



# MASTER CLASS IN ADVANCED WOUND THERAPY: Harnessing the use of Electrical Stimulation (E-Stim), Ultraviolet-C, and Ultrasound for Wound Healing

## COURSE DESCRIPTION

This education program will provide knowledge, clinical skills, and judgements needed for the safe and effective delivery of electrical, light, and sound energies to open wounds. It is designed at an advanced level for experienced clinicians who wish to add evidence-informed advanced wound therapies to the treatment plans of various types of hard to heal complex wounds. The course is delivered in three parts:

- 1) **Online self-paced modules:** that provide physical principles, appraise research evidence, and describe application techniques for E-Stim (6 modules lasting 3.25 hrs); UVC (3 modules lasting 2hrs); and Ultrasound (1 module lasting 2 hrs). Interactive self assessment exercises that help learners apply the knowledge and concepts delivered in each module.
- 2) **Virtual case discussions (ZOOM):** that enable advanced clinical decisions and critical thinking needed to set up treatment plans and address challenging scenarios that will present when adding these advanced wound therapies to your wound care program. This collaborative virtual learning environment is also an excellent opportunity to network with other interdisciplinary wound care clinicians located in different health care settings across Canada.
- 3) **Hands-on workshops:** that allow participants to practice clinical skills and application techniques used to deliver these advanced therapies to the wound bed. Experience the specialized equipment and accessories that are being used to safely deliver electrical, sound, and light energy to various types of complex wounds..

## COURSE INSTRUCTORS:

### SHARON GABISON, BSc, BScPT, MSc, PhD, IIWCC

Dr. Gabison is an Assistant Professor at the Department of Physical Therapy at the University of Toronto and an Affiliate Scientist at the KITE Research Institute at the University Health Network. She oversees the delivery of the electrophysical agents and wound prevention and management content in the curriculum. She earned her PhD in Medical Sciences from the University of Toronto. With 25 years of clinical experience, Dr. Gabison has worked across many different settings including outpatient, ICU and homecare primarily treating the adult population. She is rostered in both wound care and acupuncture. She is a member of the Canadian Physical Therapy Wound Care Collaborative.

### PAMELA E. HOUGHTON, BScPT, PhD.

Dr. Houghton is a retired university professor where she taught for over 25 years in the School of Physical Therapy at Western University. She founded and continues to instruct in the Masters of Clinical Science (MCISc) program in Wound Healing at Western. Her award-winning research program was dedicated to building the evidence that showed electrophysical agents like E-Stim can improve healing outcomes for people living with chronic wounds.

### ETHNE L. NUSSBAUM, PT, MEd, PhD

Dr. Nussbaum is an Adjunct Professor in the Department of Physical Therapy at University of Toronto and in the School of Physical Therapy, MCISc Program, at Western University. She is recognized internationally with numerous awards for excellence in teaching, for her research and writing (Silver Quill Award winner, Canadian Physiotherapy Association) and from Mount Sinai Hospital for staff distinction. Her practice and research has focused on wound management and effectiveness of electrophysical agents (EPAs). She is co-editor of 'Electrophysical Agents: Evidence Based Practice', Elsevier, London, UK, 2020.

### LYNDSAY ORR

Dr. Orr is currently the Lead for the South West Regional Wound Care Program in South Western Ontario. Her PhD thesis focused on knowledge translation and costing for the use of E-Stim in patients with Pressure Injuries. She is a lecturer for the MCISc-Wound Healing program at Western University and has published in multiple peer reviewed journals and best practice guidelines.

# COURSE CONTENT: Online Modules

## E-Stim Modules by Dr. Pamela Houghton

### **MODULE 1: E-Stim Introduction and Mechanisms. (30 min)**

Explains what E-Stim is and what type of electrical current is needed to accelerate wound healing. Review neural, cellular, and pathophysiological effects of E-Stim on wound healing processes that are responsible for accelerating healing.

**QUIZ – What is E-Stim and how it works** – 10 self assessment questions with explanations of answers allow you to test knowledge gained in this module

### **MODULE 2: E-Stim Clinical Research Evidence. (18 min)**

Review and appraisal of published research that has examined the effect of E-Stim on rate of healing and ability to close wounds of various etiologies including pressure injuries, diabetic foot ulcers, and leg wounds due to peripheral venous/arterial disease. Use this information to appreciate what clinical conditions are likely to respond to what type of E-Stim.

**QUIZ - Application of clinical research findings:** 10 multiple choice questions with explanations allow you to self assess and apply research evidence to clinical scenarios

### **MODULE 3. Identifying the best recipient of E-Stim (25 min)**

Explanation of the medical conditions and patient factors that contraindicate the use of E-Stim for wounds and review of situations where E-Stim should be used more cautiously. This information will help clinicians identify when E-Stim is more likely to produce adverse reactions and who is most likely to benefit from E-Stim therapy.

**QUIZ – Contraindications and Precautions of E-Stim** – questions help learners consider situations where E-Stim should and should NOT be used to treat chronic wounds

### **MODULE 4. E-Stim and Dressings Interaction (15min)**

How electrical currents produced by E-Stim interact with components of common dressing types is described. Learners should be able to decide what dressings and wound care products can and cannot be used during or between E-Stim treatments.

**QUIZ – What wound dressings can you use with E-Stim?** Apply your knowledge about how electrical currents interact with various components of dressings to decide what products are best to optimize the local wound environment when treating with E-Stim.

### **MODULE 5. Principles of E-Stim (30 min)**

Consider foundational principles that guide the interaction between electrical signals and biological tissues. Learn the terminology and conventions used when using electrical currents in clinical situations. Potential adverse reactions are explained and strategies to address are discussed.

**QUIZ: - Where will the electrical current flow?** Clinical scenarios are provided that will help learners understand where electrical current will flow so that you can customize the E-Stim treatment for each patient and know how to adjust the electrode set up and/or stimulus parameters to ensure consistent, even, and comfortable E-Stim delivery to the wound and peri-ulcer skin.

### **MODULE 6. E-Stim Application Techniques (30min)**

Review images and explanations of the steps involved in applying E-Stim to an open wound using a monopolar electrode technique. Understand the rationale for the selection of stimulus parameters and electrode, size, type, and placement. Alternate application techniques are also presented.

**What ifs exercise.** Consider some of the common situations that are likely to occur when doing E-Stim treatments. Assess whether the response is desirable or not and describe how you will change the E-Stim set up to optimize the patient and wound response. AFTER you have considered all the “What ifs scenarios”, check your answers in the document provided. Successful completion of these What If scenarios is a good indicator of your mastery of the knowledge, skills, and advanced clinical decisions required to use E-Stim in your practice.

# **COURSE CONTENT: Online Modules**

## **SOUND AND LIGHT MODULES BY DR. ETHNE NUSSBAUM**

### **1. Ultrasound (US) in the management of chronic wounds and deep tissue injury**

Explaining the physical characteristics of US, particularly, establishing the importance of the treatment parameters of frequency, pulse ratio and intensity. Review of relevant research and presentation of clinical cases to demonstrate what can be expected when applying US to promote wound healing.

**QUIZ** - questions with explanatory responses to your answers allow you to test knowledge gained in this module.

### **2. Ultraviolet (UV) Light - Physical principles and biophysical effects**

Review of interactions between UV and tissue cellular elements, bactericidal effects of UVC and UVB, penetration depth and measurement of UV, vasodilatation effects and timelines. Advantages of UVC are compared with UVB/UVA for wound healing.

### **3. Ultraviolet (UV) Light – Regimen for wound treatment**

How to treat the wound bed and the peri-wound skin; particularly how to promote healthy granulation tissue vs how to proceed in the presence of a rolled over wound edge, or slough and eschar. Review of research evidence supporting UV for clearing wound infection and accelerating wound closure. Risks, precautions and contraindications are discussed.

### **4. Ultraviolet (UV) Light - Steps in the Application**

Review of cases to learn the skill of dose selection and dose progression to stimulate wound edge advancement and granulation tissue formation and how to debride wounds of slough and eschar. To show the effects of UVC on pressure ulcers, venous ulcers, diabetic ulcers, and ischemic ulcers.

**UV QUIZ** - questions to allow you to test knowledge gained in the three UV modules.