



Clover Medical Solutions



**Healing Wounds, Reducing
Pain, and Improving Lives**

Disclaimer

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Electrotherapy for Pain & Tissue Repair

Theory & Science behind the
Micro-Z Mini™



Traditional TENS the old way of doing things

“Blocks Pain”

- Stimulates the non-nociceptive large diameter nerve fibers-which blocks the pain coming from the nociceptive small diameter nerve fibers.

Microcurrent Therapy



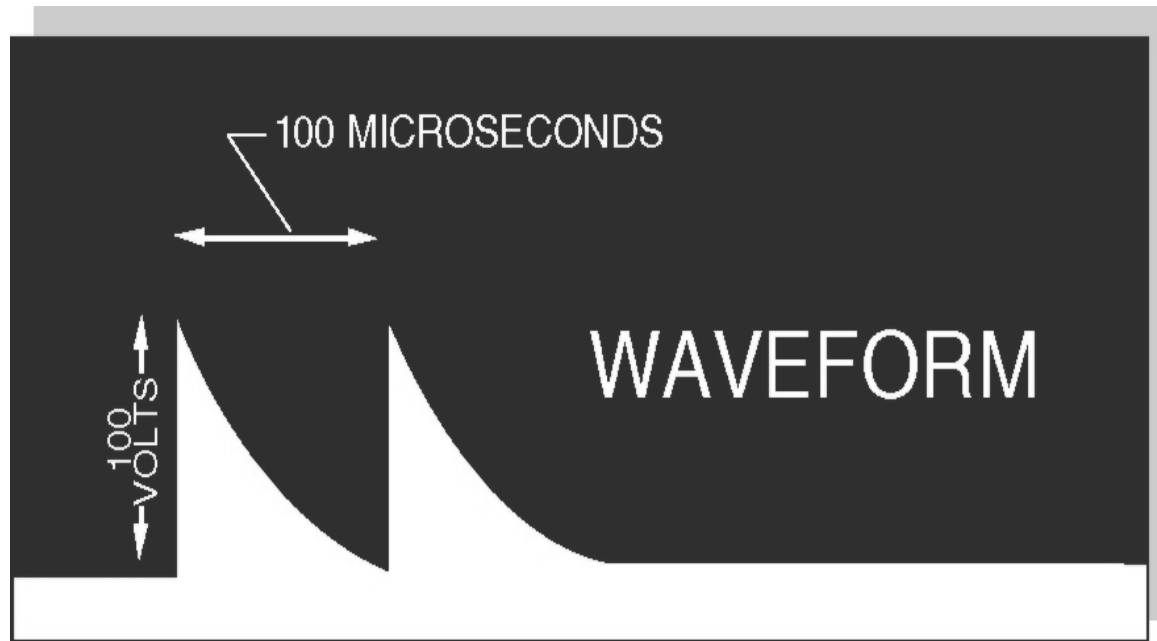
*“Mitigates pain by stimulating
the healing process”*

Micro-ZTM

- Therapeutically mitigates pain at the source of the injury
- Microamps=faster ramp speed= delivers current deeply through the tissues
- DC Current=maximum potential on ion movement
- Sub-sensory

Micro-Z Waveform

HVPG-High Volt Pulsed Galvanic



HVPG Historical Overview

- 60 year track record; developed by Bell Labs and Walter Reed Hospital
- Developed originally for wound healing
- Used Clinically for enhancing soft tissue healing through promoting microcirculation
- 17 RCT Studies; Meta analysis of 95%
- >100 citations on DC stimulation (HVPG)

Electrical Charges

- Electricity will always take the path of least resistance.
- Traditional electrical charges placed on the body will travel around the traumatized cells.

Micro-Current

- A smaller current -one that can penetrate the cell and balance the cell electrically - can restore a more normal physiological state to the damaged cells.
- Small electrical charges may be helpful in initiating and perpetuating the numerous electrical chemical reactions in the healing.

Neher & Sakmann Nobel Prize

- Awarded for discoveries of the function of ion channels the two German scientists developed a technique that allows the registration of incredibly small electrical currents that pass through a single ion channel.
- This discovery has led to the understanding as to why microcurrent electrical stimulation is so beneficial.

Robert Picker, MD

1984 Los Angeles Olympics, the use of micro stimulation won national attention when Dr. Picker used it on Olympic athletes Mary Kay Decker and Joan Benoit.

- "Areas of trauma and injury have lost a measure of their electrical potentials and thus become electrochemically undercharged and metabolically sluggish. By feeding injured tissues electrical energy within an optimal bioelectric range, their electrical potentials can be restored, which in turn sets the stage for rapid clinical recovery."

Microcurrent; Cheng et al (1982)

- At 500 microamps, ATP generation (or cellular energy production) increased about 500% and amino acid transport was increased by 30 to 40%.
- At the milliampere range, ATP generation was depleted, amino acid uptake was reduced by 20-73 percent and protein synthesis was inhibited by as much as 50%.

Pain & Injured Tissue

- Pain from an acute or long term chronic injury will typically have associated inflammation and micro-edema
- This in turn causes poor micro-circulation at the site of the disease/injury which leads to a static toxic built up of lactic acid, carbon-dioxide, metabolic waste, etc.

Pain & Injured Tissue

- ATP (Adenosine Triphosphate) in the cell helps to promote protein synthesis and healing. The lack of ATP due to trauma of the tissue results in the decreased production of sodium and an increase in metabolic wastes, which is perceived as pain.

Injured Tissue

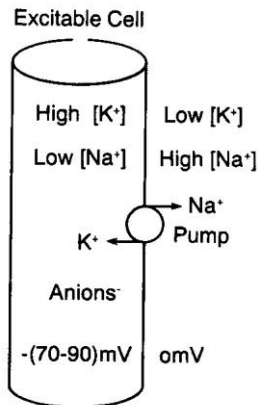
- Healthy tissue is the result of the direct flow of electrical current throughout the body. Electrical balance is disrupted when the body is injured at a particular site, causing the electrical current to change course.

Pain & Tissue Healing

microcurrent

- Because of its close proximity to our own body's current, the use of microcurrent at an injured area helps to realign the body's electrical current, increase the production of ATP & VEGF, resulting in increased healing and recovery, as well as blocking the pain that is perceived.

How it works



- ▶ E- stim enters the body and creates a charge on the cells. This alters the permeability of the cells & causes depolarization (sodium-potassium exchange). This exchange allows nutrients, oxygen & fluid to move-in and waste to move out of cells.

Bioelectric System & Tissue Repair

Micro-Z MiniTM



Bioelectric System & Tissue Repair

- Body has own bioelectric system which influences wound healing by attracting the cells of repair & changing cell membrane permeability.
- When rupture in skin-a current (Current of Injury) is generated between the skin & inner tissues until resolved.
- Healing of injured tissue is impeded if these currents no longer flow.

Current of Injury

Robert O. Becker *Father of Bioelectromagnetics*

- Positive polarity along the central axis and a negative polarity in the peripheral structures.
- Polarity is reversed following an injury which creates a positive potential at the site of trauma.
- Polarity reversal sets up this current of injury that initiates and signals the beginning of tissue repair and regeneration.

Current of Injury



How it Works

- Microcurrent electrotherapy mimics the natural current of injury & will increase the rate of wound healing and/or jump start the healing process again.

Benefits of E-stim in Wound Healing

- Jump starts body's natural bioelectric system that influences wound healing
- Changes cell membrane permeability
- Attracts cells of repair
- Enhances cellular secretion through cell membranes

Features & Benefits

- ***Micro-Z***[™] delivers micro amperage current deeply thru the skin
- Increasing microcirculation is more therapeutic in relieving pain at the source of the injury
- It's easy to use offering a 30 min. treatment and a 8 hr. nighttime treatment
- Therapy while sleeping offers a more sustaining effect in promoting microcirculation

Independent Studies

Using Micro-Z & Intelligent Textile's Garments

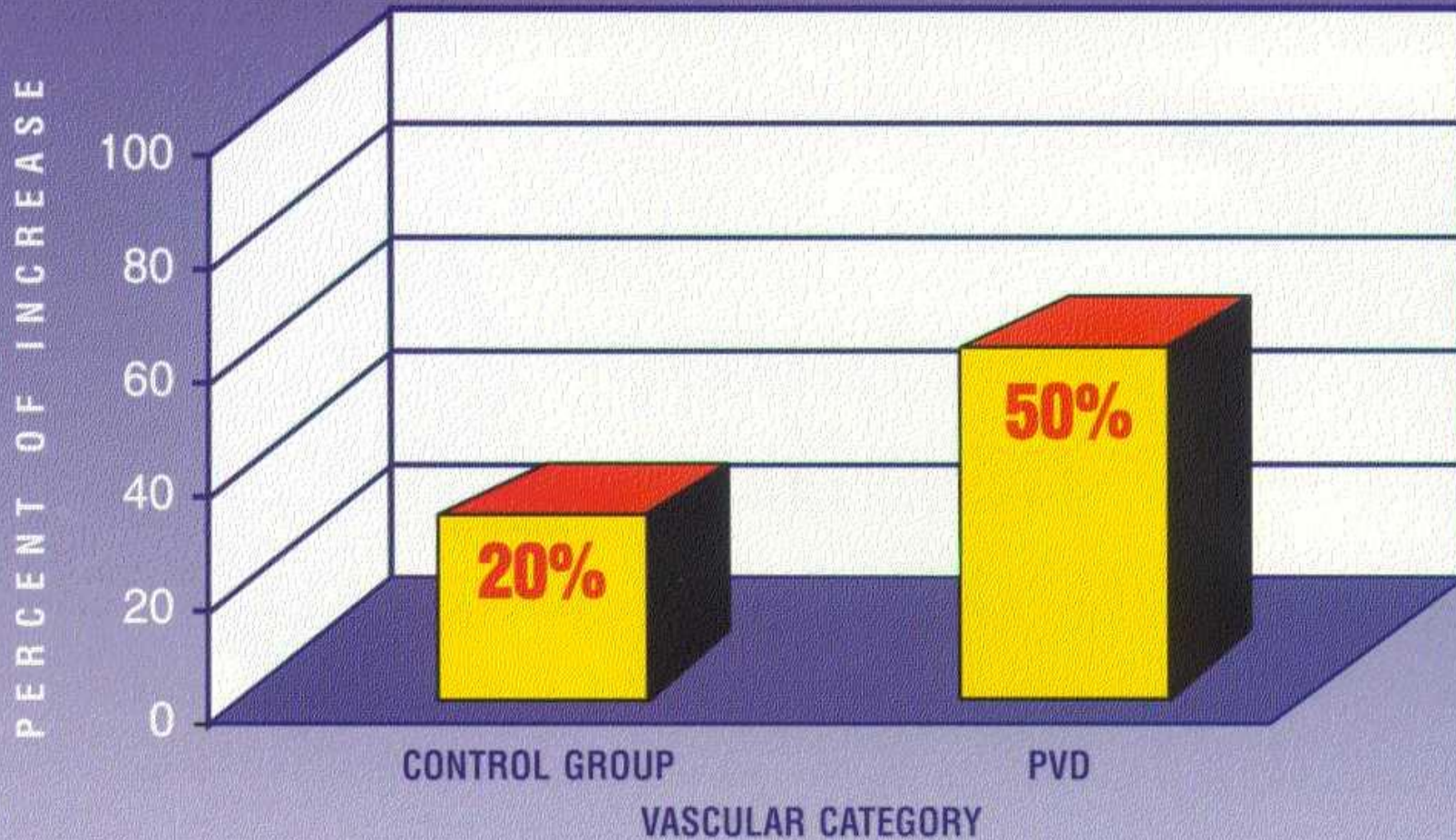
- Increased perfusion by 50% in ischemic Diabetic Foot
- Reduction in Painful Neuropathy from 7.5 to 1.5 on the analogue Pain Scale
- Doubled the healing rate over control in Diabetic Foot Wounds

Published in Journal of Foot & Ankle Surgery

- Increased perfusion by 50% in ischemic Diabetic Foot
- Study done by:
Dr. David Armstrong; Dr. Robert Wunderlich; Jan Bosma, MS; Dr. Susan Stacpoole-Shea; Dr. Lawrence Lavery; Edgar Peters, MS

Diabetic Foot Perfusion Study

INPATIENT PERFUSION STUDY

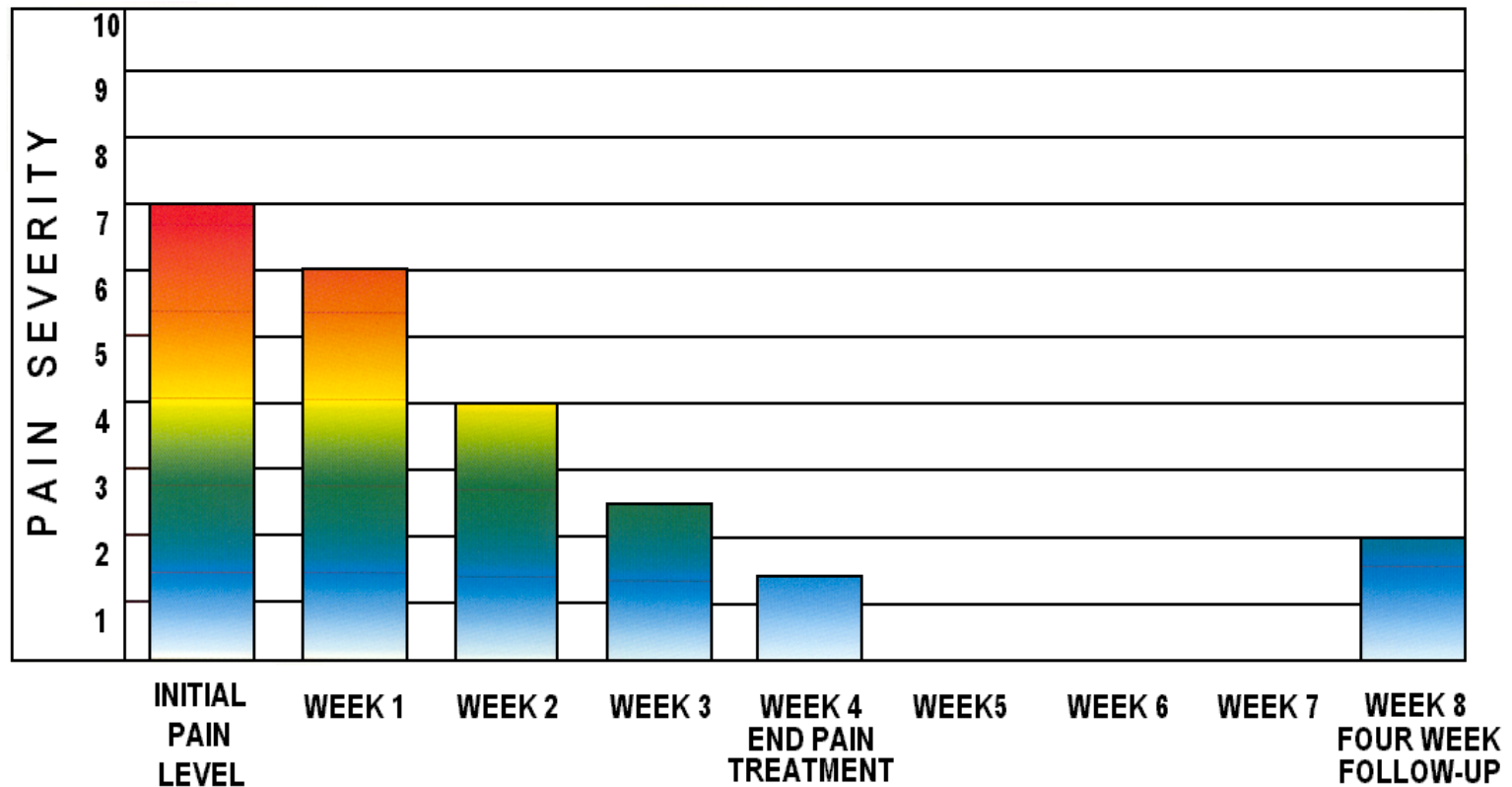


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- Reduction in Painful Neuropathy from 7.5 to 1.5 on the analogue Pain Scale
- Study done by:
Dr. David Armstrong; Dr. Lawrence Lavery; Dr. John Fleischli; Dr. Karry Ann Gilham
At the University of Texas, Dept. of Orthopedics

Diabetic Foot Pain Study

VISUAL ANALOGUE PAIN SCALE



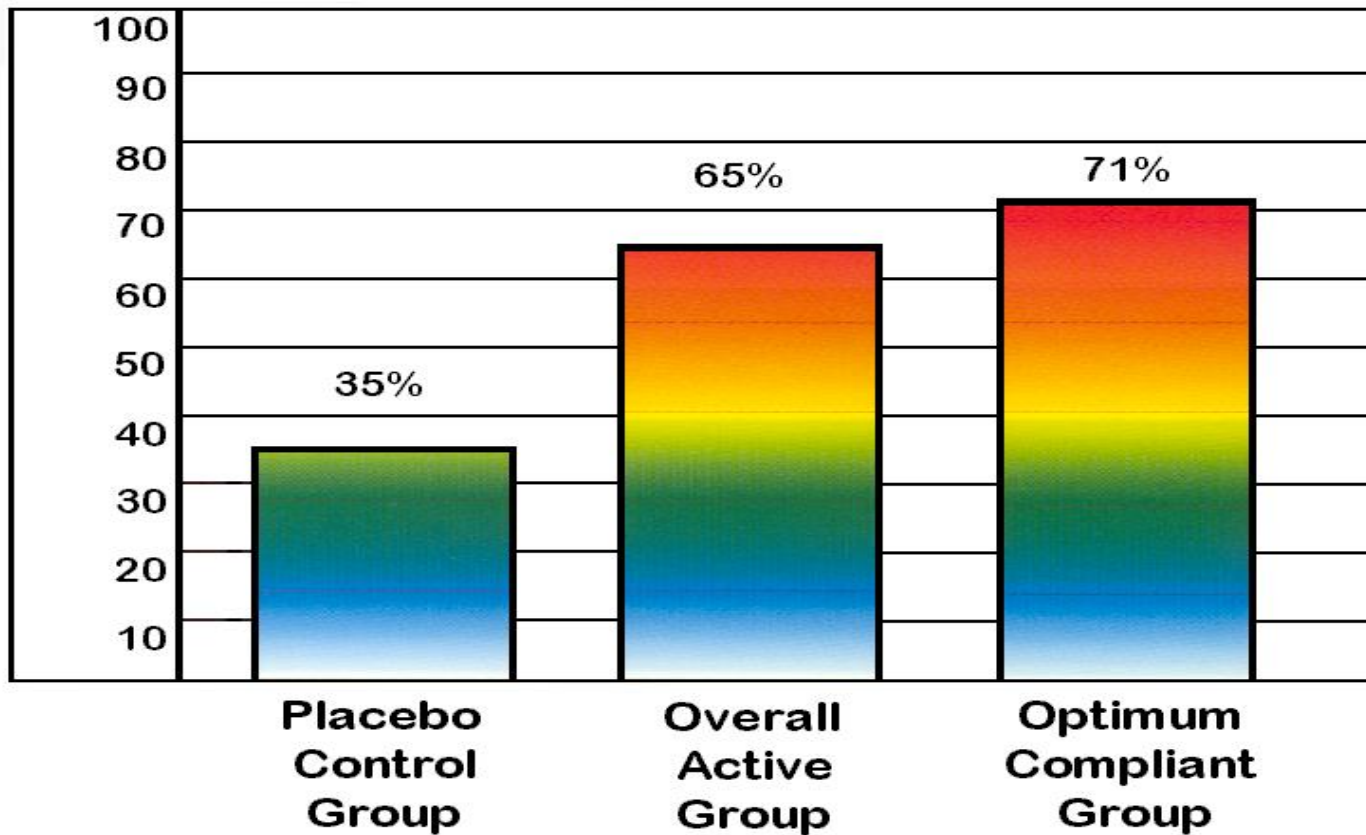


Chronic diabetic foot ulcer present for 390 days prior to enrollment in the study



Diabetic Foot Wound Study

12 WEEKS OF TREATMENT





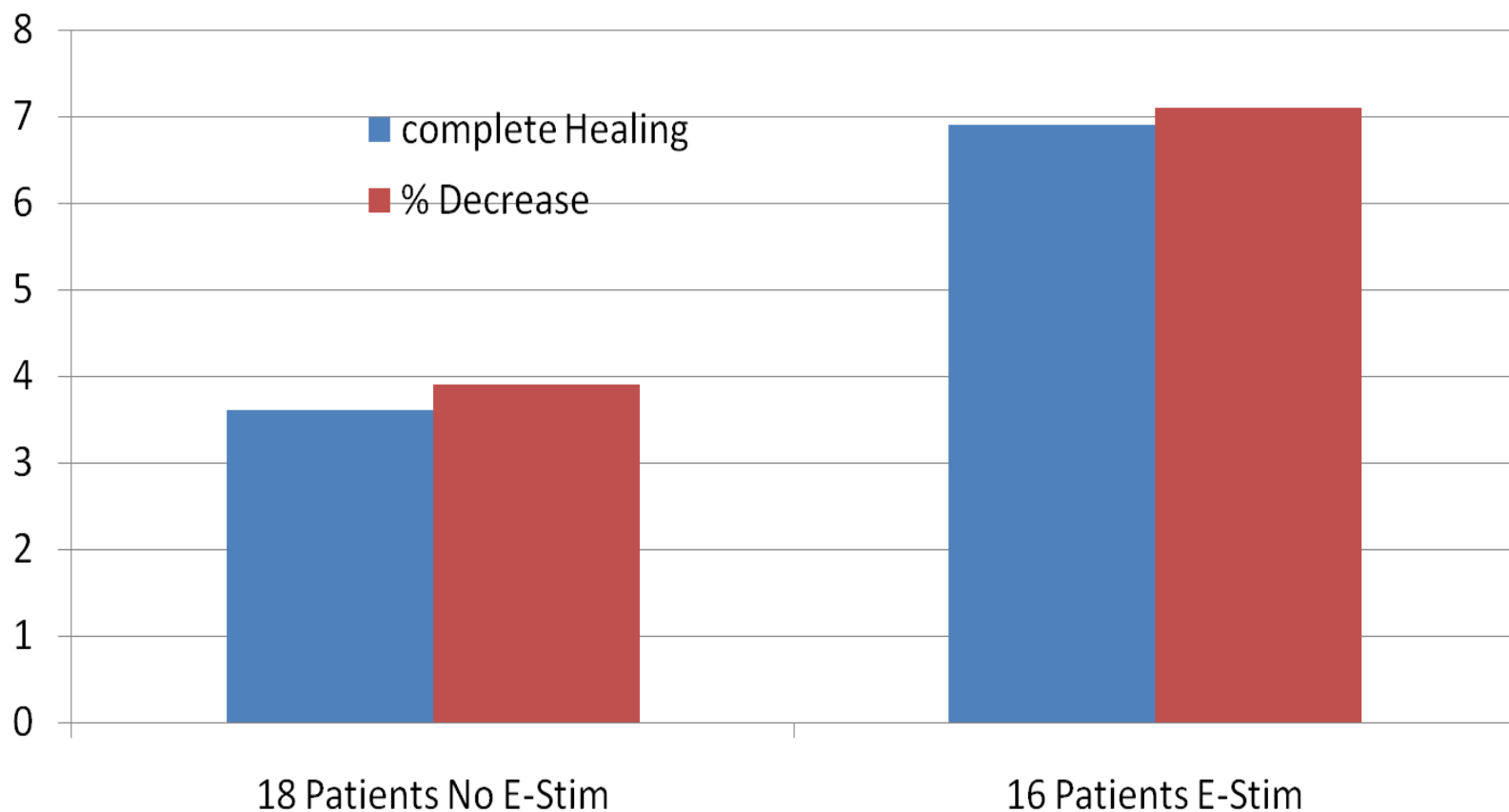
third congress of the
World Union of Wound Healing Societies

June 4 - 8, 2008

One Problem - One Voice

Toronto a world within a city

3 month Canadian E-Stim Wound Study



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