Since dentists first began using lasers in the 1990s, much has been said about the technology that allows dentists to do new and better treatments in many areas of dentistry. From less pain, less blood, cleaner sites, faster healing, and greater precision, the benefits of laser dentistry are undeniable. That’s why an increasing number of dental schools have introduced laser dentistry into their curricula. But the move into dental schools hasn’t been without its challenges.

While there’s plenty of evidence for laser dentistry’s effectiveness over traditional methods in many areas of dentistry, there’s not enough evidence-based research into its use in periodontics. Adding a curriculum in laser dentistry also requires the buy-in from administration, as well as costly equipment. To launch a successful program, someone must champion the effort. Here we take a look at a few programs that have met the challenge.
As lasers have become an integral part of medicine over the past 10 to 15 years, Dr. Robert Levine wondered about their usefulness in dentistry. “We use them in ophthalmology and many surgical procedures. My feeling was, ‘Why not in dentistry?’”

So Dr. Levine co-developed a full curriculum-based program for students in lasers at the Arizona School of Dentistry & Oral Health (ASDOH). “We are the only school in the U.S. that has a full curriculum-based program for our students in lasers,” says Dr. Levine, director of laser dentistry at ASDOH.

“We’re getting to an age where we’re going to be virtual to a certain degree,” says Dr. Levine. With virtual systems like CEREC or E4D, it’s important to have clean, visible tissues with minimal bleeding. “When used properly, lasers can give us the clean sites necessary for accurate scanning with these virtual technologies. They can also help us eliminate cord packing for traditional impression procedures.”

Development of ASDOH’s laser program started in 2006. It took two years to complete the curriculum due to strict guidelines. Finally, in 2008, the program was approved for students. “The program would never have existed except for the support of our dean, Dr. Jack Dillenberg, a visionary in all aspects of dental education,” says Dr. Levine.

Lasers are being used in many dental procedures. Soft tissue lasers are used in oral surgery, such as biopsies and frenectomies. Erbium lasers can be used in many procedures without anesthesia, making them popular in pediatric dentistry.

“There’s a wide range of procedures that we can do a lot faster and a little more efficiently with a laser,” says Dr. Levine. He uses them to remove small lesions, fibromas, and hemangiomas. “We can get minimal or no scarring when used properly.”

ASDOH is using low-level laser technology (LLLT) to relieve muscle and joint pain in patients with TMJ disorders. The school has also partnered with the University of Texas MD Anderson Cancer Center with hopes to use LLLT in oral cancer patients who develop mucositis after chemo or radiation therapy.

Most of the science shows that lasers are not any more effective than traditional means with respect to periodontal therapy, says Dr. Levine. “You can’t just use lasers without traditional perio treatment. It might allow us to get better results. Only time will tell as more studies with solid evidence-based research become available.” ASDOH is in the process of launching its own pilot study.

ASDOH has 20 lasers for student use. These include the erbium YAG (Er:YAG), used in both soft and hard tissue; two AMD diodes and several carbon dioxide (CO2) lasers for soft tissue.

A new CO2 laser called the Solea (Convergent Dental) cuts both hard and soft tissue. Dr. Levine gives a new technology a few years to prove itself before adding it to their lasers.

“Students love laser dentistry,” says Dr. Levine. “When they interview at our school they’re excited about learning it. They leave ASDOH with both laser proficiency and certification. It gives them a tremendous advantage in this tough job market.”

Dr. Levine took the school lecture program and developed it into an online training program for dental professionals. His company GLOH (Global Laser Oral Health) specializes in online laser training for current dentists. “We can efficiently train dentists at their leisure on laser science,” he says. “They can then decide whether it fits into their practice before they purchase equipment.”

Lasers vary greatly in cost. Smaller ones range from $2000 to $10,000 or more; erbium lasers range from $43,000 to $60,000; more sophisticated lasers run $75,000 to $80,000. Soft tissue CO2 lasers run $25,000 to $40,000.

“I tell new graduates to start out with a smaller laser and get used to using it in your practice,” says Dr. Levine. “When
you’re ready you can buy more sophisticated ones if appropriate to your practice.”

The University of Tennessee Health Science Center

The University of Tennessee Health Science Center (UTHSC) is in its second year of a five-year program rollout in laser dentistry. The rollout includes faculty training and certification, offering an elective course to fourth-year students and graduate students, and finally proposing a course in laser dentistry for all students to the curriculum committee.

The program was initiated by periodontist Dr. Les Binkley who had attended meetings of the World Clinical Laser Institute. “I saw general dentists using lasers for restorative procedures and the endo people using them in root canal therapy and I thought this is something our school should have,” says Dr. Binkley, assistant professor in the periodontal program at UTHSC.

He brought the idea to the dean, Dr. Timothy Hottel, who liked it and asked to see a five-year plan for a program with the input of Dr. Erica Migliorati and Dr. Paul Gregory.

“Our research dean saw a lot of benefit from having lasers in our school,” says Dr. Binkley. “Our faculty members can do research and publish and it gives our students use of the laser in restorative, periodontal, endodontic, and pediatric procedures.”

The first challenge was to get faculty on board, says Dr. Binkley. “At first they shrugged us off. But when the dean gives his stamp of approval, it drives faculty to take the course.”

The school’s restorative, pediatric, Advanced Education in General Dentistry, and periodontics faculty have now been trained and are practicing their skills during this school year with plans to instruct students in 2015-2016.

UTHSC has one iPlus (Biolase) for restorative procedures, two WaterLase MDs (Biolase) for pedodontic and periodontic procedures, and a dozen diode lasers for soft tissue (iLase by Biolase).

All UTHSC dental students are using the laser for soft tissue procedures such as contouring tissue, removing lesions, and taking impressions. “They can take better impressions because there’s no bleeding,” says Dr. Binkley.

“Students are pushing laser dentistry more than anybody else,” he says. “They watch us use it and get excited about it.”

Dr. Binkley has used the laser in his periodontal practice since 2007. “When I use laser treatment for periodontal disease there’s less recession, less pain, no blood, and patients return to work the next day. I wanted our students to be a part of that.”

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The University of California, San Francisco

Laser pioneer Dr. Donald Coluzzi is proud to have introduced laser dentistry into the curriculum at the University of California, San Francisco (UCSF) School of Dentistry, where he is part-time faculty. He is retired from 35 years in clinical practice.

Dr. Coluzzi bought his first laser for his general practice in 1990 for $53,000. “It was very exciting. Not too many of us in the early ’90s used lasers,” he says. He and another faculty member brought lasers into the dental school to show what they could do. “Faculty was pretty excited,” he says. Eventually he and several others formed the Academy of Laser Dentistry.

“At UCSF I started talking to the powers that be and said, ‘Hey, why don’t we do something?’” After jumping through “hoops,” Dr. Coluzzi says, he developed a curriculum and the school began to offer an elective in laser dentistry about 10 years ago.

For the last 10 years, students could occasionally use soft tissue lasers and had infrequent use of an Er:YAG laser for tooth preparation.

Four years ago UCSF decided to make a course in laser dentistry part of the curriculum and it is now required for fourth-year students. There is a lecture series and small group workshops to allow students to perform simulated procedures on pig jaws.

After completing the course, students can use the available soft tissue lasers under faculty supervision. “The goal is to have every student do one or two laser procedures before graduation,” Dr. Coluzzi says.

The first laser the school bought was an AMD Picasso soft tissue diode laser. Their collection now includes a CO2 laser, Nd:YAG, and four diode lasers. They also have the newest hard tissue laser, a CO2, which is not yet ready for student use.

“There’s a ton of science showing that lasers are quite effective and better than conventional headpieces at controlling bleeding and reducing bacteria,” says Dr. Coluzzi. Many studies show that adding laser to the protocol gives you some benefit.

Still, more research should be done, he says.

“Dentists should consider adding the laser to their toolbox,” he says. One of the best examples of what a laser can do is when students try to fill a cavity near the gumline. “In a minute they can contour the gum, stop any bleeding, disinfect it, see the cavity, and restore it. If you have the laser you can show the patient what you’re doing.”

Students are excited and can get instant results by adding laser to their treatment, he says. “They can see the results right now and it’s very comfortable for the patient. Everybody wins.”