

Second-degree Skin Burn Injury Following a Domestic Incident

SUMMARY: Burns caused by heat in domestic kitchens have a high incidence worldwide and commonly result in open wounds and skin scarring. This case study demonstrates the successful treatment of a second-degree skin burn with PCCA formulas 12781 (naltrexone 0.5% and aloe vera 0.2% in Spira-Wash) and 12830 (pentoxifylline 1% in PracaSil-Plus). According to the patient's self-assessment, the 4 primary treatment domains (global satisfaction, effectiveness, convenience and side effects) were all rated over 80 /100. It is suggested that these formulas may be recommended as a viable personalized treatment option in skin burns.

Submitted by: D.H. John Kim, PharmD, FAARFM, President at Robinson Drug Compounding Center, Mendham, NJ

Introduction:

A burn is an injury to the skin or other organic tissues primarily caused by heat (thermal burns). Although preventable, burns are a global public health issue accounting for an estimated 180,000 deaths annually¹. In 2016, there were 486,000 burn injuries in the USA requiring medical treatment². The majority of the incidents occur in the home and workplace; children and women are usually burned in domestic kitchens¹. Burns are classified as first-degree (superficial), second-degree (partial thickness), or third-degree (full thickness), depending on how deep and severely they penetrate the surface of the skin³. Post-inflammatory hyperpigmentation of the skin (melanosis) may occur following a thermal burn (Figure 1).

The purpose of this case study is to discuss the management of a second-degree skin burn injury following a domestic incident with a combination of topical compounded medications.

SKIN BURN

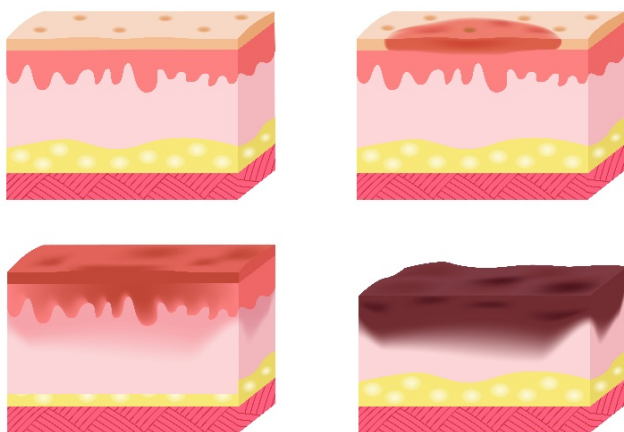


Figure 1. Schematic representation of the skin burn stages (adapted from Gritsalak Karalak/Shutterstock.com).

Case Report:

An adult male was severely burned on the right forearm and hand while opening a container with hot soup under pressure. The patient was admitted to the emergency room for immediate assistance and applied Silvadene® Cream 1% with dry burn dressing for 3 days to absorb all the fluids produced by the burn. Figures 2a and 2b show the patient's second-degree burn 12 hours following the domestic incident. Then for a period of one week the patient applied PCCA formula 12781 (Table 1), which includes naltrexone 0.5% and aloe vera 0.2% in PCCA Spira-Wash Gel. Naltrexone, an opioid receptor antagonist, is known to accelerate fibroblast proliferation and wound healing⁴. Aloe vera, derived from the tropical cactus of the genus aloe, has been traditionally used for its efficacy in the treatment of burn wounds⁵. Spira-Wash is a proprietary gel designed to promote a moist wound environment, ideal for the healing process. Figures 2c and 2d show the patient's second-degree burn 7 days and 10 days following the domestic incident, respectively.

For 5 additional days, the patient combined the naltrexone formula with PCCA formula 12830 (Table 2), which includes pentoxifylline 1% in PCCA PracaSil-Plus. Pentoxifylline, a xanthine derivative, inhibits the production of collagen and reduces the proliferation of fibroblasts in post-burn hypertrophic scars⁶⁻⁷. PracaSil-Plus is a proprietary silicone base containing pracaxi oil developed for the incorporation of different active pharmaceutical ingredients (APIs) indicated in skin regeneration and healing⁸. From day 16 onwards, the patient applied the pentoxifylline formula alone, every day until two months post-injury. Figures 2e and 2f show the patient's second-degree burn 14 days and 2 months following the domestic incident, respectively.

Second-degree Skin Burn Injury Following a Domestic Incident



Figure 2 (a-f). Digital images of the patient's burn injury on the right arm: (a,b) 12h post-injury; (c) 7 days; (d) 10 days; (e) 14 days; and (f) 2 months post-injury.

Rx: PCCA Formula 12781
Naltrexone HCl 0.5%
Aloe Vera 0.2%
Base, PCCA Spira-Wash

Rx: PCCA Formula 12830
Pentoxifylline 1%
Base, PCCA PracaSil-Plus

Tables 1 (above) and 2 (below).
PCCA formulas used to manage the patient's second-degree skin burn injury.

Methodology:

The Treatment Satisfaction Questionnaire for Medication (TSQM) was the research instrument used to evaluate the patient's level of satisfaction or dissatisfaction with the topical compounded medications. The version used was the TSQM 1.4 which comprises 14 questions that rate the treatment's effectiveness, side effects, convenience and the patient's global satisfaction. The majority of the questions are scaled on a five- or seven-point bipolar scale. The TSQM is a generic measure, as opposed to the disease-specific questionnaires, and it is psychometric sound and valid⁹.

Results and Discussion:

The patient answered all questions of the TSQM following 2 months of treatment with the compounded medications. Very good treatment outcomes were reported since all questions were rated with a high score: 100 for side effects (meaning no side effects), 92.9 for global satisfaction, 88.9 for effectiveness and 83.3 for convenience. These outcomes are consistent with the visual improvements observed in Figure 2.

Conclusions:

Burns caused by heat in domestic kitchens have a high incidence worldwide and commonly result in open wounds and skin scarring. Immediate treatment is therefore important to promote wound closure and to limit skin scarring. Compounded medications offer the flexibility to combine multiple drugs in topical bases developed for specific skin conditions, such as PCCA Spira-Wash Gel (wounds) and PracaSil-Plus (scars). This case study demonstrates the successful treatment of a second-degree skin burn with PCCA formulas 12781 (naltrexone and aloe vera) and 12830 (pentoxifylline). It is suggested that these formulas may be recommended as a viable personalized treatment option in skin burns.

References: Please contact us to access the full list.

Copyright statement: The TSQM and the corresponding scoring algorithm are licensed materials. Formal permission was obtained from QuintilesIMS to use these materials for the purposes of PCCA case studies. Those seeking information or permission to use the TSQM are directed to Quintiles at www.quintilesims.com/TSQM or TSQM@quintilesims.com.