

SH20: Is it necessary for patients to use home-based skin cleansers prior to surgery? If so, what is the best?

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Recommendation: The pre-operative use of benzoyl peroxide is the most studied at home treatment prior to shoulder surgery. The majority of studies demonstrate a reduction in the skin bacterial load, however there is not complete eradication, and most studies found the pre-operative prep in the operating room had the most significant reduction in positive skin cultures. There are not insignificant reports of skin irritation and patient compliance of at home treatment.

Strength of Recommendation: Limited

Rationale: A PubMed/Medline search was used from database inception to September 2024. The following MeSH terms with appropriate Boolean operators were used to search for the listed question: “shoulder”, “arthroplasty”, “replacement”, “benzoyl”, “chlorhexidine”, “self-cleanse”, and “wash”. A manual search was then performed forward and backward on relevant citations and related articles to those that were found in the search. After completing the search there were 1,803 articles to review with 625 unique articles after removing duplicates. These articles were screened for relevance based on titles and abstracts which left 59 articles. The full texts of these articles were then reviewed to leave 17 articles.

Most of the studies reviewed focus on the use of benzoyl peroxide (BPO) preoperatively in varying number of days. Some studies focus on BPO on its own, while other compare the efficacy of BPO versus other agents such as chlorhexidine, clindamycin, metronidazole, and blue light therapy. There were four studies that evaluated the efficacy of chlorhexidine on its own.

Of the 5 studies which evaluated BPO, two of them examined the ability of BPO to decrease positive skin cultures with treatment preoperatively. Duvall et al. treated 34 patients with BPO daily for 3 days before surgery and evaluated swabs after treatment then one week after stopping treatment and found significant log decrease after BPO treatment with a log rebound 1 week later¹. Sabetta et al. evaluated the length of BPO treatment between 1-10 days preoperatively in 65 patients and found an overall reduction of *C. acnes* skin culture of 74%, a 79% reduction if treated >1 day, and a 66.7% reduction rate if treated for one day.² Two studies performed case-control trials with a total of 130 patients with regular soap and water as the control and BPO as the treatment. One study treated twice per day for two days prior to surgery and the other for five days prior surgery and both studies demonstrated a significant reduction in *C. acnes* in the treatment group, however all patients had a significant reduction in *C. acnes* after the surgical prep was applied. No significant adverse side effects were reported.^{3,4} Similarly, Polce et al. evaluated 183 patients who were treated preoperatively with BPO and found that 83.5% of patients reported no adverse events and 16.5% reported redness, bleaching or dryness. Application was found to be “easy” for about two-thirds and 22% missed at least one treatment, demonstrated the unreliability of preoperative treatment.⁵

Three studies with a total of 170 patients compared 5% BPO treatment with 4% chlorhexidine (CHG) wipes prior to surgery for a range of 1-2 days preoperatively.⁶⁻⁸ Two studies with 120 patients found that there were significant reductions in *C. acnes* load on the skin in the BPO groups.^{7,8} The third study with 50 patients found that all patients still had positive skin cultures after treatment with no difference in *C. acnes* load. While BPO had a lower percentage of positive *C. acnes* culture in the cut skin edges (46%), it was not significantly different than CHG wipes (61%).⁶

Chlorhexidine wipes in isolation were evaluated by four studies. In three studies 157 patients compared CHG wipes with soap and water preoperatively and found there was significant reductions in *C. acnes*, but there was no difference in deep infection or long term infection.⁹⁻¹¹ Matsen et al. evaluated 51 patients who prepped with 4% CHG wipes the night before surgery and found an overall decrease in bacterial load of the skin, but not a significant reduction in *C. acnes*.¹²

Three studies with 140 patients examined the effectiveness of BPO with Clindamycin. There was a significant reduction in *C. acnes*, however the addition of clindamycin does not make a significant difference based on BPO on its own. Additionally, these studies found a decrease in *C. acnes* skin swabs, but no positive deep cultures were found.¹³⁻¹⁵ A study by Unterfrauner et al. completed a case-control study with BPO with metronidazole and found that treatment for 7 days preoperatively did decrease skin culture loads, but there was no significant difference in deep cultures.¹⁶ Cotter et al. evaluated BPO with the addition of blue light therapy and found the addition of the light therapy did not make a significant difference in reduction of *C. acnes* skin cultures. Similar to other studies, BPO treatment decreased the culture load of the skin, however the most significant reduction was seen after pre-operative prep with chlorhexidine.¹⁷

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