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THE EDITOR'S CORNER

Practicing by Smartphone

As I was walking across a crowded college campus the other day, I couldn't help but notice that almost every pedestrian, whether student or faculty, was staring into a smartphone. I had to chuckle when one student was so intent on her iPhone screen that she walked right into a No Parking sign. Although these phones are unquestionably a mainstay of modern life, I recently became so frustrated with the privacy violations that went along with owning a smartphone that I threw mine into the swimming pool. At my wife's insistence, I bought a more primitive flip phone that allowed me to stay in phone and text contact with the people I want to stay in contact with, without every retailer under the sun knowing where I am and what I'm doing. But when I mentioned the incident to an adult patient of mine, she gasped, "How can you live nowadays without a smartphone?"

In a feature story on the local evening news, a cardiologist at one of the nation's largest medical schools made a strong case that smartphone technology is revolutionizing medical-care delivery. He demonstrated an app that allowed him to monitor his own blood-glucose levels continuously without finger pricks, another app that kept him in constant contact with hospital-based vital-sign monitors for his patients, and still more apps that allowed him to access everything from patients' medical histories to their most recent lab values and diagnoses. When I was visiting my own doctor for a routine check-up, I asked a question about the pharmacodynamics and potential interactions of certain prescriptions I was on. He whipped out his iPhone, called up the Epocrates app, and had an answer in seconds. He winked at me and said, "Medical school in my hip pocket! Thirty years ago, I spent countless hours memorizing all of this stuff. Now it's all available in an app."

If physicians have achieved this level of smartphone technology, orthodontics can't be too far behind. As an example, in the current issue of JCO, Drs. Surendra Lodha, Siddharth Mehta, and Rajesh Agarwal present an effective way to demonstrate elastics placement using a smartphone. The assistant shows the patient how to apply

the elastics appropriately, then takes a picture of the configuration with the patient's own phone (or e-mails a picture taken by a digital camera in the office). It's easy to see that any and all post-procedure instructions from the orthodontist can be illustrated in this manner. I have even seen a headgear-timer app, designed by a senior orthodontic resident, that allows patients to monitor their own headgear wear while providing the practice with full records of their compliance.

Considering what's currently available in medicine, orthodontic applications will soon become much more sophisticated. It is not unrealistic to envision an app that records patient examination data, cephalometric parameters, and mal-occlusion characteristics for the development of a detailed treatment plan to be filed in a cloud-based patient record and accessed from virtually anywhere by the treating orthodontist or forwarded to the referring dentist, collaborating oral surgeon, or insurance company—all from the orthodontist's smartphone. Obviously, patient pri-

vacy and security will need to be ensured in this new cloud-based, mobile world of orthodontic practice.

As intraoral scanners become more advanced, I can envision smaller and smaller hand-pieces that will feed directly into an "impression app" on the doctor's smartphone. The data would then be uploaded to the cloud by means of an "e-model app". Interfacing with three-dimensional printers for customized bracket manufacturing based on prescription algorithms is a technology that already exists. The same holds true for robotic wire bending based on individual patient data. If the patient does not want braces, the information can already be fed directly to the manufacturer for the fabrication of aligners.

It won't be long before everything from record taking to diagnosis and treatment planning to appliance construction will be managed and coordinated from a smartphone that fits in the doctor's pocket. I already regret throwing mine into the pool.

RGK