

# Microwaves: A Painless, Efficient New Treatment for Plantar Warts

Independent research supports the effectiveness of this new technology.

BY ALEC HOCHSTEIN, DPM

**P**lantar warts (*Verruca plantaris*) are a familiar challenge for every podiatry practice. Patients turn up at the clinic in hopes of rapid relief from this painful, disfiguring condition, and are instead faced with numerous treatment options—all of which have uncertain success rates. Additionally, many of the common treatments are associated with pain and/or ongoing inconvenience. A new therapy created in

is the catalog of wart removal methodologies that have been available up until now:

## Topical Keratolytics

Salicylic acid is usually the first-line approach to treating warts, sometimes applied in combination with urea, lactic acid, mono- and trichloroacetic acid, or cantharidin. Essential oils, vinegar, duct tape, fluorourasil, silver nitrate, zinc oxide<sup>3</sup>, Vitamin A (retinoids) derived from fish oil<sup>4</sup> and numerous other remedies are also applied to warts. These treatments all require prolonged applications, multiple times each day, over a period of months. Sometimes they cause the supra dermal portion of the wart to be shed, but it often grows back.

## Cryotherapy

This method freezes the wart and destroys the cells, typically using liquid nitrogen. Local anesthesia is sometimes needed for this procedure, which usually causes some damage in surrounding tissue.

## Immunotherapy

A variety of immunotherapy agents are administered by injection, including the measles-mumps-rubella vaccine (MMR), raw *Trichophyton* antigen and/or *Candida albicans* antigen. Needling the wart (under local anesthesia) pushes the virus deeper into the body, in hopes of activating the person's immune system. A variety of topical immunomodulators such as imiquimod (Aldara) are also used off-label to treat plantar warts, with mixed results.<sup>5</sup>

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Scotland offers an effective, noninvasive option, activating the power of the patient's own immune system to address the problem and clear the underlying virus. Below is an overview of the condition and available treatments, along with a detailed look at the new immune therapy.

## The Challenge of Plantar Warts

The human papilloma virus (HPV) is a persistent organism, and like most viruses, has no direct cure; the clinician can only treat the symptoms and wait for the patient's immune system to eliminate the underlying infection. Over 118 types of HPV have been identified, although only five strains typically cause warts on the feet and hands (Types 1, 2, 4, 27 and 57)<sup>1</sup>. No vaccines exist for these strains. Patient susceptibility to HPV is directly related to the strength of the immune system. People with compromised immune systems are more likely to develop warts than are healthy people, and children are more susceptible than are adults.

Plantar warts can be particularly resistant to treatment, and up to one-third of them recur after being treated.<sup>2</sup> Appearing on weight-bearing surfaces of the foot, they grow inward and often cause considerable pain. The virus is contained within the lesion, 2 to 3 mm below the skin surface. This growth habit allows plantar warts to escape detection by the immune system, and for this reason they can persist for years.

Difficulty in resolving a problem inevitably gives rise to many types of treatments, and this is particularly evident in the case of warts. Even if warts are successfully removed, residual virus can cause their recurrence. Below

## New Concepts and Studies

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## Electrocautery and Lasers

Pulsed dye lasers and carbon dioxide lasers have been used to either excise or vaporize verruca lesions, but research<sup>1</sup> indicates that the overall results are not superior to keratolytic topical methods. Similarly, electrocautery is effective at removing the existing wart, but doesn't affect its recurrence, and is also somewhat traumatic to the patient.



15 year old female with multiple plantar verruca

## Excision

In some cases, surgery is used for warts, although even this often turns out to be a temporary solution. In the meantime, the patient may not be able to bear weight on the surgical site during healing, and there is also the issue of potential infection.



Same patient 1 month after one application of Swift Emblation Treatment

bridement is required, and the non-invasive procedure does not require any post-treatment dressing of any kind. While there is some pain during the treatment itself, there is no post-procedural pain experienced.

- Patients are fully mobile immediately following treatment. Research by the company's U.S. distributor indicates that 98 percent of patients continue all their daily activities at a normal level following Swift treatment.

- No smoke or burning odor, such as can occur after electrocautery or laser.
- No sterilization procedures are needed, because a new applicator tip is used for each patient.
- No breaks in the skin are created, so dressings are not required and infection is not a risk.

## New Option: Swift Portable Microwave Device

It's clear from the multiplicity of approaches reviewed above that no reliable solution to plantar warts has yet presented itself. As of January 2019, a new treatment modality called Swift has become available in the United States.

This relatively small (9 lb) device, made by Scotland's Emblation Ltd., provides a precise and effective treatment for warts. The clinician uses a 7 mm applicator to apply 8-10W (watts) of microwave energy directly to the affected skin area. The microwaves penetrate the tissues to a predetermined depth of 3.2mm, heating cells to between 109 to 114 degrees F. This is enough heat to cause proteins inside the virus-infected cells to be released, and the patient's immune system then becomes aware of the presence of the virus. Each application lasts only two seconds. A typical treatment session involves five of these 2-second applications, at intervals of one second. Patients typically experience complete remission after three to four such sessions spaced four weeks apart in order to align with the patient's immune cycle.



The Swift Microwave Therapy System

## Microwaves Inside the Body?

Microwaves operate at a very low frequency (8 GHz) when compared to other types of electromagnetic radiation. Situated on the energy spectrum between radio waves and infra-red waves, microwaves cannot cause any damage to living DNA. When they enter the body from the Swift applicator, they agitate water molecules and cause some friction. They do not break the surface of the skin. The same type of radiation used by Swift is also being used around the world in cutting-edge soft tissue treatments for lung, liver, kidney and breast cancer.

## Comparative Benefits of Swift

- Office visits are shortened, because the procedure is simple. No pre-treatment preparation beyond a light de-

- Microwaves penetrate at a predetermined depth of 3.2mm, no risk of lateral spread/damage.
- Microwaves are better at denaturing the HPV virus than lasers.
- Mosaic warts can be treated in one session, rather than requiring multiple excisions.
- Swift is equally appropriate for all types of warts. It works. Clinical studies on recalcitrant plantar warts indicate a 75.9% clearance rate; however, real world clinical data suggest 85% efficacy.

## Developed in Partnership with Clinicians

Swift was developed through six years of research in the UK, and has undergone thousands of hours of evaluation by podiatrists and dermatologists in that country. The Scottish government and private investors have offered support through this development process, and the result is a tool that genuinely transforms the way that warts are treated. Excellent results have been realized throughout the UK, Canada, and Australia—and as of January 2019, Swift is now available to providers in the United States. Saorsa, Inc, based in Seattle, partners with Emblation to offer the technology in this country. Saorsa has partnered with Western University and Kent State University of Podiatric Medicine as well as performed treatments at Temple University.

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## Supported by Independent Research

In one independent study, published in Case Reports in Dermatology<sup>6</sup>, an adult patient had a painful plantar wart, 10 mm in diameter, on the right styloid process. This wart had been present for over a year, and had not responded to cryotherapy. Microwave energy (50 J [10 W for 5 s]) was applied by means of the Swift applicator, directly onto the surface of the wart. A 75 percent improvement in pain was experienced almost immediately. Three weeks later, a second treatment was given. Pain had completely disappeared by two weeks following that second treatment, and at a six-month follow-up there was no further evidence of the wart.

For clinicians, it is professionally rewarding to be able to offer an effective, efficient treatment for a condition that many patients struggle with for years. Such a revolutionary modality brings financial rewards as well; Saorsa provides an ROI calculator on their website, providing complete transparency with respect to the balance between the device's cost (to purchase or lease) and the increased income that results. The treatment is new and is non-destructive and therefore not covered by any insurer at this point. This eliminates the time demands of insurance paperwork.

With today's advances in biotechnology, it is time to move past the "armamentarium"<sup>1</sup> of partially-effective treatments for verrucae. A true solution to viral infection can arise

only from engaging the body's own immune response, and Swift offers the best tool to activate that engagement. **PM**

## Footnotes

- <sup>1</sup> Clinical Medicine & Research 2006 Dec; 4(4): 273–293.
- <sup>2</sup> Podiatry Today Vol. 26, Issue 7
- <sup>3</sup> International Journal of Dermatology 2007 Apr;46(4): 427-30.
- <sup>4</sup> Virology Journal 2012; 9: 21.
- <sup>5</sup> American Family Physician 2005 Aug 15;72(4): 647-652.
- <sup>6</sup> Case Reports in Dermatology. 2017 May-Aug; 9(2): 102–107.



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**Disclosure: Dr. Hochstein is a key opinion leader and consultant for Saorsa—North American Distributor of Swift Technology.**