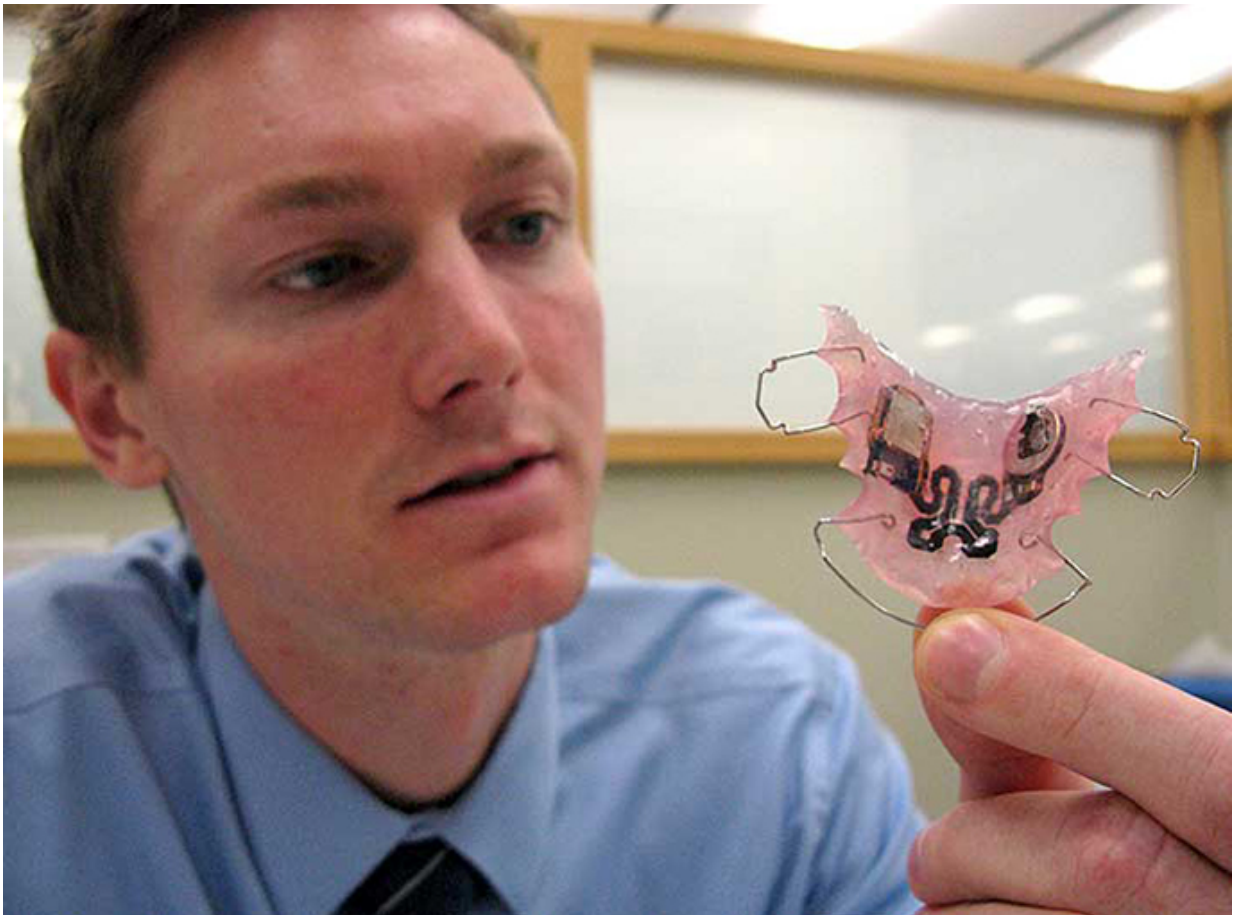


## 'Smart' retainer keeps patients (and teeth) in line

December 11 2015, by Bill Stein

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Eric Castle is one of several UC San Francisco dental and medical experts behind the Bluetooth-enabled SmartByte retainer, which is designed to improve patient usage. Credit: Al Lipske

Innovative research is underway at the UCSF School of Dentistry to produce a Bluetooth smart retainer for orthodontics patients. The goal of the SmartByte retainer is to increase the amount of time a patient wears the device, ultimately ensuring the best possible treatment outcome.

"Unfortunately, one of the frustrating aspects of orthodontics is that [patients](#) do not always wear their retainers as much as they should after their braces are removed," says Eric Castle, D.M.D., an orthodontic resident in the School of Dentistry. "This often leads to the teeth relapsing out of alignment, requiring retreatment with braces to correct." Generally, orthodontists agree that a retainer should be worn fulltime for a minimum of six months after braces have been removed.

A team comprised of Castle; Shuvo Roy, Ph.D. (School of Pharmacy and Medicine); Gerald Nelson, D.D.S.; Sneha Oberoi, D.D.S.; and Philip Chung, Ph.D. (UCSF Biodesign Laboratory) is creating a retainer that includes a Bluetooth chip, enabling orthodontists and parents to determine the amount of time someone is wearing their retainer. The retainer will be part of a package that includes a custom app for iOS, Android and Windows phones and tablets.

There have been several attempts to develop retainers that track usage in the last 10 years. However, the retainers currently on the market require the use of a docking station in the orthodontist's office, so unless patients make frequent visits to their orthodontist, there's no ability to intervene and help a noncompliant patient.

Patient compliance with retainers is a significant concern. Up to 70 percent of patients (and their parents) forget the necessity of wearing a retainer, while wear time is overestimated by a third of actual time. Forgetting to wear a retainer is a leading reason for poor compliance, along with discomfort, the hassle of wearing a device and speech difficulties.

The SmartByte retainer works through a sensor placed inside the retainer that can differentiate between body temperature and room temperature to determine if the device is being worn. The information then flows to the patient's mobile phone, a cloud database and ultimately to the orthodontist's computer server. An app that accompanies the retainer has the ability to incentivize patients with prizes and other rewards when they reach goals for retainer use.

The Smartbyte retainer currently is in the design stage. A small pilot trial is expected to start in the coming months, with a larger trial expected to begin in the next two years.

Provided by University of California, San Francisco

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