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The orthodontic retention period is often treated with lesser importance; however, it is in this concluding presentation emphasized as a phase of great importance to ensure long-term success. Recommendations are presented, the present status reflected on and a brief look provided into the future with possible additional management options to the continual changes observed in our occlusions. (Semin Orthod 2017; 23:249–252.) © 2017 Elsevier Inc. All rights reserved.

If anyone would take my cases when they are finished, retain them and be responsible afterward, I would gladly give them half the fee.—Hawley (1919)¹

This Edition on Retention of Seminars in Orthodontics hopefully will provoke significant discussion as the topic of retention is addressed during seminar discussions where the students of orthodontics gather to ensure that this topic continues to develop, more research be contemplated or conducted and clinical expertise shared.

The goal was to provide an overview of the retention phase of treatment and how it should be managed to ultimately obtain some form of stability of the dentition. There is ample evidence to show that there will be continual changes taking place over time. Long-term change and retention is thus a fact of life, a biological occurrence and it is natural to expect patients to return to a practice with the request to perform some revision due to changes that may have occurred as a result of no retention, a retention regimen being stopped too soon or no compliance to the retention protocol following treatment.

However, to some patients, a very minor change impacts on their quality of life. An example of this long-term maintenance can be seen in the following revision case (Fig.).

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Clinical treatment recommendations on the way to successful retention

The degree of dental arch changes such as arch length reduction, constriction, and resultant crowding is quite variable and unpredictable, but it occurs longitudinally in both treated and untreated malocclusions; a normal physiologic process. The final result of these changes is often expressed more specifically in the mandibular arch; most often as irregularity in tooth alignment. An orthodontic philosophy or technique equipped to deal with this phenomenon and ultimately be conducive to stability should *not* include only brackets and wires! Moreover, it should include the followings:

- (1) A complete orthodontic system that is focused on
 - a. diagnosis and
 - b. a detailed treatment plan.
- (2) It must obey the laws of nature, which provide a limit or border for our treatment.
- (3) Treat to ideal standards; utilize the contemporary clinical and radiological parameters to obtain the best possible occlusion, oral health and function.
- (4) Maintain lower arch dimensions whenever possible; consider enlargement only if a narrow arch width with lingually tipped teeth are due to a treatable etiologic factor, if mandated by facial profile concerns or to harmonize the occlusion with maxillary palatal expansion for crossbite correction.
- (5) Use the patient's pretreatment archform as a guide for the future treated arch shape.
- (6) Retain the archform long-term and continue to monitor patient response into and throughout adult life.



Figure. An example of long-term maintenance; revision or a Phase 3 where no retention was in place following treatment. (A) An adult patient consults the author with a request to align the irregular lower incisors that seem to have changed and is now causing an irritation to her tongue. The occlusion presents in a stable Class I relationship with accompanying soft tissue health and harmony; in general, the average adult patient with good occlusion and acceptable long-term physiologic stability. The research data showed that this is an acceptable long-term change; however, our commitment to excellence is long-term care. Hence, evaluation of the occlusion and determination of a concomitant treatment plan is recommended. (B) An evaluation of the morphology of the teeth showed the followings: (1) Minor irregularity of the lower central incisors. (2) Maxillary incisors show enlarged lingual mesial and distal ridges. (3) Upper palatal irregularity and especially the mesial and distal ridges match lower incisor irregularly, in particular the buccal irregularity. (4) A Bolton tooth size discrepancy² exists with the mandibular anterior segment (canine–canine) fractionally larger compared to the maxillary anterior segment. (5) The Little Irregularity Index³ measures a clinically very acceptable long-term result. (6) The treatment plan for this revision or phase 3 was set to (a) focus on revision of the alignment and adjustment of the maxillary incisor palatal anatomy, (b) lower interproximal enamel reduction to correct the Bolton discrepancy, and (c) clear aligner treatment (Invisalign, CA) to provide alignment of the teeth. (C) The end of successful treatment following uncomplicated clear aligner treatment (Invisalign). Note the corrected incisor palatal anatomy attained through enameloplasty that allows the establishment of an ideal upper palatal to lower incisor relationship. This is a showcase of successful long-term orthodontic care within the realm of physiologic stability. Note the difference in interincisor occlusion between (B) and (C). Clear retainer options as discussed instigated. (Adapted with permission from Rossouw.⁴).

- (7) Obtain the highest quality pretreatment records to ensure proper diagnosis and treatment planning; moreover, also pursue quality posttreatment records and continue to use them to assess patient progress and more importantly, evaluate personal clinician growth in the establishment of better treatment, enhanced retention, and ultimately stability.
- (8) Consider a Phase 3 of long-term care or maintenance to ensure physiologic stability.
- (9) Patients have the reasonable expectation that their well-aligned teeth following treatment will be maintained. Since change, to a minor or a major degree, will occur in both treated and untreated cases, orthodontists need to ensure that patients are well informed of these changes.
- (10) Long-term care with or without retention, which allows for maturational changes; thus a management phase to evaluate these changes and incorporate the needed refinements in the retainers where applicable.
- (11) Relapse should be reserved for poor treatment or lack of adequate cooperation during treatment and also following treatment in the retention phase.
- (12) Revision thus may be needed due to longitudinal physiologic changes. Patients can choose the removable or fixed retainers to provide artificial stability or enhance this by a management phase where corrections are maintained with or without retention as another phase of treatment or dental care. Patients thus can elect to continue to see the orthodontist indefinitely if they so wish. Consider this in the same manner as patients consulting their general practitioner for a prophylaxis.

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