

# Is an in-person exam really required for teledentistry?

Here is a review of what the **clinical studies** indicate.

**Teleorthodontic treatment with clear aligners is clinically effective** in the correction of maxillary and mandibular incisor alignment problems.<sup>1</sup>

This systematic review identified a substantial amount of scientific literature in the relatively new area of teledentistry ... **there is a consistent trend supporting the efficacy and effectiveness of teledentistry.** Teledentistry seems to be a promising path for access to care in rural and urban settings.<sup>2</sup>

Teledentistry has the potential to be part of a paradigm shift in healthcare delivery that can play a key role in mitigating barriers and improving health for populations with traditionally poor access to dental care and oral health services. **The Association of State and Territorial Dental Directors supports the development of teledentistry** as an approach to enhance the delivery of efficient and cost-effective oral health care, allowing providers to overcome traditional barriers to care faced by underserved communities.<sup>3</sup>

**Teledentistry could be comparable to face-to-face** for oral screening. Identification of oral diseases, referrals, and teleconsultations are possible and valid.<sup>4</sup>

[The] use of monitoring software **can be reliable for making clinical decisions.**<sup>5</sup>

We can conclude that apical root resorption during and after the orthodontic treatment with clear aligners is not unavoidable. But both incidence and severity of ARR **are lower after clear aligner therapy** compared with ARR results with fixed orthodontic treatment.<sup>6</sup>

Remote diagnosis using transmitted photographic images of **dentition (teledentistry) may be an alternative to visual inspection.** Three studies found image analysis **to be superior to visual inspection.**<sup>7</sup>

Clear aligners showed **improved periodontal status indices** when compared to fixed orthodontics. Our results showed increases in supragingival plaque, higher number of probing depths greater

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<sup>1</sup> Marc B. Ackerman, *Teleorthodontic treatment with clear aligners: An analysis of outcome in treatment supervised by general practitioners versus orthodontic specialists*, Journal of Dental Research and Reports, 2019, Vol. 2 1-4.

<sup>2</sup> Susan J. Daniel, RDH, PhD; Lin Wu, MLIS, AHIP; Sajeesh Kumar, PhD, *Teledentistry: A Systematic Review of Clinical Outcomes, Utilization and Costs*, The Journal of Dental Hygiene, Vol. 87, No. 6. December 2013

<sup>3</sup> ASTDD, *Teledentistry: How Technology Can Facilitate Access To Care*, March 2019.

<sup>4</sup> Jafar H. Alabdullah and Susan J. Daniel, *A Systematic Review on the Validity of Teledentistry*, Telemedicine and e-Health VOL. 24, NO. 8, 2018.

<sup>5</sup> Heather B. Moylan; Caroline K. Carrico; Steven J. Lindauer; Eser Tufek, *Accuracy of a smartphone-based orthodontic treatment-monitoring application: A pilot study*, Angle Orthod., Epub 2019 Mar 19.

<sup>6</sup> Ugne Sadauskiene, *Orthodontic treatment with clear aligners and apical root resorption*, Journal of Medical Sciences, Vol. 8 Issu. 14 (2020)

<sup>7</sup> Inês Meurer M, Caffery LJ, Bradford NK, Smith AC., *Accuracy of dental images for the diagnosis of dental caries and enamel defects in children and adolescents: A systematic review*, J Telemed Telecare. 2015;21(8):449-458.

than 3mm, higher number of bleeding sites on probing, and a higher amount of gingival recession in the subject treated **with fixed orthodontics**.<sup>8</sup>

**Clinical factors are detectable from electronically transferred clinical photographs only**, particularly, since the use of full records has not been shown to make large differences to clinical decision making. Clinician agreement, for screening and accepting orthodontic referrals based on clinical photographs, **is comparable to that previously reported for other clinical decision making (such as in-person exam)**.<sup>9</sup>

For most dental applications, the **store-and-forward method provides excellent results** without excessive costs. [T]he purpose of the study was to test the validity of diagnoses made in the absence of modern dental facilities. **Mobile phone teledentistry offers acceptable reliability for the initial diagnosis**.<sup>10</sup>

Outcomes for treatment of mild malocclusions in adolescents (teenagers) showed **equivalent effectiveness of clear aligners** compared to fixed appliances, with **significantly improved results** for clear aligner treatment in terms of tooth alignment, occlusal relations, and overjet.<sup>11</sup>

**Teledentistry had excellent sensitivity (93.8%) and specificity (94.2%) for diagnosing dental pathologies [when compared to] using face-to-face examination as a gold standard**. Teledentistry was **not associated with any serious adverse events**, and the acceptability rate (95.3%) among residents and their families was excellent. **Teledentistry has excellent accuracy for diagnosing dental pathologies**, and good accuracy for assessing the rehabilitation of dental prostheses and chewing ability.<sup>12</sup>

Teledentistry is a valid system **for positively identifying appropriate new patient orthodontic referrals**.<sup>13</sup>

There is a consistent trend in the literature **supporting the validity and reliability of teledentistry** applications in comparison to non-telemedicine alternatives. A growing body of **evidence supporting the efficacy of teledentistry** is provided by some of the studies on paediatric dentistry, oral medicine, **orthodontics** and periodontics. The majority of the research in these areas reported that **teledentistry had similar or better outcomes than the conventional alternative**.<sup>14</sup>

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<sup>8</sup> Mark Jones, *Comparison of Periodontium among Subjects Treated with Clear Aligners and Conventional Orthodontics*, Creighton University (2020).

<sup>9</sup> Mandall NA, Bearn D, Chadwick S, et al. *Are photographic records reliable for orthodontic screening?* J Orthod 2002; 29: 125–127.

<sup>10</sup> Mohammad Alshaya, *Reliability of mobile phone teledentistry in dental diagnosis and treatment planning in mixed dentition*, Journal of Telemedicine and Telecare 26(3) · August 2018.

<sup>11</sup> Borda et al, *Outcome assessment of orthodontic clear aligner vs fixed appliance treatment in a teenage population with mild malocclusions*, The EH Angle Education and Research Foundation, 2020

<sup>12</sup> Queyroux, Alain et al., *Accuracy of Teledentistry for Diagnosing Dental Pathology Using Direct Examination as a Gold Standard: Results of the Tel-e-dent Study of Older Adults Living in Nursing Homes*, Journal of the American Medical Directors Association, Volume 18, Issue 6, 528 – 532.

<sup>13</sup> Mandall NA, O'Brien KD, Brady J, Worthington HV, Harvey L. *Teledentistry for screening new patient orthodontic referrals. Part 1: A randomised controlled trial*. Br Dent J. 2005;199(10):659-653.

<sup>14</sup> Mohamed Estai, *A systematic review of the research evidence for the benefits of teledentistry*, Journal of Telemedicine and Telecare, 24(3):147-156 · April 2018