Classification of Periodontal and Peri-Implant Diseases and Conditions

I. PERIODONTAL HEALTH, GINGIVAL DISEASES/CONDITIONS

A. Periodontal health and gingival health

1. Clinical gingival health on an intact periodontium
2. Clinical gingival health on a reduced periodontium
   a. Stable periodontitis patient
   b. Non-periodontitis patient

B. Gingivitis — dental biofilm-induced

1. Associated with dental biofilm alone
2. Mediated by systemic or local risk factors
   a. Systemic risk factors (modifying factors)
      1) Smoking
      2) Hyperglycemia
      3) Nutritional factors
      4) Pharmacological agents
      5) Sex steroid hormones
         a) Puberty
         b) Menstrual cycle
         c) Pregnancy
         d) Oral contraceptives
      6) Hematological conditions
   b. Local risk factors (predisposing factors)
      1) Dental biofilm retention factors
      2) Oral dryness
3. Drug-influenced gingival enlargement

C. Gingival diseases — non-dental biofilm-induced

1. Genetic/developmental disorders
   a. Hereditary gingival fibromatosis
2. Specific Infections
   a. Bacterial origin
      1) *Neisseria gonorrhea*
      2) *Treponema pallidum*
      3) *Mycobacterium tuberculosis*
      4) *Streptococcal gingivitis*
   b. Viral origin
      1) Coxsackie virus (hand-foot-and-mouth disease)
      2) Herpes simplex I & II (primary or recurrent)
      3) Varicella-zoster (chicken pox & shingles — V nerve)
      4) Molluscum contagiosum
      5) Human papilloma virus (squamous cell papilloma; condyloma acuminatum; verruca vulgaris; focal epithelial hyperplasia)
   c. Fungal origin
      1) Candidosis
      2) Other mycoses (e.g., histoplasmosis, aspergillosis)
3. Inflammatory and immune conditions
   a. Hypersensitivity reactions
      1) Contact allergy
      2) Plasma cell gingivitis
      3) Erythema multiforme
   b. Autoimmune diseases of skin and mucous membranes
      1) Pemphigus vulgaris
      2) Pemphigoid
      3) Lichen planus
      4) Lupus erythematosus
         a) Systemic lupus erythematosus
         b) Discoid lupus erythematosus
   c. Granulomatous inflammatory lesions (orofacial granulomatosis)
      1) Crohn's disease
      2) Sarcoidosis
4. Reactive processes
   a. Epulides
      1) Fibrous epulis
      2) Calcifying fibroblastic granuloma
      3) Vascular epulis (pyogenic granuloma)
      4) Peripheral giant cell granuloma
5. Neoplasms
   a. Premalignancy
      1) Leukoplakia
      2) Erythroplakia
   b. Malignancy
      1) Squamous cell carcinoma
      2) Leukemic cell infiltration
      3) Lymphoma
         a) Hodgkins
         b) Non-Hodgkins
6. Endocrine, nutritional, and metabolic diseases
   a. Vitamin deficiencies
      1) Vitamin C deficiency (scurvy)
7. Traumatic lesions
   a. Physical/mechanical trauma
      1) Frictional keratosis
      2) Mechanically-induced gingival ulceration
      3) Factitious injury (self-harm)
   b. Chemical (toxic) burn
   c. Thermal insults
      1) Burns to gingiva
8. Gingival pigmentation
   a. Melanoplakia
   b. Smoker's melanosis
   c. Drug-induced pigmentation (anti-malarias, minocycline)
   d. Amalgam tattoo

II. PERIODONTITIS

A. Staging based on severity, complexity, extent,* distribution

1. **Stage 1 — Slight**
   - Interdental CAL 1-2 mm at site of greatest loss
   - Radiographic bone loss <15% in coronal third of root, mostly horizontal
   - Probing depths 3-4 mm
2. **Stage 2 — Moderate**
   - Interdental CAL 3-4 mm at site of greatest loss
   - Radiographic bone loss 15-33% in coronal third of root, mostly horizontal
   - Probing depths 4-5 mm
3. **Stage 3 — Severe**
   - Interdental CAL ≥ 5 mm, extending to middle third of root
   - Radiographic bone loss, extending to middle third of root, vertical defects ≥ 3 mm
   - Probing depths ≥ 6 mm
   - Furcation involvement degree II and III
   - Moderate ridge defect
   - Periodontal tooth loss ≤ 4 teeth
4. **Stage 4 — Very severe**
   - Interdental CAL ≥ 5 mm
   - Radiographic bone loss extending to middle third of root and beyond
   - Probing depths ≥ 6 mm
   - Furcation involvement degree II and III
   - Masticatory dysfunction – need for complex rehabilitation
   - Secondary occlusal trauma, mobility ≥ 2
   - Bite collapse
   - Less than 20 remaining teeth
   - Severe ridge defect
   - Periodontal tooth loss ≥ 5 teeth

***extent:** localized < 30% of teeth
generalized ≥ 30% of teeth
molar/incisor pattern

B. Grading based on past progression, risk of future progression, anticipated treatment outcome, and general health status

1. Grade A – low rate progression
2. Grade B – moderate rate progression
3. Grade C – high rate progression

III. SYSTEMIC DISEASES ASSOCIATED WITH LOSS OF PERIODONTAL SUPPORTING TISSUES

A. Systemic disorders that have a major impact on the loss of periodontal supporting tissues by influencing periodontal inflammation

1. Genetic disorders
   a. Diseases associated with immunologic disorders
      1) Down syndrome
      2) Leukocyte adhesion deficiency syndromes
      3) Papillon-Lefèvre syndrome
      4) Haim-Munk syndrome
      5) Chediak-Higashi syndrome
      6) Congenital neutropenia (Kostmann syndrome)
      7) Primary immunodeficiency diseases
         a) Chronic granulomatous disease
         b) Hyperimmunoglobulin E syndromes
      8) Cohen syndrome
   b. Diseases affecting the oral mucosa and gingival tissue
      1) Epidermolysis bullosa
         a) Dystrophic epidermolysis bullosa
         b) Kindler syndrome
      2) Plasminogen deficiency
   c. Diseases affecting the connective tissues
      1) Ehlers-Danlos syndromes (types IV, VIII)
      2) Angioedema (C1-inhibitor deficiency)
      3) Systemic lupus erythematosus
   d. Metabolic and endocrine disorders
      1) Glycogen storage disease
      2) Gaucher disease
      3) Hypophosphatasia
      4) Hypophosphatemic rickets
      5) Hajdu-Cheney syndrome
2. Acquired immunodeficiency diseases
   a. Acquired neutropenia
   b. Human immunodeficiency virus infection
3. Inflammatory immune diseases
   a. Epidermolysis bullosa acquisita
   b. Inflammatory bowel disease

B. Other systemic disorders that influence the pathogenesis of periodontal diseases

1. Diabetes mellitus
2. Obesity
3. Osteoporosis
4. Arthritis
   a. Rheumatoid arthritis
   b. Osteoarthritis
5. Emotional stress and depression
6. Smoking (nicotine dependence)
7. Medications

C. Systemic disorders that can result in loss of periodontal tissues independent of periodontitis

1. Neoplasms
   a. Primary neoplastic diseases of the periodontal tissues
      1) Squamous cell carcinoma
      2) Odontogenic tumors
      3) Other primary neoplasms

b. Secondary metastatic neoplasms of the periodontal tissues

2. Other disorders that may affect the periodontium
   a. Granulomatosis with polyangiitis
   b. Langerhans cell histiocytosis
   c. Giant cell granulomas
   d. Hyperparathyroidism
   e. Systemic sclerosis (scleroderma)
   f. Gorham-Stout Disease (vanishing bone disease)

IV. NECROTIZING PERIODONTAL DISEASES

A. In severely compromised patients

1. Necrotizing gingivitis
2. Necrotizing periodontitis
3. Necrotizing stomatitis
4. Noma

B. In moderately/temporarily compromised patients

1. Necrotizing gingivitis
2. Necrotizing periodontitis

V. PERIODONTAL ABSCESSES

A. In periodontitis site

B. In non-periodontitis site

VI. PERIODONTITIS ASSOCIATED WITH ENDODONTIC LESIONS

A. Endodontic-periodontal lesion

1. With root damage
   a. Root fracture/cracking
   b. Root canal or pulp chamber perforation
   c. External root resorption
2. Without root damage
   a. In periodontitis site
   b. In non-periodontitis site

VII. DEVELOPMENTAL OR ACQUIRED DEFORMITIES AND CONDITIONS

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

1. Localized tooth-related factors
   a. Tooth anatomic factors
   b. Root fractures
   c. Cervical root resorption, cemental tears
   d. Root proximity
   e. Altered passive eruption
2. Localized dental prostheses-related factors
   a. Restoration margins placed within the supracrestal attached tissues
   b. Loss of periodontal supporting tissues caused by fabrication of indirect restoration
   c. Hypersensitivity/toxicity reactions to dental materials

B. Mucogingival deformities and conditions around teeth

1. Gingival phenotype
2. Gingival/soft tissue recession
   a. Facial or lingual surfaces
   b. Interproximal (papillary)
      1) Recession type 1
      2) Recession type 2
      3) Recession type 3
3. Lack of gingiva
4. Decreased vestibular depth
5. Aberrant frenum/muscle position
6. Gingival excess
   a. Pseudo-pocket
   b. Inconsistent gingival margin
   c. Excessive gingival display
   d. Gingival enlargement
7. Abnormal color
8. Root surface condition

C. Traumatic occlusal forces

1. Primary occlusal trauma
2. Secondary occlusal trauma
3. Orthodontic forces

VIII. PERI-IMPLANT DISEASES AND CONDITIONS

A. Peri-implant health

1. Normal bone height
2. Reduced bone height

B. Peri-implant mucositis

C. Peri-implantitis

D. Peri-implant soft and hard tissue deficiencies

1. Soft tissue deficiencies
   a. Thin peri-implant mucosa
   b. Lack of keratinized peri-implant mucosa
   c. Reduced papilla height
   d. Peri-implant frenum attachments
2. Hard tissue deficiencies
   a. Horizontal ridge deficiency
   b. Vertical ridge deficiency
   c. Pneumatization of maxillary sinus
   d. Thin/absent buccal and lingual bone plates

Revised 10/18/18

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** *(at site of greatest loss)*	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 *(due to periodontitis)*	No tooth loss		≤4 teeth	≥5 teeth
Complexity	**Local**	• Max. probing depth ≤4 mm • Mostly horizontal bone loss	• Max. probing depth ≤5 mm • Mostly horizontal bone loss	In addition to Stage II complexity: • Probing depths ≥6 mm • Vertical bone loss ≥3 mm • Furcation involvement Class II or III • Moderate ridge defects	In addition to Stage III complexity: • Need for complex rehabilitation due to: – 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: • Localized (<30% of teeth involved); • Generalized; or • Molar/incisor pattern			

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 *Whenever available, direct evidence should be used.*	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).

Tables from Tonetti, Greenwell, Kornman. *J Periodontol* 2018;89 (Suppl 1): S159-S172.