

Super-oxidized water kills bacteria; demonstrates potential for healing

BY REBECCA BRYANT
STAFF CORRESPONDENT



Dr. Gutiérrez

International report — Mix salt and water and you get saltwater, which has long been thought to have healing properties. Put the ingredients through an electrolysis process to kick a single oxygen

electron out of its orbit, and the result is a super-oxidized water (SOW) that kills bacteria, viruses, fungi and spores.

Although SOWs have been around for at least 20 years, their use has been hampered by two problems. First, scientists and engineers could not deliver a stable product. Indeed, SOWs had a shelf life so short — a few hours — they had to be manufactured on site, using equipment that could cost more than \$100,000. Second, SOWs were either acidic or alkaline, leading to tissue damage and corrosion of equipment.

pH neutral SOW

Several years ago, all this changed dramatically when Oculus Innovative Sciences of Petaluma, Calif., patented the first process capable of producing a stable, pH-neutral SOW.

Andrés A. Gutiérrez, M.D. Ph.D., who directs the Cell Therapy Unit at the National Institute of Rehabilitation in Mexico City and serves as a medical advisor to Oculus explains, "This is the first time anyone had been able to ship the solution, instead of the equipment to make it."

Physicians worldwide who had been



10-year old patient with leg ulcer shown before and after three months of treatment.



22-year old patient with leg ulcer shown before and after three months of treatment.

Photos: Andrés A. Gutiérrez, M.D., Ph.D.

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following SOWs began to investigate the new product, often skeptically. Anecdotal reports of rapid healing wounds began to circulate at medical conferences.

Mexican doctors led early research efforts. Dr. Gutiérrez reports that they conducted a trial of second and third-degree burn patients divided into two cohorts: patients treated with standard hospital protocols (control) and patients treated with Microcyn (the Mexican brand of Dermacyn.)

"The average hospital stay for the control group was 28 days compared to 14

days for patients treated with Microcyn, Dr. Gutiérrez says. "Also, 46 out of 64 patients in the control group required antibiotics but only six out of 64 in the Microcyn group needed them."

In May, following on the footsteps of regulatory agencies in Canada, Mexico and Europe, the U.S. Food and Drug Administration (FDA) cleared Dermacyn to lubricate, moisturize, clean and debride acute wounds and burns. The product is rated as shelf-stable for up to 12 months. It requires no dilution, mixing or special handling.

Mechanism of action

SOWs appear to work as an anti-infective agent by denaturing proteins in the membrane of single-cell organisms. Differential pressures inside and outside the weakened cell wall cause it to burst. Scavenger cells clean up leftovers.

Multi-cellular organisms are immune to death by implosion because their clumping behavior leaves less membrane exposed. Alberto Piaggese, M.D, consultant diabetologist at the University Hospital of Pisa, Italy, has been using Microcyn on diabetic foot wounds.

“I suspect that the efficacy and safety of Microcyn relies not only in its bactericidal effect — which has been proven both *in vitro* and *in vivo* — but also on its possible interaction with wound biology, since many of the molecules present in the solution have been demonstrated in other contexts to interact with cells and proteins present in healing wounds,” he says. “It may well be that Microcyn could positively enhance wound healing processes, though this has yet to be challenged and demonstrated.”

Benefits of SOWs

If SOWs prove to be an inexpensive disinfectant — the solution is currently sold by prescription only for \$16.80 per 8 oz. bottle, this could help reduce human susceptibility to epidemics.

“I don’t know of any resistance to this solution,” Dr. Gutiérrez says. “So far it will kill any kind of bacteria, mycobacteria, spores, fungi and viruses.”

He adds, “If we can go back to water for cleaning and disinfecting, the world will be a much better place because we are not polluting our environment.”

He points out that Dermacyn has a very low toxicity factor compared to other broad-spectrum alternatives. For example when hydrogen peroxide is applied topically, 100 percent of human fibroblasts die within five minutes. In contrast, 80 percent of fibroblasts persist 30 min-



2-year old patient with hot water burn shown before and after 18 days of treatment with Microcyn.



12-year-old female patient with burns due to clothing igniting after an electrical discharge. Forty-three percent total body surface affected. Shown at one year follow-up after four weeks of treatment.

Photos: Andrés A. Gutiérrez, M.D., Ph.D.

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utes after treatment with Dermacyn.

He further reports that hydrogen peroxide oxidizes DNA, causing mutagenesis. Dermacyn does not.

The solution breaks down into water, sodium and chlorine (most of the chlorine in salt is stripped during electrolysis).

Other uses for SOWs

Emerging reports suggest that this anti-infective agent also blocks the inflammatory process and speeds the healing of burns, wounds and diabetic ulcers. Clinical trials are under way to investigate

additional uses of Dermacyn/Microcyn on several continents. Some of the uses under investigation include: preoperative disinfectant; treatment of periodontal disease and skin disorders; internal irrigation for fistulas, fascitis and peritonitis; and enhanced healing of chronic wounds.

Oculus also hopes to develop antiseptics and disinfectants that can be misted in the air to battle infectious diseases. **DT**

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www.oculus.com

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