



Module (Course Syllabus) Catalogue 2024-2025

College/ Institute	Erbil Technical Health	
Department	Physiotherapy	
Module Name	Therapeutic Intervention.	
Module Code		
Semester	2 nd Semester	
Credits		
Module type	Prerequisite <input checked="" type="checkbox"/>	Core <input type="checkbox"/> Assist. <input type="checkbox"/>
Weekly hours	12 hours	
Weekly hours (Theory)	(4)hr Class	(4)hr Workload
Weekly hours (Practical)	()hr Class	()hr Workload
Lecturer (Theory)	Dr. Nawroz Ismael Hassan	
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Lecturer (Practical)		
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Course Book

Course Description	<ul style="list-style-type: none">- The Therapeutic Intervention will be training in Clinical Laboratory. The focus of this course is to develop the cognitive and psychomotor competencies necessary for the safe, effective, and evidenced-based application of therapeutic modalities in a physically active patient population.- To emphasize the importance of observational skills for patient responses to therapeutic interventions and to lay the foundation for problem solving.- In the course of these activities, student/learners are expected to position and drape their patients appropriately, practice principles of safe body mechanics, observe patient responses, and share the responsibility of being both the clinician and the patient
Course objectives	<ol style="list-style-type: none">1. Describe and identify expected responses to the application of superficial heat and cold2. Provide the rationale for skin assessment before and after the application of physical agents to the skin by demonstrating the techniques.3. Differentiate between normal and abnormal responses to heat and cold as observed in a controlled activity with classmates.4. Document observations of skin appearance of a classmate in terms that would be appropriate for a patient record. Note the similarities and differences in normal responses to heat and cold by applying both to classmates and noting their individual responses.5. Integrate the problem-solving process for determining techniques for applying cold by comparing several application techniques and discussing the outcomes.6. Describe the sequence of sensations associated with the application of heat and cold through personal experience with a variety of examples of heat and cold as applied by a classmate.
Student's obligation	<ol style="list-style-type: none">1. Assignments:<ul style="list-style-type: none">- Seminar,- Homework,- Quiz,-report,- Prepare case study (Discussion).2. Article Review.3. Exam

<p>Required Learning Materials</p>	<ol style="list-style-type: none"> 1. The exercises are intended to allow student/learners to compare different application techniques, determine alternative treatment set-ups, learn to describe and document the sensations of different forms of therapeutic heat and cold, and begin themselves with the similarities and differences among the thermal agents. 2. Designed to familiarize student/learners with the common terminology associated with electrical stimulation devices. There are a wide variety of adjustable parameters and often several names for the same parameter.
<p>Assessment scheme</p>	<p>50% Assignment (Article review) 50% final</p>
<p>Specific learning outcome:</p>	<ol style="list-style-type: none"> 1. Describe the potential patient responses to therapeutic treatment interventions. 2. Understand adjustment of treatment parameters to meet the needs and responses of individual patients to the application of electrical stimulation to accomplish therapeutic treatment goals. 3. Demonstrate clinical decision-making skills regarding whether or not to apply electrical stimulation to accomplish therapeutic treatment goals. 4. Outline examination techniques for pain assessment, the presence of edema, muscle guarding, range-of-motion deficits associated with edema, and muscle strength. 5. Select appropriate assessment tests and measurements to determine the effectiveness of a treatment intervention with a physical agent. 6. Describe and identify expected responses to the application of superficial heat. 7. Provide the rationale for skin assessment before and after the application of physical agents to the skin By demonstrating the techniques on a classmate. 8. Differentiate between normal and abnormal responses to heat observed in a controlled activity with classmates. 9. Document observations of skin appearance of a classmate in terms that would be appropriate for a patient Record.
<p>Course References:</p>	<ol style="list-style-type: none"> 1- Modalities for Therapeutic Intervention, 2016 by F. A. Davis Company. 2- Physical Agents Theory and Practice Practical Manual, 2006, Barbara J. Behrens, PTA, MS. 3- Physical Agents Theory and Practice, 2014 Holly Beinert. 4. Physical Agents in Rehabilitations ,2018 Elsevier, Michelle H. Cameron

Course topics (Theory)	Week	Learning Outcome
<p><u>FOUNDATIONS OF CLINICAL ELECTROTHERAPY:</u></p> <ul style="list-style-type: none"> ➤ PRINCIPLES OF ELECTRICITY: MAKING THE PHYSICS MAKE SENSE. ➤ PHYSIOLOGICAL RESPONSE TO ELECTRICAL CURRENT. ➤ THE BOTTOM LINE FOR ELECTROTHERAPY. 	Week 1	Describe the potential patient responses to therapeutic treatment interventions
<p><u>CLINICAL ELECTRICAL STIMULATION</u></p> <ul style="list-style-type: none"> ➤ INSTRUMENTATION FOR ELECTROTHERAPY. ➤ ELECTROTHERAPY APPLICATION AND TECHNIQUES: WHY USE ELECTROTHERAPY. 	Week 2	Understand adjustment of treatment parameters to meet the needs and responses of individual patients to the application of electrical stimulation to accomplish therapeutic treatment goals
<p><u>CLINICAL APPLICATIONS OF MODALITIES:</u></p> <ul style="list-style-type: none"> ➤ MECHANISMS OF PAIN AND USE OF THERAPEUTIC MODALITIES. ➤ ELECTRICAL STIMULATION FOR PAIN CONTROL. ➤ CLINICAL ADMINISTRATION OF TENS. ➤ ELECTRICAL CURRENTS FOR PAIN MODULATION. 	Week 3	Demonstrate clinical decision-making skills regarding whether or not to apply electrical stimulation to accomplish therapeutic treatment goals
<p><u>THERAPEUTIC MODALITIES FOR IMPROVING RANGE OF MOTION:</u></p> <ul style="list-style-type: none"> ➤ CLINICAL REASONING SOURCES OF LOSS OF MOBILITY AND RANGE OF MOTION. ➤ ASSESSMENT OF LOSS OF MOTION. ➤ SPECIAL CONSIDERATIONS FOR USE OF THERAPEUTIC MODALITIES FOR CONTRACTURES. ➤ 	Week 4	Demonstrate the adjustment of various parameters on electrical stimulation devices to intentionally elicit sensory, motor, and fast pain responses and accurately document the parameters so that the response can be duplicated by a peer
<p><u>ELECTROTHERAPY FOR MUSCULOSKELETA :</u></p> <ul style="list-style-type: none"> ➤ RATIONALE FOR NEUROMUSCULAR ELECTRICAL STIMULATION. ➤ NMES AND MOTOR UNIT RECRUITMENT. ➤ NMES AND MOTOR UNIT RECRUITMENT. ➤ ELECTRICAL MUSCLE STIMULATION APPLIED TO DENERVATED MUSCLE. 	Week 5	Describe and identify expected responses to the application of superficial heat

<p><u>NMES AND FES IN PATIENTS WITH NEUROLOGICAL DIAGNOSES:</u></p> <ul style="list-style-type: none"> ➤ NEUROMUSCULAR ELECTRICAL STIMULATION. ➤ FUNCTIONAL ELECTRICAL STIMULATION. ➤ EXAMINATION NEEDS. ➤ FUNCTIONAL ELECTRICAL STIMULATION. 	Week 6	Select appropriate assessment tests and measurements to determine the effectiveness of a treatment intervention with a physical agent.
<p><u>THERAPEUTIC MODALITIES FOR TISSUE HEALING:</u></p> <ul style="list-style-type: none"> ➤ THE NORMAL HEALING PROCESS ➤ CONVENTIONAL ULTRASOUND ➤ INTERMITTENT PNEUMATIC COMPRESSION ➤ SUPERFICIAL HEATING MODALITIES ➤ NEGATIVE-PRESSURE WOUND THERAPY 	Week 7	Describe therapeutic interventions for a patient in acute pain, including methods of encouraging active patient participation in the recovery process
<p><u>ALTERNATIVE MODALITIES FOR PAIN AND TISSUE HEALING:</u></p> <ul style="list-style-type: none"> ➤ MONOCHROMATIC INFRARED PHOTO ENERGY ➤ HYPERBARIC OXYGEN THERAPY ➤ EXTRACORPOREAL SHOCK WAVE THERAPY 	Week 8	Outline examination techniques for pain assessment, the presence of edema, muscle guarding, range-of-motion deficits associated with edema, and muscle strength.
<p><u>ELECTROPHYSIOLOGICAL TESTING OF NERVES AND MUSCLES:</u></p> <ul style="list-style-type: none"> ➤ WHAT IS ELECTRONEUROMYOGRAPHY ➤ EQUIPMENT TO CONDUCT ENMG ➤ NERVE CONDUCTION STUDIES ➤ CLINICAL ELECTROMYOGRAPHY 	Week 9	Provide the rationale for skin assessment before and after the application of physical agents to the skin By demonstrating the techniques on a classmate.
<p><u>Evaluation and Planning for the Use of Physical Agents:</u></p> <ul style="list-style-type: none"> ➤ CHOOSING A PHYSICAL AGENT ➤ ATTRIBUTES TO CONSIDER IN THE SELECTION OF PHYSICAL AGENTS. ➤ USING PHYSICAL AGENTS IN COMBINATION WITH EACH OTHER OR WITH OTHER INTERVENTIONS. 	Week 10	Integrate the problem-solving process for determining techniques for applying cold by comparing several application techniques and discussing the outcomes
<p><u>Motion Restrictions:</u></p> <ul style="list-style-type: none"> ➤ Pathologies That Can Cause Motion Restriction ➤ Examination and Evaluation of Motion Restrictions. ➤ Treatment Approaches for Motion Restrictions 	Week 11	Describe and identify expected responses to the application of superficial heat
<p><u>Electrical Currents for Muscle Contraction:</u></p> <ul style="list-style-type: none"> ➤ Clinical Applications of Electrically Stimulated Muscle Contractions. ➤ Neuromuscular Electrical Stimulation After Anterior Cruciate Ligament Reconstruction. ➤ IMPROVED MUSCLE COORDINATION AND MOTOR 	Week 12	Describe the sequence of sensations associated with the application of heat and cold through personal experience with a variety of examples of

1. Does the patient have a dysfunction, limitation, or problem that can be improved with the use of TENS?
2. Is the patient appropriate for TENS (i.e., do any of the general precautions or contraindications to TENS apply to the patient or are there any specific considerations regarding application of TENS to this patient)?
3. What are the specific goals to be achieved with the use of TENS?
4. What specific form of TENS would be appropriate for the patient?
5. What specific parameters of TENS are appropriate for the patient?
6. What are the appropriate and safe application procedures for home TENS?

B: The patient is a 65-year-old female who had left total-knee arthroplasty 1 month ago. The patient presents with limitations in extension of the left knee. Palpation also reveals tightness in the distal hamstrings, proximal gastrocnemius, and posterior joint capsule of the knee, all of which are likely contributors to the decrease in ROM.

Answer the following questions briefly (CLINICAL DECISION)

1. Does the patient have dysfunction or impairment that may be improved or lessened by the use of hot packs?
2. Why would hot packs be a consideration for this patient?
3. What specific outcome measures can be used to assess the effectiveness of the agent?
4. Are there any precautions or contraindications to consider with this patient?
5. What specific parameters are recommended for this patient?
6. What are the proper steps to using hot packs for this patient?

Q.2/ Choose the most appropriate answer (20 Marks)

1. Which of the following statements is most accurate regarding the application of iontophoresis?
 - a. The treatment electrode must be the same polarity.
 - b. The dispersive electrode must be the same polarity.
 - c. The patient must be informed that he or she will need to expect to tolerate discomfort with the electrical stimulation.
 - d. It is not necessary to ask patients if they are allergic to iontophoretic medications.
2. You are adjusting the electrical stimulation unit on a patient and she reports that what she is feeling is a thumping sensation but you wanted it to feel smooth and tingling. Which parameter would you need to adjust to make the sensation feel more like a tingling sensation?
 - a. The pulse duration
 - b. The intensity
 - c. The polarity
 - d. The frequency
3. Which of the following would represent the greatest potential advantage of a self-adhering electrode over a carbon impregnated electrode?
 - a. Ease of application
 - b. Cost to the patient
 - c. Possibility of cross-contamination
 - d. Decreased impedance
4. What can you do to improve the electrode interface to enhance conduction?
 - a. Use sandpaper to rough up the patient's skin
 - b. Clean the patient's skin with a lotion-based cleanser
 - c. Moisten the electrodes with water
 - d. Replace the electrodes for each application

5. Which of the following would not be part of the process that takes place prior to the application of various forms of therapeutic electrical stimulation to a patient to maintain patient safety?
- Inspection of the lead wires
 - Inspection of the electrodes
 - Inspection of the power cord
 - Confirm possession of electrical tape
6. Which of the following electrode configuration would be most appropriate for the accomplishment of a motor response in a specific superficial muscle?
- Quadripolar with two bifurcated channels crossing the muscle
 - Monopolar with an active and dispersive electrode that is more than twice the size of the active electrode
 - Monopolar with a dispersive and active electrode that is more than twice the size of the dispersive electrode
 - Bipolar with one electrode over the motor point of the muscle
7. A patient whom you are treating with electrical stimulation has reported that he is intermittently feeling the sensation from the unit. Which of the following explanations would most likely be the cause for this if the unit had been set to function continuously without any Off time?
- One of the electrodes might have dried out and need to be re-hydrated
 - One of the lead wires might have become disconnected and need to be re-connected
 - One of the electrodes might have become detached from the lead wire and needs to be re-connected
 - One of the lead wires might have a break in its continuity and needs to be replaced.

8. Which of the following parameters on an electrical stimulator would be considered essential if your treatment goal was muscle strengthening?
 - a. Frequency
 - b. Pulse duration
 - c. Intensity
 - d. On/off times
9. Which of the following features or parameters on an NMES unit would be most helpful in differentiating between your ability to use it for range of motion (ROM), facilitation of muscle function, management of muscle guarding, edema reduction, or orthotic substitution?
 - a. Portability
 - b. Potential output intensity
 - c. Flexibility within pulse duration settings
 - d. Flexibility within on/off time settings
10. Which of the following features or parameters on an NMES unit would differentiate it from others and make it possible for use with both denervated and fully innervated patients for muscle reeducation and orthotic substitution?
 - a. Potential output intensity
 - b. Flexibility within pulse duration settings up to continuous
 - c. Flexibility within on-off time settings
 - d. A polarity setting that is adjustable
11. While you are working with a patient for the facilitation of muscle function, she complains of a prickling sensation under the electrode on her VMO. Which of the following is the most likely cause for this type of complaint and appropriate remedy?
 - a. She's fatigued and needs to rest before resuming the activity
 - b. She's feeling the effects of the electrode drying out and it needs to be rehydrated to reduce the impedance

- c. She's faking it. If she feels something you wouldn't be using NMES to facilitate a muscle contraction.
- d. The intensity needs to be higher. What she is reporting is the first sensation just before the appropriate level is perceived by the patient.
12. One of the "temps" who is filling in for a clinician who is out on maternity leave has set up a patient who has been receiving electrical stimulation to assist in the reduction of edema in her lower leg. You overhear the "temp" instructing the patient what should be felt during the treatment. Which of the following would be incorrect for this treatment goal?
- a. Let me know when you start to feel something. I've supported your leg so that it is elevated above your heart, which is how you should rest whenever possible.
- b. Once you have started to feel something, I will be increasing the intensity a little higher so that we can start to see a muscle contraction. Work with that. It will only be on for a couple of seconds but it will help pump some of the fluid back out of the area.
- c. Let me know when you start to feel something. Once you have started to feel something, I will be decreasing the intensity a little so that it's not so strong. I've supported your leg so that it is elevated above your heart, which is how you should rest it whenever possible.
- d. This should feel comfortable but I also need to see a contraction of the muscle. It will be off and on and I would like you to work with it.
13. Which of the following forms of electrical stimulation has been used effectively for tissue repair with human tissues?
- a. NMES
- b. IFC
- c. HVPC
- d. TENS
14. What is meant by the term "current of injury"?
- a. Injured tissue produces an electrical current that is different from the surrounding current potentials
- b. Tissues become injured when electrical stimulation is applied and produce a current of injury that can be measured.
- c. Matching the action potential of the current of injured tissues can balance and heal that tissue
- d. Using the opposite action potential of the current

of injury for an injured area will promote tissue healing

15. What is the rationale behind promoting mobility during the various stages of wound healing?
- There is none; the tissue will not heal unless it is immobilized
 - Alignment of the collagen fibers will be based upon function if mobility is permitted during the remodeling phase
 - Tissue repair will be enhanced as a result of constant re-injury and repair that will be caused by motions taking place throughout the injured area
 - Angiogenesis will not occur unless motion accompanies healing.
16. What would be the appropriate application of electrical stimulation to promote autolytic debridement for tissue repair?
- Placement of the negative electrode over the wound to attract the positively charged neutrophils and macrophages to promote autolysis
 - Placement of the negative electrode over the wound to attract the negatively charged neutrophils and macrophages to promote autolysis
 - Placement of the positive electrode over the wound to attract the positively charged neutrophils and macrophages to promote autolysis
 - Placement of the positive electrode over the wound to attract the negatively charged neutrophils and macrophages to promote autolysis
17. Which of the following techniques is most accurate regarding the application of HVPC for wound healing?
- Use a peri wound technique with electrodes placed adjacent to the wound bed on intact skin
 - Use a direct technique with electrodes placed adjacent to the wound bed on intact skin
 - Use a peri wound technique with the active electrode placed on the wound bed, with dispersive electrode located 15 to 20 cm distant to the wound
 - Use a direct technique with the active electrode placed on the wound bed, with dispersive electrode located 15 to 20 cm distant to the wound.

18. What is the difference between pain management and pain relief?
- There is no difference
 - Pain management is what medications do and pain relief is what occurs through the use of physical therapy
 - Both pain relief and pain management can be accomplished with physical agents but one is managed by the patient with a portable device
 - Pain management is temporary and pain relief is constant.
19. What would the rationale be for using a clinical versus portable option for pain management with electrical stimulation?
- Clinical electrical stimulation can be used in combination with manual techniques so that the patient feels no discomfort during therapy
 - Clinical electrical stimulation units are battery operated and offer more power output potential than portable units for sustained benefit.
 - Clinical electrical stimulation units are more expensive than portable units, which means that the reimbursement from insurance carriers would be higher for the same service billed to the patient.
 - Portable electrical stimulators are the most convenient form of electrical stimulation for use in the clinic and would save clinicians money because they would not need to purchase clinical models.
20. Which of the following parameters would not be important to document for the use of electrical stimulation to promote analgesia?
- The name of the electrical stimulator
 - The location of the electrodes and general setup
 - The treatment goal and amount of time for the application
 - the patient's pre- and post-treatment

Q.3/ Answer the followings: (10 Marks)

- A. Explain general electrophysiological effects that occur with the delivery of electrical current.
- B. Innumerate the steps offer a guideline of clinical application for electrical modalities
- C. Classifying Electrotherapeutic Devices & Innumerate the type of electrode with Appling each one.

Extra notes:

External Evaluator

