

Classification and algorithm for occlusal diagnosis: a teaching guide

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Received: October 15, 2025

Accepted: December 04, 2025

Online: December 30, 2025



Open access article

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ABSTRACT

A practical classification for occlusal diagnosis is presented, organized into two categories: (A) functional occlusal disorder (FOD) and (B) completely bimaxillary edentulous (CBE). Category A includes five key diagnostic entities: occlusal disharmony, traumatic occlusion, posterior bite collapse, collapsed occlusion, and combination syndrome. This classification is complemented by a clinical decision-making algorithm that emphasizes recognition of conditions and their consequences, as well as differentiation between signs and symptoms. This proposal aims to address a gap in standardized diagnostic systems that do not explicitly include occlusal diagnoses.

Keywords: dental occlusion; malocclusion; traumatic dental occlusion; edentulous mouth.

INTRODUCTION

Dental occlusion constitutes a transversal axis in the training of the stomatologist; however, its teaching is often presented in an atomized manner, limited to definitions, lists of signs, and protocols that do not foster timely clinical judgment. In the university setting, it is still difficult to distinguish between occlusal conditions and consequences, or to understand that a condition leads to a consequence, and that clinical decisions should only be prioritized when information is incomplete or fragmented.

Since 2000, information on the different diagnoses used in occlusion has been systematically compiled, and this data has been used to construct the present classifica-

tion. In 2015, the proposal was presented and adopted by consensus of the faculty members of the Section of Occlusion and Oral Rehabilitation of the Faculty of Stomatology at Universidad Peruana Cayetano Heredia (1). This article systematizes the classification and the diagnostic algorithm for occlusion as a teaching guide, an instrument developed and refined over 25 years, currently used in undergraduate and postgraduate programs at various universities.

This guide is integrated into courses on Occlusion, Oral Rehabilitation, and Comprehensive Dentistry in university clinics both nationally and internationally (2). It is also relevant for the induction of dental interns and residents, as well as for standardizing diagnostic discussions related to dental occlusion.

Cite as:

Matta CO. Classification and algorithm for occlusal diagnosis: a teaching guide. *Rev Estomatol Herediana*. 2025; 35(4): 329-336. DOI: 10.20453/reh.v35i4.7403

This contribution introduces a practical classification for the diagnosis of occlusion, accompanied by a decision-making algorithm and a checklist that organize clinical reasoning into brief, observable, and reproducible steps. The focus is placed on five frequent diagnoses in dentate patients: occlusal disharmony, traumatic occlusion, posterior bite collapse, collapsed occlusion, and combination syndrome. In addition, a complexity matrix is incorporated to guide initial clinical planning.

The educational contribution lies in translating occlusal concepts into tools for immediate use in clinical and preclinical settings, promoting a shared lexicon among faculty, students, and dentists in general. This approach contributes to standardizing decision-making without replacing comprehensive evaluation or instrumental studies when these are required.

The objectives of this guide are to:

- Identify the category of occlusal diagnosis (A and B) and justify the decision based on (objective) signs and (subjective) symptoms.
- Distinguish between occlusal condition and consequence in each diagnosis.
- Recognize the signs and symptoms of each diagnosis.
- Apply the decision algorithm to classify real clinical cases.
- Plan the clinical approach according to the level of complexity.

CONCEPTUAL FRAMEWORK

Clinical diagnosis consists of the systematic collection and description of findings to guide the resolution of the patient's complaints. The literature includes multiple descriptions of occlusal pathologies with variable—or redundant—characteristics which, due to the lack of clear characterization of representative conditions, favor a dispersion of consensus (3). A recurrent example is the terminological inconsistency regarding occlusal disharmony (a term more appropriate than “desharmony”) and collapsed occlusion. Both entities are difficult to delimit if their core signs and symptoms are not specified and if a rigorous distinction between condition and consequence is not established. This conceptual heterogeneity hinders reproducible diagnosis and clinical decision-making.

One category that deserves consideration due to its distinctive characteristics is edentulism, understood as the end point of chronic oral pathology—largely preventable—and described as the terminal marker of the burden of morbidity in oral health (4). Although the prevalence of complete tooth loss has decreased over

the last decade, edentulism remains a relevant global problem, especially among older adults, and is directly associated with impairment, functional limitation, and disability across physical, psychological, and social dimensions (5–8).

There is published literature on the diagnosis of the conditions discussed herein; however, part of it is inconclusive regarding their defining characteristics, and frequently includes total edentulism among occlusal diagnoses. This is inappropriate since, in the absence of dental structures, the conditions of functional and physiological normality of the stomatognathic system are lost. This underscores the need for rigorous clinical characterization, preferably through case series that allow efficient analysis, organization, and description of consistent clinical diagnoses.

Clinical experience and evidence-based literature agree that total edentulism constitutes a final occlusal condition, since, in the absence of teeth, there is no periodontal proprioception. Therefore, it should not be considered within the diagnosis of functional occlusal disorders (3,9).

The language of occlusal diagnosis can be understood as a logical chain: first, there is the condition, which constitutes an indispensable situation or circumstance for the existence of another. This is followed by an event or occurrence that results from the former, which would be the consequence of that condition. This cause-and-effect or causal relationship produces manifestations reflected in clinical signs and symptoms, the former being entirely objective and the latter entirely subjective.

To organize clinical information, it is essential to understand and accurately apply basic concepts. Thus, occlusal harmony describes a state of balance in which occlusion allows mastication, phonation, and swallowing in a coordinated manner (10). In contrast, occlusal disharmony—a term that is etymologically more appropriate for physiological usage—is employed to refer to alterations in the normal functioning of correlated physiological activities that are susceptible to generating pathological disorders (11).

On the other hand, it should be mentioned that, in both dentate and edentulous diagnoses, the correct term to refer to cases in which there is no tooth-to-tooth contact (but rather tooth-to-mucosa contact or absence of contact) is “occlusal collapse”. The expression “collapsed occlusion” refers to the relationship between the maxillary and mandibular teeth, whereas “occlusal collapse” denotes the loss of that dental relationship (9,12).

CLASSIFICATION OF DIAGNOSES FOR FUNCTIONAL OCCLUSAL DISORDERS (DX FOD)

A categorical classification of occlusal diagnoses is presented as follows: (A) Functional Occlusal Disorder (FOD) and B) Completely Bimaxillary Edentulous (CBE).

Category A: Functional Occlusal Disorder

Dentition is present. This category comprises five diagnoses (Figures 1 and 2).

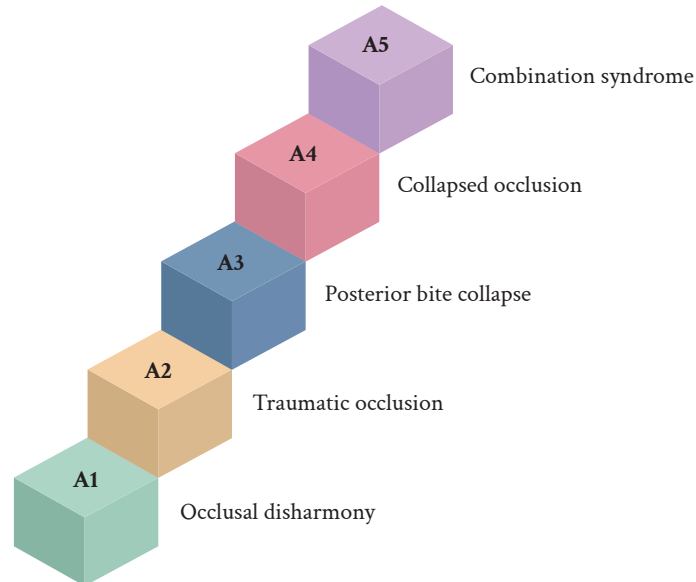


Figure 1. Gradient of Functional Occlusal Disorder.

A1. Occlusal disharmony (13,14)

- **Condition:** Interocclusal relationship that fails to achieve functional coordination despite the presence of stable contacts.
- **Consequences:** Clinically stable occlusion; preserved occlusal vertical dimension (OVD); tooth malposition; absence of symptoms.
- **Complexity:** Low/moderate/high, depending on the number and condition of teeth and prosthetic needs.

A2. Traumatic occlusion (15)

- **Condition:** Overload in a single tooth or a dental segment.
- **Consequences:** Tooth mobility, widening of the periodontal space; pain is not essential.

A3. Posterior bite collapse (13,14,16)

- **Condition:** Alteration of posterior support + anterior overload + a reduction of OVD, with tooth-to-tooth contact at the end of closure.
- **Consequences:** Flaring of the maxillary anterior segment, extrusion of the mandibular anterior teeth,

or posterior displacement of the mandible (functional mandibular retrusion).

Note. Patients with Class II Division 2 or Class III malocclusion may be classified as posterior bite collapse if tooth-to-tooth contact is present at the end of closure. If there is no dental contact, and contact occurs with the mucosa, the diagnosis corresponds to collapsed occlusion. Conversely, patients with Class II Division 1 malocclusion are not considered candidates for posterior bite collapse as the increased horizontal overjet prevents anterior overload (no maxillary anterior flaring or functional retrusion is expected). In such cases, the diagnosis is usually occlusal disharmony or traumatic occlusion, depending on the clinical signs present.

A4. Collapsed occlusion (2)

- **Condition:** Loss of posterior support and anterior dental contact, that is, total absence of antagonistic tooth contacts. During closure, the remaining teeth contact the mucosa (or there is no contact at all). This diagnosis may also be considered when one of the jaws is completely edentulous.
- **Consequences:** Loss of OVD and non-contacting mandibular trajectories in the Posselt envelope of motion.

A5. Combination syndrome (Kelly Syndrome or Anterior Hyperfunction Syndrome) (17,18)

- **Condition:** A mandibular Kennedy Class I removable partial denture (RPD) (or absence of

RPD use), anterior hyperfunction, and negative pressure on tuberosities.

- **Consequences:** Extrusion of the mandibular anterior teeth, premaxillary bone resorption, enlargement of the tuberosities, and bone resorption beneath the bases of the removable partial denture.

Gradient of deterioration → Damage and recovery → Treatment

LEGEND: Solid red arrows indicate the possibility of damage; the solid blue arrow indicates recovery (treatment is not specified because multiple therapeutic options exist); the long red and blue dashed arrows indicate that both damage progression and treatment do not necessarily pass through each individual diagnosis but rather aim to reach the appropriate treatment.

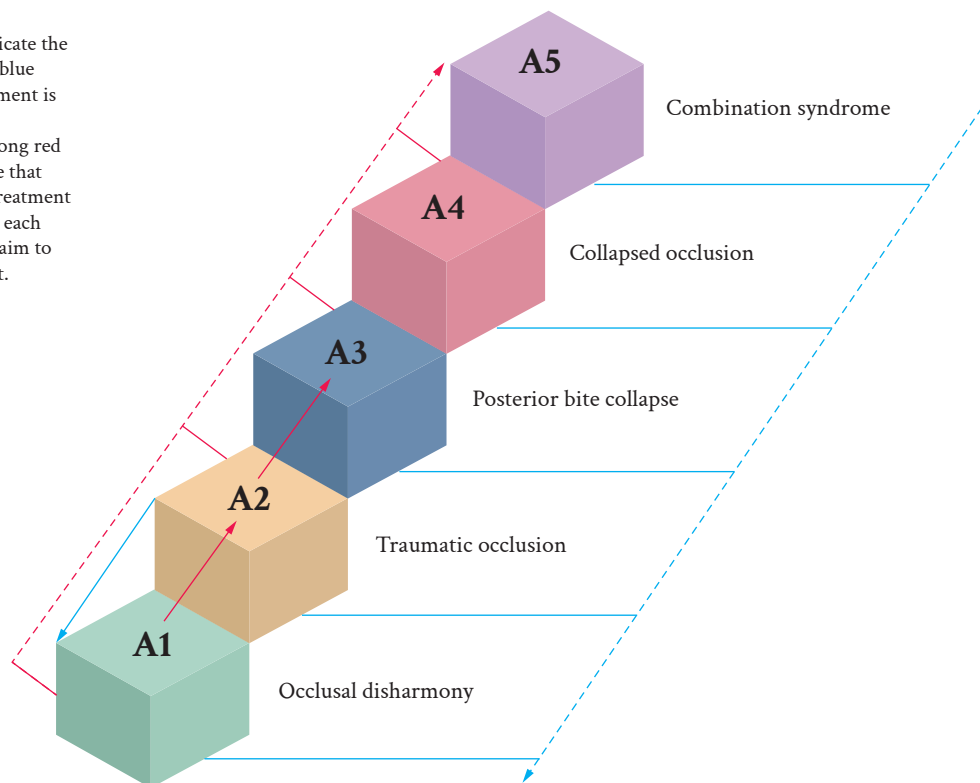


Figure 2. Deterioration/Damage and Recovery/Treatment.

Category B: Completely Bimaxillary Edentulous (CBE)

There is no presence of dentition (4,6,7). The final occlusal condition is defined by the absence of teeth and the lack of periodontal proprioception; mechanical discrimination depends on the mucosa and the residual alveolar ridge.

DECISION-MAKING ALGORITHM FOR CATEGORIZATION

For Category A: Functional Occlusal Disorder (FOD)

Occlusal disharmony

Presence of signs / Absence of symptoms / Stable occlusion / Preservation of OVD.

- IF conditions and consequences are met: CONTINUE (consider the diagnosis VALID).
- IF NOT: consider traumatic occlusion (A2) or posterior bite collapse (A3).

Traumatic occlusion

Occlusal overload / Pain not necessarily present / Tooth mobility / Widening of the periodontal space on imaging evaluation.

- IF conditions and consequences are met: CONTINUE (consider the diagnosis VALID).
- IF NOT: consider occlusal disharmony (A1) or posterior bite collapse (A3).

Posterior bite collapse

Alteration of posterior support / Anterior overload / Reduction of OVD / Tooth-to-tooth contact at the end of closure / Flaring of the maxillary anterior segment / Extrusion of the mandibular anterior teeth / or posterior displacement of the mandible (functional mandibular retrusion).

- IF conditions and consequences are met: CONTINUE (consider the diagnosis VALID).
- IF NOT: consider occlusal disharmony (A1) or collapsed occlusion (A4).

Collapsed occlusion

Loss of posterior dental support and anterior dental contact / Total absence of antagonistic tooth contacts / May be considered if one of the jaws is completely edentulous / At the end of closure, the teeth contact the mucosa / Loss of OVD.

- IF conditions and consequences are met: CONTINUE (consider the diagnosis VALID).
- IF NOT: consider posterior bite collapse (A3) or combination syndrome (A5).

Combination syndrome

Maxillary complete denture / Mandibular Kennedy Class I RPD / Anterior hyperfunction and negative pressure in both tuberosity regions due to anterior hyperfunction / Enlargement of the tuberosities / Extrusion of the

mandibular anterior teeth / Resorption of the anterior maxilla / Resorption of the alveolar ridge beneath the mandibular RPD.

- IF conditions and consequences are met: CONTINUE (consider the diagnosis VALID).
- IF NOT: consider collapsed occlusion (A4).

For Category B: Completely Bimaxillary Edentulous (CBE)

Total absence of teeth in both jaws.

- IF conditions and consequences are met: CONTINUE (consider the diagnosis VALID).
- IF NOT: NOT CONSIDERABLE, since this represents a final occlusal condition characterized by the TOTAL absence of teeth in both jaws, resulting in the absence of periodontal proprioception.

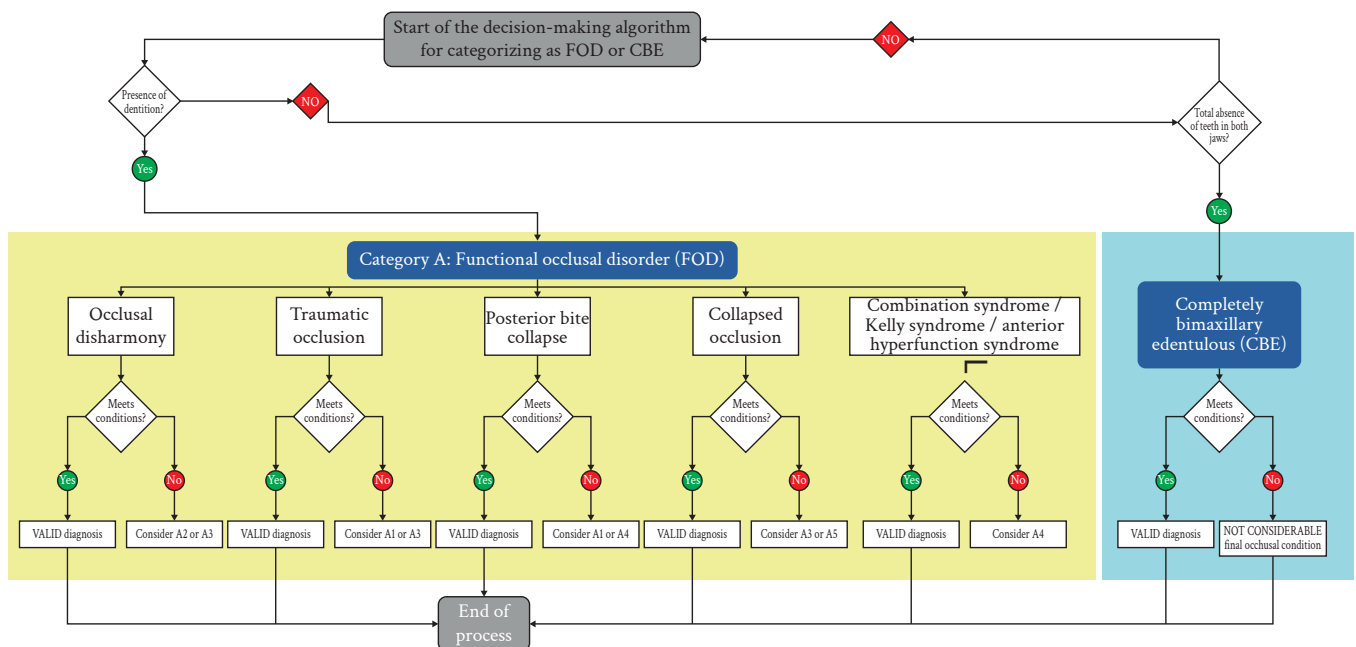


Figure 3. Flowchart of the decision-making algorithm for categorization.

MAIN SIGNS IN OCCLUSAL DIAGNOSES

Category A. Functional Occlusal Disorder

Occlusal disharmony (graded by complexity)

- Low: Stable occlusion, preserved OVD, mild malposition, asymptomatic.
- Moderate: Stable occlusion, preserved OVD, malposition + some missing teeth, asymptomatic.
- High: Poorly stable occlusion (often maintained by prostheses in fair condition), preserved OVD, multiple missing teeth and malposition, asymptomatic.

Traumatic occlusion

- Localized overload, mobility/fremitus; pain is not essential.
- Radiography: Widening of periodontal space.

Posterior bite collapse

- Alteration of posterior support (tooth loss, fractures, wear, defective restorations, mobility).
- Anterior overload with possible flaring of the maxillary anterior segment or posterior displacement of the mandible (functional mandibular retrusion).

- Reduced OVD with tooth-to-tooth contact at the end of closure.

Collapsed occlusion

- Loss of posterior and anterior support.
- May be considered when one of the jaws is completely edentulous.
- Absence of antagonistic contacts; upon closure, contact occurs on the mucosa or is absent.
- Reduced OVD.

Combination syndrome

- Maxillary complete denture (CD) + mandibular Class I RPD (irregular use or non-use).
- Anterior hyperfunction, changes in the premaxilla, and enlargement of the tuberosities.

Category B. Completely Bimaxillary Edentulous

Final condition without teeth (not an OFD): absence of periodontal proprioception, possible instability of OVD, and alterations of supporting tissues.

POSSIBLE CLINICAL SIGNS AND SYMPTOMS IN OCCLUSAL DIAGNOSES

Diagnosis is based on the identification of (objective) signs and (subjective) symptoms, which are organized by domains that compile clinical information to guide planning, management, and/or treatment.

Clinical signs

- Tooth migrations and contacts: Extrusion/intrusion, mesialization/distalization, angulation, crowding; occlusal interferences (including the Thielemann phenomenon).
- Dental stability: Mobility and fremitus (due to overload or periodontal disease).
- Interocclusal relationship: Altered anterior guidance; altered occlusal plane/curve; malocclusions (open bite, crossbite, inverted bite, edge-to-edge, surface-to-surface, deep bite).
- Supporting tissues: Loss of hard and soft tissue support.
- Missing teeth: Partial or total edentulism.
- Loss of tooth structure: Fractures; pathological tooth wear (attrition, abrasion, erosion, abfraction).

Clinical symptoms

- Dental hypersensitivity, dental pain, muscle pain, and joint pain.

Table 1. Summary of occlusal diagnoses (key signs).

Section/diagnosis	Summary (key signs)
A. Functional Occlusal Disorder (FOD)	
A1. Occlusal Disharmony – Low	Stable occlusion, preserved OVD, mild malposition, asymptomatic.
A1. Occlusal Disharmony – Moderate	Stable occlusion, preserved OVD, malposition + some missing teeth, asymptomatic.
A1. Occlusal Disharmony – High	Poorly stable occlusion (often maintained by prostheses in fair condition), preserved OVD, multiple missing teeth and malposition, asymptomatic.
A2. Traumatic Occlusion	Localized overload, mobility/fremitus, pain not essential; radiograph: widening of the periodontal space.
A3. Posterior Bite Collapse	Altered posterior support → anterior overload (flaring/functional retrusion), reduced OVD, tooth-to-tooth contact at the end of closure.
A4. Collapsed Occlusion	Loss of posterior and anterior support; no antagonistic contacts; at closure, contact on mucosa or absent; loss of OVD.
A5. Combination Syndrome (Kelly)	Maxillary CD + mandibular Class I RPD (irregular use/non-use); anterior hyperfunction; reduced height of the premaxilla (anterior ridge) and enlargement of the tuberosities.

Table 1. (Continuation).

Section/diagnosis	Summary (key signs)
B. Completely Bimaxillary Edentulous (CBE)	
Edentulous (not FOD); absence of periodontal proprioception; OVD instability and supporting tissue alterations.	
Clinical signs	Migrations/contacts: extrusion/intrusion, mesialization/distalization, angulations, crowding, interferences (including the Thielemann phenomenon). Stability: mobility and fremitus. Interocclusal relationship: altered anterior guidance and occlusal plane/curve; mal-occlusions (open, cross, inverted, edge-to-edge, surface-to-surface, deep bite). Supporting tissues: hard/soft tissue loss. Missing teeth: partial/total edentulism. Tooth structure: fractures; pathological wear (attrition, abrasion, erosion, abfraction).
Clinical symptoms	Dentin hypersensitivity, dental pain, muscle pain, and joint pain.

DISCUSSION

In 2022, the Peruvian Ministry of Health updated the “Manual for the Recording and Coding of Oral Health Care,” which compiles available information for the diagnosis of oral diseases in both public and private sectors (19). However, the document does not include diagnoses related to occlusion. This omission limits the accurate identification of occlusal problems and, consequently, the selection of appropriate treatments, with the risk of aggravating the population’s oral health status (1).

Understanding what occurs in a deteriorated stomatognathic system—recognizing that we work with biological organisms that share similar physiologies but exhibit different responses—requires precise identification of the pathology or dysfunction being addressed. Naming

the condition clearly, thus integrating its characteristics and functional dynamics, facilitates the selection of therapeutic alternatives and guides clinical resolution in a more consistent manner (1,2).

The usefulness of this proposal lies in translating occlusal concepts into practical tools that are immediately applicable in both clinical and preclinical settings. In the same way, it promotes a shared language between faculty and students, and contributes to unifying decision-making, without replacing comprehensive evaluation or instrumental studies when indicated. Having clear, organized definitions grounded in evidence-based deductive logic helps achieve more accurate diagnoses, improves treatment selection, and allows anticipation of outcomes. Ultimately, for the patient, this translates into greater confidence and safety, fewer fears, and better adherence to check-ups and maintenance.

Conflict of interest:

The author declares no conflict of interest.

Funding:

Self-funded.

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