



## Cell Therapy, the Future Trend for Burn Management

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### Editorial

Burn victims represent a huge burden on the health economy. According to the estimate of the American Burn Association for 2016, there are 486,000 patients received treatment in USA including 30,000 patients required hospitalization in burn units [1]. Furthermore, The World Health Organization focused on another important impact, which is the disability associated with burns in children. In several developing countries, 17% of the children with burns will suffer from temporarily disability and 18% will have permanent disability [2]. The latter in particular will add to the expenses of burn associated healthcare and affect the life quality of these patients. The current burn management depends on the natural healing power of the body. The role of the medical team would be to excise the non-healthy tissues and skin grafting to maintain a germ-free coverage of the wound until the re-epithelization occurs. Such management plan could require long stay duration in the hospital as well as high cost treatment for antibiotics and coverage materials.

The cell-based therapy is becoming an extensive area of research, in order to increase the healing speed and efficiency. This concept started to appear in literature since the mid-seventies with the possible isolation and expansion of keratinocytes. In the eighties, the importance of having a supportive layer, based on fibroblasts, extracellular matrix or both was identified. In the nineties, the direction was towards the clinical application and the fibrin glue was used to fix the cells to the wound bed [3]. The importance of supportive layer reappeared as the keratinocyte derived epidermis was fragile [4]. By the beginning of the stem cell era, tissue engineering of the skin became a very attractive goal. Many groups tried different approaches with variable degrees of success. One important reason could be the absence of standardized technique to identify, isolate, expand and differentiate the stem cells [3]. Nevertheless, many ongoing clinical and preclinical studies proved that we are on the verge of a new age of burns surgical care. For example, Fourbet et al. [5] tried spraying and injecting guinea pigs with full skin thickness burn with adipocyte derived stem cells, which enhanced the skin repair and neovascularization. A phase I clinical trial is currently investigating the effect of spraying bone marrow derived stem cells isolated from donors on patients with second degree burn using different cell numbers per centimeter square of the wound surface area [6]. The more modernized approach, which we are investigating, is the creation of a multilayer skin construct in the lab and transfers it back to the patient. We hope that the bioengineered skin will help patients, particularly those with extensive burns and decrease the duration of hospital stay and the associated burden to health economy.

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Received Date: 01 Jan 2018

Accepted Date: 01 Feb 2018

Published Date: 06 Feb 2018

#### Citation:

El-Serafi AT, Elmasry M, Sjöberg F. Cell Therapy, the Future Trend for Burn Management. *Clin Surg*. 2018; 3: 1896.

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