

# A BLUE LIGHT BESTOWED UPON SRI AMAN : PHOTOBIMODULATION THERAPY IN DIABETIC FOOT ULCER. CASE STUDIES

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## INTRODUCTION

The prevalence of chronic wounds due to diabetic foot ulcers is increasing and significantly impact to healthcare system. Diabetes causes abnormalities in several stages of inflammation, resulting in non-healing wounds. Photobiomodulation utilizes LED blue light emitting at the wound tissue-light absorbing chromophores, inducing photophysical and photochemical phenomena at various biological scales of wound healing. Photobiomodulation therapy can facilitate tissue repair by increasing capillary and vascular circulation, fibroblast activity and collagen deposition. Also, blue light (410-430nm wavelength) has been evidenced to have several therapeutic effects, including pain alleviation, immunomodulation and tissue regeneration. This article describes our successful experience using photobiomodulation therapy application for several diabetic foot ulcers.

## METHOD

A portable medical device (E-moled) that beams LED blue light (410-430nm wavelength, 120mW/cm<sup>2</sup> power density) is applied to the affected wound before primary dressing application. The wound is irradiated once weekly for 2 minutes for every 5cm<sup>2</sup> area until all wound surface is irradiated. Emissions of photobiomodulation therapy were managed by privileged health care staff, a 4-5 cm distance from the wound bed to light source. Initiation of photobiomodulation were procedured after major surgical intervention and resolved infection.



**Figure 1: E-moled Photobiomodulation Therapy in Wound Care Clinic Hospital Sri Aman**

After each therapy, wounds were managed according to standard wound care protocols.



**Figure 2: Infected Heel, Achieved complete wound healing in 67 Days**



**Figure 3: Wet Gangrene of 2<sup>nd</sup> toe, Achieved complete wound healing in 83 Days**



**Figure 3: Infected Ulcer, Achieved complete wound healing in 53 Days**

## CONCLUSION

The use of photobiomodulation therapy with blue light (410-430nm) in combination with standard wound dressing promotes better wound healing in recalcitrant lower limb wounds. In addition, photobiomodulation therapy is safe, well tolerated and cost-efficient.

## References:

1. Fraccalvieri M, Amadeo G, Bortolotti P et al (2022) Effectiveness of Blue light photobiomodulation therapy in the treatment of chronic wounds. Results of the Blue Light for Ulcer Reduction (B.L.U.R.) Study. *Ital J Dermatol Venerol* 157(2):187–94.

