

Clinical evidence summaries

# 3M™ DuraPrep™ Surgical Solution

(Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w)

## Patient Preoperative Skin Preparation

### Summary 1

#### DuraPrep Surgical Solution associated with lower SSI rates

Swenson B, Hedrick, TL, Metzger R, Bonatti H, Pruett TL, Sawyer RG. Effects of preoperative skin preparation on postoperative wound infection rates: a prospective study of 3 skin preparation protocols. *Infect Control Hosp Epidemiol.* 2009;30:964-71.

#### Objective

To compare the effects of different skin preparation solutions on surgical-site infection rates.

#### Methodology

Three skin preparations were compared using a sequential implementation design. Each agent was adopted as the preferred modality for a 6-month period for all general surgery cases.

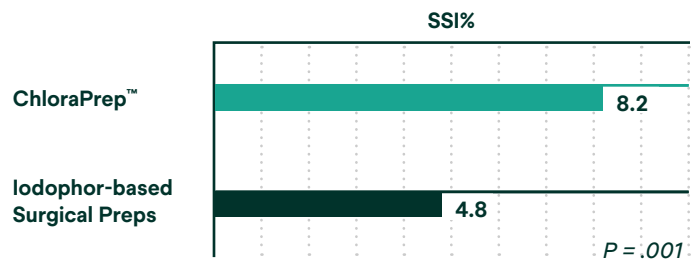
**Period 1** - povidone-iodine scrub-paint combination (Betadine® Solution) with an isopropyl alcohol application between these steps

**Period 2** - 2% chlorhexidine and 70% isopropyl alcohol (ChloraPrep™ Skin Prep)

**Period 3** - iodine povacrylex in isopropyl alcohol (DuraPrep Surgical Solution)

#### Findings

Surgeries using iodophor/alcohol-based surgical preps (including DuraPrep Surgical Solution) had a significantly lower SSI rate than surgeries using ChloraPrep Skin Prep.



SSI rate by prep received  
N = 3,209  
General Surgeries

## Summary 2

### Cardiac bypass surgery: intervention to decrease SSIs

Squier C, Miller T, DiLucia B, Bechtold C, Hardesty R, Muder RR. Cardiac bypass surgery: intervention to decrease surgical site infections. Paper presented at: 4th Decennial International Conference on Nosocomial and Healthcare-Associated Infections; March 2000; Atlanta, GA.

#### Objective

To decrease SSIs following cardiac bypass surgery. From July 1997 – June 1998, the hospital had 7/152 (4.6%) superficial sternal wound infections and 4/152 (2.6%) deep sternal infections requiring 19 surgical interventions for 4 patients and 372 extra days of hospitalization.

#### Methodology

Standards of practice were evaluated while 3 major changes were implemented.

1. A physician's assistant was hired solely to harvest saphenous veins.
2. DuraPrep Surgical Solution\* was used as the intraoperative prep.
3. Pre- and post-operative wound care standards were developed and implemented.

#### Findings

“The implemented changes resulted in a greater than 50% reduction in overall SSI, sternal infection and surgical intervention post-infection. We estimate a reduction of ICU bed days and 15 operative procedures in one year...”

\* DuraPrep Surgical Solution (Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w) Patient Preoperative Skin Preparation.

	Baseline July 1997–June 1998 (n=152)	Practice changes implemented July 1998–June 1999 (n=168)
<b>Total SSI</b>	14 (9.2%)	7 (4.2%)
<b>Superficial sternal infections</b>	7 (4.6%)	0
<b>Deep sternal infections</b>	4 (2.6%)	3 (1.8%)
<b>Surgical interventions needed for infections</b>	19	7

## Summary 3

### DuraPrep Surgical Solution and ChloroPrep™ Skin Prep equally effective at reducing microbes on the skin

Savage JW, Weatherford BW, Sugrue PA, et al. Efficacy of Surgical Preparation Solutions in Lumbar Spine Surgery. *J Bone Joint Surg Am.* 2012;94:490-4.

#### Objective

The purposes of this study were to identify the common bacteria present on skin overlying lumbar spine and determine the positive bacterial culture rate following skin preparation.

#### Methodology

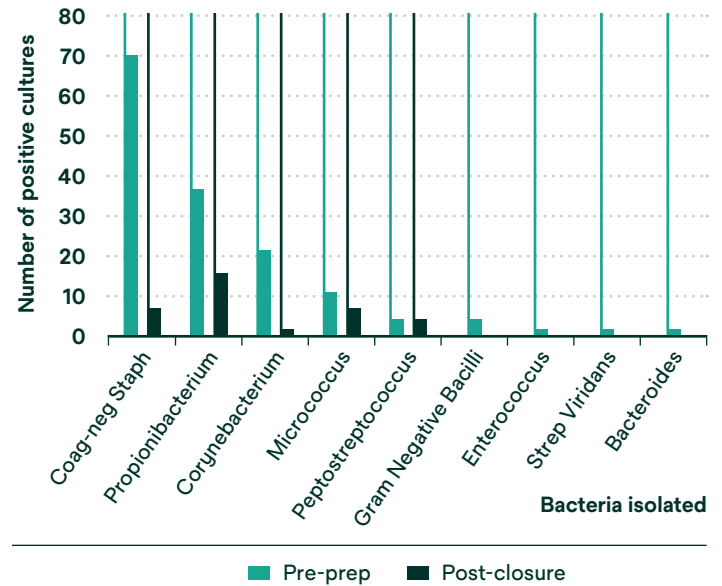
In a prospective randomized study, 100 consecutive patients undergoing lumbar spine surgery were prepped with either DuraPrep Surgical Solution\* or ChloroPrep skin prep. Cultures were obtained at 3 points (pre-prep, post-prep and post closure) using a validated neutralization sampling solution. Positive cultures and specific bacterial pathogens were recorded.

#### Findings

DuraPrep Surgical Solution and ChloroPrep skin prep are equally effective skin preparation solutions ( $P=0.24$ ).

\* DuraPrep Surgical Solution (Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w) Patient Preoperative Skin Preparation

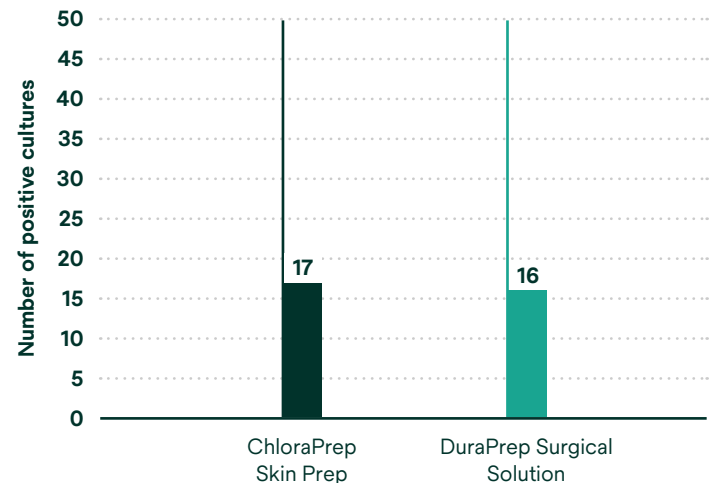
#### Culture results



Number of positive bacterial isolates found on the skin before preparation (Pre-prep) with either ChloroPrep Skin Prep or DuraPrep Surgical Solution, and after wound closure (Post-closure).

#### Post-closure culture results

There was a significant increase in positive culture results after wound closure compared with the rate following skin preparation (3% versus 33%,  $P < 0.0001$ ), but there was no difference between the ChloroPrep Skin Prep (34%, seventeen of fifty) and DuraPrep Surgical Solution (32%, sixteen of fifty) groups (chi-square analysis,  $P = 0.22$ ; 95% CI = 0.284 to 0.483) with regard to post-closure results.



## Summary 4

### Resistance of preoperative skin preparations to saline rinse

Stahl JB, Morse D, Parks PJ. Resistance of antimicrobial skin preparations to saline rinse using a seeded bacteria model. *Am J Infect Control.* 2007;35:367-73.

#### Objective

Evaluate the antimicrobial persistence of two commercially-available skin antiseptic agents following saline exposure.

#### Methodology

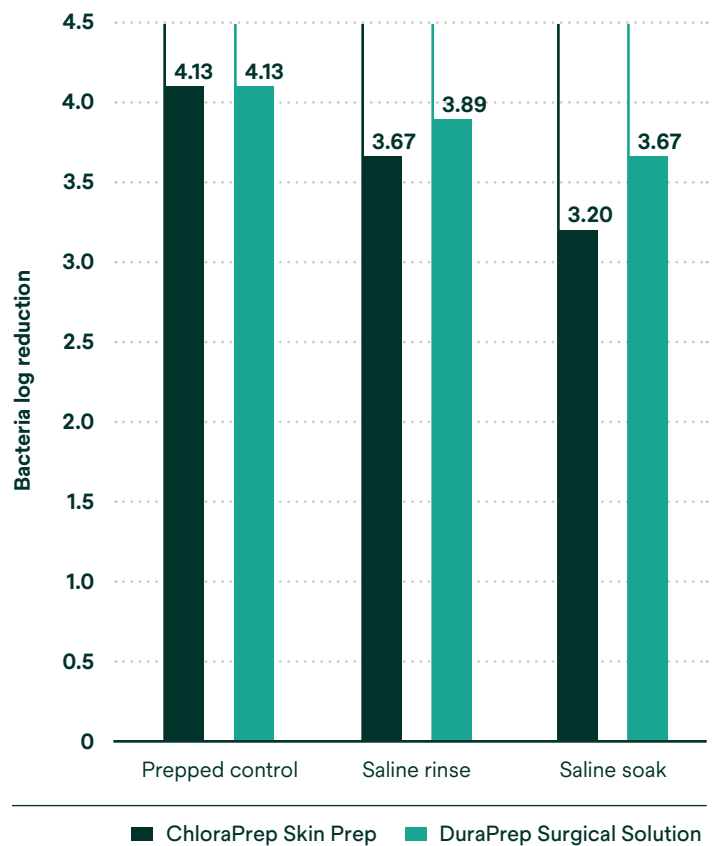
A prospective, randomized study in healthy subjects using DuraPrep Surgical Solution\* and ChloroPrep™ Skin Prep was performed. Preps were applied according to manufacturers' instructions and allowed to dry. The sites were then exposed to either a saline rinse or to a saline-saturated gauze (sponge), similar to the challenges that preps would face during most surgical procedures. Two analyses were performed:

1. An indicator organism was seeded onto the treated sites. After 30 minutes, samples were collected, surviving bacteria were counted, and log reductions calculated.
2. The saline-saturated gauze was analyzed chemically for the presence of chlorhexidine or iodine.

#### Findings

After the challenge, DuraPrep Surgical Solution had significantly higher log reduction compared to ChloroPrep Skin Prep ( $P=.006$ ). In addition, DuraPrep Surgical Solution demonstrated resistance to removal by saline-soaked gauze ( $P<.0001$ ).

#### Power of Provacrylex post-prep log reductions



\* DuraPrep Surgical Solution (Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w) Patient Preoperative Skin Preparation

## Summary 5

### Resists wash-off and maintains persistence for 48 hours

Antimicrobial Persistence of DuraPrep Surgical Solution (Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w) Patient Preoperative Skin Preparation after 48 hours following exposure to blood and saline\*

#### Objective

To evaluate the durability and antimicrobial effectiveness of DuraPrep Surgical Solution following a blood and saline challenge by measuring the regrowth of normal skin flora on the human back at 48 hours post-prep.

#### Methodology

Baseline bacterial counts were taken on the backs of ten healthy volunteers. DuraPrep Surgical Solution was applied and allowed to dry. Post-prep counts were taken

10 minutes after prep dried. Half of the remaining prepped area was then challenged with blood-soaked gauze followed by sterile, saline-soaked gauze. After the blood/saline challenge, post-prep sampling was again performed. Remaining sites were covered for 48 hours. After 48 hours, the coverings were removed and the test sites were sampled. All samples were collected with a neutralizing solution.

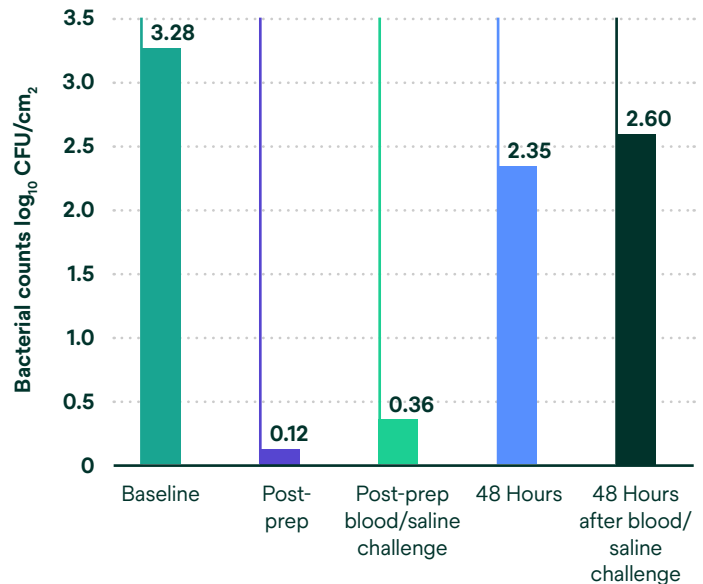
#### Findings

DuraPrep Surgical Solution suppresses regrowth of bacteria for at least 48 hours\*\* with and without a blood and saline challenge (to simulate surgical conditions).

\* 3M Study-05-010565

\*\*following ASTM E1173

#### Bacterial Recovery with and without Blood/Saline Challenge (n=10)



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