

Top Ten Innovations In Podiatric Care

Technology continues to facilitate advances in podiatry that can make a significant difference for patients. Accordingly, this author talks to a variety of podiatric physicians about emerging options in surgery, wound care, orthotic treatment and other modalities.

By Brian McCurdy, Senior Editor



In this annual look at emerging podiatric technologies and products, the author consults various podiatrists on the benefits of a wound debridement system, an ankle implant, surgical devices, an orthotic casting system, a new method of pathogen detection and more.

1. Qoustic Wound Therapy System™ (Arobella Medical). Ultrasound has been developing over the last few years as a valuable debridement mechanism for various types of lower extremity wounds. An emerging device, the Qoustic Wound Therapy System reportedly provides the benefits of low-frequency ultrasound and accommodates patients who have sensitive wounds.

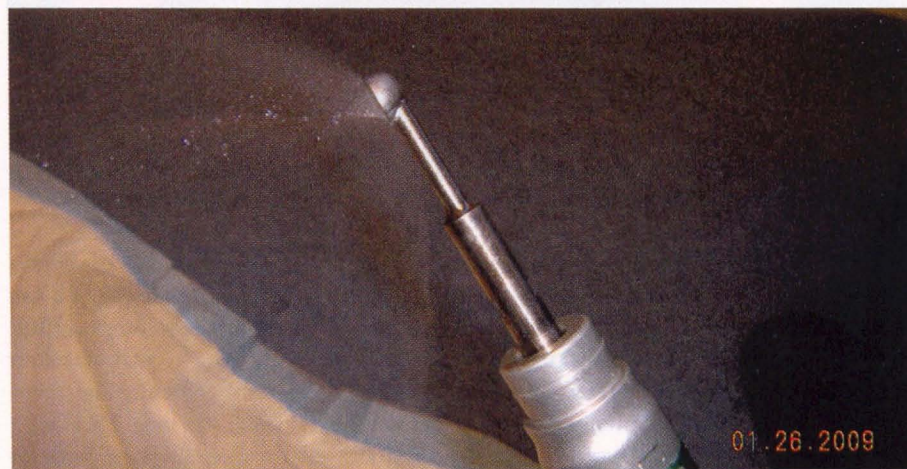
Although low-frequency ultrasound with saline irrigation has been in existence for several years, the Qoustic system includes a unique “curette” design that focuses the saline in a cone shape, which reduces splashing, according to Kazu Suzuki, DPM, CWS. He notes one can use this product in the exam room or operating room, a key advantage over older ultrasound devices, which are limited to use in the OR. In addition, Dr. Suzuki says the Qoustic is the only available ultrasound device on the market that permits both contact and non-contact ultrasound.

The Qoustic system is indicated for wound debridement of acute and chronic ulcers, burns, diseased and necrotic tissue, according to Arobella Medical, the manufacturer of the device. The company adds that the system is helpful for treating diabetic foot ulcers, pressure ulcers, arterial wounds and other lower extremity wounds. Arobella Medical cites the device’s control over the debridement procedure, saying its domed Qoustic Qurette™ allows volumetric removal of unwanted tissue while focusing ultrasonic energy directly on the area of the wound.

Dr. Suzuki says the Qoustic system offers several advantages over other ultrasonic wound debridement devices. Other ultrasound devices may require expensive, proprietary saline bottles, according to Dr. Suzuki, the Medical Director of Tower Wound Care Center at the Cedars-Sinai Medical Towers in Los Angeles. Some ultrasound devices are too painful for patients who are under local anesthesia so he notes this restricts physicians to using them only in the OR. In addition, Dr.



Kazu Suzuki, DPM, CWS, notes one can use the Qoustic system in the exam room or operating room, unlike older ultrasound devices. He also says the Qoustic system is the only available ultrasound device on the market that permits both contact and non-contact ultrasound.



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Suzuki notes the Qoustic device is highly effective in preparing the wound bed prior to skin grafting.

“Since the ultrasound wound devices are known to kill all the bacteria and the biofilms on the wound surface, I believe it is becoming the standard of care to use this modality (ultrasound) prior to applying skin graft or skin substitute,” opines Dr. Suzuki.

Dr. Suzuki notes no contraindications to low-frequency ultrasound debridement but does acknowledge potential limitations of the cost of the equipment.

2. Marathon™ Liquid Skin Protectant (Medline Industries). When it comes to protecting chronic wounds from tears and maceration, physicians may want to consider the use of Marathon Liquid Skin Protectant.

Lee C. Rogers, DPM, notes that the product is cyanoacrylate, a superglue-like material, which is novel in the skin preparation/skin barrier arena. As he explains, the cyanoacrylate forms a flexible barrier that is resistant to wound fluid and blood, which prevents maceration.

Marathon is advantageous as it has a lack of solvent but still dries very quickly, says Dr. Rogers, who notes that solvents that are sometimes used in skin preps are flammable and can cause inflammation. He also notes the product has a fairly long activity and only needs replacement every three days. Dr. Rogers adds that he has used Marathon as an adjunct to VAC therapy (KCI), noting that this combination improves the adhesive drape and prevents VAC therapy-associated maceration.



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Medline Industries says Marathon resists external moisture yet allows the skin to breathe. The company notes that the product lowers the risk of skin tears as it creates a strong barrier against abrasive forces and maintaining skin surface cell integrity. To avoid friction and lower the incidence of skin breakdown, Medline says one can apply Marathon to pressure points, such as hammertoes, ankles, toes and the plantar surface of the foot.

Similar to other skin preps and barriers, Marathon is not for use on the wound bed itself, according to Dr. Rogers, an Associate Medical Director of the Amputation Prevention Center at Valley Presbyterian Hospital in Los Angeles. He notes one can use the product on damaged or denuded skin.

Emerging Device Facilitates Use Of Platelet-Rich Plasma

3. Magellan Autologous Platelet Separator System (Arteriocyte Medical Systems). Platelet-rich plasma (PRP) is a developing technology, which may have benefits for a range of lower extremity conditions. One platelet separator that is coming into wider use is the Magellan Autologous Platelet Separator System.

With a small blood sample or a mixture of blood and bone marrow, one can use the Magellan system to prepare PRP, according to the manufacturer Arteriocyte Medical Systems. The company notes that one can mix PRP with autograft and/or allograft bone prior to application. Babak Baravarian, DPM, praises the ability of the Magellan PRP and bone marrow aspirate kit to facilitate the harvest of stem cell/ bone marrow.

"These products allow improved soft tissue and bone healing, and have radically changed the outlook for biologics use in the body," notes Dr. Baravarian, an Assistant Clinical Professor at the UCLA School of Medicine in Los Angeles.

Dr. Baravarian has been using the Magellan system for approximately three years and has had "excellent results." Arteriocyte Medical Systems cautions that PRP prepared by the Magellan system has not undergone evaluation for clinical indications.

In addition, the product permits one to adjust the concentration of the PRP and bone marrow aspirate, and has a "state of the art" filtration system, according to Dr. Baravarian, the Director of the University Foot and Ankle Institute in Los Angeles.

The company cites the cost effectiveness of the Magellan system, saying one can

conduct as many as three cycles with the same patient. This eliminates the cost of additional platelet separation disposables, according to Arteriocyte Medical Systems. The company adds the device's size makes for easy use in a variety of settings.

Can A Unique Ankle Implant Provide Pain Relief And Improved Mobility?

4. STAR® (Small Bone Innovations). An ankle implant in use for several years in Europe is now making inroads in the United States. The Scandinavian Total Ankle Replacement (STAR) received FDA approval last year and as the manufacturer Small Bone Innovations (SBI) notes, in 19 years, 15,200 patients worldwide have received the implant.

Lawrence DiDomenico, DPM, has used the device since November 2009. The STAR is the only three-piece mobile bearing ankle replacement approved by the FDA that does not require bone cement (polymethylmethacrylate), notes Dr. DiDomenico, the Director of the Reconstructive Rearfoot and Ankle Surgical Fellowship within the Ankle Foot and Care Centers and the Ohio College of Podiatric Medicine.

The STAR is indicated for patients with moderate to severe pain or loss of mobility or function due to post-traumatic arthritis, primary ankle arthritis or rheumatoid arthritis, according to SBI. The company adds that the product is also indicated for painful ankles and ankles with degenerative conditions but sufficient stability.

The STAR comes with a tibial component, available in five sizes, which has a highly polished flat articulation surface and two cylindrical fixation bars on the proximal side of tibia, which anchor the implant in the subchondral bone of the tibia, according to SBI. The company says the implant's talar component has a ridge running anteroposteriorly in the middle of the gliding surface that guides the ultra-high molecular weight polyethylene (UHMWPE) mobile bearing sliding core. Finally, the company notes the flat surface of the mobile bearing articulates with the tibial component while the concave shaped



Babak Baravarian, DPM, has had “excellent” results with the Magellan Autologous Platelet Separator System. He says the technology has “radically changed the outlook for biologics use in the body.”

underside articulates with the convex shaped talar component.

The implant permits more motion in different planes, according to Dr. DiDomenico, a Fellow of the American College of Foot and Ankle Surgeons. He says the STAR also requires less bone resection than other ankle implants.

New Lab Test May Diagnose Infection Faster

5. Tem-PCR (Diatherix Laboratories). Although culture and sensitivity (C&S) testing is the current standard for making a bacteriologic diagnosis of a lower extremity infection, it may take several days to get the results. Meanwhile the patient is on empiric antibiotics, which may have a spectrum that is too broad or narrow. Target enriched multiplex-polymerase chain reaction (Tem-PCR) may offer a quicker solution to diagnose pathogens.

Although polymerase chain reaction (PCR) has been in use for several years to examine the DNA of the organisms found on a specimen and rapidly identify bacteria, Warren Joseph, DPM, says its use has been limited to reference labs and PCR can usually only identify one organism at a time. In contrast, Dr. Joseph says Tem-PCR can identify multiple organisms with a single sample within just a few hours.

Dr. Joseph says one would take a specimen, similar to a standard C&S, and overnight express it to Diatherix Laboratories. The next day, the company gives the clinician the identity of the organism, its relative frequency compared to other bacteria in the specimen and any genetic markers for resistance, according to Dr. Joseph, a Fellow of the Infectious Diseases Society of America. He says the Tem-PCR also identifies the *mecA* gene, which indicates methicillin-resistant *Staphylococcus aureus* (MRSA).

“By rapidly identifying disease-producing pathogens, Tem-PCR results can assist physicians in forming a more accurate diagnosis,” says Dr. Joseph, who is affiliated with the Roxborough Memorial Hospital in Philadelphia.

Diatherix Laboratories notes the technology can identify 23 pathogens from one specimen, including genetic drug resistances, in one day. Tem-PCR can also differentiate among pathogens that may cause similar symptoms and identify co-infections, according to the company. Furthermore, Diatherix says the technology is useful for pre-surgical surveillance of hospital patients and can shorten hospital stays.

“By enabling physicians to link diagnostics to therapeutics, Tem-PCR results can assist by eliminating the inappropriate use of antibiotics, elimi-

nating unnecessary treatments, reducing the development of genetic drug resistance, potentially reducing the cost of therapy and providing a better patient outcome,” explains Dr. Joseph.

As Dr. Joseph explains, Tem-PCR technology provides multiplex amplification of genomic material from multiple pathogens with “greatly increased sensitivity” in comparison to standard multiplex PCR. Since standard multiplex PCR generally cannot amplify multiple pathogens in a single analysis due to each set of primers requiring differing optimum conditions for best amplification, he says Tem-PCR obviates this by turning the multiplex into a singleplex reaction. Dr. Joseph says such a reaction needs one primer set and one set of optimum conditions to obtain the best amplification.

Diatherix claims that most insurance companies cover the test, according to Dr. Joseph.

Making Casting Orthotics For Kids Simpler

6. Pediatric Slipper Sock (STS). Casting orthoses can be a messy proposition for physicians and frustrating for patients due to a slow setting time. When dealing with fearful or impatient children, those challenges can be even more pronounced. However, the new Pediatric Slipper Sock reportedly provides a fast drying resin-based cast with little fuss.

Although slipper socks for foot orthoses have been on the market for adults for a few years, Russell Volpe, DPM, says the socks have only recently been available in pediatric sizes. STS notes that the Pediatric Slipper Sock is designed for children ages 5 to 9. Dr. Volpe has used the Pediatric Slipper Sock for about a year and says it is a “quick, clean, one-piece sock” with no mess from the plaster casting.

“The time saved in applying the cast and the very fast set time with the STS sock are significant advantages when the time a child may cooperate for a cast is limited,” says Dr. Volpe, a Professor in the Department of Orthopedics and Pediatrics at the New York College of Podiatric Medicine.



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Dr. Volpe does note that the STS socks are more expensive than plaster splints and says currently only one size is available. He says the socks are a little too large for smaller children with too much “extra” material in the sock. Although Dr. Volpe will still use the socks in this population when he wants the stated benefits, he feels a smaller size would be helpful.

Expert Pointers On New Surgical Solutions

7. DeNovo® NT Natural Tissue Graft (Zimmer). When treating a patient with articular cartilage defects, podiatric surgeons may want to try an innovative juvenile cartilage allograft tissue.

One may utilize the DeNovo NT Natural Tissue Graft with fibrin fixation in a single stage procedure, according to the manufacturer Zimmer. The company says the DeNovo graft eliminates the need to harvest a periosteal graft.

Christopher F. Hyer, DPM, says the DeNovo NT graft is unique as it is living juvenile cartilage that surgeons can use to replace or patch cartilage defects in patients.

“There really isn’t anything else like it other than obtaining an entire fresh talus graft, which also will contain living cells,” says Dr. Hyer, a Fellow of the American College of Foot and Ankle Surgeons.

Dr. Hyer has used the DeNovo NT graft a few times but cautions that the product is very new and experience with it is limited among physicians.

Zimmer says surgeons have used the DeNovo NT to treat focal articular defects

in areas including the great toe and ankle. The company notes that the surgical technique is simplified and there is no donor site morbidity.

Dr. Hyer says one advantage to the product is that transplanting the living chondrocytes can permit actual hyaline cartilage healing. In comparison, traditional microfracture techniques can only heal with fibrocartilage, according to Dr. Hyer, the Director of the Advanced Foot and Ankle Reconstruction Fellowship at the Orthopedic Foot and Ankle Center in Westerville, Ohio.

However, Dr. Hyer does cite a few downsides to the DeNovo NT graft. He cautions that the process has a lead time of at least six weeks for a donor to become available. Dr. Hyer adds that DeNovo is also more expensive than the traditional microfracture technique. There is also a restriction as far as lesion size and he notes one can only use the DeNovo in a contained cartilage lesion. Osteochondral lesions with cystic bone changes or bone loss are not amenable to the cartilage patch, according to Dr. Hyer.

8. Achilles SutureBridge™ (Arthrex). A recently developed four-anchor fixation system may provide an improved way to help facilitate Achilles tendon repair.

The Achilles SutureBridge enables surgeons to suture an hourglass pattern of FiberWire® over the distal end of the tendon, according to the manufacturer Arthrex. The company says this construct provides a larger area of compression for the Achilles tendon on the cal-

caneus whereas standard anchor fixation only creates a single compression point over the anchor. Arthrex adds that the larger area of compression leads to increased stability.

Dr. Baravarian has had positive results with the SutureBridge, calling it an “excellent anchor system” to repair the Achilles tendon. He notes the technique is based on methods of repairing the rotator cuff.

“It allows for incredible strength at the repair site, which allows rapid recovery and early range of motion,” asserts Dr. Baravarian, who is the Chief of Foot and Ankle Surgery at the Santa Monica/UCLA Medical Center and Orthopedic Hospital in Santa Monica, Calif. He says this strength makes the SutureBridge “the best Achilles repair system for patients with retrocalcaneal exostosis.”

Arthrex says patients who have this procedure can bear weight in a post-op below-knee walking boot. Patients should use crutches for about four weeks postoperatively and can subsequently initiate physical therapy, notes the company.

Can A New Product Provide Cosmetic Cover For Nail Conditions?

9. Keryflex™ (Pod-Advance). Patients with nail pathologies such as onychomycosis can be apprehensive about the appearance of their feet. The new Keryflex may abate some of the worry by masking nail conditions.

Keryflex creates a flexible nail that is non-porous and allows the natural nail to regrow, according to the manufacturer Pod-Advance. The company touts the product’s natural appearance and the fact that it is not affected by acetone, nail polish or detergents. Following nail debridement, one would brush Keryflex Bond onto the nail plate and nail bed, says the company. Then the Keryflex Resin builds up the contour of the nail, allowing nail contouring and sculpting. Finally, the product’s ultraviolet light hardens the substance in two minutes, according to Pod-Advance.

Tracey Vlahovic, DPM, an Associate Professor at the Temple University School of Podiatric Medicine, says the

Top Ten Innovations

school was the first to use the Keryflex product. She adds that in January, Temple started certifying its students in the product's use.

Dr. Vlahovic calls the Keryflex a novel technique of cosmetically masking numerous nail pathologies, including onychomycosis, psoriasis, lichen planus and general dystrophy due to trauma.

"It is a unique cosmetic addition to our profession," says Dr. Vlahovic, a Fellow of the American Professional Wound Care Association.

In addition, the product is not an acrylic nail and is only available in a podiatric physician's office, according to Dr. Vlahovic. She says DPMs can use the Keryflex alone or in conjunction with oral antifungal therapy or laser therapy for onychomycosis.

Can A Portable NPWT Device Enhance Patient Outcomes?

10. SNaP™ Wound Care System (Spiracur). Although negative pressure wound therapy (NPWT) has proven benefits in treating various types of wounds, the size of the device may be cumbersome.

The SNaP Wound Care System is a more portable option that received FDA approval in August 2009. It is indicated to remove small amounts of exudate from chronic, acute, sub-acute, traumatic and dehisced wounds, as well

as diabetic or pressure ulcers, according to the manufacturer Spiracur. The device provides negative pressure at 75 mmHg, 100 mmHg or 125 mmHg.

The company notes that the system is comprised of three components with the cartridge, dressing and strap. The system's exudate canister weighs less than 3 oz and its capacity is 60 cc. The SNaP dressing is composed of a thin, proprietary hydrocolloid that provides a seal and protects the skin at the same time, according to Spiracur. Spiracur notes the product has an integrated check valve that prevents reflux of exudate to the wound.

Kristine Nemes, DPM, has used the SNaP Wound Care System since February and calls it an "incredibly innovative and exciting" device.

"This is a modality I routinely use for deep ulcers without hesitation," she says. "The simplicity of the SNaP device has allowed me to apply negative pressure to ulcers that I would have previously thought inappropriate for NPWT."

Dr. Nemes praises the small size of the device. She says she can use it on patients who would otherwise be at risk of falling due to tubing connected to the traditional larger unit. Physicians can also utilize this device to treat patients who must maintain their daily activities, including careers, according to Dr. Nemes.

Furthermore, the lightweight device attaches to the patient's leg via a strap that

can easily be hidden under clothing, according to Dr. Nemes, who is in private practice in Daly City, Calif.

She adds that the small size and use of gauze allows her to use the SNaP system on toe ulcers and also superficial ulcers that may not be treatable by other NPWT devices.

Bruce Lerman, DPM, also cites the product's portability and says its power system lasts longer than those of other NPWT devices. The company notes the system is powered by a proprietary system that does not use a battery or electricity.

Dr. Lerman has used the SNaP system on traumatic, venous and diabetic wounds. He says he has obtained good results, ranging from a reduction in wound size to complete closure of very complicated wounds. One downside is that one cannot use intermittent pressure on patients, notes Dr. Lerman, who is in private practice in San Jose, Calif.

Dr. Nemes has seen the device decrease the depth of a hallux wound by 14 mm and facilitate granulation over bone in a distal ulcer.

"This (device) has greatly aided my ability to preserve limbs and toes, and has patients ecstatic about their results," maintains Dr. Nemes. ■

Editor's note: Dr. Joseph discloses that he has no financial interest in Diatherix Laboratories or the Tem-PCR.

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