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# Plasma Therapy in Wound Management: A Scoping Review of Trends, Parameters, and Reported Outcomes over the Past Five Years

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**ABSTRACT**

**Introduction:** This scoping review aimed to identify, categorize, and systematically analyze the existing evidence on the application of cold plasma in the treatment of human and animal wounds.

**Materials and Methods:** The study was designed based on the Arksey and O'Malley framework and its enhanced versions proposed by Levac and colleagues. It was conducted in accordance with the PRISMA-ScR guidelines. A systematic search was performed in PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar, focusing on studies published within the past five years (2020–2025). After screening and quality appraisal, 17 eligible studies were included in the final analysis. Data were analyzed using an integrative and thematic approach.

**Results and Discussion:** Animal studies included diverse models, including infectious keratitis, bacterially contaminated burns, oral wounds, full-thickness diabetic wounds, and various acute and chronic wounds in companion animals. Considerable variability in plasma devices was observed across both human and animal studies. In humans, cold plasma jets, dielectric barrier discharge (DBD) systems, and plasma patches were used for wound treatment. In animal studies, different plasma jets, radiofrequency plasma, DBD systems, and microwave plasma devices were applied. Cold plasma demonstrated high efficacy in infection control, inflammation reduction, and acceleration of wound healing in both human and animal studies. In human studies, treatment with cold plasma resulted in reduced wound size and depth, decreased exudate and pain, improved epithelialization, and enhanced quality of life, with no serious adverse events reported.

**Conclusion:** Although the evidence from human studies is more limited, available research suggests that cold plasma may help reduce infections, manage wound exudate and pain, and improve healing-related outcomes. However, heterogeneity in plasma devices, treatment parameters, and clinical study designs highlights the need for high-quality clinical trials and greater standardization in future research.



*Keywords:* Chronic wound, Inflammatory markers, Plasma therapy, Scoping review, Wound healing

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