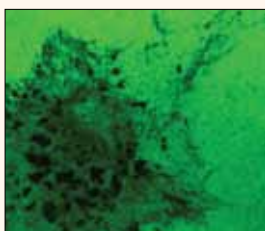




## FEEDBACK LOOP SPREADS ORAL CANCER

University of Toronto Faculty of Dentistry researchers show that neutrophil and cancer cell 'crosstalk' underlies oral cancer metastasis.

► page A2



## DOING WELL BY DOING GOOD

Henry Schein Canada, as part of its Calendar of Caring program, shines the spotlight on the many ways that its customers are 'giving back.'

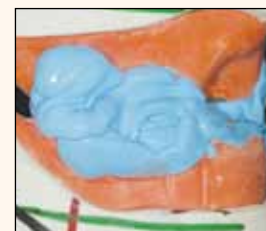
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## ROUTINE FULL PROSTHESIS ON IMPLANTS

Dental lab's detailed case study documents overdentures as viable choice among restoration options for edentulous patients.

► pages A8–A10



# Denturists from across the globe gathering in D.C.

*Canadian management expert to deliver keynote at World Symposium on Denturism gala dinner*

The Denturist Association of Canada and other national denturist organizations around the world, as members of the International Federation of Denturists (IFD), are encouraging their members and other dental professionals to attend the Ninth Annual World Symposium on Denturism, Sept. 16–19.

The meeting is being presented by the National Denturist Association USA in partnership with the IFD. The host site is the Hilton Alexandria Mark Center, in historic Alexandria, Va., five miles from Washington, D.C., and its many monuments, museums and other attractions.

Included among the educational offerings on the agenda for this year's meeting are sessions on ethics, pathology, social media, office management, clever techniques, radiograph recognition, flexible partials, cranial nerve function, designing options for implants, digital solutions for removable dentures, creating the beautiful denture, dental prosthetic identification and patient centered occlusion for fully edentulous functional dentures.

The symposium includes a three-day exhibit hall, Thursday through Saturday, Sept. 17–19, which are also the core days for the educational sessions.

The keynote speaker at a gala dinner event on Friday is Janice Wheeler, president and co-owner of The Art of Management practice management consulting firm, which is dedicated to helping health care professionals reach their full potential. As a speaker, she has a reputation for enthusiastic and motivational performances. She is also an author whose articles appear regularly in several professional magazines including The National Denturist, USA and The Journal of Canadian Denturism.

Wheeler also presents an educational session on Friday afternoon, "How to Create Your Ideal Practice." Other speakers at the symposium include: Eugene Royzengurt with "Gingival Customization," which covers the steps needed to create high-end restorations and life-like removable prosthetics; the always popular Thomas Zaleske, sharing his high-value insights on "Removable Prosthetics"; and Jonathan Bill, RDTUK, part of the research team at Loughborough University in the United Kingdom, sharing his insights as one of the primary developers of the CQR denture technique.

(Source: National Denturist Association, USA)

Publications Mail Agreement No. 42225022

## World Symposium on Denturism, Sept. 16–19



The Ninth Annual World Symposium on Denturism will be in historic Alexandria, Va., five miles from Washington, D.C., and its many monuments, museums and other attractions, including Thomas Circle, above.

Photo/Jason Hawke, www.washington.org

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- Neutrophil and cancer cell 'crosstalk' underlies oral cancer metastasis.
- Get green in Vancouver: 2016 Pacific Dental Conference to incorporate St. Patrick's Day festive spirit.
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# Neutrophil and cancer cell 'crosstalk' underlies oral cancer metastasis

An abnormal immune response or "feedback loop" could very well be the underlying cause of metastases in oral cancers, according to Dr. Marco Magalhaes, assistant professor at the University of Toronto's Faculty of Dentistry and lead researcher in a study published in the journal *Cancer Immunology Research*. Magalhaes has unearthed a significant connection between the inflammatory response of a very specific form of immune cells, neutrophils, and the spread of this deadly disease.

"There's a unique inflammatory response with oral cancers," explains Magalhaes, citing the growing body of evidence between cellular inflammation and cancer, "because the oral cavity is quite unique in the body. A great many things are happening at the same time."

Magalhaes focused attention on neutrophils, immune cells commonly found in saliva and the oral cavity but not widely researched in relation to oral cancer. Like other immune cells, neutrophils secrete a group of molecules, including TNF $\alpha$ , that regulates how the body responds to inflammation.

The study noted that oral cancer cells secreted IL8, another inflammatory mediator, which activates neutrophils, effectively establishing a massive immune-response buildup or "feedback loop."

Ultimately, the researchers found, the immune-response loop resulted in increased invasive structures known as "invadopodia," used by the cancer cells to invade and metastasize.

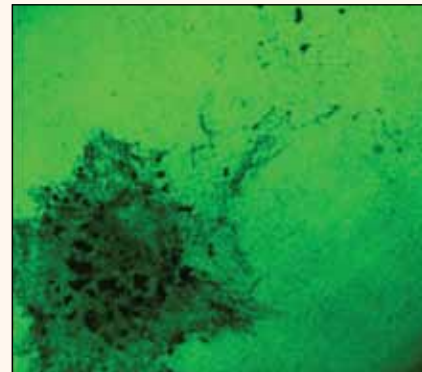
"If we understand how the immune system interacts with the cancer, we can modulate the immune response to acquire an anti-cancer response instead of a pro-tumor response," Magalhaes argues.

While the study points to the possibility of one day creating targeted, personalized immunotherapies for patients with oral cancer that could effectively shut down the abnormal immune response, the team is currently expanding upon their study of inflammation and oral cancer.

Approximately 3,600 cases of oral cancer are diagnosed in Canada every year, yet the survival rates — 50 to 60 percent over five years — have remained stagnant for decades while other cancer survival rates have dramatically improved.

## About the Faculty of Dentistry, University of Toronto

Combining the rigours of biological and clinical research with a comprehensive educational experience across a full range of undergraduate and graduate programs — with and without advanced specialty training — the Faculty of Dent-



Oral squamous cell is shown invading the extracellular matrix of a healthy cell.

Photo/Provided by Dr. Marco Magalhaes, University of Toronto Faculty of Dentistry

istry at the University of Toronto has earned international respect for its dental research and training.

Whether focused on biomaterials and microbiology, next-generation nanoparticles, stem-cell therapies or groundbreaking population and access-to-care studies, the mission is to shape the future of dentistry and promote optimal health by striving for integrity and excellence in all aspects of research, education and clinical practice. You can learn more at [www.dentistry.utoronto.ca](http://www.dentistry.utoronto.ca).

(Source: University of Toronto)

# Get green in Vancouver

2016 Pacific Dental Conference to incorporate St. Patrick's Day festive spirit

With opening day of next year's Pacific Dental Conference falling on St. Patrick's Day, attendees will get to experience the Irish holiday with a Western Canada flavor — while also earning C.E. credits.

The PDC, which typically attracts more than 12,500 dental professionals, will be from March 17–19 in Vancouver.

More than 130 local, North American

and international speakers will present 150 open sessions and 36 hands-on courses covering a variety of topics. Attendees also will be able to explore Canada's largest two-day dental tradeshow (with more than 300 exhibitors), getting the year's first chance in Canada at seeing the latest in dental equipment and services.

For most attendees, C.E. credit is given for general attendance (up to five hours) and individual courses (up to 20 C.E. credits).

Online registration opens Oct. 15 at [www.pdconf.com](http://www.pdconf.com). Special hotel rates are available now.

(Source: Pacific Dental Conference)

## C.E. and ultimate driving experience

VOCO has partnered with BMW and its Performance Driving Center to offer a unique continuing education experience.

On Sept. 25, participants can learn about trends and technologies in dentistry from G. Franklin Shull, DDS, FAGD, combined with the thrill of BMW's ultimate driving experience.

Attendees will be able to spend about five hours driving the newest models of the 1, 4, 5, 6, 7, Z, M and X series, on and

off the racetrack. After Shull's two-credit (ADA/CERP) lecture, "The Changing Face of Restorative Dentistry," attendees will be able to learn from BMW professional driving instructors on the track in timed events and elimination races.

For more information and to register, contact Russ Perlman at [Russ.Perlman@voco.com](mailto:Russ.Perlman@voco.com) or visit [www.goo.gl/LGoZXC](http://www.goo.gl/LGoZXC).

(Source: VOCO America)

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# TiN-engineered instruments match high-tech advancements seen in restoration materials

*Non-porous, wear-resistant surface ends material pullback often seen when sculpting with stainless steel*

By Cappy Sinclair, DDS  
Coastal Cosmetic Dentistry  
Virginia Beach, Va.

In the era of adhesive dentistry, there are constant and continual advancements in the areas of the materials that are used to restore teeth. Bonding agents have gone through several generations in attempts to decrease chair time and increase strength, and composites are constantly adjusting the ratios of various particle sizes to gain that perfect harmony of functionality and esthetics. However, through all of these changes, very little has been changed about the instruments with which the items are placed. In a dentist's composite armamentarium the instruments are often the weakest link, which, in some cases, can lead to a compromise of the final composite restoration.

In this case I'm talking about the pullback phenomenon that many dental composites can exhibit when sculpting. This pullback occurs when the composite material sticks to the micro-scratches in the surface of commonly used stainless steel instruments. These scratches, which can occur from just daily ultrasonic and sterilization processes, create a rough surface for the composite to grab onto and thus be pulled away from the preparation area. This pullback effect can end up creating voids in the final restoration and can also create the need for spending unnecessary time finishing the restoration to proper contours. This is ultimately true in direct anterior composite cases where a majority of the contours should be created through the material placement prior to finishing.

The ability to have a composite instrument with a smooth surface then becomes paramount to not only save time, but to have a predictable restoration. American Eagle has applied a multilayered TiN/Ti surface-engineering process that creates a non-porous and wear-resistant surface to its line of composite instruments.

This TiN process gives you the final element of control that is needed for perfect sculptability of your composites. There is no pullback effect from the TiN instruments, enabling the composite to be sculpted to the proper anatomy either in the anterior or posterior before curing and thus saving time during the finishing process and creating an esthetic and void-free restoration. The instruments are lightweight and easy to maneuver with the stainless steel EagleLite™ handle. Also, with TiN Engineered instruments, you know that you will still have the same composite handling ability from the first restoration to the 500th due to the corrosion resistance of the TiN/Ti surface engineering.

American Eagle has created composite instruments that match the technology of the composites in use today. Make sure that you don't stay stuck using those old stainless-steel instruments. Let TiN engineering help take your composite restorations to the next level. Learn more by visiting [www.am-eagle.com](http://www.am-eagle.com), phoning (800) 551-5172 or faxing (406) 549-7452.



American Eagle composite instruments provide the long-lasting, non-stick control needed for efficient, esthetic sculpting of today's constantly improving composites and bonding materials. Photos/Provided by American Eagle Instruments

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# Single-bottle adhesive self-cures without any light activation

*Futurabond M+ needs only one coat and 35 seconds*

By VOCO Staff

VOCO recently introduced Futurabond M+, a universal single-bottle adhesive. Futurabond M+ versatility enables it to be used in self-, selective- or total-etch mode without any additional primers on virtually all substrates. Futurabond M+ achieves total-etch bond strength levels with all light- self- and dual-cure resin based composites, cements and core buildup materials. With a dual-cured activator, Futurabond M+ will self-

cure without any light activation, which, according to the company, offers a big advantage for endodontic applications such as post cementation where it avoids the pooling effect, a problem with light-cured adhesives. Futurabond M+ also adheres well to metal, zirconia and ceramic making extra primers unnecessary.

Futurabond M+ needs only one coat and takes 35 seconds from start to finish. Its low film thickness of 9 microns makes bonding margins invisible (i.e. no "halo" effect) and prevents pooling problems. Additionally the material does not need to be refrigerated.

Futurabond M+ achieves total-etch bond strength levels with all light-, self- and dual-cure resin-based composites, cements and core buildup materials. Photos/Provided by VOCO

Further Futurabond M+ benefits include its indication as a desensitizer for use under amalgam restorations or on hypersensitive tooth necks, as a protective varnish for glass ionomers as well as an intraoral repair of ceramic restorations.

For more information on Futurabond M+ you can visit the VOCO website at [www.voco.com](http://www.voco.com).



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VOCO's Bifix Temp offers high esthetics with a simple application that provides users with visually pleasing results. The translucent and tooth-like universal shade blends with highly esthetic temporaries, does not shine through and promotes natural appearance of temporary restorations. Thanks to Bifix Temp's low film thickness, temporaries can be cemented to fit without adjustment.

As a composite-based dual-cure material, Bifix Temp offers 90 seconds of working

time and sets in four minutes. The light-cure mode offers the user control and easy removal of excess material via a "tack-cure" technique that activates an initial elastic gel phase. Any unwanted residues are easy to locate and remove as Bifix Temp's universal shade stands out well against the gingiva.

Bifix Temp comes in an auto-mix syringe with very short tips, making application precise and economical. To learn more, you can visit [www.voco.com](http://www.voco.com).

(Source: VOCO America)

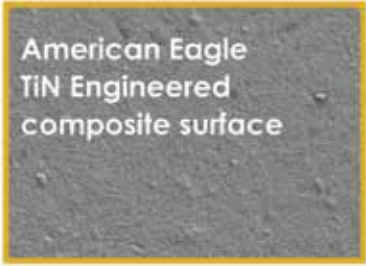
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Paddle/Paddle

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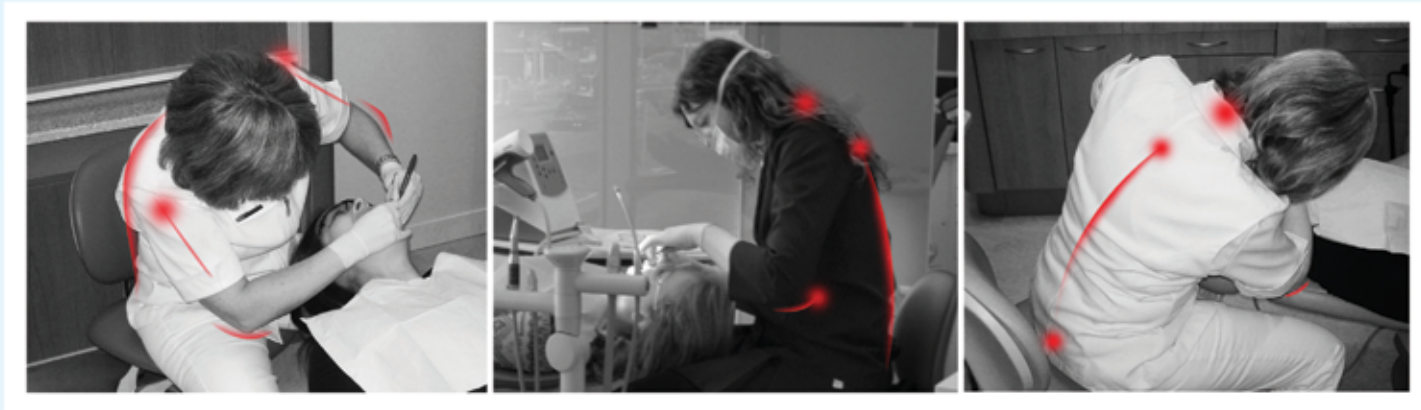
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# Doing well by d

By Robert Selleck, Managing Editor

The people at Henry Schein Canada, in the spirit of the company's philosophy of "Doing Well by Doing Good," created its Calendar of Caring to spotlight the many

charitable programs it supports. The initiative also gives Henry Schein customers the opportunity to contribute a portion of their purchases to help the charitable causes that Henry Schein supports.

This extra support expands the help the company provides, and in appreciation,

participating customers receive a plaque that can be displayed in the office.

In recent efforts, Henry Schein has distributed more than 1,000 backpacks filled with school supplies and clothing to underprivileged children and provided winter holiday gifts to families in need across

Canada. It supplied more than \$500,000 of health care products to underserved people across the globe, planted more than 4,000 trees as part of its Go Green program and backed charitable causes fighting breast, oral and prostate cancer.

At Henry Schein, according to the com-

## Robert McFarlane, DDS

Five years ago, after Mount Forest, Ontario, dentist Dr. Robert McFarlane's wife, Donna, retired from her teaching career, the couple's already expansive volunteer work took flight — literally — to Africa and India.

The McFarlanes were well known for supporting local students, the Mount Forest United Church and the area's hospital. But now — with Donna retired and Bob able to more easily step away for two-week stretches from the 11-chair dental practice he built over the preceding 30 years — the



On a recent Free The Children trip, Dr. Robert and Donna McFarlane with several Masai men near the community of Osenetoi, Kenya. Photo/Provided by Dr. Robert and Donna McFarlane

couple found themselves ready to broaden their volunteer perspective. The broader effort was realized through a fitting symmetry: The local community they had given so much to over the years returned that generosity with the same spirit, contributing time and dollars to support the couple's efforts in Kenya and northwestern India.

Bob McFarlane had never imagined his varied community service work would ultimately take on a global trajectory. His earliest projects with fellow Kinsmen Club members focused on new baseball diamonds, park pavilions and other such amenities for the immediate community. Those successes prompted him to take on a bigger challenge 10 years ago — leading a building restoration effort for the 150-plus-year-old Mount Forest United Church. Under McFarlane's leadership, fundraising goals were quickly met and more than \$1.4 million in restoration work has been completed on the historic structure.

More recently, McFarlane took on the campaign chair position in a capital development project for the community's Louise Marshall Hospital. McFarlane and a core group of other community leaders successfully coordinated the raising of \$5 million in less than two years to upgrade the hospital's emergency services and ambulatory care physical plants and equipment.

Five years ago, Donna's post-retirement research prompted the couple to align with Free The Children the Ontario-based organization founded by then-12-year-old Craig Kielburger in 1995 to fight child labour around the world.

Kielburger would later be joined by his brother Marc, and today their global organization remains dedicated to improving the lives of children and families overseas — as well as across Canada.

For their first Free The Children trip, the McFarlanes put together a team that spent two weeks in the rural community of Osenetoi near the Masai Mara National Game Reserve on the Serengeti Plain at Kenya's border with Tanzania. On that 2010 trip, the group of 21 people helped expand the community's school and health clinic, which primarily serves the area's Masai nomadic communities, totaling more than 300,000 people. Since then, they also have helped fund a deep-water-well drilling project. The McFarlanes already have another group of 19 (including two more dentists) committed to another two-week trip in 2016 to follow-up with more assistance, including providing basic dental care.

Two years ago, the McFarlanes participated in another Free The Children "Adopt a Village" program, this time in India, in the Udaipur and Rajsamand district in the northern desert state of Rajasthan. There, their team of 13 volunteers from Mount Forest helped worked with local schools on building expansion projects.

"It's been an interesting and rewarding venture," McFarlane said. "Giving back to the local community, and now the local community helping to fund a lot of the work we have been able to do in Africa and India. This outreach really has been from our community as a whole."

## Matthew Orzech, DDS

When Dr. Matthew Orzech hit the 20-year mark with his practice in Toronto's Forest Hill neighborhood, he and his wife, Shawna, the practice's marketing manager, wanted to celebrate the anniversary in a way that would benefit the immediate community. Shawna started checking into Toronto-based organizations that were locally focused in their outreach efforts — and that were using virtually all of their funding in direct support of the people being served.

The process ended up revealing a set of neighbors who were a relatively invisible presence in a community known as one of Toronto's most exclusive: There was a homeless population in the shadows being watched over by Ve'ahavta, which identifies itself as a "Jewish humanitarian response to poverty."

The Orzechs liked the fact that a high percentage of Ve'ahavta's funding was going directly to the people being assisted — plus the organization had a strong local focus. So, partnering with Ve'ahavta, the couple launched a "Keep Smiling" program at Orzech's Forest Hill practice (Orzech also has a practice in Toronto's Greektown neighborhood), and the office set a goal of raising \$2,000 to support shifts on the organization's mobile outreach van — with the Orzechs promising to match every dollar raised.

Another big part of the appeal of partnering with Ve'ahavta: The Orzechs, their staff and even their patients were welcome to ride in the van on outreach shifts to dir-

ectly participate in the work, which is exactly what they did.

"This is an affluent area, with large homes," Orzech said, describing the upscale enclave. "We'd like to believe there are no homeless people, so it was eye-opening." The van stays on a known route, and the outreach service has been in place long enough that stopping points and times have become commonly known. Shortly after the van pulls up, Orzech said, a surprising number of people seemingly emerge from nowhere to approach it. The Orzechs contributed toothbrushes, toothpaste and floss to distribute in addition to the organization's standard selection of supplies: socks, T-shirts, sweatshirts and other essentials.

The Keep Smiling campaign ran for the entire year, and the \$2,000 goal was exceeded. Ve'ahavta used the contributions to buy supplies for distribution from the van. The organization also provides pre-employment training, life skills training, social-networking access and workshops that provide outlets for self-expression and creativity.

Orzech's practice got deeper into the spirit of supporting the organization by not just raising funds but by also sponsoring a sock drive, which was enthusiastically supported by many of the practice's patients. The effort was so well received, the office is planning on another sock drive prior to the approach of this winter. "Socks are among the items the organization is always in need of," Orzech said. The outreach van covers its route four to five evenings per week as well as



Dr. Matthew Orzech, far right, distributing dental-hygiene supplies and other essentials to service users of the Ve'ahavta mobile-outreach van, which Orzech and his practice supported with a 'Keep Smiling' fundraising campaign.

Photo/Provided by Dr. Matthew Orzech

one day on the weekend. "It really is impressive to see them work," Orzech said of the outreach workers. "They really know how to connect with people and find out what people need, especially when the cooler months are approaching. We really appreciate their work."

# Doing good



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pany, “giving back” happens 365 days a year, and the Calendar of Caring initiative opens the door to expanding the help the company is able to provide.

Briefly profiled below are a few examples of some of the charitable and community service work being performed by Henry

Schein customers across Canada, many of whom receive donations of Henry Schein supplies in support of the noble efforts.

To learn more about or get involved with Henry Schein Cares, you can contact Peter Jugoon, vice president, special markets and planning, at [peter.jugoon@henryschein.ca](mailto:peter.jugoon@henryschein.ca).

## My Care Dental, Niagara Falls, Ontario

Even before ripples from the global economic downturn of 2008 began being felt in their city, the partners at My Care Dental in Niagara Falls, Ontario, were becoming aware of a growing population in the area with unmet oral health



People typically start lining up between 5 and 5:30 a.m. for My Care Dental Day (formerly McLeod Dental Day). Everybody gets a number and an estimated time for when a treatment slot will be available. Nobody is turned away. Pictured is the 2014 day. The 2015 day marked the practice's seventh year for the free-treatment event. Photo/Provided by My Care Dental

care needs. Various factors were in play, including the lack of fluoride in the municipal water supply and big gaps in insurance coverage. “Caries is rampant in this area,” said Frank Bojic, DDS, one of the partners in the practice. “You don’t need to look too hard to find it.”

Bojic and the practice’s other three partners, Robert MacInnis, DDS, Ian Cheng, DDS, and Joe Rogers, DDS, and associate Habib Tarzi, DDS, all wanted to do something to address the community’s needs. Inspired by Bojic’s membership in the charity Knights of Malta and by a Florida practice that was providing a free-care day for the underserved in its community, the partners decided they should provide a similar free-treatment day in Niagara Falls.

They opted for a Saturday in May, clear of winter/spring weather challenges but before Mother’s Day and summer travel. That first free day, seven years ago, attracted about 65 patients. Virtually all of the practice’s staff of 40 volunteered their time to make the day happen. The event was so well received, it prompted the staff and dentists to enthusiastically repeat it every year since. The number of patients treated now typically exceeds 100.

“We work almost like a MASH unit,” Bojic said. “We approach it like triage and keep the paperwork minimal. We try to see as many people as possible.” People typically start lining up between 5 and 5:30 a.m. in anticipation of the initial “triage,” which includes X-rays, starting at 6:30 a.m. Through that process, everybody in line gets a number and an estimated time for when a treatment slot

will be available. That system continues throughout the day as other patients arrive. First step is usually a cleaning, then, if needed, time with one of the dentists. “Nobody gets turned away,” Bojic said.

It’s mostly restoration work, lots of fillings, with some veneers and composite work on chipped teeth. Typically, even a few root canals are performed. “We have a great team,” Bojic said of the staff and dentists’ efforts. “It really is a well-oiled machine.”

The practice’s 14 operatories stay busy all day. Refreshment stations are set up for patients and staff. The goal is to start winding down around 2 p.m., but that’s rare. Depending on the turnout and demand, the treatments typically finally wrap up closer to 3:30 or 4 p.m. “It’s definitely the busiest day of the year,” Bojic said. “But our staff really knows how to keep things moving, turning over rooms really quick. It’s a great way for us to give back to our community and set a positive example for others. We just really want to spread that sort of good vibe and pay it forward. I think everybody — the patients and the staff — really enjoy the day. I am very thankful for everyone’s efforts. We could not do this without such a fantastic team.”

Bojic said the practice has closely tracked the value of the care cumulatively delivered across the seven annual free days to date. It adds up to \$287,000.

“It’s a lot of hard work and takes a lot of effort,” Bojic said. “But we all feel good about it. I don’t see us ever stopping. I look forward to seeing us hit \$1 million in care.”

## Ramzi Haddad, DDS

Ramzi Haddad, DDS, made his first Health Outreach trip to Guatemala five years ago. He immediately realized that practicing such “pure dentistry” in relatively primitive conditions for extremely appreciative patients was highly gratifying — and he knew he would be back. On his second trip the following year, the team of dental professionals he was with treated 380 patients in one week, breaking the organization’s record. On his third trip Haddad served as project leader, coordinating the organization’s first boat-based mission. His team staffed a dental clinic on a donated houseboat in Guatemala’s Rio Dulce region. The floating clinic (and a satellite shore-based operator they would set up nearby) enabled the team to extend care deep into the rain forest, treating primarily children in remote villages that are home to Guatemala’s Mayan indigenous population. The area has minimal access to even basic health and dental care — and few formal education resources.

Also for the first time on that river trip, the Health Outreach team partnered with a Guatemalan organization experienced with serving the area population to enable a more efficient operation from the moment the volunteers arrived. The local organization working with Haddad’s team was Asociación Ak’ Tenamit, an indigenous community development group that promotes long-term solutions to poverty through education, health care, income generation and cultural programs. The staff and volunteers run

a boarding school serving 523 students from 100 villages. They also run a 24-hour clinic that serves more than 25,000 people — as well as the dental-care boat that was staffed by Haddad’s team.

Health Outreach viewed the riverboat clinics and local partnership as a big success and committed to continue with both, as did Haddad, who shortly after his return was already planning another week-long trip for 2015.

Thirteen volunteers from Canada participated in that January 2015 trip, including five dentists (one, an oral surgeon), four assistants (including Anita Lassak, Nasha Zaheer and Lorena Ramirez-Maldonado, from Haddad’s offices) a physician and a hygienist. On four of the five clinic days, the team staffed three operatories in the boat, with a triage chair on the deck. A ground clinic with two chairs was set up near the boat, enabling the sharing of generators to power five ADEC compressors — and an instrument sterilization station. (On one of the treatment days, operatories were trucked from the boat to a high-mountain village.)

In total, the team treated 405 patients, 80 percent of them children. (Each day, after all the children had been seen, the team would treat parents in need of care.) Most of the work involved restorations and extractions. Haddad was able to perform four root canals between two patients, saving central incisors of two 13-year-old girls. Because two of the clinics were held at the Ak’ Tenamit school, Haddad was able



Dr. Ramzi Haddad, third from right in back, led 13 volunteers (and their translator, far left) on a riverboat dental outreach trip on the Rio Dulce in Guatemala (the deck pictured held the clinic’s triage chair). The 2015 trip was Haddad’s fourth to Guatemala with Health Outreach. Photo/Provided by Health Outreach

to start the root canals on Tuesday and have the patients return Friday for completion. “Our volunteers worked tirelessly and endured risks to see more patients than ever before in the 13-year history of Health Outreach,” Haddad wrote in his field report on the 2015 trip. And, of course, he is already deeply involved in planning a 2016 return.

# Photoacoustic shockwave with irrigant debrides areas files can't reach

By Enrico Divito, DDS

Successful endodontic treatment depends upon maximal debridement and disinfection of the entire root canal system. The root canal system must be shaped to a convenience form that permits adequate cleaning and disinfection by elimination of microbes.<sup>1</sup>

The literature is clear that as much as 35 percent or more of the root canal system remains untouched by any instrumentation technique. Essentially no filing technique allows instruments to sculpt all canal walls and remove infected dentin.<sup>2</sup> To decrease the bacterial load and achieve better debridement, irrigation protocols are used prior to obturation.

The efficacy of the irrigants to decontaminate canal walls has seen significant improvements recently. Both negative and positive apical pressure irrigation techniques have been surpassed by ultrasonically activated irrigants, photo-activated disinfection and laser-activated irrigants in their ability to improve cleanliness of the canal system.<sup>3,4</sup>

In particular, the Er:YAG (Lightwalker Er:YAG& Nd:YAG dental laser, National Dental Inc., Barrie, Ontario) has shown to be effective at removing debris and the smear layer from canal walls.<sup>3,4</sup> A final application of the Er:YAG laser to the sodium hypochlorite already present within the canal, after standardized instrumentation, can result in improved cleaning of the canal walls with a higher quantity of open tubules (Fig. 1) compared with results without the use of the laser.<sup>3,4</sup>

A new application of laser-activated irrigation (LAI), Photon Induced Photoacoustic Streaming (PIPS™), uses an Erbium 2,940 laser to pulse extremely low energy levels of laser light to generate a photoacoustic shockwave, which streams irrigants throughout the entire root canal system.<sup>5</sup>

Using extremely short bursts of peak power, laser energy is directed down into the canal and the action actively pumps the tissue debris out of the canals while cleaning, disinfecting and sterilizing each main canal, lateral canals, dentinal tubules and canal anastomoses to the apex. This movement of irrigant is achieved without the need to place the radial and stripped

laser tip (PIPS tip, Fig. 2) into the canal itself, unlike with other conventional hand and ultrasonic systems.

The tip is held stationary in the coronal aspect of the access preparation only. With the irrigant occupying the entire root canal system, the shockwave travels in all directions during activation and effectively debrides and removes organic tissue remnants. Through this laser-activated turbulent flow phenomenon, clinicians following the PIPS protocol are not required to place the tip into each canal, thus eliminating the need to enlarge and remove more tooth structure to deliver standard needle irrigation to the smaller and more delicate apical anatomy, commonly seen in the apical one third. The results are canal convenience forms that are more conservative, minimally invasive and biomimetic (Fig. 3).

Unlike other laser-activated irrigant techniques, PIPS is not a thermal event, but rather subablative. Properly executed, PIPS creates turbulent photoacoustic agitation of irrigants that move fluids three dimensionally throughout the root canal system even as far as the apical terminus, distant from the radial stripped tip location. By activating the tip in the access cavity and outside the root canal system, the extremely low energy needed to activate the unique PIPS tip (20 mJs or less) is below the threshold of ablation for dentin. Ledging and thermal effects that have plagued the widespread use of other laser systems is completely avoided at the energy levels used by the PIPS technique.<sup>5,6</sup>

Recent testing, performed at the University of Tennessee by Dr. Adam Lloyd, chairman of the department for endodontics, objectively confirmed the improved cleaning and debridement of organic and inorganic tissue left by instrumentation. Microcomputed tomography scans were used to assess before-and-after volumetric change in the internal intaglio of lower first molars treated with PIPS protocol (Fig. 4). Sequential slicing beginning at 6 mm from the apex and moving down to the last 2 mm demonstrated that all slice images showed significant improvements after PIPS.

Because PIPS is a less technique-sensitive, minimally invasive and time-

reducing method — and has demonstrated its ability to decontaminate and debride areas that files and instrumentation cannot reach — success rates rise and retreatment for past failures is possible.<sup>7</sup>

PIPS is also helpful in locating and helping negotiate calcified canals. PIPS is a valuable additional tool in the treatment of endodontics regardless of the shaping and obturation system used.

Laser technology used in endodontics during the past 20 years has undergone an important evolution. Research in recent years has been directed toward producing laser technologies (such as impulses of reduced length, radial-firing and stripped tips) and techniques (such as LAI and PIPS) that are able to simplify laser use in endodontics and minimize the undesirable thermal effects on the dentinal walls, using lower energies in the presence of chemical irrigants. EDTA has proved to be the best solution for the LAI technique that activates the liquid and enhances its cleaning of the smear layer. The use of a laser (PIPS) to activate sodium hypochlorite increases its antimicrobial activity.

Finally, using the correct protocol, the PIPS technique reduces the thermal effects and exerts both a stronger cleaning and bactericidal action, because of its streaming of fluids initiated by the photonic energy of the laser. Further studies are currently underway to validate LAI and PIPS technique as innovative technologies in modern endodontics.

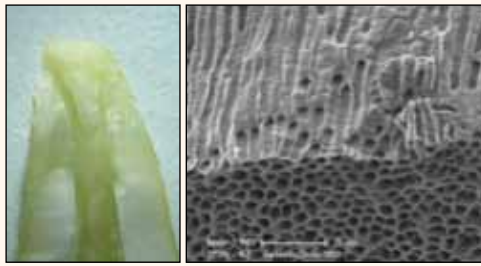


Fig. 1: Left, apical third of root treated with PIPS shows clean surfaces, no thermal damage. Right, SEM of apical third shows clean dentin tubules post PIPS with no thermal damage. Photos/Provided by Enrico Divito, DDS

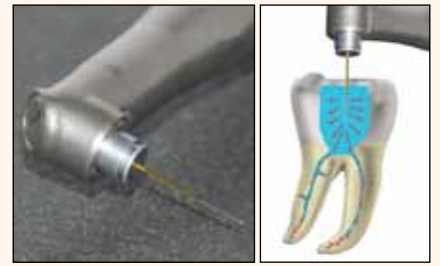


Fig. 2: Left, tapered and stripped PIPS tip used for laser-activated irrigation. Right, position of laser tip in PIPS technique: in the pulp chamber and not in canal.



Fig. 3: Left, pre-treatment. Right, post-treatment obturation after PIPS. Tooth instrumented to a #25/06 taper. Note the conservative convenience form maintaining more original anatomy of root canal system and reducing the need to use larger file sizes, conserving more dentin tooth structure.

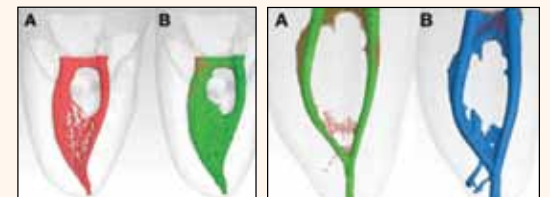


Fig. 4: Left, mandibular molar canal system shows isthmus before (A, red canal) PIPS laser-activated irrigation. Areas of organic tissue and debris from instrumentation completely eliminated, as highlighted by post-PIPS image (B, green canal). Right, mandibular molar with canal preparation to a size 30/04 (A, green canal) obturated with nano-particle BC Sealer (Brasseler USA, Savannah, Ga.) and single cone obturation (B, blue).



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*List of references is available from the publisher on request.*

## Implant-supported total prosthesis (daily routine)

By Dr. E. Veralli and Odt. Luca Ruggiero

In this clinical case, we demonstrate how the use of overdentures are a viable choice among the restoration options for edentulous patients. The clinician must carefully assess the suitable number of implants to support an overdenture to identify the ideal restoration solution.

A systematic review of the literature reveals a lack of information about the ideal number of implants for a removable restoration in an edentulous patient; however, most studies propose to insert two to four implants in the mandible.

We will illustrate all laboratory clinical stages

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Fig. 1



Fig. 2

Figs. 1, 2: Upper/lower master models. Photos/Provided by E. Veralli and Luca Ruggiero



Fig. 3



Fig. 4

Figs. 3, 4: Wax rims leveled and individually adapted.



# Smallest dimensional attachment system designed to be compatible with all implants

*Rhein'83 OT Equator has a reduced vertical profile of 2.1 mm and diameter of 4.4 mm*

Rhein'83, a global producer of precision attachments on removable prosthesis, describes its OT Equator as the smallest dimensional attachment system on the market. It has a reduced vertical profile of 2.1 mm and diameter of 4.4 mm (metal housing included). It is compatible with any implant brand.

Because of its shape, Equator provides superior stability when compared with

traditional attachments, according to the company. It corrects divergence of up to 25 degrees, the company reports. Functionality is guaranteed by coupling of attachment and cap.

Caps are available in four colors, based on levels of retention — from a minimum of 0.6 kg to a maximum of 2.7 kg.

Caps should always be used with metal housing.



To learn more about OT Equator, you can contact the company by email at [info@rhein83usa.it](mailto:info@rhein83usa.it) or by telephone at (877) 778-8383.

You can visit the company online at

[www.rhein83usa.com](http://www.rhein83usa.com) to learn more about all of its products and services, including the OT Equator.

(Source: Rhein'83)

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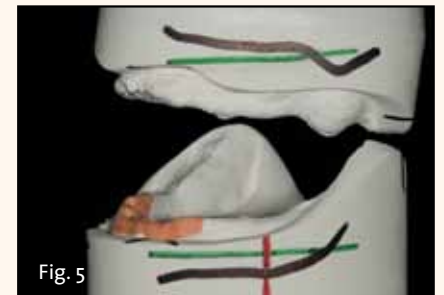


Fig. 5: Analysis of the edentulous ridges vestibular masks.

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according to Prof. Gerber's methods. These steps will lead to the production of an overdenture with OT Cap attachment and OT SpheroBlock abutments on four implants in the lower jaw and complete prosthesis with mucous support for the upper.

### Introduction

In a total edentulism, the prosthesis with a mix of implant support and mucous support represents the boundary between the resilient prosthesis (mucosal supported) and the rigid prosthesis (implant supported).

The prosthesis retained with OT Cap attachments or OT Equator is a hybrid prosthesis that must comply with a set of parameters typical of traditional prostheses. Numerous scientific studies demonstrate that two implants are sufficient to stabilize mandibular complete dentures and to improve significantly the edentulous patient's quality of life. Four implants can noticeably improve the prosthesis retention.

### Clinical case

In an initial interview, the patient asked for a more stable and esthetic prosthesis that would help improve social- and private-life interactions by removing the fear that the lack of teeth — or the prostheses — would be noticeable.

After evaluating with the patient the costs and benefits of the therapeutic options, we chose a solution with Sphero-Block Abutments. Two implants of 3.5 mm and two of 3.0 mm diameters convinced us to abandon the option of a bar because of insufficient implant support.

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