Soft-tissue dental lasers: an engineering perspective on choosing wisely

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Putting on my design engineer and marketing hat, I thought this was a good time to take a look at what’s being offered with the new soft-tissue dentistry lasers and decided to be innovative and design something really low cost and cutting edge that addresses any outstanding issues (Fig. 1).

There are many choices right now, all pretty much the same, except for price, which as of late has become a deciding factor. Below the $2,500 price point, the door is open to purchase two or three lasers for the price of one, which is great news for dentists and hygienists.

Addressing the most important requirements in order, let’s start with power. Due to the physical nature of diode degradation over time, and the need to have some overhead, I believe that anything below 3 watts will not give you enough margin in the long term. It’s been easy so far to price 2 watt or even 2.5 watt lasers at lower price points.

If you do the math, you will see that from a power perspective, and considering the current pricing structure, for low-cost lasers with less than 3 watts, you should add at least $500 to the base price for every one half watt difference so it is equal to a 3-watt system.

In my opinion, having a 3-watt system is very important. This is where warranty really matters; anything less than three years is not adequate insurance. The diode array is the most expensive part of the laser and the component that will always fail first, especially when driven harder. An extended warranty option is best.

Another important question is what’s most effective, 810 nm or 980 nm? Diode wavelength will be debated forever depending on whom you’re talking to. What is not debatable is the cost road map for higher power. With 810 nm, the cost really goes up quickly, just compare the price of higher watt 810 nm lasers and you will easily see what I mean. This is not the case with 980 nm, which can be scaled up past 10 watts at a very reasonable cost ratio. Laser Dental, however, does offer its new laser in 810 nm or 980 nm.

One might ask, why not just buy a higher watt laser? This is a good question because that extra power costs a lot more. The risk of tissue damage from incorrect settings or thermal run always increase greatly, especially when metal cannulas or tips are used.

Engineered copolymer tips designed just for laser dentistry are the best choice. Laser Glow Tips bend your fibers 90 degrees and minimize tip failures (Fig. 2).

The other area I find of interest is what I call “bells and whistles.” These are things such as wireless foot pedals, battery-powered lasers, touch screens and...
presets. In my opinion, these are nice to have but fall under the heading “more complexity translates into more to go wrong.”

Foot pedals could potentially fail to transmit, batteries are heavy and die at critical times, touch screens sometimes don’t respond to touch. A more cost-effective plan would be an extra hard-wired foot pedal and AC plugs in every treatment room.

Presets are nice, but most professionals have taken top-notch training and will have their own preference settings. After all, what happens with presets when you encounter something not cookbook? You adjust based on experience, so bottom line is, the less buttons to push the more reliable your system, which means more control.

The big move in the last three years has come in the form of pre-bent tips. These are plastic tips with a piece of fiber at a fixed length and angle that attach to a handpiece. These seem convenient but have some big drawbacks, including power loss, price and the number of tips required to do a procedure.

These single-use tips cost $5 to $10 each, and if you need to make a length or angle change during the procedure, another tip is required. Therefore, the potential exists that you need two or three tips per procedure or, in real dollar terms, up to $15 per procedure.

Consider this against the cost of the old style flexible fiber system. The costs are $1 per procedure, and you get length and angle adjustment on the fly using laser glow tips.

Another major drawback to these pre-bent tip systems is that most handpieces and connecting cables cannot be autoclaved, only wiped down. Herein exists a potential contamination problem.

I decided to innovate and designed Laser Dental’s newest handpiece cable assembly so that it attaches to most lasers, costs only $3.75 per procedure and can be autoclaved. It has the capability of length and angle adjustment on the fly in a very compact package. That’s right, $3.75 per procedure, not $5 to $15 like everyone else (Fig. 3).

Our laser also use standard fiber connectors, not special ones that are becoming obsolete. This translates into even more choices and does not lock your laser consumables into one manufacturer.

Last, but not least, is size. It does matter, but in this case smaller is better. Tiny footprints look better, weigh less and take up less space in each room.

Well, that’s my take on all of this, and in the end, I have always found simpler is better. Thus, we designed our new laser so that it is very low priced, with 3 full watts at either 810nm or 980 nm and has a minimum of bells and whistles plus lots of flexibility.

When you combine this laser with the new multi-use tip package now available, you really have chosen not to paint your practice into a corner. Now you have a real choice when purchasing a reliable, U.S.-manufactured, low-cost soft-tissue laser. In other words, take a long look at the Prometey™ Mini Laser and you will look no further (Fig. 1).