



ACHIEVING THE BEST RESULTS WITH CURING LIGHTS

SPONSORED BY:

3M Science.
Applied to Life.™

ACHIEVING THE BEST RESULTS WITH CURING LIGHTS

The curing light: the office workhorse

Curing lights are a key component in the dental practice, but surprisingly not given the respect or care that they are due. Given how much of a practice's revenue is generated based on the performance of the curing light, it's surprising how they are taken for granted.

Composite Types

“If you work out the number of restorations that the average practice does and how much revenue an average dentist produces from a restoration or from a sealant or from a dual-cure resin that's cementing a crown on, or a veneer, it's over half of their income,” Dr. Richard Price, BDS, DDS, MS, PhD, professor in the department of clinical sciences at Dalhousie University, Faculty of Dentistry in Halifax, Nova Scotia observes. “Over half of the dentist's income is generated from that curing light.”

Successful curing is a procedure relying heavily on following manufacturer's instructions. There's no test to help judge whether or not the restoration has been fully cured.

“The top of the restoration is always hard. Even if you light cure it only for a second, it will be hard,” Dr. Price says. “The problem is that the bottom of the restoration won't be. The doctor actually can't tell how well the restoration is light-cured, so they have to go by a cook book recipe, hoping that the center is going to be cured, because they have no way of testing it.”

In his presentations he uses the example of baking a cake. To test its doneness, bakers often insert a wooden stick into the middle of the cake.

“You can’t do that with a dental restoration, so you have to go by the recipe that says ‘Light cure for 20 seconds with a light of whatever output it suggests,’” he says. “And if you don’t follow that, just like a cake, it’s undercooked in the middle.”

The biggest obstacle to successful light-curing, is that doctors tend not to respect curing lights, Dr. Price observes.

“The doctor does not value the curing light,” he says. “The doctor will delegate light-curing often to the assistant. It’s a throwaway procedure at the end of the entire procedure.”

For Best Results – Pay Attention to Detail

Most light-curing problems can be avoided by paying attention to the little things – ensuring that you are illuminating the correct tooth; being close enough, and making sure that the equipment is properly maintained.

Best practices

The most prevalent problem, Dr. Price notes, is actually watching what you’re doing.

“Nobody would go and prepare a tooth without watching what they’re doing,” Dr. Price says. “But most of the time they will light-cure a restoration without actually watching what they’re doing, and **the reason why they don’t watch is that they don’t want to hurt their eyes.** And that’s a very valid concern. You don’t want to hurt your eyes. **The blue light is very dangerous.**”

He recommends using **an orange shield** or wearing protective glasses.

“I’ve seen dentists curing the wrong tooth, the wrong restoration, where they start on the right tooth and then it wanders and winds up somewhere else,” Dr. Price says. “That’s a very easy thing to fix. Just watch what you’re doing.”

The light’s distance from the restoration is another concern.

“You have to **keep the light as close as you can,**” Dr. Price says. “You should start your technique such that the light is some distance away, maybe three or four millimeters away first so that the resin cures on the surface, and then bring the light in really close so that **it actually touches the tooth.**”

Care and maintenance of the curing light are also often overlooked.

“Attention to detail is important and following instructions is important,” Dr. Price says. “We know this is the case because when we look at curing lights in dental offices, you’ll find many times they have these wonderful cone beam CT scanners and have digital x-rays and beautiful upholstery and the office looks great, but you go and look at the curing light and the curing light has usually got resin, debris, and composite all over the end of it. Whenever you get debris on the end of a light it doesn’t deliver what you’re expecting. So when the instructions say, **‘Cure for 20 seconds’ and you’re using a light that’s got debris over the end, you may have to cure it for 40 seconds.** Of course the answer is: Don’t get debris on it in the first place.”


Know What Type of Light to Buy

The most common type of curing light is the LED light, which can cure different types of composites, depending on which wavelength activates the composite's photoinitiator. Other variables factor into the purchase of a curing light, not the least of which is the importance of buying a light from a reputable manufacturer.

Equipment considerations

“The light is blue, but it actually has a very narrow spectral admission,” Dr. Price says. “That means it’s a very narrow bandwidth. If you have a curing light that’s very good at curing camphorquinone at 470 nm, it’s not going to do a very good job of curing photoinitiators that require lights that require 410 nm and below.”

For that reason, many companies have developed broadband curing lights.

The ability for the light to shine directly and with as much power as possible on the restoration is another factor when purchasing a curing light. Dr. Price says that a collimated  beam is an important feature.

“What you’re looking for is an optimally collimated beam,” Dr. Price says. “Think about a lighthouse, and the light coming out of the lighthouse. That’s what you’re looking for. You’re looking for light that has a good output over distance.”

The design of the light must also allow good access to patients’ mouths.

“Some lights work really well on the lab bench, but when you look at them, ‘How on earth am I going to get that in to the last molar?’” Dr. Price observes.

The inability to get directly over a restoration causes curing problems.

“As soon as you start to cure at an angle, then the curing ability of the light decreases dramatically,” he says. “Light travels in a straight line. It doesn’t travel around corners very well, so you need to have the tip of that curing light perpendicular, at right angles to the restoration surface. If you put an angle of 45 degrees on there, then you’ve got a real problem.”

Also, he warns against trying to save money by buying cheap curing lights. The problem with these lights is that they have small tips that do not cover the entire tooth and they produce less power than lights bought from reputable manufacturers.

“Some dentists are buying cheap lights on eBay – and I mean cheap: They’re like \$50 instead of \$1,000,” Dr. Price says. “The tip is like five, six, seven millimeters. When you go and put those on a dental radiometer they do pretty good. The problem with that is dentists nowadays are trying to do bulk filling. If the cusp distance on a molar is 10 millimeters, and the dentist has got the light with the tip of five or six millimeters, the entire tooth is not covered by the curing light. Ideally, the tip should be big enough to cover an entire molar.”

Make Sure Your Light Performs Properly.

To ensure that you are getting the best results out of your curing light, Dr. Price recommends regularly monitoring their output. Have your light checked out by a sales rep or repairman. If it is working within specs, record the value, and then monitor its output on a regular basis.

Monitor your output

“Notice that I’m saying the word ‘monitor,’ because the dental radiometer, the light testers that you can buy, are not all that accurate,” Dr. Price says. “What is important is does the output of your curing light, measured on your radiometer, change over time? It’s a relative thing.”

He recommends measuring it daily, but the more often it is tested, the better.

“Dentists often ask me, ‘Well how many times should I test the light?’ Well if you really want to be sure, test it before every patient,” Dr. Price advises. “The reason why I say that it is, ‘Well, how many patients do you feel comfortable recalling?’ If you test the light one day and then you test it again a week later, and you suddenly find that it’s defective, are you going to recall all those patients and replace those restorations? How do you know when it failed? **It’s a lot cheaper to test the light than to replace a restoration.**”

Testing isn’t a difficult task and is easily done by anyone on the care team, with results recorded in a logbook.

Curing lights are critical to the practice, and knowing how to use and care for them are easy tasks from which the practitioner will benefit. ■