



# A Novel Activated Zinc Solution with Improved Efficacy Against Pseudomonas and MRSA Biofilm Compared to Chlorhexidine and Povidone-Iodine

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## Introduction

- 2-4% of surgeries result in Surgical Site Infections (SSI)
- Irrigation fluid is a potentially highly cost-effective modality for both prevention and management of SSI by minimizing bacterial contamination and eradicating biofilm
- Identify the optimal irrigation agent remains challenging as there is limited comparative data between existing commercial products

## Purpose

- Investigate the antimicrobial efficacy of a novel activated zinc solution against Pseudomonas and MRSA biofilms
- Compare efficacy against the two most common commercially available antiseptic solutions: dilute chlorhexidine and povidone-iodine

## Methods

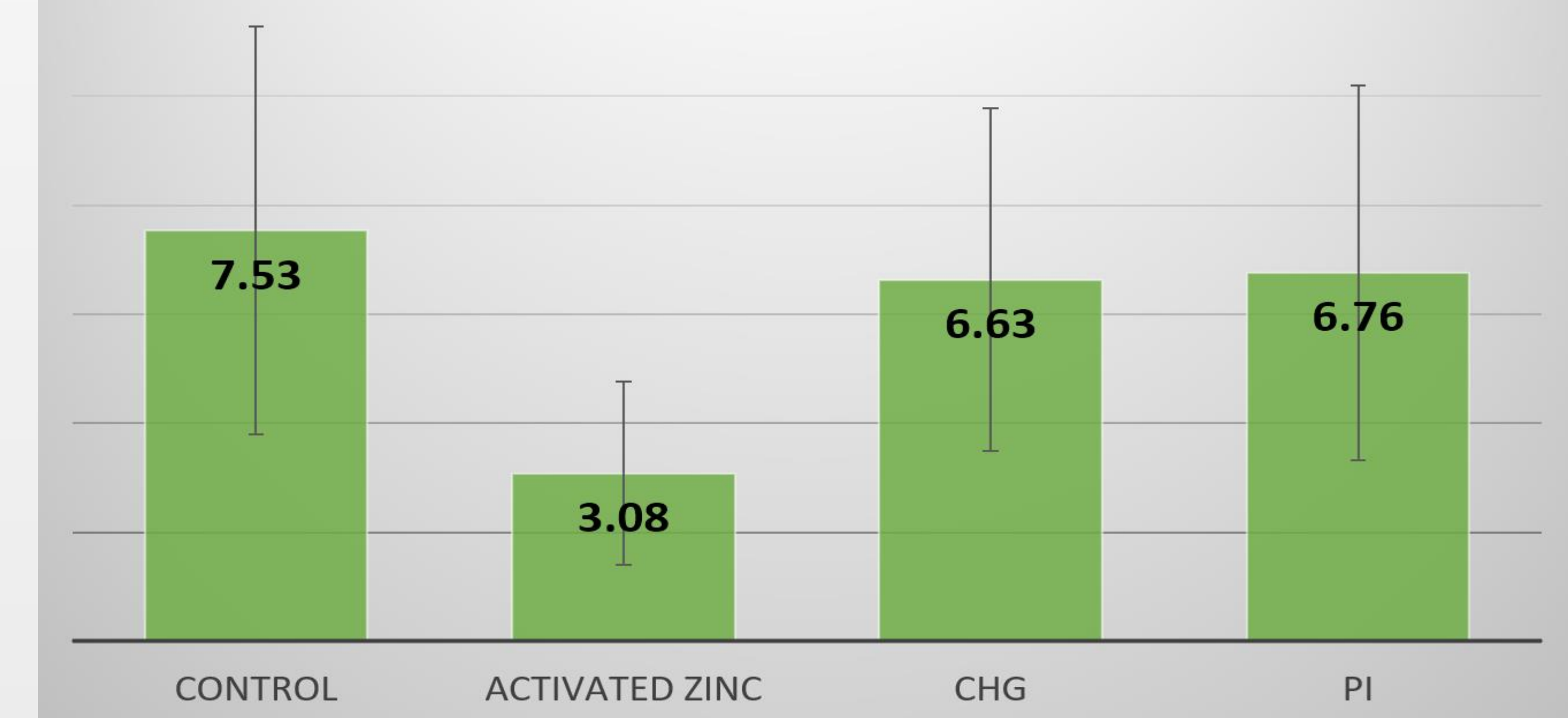
- A Modified Robbins Device (MRD) was utilized to inoculate and form Pseudomonas and MRSA biofilms, followed by biofilm exposure to irrigant (Figure, Bottom Right)
- The primary outcome was bacterial reduction after 2 hours of biofilm exposure to an activated zinc solution, dilute chlorhexidine (Irrisept, Innovation Technologies, Inc, Lawrenceville, GA), and 0.35% dilute povidone-iodine, and compare to untreated
- Our prior in vivo data demonstrated no statistically significant increase in tissue necrosis with 24-hour exposure to our activated zinc solution (Data not shown)

Antiseptic Solution	Pseudomonas (Top Graph)	MRSA (Bottom Graph)
Novel Activated Zinc	4.5 log reduction (99.996%)	7.1 log reduction (100%)
Dilute CHG	0.9 log reduction (87%) p<0.00001	1.9 log reduction (98.6%) p<0.01
Povidone-iodine	0.8 log reduction (83%) p<0.00001	3.2 log reduction (99.9%) p<0.01

## Conclusion

- There is a strong need for high potency, low irritation antimicrobial and anti-biofilm antiseptic irrigation solutions
- Our results demonstrate that our activated zinc solution is superior to commercially available dilute chlorhexidine (Irrisept) and dilute povidone-iodine against both MRSA and Pseudomonas biofilms at 2 hours of exposure
- Activated zinc is a strong candidate to replace less effective and/or highly toxic commercially available wound irrigants currently on the market
- Future studies will explore more clinically-relevant exposure times.

Log CFUs Pseudomonas Biofilm 2 hours Exposure



Log CFUs MRSA Biofilm 2 hours Exposure

