3M Science. Applied to Life.™

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.

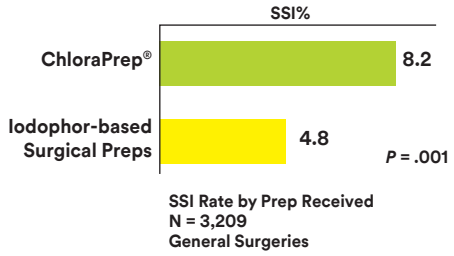
Period 1 - povidone-iodine scrub-paint combination (Betadine® Solution) with an isopropyl alcohol application between these steps

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..."

* 3M™ 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)
Total SSI	14 (9.2%)	7 (4.2%)
Superficial Sternal Infections	7 (4.6%)	0
Deep Sternal Infections	4 (2.6%)	3 (1.8%)
Surgical Interventions Needed for Infections	19	7

Summary 3

DuraPrep Surgical Solution and ChloraPrep™ 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.

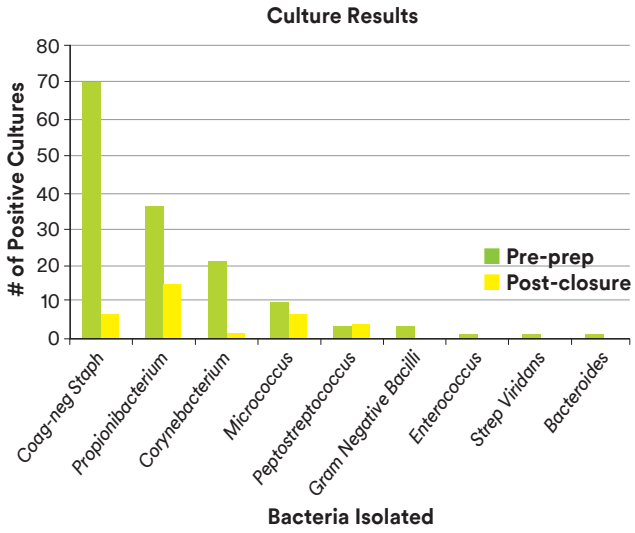
Methodology

In a prospective randomized study, 100 consecutive patients undergoing lumbar spine surgery were prepped with either DuraPrep Surgical Solution* or ChloraPrep 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 ChloraPrep skin prep are equally effective skin preparation solutions (*P*=0.24).

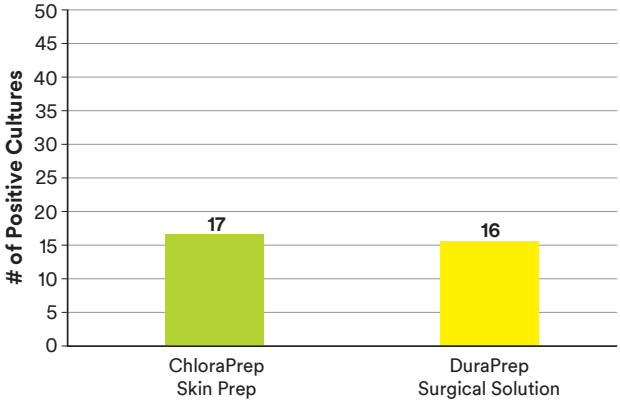
* 3M™ DuraPrep™ Surgical Solution (Iodine Povacrylex [0.7% available iodine] and Isopropyl Alcohol, 74% w/w) Patient Preoperative Skin Preparation



Number of positive bacterial isolates found on the skin before preparation (Pre-prep) with either ChloraPrep 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 ChloraPrep 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.

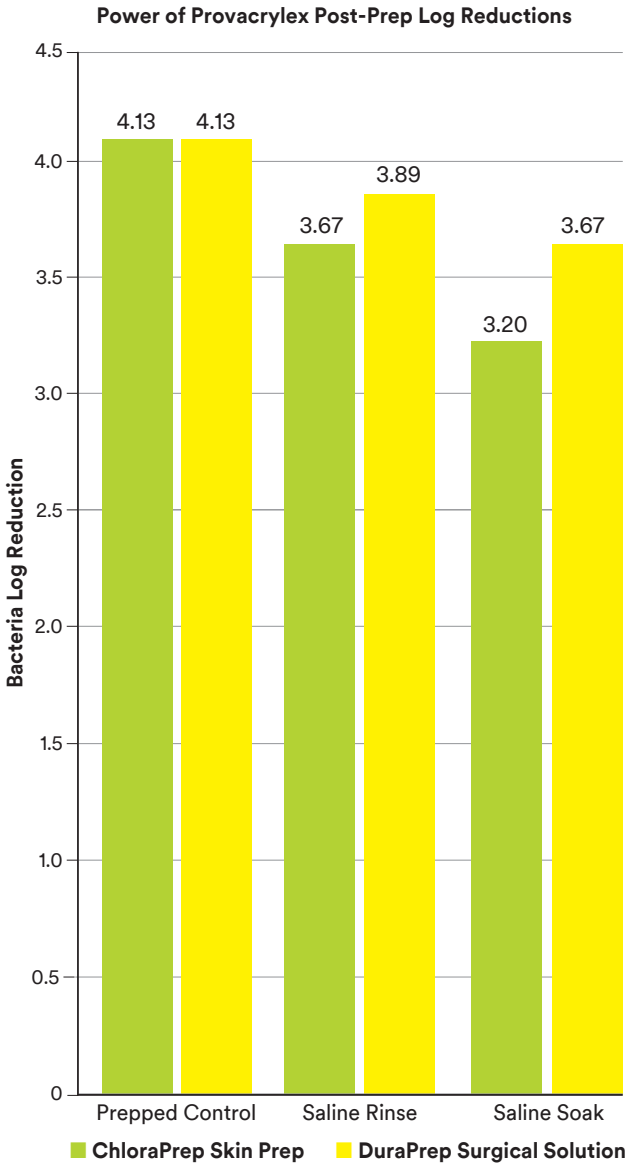
Methodology

A prospective, randomized study in healthy subjects using DuraPrep Surgical Solution* and ChloraPrep™ 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 ChloraPrep Skin Prep (P=.006). In addition, DuraPrep Surgical Solution demonstrated resistance to removal by saline-soaked gauze (P<.0001).



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Summary 5

Resists wash-off and maintains persistence for 48 hours

Antimicrobial Persistence of 3M™ 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.

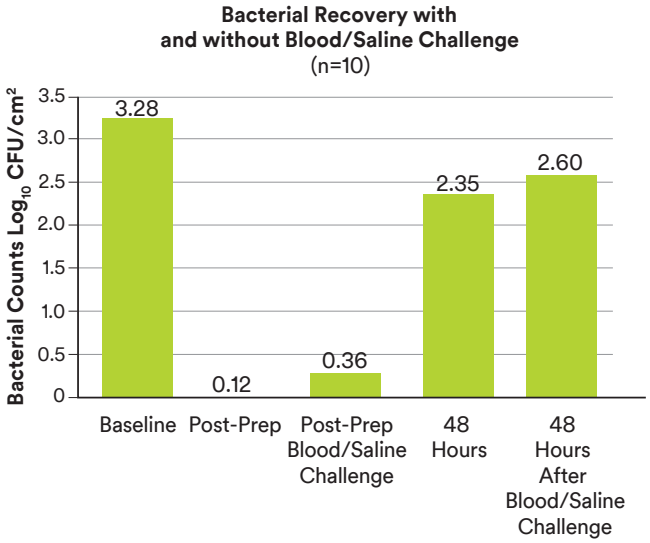
Methodology

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



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