

TELEORTHODONTICS AND CLEAR ALIGNER TREATMENT: AN AMERICAN ASSOCIATION OF TELEDENTISTRY POSITION PAPER

Introduction

A significant disparity exists between the economically advantaged and disadvantaged population's access to orthodontic care in the United States. From 2006 to 2015, Medicaid expenditures and reimbursements have decreased.¹ This has led to many orthodontists not accepting patients from this social program. Orthodontic care continues to be rationed in state Medicaid programs through the use of arbitrary scoring indexes which favor treatment of more complex conditions. Orthodontic treatment that is deemed not "medically necessary" is not approved. Many of the indices used to determine orthodontic need do not consider the esthetic component of poorly aligned teeth. This is in spite of the 2017 World Health Organization's definition of oral health which includes being free of diseases or disorders that impact an individual's ability to smile and their psychosocial wellbeing.²

The access to care crisis in orthodontics for patients who desire limited tooth straightening continues when they age out of the Medicaid program. A national orthodontic practice study found that the average cost of adult orthodontics was \$5963 in 2015, an increase of nearly \$1000 from a decade before.³ The American Association of Orthodontists released a white paper on access to orthodontic care in 2006 acknowledging that the cost of orthodontic care is a major barrier.⁴ The proposed stop gap solution was to encourage more of their members to donate free orthodontic services to the less advantaged. Eleven years later there has not been a more robust and sustainable solution offered by AAO.

Technologic advancements in the delivery of clinical orthodontic care have lowered practice overhead, shortened treatment time, and placed less of a burden on the orthodontist. Most orthodontic practices can see far more patients per day than ever before. However, in a recent survey of orthodontists no participant was "too busy" to treat all persons requesting appointments.³ Two leading factors that have created excess capacity in the contemporary orthodontic delivery model are cost of treatment and the burden of time away from work or other activities for the patient.

There is ample evidence in the scientific literature that confirms the efficacy of teledentistry and how it increases access to care for the patient.^{5,6,7} The new teleorthodontic delivery model of clear aligner treatment has the potential to bridge the gap in the access to care divide. Patients who for many different reasons had been previously denied access to orthodontic care, now have a viable option for addressing front tooth alignment issues and improvement in their social

smile. The American Teledentistry Association has been asked by clinicians and industry experts in the field to research and assess this new orthodontic delivery model. The following position paper summarizes the Association's findings and recommendations.

Teleorthodontics and Clear Aligner Treatment

BACKGROUND

Telemedicine has been employed in various forms for over two decades. Low acuity (non-serious health problem) patients have been successfully treated for such medical conditions as sinusitis and urinary tract infections (UTI). A study found that the fraction of patients with any follow up for sinusitis or UTI's was the same between eVisits and office visits.⁸ This measure is a very good proxy for misdiagnosis or treatment failure. Teledentistry has also been shown to be very safe and effective for low acuity dental patients. A systematic review examined the accuracy of detecting tooth decay from photographs versus direct visual inspection of the patient and found comparable results between both modalities.⁹ The accuracy of direct examination versus teledental examination in the diagnosis of dental pathology in older adults in nursing homes, a higher acuity group of patients, was investigated. It was found that teledentistry exams had excellent diagnostic accuracy and were much quicker than face-to-face exams (12 minutes versus 20 minutes).^{10,11} A randomized controlled trial evaluating teledentistry for screening new patient orthodontic referrals found that teledentistry was a valid system for positively identifying appropriate new patient orthodontic referrals.¹²

RISKS OF TREATMENT VIA TELEORTHODONTICS USING CLEAR ALIGNERS

The goal of teleorthodontic clear aligner treatment is to achieve limited tooth straightening for the patient and not a comprehensive remake of the patient's bite. In-office clear aligner treatment by virtue of its design features such as glued on tooth attachments can move teeth more extensively and can be programmed to significantly change the bite. What this translates to is usually a longer duration of treatment and possibly greater amounts of force with in-office clear aligner treatment. Traditional risks of orthodontic treatment like gum problems, tooth decay, and root shortening will all increase the longer the patient is in treatment and the extent to which forces are applied. All studies to date have looked at in-office orthodontic treatment with clear aligners. It has been shown that clear aligners have less risk in the area of gum health than traditional braces.¹³ There is currently no study that has evaluated the incidence of dental decay in orthodontic treatment with aligners versus traditional braces. A recent study documented the incidence of root shortening during in-office clear aligner treatment as being similar to that described in treatment with light orthodontic forces with the average change in root length being less than 10% of the original.¹⁴ By and large, clear aligner treatment appears to present less treatment risk than traditional braces.

ORTHODONTIC DIAGNOSIS AND TELEORTHODONTICS

In orthodontics, the traditional diagnostic record set consists of notes from an in-person clinical examination, photographs of the teeth and face, x-rays, and models of the teeth. Clinical practice guidelines approved by the American Association of Orthodontists in 2017 discuss the taking of records for orthodontic patients.¹⁵ In this document, they state “deviations from these guidelines may be appropriate based on professional judgment and individual patient needs and preferences.” The guidelines further state that when “limited orthodontic procedures are anticipated, diagnostic records may vary from those associated with comprehensive care.” The British Orthodontic Society published guidelines for the use of radiographs in clinical orthodontics. In it, they assert that there is no indication for taking radiographs before a clinical examination when only minimal tooth movement is planned.¹⁶ A systematic review affirmed that the minimum record set required for orthodontic diagnosis and treatment planning could not be defined.¹⁷ The record set utilized in doctor-directed at home clear aligner treatment includes a patient’s medical/dental history, photographs of the teeth and face, and virtual models of the teeth. There is no evidence in the professional literature that this record set fails to satisfy the current standard for limited orthodontic care.

BARRIERS TO TELEORTHODONTIC TREATMENT

There has been a great deal of confusion about the definition of teleorthodontics which has unfortunately negatively influenced orthodontists, state dental boards, and the lay public.¹⁸ Teleorthodontics is the delivery of health information and orthodontic care across distances using information technology and telecommunications. Teleorthodontics encompasses diagnosis, treatment, monitoring and prevention, continuing education of providers and consumers, and research. Do-it-yourself orthodontics has been used synonymously with teleorthodontics.¹⁹ When in fact, do-it-yourself orthodontics refers to a patient’s self-directed efforts to move teeth **without** the supervision of a doctor.

CONCLUSION

A thorough review and analysis of teleorthodontic clear aligner treatment facilitated by teleorthodontics has been conducted by the American Teledentistry Association. The following position statements are a result of this effort.

ATDA POSITION STATEMENTS

- 1. ATDA supports teleorthodontic clear aligner treatment and views it as a low-risk, effective method of orthodontic delivery that increases access to care and reduces costs for the patient.*
- 2. ATDA believes that a valid patient–doctor relationship should be established for a professionally responsible teleorthodontic service to take place. A teleorthodontic encounter itself **can** establish a patient–doctor relationship using either real-time or asynchronous teleorthodontics.*
- 3. ATDA believes that dentists should use their professional judgment about whether the use of teleorthodontics is appropriate for a patient. Dentists should not compromise their ethical obligation to deliver clinically appropriate care for the sake of new technology adoption.*
- 4. ATDA recommends that dentists ensure that their use of teleorthodontics is secure and compliant with federal and state security and privacy regulations.*
- 5. ATDA supports ongoing research to develop new teleorthodontic technologies.*
- 6. ATDA believes that dental benefit plans and other third-party payers, public and private, should cover teleorthodontic services at the same level as if the services were delivered in a traditional in-person encounter.*

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