

## P3700

**A modern hydrogen peroxide cream for wound healing**

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Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) solution 1% to 6% has been used for cleaning of wounds for many years but is not recommended nowadays because of its concern about potential tissue damaging effects. The product studied here is a H<sub>2</sub>O<sub>2</sub> cream that has been on the market for many years for treatment and prevention of minor skin infections. The H<sub>2</sub>O<sub>2</sub> is stabilized through embedding in a lipid crystalline structure resulting in a depot cream. The lipids used boost the antimicrobial effect of the hydrogen peroxide and the sustained release system results in a product with long lasting antimicrobial effect in situ. The cream is an excellent alternative to topical antibiotics without the risk for bacterial resistance which is an increasing concern. An increased clinical effect has been observed for wound healing when using this cream and this effect is more than an antimicrobial cleaning effect. The exact role and therapeutic levels of H<sub>2</sub>O<sub>2</sub> is not completely understood even if recent knowhow of H<sub>2</sub>O<sub>2</sub> as part of the signalling messenger in wound healing is available. The studies presented here are aiming to correlate the concentration of endogenous H<sub>2</sub>O<sub>2</sub> at the wound site and the significance of exogenous hydrogen peroxide in wound healing. H<sub>2</sub>O<sub>2</sub> is in the body a naturally occurring mediator that is released in the inflammatory processes. It could positively affect wound healing by increasing angiogenesis, facilitate fibroblast proliferation and activity, and increase wound constriction. At the same time, excessive H<sub>2</sub>O<sub>2</sub> may be toxic and prevent wound healing. Release of H<sub>2</sub>O<sub>2</sub> from various formulations including 1% solution and cream, 0.5% solution and cream, and 0.25% cream through flow cells over a period of 4 hours using dialysis membranes was determined. The release of H<sub>2</sub>O<sub>2</sub> was proportional to the concentration in the donor formulations. The concentration released to the wound surface was correlated to bridging cell proliferation studies using cultures of L929 mouse fibroblast and MTS-assay for 24 and 48 hours, respectively. The concentrations of H<sub>2</sub>O<sub>2</sub> ranged from 10<sup>-3</sup> to 10<sup>-10</sup> M, where 10<sup>-3</sup> M and 10<sup>-5</sup> M H<sub>2</sub>O<sub>2</sub> had a profound antiproliferative effect on the L929 cells, compared to the control without addition of H<sub>2</sub>O<sub>2</sub>. Whether H<sub>2</sub>O<sub>2</sub> at the concentrations 10<sup>-6</sup> to 10<sup>-10</sup> M are beneficial for cell proliferation or not, is currently investigated. In conclusion, there is a steady release rate of H<sub>2</sub>O<sub>2</sub> over the dialysis membrane, and H<sub>2</sub>O<sub>2</sub> can inhibit L929 cell proliferation at high concentrations.

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## P3701

**Complications of electrodesiccation for the removal of cutaneous neurofibromas**

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Because neurofibromas are the most conspicuous and stigmatizing feature of neurofibromatosis type 1 (NF1), many patients wish to have their neurofibromas surgically removed. No standard surgical or laser modality is currently recommended for most patients suffering with cutaneous features of neurofibromatosis. Treatment options include excision, ablation with carbon dioxide (CO<sub>2</sub>) laser, and electrodesiccation. The appeal of electrodesiccation is that several hundred neurofibromas can be removed per treatment session. A recent case series published in the plastic surgery literature suggests that electrodesiccation will result in cosmetically pleasing results, although potential complications are not discussed in the manuscript. Potential complications of this surgical approach to manage neurofibromas include open wounds, ongoing discomfort, and frequent skin infections. The importance of these complications in two patients who underwent electrodesiccation of neurofibromas will be illustrated and summarized in detail. Two patients underwent electrodesiccation of multiple neurofibromas by a plastic surgeon with resultant cutaneous complications. The first patient had approximately three hundred neurofibromas electrodesiccated on her face, abdomen, chest, arms, and legs. For half a year following the procedure, she had recurrent cellulitis in a surgical site on her lower leg requiring multiple courses of antibiotics. In addition, chronic lymphedema developed insidiously in that lower extremity. The second patient had 50 neurofibromas electrodesiccated from his chest, abdomen, and knees, and subsequently developed multiple hypertrophic scars in areas of treatment. After his second surgical intervention, in which approximately 100 neurofibromas were electrodesiccated from his back, wound dehiscence occurred, and many smaller wounds developed purulent exudates and surrounding cellulitis that necessitated a course of oral antibiotics. The postoperative complications of each patient will be detailed with photographic documentation and summaries of the diminished quality of life that developed as a direct consequence of the surgical interventions. The surgical outcomes of these two patients suggest that electrodesiccation may not provide optimal amelioration of cutaneous neurofibromas for some afflicted with this neurocutaneous disorder.

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## P3702

**A comparison of facial wound healing agents after removal of dermatosis papulosa nigra in an African American population**

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**Background:** Dermatosis papulosa nigra (DPN) is a benign skin condition that is commonly found in African Americans and others with Fitzpatrick skin types IV, V, and VI. Removal of DPN lesions results in superficial cutaneous wounds that are frequently treated with topical antibiotic ointments. We hypothesize that antibiotics are not necessary for the effective and safe healing of such wounds.

**Objective:** This study compared the wound healing efficacy and safety of a petrolatum-based skin protectant ointment (Beiersdorf) and a combination antibiotic first aid ointment (Johnson and Johnson) for the treatment of cutaneous wounds resulting from removal of DPN lesions.

**Methods:** This double-blind, split-face study removed two DPN lesions from each side of the face of 20 African American subjects. Wounds on opposite sides of the face were treated with petrolatum-based ointment or antibiotic-based ointment twice daily for 21 days. Wounds were evaluated for erythema, edema, crusting, scabbing, epithelial confluence, melanin confluence, general wound appearance, and subjective irritation on days 1, 3, 7, 10, 14, and 21 after surgery using 5-point scales.

**Results:** Wound healing parameter assessments showed no differences between wounds treated with the petrolatum-based ointment versus antibiotic-based ointment in erythema, edema, epithelial confluence, crusting, scabbing, melanin confluence, or post-inflammatory hyperpigmentation at any time point. Subjective irritation was similar between treatments for burning, stinging, itching, tightness, tingling, and pain. Eight subjects experienced mild or moderate post-inflammatory hyperpigmentation. No other adverse events were reported.

**Conclusion:** Postprocedure treatment with either the petrolatum-based skin protectant ointment or the combination antibiotic-based ointment demonstrated equivalent wound healing in an African American population. This is the first study comparing the efficacy of postprocedure wound care products for the treatment of dark-skinned populations. These results support our hypothesis that antibiotics are not necessary for the safe and effective healing of facial wounds resulting from removal of DPN lesions.

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## P3703

**Effect of a combination of a propyl-betaine and polyhexanide containing irrigation solution on methicillin resistant *Staphylococcus aureus* (MRSA) biofilms in porcine model**

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The importance of irrigation for wound debridement has been understood since ancient times. Normal saline or Ringer solution are most frequently used to irrigate wounds. However, it is becoming increasingly evident that wounds which are commonly colonized with biofilm forming bacteria such as *Staphylococcus aureus* can be more difficult to eradicate. Here we report our findings of a new irrigation solution containing propyl-betaine, a mild surfactant and polyhexanide, a disinfective and preservative. The aim of this study was to determine the effects of this wound irrigation solution on methicillin-resistant *S aureus* (MRSA) biofilms using a porcine wound model. Thirty-two partial thickness wounds were created and eight wounds were assigned to four treatment groups: (1) new irrigation solution, (2) Ringer solution, (3) sterile saline, or (4) untreated groups. Wounds were inoculated with MRSA and covered with a polyurethane dressing for 24 hours to allow biofilm formation. After 24 hours, the dressings were removed and wounds irrigated twice a day with the appropriate solution. Colonies from overnight cultures on solid medium were counted and the Log of colony forming units per milliliter (CFU/mL) calculated. Irrigation of wounds with the new irrigation solution resulted in a 93.39% reduction of MRSA at 48 and 72 hours compared to untreated group. The reduction in the new irrigation solution group was statistically significant at 48 and 72 hours compared to all other treatment groups ( $P < .05$ ).

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