

## INTRODUCTION

- While the optimal pre-operative preparation solutions has been debated, the application process is seldom considered.
- Surface anatomy of the hand raises concern for “missed spots” after pre-operative preparation using commercially available “prep-sticks.”

## PURPOSE

- To determine the extend of skin coverage during surgical preparation of the hand using a commercially available prep-stick as compared to immersed 4x4cm sterile gauze sponges applied manually.

## MATERIALS & METHODS

- 60 upper extremities of 30 healthy volunteers were utilized.
- Standard operating room set-up and positioning; supine with upper extremity positioned over a bolster.
- 2 fellowship trained hand surgeons prepared all subjects as 30 matched pairs.
- Experimental group:** Prep-stick (26ml applicator, Chloraprep, Carefusion, San Diego CA) (Figure 1)
- Control group:** 4x4cm sponges immersed in solution and applied by a gloved surgeon using two hands. (Figure 1)
- Solution in all cases was a commercially available material that illuminates under exposure to UV-A light (GloGerm, Moab UT)
- All volunteers' hands were washed with a cleaning solvent prior to preparation and were checked under UV-A light to ensure no pre-existing sites of illumination.
- One hand of the volunteer was prepped with the experimental method, while the other hand was prepped with the control method, as matched pairs.
- In a dark room, the hands were exposed to UV-A light after prepped by the hand surgeon, and were inspected for Un-prepped areas (UPA's), ie: sites that did not illuminate. (Figure 2)
- The volar and dorsal aspects of the hands were digitally photographed. (Figure 2)
- Image analysis software analyzed each photograph to determine the combined percentage of uncovered skin on each hand.

## FIGURES



Figure 1. (Left) Control method; immersed gauze sponges applied by gloved hands, (Right) commercially available prep-stick



Figure 2. (Left) Digital photograph demonstrating UPAs, (Right) Imaging software recognition of UPAs.

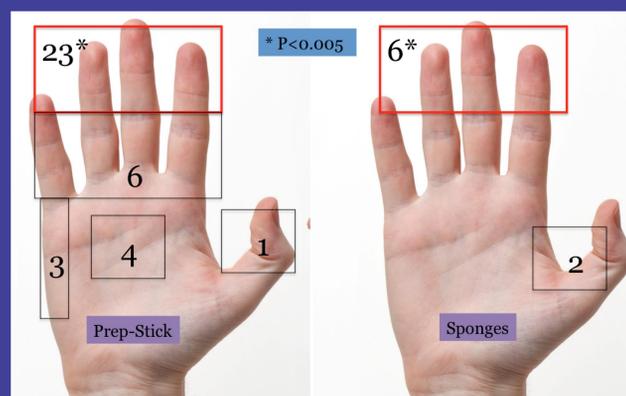
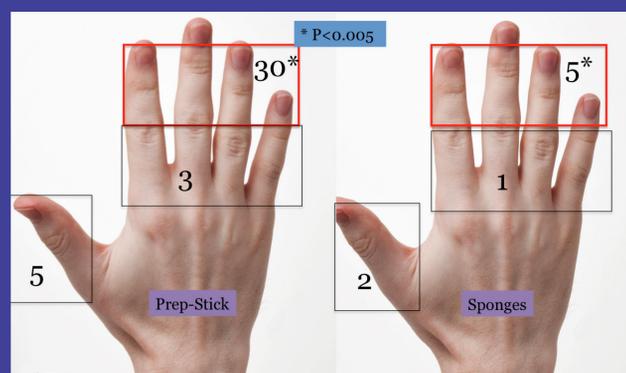


Figure 3. Location of UPA's comparing prep-stick (left) and control method (right)

## RESULTS

- There were 77 Un-prepped areas (UPAs) when using the prep-stick vs. 14 UPA's when using the control method.
- Ave UPAs per hand for the experimental method was 2.63 vs. 0.43 for control.
- When categorizing the number of UPAs by anatomic location, the sites were found most commonly at the dorsal and volar aspects of the fingers distal to the PIP joint. (Figure 3)
- Average percentage of UPAs was 0.76% vs. 0.15% after digital analysis of the experimental and control groups respectively.

## DISCUSSION/CONCLUSIONS

- This study demonstrates significantly more un-prepped areas when using a commercially available prep-stick vs. immersed gauze sponges applied by a sterile gloved surgeon using both hands.
- Intricate surface anatomy of the hand may explain our results, but may not translate to areas of the body with easily accessible surface anatomy ie: back, abdomen, thigh.
- Hand and wrist does not have positional stability when positioned, and the use of two hands in the prep-process may be beneficial.
- The highest concentration of UPAs were found distal to the PIP joint, and should be a site of concern irrespective of method used.

## REFERENCES

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