# Definition and Scope of Therapeutic Exercise

## Introduction

Therapeutic exercise is a key component of any rehabilitation program and should be included as part of the concurrent care of any patient. Physical therapists have been utilizing therapeutic exercises with great success since the conception of the profession in the beginning of the twentieth century and it has been demonstrated to be fundamental in improving function, performance and disability. Therapeutic exercise can consist of a variety of exercises inclusive of balance, strengthening, range of motion, endurance, and plyometric activities

**DeLateur** defined therapeutic exercise as bodily movement prescribed to correct impairment, improve musculoskeletal function, or maintain a state of well-being. It may vary from highly selected activities restricted to specific muscles or parts of the body, to general and vigorous activities that can return a convalescing patient to the peak of physical condition

## Objectives of therapeutic exercise

Quality patient care involve a problem solving process whereby the therapist makes effective decisions based on symptom, signs and limitations identified when evaluating and revaluating the patient. A comprehensive evaluation of the patient not only avoids the pitfall of overlooking some important contributing factor and allow for defining the functional limitation of the patient but also influence important decision regarding the development of the treatment program. Some of the objectives of the therapeutic exercise are-

1. Assessment
2. Develop a plan
3. Implement the plan
4. Evaluate the plan
5. Home programme

## Assessment

The first step is to assess the needs of the patient. To provide cost effective quality care in today's health care environment, it is critical to measure needs in term of the patient's impairment as well any functional limitations resulting disability or handicaps. The examination and assessment of the result provide the foundation for establishing a baseline from which outcomes of therapeutic intervention can be measured. The assessment can be the subjective information or it can be the objective data of the patient.

### A. Subjective information (case history)

Ask question so that the patient will

i. Describe the onset of symptom or mechanism of injury.
ii. Describe how the symptoms are perceived.
iii. Describe the behaviour of the symptom through 24 hour period while carrying out typical daily activities.
iv. Describe any previous history of condition. Find out if there was previous treatment for the problem.
v. Describe related history such as medical or surgical intervention.

vi. Identify any medical condition that may contraindicate to any testing procedure.

**B. Objective Data (Clinical evaluation)**

**i. Inspection**

Make observation of appearance and basic abilities

a. use of any adaptive or supportive aids
b. general posture and specific posture or shape of involvedbody part such as contour changes, swelling , atrophy, hypertrophy and asymmetry
c. appearance of skin, such as scar and discoloration.
d. Sitting and gait pattern, coordination and balance.

**ii. Provocation**

Use the principle of selective tension by administering specific tests in a systemic manner to provoke or re-create the symptom and thus determine whether the lesion is within an inert structure(joint capsule, ligament, bursae, fascia)or a contractile unit(muscle with its tendon and attachment).

**iii. Palpation**

Palpatethe structures that are incriminated as the source of the problems.

**iv. Neurological tests**.

Any indication of motor weakness or change in sensation directs the evaluator to specify tests to determine nerve, nerve root or central nervous system involvement.

**v. Additional test.**

Special tests, unique to the specific tissue in each region, are carried out if necessary to confirm or rule out the structure in question.

**2. Develop plan**

After evaluating and assessing the patient's needs the next step in the clinical decision-making process is to establish goal and appropriate plan.

**i. Established goals for expected functional outcome.**

They are related to how treatment will affect the functional limitation or disability at the conclusion of the therapeutic program. Each goal should be measurable and specified to the condition.

**ii. Develop a plan of care**

a. Determine what therapeutic approach will most appropriately meet the goal; consider resources available to the patient's situation.

b. Select techniques or therapeutic modalities that will fulfill the plan and meet the goal.

c. Determine what mode of evaluation will be used to document the change reflected in the goal.

d. Anticipate the length of treatment and plan for discharge; consider any alternate services for treatment.

**3. Implementation of the plan**

a. once the plan of care is established, use procedure and technique that will fulfill the plan and meet the goal.

b. Involve the patient in the management of the impairment both in a home exercise program as well in the adaptation or modification of the home, work or recreational environment to minimize or eliminate precipitating factors contributing to the problems.

**4. Evaluating the plan**

Frequently evaluate and reassess the effectiveness of the procedure and techniques and modify them or the treatment plan whenever indicated.

**5. Home programme**

A home programme should be viewed as an extension of the treatment plan of care. Early identification of the patient's home or alternative care setting, family recreation, social and economic capabilities, equipment needed and vocational plan provided a foundation for anticipating compliance with a home exercise programme. If necessary, identify who could and would work with the patient at home.

**Scope of therapeutic exercise**

Following a comprehensive evaluation of the patient and identification of impairments, functional and limitation, disabilities, the goal of treatment and functional outcome are developed and the plan of care (i.e. Treatment plan) is established.

The scope of therapeutic exercise include the prevention of dysfunction as well the development, improvement, restoration or maintenance of :

1. Strength
2. Endurance and Cardiovascular Fitness
3. Mobility and Flexibility
4. Stability
5. Relaxation
6. Coordination, Balance and Functional Skill

**1. Strength**

A major goal that can be achieved through therapeutic exercise is the development, enhancement or maintenance of muscle strength. Strength is the ability of a muscle or muscle group to produce tension and a resulting force during a maximal effort, either dynamically or statically, in relation to the demands place upon.

**Guidelines for developing strength**

a. The overload principle

To increase strength, a load that exceeds the metabolic capacity of the muscle must be used during exercise. This will lead to hypertrophy and recruitment and therefore to an increase in strength of the muscle.

b. The capacity of a muscle to produce greater tension can be achieved primarily with high-intensity exercise (Exercise perform against heavy load) carried out for a relatively low number of repetitions. In both cases, the muscle must be exercised to the point of fatigue for adaptive increase in strength to occur.

**2. Endurance and cardiovascular fitness**

Muscular endurance or total-body endurance can also be improved or maintained with therapeutic exercise. Endurance is necessary for performing repeated motor task in daily living and carrying on a sustained level of functional activity such as walking and climbing stairs.

**Types of endurance**

a. muscular endurance

b. General (total) body endurance

a. Muscular endurance

The ability of a muscle to contract repeatedly or generate tension sustain that tension and resist fatigue over a prolonged period of time. As endurance increase, a muscle will be able to perform a greater number of contractions or hold against a load over an extended time.

b. General (total) body endurance.

The ability of an individual to sustain low-intensity exercise such as walking, jogging or climbing over an extended period. Endurance exercise, also called aerobic exercise or conditioning is performed to enhance the cardiovascular or pulmonary fitness of an individual.

**Guidelines for developing endurance**

**a. Muscular endurance**

Active exercise performed repeatedly against a moderate load to the point of fatigue will increase the endurance of a muscle.

**b. General endurance**

Exercises that challenge the oxygen transport system will increase endurance, aerobic capacity and overall cardiopulmonary fitness.

i. Exercise is usually directed to large muscle groups, as in walking, running, swimming and cycling.

ii. Exercise is prolonged and performed for 15-45 minutes or more.

iii. The frequency of exercise varies; (e.g.:-every other day, 5 days a week)

**3. Mobility and Flexibility**

In addition to strength and endurance, mobility of contractile soft tissue and joint is necessary for the performance of normal functional movement. If normal motion of body parts is restricted in any way, adaptive shortening of soft tissue and joint will occur. Tightness should be prevented, if possible, but if tightness does occur, mobility exercise may be used to restore the involved structure to their appropriate length.

Soft tissue refers to contractile and non-contractile tissue that is muscle, connective tissue and skin. Each structure should take in consideration the normal functional mobility.

Guidelines for developing mobility

i. Passive stretching

Manual, mechanical or positional stretches are applied to soft tissue, in which the force is applied to the direction of shortening.

ii. Active inhibition

Reflex inhibition and subsequent elongation of muscle using neurological principle to reduce tension and lengthened the contractile element within muscle.

iii. Flexibility exercise

Exercises are performed by the patient, passively or actively to elongate soft tissue.

iv. Joint mobilization

Passive traction or gliding movements are applied to joint surface to increase the joint mobility.

**4. Stability**

Stability refers to the synergistic coordination of the neuromuscular system to provide a stable base for superimposed functional or activities. Stability is usually required more in proximal structure such as trunk, hips and shoulder girdle for effective positioning and motion of the arm and hands or legs and feet.

**Guidelines for developing stability**

a. Stability exercises are the means by which a patient can learn to control proximal areas of the body and maintain a stable, well-aligned position while carrying out functional activity.

b. Closed-chain weight bearing activities using graduated compressive loads stimulate co-contraction in antagonist muscle group ie opposite to prime movers muscle.

c. Stabilization exercises are progressed by performing controlled diagonal motion while maintaining proximal stability.

d. Endurance in stabilizing muscle must be developed with repetitive controlled stress.

e. Components of functional activities and finally entire functioanal activities are practiced using appropriate proximal stabilization.

**5. Relaxation**

Prolonged muscle tension can cause pain, which leads to muscle spasm which cause more pain. Relaxation refers to a conscious effort to relieve tension in muscle. Through therapeutic exercise an individual can become aware of prolonged muscle tension and can be taught to control or inhibit it.

**Therapeutic basis of relaxation exercise**

i. After an active contraction of skeletal muscle, a reflex relaxation occurs. Stronger the contraction, the greater the relaxation of that muscle.

ii. Conscious thought can also affect tension in muscle. This has been demonstrated in biofeedback.

**Guidelines for developing relaxation**

The patient is placed in a comfortable position, with all body part well supported. The patient is taught to progressively contract and relax the musculature.

**6. Coordination, Balance and functional skill**

Coordination, balance and functional skills are all interrelated and are complex aspect of motor control.

Coordination refers to the ability to use the right muscle at the right time with appropriate sequencing and intensity

Balance refers to the ability to maintain the centre of gravity over the base of support, usually while in upright position.

Functional skills refer to the varied motor skill necessary to function independently in all aspect of daily living.

Coordination, Balance and functional motor skills are all dependent upon and affected by the sensory systems, particularly the somatosensory and proprioceptive.

**General principles of exercise to develop coordination, balance and functional motor skills**.

a. Learning and relearning functional motor task involves constant repetition of simple to more complex motor activities.

b. Movement can be initially practiced in simple form and then carried out using combined or diagonal movement.

c. Proximal stability is often emphasized before distal mobility.

d. As the quality of movement improves, the speed and timing of movement should be improve simultaneously.

## Conclusion

An important factor that influence the effectiveness of any therapeutic exercise program is patient is education and active involvement in a systemic plan of care. Long term functional improvement and prevention of future injury will occur only if the patient understands the goal of an exercise plan and incorporate the advice and instruction of the therapist into all aspects of daily living routines.