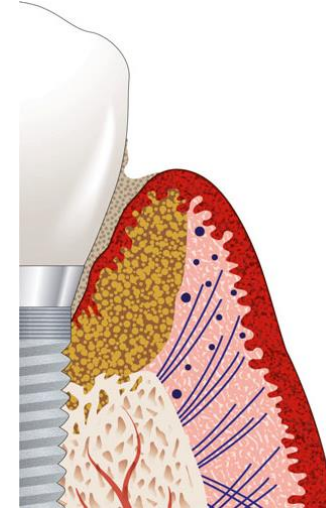
## Peri-implant health

- Maintenance care essential



## Peri-implant mucositis

- Non-surgical mechanical therapy
- Maintenance care



## Peri-implantitis

- Non-surgical mechanical therapy
- surgery
- Maintenance care

# Conclusion

- You should Know (probing,Rx,,)
- Follow-up is a fundamental
- Baseline data are important

Thank you