

TECHNOLOGY

INTEGRATION

The why, the how, and the now.

Implementation of Shade-Taking Devices in the Dental Office

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Technology is changing every day, and dental office technology is no exception, with advances in electronic equipment, software, and computers. Digital radiographs, digital cameras, practice management software, lasers, electric handpieces, and flat-screen monitors are just some of the many items dental offices have the opportunity to purchase. All of these advances in dental technology seem endless and there is a constant stream of new products coming to market. Before making an impulse purchase on any new technology, however, one first needs to sit down and determine what their practice needs in the way of technology.

One device that is an asset to any practice is an electronic shade-taking device (Figure 1). This type of technology offers minimal overhead expense, and a great indirect return on investment (ROI). The dental profession has been reasonably capable at matching the patient's dentition with shade guides. However, the simplification of daily office tasks, fewer remakes annually, and the freeing-up of the dentist's time that are made possible by an electronic shade-taking device are certainly huge advantages. The ability to delegate the shade-taking function can free the dentist to see other patients or concentrate on tasks that create more income for the practice. Additionally, the accuracy of these devices is better than what could be obtained with a traditional shade guide.¹

ACQUISITION

The implementation of shade-taking devices in the dental office involves many



Figure 1 Small, portable, self-contained shade-taking device (Easy Shade, Vident).

steps for it to be used efficiently and provide a benefit. The first step is to find a device that meets the practice's needs. Various systems are available with different options. Some things to consider when buying a shade-taking device are:

Size and portability. Shade-taking devices have gotten more compact and easier to use in recent years. A small, portable, stand-alone device is an advantage with the limited counter space in today's practices. A larger device requires time to set up the system, move it into an operator, and connect it to a computer. Similarly, if a device requires removing a media card that has to then be read by a computer, this will also limit the device's frequency of use. In the author's opinion, an ideal system would be wireless with a base unit for charging.

The type of measuring technology. The two main types of shade-taking devices are colorimeters, which rely on RGB calculations, and spectrophotometers, which measure the entire visible light spectrum to derive a shade.

The replication of results under any lighting condition. A system that can work the same regardless of lighting is mandatory because of the varying lighting conditions in the dental operator. To the human eye, teeth can appear as a different shade under various lighting conditions. To eliminate this problem, implement a shade-taking device. Check a system before purchasing to see if it can repeatedly

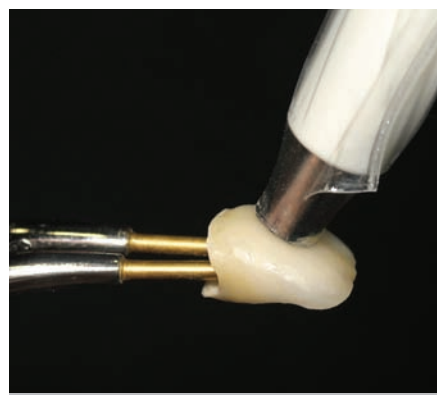


Figure 2 The device has the capability to measure restorations for accuracy in color.

take the same shade reading in complete darkness or sunlight, as well as incandescent and fluorescent lighting. If a device does not have repeatability under all lighting conditions, it will be impossible for the practitioner to ever know when the device is truly accurate.

The type of shade documentation. The system has to be able to be used on enamel and dentin so that the final shade and stump shade can be recorded for an all-ceramic restoration. Furthermore, it must possess the ability to measure ceramic restorations to verify the shade of a restoration coming from the laboratory technician (Figure 2). This allows for shade verification before the patient's appointment, so that if the shade is not correct an unnecessary appointment can be avoided. A device that has the ability to provide information regarding why the shade is incorrect can help the technician refabricate the restoration (Figure 3). The output for the shade needs to be in a form that is compatible with the shade guide used for the ceramic system (eg, TRUBYTE®, Bioform®, IPN®, by DENTSPLY International, York, PA; IPS Empress®, Ivoclar Vivadent, Amherst, NY; VITA® Classic, VITA Bleached-guide 3D-Master®, VITA Toothguide 3D-MASTER®, Vident, Brea, CA).

Ease of use. The device should be quick and easy to operate. The amount of time needed to turn the device on, calibrate, and take a shade reading should be just a few minutes.

The ability to upgrade. As most technology rapidly becomes obsolete, it is important that the technology can be easily upgraded.

INTEGRATION

After making a purchase of technology for the dental practice, integration is critical to achieving a successful ROI. Some things that will need to be implemented upon receiving the equipment are:

Employee training. A new piece of equipment requires that time be set aside when there are no interruptions or distractions for the entire staff to go over how the



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technology is to be operated and maintained. A few hours of time could be the deciding factor of whether the device will be used or not. Additionally, an untrained staff member using a piece of technology that they are unfamiliar with opens up the possibility of causing a very costly mistake if the device is mishandled or broken. After going over these items, each staff member should then have adequate time to actually practice using the equipment. The staff can only be competent at using the device after sufficient time has been given for training and hands-on exposure.

Placement of the technology in the office. The placement of a new piece of advanced dental equipment in the office is as important as the location of your practice and your name on the front door. If the new technology is placed in a corner where it is not seen or readily accessible, then it will not be implemented into the practice. Furthermore, there will not be any promotion of the device or enthusiasm from the patients or staff members because it is out of sight and, therefore, out of mind. Placement of the new technology is not only important for ease of use but also for marketing and promotion of the practice. The device needs to be centrally located in the office so that it is readily accessible to all staff members. The device should be used quickly and then returned back to its normal location so that it can be immediately used by someone else if needed. This will make sure that staff will not have to go into an operator and interrupt a procedure.

How and when it will be used. Use of the device now becomes important in the early stages of implementation. It needs to be used on numerous patients over a period of weeks for it to become a normal occurrence. It can be used by the hygienist to monitor the whiteness of his or her patients both before and after a cleaning. This can demonstrate the device's capabilities



Figure 3 Readout showing shade verification for value, chroma, and hue.



Figure 4 Numerous shade readings are available, along with different shade readouts.

as well as reinforce how a cleaning can help the whiteness of teeth. In addition, it can also demonstrate to some patients that a cleaning alone cannot whiten every patient's teeth. This is a perfect opportunity to inform the patient about a dentist-provided whitening system to lighten their discolored teeth. Dental assistants can implement the shade-taking device on every patient having restorative treatment. This can save a great deal of time for the dentist. When entering the operatory with the patient, the assistant can help the patient to get seated and then perform a shade analysis of the tooth to be worked on along with the adjacent and contralateral teeth for reference.

The shade-taking device could also be implemented while waiting for anesthesia to take effect, freeing up the dentist to check on another patient or complete other tasks. Even if the receptionist, treatment coordinator, or office manager are seating the patients, they too can use the shade-taking device to take a preoperative shade. They may also take the time to highlight the new technology in a discussion with the patient on its function and implementation.

The shade readout typically will give you a base shade for the entire restoration. The device also should be able to provide numerous readings if desired (Figure 4). Readings can be taken on different portions of the tooth structure, enabling the technician to have more information about the desired final product. Some devices have the ability to store the shade information directly into existing practice-management software as opposed to having to manually write it into the patient's chart or print it out. Some systems also provide a geographic map that shows where to place numerous different shades to create the final restoration, although a degree of caution is necessary:

although the minute detail seems very helpful it can be very overwhelming, difficult to duplicate, and even misleading.

Cleaning and maintenance. After using the shade-taking device, it is important to disinfect the unit to eliminate any risk of cross-contamination. A barrier system is advantageous and efficient but may still require the use of a disinfectant. Disinfectant sprays, if used overzealously, can potentially leak into an electronic device and cause premature failure or irreparable damage. Therefore, a disinfectant towel is more advantageous.

Internal and external marketing. Any new piece of equipment must be marketed both internally and externally. This is an opportunity to showcase the dental office and reinforce the patient's decision to come there. The shade-taking device offers numerous patient advantages that can be easily shared on the dental office's Web site, in a press release for newspapers, magazines, and local radio and television stations. Internal marketing could consist of fliers, signs, boards, newsletters to existing patients, on-hold telephone messages, or a mail insert that goes out with every piece of office mail.

CONCLUSION

Implementing a new piece of technology into the dental office can be very beneficial. The numerous systems available offer many options to allow practices the ability to customize the device for their needs. A shade-taking device properly implemented in the dental office is an asset that helps to decrease remakes of restorations, frees up the dentist to perform other tasks, boosts the appearance of the office through both direct and indirect marketing, and has an overall positive impact on pro-

duction and, therefore, annual profit for the office.

REFERENCE

1. Doric A, Cleveland CJ, El-Mohair A, et al. Performance of five commercially available tooth color measuring devices. *J Prosthodont.* 2007;16(2):93-100.

Table 1 : Shade-Taking Systems

CORPORATION	SYSTEM	CAPTURE DEVICE
Medical High Technologies (Arbizzano di Negrar, Italy)	SpectroShade™ Micro	Spectrophotometer
Vident (Brea, CA)	VITA Easyshade®	Spectrophotometer
X-Rite, Inc (Grand Rapids, MI)	ShadeVision™ System	Colorimeter
X-Rite	Shade-X™	Spectrophotometer