# Antibacterial Effect of Cold Plasma Therapy on Burn Wounds: A Literature Review

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**ABSTRACT**

**Introduction:** Burn wounds are prone to infections and poor healing due to increased antibiotic resistance; therefore, there is a need for new therapies. Cold atmospheric plasma (CAP) technology has recently been proposed as a useful non-thermal treatment with antibacterial and wound-healing effects. This review will evaluate the application of CAP technology with regard to microbial killing and wound healing in burns.

**Materials and Methods:** This study was conducted as a Literature Review. Search was conducted in PubMed, Scopus, CINAHL, Web of Science using MESH keywords “Cold atmospheric plasma”, “burn wound”, “wound healing”, “antibacterial” and covering the years 2012-2025. Articles were selected based on predefined inclusion and exclusion criteria including those addressing antibacterial effect of cold plasma therapy on burn wounds. Twelve eligible articles were selected for the final analysis,

**Results and Discussion:** The antibacterial activity of CAP was highly effective on various bacterial species tested both in vitro and animal models because of the reactive oxygen and nitrogen species produced. Also, the treatment with CAP increased the rate of wound healing with low cytotoxic effects. However, the variations in plasma concentration and exposure times made it difficult to compare the results of different experiments.

**Conclusion:** CAP can kill bacteria effectively and is beneficial to multiple aspects of burn wound healing, showing potential as an adjuvant or potentially new approach in replacement of routine treatment. Despite these results, additional standardized studies and appropriately clinical trials are required to a consensus on therapeutic modalities and dual antimicrobial and pro-reparative effects.

*Keywords:* Antibacterial, Burn wound, Cold atmospheric plasma, Wound healing

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