

## AN EVALUATION OF SURGICAL SKIN PREPARATIONS FOR CHILDREN UNDERGOING PENILE SURGERY

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**BACKGROUND:** Post-operative infection is rare following circumcision and other corrective penile surgeries. Recent studies have demonstrated skin preparation with povidone iodine to be noninferior to chlorhexidine in preventing surgical site infections, though primarily across cardiac and abdominal surgeries. Direct comparisons of these two agents in the context of penile surgery remain limited in the literature. In parallel, growing attention to the environmental impact of modern operating rooms has highlighted surgical packaging of single-use materials as a primary contributor to hospital waste and pollution. Different surgeons have their own preferences that have originated from common practice and not proven superiority. Routine skin preparation for penile surgery at this facility has evolved to include standard povidone-iodine skin preparation (including scrub applicators), custom povidone-iodine preparation, and chlorhexidine skin preparation. Our custom povidone-iodine skin preparation aims to minimize cost and waste, limiting supplies to two surgical sponges and a smaller bottle of povidone-iodine. Should this custom preparation prove noninferior to chlorhexidine in our patient population, a case could be made for recommending the cheaper povidone-iodine which also grants better environmental sustainability.

**METHODS:** Patients were eligible for inclusion if they were 0–18 years of age at the time of surgery, underwent a penile surgical procedure, and were managed with one of three surgical skin preparation methods under investigation. A total of 445 cases from the 2024 calendar year met these criteria. A retrospective review of the electronic medical record extracted data including type of surgery, surgical skin preparation used, and follow-up information including postoperative antibacterial/antifungal use. Given the low rate of infection and limited follow-up, this investigation defines a post-operative surgical site infection as any antibiotic use during the one-month post-operative period, unless documented for a non-genitourinary site. Cases were grouped by skin preparation used: standard povidone-iodine (Prep 1), custom povidone-iodine (Prep 2), and chlorhexidine (Prep 3). A chi-square analysis was performed to evaluate the association between surgical skin preparation type and the rate of postoperative infection, as well as the association between preparation used and dermatitis requiring an antifungal.

**RESULTS:** Of the 445 cases included in the study, 10 developed postoperative infections, corresponding to an overall infection rate of 2.24%. The postoperative infection rates for Prep 1, Prep 2, and Prep 3 were 3.9%, 1.75%, and 1.74%, respectively. Chi-square analysis evaluating the association between surgical skin preparation type and postoperative infection rate demonstrated no significant difference ( $p = 0.43$ ). The overall rate of candidal dermatitis was 2.7%. The rates of candidal dermatitis for Prep 1, Prep 2, and Prep 3 were 3.9%, 2.6%, and 1.7%, respectively. Chi-square analysis evaluating the association between surgical skin preparation type and the incidence of candidal dermatitis also demonstrated no significant difference ( $p = 0.61$ ).

**CONCLUSIONS:** Our data demonstrated no statistically significant difference between rates of postoperative infection or candidal dermatitis based on surgical skin preparation type. Our current results suggest moving towards the most economical and environmental sustainable option, our custom povidone-iodine preparation. Further investigation through prospective study may clarify whether surgical skin preparation type influences postoperative infection risk.