

KIN 422 (Credits 3) Spring 2007
Rehabilitation of Athletic Injury
Location: 309 Jenison Fieldhouse
Time: M/W 10:20-11:40 AM

Instructor: Sally Nogle, Ph.D., ATC
Office: 105 IM Sports Circle
Phone: 517.353.4412

Office Hours: by appointment

Email: nogle@ath.msu.edu

COURSE DESCRIPTION:

Rehabilitation techniques to manage athletic injuries. Anatomical and neurophysiological bases of techniques. Indications and contraindications of rehabilitation protocols.

COURSE OVERVIEW:

This course is designed to serve as an advanced course for athletic training students. The content of this course will focus on rehabilitation techniques utilized in managing athletic injuries. An emphasis will be placed on the anatomical and neurophysiological basis of various rehabilitation techniques and the associated indications and contraindications. Laboratory experience will emphasize the proper hands-on methods and instruction of techniques in rehabilitation of athletic injuries.

PREREQUISITES: KIN 421

COURSE OBJECTIVES:

- Learn the principles of various therapeutic exercises.
- Demonstrate the ability to perform therapeutic exercises to increase range of motion, strength, muscular endurance, speed, and power.
- Demonstrate the use of isokinetic, isotonic, and isometric exercises in the rehabilitation of athletic injuries.
- To design a comprehensive rehabilitation program for athletic injuries.
- To select the appropriate therapeutic technique and develop criterion for progression in a rehabilitation program.
- To record and monitor progress of a rehabilitation program.

REQUIRED TEXT:

Prentice, William E., Rehabilitation Techniques in Sports Medicine, WCB/McGraw-Hill, Boston, 1999.

OPTIONAL TEXT(S):

- 1) Prentice, William E. & Voight Michael L., Techniques in Musculoskeletal Rehabilitation, McGraw-Hill, New York, 2001.
- 2) Houglum, Peggy A., Therapeutic Exercise for Athletic Injuries, Human Kinetics, Champaign, 2001.

ADDITIONAL REFERENCES: Articles and papers from professional journals in sports medicine.

COURSE REQUIREMENTS:

Attendance & Participation:

Attendance to lectures and lab sessions is the responsibility of the student. The student is responsible for any information missed due to absences. Students are expected to participate in scheduled lab sessions.

Examinations:

Students will be evaluated through 4 examinations. Dates of examinations are listed in the syllabus. An unexcused absence on the day of the exam will result in a score of 0 for that exam. A student may reschedule the exam date if prior arrangements are made with the instructor.

GRADING:

| <u>EXAMS</u> | | <u>COURSE GRADE</u> | |
|------------------|----------------|---------------------|--------------|
| Exams | 150 pts | 92-100% = 4.0 | 64-70% = 2.0 |
| Practical Exams: | 150 pts | 85-91% = 3.5 | 57-63% = 1.5 |
| Final Exam: | 100pts | 78-84% = 3.0 | 50-56% = 1.0 |
| Abstracts: | 50 pts | 71-77% = 2.5 | < 50% = 0.0 |
| TOTAL | 450 pts | | |

| DATE | TOPIC | READINGS |
|------------|---|--------------|
| 01/8 | Course Introduction: Principles: Rehabilitation | Chap 1 |
| 01/10 | Principles: Wound Healing | Chap 2 |
| 01/15 | NO CLASS | |
| 01/17 | Principles of Mobilization/Immobilization | Chap 14 |
| 01/22 | Principles/ Techniques of: Mobilization, Traction | Chap 14 |
| 01/24 | Principles: Balance, Neuromuscular Control, Cardiorespiratory Fitness | Chap 5,6,8,9 |
| 01/29 | Techniques: Isometric, Isotonic, Isokinetic, Plyometrics | Chap 11,13 |
| 01/31 | Principles: Strength, Endurance, Power | Chap 7, 17 |
| 02/05 | Principles/Techniques: PNF | Chap 15 |
| 02/07** | Principles/Techniques: PNF | Chap 15 |
| 02/12 | Record Keeping Techniques | Chap 11 |
| 02/14 | Principles: Psychological Aspects of Rehabilitation | Chap 4 |
| 02/19 | EXAM | |
| 02/21 | Ankle/Foot Rehabilitation | Chap 24 |
| 02/26 | Ankle/Foot Rehabilitation | Chap 24 |
| 02/28 | Lower-Leg/Knee Rehabilitation | Chap 12, 22 |
| 03/05 | SPRING BREAK | |
| 03/07 | SPRING BREAK | |
| 03/12 | Lower-Leg/Knee Rehabilitation | Chap 22, 23 |
| 03/14 | Groin/Hip/Thigh Rehabilitation | Chap 21 |
| 03/19 | Groin/Hip/Thigh Rehabilitation | Chap 21 |
| 03/21 | Lower Extremity- practice | |
| 03/26 | PRACTICAL /EXAM | |
| 03/28 | Shoulder Rehabilitation | Chap 18 |
| 04/02 | Practice | |
| 04/04 | Hydro/Aquatic Therapy | Chap 16 |
| 04/09 | Shoulder Rehabilitation | Chap 18 |
| 04/11** | Elbow/Wrist and Hand Rehabilitation | Chap 19, 20 |
| 04/16 | Lumbar Spine Rehabilitation | Chap 10,25 |
| 04/18 | Thoracic Spine Rehabilitation | Chap 25 |
| 04/23 | Cervical Spine Rehabilitation | Chap 25 |
| 04/25 | Practice | |
| 05/01 TUES | FINAL EXAM (10:00AM – 12:00PM) | |

** Abstracts Due

CAATE Competencies and proficiencies covered in this class:

AC-C33 Describe home care and self-treatment plans of acute injuries and illnesses.

TM-C8 Identify appropriate therapeutic modalities for the treatment and rehabilitation of injuries and illness.

TM-C9 Describe the process/methods of assessing and reassessing the status of the patient using standard techniques and documentation strategies to determine appropriate treatment and rehabilitation and to evaluate readiness to return to the appropriate level of activity. This includes the ability to:

TM-C9a Describe and interpret appropriate measurement and assessment procedures as they relate to the selection and application of therapeutic modalities.

TM-C9g Interpret physician notes, postoperative notes, and physician prescriptions as they pertain to a treatment plan.

TM-P2 Obtain and interpret baseline and posttreatment objective physical measurements to evaluate and interpret results.

TM-P6 Document treatment goals, expectations, and treatment outcomes.

TM-CP1 Synthesize information obtained in a patient interview and physical examination to determine the indications, contraindications and precautions for the selection, patient set-up, and evidence-based application of therapeutic modalities for acute and chronic injuries. The student will formulate a progressive treatment and rehabilitation plan and appropriately apply the modalities. Effective lines of communication should be established to elicit and convey information about the patient's status and the prescribed modality(s). While maintaining patient confidentiality, all aspects of the treatment plan should be documented using standardized record-keeping methods.

TM-CP1.1 Infrared Modalities

TM-CP1.2 Electrical Stimulation Modalities

TM-CP1.3 Therapeutic Ultrasound

TM-CP1.4 Mechanical Modalities

TM-CP1.5 Massage and other Manual Techniques

EX-CP3.1 Exercises and Techniques to Improve Joint Range of Motion

EX-CP3.2 Exercises to Improve Muscular Strength

EX-CP3.3 Exercises to Improve Muscular Endurance

EX-CP3.4 Exercises to Improve Muscular Speed

EX-CP3.5 Exercises to Improve Muscular Power

EX-CP3.6 Exercises to Improve Balance, Neuromuscular Control, and Coordination

EX-CP3.7 Exercises to Improve Agility

EX-CP3.8 Exercises to Improve Cardiorespiratory Endurance

EX-CP3.9 Exercises to Improve Activity-Specific Skills, including Ergonomics and Work Hardening

EX-CP4 Program for injuries to the spine

EX-CP4.1 Exercises and Techniques to Improve Joint Range of Motion

EX-CP4.2 Exercises to Improve Muscular Strength

EX-CP4.3 Exercises to Improve Muscular Endurance

EX-CP4.4 Exercises to Improve Muscular Speed

EX-CP4.5 Exercises to Improve Muscular Power

EX-CP4.6 Exercises to Improve Balance, Neuromuscular Control, and Coordination

EX-CP4.7 Exercises to Improve Agility

EX-CP4.8 Exercises to Improve Cardiorespiratory Endurance

EX-CP4.9 Exercises to Improve Activity-Specific Skills, including Ergonomics and Work Hardening

NU-C4 Identify nutritional considerations in rehabilitation, including nutrients involved in healing and nutritional risk factors (e.g., reduced activity with the same dietary regimen and others).

RM-P3 Instruct a patient regarding fitness exercises and the use of weight training equipment to include correction or modification of inappropriate, unsafe, or dangerous lifting techniques.

RM-CP1 Plan, implement, evaluate, and modify a fitness program specific to the physical status of the patient. This will include instructing the patient in proper performance of the activities and the warning signs and symptoms of potential injury that may be sustained. Effective lines of communication shall be established to elicit and convey information about the patient's status and the prescribed program. While maintaining patient confidentiality, all aspects of the fitness program shall be documented using standardized record-keeping methods.

EX-C1 Describe the physiological and pathological processes of trauma, wound healing and tissue repair and their implications on the development, progression and implementation of a therapeutic exercise program.

EX-C2 Describe the mechanical principles applied to the design and use of therapeutic exercise equipment and techniques (leverage, force, kinesiology and biomechanics).

EX-C3 Describe common surgical techniques, pathology, and any subsequent anatomical alterations that may affect the implementation of a therapeutic exercise program.

EX-C4 Describe the appropriate selection and application of therapeutic exercises taking the following into consideration:

EX-C4a The physiological responses of the human body to trauma

EX-C4b The physiological effects of inactivity and immobilization on the musculoskeletal, cardiovascular, nervous, and respiratory systems of the human body

EX-C4c The anatomical and/or biomechanical alterations resulting from acute and chronic injury and improper mechanics

EX-C4d The physiological adaptations induced by the various forms of therapeutic exercise, such as fast- versus slow-twitch muscle fibers

EX-C4e The physiological responses of additional factors, such as age and disease

EX-C5 Describe the indications, contraindications, theory, and principles for the incorporation and application of various contemporary therapeutic exercise equipment and techniques, including aquatic therapy, manual therapy and mobilization.

EX-C6 Define the basic components of activity-specific rehabilitation goals, functional progressions, and functional outcomes in a therapeutic exercise program.

EX-C7 Describe the process/methods of assessing and reassessing the status of the patient using standard techniques and documentation strategies in order to determine appropriate treatment and rehabilitation plans and to evaluate the readiness to return to the appropriate level of activity. This includes the ability to:

EX-C7a Describe and interpret appropriate measurement and functional testing procedures as they relate to the selection and application of therapeutic exercise.

EX-C7b Interpret objective measurement results (muscular strength/endurance, range of motion) as a basis for developing an individualized therapeutic exercise program.

EX-C7c Interpret the results of a physical assessment and determine an appropriate therapeutic exercise program to return the patient to physical activity.

EX-C7d Determine the appropriate therapeutic exercise program and appropriate therapeutic goals and objectives based on the initial assessment and frequent reassessments.

EX-C7e Determine the criteria for progression and return to activity based on the level of functional outcomes.

EX-C7f Describe appropriate methods of assessing progress in a therapeutic exercise program and interpret the results.

EX-C7g Interpret physician notes, postoperative notes, and physician prescriptions as they pertain to a therapeutic exercise program.

EX-C7h

EX-C8 Describe appropriate medical documentation for recording progress in a therapeutic exercise program.

EX-C9 Explain the effectiveness of taping, wrapping, bracing, and other supportive/protective methods for facilitation of safe progression to advanced therapeutic exercises and functional activities.

EX-P1 Describe manufacturer's, institutional, state and federal guidelines for the inspection and maintenance of therapeutic exercise equipment.

EX-P2 Obtain and interpret baseline and postexercise objective physical measurements to evaluate therapeutic exercise progression and interpret results.

EX-P3 Inspect therapeutic exercise equipment to ensure safe operating condition.

EX-P4 Demonstrate the appropriate application of contemporary therapeutic exercises and techniques according to evidence-based guidelines.

EX-P5 Instruct the patient in proper techniques of commonly prescribed therapeutic exercises.

EX-P6 Document rehabilitation goals, progression and functional outcomes.

EX-P7 Perform a functional assessment for safe return to physical activity.

EX-CP Synthesize information obtained in a patient interview and physical examination to determine the indications, contraindications and precautions for the selection, application, and evidence-based design of a therapeutic exercise program for injuries to the upper extremity, lower extremity, trunk, and spine. The student will formulate a progressive rehabilitation plan and appropriately demonstrate and/or instruct the exercises and/or techniques to the patient. Effective lines of communication should be established to elicit and convey information about the patient's status and the prescribed exercise(s). While maintaining patient confidentiality, all aspects of the exercise plan should be documented using standardized record-keeping methods.

EX-CP1 Program for injuries to the upper extremity

EX-CP1.1 Exercises and Techniques to Improve Joint Range of Motion

EX-CP1.2 Exercises to Improve Muscular Strength

EX-CP1.3 Exercises to Improve Muscular Endurance

EX-CP1.4 Exercises to Improve Muscular Speed

EX-CP1.5 Exercises to Improve Muscular Power

EX-CP1.6 Exercises to Improve Balance, Neuromuscular Control, and Coordination

EX-CP1.7 Exercises to Improve Agility

EX-CP1.8 Exercises to Improve Cardiorespiratory Endurance

EX-CP1.9 Exercises to Improve Activity-Specific Skills, including Ergonomics and Work Hardening

EX-CP2 Program for injuries to the lower extremity\

EX-CP2.1 Exercises and Techniques to Improve Joint Range of Motion

EX-CP2.2 Exercises and Techniques to Improve Joint Range of Motion

EX-CP2.3 Exercises to Improve Muscular Endurance

EX-CP2.4 Exercises to Improve Muscular Speed

EX-CP2.5 Exercises to Improve Muscular Power

- EX-CP2.6 Exercises to Improve Balance, Neuromuscular Control, and Coordination
- EX-CP2.7 Exercises to Improve Agility
- EX-CP2.8 Exercises to Improve Cardiorespiratory Endurance
- EX-CP2.9 Exercises to Improve Activity-Specific Skills, including Ergonomics and Work Hardening