



The 2017 Update

A REVIEW OF PROCEEDINGS OF THE WORLD WORKSHOP ON THE CLASSIFICATION
OF PERIODONTAL AND PERI-IMPLANT DISEASES AND CONDITIONS

Armitage 1999

I. Gingival Diseases

A. Dental plaque-induced gingival diseases*

1. Gingivitis associated with dental plaque only
 - a. without other local contributing factors
 - b. with local contributing factors (See VIII A)

2. Gingival diseases modified by systemic factors

- a. associated with the endocrine system
 - 1) puberty-associated gingivitis
 - 2) menstrual cycle-associated gingivitis
 - 3) pregnancy-associated
 - a) gingivitis
 - b) pyogenic granuloma
 - 4) diabetes mellitus-associated gingivitis
- b. associated with blood dyscrasias
 - 1) leukemia-associated gingivitis
 - 2) other
3. Gingival diseases modified by medications
 - a. drug-influenced gingival diseases
 - 1) drug-influenced gingival enlargements
 - 2) drug-influenced gingivitis
 - a) oral contraceptive-associated gingivitis
 - b) other

4. Gingival diseases modified by malnutrition
 - a. ascorbic acid-deficiency gingivitis
 - b. other

B. Non-plaque-induced gingival lesions

1. Gingival diseases of specific bacterial origin
 - a. *Neisseria gonorrhoea*-associated lesions
 - b. *Treponema pallidum*-associated lesions
 - c. streptococcal species-associated lesions
 - d. other

2. Gingival diseases of viral origin

- a. herpesvirus infections
 - 1) primary herpetic gingivostomatitis
 - 2) recurrent oral herpes
 - 3) varicella-zoster infections
- b. other

3. Gingival diseases of fungal origin

- a. *Candida*-species infections
 - 1) generalized gingival candidosis
- b. linear gingival erythema
- c. histoplasmosis
- d. other

4. Gingival lesions of genetic origin

- a. hereditary gingival fibromatosis
- b. other

5. Gingival manifestations of systemic conditions

- a. mucocutaneous disorders
 - 1) lichen planus
 - 2) pemphigoid
 - 3) pemphigus vulgaris
 - 4) erythema multiforme
 - 5) lupus erythematosus
 - 6) drug-induced
 - 7) other
- b. allergic reactions
 - 1) dental restorative materials
 - a) mercury
 - b) nickel
 - c) acrylic
 - d) other
 - 2) reactions attributable to
 - a) toothpastes/dentifrices
 - b) mouthrinses/mouthwashes
 - c) chewing gum additives
 - d) foods and additives
 - 3) other

6. Traumatic lesions (factitious, iatrogenic, accidental)

- a. chemical injury
- b. physical injury
- c. thermal injury

7. Foreign body reactions

8. Not otherwise specified (NOS)

II. Chronic Periodontitis[†]

- A. Localized
- B. Generalized

III. Aggressive Periodontitis[†]

- A. Localized
- B. Generalized

IV. Periodontitis as a Manifestation of Systemic Diseases

A. Associated with hematological disorders

1. Acquired neutropenia
2. Leukemias
3. Other

B. Associated with genetic disorders

1. Familial and cyclic neutropenia
2. Down syndrome
3. Leukocyte adhesion deficiency syndromes
4. Papillon-Lefèvre syndrome
5. Chediak-Higashi syndrome
6. Histiocytosis syndromes
7. Glycogen storage disease
8. Infantile genetic agranulocytosis
9. Cohen syndrome
10. Ehlers-Danlos syndrome (Types IV and VII)
11. Hypophosphatasia
12. Other

C. Not otherwise specified (NOS)

V. Necrotizing Periodontal Diseases

- A. Necrotizing ulcerative gingivitis (NUG)
- B. Necrotizing ulcerative periodontitis (NUP)

VI. Abscesses of the Periodontium

- A. Gingival abscess
- B. Periodontal abscess
- C. Pericoronal abscess

VII. Periodontitis Associated With Endodontic Lesions

A. Combined periodontic-endodontic lesions

VIII. Developmental or Acquired Deformities and Conditions

A. Localized tooth-related factors that modify or predispose to plaque-induced gingival diseases/periodontitis

1. Tooth anatomic factors
2. Dental restorations/appliances
3. Root fractures
4. Cervical root resorption and cemental tears

B. Mucogingival deformities and conditions around teeth

1. Gingival/soft tissue recession
 - a. facial or lingual surfaces
 - b. interproximal (papillary)
2. Lack of keratinized gingiva
3. Decreased vestibular depth
4. Aberrant frenum/muscle position
5. Gingival excess
 - a. pseudopocket
 - b. inconsistent gingival margin
 - c. excessive gingival display
 - d. gingival enlargement (See IA.3. and IB.4.)
6. Abnormal color

C. Mucogingival deformities and conditions on edentulous ridges

1. Vertical and/or horizontal ridge deficiency
2. Lack of gingiva/keratinized tissue
3. Gingival/soft tissue enlargement
4. Aberrant frenum/muscle position
5. Decreased vestibular depth
6. Abnormal color

D. Occlusal trauma

1. Primary occlusal trauma
2. Secondary occlusal trauma

1999 Shortcomings

Shortcomings of the 1999 Classification include:

- ❖ Overlap of diagnostic categories
- ❖ Lack of distinction between categories
- ❖ Diagnostic imprecision
- ❖ Implementation difficulties

Group Effort

- ❖ Joint venture between the AAP and EFP
- ❖ 19 review papers were commissioned including 4 consensus reports
 - ❖ *Chapple et al.*
 - ❖ *Papapanou et al.*
 - ❖ *Jepsen et al.*
 - ❖ *Berglundh et al.*

Main Goals

1. Update the 1999 Classification
2. Create “*Case definitions*”
3. Provide diagnostic criteria to aid clinicians

Workgroups

- ❖ Workgroup 1 – Periodontal Health, gingival diseases and conditions on an intact and a reduced periodontium
- ❖ Workgroup 2 – Periodontal diseases
- ❖ Workgroup 3 – Periodontal manifestation of systemic diseases and developmental and acquired conditions
- ❖ Workgroup 4 – Peri-implant health and disease states

Key Changes

1. Chronic Periodontitis is replaced with **periodontitis**
2. Aggressive Periodontitis is replaced with **periodontitis**
3. Addition of Staging (severity) AND Grading (rate of progression)
4. The terms mild, moderate and severe have been removed and are replaced with a disease STAGE with respect to periodontitis.
5. Periodontal *biotype* is replaced with **periodontal phenotype**
 - ❖ **Probe visible: thin ($\leq 1\text{mm}$)**
 - ❖ **Probe not visible: thick ($> 1\text{mm}$)**

Key Changes

1. Excessive occlusal force is replaced with **traumatic occlusal force**
2. Biologic width is replaced with **supracrestal supporting tissues**
3. Lineal gingival erythema as a term is removed
4. Suggestion of “incipient periodontitis”
5. The term ulcerative has been removed from necrotizing periodontal diseases.
6. The Miller Classification for recessions has been replaced with **recession types 1-3.**

Periodontal Diseases and Conditions

Periodontal Health, Gingival Diseases and Conditions			Periodontitis			Other Conditions Affecting the Periodontium				
Periodontal Health and Gingival Health	Gingivitis: Dental Biofilm-Induced	Gingival Diseases: Non-Dental Biofilm-Induced	Necrotizing Periodontal Diseases	Periodontitis	Periodontitis as a Manifestation of Systemic Disease	Systemic diseases or conditions affecting the periodontal supporting tissues	Periodontal Abscesses and Endodontic-Periodontal Lesions	Mucogingival Deformities and Conditions	Traumatic Occlusal Forces	Tooth and Prosthesis Related Factors

Peri-Implant Diseases and Conditions

Peri-Implant Health	Peri-Implant Mucositis	Peri-Implantitis	Peri-Implant Soft and Hard Tissue Deficiencies
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Gingival Health

What is the “case” definition for periodontal health?

Gingival Health

Less than 10% bleeding sites with probing depths $\leq 3\text{mm}$
- Epidemiological definition

Characterized by successful treatment through control of local and systemic risk factors, resulting in minimal (< 10% of sites) BOP, no probing depths of 4 mm or greater that bleed on probing, optimal improvement in other clinical parameters and lack of progressive periodontal destruction

- Clinical practice definition

Gingivitis

What is a “Gingivitis Case”?

Gingivitis

$\geq 10\%$ bleeding sites with probing depths $\leq 3\text{mm}$

- Epidemiological definition
- Localized is defined as 10% - 30% bleeding sites
- Generalized is defined as $> 30\%$ bleeding sites
- In clinical practice we should refer to the gingivitis look-up table to determine if we have a gingivitis case.

Health vs. Gingivitis Look-up Table

<i>Intact periodontium</i>	Health	Gingivitis
Probing attachment loss	No	No
Probing pocket depths (assuming no pseudo pockets)	≤ 3 mm	≤ 3 mm
Bleeding on probing	< 10%	Yes ($\geq 10\%$)
Radiological bone loss	No	No
<i>Reduced periodontium</i>		Gingivitis
<i>Non-periodontitis patient</i>	Health	
Probing attachment loss	Yes	Yes
Probing pocket depths (all sites and assuming no pseudo pockets)	≤ 3 mm	≤ 3 mm
Bleeding on probing	< 10%	Yes ($\geq 10\%$)
Radiological bone loss	Possible	Possible
<i>Successfully treated stable periodontitis patient</i>	Health	Gingivitis in a patient with a history of periodontitis
Probing attachment loss	Yes	Yes
Probing pocket depths (all sites and assuming no pseudo pockets)	≤ 4 mm (no site ≥ 4 mm with BOP)	≤ 3 mm
Bleeding on probing	< 10%	Yes ($\geq 10\%$)
Radiological bone loss	Yes	Yes

Periodontitis

Defining a “periodontitis case”:

- ❖ **Interdental CAL is detectable at ≥ 2 non-adjacent teeth,**
OR

Periodontitis

- ❖ **Buccal or oral (lingual) CAL \geq 3 mm with pocketing \geq 3 mm is detectable at \geq 2 teeth but the observed CAL cannot be ascribed to non-periodontitis-related causes such as :**
 - ❖ 1. Gingival recession of traumatic origin
 - ❖ 2. Dental caries extending in the cervical area of the tooth
 - ❖ 3. Presence of CAL on the distal aspect of a second molar and associated with malposition or extraction of a third molar
 - ❖ 4. An endodontic lesion draining through the marginal periodontium
 - ❖ 5. The occurrence of a vertical root fracture

Three Steps to Staging and Grading a Patient



Step 1: Initial Case Overview to Assess Disease

Screen:

- Full mouth probing depths
- Full mouth radiographs
- Missing teeth

Mild to moderate periodontitis will typically be either Stage I or Stage II

Severe to very severe periodontitis will typically be either Stage III or Stage IV

Step 2: Establish Stage

For mild to moderate periodontitis (typically Stage I or Stage II):

- Confirm clinical attachment loss (CAL)
- Rule out non-periodontitis causes of CAL (e.g., cervical restorations or caries, root fractures, CAL due to traumatic causes)
- Determine maximum CAL or radiographic bone loss (RBL)
- Confirm RBL patterns

For moderate to severe periodontitis (typically Stage III or Stage IV):

- Determine maximum CAL or RBL
- Confirm RBL patterns
- Assess tooth loss due to periodontitis
- Evaluate case complexity factors (e.g., severe CAL frequency, surgical challenges)

Step 3: Establish Grade

- Calculate RBL (% of root length x 100) divided by age
- Assess risk factors (e.g., smoking, diabetes)
- Measure response to scaling and root planing and plaque control
- Assess expected rate of bone loss
- Conduct detailed risk assessment
- Account for medical and systemic inflammatory considerations



Step One

Patient Exam

- ❖ Full mouth probing depths
- ❖ Full mouth radiographs
- ❖ Missing teeth (particularly those lost due to periodontitis)

Step Two

Establish Stage

- ❖ Severity
 - ❖ Clinical attachment loss (CAL)
 - ❖ Radiographic bone loss (RBL)
 - ❖ Tooth loss (due to periodontitis)

Establish Stage

- ❖ Complexity (new)
 - ❖ Increased pocket depths
 - ❖ Type of bone loss
 - ❖ Furcation invasion
 - ❖ Occlusal trauma
 - ❖ Less than 10 opposing pairs of teeth

Establish Stage

Extent and Distribution

- ❖ Localized (less than 30% of teeth involved)
- ❖ Generalized
- ❖ Molar-Incisor pattern (formerly LJP, localized aggressive)

Staging and Grading Periodontitis



The 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions resulted in a new classification of periodontitis characterized by a multidimensional staging and grading system. The charts below provide an overview. Please visit perio.org/2017wwdc for the complete suite of reviews, case definition papers, and consensus reports.

PERIODONTITIS: STAGING

Staging intends to classify the severity and extent of a patient's disease based on the measurable amount of destroyed and/or damaged tissue as a result of periodontitis and to assess the specific factors that may attribute to the complexity of long-term case management.

Initial stage should be determined using clinical attachment loss (CAL). If CAL is not available, radiographic bone loss (RBL) should be used. Tooth loss due to periodontitis may modify stage definition. One or more complexity factors may shift the stage to a higher level. See perio.org/2017wwdc for additional information.

	Periodontitis	Stage I	Stage II	Stage III	Stage IV
Severity	Interdental CAL <i>(at site of greatest loss)</i>	1 – 2 mm	3 – 4 mm	≥5 mm	≥5 mm
	RBL	Coronal third (<15%)	Coronal third (15% - 33%)	Extending to middle third of root and beyond	Extending to middle third of root and beyond
	Tooth loss <i>(due to periodontitis)</i>	No tooth loss		≤4 teeth	≥5 teeth
Complexity	Local	<ul style="list-style-type: none"> Max. probing depth ≤4 mm Mostly horizontal bone loss 	<ul style="list-style-type: none"> Max. probing depth ≤5 mm Mostly horizontal bone loss 	In addition to Stage II complexity: <ul style="list-style-type: none"> Probing depths ≥6 mm Vertical bone loss ≥3 mm Furcation involvement Class II or III Moderate ridge defects 	In addition to Stage III complexity: <ul style="list-style-type: none"> Need for complex rehabilitation due to: <ul style="list-style-type: none"> Masticatory dysfunction Secondary occlusal trauma (tooth mobility degree ≥2) Severe ridge defects Bite collapse, drifting, flaring < 20 remaining teeth (10 opposing pairs)
Extent and distribution	Add to stage as descriptor	For each stage, describe extent as: <ul style="list-style-type: none"> Localized (<30% of teeth involved); Generalized; or Molar/incisor pattern 			

Step Three

Establish Grade

- ❖ Primary Criteria: Direct and Indirect
- ❖ Grade Modifiers

Establish Grade

Primary Criteria

- ❖ Radiographic bone loss or CAL over 5 years
 - ❖ This is direct evidence and is preferred
- ❖ % bone loss/age (see chart)
- ❖ Plaque levels

% Bone Loss/Age

% Bone Loss	Age	% Bone Loss/Age	Grade
25	25	1.00	C
50	25	2.00	C
75	25	3.00	C
25	30	0.83	B
50	30	1.67	C
75	30	2.50	C
25	35	0.71	B
50	35	1.43	C
75	35	2.14	C
25	40	0.63	B
50	40	1.25	C
75	40	1.88	C
25	45	0.56	B
50	45	1.11	C
75	45	1.67	C
25	50	0.50	B
50	50	1.00	C
75	50	1.50	C
25	55	0.45	B
50	55	0.91	B
75	55	1.36	C

% Bone Loss	Age	% Bone Loss/Age	Grade
25	60	0.42	B
50	60	0.83	B
75	60	1.25	C
25	65	0.38	B
50	65	0.77	B
75	65	1.15	C
25	70	0.36	B
50	70	0.71	B
75	70	1.07	C
25	75	0.33	B
50	75	0.67	B
75	75	1.00	C
25	80	0.31	B
50	80	0.63	B
75	80	0.94	B
25	85	0.29	B
50	85	0.59	B
75	85	0.88	B
25	90	0.28	B
50	90	0.56	B
75	90	0.83	B

% Bone Loss	Age	% Bone Loss/Age	Grade
10	25	0.40	B
25	25	1.00	C
50	25	2.00	C
75	25	3.00	C
10	30	0.33	B
25	30	0.83	B
50	30	1.67	C
75	30	2.50	C
10	35	0.29	B
25	35	0.71	B
50	35	1.43	C
75	35	2.14	C
10	40	0.25	B
25	40	0.63	B
50	40	1.25	C
75	40	1.88	C
10	45	0.22	A
25	45	0.56	B
50	45	1.11	C
75	45	1.67	C
10	50	0.20	A
25	50	0.50	B
50	50	1.00	C
75	50	1.50	C
10	55	0.18	A
25	55	0.45	B
50	55	0.91	B
75	55	1.36	C

% Bone Loss	Age	% Bone Loss/Age	Grade
10	60	0.17	A
25	60	0.42	B
50	60	0.83	B
75	60	1.25	C
10	65	0.15	A
25	65	0.38	B
50	65	0.77	B
75	65	1.15	C
10	70	0.14	A
25	70	0.36	B
50	70	0.71	B
75	70	1.07	C
10	75	0.13	A
25	75	0.33	B
50	75	0.67	B
75	75	1.00	C
10	80	0.13	A
25	80	0.31	B
50	80	0.63	B
75	80	0.94	B
10	85	0.12	A
25	85	0.29	B
50	85	0.59	B
75	85	0.88	B
10	90	0.11	A
25	90	0.28	B
50	90	0.56	B
75	90	0.83	B

Establish Grade

Grade Modifiers

- ❖ Smoking
 - ❖ <10 vs. ≥ 10 per day
- ❖ Diabetes
 - ❖ HbA1c < 7.0 vs. ≥ 7.0



PERIODONTITIS: GRADING

Grading aims to indicate the rate of periodontitis progression, responsiveness to standard therapy, and potential impact on systemic health.

Clinicians should initially assume grade B disease and seek specific evidence to shift to grade A or C.

See perio.org/2017wwdc for additional information.

	Progression		Grade A: Slow rate	Grade B: Moderate rate	Grade C: Rapid rate
Primary criteria <i>Whenever available, direct evidence should be used.</i>	Direct evidence of progression	Radiographic bone loss or CAL	No loss over 5 years	<2 mm over 5 years	≥2 mm over 5 years
	Indirect evidence of progression	% bone loss / age	<0.25	0.25 to 1.0	>1.0
		Case phenotype	Heavy biofilm deposits with low levels of destruction	Destruction commensurate with biofilm deposits	Destruction exceeds expectations given biofilm deposits; specific clinical patterns suggestive of periods of rapid progression and/or early onset disease
Grade modifiers	Risk factors	Smoking	Non-smoker	<10 cigarettes/day	≥10 cigarettes/day
		Diabetes	Normoglycemic/no diagnosis of diabetes	HbA1c <7.0% in patients with diabetes	HbA1c ≥7.0% in patients with diabetes

The 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions was co-presented by the American Academy of Periodontology (AAP) and the European Federation of Periodontology (EFP).

Classification of necrotizing periodontal diseases (NPD)

Category	Patients	Predisposing Conditions	Clinical Condition
Necrotizing periodontal diseases in chronically, severely compromised patients	In adults	HIV+/AIDS with CD4 counts < 200 and detectable viral load	NG, NP, NS, Noma. Possible progression
		Other severe systemic conditions (immunosuppression)	
	In children	Severe malnourishments	
		Extreme living conditions	
Necrotizing periodontal diseases in temporarily and/or moderately compromised patients	In gingivitis patients	Uncontrolled factors: stress, nutrition, smoking, habits	Generalized NG. Possible progression to NP
		Previous NPD: residual craters	Localized NG. Possible progression to NP
		Local factors: root proximity, tooth malposition	NG. Infrequent progression
	In periodontitis patients	Common predisposing factors for NPD (see paper)	NP. Infrequent progression

Case Definitions

Necrotizing gingivitis

- ❖ An acute inflammatory process of the gingival tissues characterized by presence of necrosis/ulcer of interdental papillae, gingival bleeding, and pain.

Necrotizing periodontitis

- ❖ An inflammatory process of the periodontium characterized by presence of necrosis/ulcer of the interdental papillae, gingival bleeding, halitosis, pain and rapid bone loss.

Necrotizing stomatitis

- ❖ A severe inflammatory condition of the periodontium and the oral cavity in which soft tissue necrosis extends beyond the gingiva and bone denudation may occur through the alveolar mucosa, with larger areas of osteitis and formation of bone sequestrum.

Classification of periodontal abscesses

Periodontal abscess in periodontitis patients (in a pre-existing periodontal pocket)	Acute exacerbation	Untreated periodontitis	
		Non-responsive to therapy periodontitis	
		Supportive periodontal therapy	
	After treatment	Post-scaling	
		Post-surgery	
		Post-medication	
Periodontal abscess in non-periodontitis patients (not mandatory to have a pre-existing periodontal pocket)	Impaction		Dental floss, orthodontic elastic, toothpick, rubber dam, or popcorn hulls
	Harmful habits		Wire or nail biting and clenching
	Orthodontic factors		Orthodontic forces or a cross-bite
	Gingival overgrowth		
	Alteration of root surface	Severe anatomic alterations	Invaginated tooth, dens evaginatus or odontodysplasia
		Minor anatomic alterations	Cemental tears, enamel pearls or developmental grooves
		Iatrogenic conditions	Perforations
		Severe root damage	Fissure or fracture, cracked tooth syndrome
External root resorption			

Case Definition

Periodontal abscess

- ❖ A localized accumulation of pus located within the gingival wall of the periodontal pocket/sulcus, resulting in a significant tissue breakdown.

Classification of endo-periodontal lesions

Endo-periodontal lesion with root damage	Root fracture or cracking	
	Root canal or pulp chamber perforation	
	External root resorption	
Endo-periodontal lesion without root damage	Endo-periodontal lesion in periodontitis patients	Grade 1 – narrow deep periodontal pocket in 1 tooth surface
		Grade 2 – wide deep periodontal pocket in 1 tooth surface
		Grade 3 – deep periodontal pockets in > 1 tooth surface
	Endo-periodontal lesion in non-periodontitis patients	Grade 1 – narrow deep periodontal pocket in 1 tooth surface
		Grade 2 – wide deep periodontal pocket in 1 tooth surface
		Grade 3 – deep periodontal pockets in > 1 tooth surface

Case Definition

Endo-periodontal lesion

- ❖ A pathologic communication between the pulpal and periodontal tissues at a given tooth that may occur in an acute or chronic form.

Perio-Systemic

1a. Rare conditions that may have major effects on the course of periodontitis.

❖ Defined clinically as “periodontitis in the presence of _____”

1b. Common conditions with variable effects on the course of periodontitis.

❖ Diabetes, Smoking

❖ Defined clinically as “periodontitis and diagnosis of diabetes/smoking”

Perio-Systemic

2. Conditions affecting the periodontal apparatus independently of dental plaque biofilm-induced inflammation

- ❖ Neoplasms
- ❖ Defined clinically as “periodontal attachment loss occurring in _____”

Acquired Deformities

Gingival site				Tooth Site	
	REC Depth	GT	KTW	CEJ (A/B)	Step (+/-)
No recession					
RT1					
RT2					
RT3					

RT = Recession type

REC Depth = depth of the gingival recession

GT = gingival thickness

KTW = keratinized tissue width

CEJ = cemento-enamel junction (Class A = detectable CEJ, class B = undetectable CEJ)

Step = root surface concavity (Class + = presence of a cervical step > 0.5 mm Class - = absence of a cervical step > 0.5 mm)

Recession Types

- ❖ Recession Type 1 (RT1)
- ❖ Recession Type 2 (RT2)
- ❖ Recession Type 3 (RT3)

RT1

Gingival recession with no loss of interproximal attachment. Interproximal CEJ is clinically not detectable at both mesial and distal aspects of the tooth.

RT2

Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment loss (measured from the interproximal CEJ to the depth of the interproximal sulcus/pocket) is less than or equal to the buccal attachment loss (measured from the buccal CEJ to the apical end of the buccal sulcus/pocket).

RT3

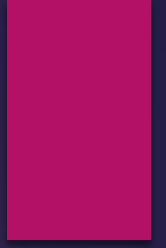
Gingival recession associated with loss of interproximal attachment. The amount of interproximal attachment (measured from the interproximal CEJ to the apical end of the sulcus/pocket) is higher than the buccal attachment loss (measured from the buccal CEJ to the apical end of the buccal sulcus/pocket).

Traumatic Occlusal Forces

- ❖ Traumatic Occlusal force
- ❖ Occlusal Trauma



Case Definitions

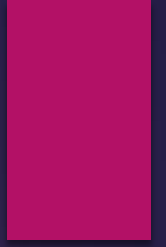


Traumatic occlusal force

- ❖ Defined as any occlusal force resulting in injury of the teeth and/or the periodontal attachment apparatus.

Traumatic occlusal force

- ❖ Clinical signs may include:
 - ❖ Fremitus
 - ❖ Tooth mobility
 - ❖ Tooth sensitivity
 - ❖ Occlusal wear
 - ❖ Tooth migration
 - ❖ Pain on chewing
 - ❖ Tooth fracture
 - ❖ Wide PDL space
 - ❖ Root resorption
 - ❖ Hypercementosis



Occlusal trauma (lesion)

- ❖ A **lesion** in the periodontal ligament, cementum and adjacent bone caused by traumatic occlusal forces.