# Biomechanical Frame of Reference

The Biomechanical Frame of Reference (FOR) is a remedial approach used in occupational and physical therapy that focuses on physical impairments and their effects on occupational performance. This approach assumes patients can acquire voluntary motor skills needed to perform daily occupations. The goals of the Biomechanical FOR is to prevent deterioration, maintain existing movements, restore movements, and/or compensate/adapt for loss of movements in occupational performance.This FOR is best suited for individuals with musculoskeletal or neurological conditions, with an intact central nervous system, allowing for smooth, isolated movements. Assessments used in this approach include range of motion (ROM), manual muscle testing (MMT), endurance testing, joint stability testing, and functional mobility assessments. Techniques used in Biomechanical FOR include therapeutic exercise to improve ROM, strength, endurance and compensatory techniques to modify the task or environment.




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## Population

**Musculoskeletal or Neurological Conditions**
Muscle-skeleton or Nerve-guy
The Biomechanical Frame of Reference can be used to assess and treat physical impairments or limitations in individuals of all ages and across various populations. However, it is particularly useful for individuals with musculoskeletal or neurological conditions that affect their ability to move.

## Assumptions

**Purposeful Activities**
Porpoise Active-runner
Purposeful activities can be used to treat loss of range of motion (ROM), strength, and endurance.

**Regain Function**
Re-Gain Function
After ROM, strength, and endurance are regained, the patient automatically regains function.

**Rest and Stress**
Rest and Stress
First, the body must rest to heal itself. Then, the peripheral structure must be stressed to regain range, strength, and endurance.

**Intact Central Nervous System**
Intact CNS-brain
Biomechanical FOR is best suited for patients with an intact central nervous system. Patients may have limited range, strength, and endurance but have the ability to perform smooth, isolated movements.

## Goals

**Maximize Physical Functioning**
Maxi-pad Physics Functioning
The goals are to prevent deterioration, maintain existing movements, restore movements, and/or compensate/adapt for loss of movements in occupational performance.

## Assessments

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### ROM Assessments

Full Range of Motion and Assess-man

Range of Motion (ROM) assessments are commonly used in the Biomechanical Frame of Reference (FOR) to evaluate an individual's joint flexibility and mobility. These assessments involve measuring the angle at which a joint can move through its full range of motion. This information is important in identifying areas of restricted movement and developing treatment plans to improve joint function. ROM assessments may involve the use of goniometers or other tools to measure joint angles and document progress over time. The results of these assessments help therapists determine the appropriate interventions to increase joint range of motion and improve overall physical function. By increasing joint flexibility and mobility, individuals are better able to engage in desired occupations and activities, leading to improved quality of life.

### Muscle Strength Testing

Muscle-man Strong-man

In the Biomechanical Frame of Reference (FOR), muscle strength testing is used to assess an individual's ability to generate force with their muscles. This type of testing is often done using manual muscle testing, where the therapist applies resistance while the individual contracts the muscle being tested. Alternatively, dynamometers may be used to measure the force produced during a specific movement. The results of muscle strength testing help therapists develop a targeted exercise program to improve muscle strength and overall physical function.

### Endurance Testing

Endurance-race

Endurance testing is used in the Biomechanical Frame of Reference (FOR) to assess an individual's ability to sustain activity over time. This type of testing may involve assessing how long an individual can maintain a specific activity, such as holding a plank position or walking a certain distance. Endurance testing is important in developing treatment plans to improve an individual's physical endurance and ability to engage in activities for longer periods of time.

### Joint Stability Testing

Joint Stabilized

Joint stability testing is used in the Biomechanical Frame of Reference (FOR) to assess the amount of play or movement in a joint. This type of testing is important in identifying areas of joint instability and developing interventions to improve joint function. Joint stability testing may involve applying stress to the joint while measuring the amount of movement or using imaging techniques to visualize the joint and identify any abnormalities.

### Functional Mobility Assessments

Functional-chair Mobility Mobile-phone Assess-man

Functional mobility assessments are used in the Biomechanical Frame of Reference (FOR) to evaluate an individual's ability to perform activities of daily living and more complex occupational tasks. These assessments may involve measuring an individual's ability to transfer from one position to another, walk, climb stairs, or perform other activities that are necessary for independent living and engagement in daily occupations. The results of functional mobility assessments help therapists develop targeted treatment plans to improve an individual's functional mobility and ability to engage in desired activities.

## Techniques

### Therapeutic Exercise

Therapeutic-massage Exercise-machine

Therapeutic exercise is a technique used in the Biomechanical Frame of Reference (FOR) to improve range of motion, strength, and endurance in individuals with physical impairments or limitations. The exercises are tailored to the specific needs and goals of each individual and may include activities such as resistance training, stretching, and cardiovascular training. Therapeutic exercise is used to improve overall physical function, which, in turn, can help individuals to engage in their desired occupations. In the Biomechanical FOR, therapeutic exercise is often used in combination with other techniques, such as joint mobilization or soft tissue mobilization, to help individuals achieve their therapeutic goals. The focus is on improving physical impairments and limitations to enable the individual to perform activities of daily living and achieve their occupational goals.

### Compensatory Techniques

Compensatory Techniques

Compensatory techniques in the Biomechanical Frame of Reference (FOR) involve adapting or modifying the task or environment to help individuals with physical impairments or limitations perform their desired occupations. This process can include modifying the environment by placing commonly used items at waist level or lower or modifying the task by using a different reaching pattern. Compensatory techniques can also reduce pain or discomfort during physical activities, such as providing larger, padded grips on objects for individuals with arthritis. The goal of compensatory techniques is to help individuals achieve their occupational goals by adapting the task or environment to their physical abilities while also working to improve their physical impairments or limitations through other therapeutic techniques.

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