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Injury management: Developing a therapeutic exercise program

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Abstract

The ultimate goal of therapeutic exercise is to return the injured sport participant to full activity, pain-free, and fully functional. To achieve this target, attention must focus on controlling inflammation and regarding normal joint range of motion, flexibility, muscular strength, muscular endurance, coordination and power. Modern rehabilitation program emphasis teamwork and proper rehabilitation planning, and the rehabilitation team has to be led by a trained sports physiotherapist, with an understanding of the protocols and interventions required at various stages. An individualized therapeutic exercise program is developed and maintained through continual identification of the needs and treatment goals of the patient. To address the problem list and return the individual to participation without risk of reinjury, four phases of rehabilitation comprise the therapeutic exercise program. These are controlling inflammation, restoration of motion, developing muscular strength, power, and endurance and return to sport activity.

Keywords: Rehabilitation, inflammation, therapeutic exercises, isometric, isotonic, isokinetic exercises, AROM, PROM, proprioception

Introduction

The changing profile of sports related injury, as well as limited availability of facilities for rehabilitation in many areas of India, is a matter of concern. Elite sportspersons have some protection, but the average athlete is often left to fend for himself. Key factors in successful sports injury rehabilitation protocols are the application of modern rehabilitation protocols under appropriate supervision, appropriate and well-timed surgical interventions, and judicious and need based use of pharmaceutical agents. The ultimate goal of therapeutic exercise is to return the injured sport participant to full activity, pain-free, and fully functional. To achieve this target, attention must focus on controlling inflammation and regarding normal joint range of motion, flexibility, muscular strength, muscular endurance, coordination and power. Modern rehabilitation program emphasis teamwork and proper rehabilitation planning, and the rehabilitation team has to be led by a trained sports physiotherapist, with an understanding of the protocols and interventions required at various stages. Injury specific rehabilitation programs are being practiced worldwide but need to be introduced according to the nature of the sport as well as available facilities. Even in India, sports physicians are increasingly joining specialist rehabilitation teams, and they can help with medication, nutritional supplements, and specialized tests that could improve injury understanding.

To an individual who enjoys sports participation, an injury can be devastating. For many, the development and maintenance of a physically fit body provides a focal point for social and economic success important for self-esteem. A therapeutic exercise program must address not only the physical needs in returning the individual to activity, but also address the emotional and psychological needs of the injured participant.

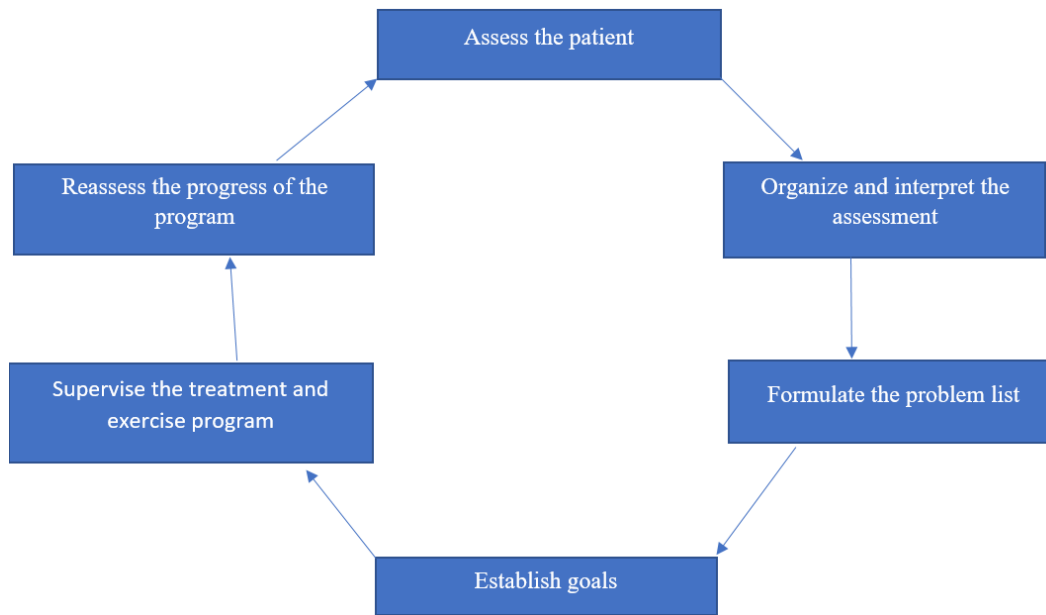
Elizabeth Kubler-Ross identified five theoretical emotional stages that individuals progress through when confronted with grief. These stages can be adapted to an individual who has sustained an injury. The stages include denial and isolation, anger, bargaining, depression and acceptance. Each individual reacts differently; some may progress rapidly through the stages in varying intensity, others may omit a phase, still others may reach a plateau and not progress. An individual's emotional state will have a direct impact on success of an exercise program. Charts, graphs, and activity modification that directly mirrors regular training will help

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motivate the individual to progress through the exercise program. Motivating the person to attend regular rehabilitation sessions, or to maintain a home program of exercise can be very challenging for even the most patient and

understanding athlete trainer. Realistic short-term goals can help motivate the injured individual to avoid this.

Therapeutic Exercise Program



As continued assessment of the exercise program occurs, alternations in long -or short -term goals may result in changes in treatment or exercise progression. The process is dependent on the patient’s progress and adaptation to the therapeutic exercise program.

An individualized therapeutic exercise program is developed and maintained through continual identification of the needs and treatment goals of the patient.

Assess the Patient

Patient assessment initiates rehabilitation by establishing a baseline of information. In paired body segments, the dysfunction of the injured body parts is compared to the non-injured body part to establish standards for bilateral functional status.

Organize and Interpret the Assessment

When assessment is completed, data is organized and interpreted to identify factors outside normal limits for an individual of the same age and fitness level. Primary deficits or weaknesses from injury are identified. These deficits, along with secondary problems resulting from prolonged immobilization, extended nonactivity, or lack of intervention, are organized into a priority list of concerns. Examples of major concerns might include decreased range of motion, muscle weakness or stiffness, joint contractures, sensory changes, inability to walk without a limp, or increased pain with activity. Physical assets are then identified to determine the individual’s present functional status. For example,

- Is there equal bilateral range of motion, muscle strength and endurance, and sensation?
- In the case of a lower extremity injury, is there normal gate? Can the individual pass the functional tests?

Formulate the Problem List

From the two previous lists, analyze and interpret the information, and identify specific deficits and assets. Deficits dictate the long-and short-term goals. Activities or exercises to address the deficits should not interfere with patient progress. The assets (such as, good cardiovascular fitness, range of motion or muscular strength) must be maintained. The specific problems are recorded in a section called

problem list, which is a part of the Assessment.

Establish Goals

The driving forces of the exercise program are the long- and short- term goals. Long- term goals establish the individual’s expected level of performance at the conclusion of the exercise program. Short- term goals develop the specific component skills needed to reach the long- term goals. The patient must feel a part of the process, as this may educate and motivate the individual to work harder to attain the stated goals. Many sport-specific factors, such as demands of the sport, position played, time remaining in the season, regular-season vs. post-season or tournament play, game rules and regulations regarding safety equipment, and the mental state of the athlete may affect goal development. In addition, the location, nature, and severity of injury will also impact setting goals.

Long-term goals typically focus on functional deficits in performing activities of daily living (ADLs). Sport participants focus on additional deficits in sport-specific skills.

Long-term goals include

- bilateral equal range of motion
- flexibility
- muscular strength, endurance, and power
- relaxation training
- coordination
- cardiovascular endurance
- and performing sport-specific functional tests (such as, throwing, running, or jumping)

When long-term goals are established, short-term goals are developed in a graduated sequence to address the list of problems identified during the assessment. Specific subgoals should include an estimated time table needed to attain that goal. These subgoals are time dependent, but not fixed, as may do not take into consideration individual differences in preinjury fitness and functional status, severity of injury, motivation to complete the goals, and subsequent improvement.

Short-term goals include

- control inflammation, pain and swelling at the site of injury
- restore full bilateral active range of motion (AROM) and passive range of motion (PROM) at injury site
- Improve the strength of injured body part from fair to good condition
- Increase muscle strength, endurance and power in all motions at the site of injury
- Improve general body strength and returned to full functional activity as tolerated

These short-term goals can be achieved by the individual in several weeks under the supervision of physiotherapist or specialist.

Supervise the Treatment and Exercise Program

Each phase of the exercise program and use of therapeutic modalities are supervised and documented. In addition, progress notes are completed on a weekly or biweekly basis. These records of health supervision can be used for the treatment of other injured individual and this will be helpful in that condition.

Reassess the Progress of the Program

Short-term goals should be flexible enough to accommodate the progress of the individual. For example, if therapeutic modalities and medications are utilized, and the individual attains a short-term goal sooner than expected, a new short-term goal should be written. However, edema, hemorrhage, muscle spasm, atrophy and infection prevent the healing process and delay attaining a short-term goal. Periodic measurement of girth, range of motion, muscle strength, endurance, power and cardiovascular fitness will determine whether progress occurs. If progress is not seen, the individual should be re-evaluated, or referred to a physician so modifications can be made in the short-term goals and treatment plan. The individual should progress through the sequential short-term goals until the long-term goals are attained, and the individual is cleared for full activity.

Development of Treatment Plan

When goals are developed, determine what exercise and therapeutic modalities can be utilized to achieve those goals. The physician may also prescribe medications. To address the problem list and return the individual to participation without risk of reinjury, four phases of rehabilitation comprise the therapeutic exercise program. Each phase, however, has a specific role. The four phases are as follows:

Phase One: Controlling Inflammation

- Control inflammatory stage and minimize scar tissue with cryotherapy using PRICE principles (Protect, Restrict activity, Ice, Compression, and Elevation)
- Instruct patient on relaxation techniques
- Maintain range of motion, joint flexibility, strength, endurance, and power in the unaffected body parts
- Maintain cardiovascular endurance

Phase Two: Restoration of Motion

- Restore active and passive range of motion to within 80% of normal in the unaffected limb
- Restore joint flexibility as observed in the unaffected limb
- Begin pain-free isometric strengthening exercise on the affected limb
- Begin unresisted pain-free functional patterns of sport-specific motion
- Maintain muscular strength, endurance, and power in

unaffected muscles

- Maintain cardiovascular endurance

Phase Three: Developing Muscular Strength, Power, and Endurance

- Restore full AROM and PROM in the affected limb
- Restore muscle strength, endurance, and power using isometric, isotonic and isokinetic exercises
- Restore proprioception with closed and open kinetic chain exercises
- Maintain cardiovascular endurance
- Initiate minimal to moderate resistance in sport-specific functional patterns

Phase Four: Return to Sport Activity

- Analyze skill performance and correct biomechanical inefficiencies in motion
- Improve muscular strength, endurance, and power
- Restore coordination and balance
- Improve cardiovascular endurance
- Increase sport specific functional patterns and return to protected activity as tolerated

Conclusion

Modern rehabilitation program emphasis teamwork and proper rehabilitation planning, and the rehabilitation team has to be led by a trained sports physiotherapist, with an understanding of the protocols and interventions required at various stages. Injury specific rehabilitation programs are being practiced worldwide but need to be introduced according to the nature of the sport as well as available facilities. An individual's emotional state will have a direct impact on success of an exercise program. Charts, graphs, and activity modification that directly mirrors regular training will help motivate the individual to progress through the exercise program. To address the problem list and return the individual to participation without risk of reinjury, four phases of rehabilitation comprise the therapeutic exercise program. In addition, patient education on relaxation and proper exercises can assist in relieving muscle spasm and pain.

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