



[Return to AAOS 2014 Annual Meeting](#)

Presentation Abstract

Print

Session: P111-P205-Adult Reconstruction Knee Posters

Date/Time: Tuesday, Mar 11, 2014, 8:00 AM - 3:00 PM

Presentation Number: P182

Posterboard Number: P182

Title: Povidone-iodine Inhibits Bone Cement Polymerization

Classification: +Basic Science/Biologics (Knee)

Keywords: Basic Science; Total Knee Arthroplasty Infection; Total Knee Arthroplasty Complications; Total Knee Arthroplasty Technique

Author(s): **Joshua Bingham**, MD, Mesa, Arizona  
**Alexander C. McLaren**, MD, Phoenix, Arizona  
**Henry D. Clarke**, MD, Phoenix, Arizona  
**Ryan McLemore**, PhD, Phoenix, Arizona

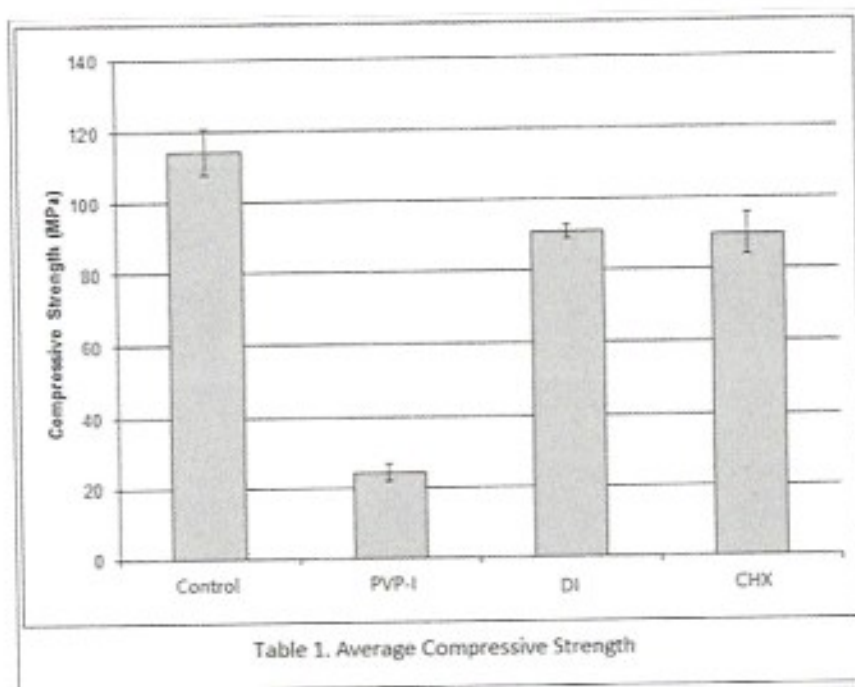
Abstract: INTRODUCTION: Bone cement sets by free radical polymerization of the liquid monomer around particulate polymethylmethacrylate (PMMA) powder. Antiseptic agents including povidone-iodine (PVP-I) and chlorhexidine (CHX) are used for intraoperative irrigation to decrease implant

infections. These agents disrupt bacterial cell membranes through oxidation. Their oxidative properties may also affect polymerization of the PMMA leading to the study question: Does PVP-I or CHX inhibit PMMA polymerization?

**METHODS:** Bone cement was prepared in four formulations. 1) no antiseptic, 2) 4ml deionized (DI) H<sub>2</sub>O, 3) 4ml 4% CHX or 4) 4ml 10% PVP-I per batch of cement (40g powder PMMA and 20ml of liquid monomer). The cement was mixed by hand without vacuum, then molded into standardized 12x6mm cylinders (ASTM F451-08) and allowed to harden for 48 hours. Ten cylinders from each group totaling 40 test cylinders were studied. Set times were measured. All specimens were axially loaded to failure at 24.0mm per minute in a test frame. The yield point for each group was determined and subjected to statistical analysis using ANOVA with post-hoc t-test to determine changes in compressive strength between groups.

**RESULTS:** PVP-I took the longest to set: control-13.75+/- SD, DI- 8.75+/-SD, CHX-10.25+/-SD and PVP-I > 1440 minutes. PVP-I also had the lowest compressive strength (P<0.001): control-114+/-SD, DI- 90.9+/-SD, CHX-89.9+/-SD and PVP-I- 24.1+/-SD MPa.

**DISCUSSION AND CONCLUSION:** Our data are consistent with PVP-I inhibition of PMMA polymerization. This may occur clinically at the surface of polymerizing PMMA exposed to PVP-I irrigation. Until further data is obtained it may be prudent to not expose PMMA to PVP-I until after it has hardened.



---

*Please remember to clear your previously entered search criteria when doing a new search.*

6300 North River Road  
Rosemont, Illinois  
60018-4262  
Phone 847.823.7186  
Fax 847.823.8125

***Need Technical Assistance?***  
***OASIS Helpdesk***  
***Hours: 8:00 AM - 5:00 PM CT***

---

The Online