PTA 5

Therapeutic Exercise

SYLLABUS AND COURSE INFORMATION PACKET

Fall 2018

5 credits
2 hours lecture/6 hours laboratory

Prof. Christina McVey
Office: S129
Phone: 718-368-5727
Email: christina.mcvey@kbcc.cuny.edu
KINGSBOROUGH COMMUNITY COLLEGE
OF THE
CITY UNIVERSITY OF NEW YORK

Physical Therapist Assistant Program

Course Syllabus

PTA 5
THERAPEUTIC EXERCISE

Course Description: This course is designed to introduce students to therapeutic exercise techniques. Manual muscle testing is presented and practiced. Topics including resistive exercise, passive stretching, and range of motion techniques are studied. Students are introduced to therapeutic exercise equipment such as: computerized isokinetic testing and exercise systems, variable resistance and other free standing resistive exercise equipment, ergometers, treadmill, and basic exercise equipment including cuff weights and elastic resistive equipment. Therapeutic exercise techniques are studied by anatomical regions.


Pre-requisite Courses: PTA 1, PTA 10, PTA 20, PTA 2, PTA 3, BIO 11

Co-requisite Course: PTA 4, BIO 12
Student Learning Objectives

As evidenced by successful performance and completion of written and practical examinations, assignments, research article review, lab presentations and the role playing and analysis of clinical scenarios, the student will:

1.0 Apply principles of therapeutic exercise.

1.1 Identify the principles of range of motion, resistive exercise and manual muscle testing.
1.2 State the general principles of exercise including endurance, power, cardiovascular effects, and psychomotor considerations.
1.3 State the indications and contraindications to therapeutic exercise.
1.4 Identify the effects of pain on therapeutic exercise.
1.5 Identify components of an exercise program.
1.6 State the criteria for progressing a patient’s exercise program.
1.7 Identify principles of passive stretching, including self-stretching.
1.8 List the indications and contraindications of passive stretching.
1.9 Discuss physiological and psychological impacts on therapeutic exercise.
1.10 Differentiate the various modes of range of motion including: active, assistive and passive.
1.11 Describe the rationale for the selection of various range of motion techniques, while recognizing normal and abnormal patient movement.
1.12 Distinguish the various types of resistive exercise including: manual resistance, isotonic, isometric, isokinetic and open and closed chain.
1.13 Discuss the indications and contraindications of resistive exercise, range of motion and manual muscle testing.
1.14 Monitor mock patients’ endurance while performing therapeutic exercise and alter intervention appropriately within the plan of care.
1.15 Distinguish the differences in manual muscle testing grades.
1.16 Outline the procedures in manual muscle testing.
1.17 Perform manual muscle testing for upper and lower extremity musculature using standard techniques and hand held digital dynamometers.
1.18 Correlate different exercise regimens with mechanical principles influencing effectiveness.
1.19 Define and discuss the principles of aerobic exercise and conditioning.
1.20 List the beneficial effects of aerobic exercise.
1.21 List indications and contraindications of aerobic exercise such as oxygen saturation.
1.22 Implement aerobic exercise activities to enhance general fitness.
1.23 Perform aerobic therapeutic exercise appropriate for the cardiovascular impaired patient including assessment of oxygen saturation and vital signs.
1.24 Recognize signs and symptoms of distress (cardio-pulmonary, fatigue, etc.) associated with the performance of therapeutic exercise activities.
2.0 **Implement therapeutic exercise interventions for upper and lower extremities.**

2.1 Identify proper technique in range of motion activities and manual muscle testing.

2.2 Identify therapeutic exercise equipment commonly used in physical therapy practice.

2.3 State the rationale for therapeutic exercise.

2.4 Outline the techniques of therapeutic exercise as applied to different regions of the body.

2.5 Describe factors affecting outcomes of therapeutic exercise.

2.6 Describe the factors affecting selection of therapeutic exercise equipment.

2.7 Implement therapeutic exercise and stretching techniques and concepts.

2.8 Demonstrate proper technique in range of motion and resistive exercise techniques.

2.9 Demonstrate safe use of therapeutic exercise equipment.

2.10 Perform various resistive exercise including: manual resistance, isotonic, and isokinetic activities during patient scenarios.

3.0 **Given mock patient scenarios, implement comprehensive physical therapy plan of care as directed by a physical therapist.**

3.1 List effective strategies in teaching therapeutic exercise techniques.

3.2 Explain patient response to therapeutic exercise.

3.3 Link pathological conditions and patient problems with appropriate therapeutic exercises and exercise equipment.

3.4 Recognize aspects of the plan of care that may be outside the PTA’s scope of practice and act accordingly.

3.5 Perform therapeutic exercise techniques identifying the role of the physical therapist assistant in rehabilitation.

3.6 Perform therapeutic techniques appropriately employing universal precautions and sound body mechanics.

3.7 Perform therapeutic techniques demonstrating an understanding of organizational structure, levels of authority, and fiscal considerations of the health care delivery system.

3.8 Demonstrate proper manual muscle testing technique while considering pathological conditions.

3.9 Select appropriate therapeutic exercise based on manual muscle testing results.

3.10 Implement thermal modalities in conjunction with therapeutic exercise techniques.

3.11 Describe rationale when selecting therapeutic exercise activities, considering specific characteristics of pathological conditions.

3.12 Identify patient progress as it relates to the achievement of short term goals.

3.13 Teach the uses, applications and responses of therapeutic exercise and therapeutic exercise concepts to mock patient, family and other healthcare workers with emphasis on safety and rationale as directed by the physical therapist.

3.14 Demonstrate the adjunctive nature of therapeutic exercise by integrating their
3.15 Implement therapeutic interventions within the plan of care considering knowledge of assessment and measurement (including goniometry), functional activity, modality and therapeutic exercise skills on mock patients.

3.16 Implement therapeutic interventions within the plan of care demonstrating consideration of time management, therapeutic sequence and procedure selection issues.

3.17 Implement physical therapy interventions for a variety of mock patient types including: orthopedic, neurological, and general deconditioned patients in a variety of settings.

3.18 Devise and teach home maintenance program for a variety of diagnoses.

3.19 Demonstrate appropriate documentation of therapeutic exercise interventions considering patient response, treatment parameters, long/short term goals, and effectiveness.

3.20 Perform mock physical therapy interventions considering influencing factors (psychosocial, cultural, economic, legal/ethical, etc.).

3.21 Assist in discharge planning and alternative levels of care decision making with supervising physical therapist.

3.22 Associate patient verbal and non-verbal response with effectiveness of therapeutic exercise procedures employed.

3.23 Communicate to supervising physical therapist the patient response to therapeutic exercise.

3.24 Deduce the effectiveness of therapeutic exercise considering pathological conditions, attainment of short term goals and the patient’s overall response.

3.25 Assess patient response to treatment and appropriately alter therapeutic intervention within the plan of care.

3.26 Verify the effectiveness of his/her teaching behavior by analyzing performance.

3.27 Delineate the beneficial and untoward effects of therapeutic exercise.

3.28 Analyze the relationship of therapeutic exercise with other therapeutic procedures (modalities, range of motion, functional activities) as they relate to the achievement of rehabilitation goals.

3.29 Recognize patient response(s) that require the attention of the supervising physical therapist or immediate interventions such as basic first aid or cardiopulmonary resuscitation and take appropriate action.

4.0 Demonstrate the ability to express ideas in writing.

   4.1 Perform free write assignments.

   4.2 Summarize and analyze academic experiences.

   4.3 Effectively organize thoughts and ideas.

5.0 Demonstrate appropriate professional behavior.

   5.1 Attend and be on time for class, lab, and scheduled appointments.

   5.2 Be prepared for lab activities; attend to assigned tasks.

   5.3 Accept constructive criticism and respond or follow through appropriately.

   5.4 Express self in a clear and easily understood manner.
5.5 Maintain appropriate personal hygiene.
5.6 Treat others with positive regard, dignity, and respect.
5.7 Analyze and examine professional literature considering: specific scientific methods, interpretation of results, and clinical significance, in order to foster further personal investigation and clinical effectiveness.
5.8 Explain the importance of lifelong learning.
5.9 Describe how professional development can occur.

**Student Assessment**
As indicated in the student handbook, to receive a passing grade in this course the student must successfully complete all comprehensive examinations, assignments and practical examination with a “C” or better. Additionally, the instructor assesses student competencies in skills critical to this course using the standardized skills checklists, located in the laboratory, requiring a passing score of at least 90%. Critical skills in this course include:

1. Accurate performance manual muscle testing of major extremity musculature
2. Performance therapeutic exercise techniques (active, passive, resistive) for the shoulder, elbow, wrist, hand, hip, knee, ankle and foot.
3. Organization of exercise programs considering pathological conditions
4. Teaching therapeutic exercises to peers and instructor.
5. Conveying information about exercise program and patient status to supervising therapist.

**Grade Determination**

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<thead>
<tr>
<th>Assignment</th>
<th>Percentage</th>
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<tr>
<td>Documentation Assignments</td>
<td>5%</td>
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<tr>
<td>Research Article Paper</td>
<td>5%</td>
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<tr>
<td>Home Exercise Program</td>
<td>15%</td>
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<td>Quizzes</td>
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<td>Mid - Term Examination</td>
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<td>Lab. Practical</td>
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<td>Final Examination</td>
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<td><strong>Total</strong></td>
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**Documentation Assignments**
Students document exercises and justifications learned and performed during lab. This assignment includes exercise writing assignments as well as mock patient documentation (handwritten and computerized). Assignments are worth five percent of the final grade.

**Research Article Paper**
Students are assigned to find a current research article pertaining to therapeutic exercise.
The student must summarize and critique the article and submit it to the instructor during week six. The research article paper is worth five percent of the final grade.

**Home Exercise Program**
Students are given two physical therapy evaluations and plan of cares and must design one exercise program using one traditional (due week 8) and one multimedia (due week 12) format. Outline of the project will be distributed in class. The two home exercise programs are worth a total of fifteen percent of the final grade.

**Quizzes**
Students take 4-6 quizzes throughout the semester. Quizzes are short-essay and multiple choice type questions. The quizzes are worth fifteen percent of the final grade.

**Mid-term Examination**
The student takes a cumulative examination covering the first six weeks of the course. The examination includes mainly short essay and multiple choice type questions. The midterm is worth fifteen percent of the final grade.

**Laboratory Practical Examination**
All students are required to take a practical examination. This examination tests the students' proficiency in therapeutic exercise and previously learned material. Practical exam is worth twenty five percent of the final grade.

**Final Examination**
The student takes a cumulative final examination. The examination includes mainly short essay and multiple choice type questions. The final exam is worth twenty percent of the final grade.

**Writing Exercises**
The student participates in writing exercises throughout the semester. These non-graded writing exercises are designed to promote understanding of concepts and encourage written communication. For example, students may present a power point presentation on orthopedic conditions and interventions as it relates to their reading assignments.

**Week #1—Principles of Therapeutic Exercise**

**Lecture**
Assignments: Kisner Chapter 1, 3 and chapter 4 pp. 83-112
Pierson Chapter 6

This initial week students are introduced to the systematic approach to therapeutic exercise. Emphasis is placed upon the need for critical thinking, identifying impairments, and functional limitations. Goal setting, exercise terminology, indications and contraindications and functional outcomes are presented. Principles of manual resistance are explained.
Laboratory
Students practice passive and active range of motion techniques of both upper and lower extremities previously learned in PTA 1. Students perform general passive stretching techniques. Manual muscle testing is demonstrated and students practice positioning, hand placement and grading techniques in specific scenarios.

Treatment Application Activity
Students exhibit critical thinking and sound technical skills (transfers, goniometry and range of motion) in the management of a spinal cord injured mock patient as presented by the instructor and implement the prescribed plan of care. Following this treatment application activity, students discuss patient management and therapeutic techniques.

Week #2 – Principles of Resistive Exercise/Cardio-vascular Considerations
Lecture
Assignments: Kisner Chapter 6 pp. 166-208 and 7 Hislop, introduction

Students are provided the definition of resistive exercise including: goals, indications and contraindications. Concepts of strength and endurance assessment are presented. The effects of therapeutic exercise on the cardiovascular system are reviewed. Aerobic exercise is presented. Students are introduced to concepts of cardiac rehabilitation. The effect of types of exercise (isometric, isotonic, open and closed chain) on the cardiovascular system are explored.

Laboratory
Assignment: Metabolic Equivalent Handout
Students perform exercises appropriate for cardiovascular patients. Students practice assessing oxygen saturation levels. Given patient scenarios, students perform therapeutic exercise techniques consistent with principles of energy expenditure for the cardiac patient while at the same time students monitor vital signs and oxygen saturation. In addition, students monitor their mock patient’s pulse ox. In preparation for their roles as physical therapy care educators, students practice teaching exercise activities.

Treatment Application Activity
Students exhibit critical thinking and sound technical skills in the management of a mock cardiovascular patient as presented by the instructor and implement the prescribed plan of care. Students perform measurement and assessment techniques, vital signs monitoring, range of motion and basic therapeutic exercise techniques appropriate to the scenario. While performing interventions, students consider additional factors influencing patient care. Following this treatment application activity students discuss patient management and therapeutic techniques.

Week #3—Shoulder Activities
Lecture
Assignments: Kisner Chapter 17 Chapter 4 pp. 113-115
Chapter 6 pp. 209-211
Hislop, shoulder and scapular manual muscle tests

Range of motion, goniometry, and anatomical considerations (previously learned in PTA 2) of the shoulder are reviewed. The student is provided with instruction of manual muscle testing techniques for the shoulder. Principles of active and resistive exercises for the shoulder are provided. Equipment used specifically for shoulder exercise is introduced.

**Laboratory**
Students apply their knowledge of post-operative and non-operative orthopedic conditions to the shoulder joint and perform mock exercise interventions accordingly. Additionally, students begin an examination of central nervous system conditions and their effects on the shoulder. Students use specific patient scenarios to practice manual muscle testing and exercise techniques. Students assess patient response and endurance. In preparation for their roles as physical therapy care educators, students practice teaching these skills.

*Treatment Application Activities*
Students exhibit critical thinking and sound technical skill in the management mock patient status post cerebral vascular accident as presented by the instructor and implement the prescribed plan of care. Students perform a mock patient intervention consisting of appropriate therapeutic exercise as well as bed mobility, transfer training, gait training activities (as previously learned in PTA 1 and PTA 3) appropriate to the scenario. Following this treatment application activity, students discuss patient management and therapeutic techniques.

**Week#4 – Shoulder and Elbow Activities**

**Lecture**
Assignments: Kisner Chapter 17 and 18
Chapter 4 pp.115-116
Chapter 6 pp.211-212
Hislop, elbow and forearm manual muscle tests
Documentation Assignment

Discussion of the shoulder continues. Range of motion, goniometry, and anatomical considerations (previously learned in PTA 2) of the elbow and forearm complex are reviewed. The student is provided with instruction of manual muscle testing techniques for the elbow and forearm complex. Therapeutic exercise of the elbow and forearm complex is introduced.

**Laboratory**
Students apply their knowledge of peripheral nervous system conditions and general deconditioning pathologies to the shoulder joint and perform appropriate exercise interventions. Given patient scenarios, students use therapeutic exercise equipment
Including: wall pulleys, Theraband, etc. Students begin to practice manual muscle testing and therapeutic exercise of the elbow and forearm complex. Students assess patient response and endurance. In preparation for their roles as physical therapy care educators, students practice teaching these skills.

*Treatment Application Activity*

Students exhibit critical thinking and sound technical skill in the management of a mock patient with cervical radiculopathy as presented by the instructor and implement the prescribed plan of care. Students perform mock patient intervention activities, appropriate to this scenario, considering their knowledge of anatomy, pathology, and therapeutic exercise. Following this treatment application activity, students discuss patient management and therapeutic techniques.

**Week #5—Elbow and Wrist Activities**

*Lecture*

Assignments: Kisner Chapter 18 and 19
- Chapter 4 pp. 116-117
- Chapter 6 pp. 212
- Hislop, wrist manual muscle tests

Range of motion, goniometry, and anatomical considerations (previously learned in PTA 2) of the wrist are reviewed. The student is provided with instruction of manual muscle testing techniques for the wrist. The student is introduced to therapeutic exercise of the wrist.

*Laboratory*

Students’ knowledge of orthopedic, neurological, and general deconditioning pathologies is applied to the elbow and forearm complex. Given patient scenarios, students perform therapeutic exercises. Students begin to practice manual muscle testing and therapeutic exercise of the wrist. Students assess patient response and endurance. In preparation for their roles as physical therapy care educators, students practice teaching these skills.

*Treatment Application Activity*

Students exhibit critical thinking and sound technical skill in the management of a mock generally deconditioned patient with severe rheumatoid arthritis affecting the wrist as presented by the instructor and implement the prescribed plan of care. Students perform mock patient intervention activities considering their knowledge of anatomy, pathology, goniometry, thermal modalities and therapeutic exercise appropriate to the scenario. Following this treatment application activity, students discuss patient management and therapeutic techniques.

**Week #6—Wrist and Hand Activities**

*Lecture*

Assignments: Kisner Chapter 19
- Research Article Paper Due
Range of motion, goniometry, and anatomical considerations (previously learned in PTA 2) of the hand are reviewed. Manual muscle testing of the hand is presented. The student is introduced to therapeutic exercise of the hand.

**Laboratory**

Students’ knowledge of orthopedic, neurological and general deconditioning pathologies is applied to the wrist and hand. Students practice manual muscle testing of the wrist and hand. Given patient scenarios, students perform therapeutic exercises. Students assess patient response and endurance. In preparation for their roles as physical therapy care educators, students practice teaching these skills.

**Treatment Application Activity**

Students exhibit critical thinking and sound technical skill in the management of a mock post upper extremity fracture case as presented by the instructor and implement the prescribed plan of care. Students perform mock patient intervention activities considering their knowledge of anatomy, pathology, goniometry, thermal modalities and therapeutic exercise appropriate to the scenario. Following this treatment application activity, students discuss patient management and therapeutic techniques.

**Week #7—Mid-Term Examination/Upper Extremity Activities**

**Lecture**

Assignment: Skinner Chapter 8
- Documentation Assignment
- Mid-Term Examination

**Laboratory**

Students are provided with multiple opportunities to apply upper extremity range of motion, manual muscle testing, and therapeutic exercise. Principles of endurance, treatment organization, program progression, effects of pain, and outcome assessments, are emphasized. Students give rationale for therapeutic exercise program selection including the use of exercise equipment and manual techniques. Construction of home exercise programs is practiced. Students continue to practice the communication of patient status to the supervising physical therapist.

**Week #8--Hip Activities**

**Lecture**

Assignment: Kisner, Chapter 20
- Chapter 4 pp. 117-120
- Chapter 6 pp. 212-214
- Hislop, hip manual muscle tests

Range of motion, goniometry, and anatomical considerations of the hip are reviewed. Manual muscle testing of the hip is presented. The student is introduced to therapeutic exercise of the hip.
Laboratory
Students’ knowledge of orthopedic, neurological, and general deconditioning pathologies are applied to the hip joint. Given patient scenarios, students perform therapeutic exercises. Students practice manual muscle testing and therapeutic exercise of the hip. Students practice both manual and mechanical therapeutic exercise of the hip. Students assess patient response and endurance. In preparation for their roles as physical therapy care educators, students practice teaching these skills.

Treatment Application Activity
Students exhibit critical thinking and sound technical skill in the management of a mock patient with osteoarthritis of the hip as presented by the instructor and implement the prescribed plan of care. Students perform mock patient intervention activities considering their knowledge of anatomy, pathology, goniometry, thermal modalities, functional and transfer activities and therapeutic exercise appropriate to the scenario. Following this treatment application activity, students discuss patient management and therapeutic techniques.

Week #9--Hip and Knee Activities
Lecture
Assignment: Kisner, Chapter 20
   Hislop, knee manual muscle test
   Documentation Assignment
   Home Exercise Program #1 due

Therapeutic exercise and the hip is explored further. Range of motion, goniometry, and anatomical considerations of the knee are reviewed. Manual muscle testing of the knee is presented. The student is introduced to therapeutic exercise of the knee.

Laboratory
Students’ knowledge of orthopedic, neurological, and general deconditioning pathologies are applied to the knee joint. Given patient scenarios, students perform therapeutic exercises. Students begin to practice manual muscle testing and therapeutic exercise of the knee. Students practice both manual and mechanical therapeutic exercise of the hip. Students assess patient response and endurance. In preparation for their roles as physical therapy care educators, students practice teaching these skills.

Treatment Application Activity
Students exhibit critical thinking and sound technical skill in the management of a mock post-operative orthopedic case as presented by the instructor and implement the prescribed plan of care. Students perform mock patient intervention activities considering their knowledge of anatomy, pathology, goniometry, thermal modalities, functional and transfer activities and therapeutic exercise appropriate to the scenario. Following this treatment application activity, students discuss patient management and therapeutic techniques.
Week #10—Knee Activities

Lecture
Assignments - Kisner Chapter 21
   Chapter 4 pp. 120-121
   Chapter 6 pp. 214

Discussion of the knee continues. The student is provided with more in depth information about therapeutic exercise in the management of common post-surgical and pathological conditions including generalized weakness, osteoarthritis, and ligament and cartilage damage.

Laboratory
Students continue to practice manual muscle testing and therapeutic exercises of the knee. Students assess patient response and endurance. Given patient scenarios, students perform therapeutic exercises for the knee using therapeutic equipment. In addition, students are exposed to different types of knee braces used in a variety of pathological conditions.

Treatment Application Activity
Students exhibit critical thinking and sound technical skill in the management of a mock traumatic sports injury as presented by the instructor and implement the prescribed plan of care. Students perform mock patient intervention activities considering their knowledge of anatomy, pathology, goniometry, thermal modalities, functional and transfer activities and therapeutic exercise appropriate to the scenario. Following this treatment application activity, students discuss patient management and therapeutic techniques.

Week #11--Ankle Activities

Lecture
Assignment: Kisner, Chapter 22
   Chapter 4 pp.121-122
   Chapter 6 pp.214-215

Range of motion, goniometry, and anatomical considerations of the ankle and foot are reviewed. Manual muscle testing of the ankle and foot are presented. The student is introduced to therapeutic exercise of the ankle and foot.

Laboratory
Students' knowledge of orthopedic, neurological and general deconditioning pathologies are applied to the ankle and foot. Given patient scenarios, students perform therapeutic exercises. Students practice manual muscle testing and therapeutic exercise of the ankle and foot. Students assess patient response and endurance. In preparation for their roles as physical therapy care educators, students practice teaching these skills.

Treatment Application Activity
Students exhibit critical thinking and sound technical skill in the management of a
generally debilitated mock patient in a spinal cord injury case as presented by the instructor and implement the prescribed plan of care. Students perform mock patient intervention activities considering their knowledge of anatomy, goniometry, pathology, functional and transfer activities and therapeutic exercise appropriate to the scenario. While performing interventions students consider additional factors influencing patient care and the contemporary practice of physical therapy including psychosocial issues and other issues impacting the health care delivery system. Following this treatment application activity, students discuss patient management and therapeutic techniques.

**Week # 12 Comprehensive Exercise Programs and Home Exercise Programs**

**Lecture**
Assignments: Kisner Chapter 21
- Home Exercise Program #2 Due
- Skinner Chapter 8 (review activity examples)

Concepts of home exercise programs are further explored with emphasis placed on patient compliance, program revision, diversity of instruction and assessment of results. Concepts and practices of therapeutic exercise management are reviewed. Emphasis is placed on patient progression and response, appropriate goal setting and treatment diversity all based on the plan of care. Correlation of the achievement of exercise goals with changes in functional abilities is also reinforced.

**Laboratory**
Discussion of therapeutic principles continues. Students are provided with multiple opportunities to apply lower extremity range of motion, manual muscle testing, and therapeutic exercise. Principles of endurance, treatment organization, program progression, effects of pain, and outcome assessments, are emphasized. Students give rationale for therapeutic exercise program selection including the use of exercise equipment and manual techniques. Students continue to practice the communication of patient status to the supervising physical therapist.

**Treatment Application Activity**
Students exhibit critical thinking and sound technical skill in the management of a mock patient status-post a cerebral vascular accident in a rehabilitation setting as presented by the instructor and implement the prescribed plan of care. Students perform patient intervention activities of the upper and lower extremity considering their knowledge of anatomy, pathology, goniometry, thermal modalities, functional and transfer activities and therapeutic exercise appropriate to the scenario. In addition, intervention includes the design and instruction of a home exercise program. Following this treatment application activity, students discuss patient management and therapeutic techniques.

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***Class attendance is a vital part of the learning experience. A student who has been absent 15% or more of the total instructional hours that a class meets may be considered excessively absent by the instructor. The instructor may consider excessive absences as a factor in the assignment of a student’s grade.

****The course professor utilizes a variety of teaching methodologies to facilitate accomplishment of student learning objectives. These methodologies may include interactive lecturing, supervised group and simulation activities, web-based instruction, use of custom computer based study guides, and active learning strategies.