



LOUISIANA FOOT & ANKLE SPECIALISTS

Daniel T. Hall IV, DPM

Mallory M. Przybylski Hall, DPM

212 W. McNeese Street, Lake Charles, LA

(337) 474-2233 (337) 478-1994

ULTRAPREP Research Study

The primary objectives of any high-volume surgery department across the country should include the following: patient safety, block time utilization and operating room efficiency. With the advancements in surgery technology and equipment, many surgeons are able to perform procedures faster with reproducible precision and successful surgical outcomes than ever before. This, among other factors, has led to the steady increase in the volume of surgeries performed on a yearly basis in the United States. Additionally, with the increased requirements of electronic medical records and hospital documentation, the peri-operative setting has become more burdensome for operating room nurses and staff.

Introducing Ultra-Prep. As Department Chairman and Chief of Surgery, I have witnessed first-hand the increased regulatory demands and responsibility of a high-volume operating room and the expanded roles of the peri-operative team. Ultra-Prep has set a new standard within my surgical practice. This device has proven to decrease operating room time, decrease the work-load on the operating room nurses and staff, while keeping the surgical site infection rates to a minimum. As a surgeon, increased speed is an important aspect of practice, but what is even more importance is maintaining a low surgical site infection rate. A device that can improve operating room efficiency and speed, but also maintain or improve the efficiency of the sterile surgical preparation would be of great use in a variety of surgical settings.

Daniel Thomas Hall IV DPM

ULTRAPREP Study Abstract

Introduction: With the increased costs of medical care, there is a constant drive to control and improve spending across all fields of medicine. In particular, exploration into decreasing operating room costs and improving efficiency has become of significant importance. One aspect of improving efficiency in the operating room (OR) is patient preparation. One aspect, pre-operative skin preparation, is a vital part of patient care as it impacts surgical site infection rate, thus morbidity and mortality, length of stay in the hospital, health care costs and readmission rates. A device that can reduce surgical site infection rates, reduce OR time, and increase patient safety would be highly beneficial to investigate. A novel device, ULTRAPREP (Prep Tech, LLC; Lake Charles, LA), is a sterile, medical-grade plastic bag that is applied to the upper or lower extremity in the pre-operative holding area and allows the nurse to complete the disinfection process prior to entering the OR. The device has been evaluated in this prospective, randomized study performed in an outpatient surgical setting in a single hospital setting. The aims of this study were: to determine whether the ULTRAPREP (Prep Tech, LLC; Lake Charles, LA) device reduces OR time as compared to conventional skin preparation techniques, to determine if the antiseptic efficacy of the ULTRAPREP (Prep Tech, LLC; Lake Charles, LA) device meets or exceeds conventional skin preparation techniques as measured by bacterial colony forming units(CFU) via superficial skin swab, and to explore the impact of this device on OR procedures, workflow and user experiences.

Methods: Surgeons operating on the upper and lower extremity at Lake Charles Memorial Hospital were selected to participate in this study. Patients (greater than 18 years of age) undergoing elective upper or lower extremity surgery within the data collection period were eligible for inclusion in the study. Consenting patients were randomized into a control (Conventional skin preparation technique) and treatment (use of ULTRAPREP skin preparation technique) group. Culture swabs were obtained from the hand or foot before and after the conventional or treatment group skin preparation technique was performed and CFU were documented at 48 hours and 72 hours. Patient blood pressures were documented as well as multiple time values in order to calculate patient preparation time after entering the OR.

Results: Analysis of data was undertaken via repeated measures of Anova. The analysis of bacterial load in skin swabs obtained post-surgical skin preparation in the control vs treatment group did not reveal a significant main effect ($F=2.35$, $p=0.14$, $ES=0.07$). The treatment group overall resulted in reduction in skin preparation time from 1006.8 ± 207.6 sec to 652.6 ± 159.8 sec, which was a 35.1% reduction in preparation time for the treatment group.

Discussion: In conclusion, reducing OR preparation time, improving surgical skin preparation efficiency, while maintaining optimal skin disinfection can be achieved with a novel product that allows for surgical skin preparation in the pre-operative holding area. The ULTRAPREP (Prep Tech, LLC; Lake Charles, LA) device reduced pre-operative preparation time by six minutes while demonstrating equal efficacy in bacterial count reduction as compared to the control group. This device has the ability to revolutionize OR utilization and reduce time spent in the OR leading to cost reduction and improved workflow. Future research should be performed for further evaluation of the device. Likely, additional time savings can be achieved as nursing staff become more familiar with the device and efficiency improves.