Fall 9-1-2000

PT 483.01: Measurement and Modalities Laboratory

James J. Laskin  
*University of Montana - Missoula*, james.laskin@umontana.edu

Steve Fehrer  
*University of Montana - Missoula*

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Course Coordinator:
James Laskin, M.S., P.T., Ph.D. (candidate)
Office: Skaggs Building, room 105
Phone: 243 - 4757
Email: jlaskin@selway.umt.edu
Office Hours: by appointment (individual or groups)

Modality Section Lab Assistant:
Scott Richter, M.S.

- Credits: PT 482 (3 units), PT 483 (1 unit)
- Lecture Times: Wednesday and Friday- 8:10 to 10:00 AM
- Laboratory Times: Monday - 8:10 to 10:00 AM (All students)

Laboratory Attire:
Men and women must wear loose shorts and women must wear an appropriate bra, sports bra or the upper portion of a two piece swimsuit (one piece swimsuits are not acceptable). Sweats may be worn during lab when not acting as the client.

Required Textbooks:
Philadelphia, PA: W.B. Saunders, Co.


Suggested Alternative Textbook:

Supplemental Readings:
Selected readings will either be available in required text from another course or a master copy will be placed in a binder in the student area.
Unit Description:
Physiology, indications, contraindications, and methods of applying physical agents including, but not limited to superficial heat and cold, ultrasound, electromagnetic radiation, and mechanical traction.

Unit Objectives:
To be handed out separately.

Unit Evaluation:

PT 482
Comprehensive Written Unit Examination 100 points
3 - Lecture Quizzes 30 points
Research Article Presentation (P.T. only) 20 points

PT 483
Practical Exam (P.T. only) 100 points
4 - Lab Quizzes 40 points

**Exam and quizzes will cover lecture, lab, and assigned readings**

Research Article Assignment and Presentation (P.T. only):
This assignment is being done in conjunction with Dr. Gajdosik's "Introduction to Professional Literature" section of PT 503. This assignment will require that each student find a recent (within the last five years) research article (no descriptive or review of literature review) from a peer reviewed journal. The selected article must deal with the effectiveness and/or the clinical application of a modality discussed in class. If you have any questions please see Professor Laskin. The written component of this exercise will be dealt with in PT 503 by Professor Gajdosik.

Each student must review a different article. We will use a first come first served approach - in other words I will have a list posted on the bulletin board across from my office. When you have selected an article please come and put the details on the list. I would suggest that when you do your literature search you select several potential articles. A copy of the selected article must be handed in to Professor Laskin's mail box by 4:00 PM - Friday, September 29, 2000.
On Wednesday, October 18, 2000 the class will be divided into a number of small research presentation groups. Each student will have 10 minutes (7 minutes for the presentation and 3 minutes for questions) to present their research article assignment to their assigned research group. The presentation will be comprised of the following components: purpose of the study, methodology, results, and most importantly focus on the clinical relevance and the clinical application of the results. For each presentation a student within the group will be assigned to ask the initial question(s) and will be responsible to have read the article being presented prior to the presentation. Each small group will have a faculty member present and along with the rest of the student audience they will assess the presenters performance based primarily on the following criteria:

1) Clarity of the presentation (5 points)
   - appropriate language
   - clarity of speaking voice
   - quality of AV and handout

2) Quality of the presentation (15 points)
   - logical and concise presentation of material
   - addressed each of the required components
   - appropriate responses to questions
   - adherence to the time limit

**Practical Examination (P.T. only):**

The practical examinations for this course will be conducted during the week of October 23, 2000. The requirements, format, and other details will be forthcoming. This practical exam is primarily to assess your skills, although specific questions to assess your knowledge regarding rationale and indications/contraindications are also addressed. The content of this practical exam includes both the material covered in the "Modalities" section of PT 482/483 and the components of draping, gait, transfers, and assistive devices from PT 516/517.
Proposed Unit Schedule:

W-Sep 6  Unit I - Introduction, Research Assignment, and Vitals Signs,  
Cameron - Chapter 1  
O'Sullivan - Chapter 4

F-Sep 8  Vital Signs, Safety, and Pain (mechanisms and measurement)  
Cameron - Chapter 3

M-Sep 11  Lab: Vital Signs

W-Sep 13  Inflammation & Tissue Repair and Documentation  
Cameron - Chapter 2

F-Sep 15  Thermal Agents: Superficial Heat  
Cameron - Chapter 6

M-Sep 18  Lab: Application of Hot & Cold

W-Sep 20  Thermal Agents: Superficial Heat & Cryotherapy  
Cameron - Chapter 6

F-Sep 22  Thermal Agents: Cryotherapy  
Cameron - Chapter 6

M-Sep 25  Lab: Application of Hot & Cold

W-Sep 27  Therapeutic Ultrasound  
Cameron - Chapter 9

F-Sep 29  Therapeutic Ultrasound  
Cameron - Chapter 9  
Research Article Due

M-Oct 2  Lab: Therapeutic Ultrasound

W-Oct 4  Mechanical Traction  
Cameron - Chapter 8

F-Oct 6  Hydrotherapy and Electromagnetic Radiation  
Cameron - Chapter 7 & 10
M-Oct 9  Lab: Therapeutic Ultrasound

W-Oct 11  Electromagnetic Radiation
          Cameron - Chapter 10

F-Oct 13  Clinical Decision Making - The Selection of the Ideal Physical Agent
          O'Sullivan - Chapter 1
          Cameron - Chapter 12

M-Oct 16  Lab: Review

W-Oct 18  Small Group Research Presentations

F-Oct 20  Modalities Written Exam
PT 482/483 Unit 2 (50% of course)
Goniometry and Manual Muscle Testing
Fall 2000

Instructors:
Steven Fehrer, Ph.D., P.T.
107 Skaggs Building
243-2429, sfehrer@selway.umt.edu
Office hours by appointment.

Patti Jo Lane, P.T.
plane@selway.umt.edu

Required Textbooks:


Assigned reading is expected to be completed prior to the start of class!

Required Equipment/Supplies
Each student will supply twelve and six inch universal goniometers and a clean towel. Each class session will include a lab component. Men are expected to wear shorts and T-shirt and women shorts and sports bra or two piece swimsuit. Students should change clothes before class begins. All students must be able to readily expose the joint being worked on during the specific lab session. Students are welcome to wear sweats over their lab cloths when not acting as the client. You will not be allowed to participate in lab if dressed inappropriately.

Method of Evaluation:
PT 482:
- November 17, 2000 - Written midterm examination - 50 points (PT and AT students)

- December 20, 2000 1:10-3:10 Rm SB 114 Written cumulative final examination - 75 points (PT and AT students). AT students, if you have a conflict with this examination time please see Dr. Fehrer to arrange for an alternative time.

- Two technique demonstrations to class - 10 points each (PT students only). Each PT student has been assigned a goniometer measurement group and a MMT group – see schedule. On the assigned day the student will give a brief demonstration to the class, correctly illustrating how the measurement is made.
It is recommended that the student visit with Dr. Fehrer and spend some time practicing prior to the presentation.

Course grades will be determined as follows: A = 90-100% achievement of course points, B = 80-89%, and C = 70-79%. Attainment of less than 70% of course points will obligate the student to retake the course. If a student scores below 70% on an exam they will be given the opportunity to retake an alternate version of the exam. If the student achieves a score of 70% or greater on the retake exam, the student will receive a 70% score for the exam.

PT 483:
- Upper Extremity Practical Exam 50 points – will be given November 16-22.
- Cumulative Practical Exam 50 points – will be given December 18-21.

For the PT students (not the AT students), these practical exams may be integrated with the practical exams for PT 517. Practical exams may be scheduled throughout the day and evening!

Course grades will be determined as described above for the AT students. For the PT students, competency is expected for all the requisite skills. This will result in a grade of B. PT students will need to repeat the practical exam if competency is not demonstrated. A grade of “A” will be given for demonstration of competency in skills beyond the requisite group.

Practical exams are given over a course of days, so there are times when some students have completed the exam while others are still studying. Students will be expected to adhere to the following:

1. Do not solicit any information from students who have completed the practical.
2. Do not discuss any part of the practical with any classmates!
3. Certain equipment may not be available to practice with while practical exams are being given. Plan accordingly!

COURSE SCHEDULE

Mon. Oct. 23 Introduction to goniometry (Goni)
    N&W 1-37, 49-61
    Goni – shoulder (shld) flexion (flex), extension (ext), abduction (abd), adduction (add)

Wed. Oct 25 Introduction of manual muscle testing (MMT)
    H&M 1-9, 81-93
    MMT – shld flex, ext, scaption*, abd

*skill beyond requisite group
Fri. Oct 27  Shoulder continued.
N&W 62-65, H&M 94-107
Goni – shld lateral/external rotation (ER), medial/internal rotation (IR) – Aarrestad
MMT – shld horiz abd* and add* – Kempfert
shld ER and IR – Wilson

Mon Oct 30  Shoulder – scapular motion
H&M 58-81
MMT – scapular abd and upward rot, scap elev – Tonna
scap add, scap dep – Schonberg
scap add down rot – Rubel

WED Nov 1  Elbow
N&W 67-77, H&M 108-123
Goni – flex, ext – Anderson
pronate, supinate – Atwood
MMT – flex, ext – Aarrestad
pronate, supinate – Rose

Fri Nov 3  Wrist
N&W 79-91, H&M 124-131
Goni – flex, ext – Barna
radial dev, ulnar dev – Benth
MMT – flex, ext – Rinaldi

Mon Nov 6  Hand (Bring small goniometer)
N&W 92-99, H&M 132-141
Goni – MCP flex, ext – Cardoza
MCP abd, add – Clewley
MMT – MP flex, ext – Reesor
PIP/DIP flex* – Mollett

Wed Nov 8  Hand continued
N&W 100-104, H&M 142-147
Goni – PIP flex, ext – Cope
DIP flex, ext – Feastline
MMT – Finger abd, add – Messer
Mon Nov 13  Thumb
N&W 104-116, H&M 148-165
Goni- CMC flex, ext, abd – Glass
    CMC add, opp – Gordon
    MCP flex, ext – Gustavson
    IP flex, ext – Kimball
MMT- MP IP flex, ext – McDonough
    Thumb abd, add – McCarthy
    Thumb opp – MacDonald

Wed Nov 15  Cervical
N&W 181-197, H&M 11-31
Goni- flex, ext – Lewis
    Lat flex, rot – MacDonald
MMT- combined ext, cap ext*, cerv ext* - Gustavson
    Combined flex, cap flex*, cerv flex* - Gordon
    Rotation – Glass

Fri Nov 17  Midterm written examination
    Nov 16-Nov 22 Practical examination

Mon Nov 20  Trunk
N&W 199-213, H&M 33-49
Goni- flex, ext – McCarthy
    Lat flex, ext – McDonough
MMT- flex, ext Lewis
    Rot - Kimball

Mon Nov 27  Hip
N&W 119-135
Goni – flex, ext – Messer
    Abd, add – Mollett
    IR, ER – Reessor

Wed Nov 29  Hip continued
H&M 167-201
    MMT- flex, ext – Feasline
    Abd, add – Cope
    ER, IR – Clewley

Fri Dec 1  Knee
N&W 137-145, H&M 202-209
Goni – flex, ext – Rinaldi
    MMT – flex, ext – Cardoza
Mon Dec 4  Ankle/foot
N&W 147-161, H&M 211-220
Goni – dorsiflex, plantar flex – Rose
Tarsal invert, evert – Rubel
MMT – dorsiflex, plantarflex – Benth

Wed Dec 6  Foot
N&W 162-177
Goni – subtalar invert, evert – Schonberg
Transverse tarsal invert*, evert* – Tonna
MTP flex, ext – Wilson
MTP abd, add – Kempfert
PIP flex, ext and DIP flex, ext – on your own

Fri Dec 8  Foot continued
H&M 221-233
MMT – Foot invert,evert – Barna
Hallux and toe MP flex – Atwood
Hallux and toe DIP and PIP flex – Anderson
Hallux and toe MP and IP ext – on your own

Mon Dec 11  Screens/general assessment of ROM and Strength

Wed Dec 13  Alternative methods for assessing strength – dynamometers

Fri Dec 15  Review/practice

Objectives for Measures Unit
1- Knowledge and Comprehension
2- Application
3- Psychomotor
4- Analysis, synthesis, evaluation
5- Affective

I. Evaluation of Range of Motion
A. Instrumentation
   1.1 Identify common instruments used to measure joint motion.
   1.2 Describe reliability and validity for ROM measurement procedures.
   1.3 Given a case, select the appropriate instrument.
B. Principles of evaluation and application.
   1.1 Give rationale for measuring ROM.
   1.2 List indications and contraindications.
   1.3 Explain normal and abnormal joint end-feel.
   1.4 Explain the sequencing of goniometric procedure.
   1.5 Identify the correct bony landmarks, client position and stabilization, and goniometer position.
1.6 State normal ROM and functional ROM values for joints.
1.7 Describe a technique to perform a screen of upper and lower extremity ROMs.
2.1 Given a case, determine which joints to measure.
2.2 Select the appropriate instrument for the joint and client.
2.3 State factors accounting for differences in active and passive motion.
2.4 Explain when you would assess active versus passive motion.
2.5 Identify substitutions and suggest stabilization or alternate test positions.
2.6 Demonstrate clear/concise documentation of ROM measures as a form of communication with other health care providers.
3.1 Perform the procedures accurately and efficiently in the correct order.
3.2 Use appropriate body mechanics.
3.3 Address appropriate comfort and positioning of client.
3.4 Provide client with clear verbal cues.
4.1 Given a specific case, determine components of the procedure that could be eliminated or modified.
4.2 Given a specific case, including end-feel, active and passive ROM measurements, and pain level, determine possible origins of pathology.
4.3 Propose further testing for a specific client.
5.1 Act professionally.

II. Manual Evaluation of Muscle Strength

C. Principles of muscle performance.
   1.1 Define operationally strength and endurance.
   1.2 Identify functional classifications of muscles.
   1.3 List the three types of muscle contraction.
   1.4 Name factors that impact muscle performance.
D. Principles of evaluation and application.
   1.1 Give rationale for measuring muscle strength and endurance.
   1.2 Describe common instruments to test muscle strength/endurance.
   1.3 Define the manual muscle testing grading scale.
   1.4 List indications and contraindications to muscle testing.
   1.5 Explain the normal sequence for performing a MMT.
   1.6 Identify the correct client position, manual contacts, stabilization, and verbal cues to perform MMTs.
   1.7 Describe the technique to perform a general screen of upper and lower extremity strength.
2.1 Given a specific muscle, choose the correct position, manual contact and verbal commands to make a manual assessment of strength.
2.2 Determine if MMT is the most appropriate measure of muscle performance for a given client.
2.3 Identify substitution patterns and implement stabilization or alternative test positions.
2.4 Demonstrate clear/concise documentation of strength measures to facilitate communication between health care providers.
3.1 Perform the procedures accurately and efficiently in the correct sequence.
3.2 Utilize appropriate body mechanics.
3.3 Address appropriate comfort and positioning of the client.
3.4 Provide clear verbal cues to the client.
4.1 Develop a hypothesis of origin of muscle impairments, given a specific case.
4.2 Propose further testing to evaluate hypothesis.
5.1 Act professionally.