The Light Device Helps Heal Wounds

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Introduction

Today there is new Technology being developed that will allow us to used light to heal our wounds. Dr. Rachel Lubart of Bar-Ilan University and her colleagues have developed new light technology that actually heals wounds.

Photo Therapy

This new technology employs the use of phototherapy.

The main idea behind it is to heal wounds using LED or light Emitting Diodes.

Other examples of light related treatments include LEL or Low energy lasers.

It has been known to be used in vitro with cells and has shown to be effectively able to stimulate cells. Also LEL were able to be used to stimulate the release of both growth factor-B and PDGF with his platelet derived growth factor.

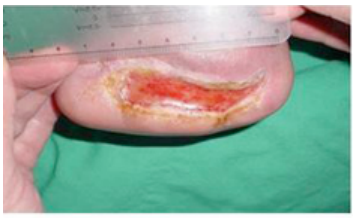
(Lubart et al, Rachel. "A New Light Device for Wound Healing." 29 Oct. 2007. 10 Nov. 2008 <http:// www.bentham.org/biomeng/samples/biomeng1-1/lubart.pdf> .)

Testing

Although research is on going thus far phototherapy has been tested on smaller animals like toads and mice up to larger animals such as swine.

It has also been tested on humans before. In both examples of testing the wounds were successfully healed using low power density lasers. There were more successful results on humans because the rate of epithelial cell growth was faster which facilitated wounds to close faster and aided in skin graft healing.

(Lubart et al, Rachel. "A New Light Device for Wound Healing." 29 Oct. 2007. 10 Nov. 2008 <http:// www.bentham.org/biomeng/samples/biomeng1-1/lubart.pdf>.)



("Diabetic foot." Wikipedia, The Free Encyclopedia. 30 Sep 2008, 13:28 UTC. 14 Nov 2008 <http://en.wikipedia.org/w/index.php?title=Diabetic_foot&oldid=242005558>)

How does it work?

There have to be special conditions so the light can interact with "cellular photosensitizers". Riboflavin and NADP are examples of "cellular photosensitizers" can absorb visible light. This absorption of light leads the production of (ROS) or reactive oxygen species. Low ROS has show to be important for cell growth and is utilized in this process. ROS has also been known to be effective for killing bacteria known as S. Aureous. This is important because S. Aureous bacteria makes up over 30% of the bacteria in wounds. The maximum effectiveness of using white light was 99.8% with S. Aureous 101. This treatment is used for wound healing also.

It is especially effective with cutaenous lesions like diabetic foot and chronic venous ulcers where as other treatments are usually ineffective. Forty patients were treated and 70% had their ulcers heal completely.

(Lubart et al, Rachel. "A New Light Device for Wound Healing." 29 Oct. 2007. 10 Nov. 2008 <http:// www.bentham.org/biomeng/samples/biomeng1-1/lubart.pdf>.)

Diabetic Foot

Diabetic foot is a term that describes foot problems people with diabetes have.

This can be caused by arterial abnormalities or micro vascular injury of blood vessels caused by diabetic neuropathy.

This also makes wounds more difficult to heal and may cause gangrene.

("Diabetic neuropathy." Wikipedia, The Free Encyclopedia. 31 Oct 2008, 02:37 UTC. 13 Nov 2008 <http://en.wikipedia.org/w/index.php?title=Diabetic_neuropathy&oldid=248746324>.)

("Diabetic foot." Wikipedia, The Free Encyclopedia. 30 Sep 2008, 13:28 UTC. 14 Nov 2008 <http://en.wikipedia.org/w/index.php?title=Diabetic_foot&oldid=242005558>

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("Diabetic foot." Wikipedia, The Free Encyclopedia. 30 Sep 2008, 13:28 UTC. 14 Nov 2008 <http://en.wikipedia.org/w/index.php?title=Diabetic_foot&oldid=242005558>)

Chronic Venous Ulcers

These ulcers are caused by non-functional valves in the veins.

Venous Ulcers occur in 70 to 90% of chronic wounds.

It is most common for this to occur in the legs or feet.

("Venous ulcer." Wikipedia, The Free Encyclopedia. 5 Nov 2008, 03:51 UTC. 13 Nov 2008 <http://en.wikipedia.org/w/index.php?title=Venous_ulcer&oldid=249782772>.)

What is the Device itself?

The main portion of the device is a Halogen lamp which can adjust to different UV and IR wavelengths. This lamp has a range of 400-800 nm and has an intensity rage of 40 to 800 mW/cm2 to adjust to the type of treatment.

(Lubart et al, Rachel. "A New Light Device for Wound Healing." 29 Oct. 2007. 10 Nov. 2008 <http:// www.bentham.org/biomeng/samples/biomeng1-1/lubart.