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Course Title: Therapeutic Modalities 101

Course Subtitle: Physical Agents in Rehabilitation

Source: Physical Agents in Rehabilitation from Research to Practice, 4th edition, by Michelle Cameron.

Source Description: Presenting a variety of treatment choices supported by the latest clinical research, **Physical Agents in Rehabilitation: From Research to Practice, 4th Edition** is your guide to the safe, most effective use of physical agents in your rehabilitation practice. Coverage in this new edition includes the most up-to-date information on thermal agents, ultrasound, electrical currents, diathermy, lasers and light and ultraviolet radiation. Straightforward explanations make it easy to integrate physical agents into your patients' overall rehabilitation plans. Review course outline below for details for Therapeutic Modalities 101 course.

Target Audience: OT/OTA and other healthcare professionals

Course Length: 20 hours

Course Author/Instructor: Michelle Cameron, MD, PT, OCS / Brown, MS, OTR/L, CHT

Educational Level: Introductory, Intermediate, Advanced

The course is written at the intermediate level, but learners of all levels will benefit from the information.

Course Objectives:

At the end of the course, participants will be able to: (objectives are listed based on course section for individual detail)

Part I: Physiology of Physical Agents - 1 hour

- List and examine 3 categories of physical agents
- Outline and describe 4 effects of physical agents
- List contraindications and precautions for the use of physical agents
- Describe the process for evaluating and planning for the use of physical agents
- List important considerations for documentation for the use of physical agents

Part II: Physical Agents in the Clinical Practice – 1 hour

- Review the history of PAMS in physical medicine and rehabilitation

- Outline and analyze the role of PAMS in rehabilitation
- Discuss the use of PAMS and evidence based practice
- Describe how PAMS can be used in different health care settings
- List and define terminology associated with PAMS

Part III: Inflammation and Tissue Repair – 2 hours

- Outline and describe 3 phases of inflammation and healing
- Describe and differentiate chronic healing from acute healing
- List and examine various features that effect the healing process
- Outline and describe the healing of specific musculoskeletal tissues including cartilage, bone, ligaments and muscle
- Review case studies that highlight clinical application

Part IV: Introduction to Thermal Agents - 1 hour

- List and describe 5 different modes of heat transfer
- Define and differentiate conduction, convection, conversion, radiation, evaporation
- Provide an example for each mode of heat transfer

Part V: Superficial Hot and Cold – 3 hours

- Describe 3 effects of cold and 4 effects of heat
- Indicate 4 clinical uses for heat and 4 uses for cold
- List and describe 2 contraindications for heat and 2 contraindications for cold
- Analyze 4 adverse effects of thermotherapy
- Describe the application techniques of both hot and cold
- Describe important components for documentation for thermal modalities
- Read case studies to highlight clinical application
- Discuss clinical reasoning for choosing between cryotherapy and thermotherapy

Part VI: Pain -2 hours

- Describe the mechanism of pain receptors and how pain is transmitted
- Discuss the gate control theory and how pain is modulated and controlled
- Compare and contrast the 6 different types of pain including: acute, chronic, nociceptive, neuropathic, dysfunctional, and psychogenic
- Analyze 3 different ways to assess pain including the use of pain scales
- Describe 5 different approaches for managing pain including the use of physical agents, pharmacological, exercise, and other pain management programs
- Read case studies to highlight and understand clinical application

Part VII: Tone Abnormalities – 2 hours

- Describe the various challenges to assessing tone abnormalities

- Compare and contrast hypertonicity vs. hypotonicity
- Describe and differentiate quantitative measuring of muscle tone vs. qualitative measuring of muscle tone
- Review and describe anatomical bases of muscle tone including neural and muscular contributions
- Describe abnormal muscle tone and list 3 consequences of abnormal tone
- Read clinical case studies to highlight and understand clinical application

Part VIII: Motion Restrictions – 1 hour

- Describe and differentiate 3 different types of motion
- Describe capsular and noncapsular patterns of motion restrictions
- Analyze 5 pathologies that can restrict motion
- Compare and contrast examination and evaluation techniques for motion restriction
- Assess 3 methods for treating motion restrictions
- Discuss the role of physical agents in the treatment of motion restrictions
- List 5 contraindications and precautions to range of motion techniques
- Read and examine case studies to highlight clinical application

Part IX: Ultrasound – 2 hours

- Analyze the thermal and nonthermal benefits of ultrasound
- Discuss the clinical application of ultrasound in the use of soft tissue shortening, pain control, bone fractures and other clinical conditions
- List 5 contraindications and precautions for the use of ultrasound
- Describe application techniques and parameters surrounding the use of ultrasound
- Discuss components of ultrasound that should be included in documentation

Part X: Diathermy – 2 hours

- Examine and discuss the physical properties of diathermy
- Compare and contrast diathermy applicators
- Describe the thermal and nonthermal effects of diathermy
- Outline application techniques and understand positioning for diathermy
- Read case studies to highlight clinical application

Part XI: Lights and Lasers – 2 hours

- Discuss the physical properties of electromagnetic radiation
- Become familiar with the history and physical properties of lasers and lights
- List and describe 6 effects of lasers and lights
- Review the indications and contraindications for the use of lasers and lights
- Outline the steps involved in the application of lasers and lights
- Discuss important components involved in documentation with the use of lasers and lights
- Read case studies to understand clinical application

Part XII: - Ultraviolet Radiation – 1 hour

- Outline and describe the physical properties of ultraviolet radiation
- Describe 5 effects of ultraviolet radiation
- List and examine 2 clinical indications for the use of ultraviolet radiation
- List 5 contraindications and adverse effects for the use of ultraviolet radiation
- Describe application techniques for ultraviolet radiation

Outline of Content:

Hour #1

Physiology of Physical Agents

What Are Physical Agents?

Categories of Physical Agents

Thermal Agents

Mechanical Agents

Electromagnetic Agents

Effects of Physical Agents

Inflammation and Healing

Pain

Collagen Extensibility and Motion Restrictions

Muscle Tone

General Contraindications and Precautions for Physical Agent Use

Pregnancy

Malignancy

Pacemaker or Other Implanted Electronic Device

Impaired Sensation and Mentation

Evaluation and Planning for the Use of Physical Agents

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

Documentation

Hour #2

Physical Agents in the Clinical Practice

History of Physical Agents in Medicine and Rehabilitation

Approaches to Rehabilitation

The Role of Physical Agents in Rehabilitation

Practitioners Using Physical Agents

Evidence-Based Practice

Using Physical Agents Within Different Health Care Delivery Systems

Hour #3 + Hour #4

Inflammation and Tissue Repair

The Phases of Inflammation and Healing

Inflammation Phase (Days 1 to 6)

Proliferation Phase (Days 3 to 20)

Maturation Phase (Day 9 Forward)

Chronic Inflammation

Factors Affecting the Healing Process

Local Factors External Forces Systemic

Factors

Healing of Specific Musculoskeletal Tissues

Cartilage

Tendons and Ligaments

Skeletal Muscle

Bone

Clinical Case Study

Hour #5

Introduction to Thermal Agents

Specific Heat

Modes of Heat Transfer

Conduction

Convection

Conversion

Radiation

Evaporation

Hour #6, Hour #7, Hour #8

Superficial Hot and Cold

Cryotherapy

Effects of Cold

Hemodynamic Effects

Neuromuscular Effects

Metabolic Effects

Uses of Cryotherapy

Inflammation Control

Edema Control

Pain Control

Modification of Spasticity

Symptom Management in Multiple Sclerosis

Facilitation

Cryokinetics and Cryostretch

Contraindications and Precautions for Cryotherapy

Contraindications for the Use of Cryotherapy

Precautions for the Use of Cryotherapy

Adverse Effects of Cryotherapy
Application Techniques
General Cryotherapy
Cold Packs or Ice Packs
Ice Massage
Controlled Cold Compression Unit
Vapocoolant Sprays and Brief Icing
Documentation
Examples
Clinical Case Studies
Thermotherapy
Effects of Heat
Hemodynamic Effects
Neuromuscular Effects
Metabolic Effects
Altered Tissue Extensibility
Uses of Superficial Heat
Pain Control
Increased Range of Motion and Decreased Joint Stiffness
Accelerated Healing
Infrared Radiation for Psoriasis
Contraindications and Precautions for Thermotherapy
Contraindications for the Use of Thermotherapy
Precautions for the Use of Thermotherapy
Adverse Effects of Thermotherapy
Burns
Fainting
Bleeding
Skin and Eye Damage from Infrared Radiation
Application Techniques
General Thermotherapy
Hot Packs
Paraffin
Fluidotherapy
Infrared Lamps
Contrast Bath
Documentation
Examples
Clinical Case Studies
Choosing Between Cryotherapy and Thermotherapy

Hour #9, Hour #10

Pain
Mechanisms of Pain Reception and Transmission
Pain Receptors
Primary Afferent Neurons

Central Pathways
Pain Modulation and Control
Pain Modulation at the Spinal Cord Level: Gate Control
Theory
The Endogenous Opioid System Sympathetic
Nervous System Influences
Motor System Influences
Types of Pain
Acute Pain Chronic
Pain
Nociceptive Pain
Neuropathic Pain
Dysfunctional Pain
Psychogenic Pain
Assessing Pain
Visual Analog and Numerical Scales
Semantic Differential Scales
Other Measures
Pain Management
Physical Agents
Pharmacological Approaches
Exercise
Cognitive-Behavioral Therapy Comprehensive
Pain Management Programs
Clinical Case Studies

Hour #11, Hour #12

Tone Abnormalities
Muscle Tone
Challenges to Assessing Muscle Tone
Tone Abnormalities
Hypotonicity
Hypertonicity
Terms Confused With Muscle Tone
Fluctuating Abnormal Tone
Measuring Muscle Tone
Quantitative Measures
Qualitative Measures
General Considerations When Muscle Tone is Measured
Anatomical Bases of Muscle Tone and Activation
Muscular Contributions to Muscle Tone and Activation
Neural Contributions to Muscle Tone and Activation
Sources of Neural Stimulation of Muscle
Summary of Normal Muscle Tone
Abnormal Muscle Tone and Its Consequences
Low Muscle Tone

High Muscle Tone
Fluctuating Muscle Tone
Clinical Case Studies

Hour #13

Motion Restrictions
Types of Motion
Active Motion
Passive Motion
Physiological and Accessory Motion
Patterns of Motion Restriction
Capsular Pattern of Motion Restriction
Noncapsular Pattern of Motion Restriction
Tissues That Can Restrict Motion
Contractile Tissues
Noncontractile Tissues
Pathologies That Can Cause Motion Restriction
Contracture
Edema
Adhesion
Mechanical Block
Spinal Disc Herniation
Adverse Neural Tension
Weakness
Other Factors
Examination and Evaluation of Motion Restrictions
Quantitative Measures
Qualitative Measures
Test Methods and Rationale
Contraindications and Precautions to Range of Motion
Techniques
Treatment Approaches for Motion Restrictions
Stretching
Motion
Surgery
The Role of Physical Agents in the Treatment of Motion
Restrictions
Increase Soft Tissue Extensibility
Control Inflammation and Adhesion Formation
Control Pain During Stretching
Facilitate Motion
Clinical Case Studies

Hour #14, Hour #15,

Ultrasound
Introduction

Terminology
History
Ultrasound Definition
Generation of Ultrasound
Effects of Ultrasound
Thermal Effects
Nonthermal Effects
Clinical Applications of Ultrasound
Soft Tissue Shortening
Pain Control
Dermal Ulcers
Surgical Skin Incisions
Tendon and Ligament Injuries
Resorption of Calcium Deposits
Bone Fractures
Carpal Tunnel Syndrome
Phonophoresis
Contraindications and Precautions for the Use of Ultrasound
Contraindications for the Use of Ultrasound
Precautions for the Use of Ultrasound
Adverse Effects of Ultrasound
Application Technique
Ultrasound Treatment Parameters
Documentation

Hour #17, Hour #18

Diathermy
Physical Properties of Diathermy
Types of Diathermy Applicators
Inductive Coil
Capacitive Plates
Magnetron (Condenser)
Effects of Diathermy
Thermal Effects
Nonthermal Effects
Clinical Indications for the Use of Diathermy
Thermal Level Diathermy
Nonthermal Pulsed Shortwave Diathermy
Contraindications and Precautions for the Use of Diathermy
Contraindications for the Use of All Forms of Diathermy
Contraindications for the Use of Thermal Level Diathermy
Contraindications for the Use of Nonthermal Pulsed
Shortwave Diathermy
Precautions for the Use of All Forms of Diathermy
Precautions for the Use of Nonthermal Pulsed Shortwave
Diathermy

Precautions for the Therapist Applying Diathermy
Adverse Effects of Diathermy
Burns
Application Techniques
Positioning
Documentation
Examples
Selecting a Diathermy Device
Clinical Case Studies

Hour #19

Lights and Lasers
Terminology
Introduction to Electromagnetic Radiation
Physical Properties of Electromagnetic Radiation
History of Electromagnetic Radiation
Physiological Effects of Electromagnetic Radiation
Introduction to Lasers and Light
Brief History of Lasers and Light
Physical Properties of Lasers and Light
Effects of Lasers and Light
Promote Adenosine Triphosphate Production
Promote Collagen Production
Modulate Inflammation
Inhibit Bacterial Growth
Promote Vasodilation
Alter Nerve Conduction Velocity and Regeneration
Clinical Indications for the Use of Lasers and Light
Tissue Healing: Soft Tissue and Bone
Arthritis
Lymphedema
Neurological Conditions
Pain Management
Contraindications and Precautions for the Use of Lasers
and Light
Contraindications for the Use of Lasers and Light
Precautions for the Use of Lasers and Light
Adverse Effects of Lasers and Light
Application Technique for Lasers and Light
Parameters for the Use of Lasers and Light
Documentation
Examples
Clinical Case Studies

Hour #20

Ultraviolet Radiation

Physical Properties of Ultraviolet Radiation
Effects of Ultraviolet Radiation
Erythema Production
Tanning
Epidermal Hyperplasia
Vitamin D Synthesis
Bactericidal Effects
Other Effects of Ultraviolet Radiation
Clinical Indications for Ultraviolet Radiation
Psoriasis
Wound Healing
Contraindications and Precautions for the Use of Ultraviolet Radiation
Contraindications for the Use of Ultraviolet Radiation
Precautions for the Use of Ultraviolet Radiation
Adverse Effects of Ultraviolet Radiation
Burning
Premature Aging of Skin
Carcinogenesis
Eye Damage
Adverse Effects of Psoralen With Ultraviolet A
Application Techniques
Dose-Response Assessment
Ultraviolet Therapy Application
Dosimetry for the Treatment of Psoriasis With Ultraviolet Radiation
Documentation
Example
Ultraviolet Lamps
Selecting a Lamp
Lamp Maintenance
Clinical Case Study

Instructional Methods and Formats:

Online course available 24/7 at www.OnlineCE.com includes PDF downloadable course. See course formats for additional details.

Course Completion Requirements:

A minimum passing score of 100% is required for course completion. You will have as many attempts as needed until your passing score of 100% is achieved. Upon successful completion of course, you will receive your certificate of completion and AOTA eligible CEUs.

AOTA Classification Codes:

Category 1: Domain of OT

Category 2: Occupational Therapy Process
Category 3: Professional Issues

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