

# A Comparative Study for Pre-operative Skin Preparation - Shaving Versus Depilation Cream

<sup>1</sup>Owen Mielke, <sup>1</sup>J K H Parry

<sup>1</sup>Lecturer, Department of Surgery, Faculty of Medical Sciences, University of Zimbabwe, Harare, Zimbabwe.

## Abstract

**Background:** The use of depilatory creams was shown to be effective, atraumatic, non-toxic and could be self-administered. Depilatory creams could be used safely on granulating wounds and did not give rise to bacterial growth. **Subjects and Methods:** A prospective, randomized study was carried out to compare the effect of pre-operative shaving with chemical depilation on wound infection in 100 patients. **Results:** It was shown that depilatory creams saved time for pre-operative preparation and had an advantage in areas where shaving was difficult. Their use was associated with significance. **Conclusion:** The depilatory cream has an advantage in areas which are difficult to shave or if the patient is scheduled to undergo diagnostic procedures and operations in the same area in close succession.

**Keywords:** Skin Preparation, Shaving, Depilation Cream.

**Corresponding Author:** Dr. J K H Parry, Lecturer, Department of Surgery, Faculty of Medical Sciences, University of Zimbabwe, Harare, Zimbabwe.

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## Introduction

Preparation for surgery has traditionally included the routine removal of body hair from the intended surgical wound site. Hair is removed, as its presence can interfere with the exposure of the incision and subsequent wound, the suturing of the incision and the application of adhesive drapes and wound dressing. Hair is also perceived to be associated with a lack of cleanliness, and hair removal is thought to reduce the risk of surgical-site infection (SSI).<sup>[1]</sup>

The preparation of people for surgery has traditionally included the routine removal of body hair from the intended surgical wound site. However, there are studies which claim that pre-operative hair removal is deleterious to patients; perhaps it causes SSIs, and should not be carried out.<sup>[2]</sup>

The use of depilatory cream produces clean, intact skin without the risk of developing lacerations or abrasions. It can, however, cause skin irritation or rash, especially in the groin area. If possible, long hair should be cut with a pair of scissors before applying the cream so that less amount of cream is used.<sup>[3]</sup> The chemical in the hair removal cream affects the chemistry of the individual hair strands. The active chemicals in the cream break down keratin, the principal protein, which normally requires a blade for depilation or any other harsh treatment. The effects of the cream vary, based on the strength, colour and coarseness of the hair being removed as well as the length of time the cream is left undisturbed on the hair to act. Most common complications with creams are rashes and erythema which can also increase the risk of post-operative infection.<sup>[4]</sup>

The following points should be especially considered before depilating an area for surgery: the proposed incision site should be known; modesty should be exercised, and the patient should be given privacy; permission of the patient should be obtained for skin preparation; the area to be shaved should be examined for any signs of irritation or any abnormal conditions; particular attention should be paid to the umbilicus in abdominal surgery; the operative site should be shaved the day or the night before surgery; in shaving, direction of the hair growth should be followed; if a wound is present in the area to be shaved, the depilation procedure should start from the clean area moving towards the dirty area.<sup>[5-7]</sup>

## Subjects and Methods

The present prospective randomized study included 100 patients for shaving and 100 patients for depilation as part of pre-operative preparation.

### Inclusive criteria

Patients >15 yrs of age  
Both sexes  
No local skin lesions  
Skin test for reaction

### Exclusion criteria

Neck, face and thyroid and Emergency surgeries  
Skin lesion/infection  
A small, discrete area in the same region of the body should

be tested with the depilatory cream before a more wide-spread application is attempted. This helps determine how long the cream should be left in situ and also helps discern any negative skin reactions. The cream should be applied thickly and evenly over the area to be treated and should be left undisturbed for the recommended period of time. After the appropriate time has elapsed, a small portion of the cream should be removed to test the effectiveness of the treatment, and if the hair comes off easily, the remaining cream should be removed.

The cream was applied in a layer A1/2 Prime (1.3-cm thick). After about 10 min, it was removed with a damp wash cloth, applying firm strokes in the direction of the hair growth.

The appropriate statistical analysis was done to compare the results.

## Result & Discussion

The influence of pre-operative shaving on the incidence of post-operative wound infection is well documented in the literature. Seropian and Reynolds observed a decrease in the infection rate when hair was removed using depilatory cream.<sup>[7]</sup>

Cruse and Foord [8] reported a wound infection rate of 0.9% without any hair removal, 1.7% when hair had been clipped, and 2.3% after shaving

Data from the study by Alexander et al.<sup>[9]</sup> showed a correlation between hair removal on the eve of surgery and increase in the infection rate, when compared with shaving or clipping immediately before the operation. Depilatory creams containing thioglycolate have been shown to be effective enhancers for transdermal drug delivery. However, the mechanism of action remains unknown. The depilatory agents enhance transepidermal drug delivery by reducing resistance in both transcellular and intercellular routes of the stratum corneum.<sup>[10]</sup>

Post-operative wound infection is a serious problem. Several strategies to decrease wound infections have been suggested and studied, including the use of prophylactic antibiotics, surgery in an aseptic operating room, improved surgical skills, surgical skin preparation and so on. Shaving is the most common skin preparation method today as it has been for hundreds of years. It was thought that wound infections might be prevented if hair does not interfere with suturing.<sup>[11]</sup>

Nurses should understand the rationale behind the choice of a particular antiseptic, and the clinical effectiveness of the use of an antiseptic pre-operatively, to achieve optimum results.<sup>[12]</sup> Many studies show that hair removal with a razor or clippers can cause skin abrasion, even nicks which can lead to the development of pseudo-folliculitis and subsequent SSIs. Studies show that use of chlorhexidine gluconate with alcohol for intra-operative skin preparation and appropriate instrument sterilization led to a reduction in SSI rates in patients undergoing caesarean section.<sup>[13]</sup>

The best practice is to refrain from hair removal unless it interferes with the surgical procedure or wound closure. If hair has to be removed, it should be done using a depilatory cream.<sup>[14]</sup> If electrosurgical scalpel is used for skin and soft-tissue dissection, bleeding is minimum; hence, the probability of wound infection appears to be reduced.

Therefore, cranial surgery without head shaving does not increase the risk of wound infection.<sup>[15]</sup>

Depilatory creams have an advantage in areas which are difficult to be shaved or if the patient has been scheduled for diagnostic procedures and operations in the same area in close succession.<sup>[16]</sup>

Standards and recommended practices from the Association of Peri-Operative Registered Nurses state that pre-operative skin preparation of surgical patients should include little or no hair removal, cleansing of the area around the surgical site and use of an antiseptic agent immediately before the surgical incision.<sup>[17]</sup>

Seven trials involving 1,213 people compared shaving with removing hair using a depilatory cream and found that there were statistically more SSIs when people were shaved than when a depilatory cream was used. One trial compared shaving on the day of surgery with shaving the day before the surgery and found no statistically significant difference in the number of SSIs.

Price lists skin preparation as a major intrusion into the patient's body space; removal of hair also can be very embarrassing for the patient, giving them a sense of loss of control and even loss in sexual identity, especially when pubic hair is removed. The iodine-impregnated drape not only reduces the resident skin flora, but its use also clearly reduces intra-operative wound contamination.<sup>[18,19]</sup>

The combination of ranalexin with lysostaphin warrants its consideration as a new agent to eradicate nasal and skin carriage of *Staphylococcus aureus*, including methicillin-resistant *Staphylococcus aureus* (MRSA). The exact mechanism of action remains unresolved, but its specific spectrum of activity includes fast killing kinetics and low resistance. This combination yields good results.<sup>[20]</sup>

## Conclusion

In conclusion, pre-operative skin preparation continues to be an area comprising a variety of procedures. Prevention of infection is of utmost concern. Pre-operative reduction of skin flora remains the goal and standard of care. The skin should be cleansed before surgery.

If used properly, hair removal creams have many benefits including painless hair removal without the risk of developing nicks and cuts. It is a quick procedure and usually takes 3–15 min depending on the type of hair and the type of creams used. At the same time, hair removal creams are not suitable for all and can have serious drawbacks. Many creams have strong, unpleasant odours, and can result in chemical burns if left on for a long time. The wound infection rate not only depends on the skin preparation, but also on the interval between skin preparation and surgery, the thickness of the subcutaneous tissue, the operating time and the suture materials used.

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