

DEVELOPMENT OF AN ACUTE WOUND HEALING MODEL

Brandy L. Lehman, MS, Joyce Stechmiller, ARNP PhD, Beverly Childress, ARNP PhD
University of Florida College of Nursing
PO Box 100197
Gainesville, FL 32610-0197

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Purpose: The purpose of this pilot study is to develop an acute wound healing model. This model will provide in vivo data on local immune responses that are central in the early stages of wound repair. Wound repair progresses through three overlapping stages, the inflammatory phase, the proliferative phase, and wound remodeling. Immune function plays a key role early in these phases. Proinflammatory cytokines such as interleukin (IL) 1 and tumor necrosis factor (TNF) are essential in the wound healing cascade. They help protect against infection and prepare injured tissue by enhancing phagocytic cell recruitment and activation. Early events in wound healing, particularly in the first 24 hours, represent a critical period. Wound fluid from a skin blister is of interest because it allows the investigator to monitor the kinetics of the inflammatory phase in vivo.

Method: This pilot study is an exploratory descriptive correlational design. Ten healthy adult subjects over the age of 21 are being recruited and studied who meet the exclusion criteria, which consists of illnesses with immunological or endocrinological components, or illnesses or medications with obvious consequences for these systems or for wound healing (e.g. excluding those individuals with cancer, peripheral vascular disease, wound healing problems, and pregnant women). Skin blisters will be created on the forearm of these ten health adult subjects by a cylindrical suction cup of 20 mL capacity and 2.5 cm in diameter that will be attached to a three-way stop cock by a small rubber tube. This will produce an epidermal graft of about 3 cm in diameter. The negative pressure in the suction cup will be retained until the skin bulges into it. A pressure measuring apparatus, a vacuum gauge, will measure the pressure. It takes approximately 60-90 minutes to form the small vesicles. Three small vesicles, the size of a pea, will appear in the suction area. These three small vesicles will increase significantly in size and coalesce to form a large blister. The fluid will be drained from the blister with a syringe, the blister roof (epidermis) will be removed with sterile scissors, and a nonadherent sterile dressing will be applied. Wound healing will be measured by TNF a and IL-1 proinflammatory cytokines using Amersham ELISA kits. The acute wounds will also be photographed and measured every day until it is completely healed, which is approximately seven days. This research is the first critical step in developing a dissertation methodology concerning stress and wound healing.

Findings: In progress

Discussion: In progress