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Original Article

Establishing Readiness for Orthodontic Treatment after Periodontal Therapy: An Interdisciplinary Framework for Inflammatory Control, Residual Pocket Interpretation, and Shared Clinical Responsibility

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ABSTRACT

Orthodontic treatment is increasingly incorporated into the rehabilitation of patients with a history of periodontitis, yet completion of active periodontal therapy does not by itself establish readiness for orthodontic tooth movement. Clinical decisions must distinguish historical periodontal destruction from current inflammatory control, interpret residual probing findings in their anatomical and temporal context, and anticipate the biological and mechanical demands imposed by planned tooth movement. This clinical reasoning framework examines readiness as a provisional multidimensional state rather than a binary clearance decision. It integrates periodontal stability, residual pocket interpretation, maintenance behaviour, systemic and local risk modifiers, defect morphology, and the requirement for continuing reassessment. Residual probing depth is treated as clinically meaningful without being converted into a universal contraindication, because post-treatment pockets differ in inflammatory activity, anatomy, treatment history, and prognostic significance. Likewise, successful periodontal treatment is considered necessary but insufficient when the intended orthodontic movement, reduced periodontal support, adherence capacity, and monitoring requirements remain unresolved. The framework therefore separates three questions: whether inflammatory disease is adequately controlled, whether residual findings are compatible with stability or require further intervention, and whether the proposed orthodontic movement is biologically and clinically admissible. Readiness should consequently be regarded as conditional and revisable, with responsibility shared across periodontal and orthodontic care rather than transferred permanently at the end of active periodontal treatment.

Keywords: Periodontitis, Orthodontic tooth movement, Periodontal stability, Residual periodontal pockets, Interdisciplinary dentistry, Supportive periodontal care

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Introduction

Periodontitis produces an enduring biological and anatomical history even after clinically successful therapy. Contemporary classification distinguishes disease severity, complexity, and progression risk rather than treating periodontal destruction as a single homogeneous state [1]. Staging and grading therefore provide important information about prior tissue loss, complexity of rehabilitation, and susceptibility to future deterioration, but they do not directly answer whether a treated patient is currently suitable for orthodontic movement [2]. This distinction becomes particularly important in patients with reduced periodontal support, in whom clinical health can be achieved despite previous attachment and bone loss.

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Current periodontal health on a reduced periodontium is therefore not equivalent to restoration of an intact periodontium, nor does it erase the patient's susceptibility to recurrence [3].

The central clinical problem is that completion of periodontal therapy and readiness for orthodontic treatment are related but non-equivalent decisions. Contemporary periodontal treatment is explicitly organized as a staged process extending from behavioural and risk-factor control through subgingival instrumentation and, where needed, surgical therapy to supportive periodontal care [4]. The end of active therapy therefore represents a transition in management rather than a permanent declaration of biological safety. Treatment endpoints such as low bleeding levels, reduction in deep probing depths, pocket closure, and maintenance of attachment are clinically useful because they indicate response to therapy and future risk. Nevertheless, these endpoints remain partly surrogate measures: none alone establishes that a specific tooth, movement, patient, or treatment plan is orthodontically admissible [5].

An orthodontic decision adds questions that ordinary periodontal treatment endpoints were not designed to answer. The clinician must determine whether the current inflammatory state is sufficiently controlled, whether residual probing findings represent stable anatomy or ongoing risk, whether proposed tooth movement can be performed within the limits of reduced support, and whether the patient and care team can sustain the monitoring required during treatment. A previously deep site that remains moderately deep but non-bleeding and stable after successful therapy is not clinically identical to a site of the same probing depth that continues to bleed, suppurate, lose attachment, or demonstrate inadequate plaque control. Conversely, apparent clinical quietness cannot be assumed to remain durable when maintenance adherence, smoking exposure, glycaemic control, tooth anatomy, or treatment demands change.

This article develops a clinical reasoning framework in which orthodontic readiness is treated as a provisional state produced by concordance across multiple dimensions. The first dimension is periodontal stability: the biological environment must demonstrate adequate control of inflammation and continued capacity for maintenance. The second is interpretation of residual periodontal findings: remaining pockets, previous attachment loss, defect morphology, and site-specific response require contextual judgment rather than automatic classification as either harmless or prohibitive. The later dimensions concern whether the intended orthodontic movement is compatible with the reduced periodontium and whether periodontal and orthodontic clinicians share explicit responsibility for surveillance, modification, interruption, and reassessment. The framework does not propose a new numeric threshold and does not claim that any single periodontal variable can function as a universal orthodontic clearance test.

Periodontal stability as a clinical preconditions framework

Periodontal stability before orthodontic treatment is best understood as a clinical precondition, not as a one-time test result. The relevant question is whether the post-treatment periodontal environment is sufficiently controlled to tolerate the additional biological demands of tooth movement without allowing preventable inflammatory disease to remain active. Such control begins with the distinction between historical damage and current disease activity. A tooth may have severe previous attachment loss yet show little current inflammation, while another tooth with less historical destruction may retain active inflammatory signs. For that reason, the quantity of previous support lost and the present inflammatory state must be interpreted together rather than used interchangeably.

Durable periodontal control also depends on patient behaviour. Behavioural interventions directed at oral hygiene can improve self-care, but their effects vary between patients and intervention designs, and no single motivational strategy produces universally predictable periodontal outcomes [6]. In a readiness assessment, adherence should therefore be considered an observable capacity demonstrated over time rather than inferred from a patient's stated intention to maintain plaque control once orthodontic appliances are placed.

Systemic and behavioural risk modification further affects the stability of the treated periodontium. Smoking cessation, diabetes management, and broader lifestyle measures form part of contemporary periodontal care because persistent risk exposure can weaken treatment response and long-term maintenance [7]. These factors should not be converted into absolute orthodontic exclusions. Their significance lies instead in how they alter the probability that an apparently controlled periodontal state will remain controlled under the additional plaque-retentive, inflammatory, and behavioural demands of orthodontic treatment.

Mechanical plaque control during supportive periodontal care has the same conditional role. Available comparisons of maintenance devices do not justify a universal hierarchy in which one toothbrush or interdental method establishes readiness [8]. What

matters clinically is whether the patient's chosen regimen achieves reproducible control at the sites that will be exposed to orthodontic forces and appliance-related plaque-retention challenges. Readiness is therefore weakened when acceptable plaque control depends heavily on professional intervention and cannot be maintained by the patient between visits.

Subgingival instrumentation usually reduces probing depths and improves periodontal conditions, but treatment response varies by initial pocket depth, tooth anatomy, and local disease characteristics [9]. Accordingly, a completed course of instrumentation is evidence that appropriate therapy has been delivered; it is not evidence that every treated site has reached an identical biological endpoint. Orthodontic planning must therefore evaluate the state achieved after treatment rather than assuming that treatment completion itself has normalized risk.

A further distinction is required for teeth with intrabony defects or a history of regenerative therapy. Regenerative surgery can provide additional clinical attachment gains relative to access-flap treatment in selected periodontal defects, but the result is defect-specific and dependent on morphology, surgical conditions, patient factors, and healing [10]. A successfully treated intrabony defect is consequently not interchangeable with a previously shallow site, even when both are currently non-inflamed. The former carries a treatment history and anatomical context that may influence orthodontic timing, movement selection, monitoring intensity, and interpretation of subsequent changes.

These considerations support a stability assessment based on concordant clinical evidence rather than a single threshold. The relevant preconditions include control of overt inflammation, a maintenance pattern compatible with sustained plaque control, acceptable management of modifiable risk, a stable or improving attachment profile, and an understanding of local anatomical limitations. Importantly, these elements do not need to imply perfect periodontal normality. A reduced but controlled periodontium can be clinically stable. The question is whether the remaining abnormalities represent stable consequences of past disease or evidence that the disease process is still insufficiently controlled.

The relationship between these variables is summarized in Table 1. The purpose is not to create a numerical score but to distinguish findings that can support readiness from the conditions that limit their interpretation.

Table 1. Clinical signals supporting periodontal stability before orthodontic loading and their interpretive limits

Clinical signal	What the finding can reasonably support	Why the finding is insufficient alone	Readiness concern requiring further interpretation
Low current inflammatory burden	Suggests effective control of active gingival inflammation	Does not erase prior attachment loss or future susceptibility	Whether stability persists between maintenance visits and during appliance therapy
Reduced probing depths after therapy	Demonstrates treatment response and reduced inflammatory pocket burden	Similar residual depths can have different anatomy, bleeding status, and prognostic meaning	Site-specific inflammatory activity, defect morphology, and longitudinal behaviour
Stable clinical attachment	Supports absence of evident continuing attachment loss over the observed interval	Stability depends on observation period and measurement reproducibility	Whether apparent stability has been demonstrated long enough for the intended treatment context
Effective self-performed plaque control	Supports capacity to maintain a low-biofilm environment	Performance may deteriorate after appliance placement or treatment complexity increases	Whether the patient can maintain equivalent control during active orthodontic treatment
Controlled modifiable systemic and behavioural risk	Reduces avoidable contributors to periodontal instability	Risk reduction does not eliminate individual susceptibility	Persistence or recurrence of smoking exposure, glycaemic instability, or poor adherence
Completion of non-surgical periodontal therapy	Confirms delivery of foundational disease-control treatment	Treatment completion does not ensure identical response at every tooth or site	Residual pockets, bleeding, furcation involvement, or site-specific retreatment need
Successful treatment of an intrabony defect	Indicates that a previously compromised site may have achieved clinical improvement	Regenerated or repaired tissues cannot be assumed to behave like never-diseased tissues	Healing status, defect configuration, planned direction of movement, and monitoring needs

Engagement with supportive periodontal care	Demonstrates continuing surveillance and maintenance	Attendance alone does not prove biological stability	Quality of plaque control, recurrent inflammation, and response to maintenance

The key implication is that periodontal stability is a state assembled from several compatible observations. When these observations are discordant, readiness should not be determined by selecting whichever single variable is most reassuring. Instead, the discordance itself becomes clinically meaningful. A patient with low generalized bleeding but a persistent deep bleeding site, for example, requires site-level interpretation. Likewise, a patient with apparently favourable probing values but unreliable plaque control may have a less durable periodontal state than the measurements initially suggest.

This approach also prevents a common conceptual error: equating periodontal stability with biological uniformity. Treated periodontitis creates a heterogeneous periodontal landscape. Some sites may be shallow and readily maintainable; others may remain deep because of root morphology, intrabony anatomy, furcation involvement, or past surgical treatment. Orthodontic readiness therefore depends not only on whether disease appears generally controlled, but also on whether the remaining local findings have been adequately explained.

Interpreting residual periodontal findings

Residual periodontal findings occupy the most difficult space between successful periodontal treatment and orthodontic decision-making. They matter because persistent deep pockets and inflammation can be associated with recurrence and tooth loss, yet their presence cannot be interpreted without reference to site anatomy, treatment response, bleeding status, prior attachment loss, and longitudinal behaviour. The clinical task is therefore not to decide whether a residual finding exists, but to determine what that finding represents in the treated patient.

Residual pockets are common after otherwise effective non-surgical therapy. Systematic evidence shows substantial reductions in the prevalence of deep probing depths following treatment, while also demonstrating that a meaningful proportion of sites remain at or above commonly used residual-pocket definitions [11]. The existence of such sites should trigger interpretation rather than automatic disqualification from orthodontic care. A persistent pocket can reflect incomplete inflammatory resolution, difficult root anatomy, a residual intrabony component, a furcation, tissue architecture after healing, or a site in which additional treatment may be warranted.

The uncertainty surrounding treatment of residual pockets reinforces this point. Evidence for adjunctive therapies during supportive periodontal care is heterogeneous, and many proposed adjuncts have not demonstrated sufficiently consistent superiority over careful mechanical retreatment to support a universal management hierarchy [12]. If the treatment literature itself does not justify a single preferred intervention for every residual pocket, it follows that a single residual probing-depth value cannot credibly function as a universal orthodontic clearance threshold.

Long-term endpoint evidence provides an additional caution against binary reasoning. A systematic synthesis of treated periodontitis populations found that only a minority fulfilled stringent definitions of complete periodontal stability or formal treatment endpoints, whereas a larger proportion remained clinically controlled and many retained their teeth during supportive periodontal care [13]. This does not make residual disease unimportant. Instead, it demonstrates that strict endpoint failure and inevitable clinical deterioration are not equivalent. Orthodontic decisions should therefore avoid both extremes: residual findings must not be dismissed, but neither should failure to satisfy the strictest periodontal endpoint automatically be interpreted as an absolute contraindication.

Some residual sites require active retreatment. Randomized evidence comparing renewed non-surgical instrumentation with periodontal surgery for persistent pockets illustrates that residual disease can remain clinically actionable after initial therapy [14]. Such evidence supports a site-specific decision process. If a residual site is still bleeding, shows suppuration, progressive attachment change, poor accessibility for self-care, or morphology suggesting a remediable persistent lesion, further periodontal treatment may reasonably precede orthodontic movement at that tooth. The implication is not that surgery is required before orthodontics whenever a pocket remains; rather, the residual finding must first be classified as stable, uncertain, or still requiring disease-control intervention.

Residual-pocket burden also has prognostic significance. Observational evidence links a greater proportion of residual deep pockets during supportive care with increased risk of periodontal tooth loss [15]. That association is clinically useful because it prevents complacency when multiple untreated or recurrent sites

remain. It must not, however, be transformed into a new orthodontic exclusion rule. A prognostic threshold derived from a periodontal tooth-loss cohort answers a different question from whether a particular patient can safely begin a particular orthodontic movement. Readiness requires integration of that prognostic information with site distribution, bleeding, maintenance history, tooth importance, movement direction, and the capacity for close review.

Stage IV periodontitis makes this integration explicit. The European Federation of Periodontology guideline places orthodontic therapy within interdisciplinary rehabilitation after successful periodontal treatment and within a pathway that requires continued periodontal management [16]. The phrase "successful periodontal treatment" should not be interpreted as a single universal measurement. It represents adequate control of the disease process to permit subsequent rehabilitation while maintaining continued surveillance. In clinical reasoning terms, the guideline supports a prerequisite relationship—periodontal disease control before orthodontic movement—without reducing disease control to one probing-depth number.

Tooth-level characteristics further explain why identical probing measurements can carry different meanings. Large clinical datasets show that response to non-surgical periodontal therapy varies according to tooth type and local characteristics, with initially deep sites often retaining greater residual depths despite substantial improvement [17]. A 5-mm residual depth on a previously very deep molar site with stable attachment, no bleeding, and good maintenance cannot therefore be assumed to have the same biological meaning as the same measurement at a site showing persistent bleeding and inadequate treatment response. Readiness assessment must preserve this contextual information rather than stripping the measurement from its clinical history.

The final limitation is temporal. Periodontitis can recur or progress during long-term supportive care, and evidence from longitudinal studies shows that recurrence risk is not eliminated merely because active treatment has been completed [18]. Consequently, the interpretation of a residual finding can change. A site considered stable before orthodontics may become concerning if bleeding returns, probing depth increases, plaque control deteriorates, mobility changes, or maintenance attendance becomes unreliable. This temporality is central to the concept of orthodontic readiness: the decision is valid for a defined clinical state and remains contingent on that state being maintained.

Table 2 translates these distinctions into a clinically interpretable form. It does not assign treatment thresholds; it separates what a residual finding may indicate from the additional observations required before that finding can influence orthodontic timing.

Table 2. Residual periodontal findings after therapy: interpretive meaning and implications for orthodontic timing

Residual finding	Plausible interpretation after therapy	Finding that strengthens concern	Finding that supports cautious compatibility with orthodontic planning	What the finding does not establish by itself
Residual increased probing depth	Persistent anatomical pocket, incomplete resolution, post-treatment morphology, or residual disease	Bleeding, suppuration, worsening depth, attachment loss, poor access for hygiene	Stable depth over time, absence of inflammatory signs, effective plaque control	Automatic contraindication or automatic readiness
Bleeding on probing at a residual site	Possible local inflammatory activity	Repeated bleeding at the same deep site, plaque accumulation, worsening attachment measures	Isolated or transient finding that resolves with improved local control and remains stable thereafter	A precise probability of future breakdown
Historical attachment loss with current shallow probing	Reduced periodontal support after previous disease	New attachment loss, increasing mobility, recurrent inflammation	Longitudinal stability, good maintenance, favourable planned movement	Restoration of normal periodontal support
Previously treated intrabony defect	Healed, repaired, or regenerated site with altered treatment history	Persistent deep bleeding pocket, unfavourable defect behaviour, incomplete healing	Stable periodontal measurements after appropriate healing and surveillance	Biological equivalence to an unaffected site

Furcation involvement	Anatomical maintenance challenge and potential site-specific vulnerability	Persistent inflammation, poor cleansability, progressive attachment change	Stable accessible furcation with effective maintenance	That all furcation-involved teeth have the same orthodontic prognosis
Residual mobility	Reduced support, occlusal loading, inflammation, or combined causes	Increasing mobility with inflammatory deterioration or functional instability	Stable mobility consistent with reduced support and controlled periodontal conditions	Active periodontitis without additional evidence
Multiple residual deep sites	Greater residual periodontal burden and possible higher future risk	Widespread bleeding, poor plaque control, progression, irregular maintenance	Stable non-inflamed residual anatomy under reliable supportive care	A universal numerical orthodontic exclusion threshold
Stable residual finding that later changes	Recurrence, altered plaque control, biomechanical stress, or other change in clinical state	New bleeding, depth increase, attachment change, symptoms, or declining adherence	Prompt reassessment with restoration of control before further progression of treatment	Permanent invalidity or permanent validity of the original readiness decision

Taken together, these findings support a disciplined separation between residual anatomy, residual inflammation, and residual prognostic risk. Those categories overlap but are not synonymous. Residual anatomy may be compatible with orthodontic treatment when inflammation is controlled and maintenance is reliable. Residual inflammation may require additional periodontal management even when generalized treatment results are satisfactory. Residual prognostic risk may justify closer surveillance or modification of the orthodontic plan without necessarily precluding treatment.

This interpretive step is essential before biomechanics are considered. Without it, orthodontic planning risks beginning from either an excessively permissive assumption that successful periodontal treatment has neutralized all future risk, or an excessively restrictive assumption that any residual abnormality makes movement unsafe. A defensible readiness assessment must instead establish which residual findings are stable consequences of previous disease, which remain unresolved, and which require their significance to be tested through continued observation or further periodontal intervention before orthodontic forces are applied.

A multidimensional orthodontic readiness framework

Once periodontal stability and residual findings have been interpreted, the clinical question changes from whether periodontal treatment has been completed to whether the proposed orthodontic movement is admissible in the specific treated periodontium. Evidence synthesized across treated periodontitis populations indicates that orthodontic therapy can be undertaken successfully in appropriately selected patients, but outcomes are heterogeneous and the available studies do not justify a universal declaration that orthodontic movement is harmless in every reduced periodontium [19]. Readiness must therefore be movement-specific, tooth-specific, and conditional on continued disease control.

Patients with pathological tooth migration illustrate this principle particularly clearly. Combined periodontal and orthodontic treatment may improve tooth position and selected periodontal measures, but the available evidence is heterogeneous and frequently of limited quality [20]. These findings support feasibility rather than a therapeutic claim that orthodontic movement reverses periodontal disease. The periodontal contribution remains disease control; the orthodontic contribution is correction of migration, spacing, inclination, or functional relationships once the biological environment permits movement.

The same caution applies to teeth with intrabony defects, furcation involvement, or complex positional problems. Evidence concerning orthodontic treatment of tilted molars and teeth with periodontal defects suggests that combined treatment can be useful in selected stage IV cases, but applicability depends on defect type, periodontal management, movement direction, and treatment sequence [21]. A tooth should therefore not be considered orthodontically ready merely because its periodontal measurements have improved. The intended movement itself must be assessed against the quantity and distribution of remaining support.

Clinical experience with regenerative periodontal treatment demonstrates why timing cannot be reduced

to a fixed waiting interval. Cohort evidence shows that orthodontic movement after regenerative periodontal surgery can coexist with substantial periodontal improvement in carefully treated patients [22]. Randomized evidence has further examined different timings of orthodontic initiation after regenerative treatment, confirming that timing can be studied as a biological and clinical variable rather than assumed from convention [23]. Long-term follow-up of selected patients has also shown that favourable periodontal conditions can persist years after combined regenerative and orthodontic management [24]. These findings are reassuring, but they apply most directly to defined regenerative-treatment contexts and should not be generalized into a single waiting period for all post-periodontal patients.

Reduced periodontal support additionally changes the mechanical environment in which orthodontic forces act. Systematic evidence on orthodontic treatment in periodontally compromised patients supports the need for modified planning, careful force control, and close periodontal supervision, while also emphasizing the limited quality and heterogeneity of the underlying evidence [25]. Contemporary clinical recommendations similarly emphasize control of inflammation before movement, cautious biomechanics, appropriate anchorage, and continuing periodontal maintenance [26]. These principles provide direction without supplying a universally validated numerical force prescription.

The reason for such caution is not solely periodontal. Orthodontically induced inflammatory root resorption represents an additional movement-related constraint. An overview of systematic reviews found associations between root resorption and several treatment-related variables, including aspects of force application and the extent or duration of movement, while also identifying substantial uncertainty in the evidence [27]. The implication for a reduced periodontium is that clinicians should avoid assuming that periodontal stability eliminates other tissue-specific risks.

The gingival phenotype and mucogingival environment also influence readiness. A systematic review of gingival recession after orthodontic treatment found heterogeneous evidence across patient, periodontal, and movement-related factors [28]. Baseline recession, thin tissues, reduced alveolar housing, and movement toward anatomical limits may therefore influence treatment planning even when periodontitis itself is well controlled. These factors are best interpreted as risk modifiers rather than deterministic predictors.

Plaque and gingival inflammation must remain under surveillance after appliances are placed. Adjunctive chlorhexidine use has been investigated as a means of supporting periodontal health during fixed-appliance therapy, but adjunctive antimicrobial strategies cannot substitute for effective plaque control and periodontal maintenance [29]. The biological distinction is important because orthodontic tooth movement itself is an inflammatory-remodelling process. Osteoimmunological pathways involved in periodontal disease overlap with those involved in force-induced bone remodelling, yet pathological infection-associated inflammation and controlled sterile orthodontic inflammation are not equivalent states [30]. Their overlap creates a reason for surveillance, not a reason to regard all inflammation during orthodontics as disease recurrence.

Experimental evidence also suggests a plausible connection between excessive mechanical stress and adverse tissue responses. NLRP3-related periodontal ligament cell pyroptosis has been implicated in experimental models of orthodontically induced root resorption [31]. Such findings strengthen the biological rationale for avoiding excessive or poorly controlled loading, but they do not provide a validated human force threshold. Translating a molecular pathway directly into a clinical cutoff would exceed the evidence.

Orthodontic readiness can therefore be conceptualized across four interacting dimensions: periodontal stability, biomechanical admissibility, patient maintenance capacity, and surveillance feasibility. Failure in one domain may not always prohibit treatment, but it should change the decision. A patient with excellent inflammatory control but unreliable maintenance may require delay. A patient with reliable maintenance but an unfavourable movement through reduced or fragile tissues may require modification of mechanics. A patient with stable periodontal findings and acceptable biomechanics but no realistic pathway for interdisciplinary reassessment may likewise be insufficiently prepared for treatment.

Table 3 organizes these dimensions around the practical decisions that precede and accompany orthodontic treatment.

Table 3. Readiness domains, treatment responsibilities, and conditions requiring modification during orthodontic care after periodontal therapy

Readiness domain	Evidence that supports proceeding	Responsibility before movement	Responsibility during orthodontic treatment	Finding that should trigger modification or reassessment
Periodontal inflammatory control	Stable periodontal measurements with low inflammatory burden and manageable residual sites	Confirm disease control and resolve sites requiring further periodontal therapy	Repeat periodontal surveillance and maintain supportive care	Recurrent bleeding at deep sites, suppuration, attachment deterioration, or increasing pocket depth
Residual anatomical findings	Residual pockets or reduced support that are stable and clinically interpretable	Document anatomy, previous treatment, and site-specific risk	Compare subsequent measurements with the established post-treatment baseline	Change in a previously stable residual finding
Planned orthodontic movement	Movement compatible with remaining periodontal support and tissue boundaries	Define movement objective, direction, anchorage needs, and anticipated tissue loading	Adapt mechanics if tissue response or periodontal condition changes	New mobility, recession, root-resorption concern, or deteriorating periodontal measurements
Patient plaque-control capacity	Reproducible self-care and attendance before appliance placement	Confirm that hygiene can be maintained under planned appliance conditions	Reinforce and reassess plaque control throughout treatment	Persistent plaque accumulation or inflammatory deterioration despite intervention
Modifiable systemic and behavioural risk	Risk factors reasonably controlled within the patient's clinical context	Identify smoking, metabolic, behavioural, and adherence concerns	Reassess changes that could undermine periodontal stability	Loss of risk-factor control or reduced adherence
Maintenance infrastructure	Reliable access to supportive periodontal care and communication between clinicians	Establish review pathway and responsible clinicians	Coordinate periodontal and orthodontic appointments when clinically needed	Missed maintenance, unclear responsibility, or delayed communication about deterioration
Treatment tolerance over time	Stable biological and clinical response after movement begins	Establish baseline periodontal and orthodontic records	Compare serial findings rather than relying on a one-time clearance decision	Evidence that the assumptions supporting initial readiness are no longer valid

Shared responsibility across clinical disciplines

A multidimensional readiness decision cannot be implemented safely if responsibility becomes ambiguous after referral. The end of active periodontal treatment should therefore not function as a permanent transfer of risk from the periodontist to the orthodontist. The two disciplines address different but overlapping dimensions of the same treated dentition. Periodontal expertise is required to interpret recurrence, residual pockets, attachment changes, mobility, mucogingival concerns, and maintenance response; orthodontic expertise is required to judge the consequences of force systems, anchorage, movement direction, and treatment sequencing. Neither perspective is sufficient by itself in complex reduced-periodontium cases.

The limited evidence concerning splinting and occlusal adjustment in periodontitis illustrates why explicit allocation of responsibility is preferable to routine protocolization. Systematic review evidence does not support indiscriminate use of these interventions for every mobile or functionally compromised tooth [32]. Decisions must instead be linked to the cause of mobility, functional demand, periodontal stability, planned tooth movement, and the role of temporary stabilization within the broader treatment plan.

Shared responsibility should therefore operate through defined decision ownership rather than vague co-management. Before orthodontic treatment, the periodontal clinician should establish whether active disease has been adequately controlled and identify sites that require further treatment or special surveillance. The orthodontic clinician should specify the intended movements and whether those movements alter risk at the identified sites. During treatment, both disciplines should retain authority to question the assumptions supporting the original readiness decision. A periodontal deterioration that changes the biological

conditions of treatment should be able to trigger modification or temporary interruption of orthodontic mechanics; conversely, an orthodontic movement that creates new tissue concerns should prompt periodontal reassessment rather than being managed as an isolated mechanical event.

These responsibilities do not require identical appointments or duplicated examinations. They require a shared clinical model in which the relevant information is transferred, interpreted, and acted upon by the clinician best positioned to do so. The practical objective is to avoid two opposite failures: periodontal "clearance" that is treated as permanent despite later deterioration, and repeated referral in which neither discipline accepts responsibility for deciding whether movement should continue.

The integrated relationships developed across the preceding sections are consolidated in **Figure 1**. The figure treats readiness as a bounded clinical state produced by concordance among periodontal stability, interpretation of residual findings, movement-specific admissibility, patient maintenance capacity, and accountable interdisciplinary surveillance.

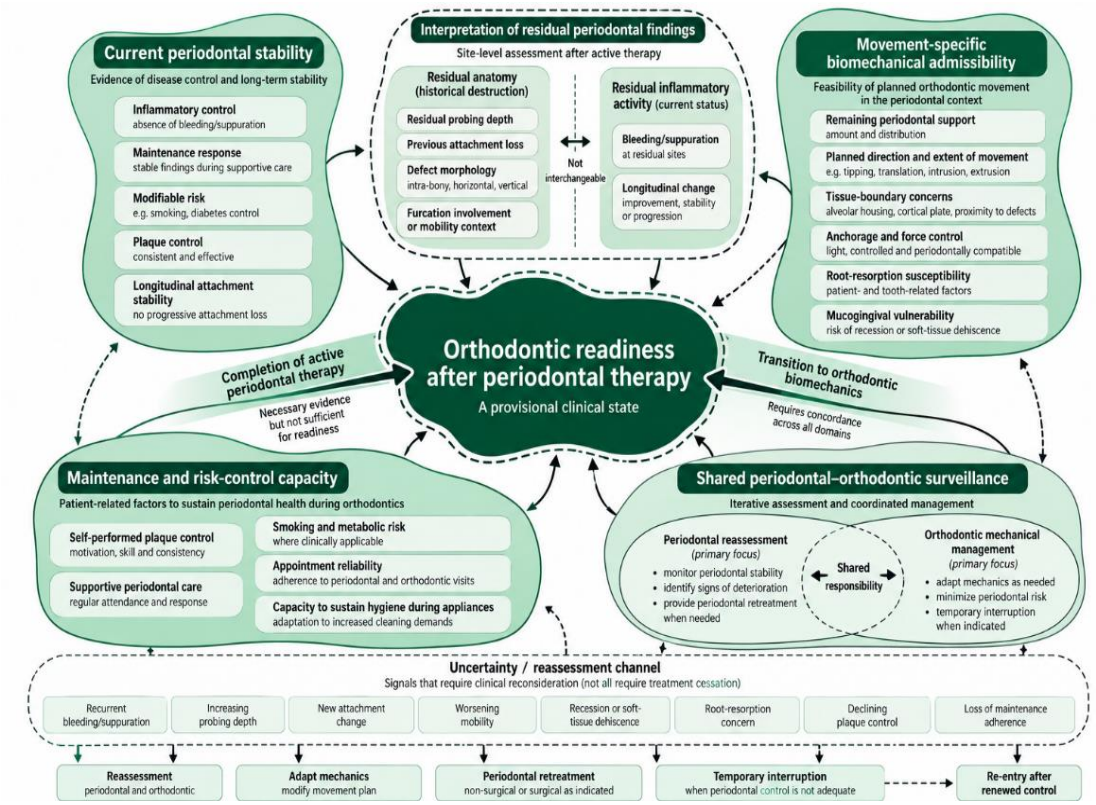


Figure 1. Orthodontic readiness as a provisional clinical state within a treated reduced periodontium

Uncertainty, reassessment, and clinical implementation

The practical value of a readiness framework depends on acknowledging that the decision can become outdated. Long-term periodontal evidence demonstrates that treated patients can experience recurrence or progression despite previous clinical improvement [18]. Orthodontic readiness should therefore be documented as a judgment made under defined conditions, not as a permanent attribute of the patient.

This temporal perspective is particularly important because some risks emerge only after movement begins. Root-resorption susceptibility, mucogingival change, deteriorating plaque control, new mobility, and recurrent periodontal inflammation may become clinically relevant after the initial decision to proceed. The appropriate response is not predetermined by the framework. Depending on severity and cause, the finding may justify closer observation, altered mechanics, additional periodontal therapy, temporary interruption, or revision of the treatment objective.

Mechanistic information can contribute to reassessment but should not displace clinical evidence. Experimental data concerning force-related periodontal ligament responses and root resorption help explain why excessive loading may be undesirable [31], yet they do not provide a validated chairside threshold. Similarly, longitudinal microbiome investigation after periodontal treatment demonstrates that subgingival communities can change after instrumentation and that biological changes do not map

perfectly onto clinical outcomes [33]. Molecular or microbiological findings should therefore support interpretation where validated, rather than becoming surrogate clearance tests.

Clinical monitoring remains the decisive implementation mechanism. Supportive periodontal care studies confirm that structured maintenance can sustain favourable periodontal conditions, although individual protocols and instrumentation strategies should not be treated as universally superior [34]. The implication for combined periodontal–orthodontic treatment is that reassessment should be built into care from the outset. The periodontal baseline established before orthodontics provides the reference against which subsequent changes can be interpreted.

A clinically useful reassessment should ask whether the assumptions that justified treatment initiation still hold. Is inflammation still controlled? Are residual pockets behaving as expected? Has attachment remained stable? Can the patient still maintain adequate plaque control with appliances? Has the planned movement changed? Have mobility, recession, or other tissue findings altered the risk profile? Is communication between clinicians sufficient for a timely response? These questions are more defensible than applying a universal recall interval or a fixed numerical interruption threshold unsupported by evidence.

Implementation also requires accepting that a temporary pause is not necessarily treatment failure. If the periodontal state deteriorates, interruption of orthodontic mechanics can represent appropriate risk control while the underlying cause is clarified. Treatment can subsequently be reconsidered after renewed periodontal control if the clinical conditions again support movement. Conversely, repeated deterioration despite appropriate periodontal management may indicate that the original orthodontic objective should be modified or abandoned.

The resulting decision process is intentionally conservative without being prohibitive. Periodontitis history does not automatically exclude orthodontic treatment, and residual anatomical abnormalities do not necessarily signify active disease. At the same time, the absence of overt inflammation at one visit cannot guarantee continued stability. The most defensible clinical position lies between these extremes: proceed when multiple dimensions support readiness, monitor the conditions on which that decision depended, and revise treatment when those conditions change.

Conclusion

Readiness for orthodontic treatment after periodontal therapy should not be defined by the completion of active periodontal treatment, a single probing-depth threshold, or the passage of a predetermined waiting period. It is a provisional clinical state that depends on concordance among inflammatory control, interpretation of residual periodontal findings, movement-specific biomechanical admissibility, patient capacity for maintenance, and reliable interdisciplinary surveillance.

Residual pockets and previous attachment loss remain clinically meaningful, but their significance must be interpreted according to inflammatory activity, anatomy, treatment history, longitudinal behaviour, and the movement being considered. A reduced yet stable periodontium may be compatible with orthodontic treatment, whereas apparently favourable measurements may be insufficient when adherence, local disease control, biomechanical conditions, or follow-up arrangements are inadequate. Shared responsibility between periodontal and orthodontic clinicians therefore continues after treatment initiation, because readiness can strengthen, weaken, or be lost as biological and mechanical conditions change. The defensible objective is not permanent periodontal "clearance," but a continuously reassessed basis for proceeding, modifying, pausing, or discontinuing orthodontic treatment.

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