Spring 1-2003

PT 527.01: Electrotherapeutic Testing and Therapy

Carrie Gajdosik
University of Montana - Missoula

Gajdosik, C.
PT 527 - ELECTROTHERAPEUTIC TESTING AND THERAPY
SPRING 2003

Jan 28, 30 Feb 4	**LECTURE:** Principles of Electricity and Electrical Stimulation	**Cameron**: pgs. 345-370; 407-409
FEB 5 **1:10 - 3:00** FEB 6	½ **LAB:** principle of ES ½ **LAB:** principle of ES	
FEB 10 **1:10 - 3:00**	Review session	
FEB 11	**1st hour – test** **2nd hour** – Lecture - Electroanalgesia	**Cameron**: pgs. 412-413 (application); 387-392
FEB 13	no class	
FEB 18 FEB 19 **1:10- 3:00** FEB 20	**LECTURE:** Electroanalgesia ½ **LAB:** Electroanalgesia ½ **LAB:** Electroanalgesia	
FEB 25 FEB 27	½ **LAB:** Electroanalgesia ½ **LAB:** Electroanalgesia	
MAR 4	**LECTURE**: ESTR (Electrical Stimulation For Tissue Repair)	**Cameron:** pgs: 393-405
MAR 5 **1:10-3:00** MAR 6	½ **LAB:** ESTR (See fac pac) ½ **LAB:** ESTR (See fac pac)	
MAR 11	**TEST**	
MAR 13	**LECTURE:** NMES (Neuromuscular Electrical Stimulation)	**Cameron**: pgs: 370-386
MAR 18 MAR 19 **1:10-3:00** MAR 20	**LECTURE:** NMES ½ **LAB:** NMES ½ **LAB:** NMES	
MAR 24-28	**SPRING BREAK**	

APR 1 APR 3 APR 3 **1:10-3:00**	½ **LAB:** NMES **LECTURE**: Electrophysiological Testing (EMG & NCV) ½ **LAB:** NMES	 **O'Sullivan**: Ch 9
April 4 **10 AM – 4 PM**	**EMG & NCV: All day class.** **WEAR LAB CLOTHES** (Shorts, tee shirts, sports bras)	
APR 8	meet another class	
APR 10	**LECTURE:** Biofeedback	**O'Sullivan**: Ch 32
APR 15	**LECTURE:** Working with the PTA, Issues of documentation Review session for final test	
APR 17	**FINAL TEST**	
APR 22	**LAB:** preparation for practical exam	
APR 24 **10:00-12:00**	**beginning of practical exams**	

PT 527 - ELECTROTHERAPEUTIC TESTING AND THERAPY

TIME/DAY: 8:10 - 10:00 Tuesday
10:10 – 12:00 Thursday
Some Wednesday and Thursday afternoons
CREDITS: 2
PROFESSOR: Carrie Gajdosik, MS, PT
CONTACT NUMBERS: 243-5189
251-0266
cgajdo@selway

OFFICE HOURS: Whenever

EVALUATION PROCEDURES:

3 Tests = 75% of grade
1 practical exam = 25% of grade

90-100% = A
80-89% = B
70-79% = C
< 70% - repeat test or practical exam

A failure of the practical exam will occur if the student does not do the following:

1. Question the "patient" about contraindications and precautions
2. Does not ask specifically ask about a **cardiac pacemaker**

Important contraindications and precautions to ask about

1. Heart disease
2. Pregnancy
3. Cancer
4. Circulation or blood clots - if treating the LE

Important safety procedures

1. Sensory testing
2. Give patient the control button

REQUIRED TEXTS:

Cameron, MH: Physical Agents in Rehabilitation
O'Sullivan SB, Schmitz TJ: Physical Rehabilitation Assessment and Treatment.

SUPPLEMENTAL INFORMATION:

Benton LA, Baker LL, Bowman BR, et al: Functional Electrical Stimulation: A Practical

Clinical Guide, 2nd ed. Downey, CA, Professional Staff Association of Rancho Los Amigos Medical Center, 1981

Gersh, MR: Electrotherapy in Rehabilitation. Phila, FA Davis, 1992

Kloth LC, McCulloch JM, Feeder JA: Wound Healing: Alternatives to Management. Philadelphia, FA Davis, 1990

Wolf SL: Electrotherapy. New York, Churchill Livingstone, 1981 (See Carrie to borrow this book)

LAB CLOTHING: Shorts, T-shirts, halter tops, bathing suit tops. Be prepared to expose shoulders or back for "treatment."

PRACTICALS: As you know, practical exams are given over a period of days. The following guidelines have been established to ensure confidentiality of the exam material as well as fairness to all students.

1. Do not solicit any information from students who have taken the exam.

2. Do not discuss any part of the exam with classmates who have not taken the exam.

3. While practical exams are being given do not use the equipment that might be used during the exam.

4. While practical exams are in session do not study, practice, or otherwise loiter in the exam area.

PT 527 - ELECTROTHERAPEUTIC TESTING AND THERAPY

COURSE DESCRIPTION: This course will prepare the students with a foundation of knowledge and laboratory experience in the area of electrotherapy and electrophysiological testing. The physiological responses to therapeutic electrical currents and the indications, contraindications, and methods of applying clinical electrotherapy agents will be studied. Lab experiences with a variety of electrotherapeutic machinery will be included in the course.

COURSE OBJECTIVES:

1 Knowledge and Comprehension
2 Application
3 Psychomotor
4 Analysis, Synthesis, & Evaluation
5 Affective

A. Principles of electricity and electrical stimulation

- 1.1 Describe the characteristics of surface electrodes.
- 1.2 Define pre-sensory, sensory, motor, and noxious levels of electrical stimulation.
- 1.3 Define electrotherapeutic terms as outlined by the Electrophysiology Section of the APTA.
- 1.4 Describe the contraindications and precautions for using electrotherapeutic devices.
- 2.1 Describe the interactions of pulse/phase intensity, frequency, and duration with each other.
- 2.2 Describe the effects of electrode size and orientation on current flow.
- 3.1 Demonstrate correct application of surface electrodes, including monopolar, bipolar, quadripolar electrode arrangements.
- 4.1 Examine the concepts depicted by the strength-duration curve and its clinical application.
- 4.2 Compare and contrast the characteristics of therapeutic currents, including current flow, waveform, pulse and phase duration, and amplitude.
- 4.3 Apply the interrelated concepts of of voltage, current flow, and resistance as defined by Ohm's law.

B. Electroanalgesia

- 1.1 Describe the pain inhibitory mechanisms of the nervous system.
- 2.1 Given a case study, select the correct electrotherapeutic device for electroanalgesia.
- 2.2 Explain the stimulation parameters for electroanalgesia.
- 3.1 Given a case study, demonstrate the correct application of electrotherapeutic devices for electroanalgesia.
- 3.2 Given a case study, instruct a peer to use a electrotherapeutic device for

electroanalgesia at home.

4.1 Given a case study, select parameters, explain their purposes & justify their use.

4.2 Compare and contrast electrotherapeutic devices used for electroanalgesia.

D. Electrical Stimulation for Tissue Repair (ESTR)

1.2 Discuss the Montana State regulations as they pertain to the purchase, storing, and delivery of medication subcutaneously by physical therapists.

2.1 Given a case study, select the correct electrotherapeutic device for ESTR.

2.2 Explain the stimulation parameters for iontophoresis, wound healing, and edema control.

3.1 Given a case study, demonstrate the correct application of electrotherapeutic devices for ESTR.

4.1 Given a case study, select parameters, explain their purposes & justify their use for ESTR.

E. Neuromuscular Electrical Stimulation (NMES)

2.1 Discuss the effectiveness of electrical stimulation in strengthening normal and atrophied muscle.

2.2 Discuss the pros and cons of using electrical stimulation on denervated muscle.

2.3 Given a case study, select the correct electrotherapeutic device for NMES.

2.4 Discuss the stimulation parameters for strengthening, functional electrical stimulation, orthotic control, controlling scoliosis, and reducing spasticity.

3.1 Given a case study, demonstrate the correct application of electrotherapeutic devices for NMES.

4.1 Given a case study, select parameters, explain their purposes & justify their use.

F. Electrophysiological Testing

1.1 Describe the instrumentation for diagnostic electromyography (EMG) and nerve conduction velocity (NCV) assessment.

1.2 Describe the normal and abnormal electrical activity seen and heard during diagnostic EMG

1.3 Describe the testing protocol for diagnostic EMG and NCV.

2.1 Discuss the purposes of diagnostic EMG and NCV.

3.1 Demonstrate needle EMG or NCV testing.

G. Biofeedback

1.1 Describe the therapeutic uses of biofeedback.

2.1 Given a case study, select the correct electrotherapeutic device for biofeedback.

3.1 Given a case study, demonstrate the correct application of electrotherapeutic devices for feedback.

4.1 Given a case study, select parameters, explain their purposes & justify their use.

H. Other Issues

4.1 Discuss the role of PTAs in the use of electrical stimulation devices with patients.

4.2 Given a case study where electrical stimulation is appropriate but denied by a third party payer, justify the use of electrical stimulation devices.

I. Affective

5.1 Participate in lab sessions and discussions.

5.2 Administers devices for different case studies on peers.

5.3 Attend and actively participate in the day class on EMG and NCV testing.

5.4 Perform electrodiagnostic tests on peers.

Split E-stim labs

Feb 5 1:10 to 3:00	**Feb 6 10:10 – 12:00**
Michelle	Ryan
Shawn	Kelly
Angela	Dianne
Colleen	Kelsey
Natasha	Kaylene
Trevor	Tansy
Teri	Amber
Melissa	Kevin
Amy	Elisa
Robin	Maureen
Michael	Renee
Jennifer	Kate
Debbie	
Eric	

Feb 20 10:10 – 12:00	**Feb 19 1:10 to 3:00**
Michelle	Ryan
Shawn	Kelly
Angela	Dianne
Colleen	Kelsey
Natasha	Kaylene
Trevor	Tansy
Teri	Amber
Melissa	Kevin
Amy	Elisa
Robin	Maureen
Michael	Renee
Jennifer	Kate
Debbie	
Eric	

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Michelle	Ryan
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Colleen	Kelsey
Natasha	Kaylene
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Amy	Elisa
Robin	Maureen
Michael	Renee
Jennifer	Kate
Debbie	
Eric	

April 3 1:10 to 3:00	**April 1 8:10 – 10:00**
Michelle	Ryan
Shawn	Kelly
Angela	Dianne
Colleen	Kelsey
Natasha	Kaylene
Trevor	Tansy
Teri	Amber
Melissa	Kevin
Amy	Elisa
Robin	Maureen
Michael	Renee
Jennifer	Kate
Debbie	
Eric	