

Chapter 16: Therapeutic Exercise

Therapeutic Exercise

- The long term goal is to return the injured athlete to practice or competition as quickly and safely as possible!

Therapeutic Exercise

- Designing programs for rehabilitation is relatively simple and involves several basic short-term goals:
 - a. controlling pain
 - b. maintaining or improving flexibility
 - c. restoring or increasing strength
 - d. re-establishing neuromuscular control
 - e. maintaining levels of cardiovascular fitness

Therapeutic Exercise

- At best, the athletic trainer can only try to create an environment that is conducive to the healing process.
- Little can be done to speed up the process physiologically, but many things can be done to impede healing

Therapeutic Exercise

- A cookbook approach to rehabilitation is impossible.
- In fact, use of rehabilitation recipes are strongly discouraged.
- Therapeutic exercises are concerned with restoring normal body function after injury.

Therapeutic Exercise

- A sudden loss of physical activity leads to a generalized loss of physical fitness.
- When a body part is immobilized for as short as a period of twenty-four hours, definite adverse muscular changes occur.

Therapeutic Exercise

- Components of a rehabilitation program include:
 1. minimizing swelling
 2. controlling pain
 3. restoring full range of motion
 4. restoring muscular strength and endurance
 5. re-establishing neuromuscular control
 6. regaining balance
 7. maintaining cardiorespiratory fitness
 8. incorporating functional progressions

Isometric Exercise

- Isometric exercises are commonly performed in the early phase of rehabilitation when a joint is immobilized for a period of time.
- They are useful when resistance training through a full range of motion may make the injury worse.
- Isometrics increase static strength and assist in decreasing the amount of atrophy.
- Isometrics can also lessen swelling by causing a muscle pumping action to remove fluid and edema.
- Strength gains are limited primarily to the angle at which the joint is exercised.
- No functional force or eccentric work is developed.

Contraction Types

- Progressive resistance exercises uses isotonic contractions in which force is generated while the muscle is changing length.
- Isotonic contractions may be either concentric (shortening) or eccentric (lengthening).
- Isokinetic exercises uses fixed speed with accommodating resistance to provide maximal resistance throughout the range of motion.

Neuromuscular Control

- Neuromuscular control is the mind's attempt to teach the body conscious control of a specific movement.
- Re-establishing neuromuscular control requires many repetitions of the same movement through a step-by-step progression from simple to more complex movements.
- Strengthening exercises, particularly those that tend to be more functional, are essential for re-establishing neuromuscular control.

Neuromuscular Control

- Four elements are critical for re-establishing neuromuscular control:
 1. proprioceptive and kinesthetic awareness
 2. dynamic stability
 3. preparatory and reactive muscle characteristics
 4. conscious and unconscious functional motor patterns.

Proprioception and Kinesthesia

- Proprioception is the ability to determine the position of the joint in space.
- Kinesthesia is the ability to detect movement.

Stages of Rehabilitation

- Phase 1 – acute phase
- Phase 2 – repair phase
- Phase 3 – remodeling phase

Phase 1 - The Acute Injury Phase:

- Phase 1 begins immediately when an injury occurs and may last as long as four days.
- This inflammatory stage of the healing process is attempting to control and clean up the injured tissue, thus creating an environment that is conducive to the fibroblastic stage.
- The primary focus of rehabilitation during this phase is to control swelling and to modulate pain by using by using rest, ice, compression, and elevation (RICE) immediately after injury.
- Throughout this phase, rest, ice, compression, and elevation (RICE) should be used as much as possible.

Phase 1 - The Acute Injury Phase:

- Rest of the injured part is critical during this phase.
- It is widely accepted that early mobility during rehabilitation is essential.
- However, if the athletic trainer becomes overly aggressive during the first 48 hours after injury and does not allow the injured body part to rest during the inflammatory stage of healing, the inflammatory process never gets a chance to accomplish its purpose.
- Consequently, the length of time required for inflammation may be extended.
- Immobility during the first two days after injury is necessary to control inflammation.

Phase 2 - The Repair Phase:

- This stage may begin as early as four days after the injury and may last for several weeks.
- At this point, swelling has stopped completely.
- The injury is still tender to the touch but is not as painful as the last stage.
- Pain is also less on active and passive range of motion.
- Modalities in this phase, as in the acute phase, should be used to control pain and swelling.
- Cryotherapy should be used during the early portion of this phase to reduce the likelihood of swelling.
- Electrical stimulating currents can help to control pain and improve strength and range of motion.

Phase 3 - The Remodeling Phase:

- The remodeling phase is the longest of the three phases and may last for several years, depending on the severity of the injury.
- The ultimate goal during this maturation stage of the healing process is return to activity.
- The injury is no longer painful to the touch, although some progressively decreasing pain may still be felt on motion.
- The focus during this phase should be on regaining sport-specific skills.
- At this point, some type of heating modality is beneficial to the healing process.
- The deep-heating modalities should be used to increase circulation to the deeper tissues.

Rehab Success

- For rehabilitation to be successful, the injured athlete must comply with and adhere to the plan of rehabilitation.
- In the field of athletic injury, compliance is the biggest deterrent to successful rehabilitation.

Criteria for Full Return to Activity:

- physiological healing constraints
- pain status
- minimal swelling
- complete range of motion
- full strength
- neuromuscular control/proprioception/kinesthesia
- cardiorespiratory fitness
- sport-specific demands
- functional testing
- prophylactic strapping, bracing, padding
- responsibility of the athlete
- predisposition to injury
- psychological factors
- athlete education and preventative maintenance program

PNF: Proprioceptive Neuromuscular Facilitation

- PNF techniques are generally used in rehabilitation for the purposes of facilitating strength and increasing range of motion.
- Flexibility is increased by techniques of contract-relax, hold-relax, and slow-reversal-hold-relax.

Assignment

- Find at least one exercise or modality for each of the following techniques:
 1. minimizing swelling
 2. controlling pain
 3. restoring full range of motion
 4. restoring muscular strength and endurance
 5. re-establishing neuromuscular control
 6. regaining balance
 7. maintaining cardiorespiratory fitness
 8. incorporating functional progressions