Referenslista

1. Melamed, E.; Rovitsky, A.; Roth, T.; Assa, L.; Borkow, G. *"Stimulation of Healing of Non-Infected Stagnated Diabetic Wounds by Copper Oxide Impregnated Wound Dressings."* Medicina (Kaunas) 2021;57(10):1129; doi: 10.3390/ medicina57101129.

This article describes the clinical trial conducted in Rambam Medical Center in Israel with diabetic patients whose wounds were in a stagnated stage (non-healing or healing very slowly) despite standard of care treatment, and following the use of MedCu wound dressings, granulation tissue and wound healing processes started, and the wound size was reduced dramatically and statistically significantly.

2. Melamed, E., Kiambi, P., Okoth, D., Honigber, I., Tamir, E., and Borkow, G. (2021*) "Healing of Chronic Wounds by Copper Oxide-Impregnated Wound Dressings – Case Series."* Medicina (Kaunas) 2021;57(3):296; doi: 10.3390/medicina57030296.

Describes 10 hard to heal wound cases that responded partially or poorly to conventional wound healing treatments but following the use of MedCu copper wound dressings significant enhanced wound healing occurred. The patients treated included etiologies such as diabetes mellitus, sickle cell disease, renal failure, and necrotizing fasciitis.

3. Borkow et al (2010) *"Molecular mechanisms of enhanced wound healing by copper oxide-impregnated dressing."* Wound Repair Regen. 18(2): 266-275.

Describes how the application of wound dressings containing copper to wounds inflicted in genetically engineered diabetic mice resulted in increased gene and in situ up-regulation of proangiogenic factors (e.g., placental growth factor, hypoxia-inducible factor-1 alpha, and vascular endothelial growth factor), increased blood vessel formation, and enhanced wound closure as compared with control dressings (without copper) or commercial wound dressings containing silver.

4. Borkow, G.; Roth, T.; Kalinkovich, A. *"Wide Spectrum Potent Antimicrobial Efficacy of Wound Dressings Impregnated with Cuprous Oxide Microparticles."* Microbiology Research 2022;13(3):366–376.

Powerful continuous antimicrobial efficacy demonstrating a reduction of more than 4 logs (>99.99%) in 8 known wound pathogens, including after 7 consecutive days exposure with ~ million microorganisms each time. It demonstrates that there is no reduction in the antimicrobial efficacy of the dressing even after 3 years of natural aging. It also shows how adhesive contour dressings serve as a physical microbial barrier and thus can confer further wound protection from external microbial contamination.

5. **Jihad Dabbah, Talia Israel, Ilana Kan, Michael S. Pinzur, Tohar Roth, and Gadi Borkow,** "*Noninferiority of Copper Dressings Than Negative Pressure Wound Therapy in Healing Diabetic Wounds: A Randomized Clinical Trial.*"
Advances in wound care (New Rochelle) 2025 May 8. DOI: 10.1089/wound.2024.0273.

A rigorously controlled randomized clinical trial (RCT) was conducted with 46 diabetic patients recovering from foot surgery after infections at the Rambam Health Care Campus, Israel with the goal to determine if copper dressings are non-inferior compared to NPWT. One group received gold standard NPWT; the other received only copper dressings. Wound healing with copper dressings was found to be non-inferior to NPWT, with some statistical analyses suggesting even better outcomes in terms of wound size reduction (91% vs. 68%). Wound closure occurred in 48% of copper-treated patients, compared to 35% in the NPWT group. The cost of copper dressing treatment was only 14% of the cost of NPWT. Patients and caregivers reported significantly higher satisfaction, ease of use, and shorter dressing times with copper dressings. The findings could revolutionize wound care worldwide by offering a significantly cheaper, more convenient, and scalable alternative to an expensive standard treatment.

6. Melamed, Eyal and Borkow, Gadi. *"Continuum of care in hard-to-heal wounds by copper dressings: a case series."*
J Wound Care 2023;32(12):788–796; doi: 10.12968/jowc.2023.32.12.788

Describes cases of hard-to-heal wounds of various aetiologias, in which the application of MedCu copper dressings consistently across all stages of wound healing, resulted in with rapid uneventful healing. This article demonstrated the benefits of using copper dressings throughout the entire wound healing process, introducing the concept of continuum of care of hard-to-heal wounds with a single dressing, making wound management easier and more efficient.

7. BGorel, Oxana, et al. *"Enhanced healing of wounds that responded poorly to silver dressing by copper wound dressings: Prospective single arm treatment study."* Health Science Reports. 7.1 (2024): e1816; doi: 10.1002/hsr2.1816.

A study conducted at Beth Loewenstein Rehabilitation Center in Israel comparing the use of silver dressings versus copper dressings published in the Health Science Reports.

8. Borkow, G., & Melamed, E. (2025). *"The Journey of Copper-Impregnated Dressings in Wound Healing: From a Medical Hypothesis to Clinical Practice:"* Biomedicines, 13(3), 562.

The progression from the medical hypothesis that chronic wounds may fail to heal due to insufficient systemic copper at the wound site, to the development of copper wound dressings that actively promote healing in hard-to-heal wounds, including non-responsive stagnated wounds. It presents representative cases demonstrating how copper dressings support wound healing across all physiological phases. Part of a special issue " Wound Healing: From Basic to Clinical Research" that was published in the high impact factor journal "Biomedicines".

9. **Borkow, G., Melamed, E. (2021).** *"Copper, an abandoned player returning to the wound healing battle."* In: Scars and Kelloids. Ed: Shahin Aghaei; IntechOpen London: 5 Princes Gate Court, London, SW7 2QJ, UK; 2021; pp. 165–184.

A chapter in a wound healing book that describes the molecular mechanisms of enhanced wound healing by the copper dressings. It describes the in situ upregulation of proangiogenic factors and increased blood vessel formation. It also includes clinical cases showing clearance of infection, induction of granulation and epithelialization of necrotic wounds, reduction of post-operative swelling inflammation and reduction of scar formation, in wounds when they were treated with copper dressings.

10. Alexandra H.J. Janssen, and Yvonne H.P. Siebers. *"Copper dressing resulting in increased oxygen levels in wound and surrounding skin: A case series study."* Poster *EWMA 2024*