

THE BEST CURE

Tips to make sure the curing light in your

by Dr. Jed M. Best

After earning his dental degree from Case Western Reserve University, **Dr. Jed M. Best** went on to complete a pediatric dental residency at the University of Minnesota. Best is a published author, gives public lectures on children's oral health, is a diplomate of the American

Board of Pediatric Dentistry and is on the faculty of Columbia University's College of Dental Medicine, Case School of Dental Medicine and NYU. He is an active member in many dental organizations, including the ADA and the AAPD.



Successful dentistry relies on identifying problems and creating healthy oral care solutions for our patients. If we want to continue to grow our businesses and satisfy our patients, it is critical to provide results that are long-lasting, aesthetic and trustworthy. To ensure the dental restorations we produce are successful, we rely on properly performing curing lights.

One of the most important, and sometimes forgotten-about, aspects of dentistry is the restoration curing process. Curing lights are used for many different dental procedures, though light curing can be one of the processes that doesn't receive the full concentration it requires.



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Importance of light curing

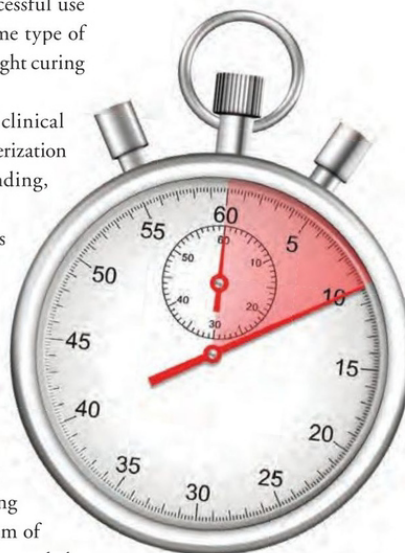
According to the American Dental Association Survey of Dental Services Rendered, half of all dental income relies on the successful use of light-cured materials.¹ Many dental procedures involve some type of material that must be cured, demonstrating the importance of light curing in creating long-lasting, successful dental restorations.

If the tooth is not cured properly, there are a variety of clinical problems that can arise. The ADA states that incomplete polymerization can lead to issues such as fractures, secondary decay, debonding, discoloration and postoperative sensitivity.²

To avoid these problems, dentists can follow a few simple rules to make sure they are using a properly functioning curing light.

Steps for proper light curing

The two main conditions that need to be met to achieve a successful cure are the dentist's overall technique and the curing light itself. Since proper technique dramatically increases the efficiency of light curing, it is imperative to handle the light appropriately. This includes making sure that the light reaches all the way to the posterior of the mouth, always holding the light perpendicular to the tooth, and curing for a minimum of 10 seconds. If the restoration is cured for less than the recommended exposure time, there will be a poor interaction with the photo initiator, which will result in an incomplete cure.





Even though technique is extremely important, if the curing light in use is not functioning properly, there will be critical issues with the final cure. Along with frequently cleaning the light, regular testing should also be performed to ensure proper functioning and adequate light quality.

Similarly, if the light is not held perpendicular to the tooth, the efficiency of the cure is dramatically reduced. As the tilt angle of the light increases, the shape of the beam of light alters, which can have a distinct effect on the total amount of light delivered during polymerization and may cause insufficient conversion of the material.³

Even though technique is extremely important, if the curing light in use is not functioning properly, there will be critical issues with the final cure. Along with frequently cleaning the light, regular testing should also be performed to ensure proper functioning and adequate light quality. Over time, battery degradation, rough handling, or material build-up can lead to faulty and insufficient light quality.

Since all curing lights perform differently, and because irradiance can drastically change over time, it is equally crucial to test them at regular intervals. Test curing lights a few times per year to establish that the integrity of the light has not degraded and to ensure consistent performance over time.

How to test a curing light

The process of curing restorations is one of the most crucial steps in many dental procedures. However, many curing lights do not function at the proper level. Along with using the correct curing light technique, it is important to use an adequately functioning curing light with proper light emittance.

Radiometers are commonly used for testing curing lights and measuring light output because they are affordable and appear to provide a reliable test. Even though radiometers can provide a general benchmark for the curing lights, they are not the best option for measuring light output, in my opinion.

Handheld radiometers have been found to exhibit significantly different irradiance readings when compared with one another.⁴ As a result of this inconsistency, I recommend engaging a professional testing process that delivers thorough reports at the end of an assessment.

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One such service is the checkMarc curing light testing service from BlueLight Analytics, which tests curing lights and provides evidence-based information on how well the curing light performs when used intraorally on a restoration at a clinically relevant distance. The detailed report keeps my clinic and me well informed on the overall performance of my lights.

3M has partnered with BlueLight Analytics to offer the checkMarc curing service for free. 3M representatives can test and identify the efficacy of the curing lights in a dental office, and provide a report that highlights the curing light performance, protocol and curing procedure recommendations. Based on the results, 3M will review protocols in the practice and work with the clinic to identify evidence-based opportunities to improve clinical outcomes and patient satisfaction.

For more information about the checkMarc technology, visit checkmarc.net. ■

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