Professional Certificate in Physical Therapy Techniques

Gait Analysis and Training

Gait Analysis: Gait analysis is a systematic study of human walking patterns, using the eye and brain of observers, augmented by instrumentation for measuring body movements, body mechanics, and the activity of the muscles. Gait analysis is used to assess and treat individuals with conditions such as cerebral palsy, stroke, and amputations. Acceleration: Acceleration is the rate of change of velocity of an object with respect to time. In gait analysis, acceleration is used to measure the rate of change of movement of the body segments. Activity-Based Interventions: Activity-based interventions are a type of therapy that focuses on helping individuals with disabilities to participate in everyday activities. In gait analysis and training, activity-based interventions are used to help individuals with gait disorders to improve their walking ability. Adaptive Equipment: Adaptive equipment refers to devices or tools that are used to assist individuals with disabilities to perform daily activities. In gait analysis and training, adaptive equipment such as canes or walkers may be used to help individuals with gait disorders to walk safely and independently. Ankle Dorsiflexion: Ankle dorsiflexion is the movement of the foot upwards towards the shin. In gait analysis, ankle dorsiflexion is an important movement that helps to control the foot during the swing phase of walking. Ankle Plantarflexion: Ankle plantarflexion is the movement of the foot downwards away from the shin. In gait analysis, ankle plantarflexion is an important movement that helps to propel the body forward during the stance phase of walking. Assistive Technology: Assistive technology refers to devices or tools that are used to assist individuals with disabilities to perform daily activities. In gait analysis and training, assistive technology such as orthotics or prosthetics may be used to help individuals with gait disorders to walk safely and independently. Base of Support: The base of support refers to the area within which the body is stable and balanced. In gait analysis, the base of support is an important factor in maintaining balance and preventing falls. Biomechanics: Biomechanics is the study of the mechanics of living organisms, including the study of movement and forces that act on the body. In gait analysis, biomechanics is used to understand the mechanics of walking and to identify abnormalities in gait patterns. Cadence: Cadence refers to the rate of steps taken per minute. In gait analysis, cadence is an important factor in determining walking speed and efficiency. Center of Gravity: The center of gravity refers to the point at which the weight of the body is evenly distributed. In gait analysis, the center of gravity is an important factor in maintaining balance and preventing falls. Circumduction: Circumduction is the movement of the leg in a circular motion, away from the midline of the body. In gait analysis, circumduction is an important movement that helps to widen the base of support and improve balance. Compensatory Strategies: Compensatory strategies refer to the techniques used by individuals with gait disorders to compensate for their abnormalities. In gait analysis and training, compensatory strategies such as using a cane or walker may be used to help individuals with gait disorders to walk safely and independently. Deceleration: Deceleration is the rate of change of velocity of an object with respect to time, in the opposite direction. In gait analysis, deceleration is used to measure

the rate of change of movement of the body segments. Double Support Phase: The double support phase refers to the period of time during walking when both feet are in contact with the ground. In gait analysis, the double support phase is an important factor in maintaining balance and preventing falls. Electromyography: Electromyography is a technique used to measure the activity of muscles using electrodes. In gait analysis, electromyography is used to measure the activity of muscles during walking and to identify abnormalities in muscle function. Energy Expenditure: Energy expenditure refers to the amount of energy used by the body to perform a particular activity. In gait analysis, energy expenditure is an important factor in determining walking efficiency and endurance. Flexion: Flexion is the movement of the joint in a direction that decreases the angle between the bones. In gait analysis, flexion is an important movement that helps to control the foot during the swing phase of walking. Foot Strike: Foot strike refers to the point at which the foot makes contact with the ground during walking. In gait analysis, foot strike is an important factor in determining walking pattern and efficiency. Gait Cycle: The gait cycle refers to the complete sequence of events that occurs during one step of walking, from the moment the foot strikes the ground to the moment it leaves the ground again. In gait analysis, the gait cycle is an important factor in understanding walking patterns and abnormalities. Gait Speed: Gait speed refers to the rate at which an individual walks. In gait analysis, gait speed is an important factor in determining walking efficiency and endurance. Gait Training: Gait training refers to the process of teaching individuals with gait disorders to walk safely and independently. In gait analysis and training, gait training is an important aspect of rehabilitation and therapy. Hip Abduction: Hip abduction is the movement of the leg away from the midline of the body. In gait analysis, hip abduction is an important movement that helps to widen the base of support and improve balance. Hip Flexion: Hip flexion is the movement of the leg in a direction that decreases the angle between the bones. In gait analysis, hip flexion is an important movement that helps to control the foot during the swing phase of walking. Inclinometer: An inclinometer is a device used to measure the angle of incline or decline of a surface. In gait analysis, an inclinometer may be used to measure the angle of the ground or floor to determine the effect of inclination on walking patterns. Inertial Measurement Unit: An inertial measurement unit is a device used to measure the acceleration, orientation, and velocity of an object. In gait analysis, an inertial measurement unit may be used to measure the movement of the body during walking. Knee Extension: Knee extension is the movement of the knee in a direction that increases the angle between the bones. In gait analysis, knee extension is an important movement that helps to control the foot during the stance phase of walking. Knee Flexion: Knee flexion is the movement of the knee in a direction that decreases the angle between the bones. In gait analysis, knee flexion is an important movement that helps to control the foot during the swing phase of walking. Load Cell: A load cell is a device used to measure the force or weight applied to a surface. In gait analysis, a load cell may be used to measure the force applied to the ground during walking. Motion Capture System: A motion capture system is a device used to track the movement of the body in three-dimensional space. In gait analysis, a motion capture system may be used to measure the movement of the body during walking. Muscle Activity: Muscle activity refers to the contraction and relaxation of muscles during movement. In gait analysis, muscle activity is an important factor in understanding walking patterns and abnormalities. Normal

Gait: Normal gait refers to the typical walking pattern of an individual without any gait disorders. In gait analysis, normal gait is used as a reference to compare with abnormal gait patterns. Orthotics: Orthotics refers to the use of devices such as braces or supports to correct or improve the function of a joint or limb. In gait analysis and training, orthotics may be used to help individuals with gait disorders to walk safely and independently. Pathology: Pathology refers to the study of diseases and abnormalities. In gait analysis, pathology is used to understand the underlying causes of gait disorders and to develop treatment plans. Physical Therapy: Physical therapy refers to the treatment of injuries or disabilities using exercise, manual therapy, and other techniques. In gait analysis and training, physical therapy is an important aspect of rehabilitation and therapy. Prosthetics: Prosthetics refers to the use of artificial devices to replace or support a missing or weak limb. In gait analysis and training, prosthetics may be used to help individuals with amputations to walk safely and independently. Range of Motion: Range of motion refers to the amount of movement that a joint can make. In gait analysis, range of motion is an important factor in determining walking patterns and abnormalities. Rehabilitation: Rehabilitation refers to the process of helping individuals with injuries or disabilities to recover and regain their function. In gait analysis and training, rehabilitation is an important aspect of treatment and therapy. Single Support Phase: The single support phase refers to the period of time during walking when only one foot is in contact with the ground. In gait analysis, the single support phase is an important factor in maintaining balance and preventing falls. Stance Phase: The stance phase refers to the period of time during walking when the foot is in contact with the ground. In gait analysis, the stance phase is an important factor in determining walking patterns and abnormalities. Stride Length: Stride length refers to the distance between the points at which the foot strikes the ground during two consecutive steps. In gait analysis, stride length is an important factor in determining walking efficiency and endurance. Swing Phase: The swing phase refers to the period of time during walking when the foot is not in contact with the ground. In gait analysis, the swing phase is an important factor in determining walking patterns and abnormalities. Temporospatial Parameters: Temporospatial parameters refer to the measures of time and space that are used to describe walking patterns. In gait analysis, temporospatial parameters such as cadence and stride length are used to evaluate walking efficiency and endurance. Three-Dimensional Motion Analysis: Three-dimensional motion analysis is a technique used to track the movement of the body in three-dimensional space. In gait analysis, three-dimensional motion analysis is used to measure the movement of the body during walking. Video Analysis: Video analysis is a technique used to evaluate walking patterns using video recordings. In gait analysis, video analysis is used to measure the movement of the body during walking and to identify abnormalities in gait patterns. Velocity: Velocity refers to the rate of change of position of an object with respect to time. In gait analysis, velocity is used to measure the rate of movement of the body segments. Weight Acceptance: Weight acceptance refers to the process of transferring weight from one foot to the other during walking. In gait analysis, weight acceptance is an important factor in maintaining balance and preventing falls. Zero Moment Point: The zero moment point refers to the point at which the moment of the ground reaction force is zero. In gait analysis, the zero moment point is an important factor in determining walking stability and balance.