



LED-Based Lighting Treatment for Wound Healing

Marshall Space Flight Center
1998 Phase I

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Barneveld, WI



INNOVATION

Light-emitting diodes (LEDs), developed for NASA Space Shuttle plant growth experiments, are being used in the treatment of wounds. Applying light-emitting diode (LED) technology to healing wounds.

ACCOMPLISHMENTS

The Phase I effort achieved its objective of ascertaining and demonstrating the efficacy of light therapy using LEDs, alone and in conjunction with hyperbaric oxygen, in the treatment of wounds. Phase II results in speeding the early phase of wound closure were particularly successful. Doctors at the Medical College of Wisconsin have examined how LEDs can help heal oral mucositis (severe oral sores caused by chemotherapy and radiation), diabetic skin ulcers, and serious burns. (Preventing oral mucositis improves the patients' ability to eat and drink and may also reduce the risk of infections in patients with compromised immune systems.)

COMMERCIALIZATION

NASA LED arrays have already flown on Space Shuttle missions for studies of plant growth. Improved wound healing may have multiple applications, including civilian medical care, military situations, and long-term space flight. Phase II objectives have included the development of a tri-photon light source and human clinical trials at the Medical College of Wisconsin. The FDA pre-approved the procedure. Verification of operation in ISS environment to be determined.

GOVERNMENT / SCIENCE APPLICATIONS

Wounds are slow to heal in a microgravity environment. Muscle and bone atrophy are well documented in astronauts, and various minor injuries have been reported not to heal until landing on Earth. LED therapy could keep what would be termed as minor wounds on Earth from becoming mission-catastrophic in space. While under contract to NASA, QDI's LEDs have been utilized as part of a cancer treatment. In Special Operations, LED arrays could be used for improved wound healing and in the treatment of problem wounds, as well as speeding deconditioned personnel to full-duty performance. LED usage has been approved by the Naval Special Warfare Command.