the same percentage of practices didn't use a lead or lead-equivalent apron.

In 63 dental practices, the dentist always or usually performed the CBCT reporting. No significant difference was found between the proportions of scans using larger or smaller FOVs that had the results conveyed by dentists. In addition, none of the respondents stated that only the dentist had enough information to report CBCT images and did so without additional training.

DISCUSSION

As more dental practices acquire CBCT scanners, more patients will be scanned. Concerns have been raised over the increased exposure to radiation, but this survey adds concerns over the sufficiency of the dentist's training to read CBCT scans, the appropriate use of CBCT scanners, the provision of sufficient shielding to patients being scanned, and the technical knowledge of those in the dental practices. This survey reported only a small number of patients actually being scanned, which raises the question of whether it is cost-effective to own a CBCT scanner.

Yalda FA, Holroyd J, Islam M, et al: Current practice in the use of cone beam computed tomography: A survey of UK dental practices. *Br Dent J* 226:115-124, 2019

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FIXED PROSTHODONTICS

Crown types

BACKGROUND

With the development of a wide range of different types of crowns it has become more difficult to select the correct one for a specific case. This has caused significant and frustrating confusion for dental laboratories as well as dentists. A brief list of categories of crowns currently in use was offered, with recommendations based on the available research and experience.

TYPES OF CROWNS

The Clinicians Report Foundation offers long-term in vivo research for most of the restorations listed, but there is always the possibility that more recent research will give different findings. The current clinical findings in terms of acceptability rank the crowns as follows: cast gold alloy; porcelain fused to metal (PFM); full-strength zirconia (includes 3Y zirconia, BruxAir Solid Zirconia, and generation I zirconia); lithium disilicate (IPS e.max); veneered full-strength zirconia (zirconia-based); lithium silicate; translucent zirconia; and resin-nanoceramic. The last 4 of these choices are new and cannot yet be evaluated confidently. However, early reports confirm various challenges.

Cast Gold Alloy

Cast gold alloy has the most data regarding longevity of all the crown types and can serve acceptably for 40 years or longer. They cause little or no wear of the opposing dentition if the alloy is appropriate and used correctly, can produce nearly perfectly closed margins, have little or no allergenic potential, and demonstrate good gingival acceptance. These restorations are not esthetic, which results in their use in fewer than 5% of the indirect restorations placed in the United States. Dentists tend to be the primary remaining recipients of cast gold alloy crowns.

PFM

PFM restorations have moderate longevity, lasting at least 20 years, and have moderate to very good esthetics until the glaze and stain wear off. They have moderate to excellent strength, and, as long as base metal is not used, few allergic reactions are associated with PFM crowns. Their drawbacks include occasional chipping and debonding of the ceramic from the metal, diminished color acceptability with age, and moderate to extreme wear of opposing teeth when older feldspathic ceramics are used.

Full-strength Zirconia

Full-strength zirconia has been available for about 10 years, and the 3Y version now dominates among crown use in the United States. Studies of its performance go back about 9 years and find outstanding clinical service. 3Y zirconia has been used successfully in many industrial situations for over 25 years. The advantages of this material include very high strength, ability to perform well in multiunit fixed prostheses, low manufacturing cost, few clinical problems, minimal laboratory fees, and low wear on the opposing dentition if the restoration is not glazed. Gingival irritation and allergic reactions are almost never seen. Esthetics have been addressed by staining presintered zirconia, which then delivers the desired pigments into the internal zirconia structure.

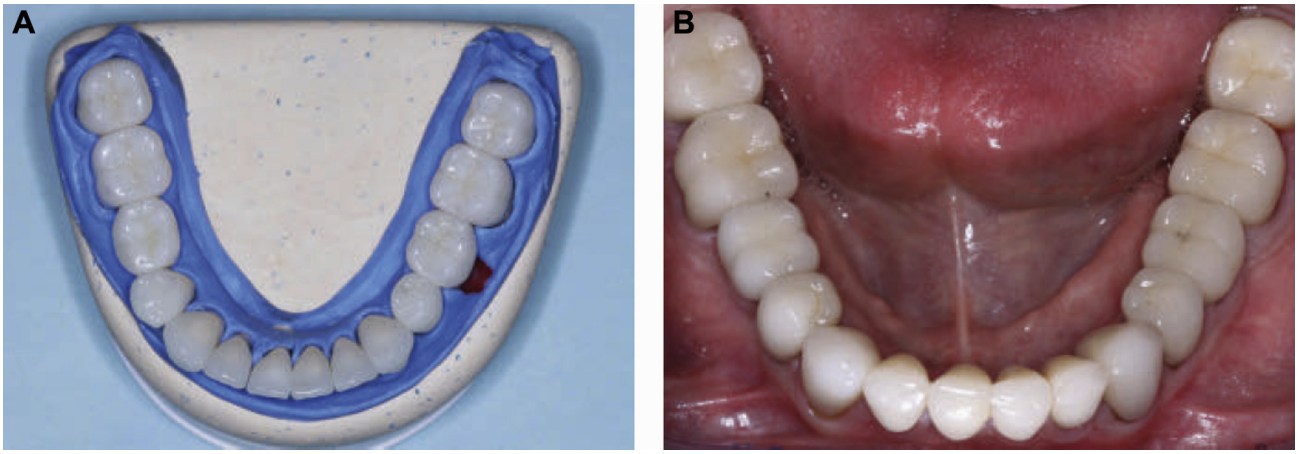

Figure 2. A and **B,** What material are these crowns? The anterior and premolar teeth are IPS e-max, and the molars are 3Y zirconia stained in the pre-sintered stage. None of these crowns have external stain or glaze. They are polished only. We accomplished the case recently. It represents the current state of the art in ceramic crown use. The characteristics you see in this case will appear the same many years in the future. Technicians: John and Jed Archibald (Archibald Associates, Orem Utah); clinician: Gordon Christensen, DDS. (Courtesy of Christensen G: What type of crown should I use? *Dent Econ* 109:68, 70, 72, 2019.)

Lithium Disilicate

Lithium disilicate (IPS e.max) has been used successfully for about 10 years in single crowns and some multiunit restorations. It's primarily used in anterior situations (Figure 2). The esthetics of these restorations are stunning. In addition, relatively easy fabrication by pressing or milling, sufficient strength for single crowns in most nonbruxers, and low to no wear on opposing teeth if polished (not glazed) are among the advantages of IPS e.max. The newest forms have overcome a previous monochromatic limitation, but they are not yet widely available, so it may still be necessary to perform external staining. In addition, the material isn't sufficiently strong for use in long-span fixed prostheses and it requires an optimum tooth prep depth of 1 mm or more on axial surfaces and 1.5 to 2 mm of occlusal reduction.

Veneered Full-strength Zirconia

Although the early versions cracked in the first year of service, most current versions of crowns using veneered full-strength zirconia that are adequately fabricated will work well.

RECOMMENDATIONS

The major currently available crown materials with a relatively well-supported track record that are used for tooth-colored restorations are the cast gold alloy, PFM, 3Y zirconia, lithium disilicate, and veneered full-strength zirconia types. Before placing any of the others that are available, it's wise to do some research to determine if they are appropriate for a particular case.

Dentists should know that the terms *translucent* and *esthetic* can be misleading, with several companies using the terms in their brand names and not to describe the restorations' components or characteristics. Either the manufacturer or the Clinicians Report Foundation can be contacted to clarify what the constituents of various products are so that clinicians aren't mislead by the product's name.

Clinical Significance

Before changing over to a new crown type, it's advisable to research the literature on the product. Some of the new crown materials don't perform well and others can be outstanding.

Christiansen G: What type of crown should I use? *Dent Econ* 109:68, 70, 72, 2019

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