

# [Chapter 24-motor control and motor learning](https://assignbuster.com/chapter-24-motor-control-and-motor-learning/)

Principles of Motor Learning\*Motor learning: learning and refinement of motor skills over time   
-Takes place in a complex interaction between child and environment   
-Refers to the intrinsic process that accompanies a child experiencing and participating in meaningful activities and the long-lasting changes in motor performance   
-Based on principles of neuroplasticityNeuroplasticity\*The ways the brain can change by laying down new circuitry and making new neural connections   
-Occur when the brain receives new information/stimuli   
-In response, permanent   
changes happen in   
the brain.   
-Learning requires feedback, feedforward, practice, modeling and transfer of learning. ONCHAPTER 24-MOTOR CONTROL AND MOTOR LEARNING SPECIFICALLY FOR YOUFOR ONLY$13. 90/PAGEOrder NowPrinciples of Motor Control\*Motor control: the ability to regulate or direct the mechanisms essential to movement   
-Role of CNS, techniques to quantify movement, nature and quality of the movement   
-Addresses posture, mobility, and fine motor and gross motor skills; explores motor development throughout the lifespan   
-Supports a dynamic systems approachPrinciples of Motor Control (cont'd)\*Dynamic systems theory: interplay between the neuromuscular system, the environment, cognition, and the intended task   
\*Change in one system affects the others.   
\*One task involves the dynamic interaction of many systems (e. g., visual, proprioceptive, tactile).   
\*To engage, one must have an intent to move (guided by a cognitive process).   
\*Change leads to neuroplasticity. Pillars of Motor Control\*Interventions are meaningful.   
-Children engage more and for longer when things   
are meaningful.   
\*Interventions closely mimic occupations of childhood.   
\*Intervention occurs in the   
\*setting similar to the natural   
\*context where the   
\*occupation takes place. Applying Motor Learning to Practice\*Motor learning concepts can inform occupational therapy intervention.   
-Use the concepts in a meaningful, occupation-based activity within the natural context. Feedback\*Informs the learning about progress in acquiring new motor skills   
\*Before (feedforward) and after (feedback) performance   
\*Intrinsic (within the child)   
\*Extrinsic (provided by an external source)   
\*Verbal and nonverbal   
\*Consider type, timing, motor outcomes. Feedback (cont'd)\*Feedforward: adjustments in anticipation of the movement required   
-OT may help by discussing the movement required before doing it   
\*Feedback: adjustments based on performance   
-OT may help by asking the child to reflect on the movement   
\*Intrinsic feedback: information a child received following a practice attempt (nervous system processes)   
\*Extrinsic feedback: provided by OT, others. Helpful in identifying errors in movementTiming of Feedback\*May be provided in various ways:   
-Concurrent: during the movement   
-Immediate: just following   
-Terminal: right at the completion   
-Delayed: after the movement has been completed and a time interval has transpired   
\*Sporadic (following some but not every trial) feedback was found to be more beneficial.   
\*Children respond to consistent extrinsic feedback at the beginning of a new skill, and then internalize it after practice. Modeling or Demonstration\*Providing visual information about how to perform a skill or task   
-Most effective when presented in natural context   
\*Demonstrations are best if provided:   
-Before practicing skill and in early stages of learning   
-Slowly, without verbal feedback   
-After emphasizing critical cues   
-Throughout practice as frequently as is helpfulVerbal Instruction\*Can be used to teach children and youth motor skill   
-Practice is typically preceded or accompanied by verbal instruction or cues.   
~Brief, 1-3 words   
-Once the child completes key components, the OT may provide additional verbal instruction to refine movement.   
-Providing repetitive practice   
with the same verbal instruction   
reinforces learningKnowledge of Results and Knowledge of Performance\*Knowledge of results (KR)   
-Information provided from external source about the outcome or end result   
-Helps children retain newly learned motor skills   
\*Knowledge of performance   
-Providing information about the nature or characteristic of the movement   
-Helps children understand how they could adjust or change movementsPractice and Repetition\*Repetition of motor tasks enhances brain development.   
\*Blocked practice: repeating the similar movements with short rest breaks   
\*Distributed: repetition of different skills spread over the course of the intervention with rest breaks   
\*Variable/random: practice of many different skills with periods of restTransfer of Learning/Generalization\*Applying past learning to new situations   
-Works best when client has opportunity for mastery of foundational skills first   
-Then you incorporate different skills. Motor Control Principles in Practice\*Motor memory includes registration of the influence and the internal feedback from the motor output back into the sensory system.   
-After this link is when learning occurs.   
-Motor control is best addressed by engaging the child in meaningful activities that closely mimic occupations of childhood and occur in natural context. Degrees of Freedom\*Joints vary in the amount of movement allowed, may be difficult for a child to control the movements   
-For fine motor tasks, a child must control the shoulder, wrist, elbow, and hand joints.   
~To increase control, the degrees of freedom can be limited by holding or stabilizing the jointCoordination and Timing\*Coordination: activation of specific muscles together   
-May be addressed by beginning with gross movements and progressing to more precise movements during intervention   
-Also by encouraging postural stability during tasks   
\*Timing may be promoted by including music, rhythmic songs, or counting. Strength and Muscle Tone\*Strength: ability to contact a muscle or muscle group against gravity and resistance   
-Children with motor deficits may have decreased strength and endurance, impacting occupational participation.   
\*Muscle tone: amount of tension in resting muscle or muscle group   
-Discrepancies interfere with occupations.   
-OT may focus on helping the child engage, allow him or her to refine motor skills