

# tech meets teeth



Space-age advances in procedures and technology  
are transforming dentistry, both general and cosmetic.

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PHOTOGRAPHY BY MITRO HOOD





## Technology is fundamentally changing the way we do everything, from personal communication to manufacturing to health care. And dentistry is no exception, with computer-aided procedures offering huge leaps forward for patients and their dentists, as well.

Take the 3D printer, for example: It may be making headlines for its huge range of possibilities, from hobbies and industrial uses to more controversial applications like creating airport-scanner-defying plastic firearms.

But New Jersey resident Dr. Joel Gordon witnessed the technology doing something entirely different while visiting his dentist: He saw it make his new crown. Computer-aided design/computer-assisted manufacturing (CAD/CAM) is also being put to increasing use for ceramic restorations—crowns and inlays.

According to Dr. George Shepley, president of the Maryland State Dental Association, one of the biggest trends in cosmetic dentistry using that technology is in making crowns and veneers. With this, patients can say goodbye to those yucky pastes and gels used for impressions. Instead, an intra-oral scanner (a camera) creates a 3D image of the mouth, jaw, and teeth. Dentists then have a precise picture of what the mouth looks like in that area and can build the tooth digitally.

For dentists who prefer to use an out-

side lab to create a crown, the CAD allows for immediate transfer of the digital impression to the lab, and the patient gets the crown back faster than before.

According to Dr. Ngoc Chu, past president of the Maryland State Board of Dental Examiners, there are two kinds of computer-aided manufacturing: 3D printing involves building a product layer by layer, while milling involves removing superfluous material from a solid block.

“The technology is phenomenal,” says Shepley. “My patients walk out with a new crown during that visit. It’s such a big service for them, not having to wait or come back for another appointment.”

But CADs, CAMS, and 3D printers are just some of the headlines in the new world of dentistry. We went looking for some others, and found plenty of changing trends, procedures, and technologies. One shift, for instance, is the market for cosmetic dentistry.

“Today we see a lot more men coming in for cosmetic dentistry, especially men in their 40s and 50s,” says Dr. Peter Rinaldi, a cosmetic

dentist in Washington, D.C. “Men are more attuned to their well-being and looks than they used to be.” Many of them, he says, are attorneys or other professionals in the public eye who want to improve their smiles.

According to the American Academy of Cosmetic Dentistry (AACD), a smile may be the secret to attractiveness as we age. A 2012 survey by the AACD concluded that a smile is the one feature that can remain attractive no matter how old we get. “The fact is, we are living in a time when it’s possible to turn back the clock and minimize some of the damages of aging,” said Dr. Ron Goodlin, former AACD president. “With that, we find that our dental patients, both men and women of all ages, see a major improvement in their confidence levels, which impacts every part of their lives.”

But more important to many than a Hollywood smile is a natural-looking one: According to the AACD, more patients are now asking for cosmetic services that embrace naturalism over idealism.

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## VENEERS TO THE RESCUE

While teeth-whitening remains the number one requested cosmetic dental service, veneers are the second most popular procedure because porcelain veneer technology allows changes to look organic, not contrived. Even the shape of veneers has changed to a more natural look instead of the older style, which looked large and square.

"Veneers can be made a lot thinner than they used to be but it depends on the situation," says Rinaldi. "The thinner veneers are ideal for someone who is happy with their tooth color but wants to have their teeth lengthened." Very thin veneers utilize the patient's own underlying tooth tones and give a very natural look.

"However, if a patient comes in with very dark, yellowing teeth, the thinner veneers would not work, so we would use a little thicker veneer."

*Pictured, previous page: Dr. Sarah Lyden uses a whitening laser on a patient at Horizon Family Dental in Hanover. Pictured below: Dr. Matthew Wallengren shows a patient the range of veneer shade selections at his aesthetic and family dental practice in Roland Park.*

According to Long Island dentist Dr. Adamo Notarantonio, many dentists now do prepless veneers. These are perfect for patients who want veneers but are hesitant to shave healthy tooth enamel. Unlike regular veneers, prepless veneers can also be reversed. "Sometimes we can do them with absolutely no prep," says Notarantonio. "The ideal candidate is someone whose teeth are slightly tipped inside their mouth or don't have what we would call the Julia Roberts broad smile and want to bring the teeth out a little to give them a broader smile." While Dr. Notarantonio makes the crowns in his office with the 3D printer, he uses an outside lab for his veneers.

"Thank goodness for veneers," says patient Marianne Hardwick. She broke one of her front teeth in a pool accident. To have them match, Dr. Notarantonio put veneers on her two front teeth. "Once it was done, they were perfect. They looked like how my teeth always looked," says Hardwick.

## WHITEN? SURE. BUT GUMS CAN BENEFIT, TOO.

Remember the white, white of the 1990s? It's out. Fast forward to today and "people want a

more natural look," says Rinaldi. "But that being said, they still want a better smile. It's amazing how subtle changes with bleaching, when done correctly, can have a big impact on someone's smile."

But not only are teeth being bleached, so are the gums. "When people have dark pigmentation of the gums, they don't want to smile," notes Rinaldi. "We use a laser called a Waterlase that slowly peels away the dark pigmentation until the gums are pink. With this laser, only a topical anesthetic is necessary because the laser actually numbs the nerve endings while you're working." It takes about a half hour to do the upper arch, which is the one most commonly done. What's nice is that the results are immediate, though the gum tissue is tender and raw. It takes about two weeks to heal.

## ADIOS, DENTURES

"Today, implants restore the mouth beautifully and function like your own teeth," says Rinaldi. "It used to be we did everything that we could do to save a tooth—root canals and crown lengthening. Many times, though, the tooth we were trying to save only lasted five years, cost a lot, and in the end had to be pulled," notes Rinaldi. Now, though, dentists and patients are a lot quicker to have an implant.

"Implants are light years ahead of where they use to be," says Notarantonio. "Our techniques are so improved that it's less traumatic to the area and the implant integrates better with the bone. Implants are more predictable and can last a lifetime with proper hygiene, maintenance, and regular checkups."

But neither Rinaldi nor Notarantonio are big believers in the implants-in-a-day claims made by some peers. "Implants are a big investment for the patient," says Notarantonio. "Can it work in a day? Yes, but I'm more comfortable letting the implant heal before we start working on the next step."

## MR. SANDMAN MEETS DENTISTRY

Dr. Shepley finds that one of the booming trends in general dentistry is "Sleep Dentistry." "And I don't mean putting patients





to sleep,” he says. “It’s the fabrication of appliances for people who suffer from sleep disorders, such as sleep apnea and snoring.”

Many people can’t tolerate sleeping with a CPAP machine, a machine connecting a hose to a mask that you sleep with. Plus, it’s certainly not a sexy look in the bedroom.

“Oral appliances are increasingly being used,” says Shepley. “It’s sort of like an Invisalign or retainer tray that fits on your upper and lower teeth. It pulls your lower jaw forward enough to open the airways and reduce or eliminate your sleep apnea or snoring. “It may change your bite, but from personal experience, my patients get so much relief, they don’t care.”

Shepley adds that researchers are finding more and more confirmation of the link between oral health and systemic health. For example, periodontal disease, an infection of the gums and bone, appears to be a contributing factor for coronary artery disease, new data suggests. Also, when you have chronic periodontal disease, it can aggravate your diabetes and can harm your joints as well, Shepley says.

As a dentist, Shepley notes he’s gotten many requests from physicians whose patients are going in for joint replacements or having cancer treatments (chemotherapy), to make sure they have good oral health. Physicians know that having any kind of chronic infection of the body can compromise the patient’s outcome.

## THE FUTURE IS COMING

Marianne Hardwick, who broke her tooth in a pool accident, also recalls that her daughter knocked out a permanent front tooth when she was in kindergarten.

“So Dr. Notarantonio called in an oral surgeon and the two reattached the tooth,” she says. “Now, five years later, the tooth is still in place.” But if that tooth doesn’t stay, there may be something new that dentists will be able to do in the future.

According to a study published in *The*

*Journal of Dental Research*, scientists predict that people may someday be able to have missing teeth replaced with ones grown from cells taken from their own mouths. Hybrid teeth have already been created by combining human gum cells and stem cells from mouse teeth in the lab. But that’s just one of the futuristic solutions on the horizon.

While having your teeth replace themselves is still off in the future, don’t be surprised if your dentist starts to use ozone, which is super-charged oxygen, to help stop tooth decay and inflammation. And the good news is, it’s painless.

“It’s being used more in Europe right now, but it’s beginning to catch on here,” says Shepley. “Another advance tackles one of patients’ biggest complaints, which is anesthesia [especially Novocain] that lasts long after the procedure is done. Now, we have products that we inject at the end of the procedure and the numbness goes away in 10 to 15 minutes,” says Dr. Shepley.

And here’s something else that seems like a little bit of magic: MI Paste therapy. According to Baltimore County’s Dr. Chris Toomey, it strengthens teeth that have become spotty and weak, actually remineralizing your teeth.

“We often use it after braces come off, on kids and adults.” ■



## FOR MORE INFORMATION

AMERICAN DENTAL ASSOCIATION  
**ada.org**

AMERICAN ACADEMY OF  
COSMETIC DENTISTRY  
**aacd.org**

## AND, SO YOU WON'T BE GUMMING YOUR FOOD AT 50 . . .

***Prevention is the best way to keep your teeth healthy. If the dentist can lecture you on every visit, so can we:***

»Brush your teeth twice a day.

»Floss daily at night.

»Eat good foods, such as strawberries, pineapples, and broccoli. Also eat crunchy fruits and vegetables like celery, apples, and carrots.

»“Avoid bad foods—sugars and sodas both regular and diet,” says Dr. Shepley.

»“Avoid sports drinks, unless playing two to three games in one day or have the flu,” says Baltimore County dentist Dr. Chris Toomey. Sports drinks eat away tooth enamel, making easy entry for bacteria.

»Drink water with fluoride. (Studies show that drinking water with fluoride cuts cavities in children by 20 to 50 percent.)

»Use fluoride toothpaste, and when you have your teeth cleaned at the dentist, have a fluoride treatment, if s/he suggests you have one. And that’s true at all ages. Dr. Shepley says that in his practice, he has many patients in their 90s (plus two who are 100) and all have their own teeth and still get fluoride treatments.

»See your dentist twice a year.

»Wear your retainer at night for life, if you had braces. It will prevent shifting of your teeth. Forgot that rule, and found your teeth shifted? According to Towson’s Dr. Charlie Ward, Invisalign has been a great alternative to traditional wires and brackets and provides adults with a virtually invisible way to straighten their teeth. “It allows us to properly position teeth and often creates a beautiful final result with no restoration at all,” he says.



LEFT: Dr. Bryan Fitzgerald, of Feldman, Fitzgerald, and Choe in Towson, demonstrates a connective tissue graft to a patient. The procedure is used to treat gingival recession and uses the patient's own tissue from the palate, transferring it to the area with gum recession.



ABOVE: One growing trend in the industry is the use of oral appliances to help those suffering from sleep disorders.

## PAYING THE PIPER

*The following are estimated costs for the most popular procedures, according to the AACD. Prices vary by area and the experience of the dentist.*

### Whitening, per arch

Take-home trays: \$250-400

In-office power bleaching: \$450-800

### Implants: \$900-3,000

### Invisalign: \$5,600 on average

(according to [Invisalign.com/cost](http://Invisalign.com/cost))

### Porcelain Veneers, per veneer: \$800-2,000

**Crowns:** \$1,000-1,500 for a posterior crown and \$1,500-2,000 for an anterior crown (according to the AACD, there are many factors that influence crown costs)

### Gum Bleaching, per arch: \$1,200 (according to Dr. Rinaldi)

