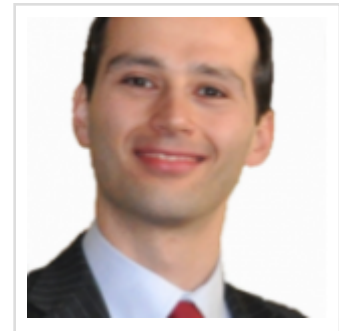


Smartphone-based orthodontic monitoring: the big brother in our patient's mouth

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Nowadays almost all of us have a smartphone and we use it hundreds of times during the day checking incoming e-mails, surfing through the web and sharing our thoughts and pictures online within our social communities. This is the “permanently online” era and our patients ask for immediate information supply and assistance request satisfaction.



Since sometime orthodontists have used text messaging apps like WeChat or WhatsApp to communicate with their patients, to remind them the next visit, to solve an emergency or replying to a late doubt, or even checking the oral hygiene status or the cooperation level with removable appliances. There is a growing evidence in the literature showing the efficacy of these “App based” monitoring protocols in ameliorating oral hygiene and reducing treatment duration, bracket bond failure, and failed or late attendance [1-2].

Commercial interest regarding patient monitoring has also increased progressively and nowadays there are few apps especially designed for this purpose. In all these systems the orthodontist has his own dashboard on reserved area in the company website that can be used to invite patients to download the app in their smartphones and to visualize their smile pictures.

SmileTracker™ (TP Orthodontics) also allows visualizing a time-lapse video, based on daily pictures taken by the patient during the monitoring, of the treatment progress. Furthermore this app has a rewards-based system in order to keep patients engaged throughout the monitoring and it also allows them to share their progresses through their own social profiles.

Dental Monitoring® allows patients to take smile pictures every 2 weeks in case of fixed orthodontic treatment or even every week for invisible aligners treatments. Doctors can also ask for a supplementary exam whenever they want, sending through their personal homepage a specific invitation that is forwarded by e-mail to the patient. This system requires doctors to send patient dental impressions before monitoring begins, because it utilizes a specific algorithm that allows calculating teeth movements based on pictures 3D matching and superimposition on the initial virtual models. For this reason patients are required to take 13 pictures for each exam from different angulations focusing on both single arches and on their position in occlusion. Three more

pictures are required for patients treated with invisible aligners, in order to check each single aligner fit. This system, apart from calculating through the algorithm tooth by tooth displacement as mesial/distal, intrusion/extrusion, retraction/advancement, rotation, inclination and angulation variations, provides pictures observation by an orthodontist that looks at oral hygiene level, aligners fitting, possible presence of teeth abrasion, decays or brackets failure, sending a warning to the treating orthodontist in case of any unexpected event.

Could these systems become important tools allowing us to improve our treatments efficiency and quality? Is it credible that “virtual” appointments could in some occasions substitute the traditional “physical” appointments? Will our patients be available to be continuously controlled by this orthodontic “big brother”?

It is hard to foresee the future. The possibility for patients, especially if they live far from the orthodontic office, to save time and money by reducing the number of visits having the same, or even a better, accuracy in treatment progress control, can be universally recognized as positive factors fostering the diffusion of these systems.

Are we ready for this further step forward along the digitalization path of our beloved orthodontic specialty?

1: Zotti F, Dalessandri D, Salgarello S, Piancino M, Bonetti S, Visconti L, Paganelli C. Usefulness of an app in improving oral hygiene compliance in adolescent orthodontic patients. *Angle Orthod.* 2016;86:101-7.

2: Li X, Xu ZR, Tang N, Ye C, Zhu XL, Zhou T, Zhao ZH. Effect of intervention using a messaging app on compliance and duration of treatment in orthodontic patients. *Clin Oral Investig.* 2015 Dec 2. [Epub ahead of print]

Domenico Dalessandri qualified in Dentistry from the University of Brescia, Italy, where he received specialty training in Orthodontics. He obtained his PhD from the University of Torino discussing a thesis entitled “Cone Beam Computed Tomography: accuracy and reliability”. He received a research fellowship in “CBCT applications in Orthodontics” by the University of Trieste. Currently he is Adjunct Assistant Professor at the University of Brescia.

He has additional clinical research interests in: indirect bonding; self-ligating braces; use of mini implants and miniscrews; lingual orthodontics; Invisalign; cleft lip and palate; impacted teeth; 3D technology and virtual treatment planning; CAD-CAM; corticotomy and piezocision.

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Gaetano Isola

on **March 11, 2016 at 12:34 pm** said:

I would like to compliment with the committee that published this interesting The purpose of this study was to develop a new orthodontic methodology. I think that these technologies represents an important challenge that should be keep in mind for the orthodontists. I hope for the future, further studies on this topic.