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# Regenerative Medicine in Burn Wound Healing

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## ABSTRACT

Delays in burn wound closure worsen a patient's susceptibility to infection, prolong pain, increase the total number of operative procedures, increase the incidence of hypertrophic scarring, and lengthen hospital stays. Stem cell therapies in wound care may lessen these morbidities. Specifically, the burn wound has unique characteristics that have to be considered when designing a clinical trial for stem cell therapy applications: it is an ischemic wound, with an altered pH and temperature, prone to infection and development of chronic sequel, such as non-healing ulcers and hypertrophic scarring. Furthermore, a major burn represents a handicap, with uncovered wounds open to air, which requires frequent operations and dressing changes, and with long periods of immobilized hospital stay, which involve frequent position changes and physiotherapy, to avoid pressure sores, enhance rehabilitation and improve overall prognosis. This dynamic paradigm popularized the use of polymeric films for the repair and closure of wounds. These films are semipermeable and transparent materials that create an accelerated healing environment while avoiding dehydration, trauma and infection over the injury. Moreover, radiofrequency applied to wound-contacting iron oxide nanoparticles have been used to debride the wound may represent a novel burn treatment method, once stronger scientific evidence is available.

An ideal method for the effective administration of stem cells for burn patients has not yet been elucidated. Further comparison of the local and systemic effects in burn patients, associated with each route of stem cell delivery, needs to be performed. There is still not enough evidence in terms of analyzing systemic or local effects of stem cell delivery in burn patients, regarding different possible routes of administration.

**Keywords:** Isolation, Culture, Transfection, Keratinocyte, Cell Therapy, Gene Therapy



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